SOUTHWEST GENERAL HEALTH CENTER

Partnering with University Hospitals Health System

EMS Services

PRE-HOSPITAL CARE

MEDICAL CONTROL

PROTOCOLS AND PROCEDURES

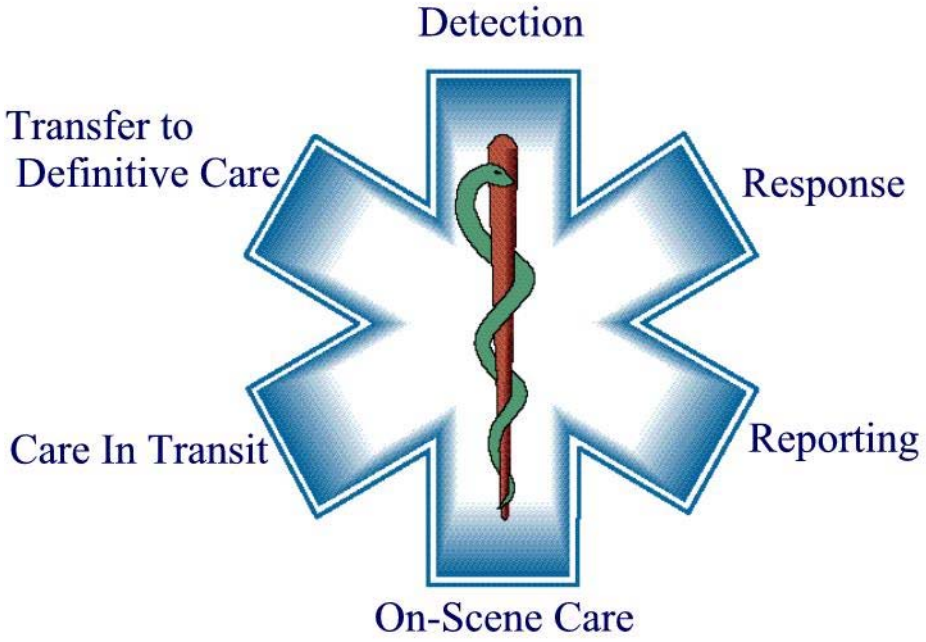


TABLE OF CONTENTS

ACLS

ACUTE CORONARY SYNDROME

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

UNIVERSAL PATIENT CARE PROTOCOL

Oxygen
10-15 L NRB

Apply Cardiac Monitor → **Go to Appropriate Dysrhythmia Protocol**

Obtain 12 – Lead EKG
(Look for ST Elevation)

IV PROTOCOL

ASPIRIN
324 mg chew and swallow
(81 mg / tab x 4)

NITROGLYCERIN 0.4 mg SL every 5 minutes x3
(If BP greater than 90 Systolic with IV)
(If BP greater than 110 Systolic without IV)
***Basic EMT's may assist pt. with 1 of their own nitro.**

→ **Hypotension / Dysrhythmias**
Treat per Appropriate Protocol

(if no relief with a toal o 3 NTG)
Morphine Sulfate
2 mg IV every 4-5 minutes titrated to respiratory status and pain (MAX = 10 mg)

Reassess and Monitor

Continued Pain?

Consider Nitrous Oxide if no relief from Morphine

CONTACT MEDICAL CONTROL

ACLS

ACUTE CORONARY SYNDROME

History	Signs and Symptoms	Differential Diagnosis
• Age • Medications • Past medical history (MI, Angina, Diabetes) • Recent physical exertion • Onset Palpatation	• CP (pain, pressure, aching, vice like tightness) • Location (substernal, arm, jaw, epigastric, neck, shoulder) • Radiation of pain • Pale, diaphoresis • Shortness of breath • Nausea, vomiting, dizziness	• Trauma vs. Medical • Angina vs. Myocardial infarction • Pericarditis • Pulmonary embolism • Asthma / COPD • Pneumothorax • Aortic dissection or aneurysm • GE reflux or Hiatal hernia • Esophageal spasm • Chest wall injury or pain • Pleural pain

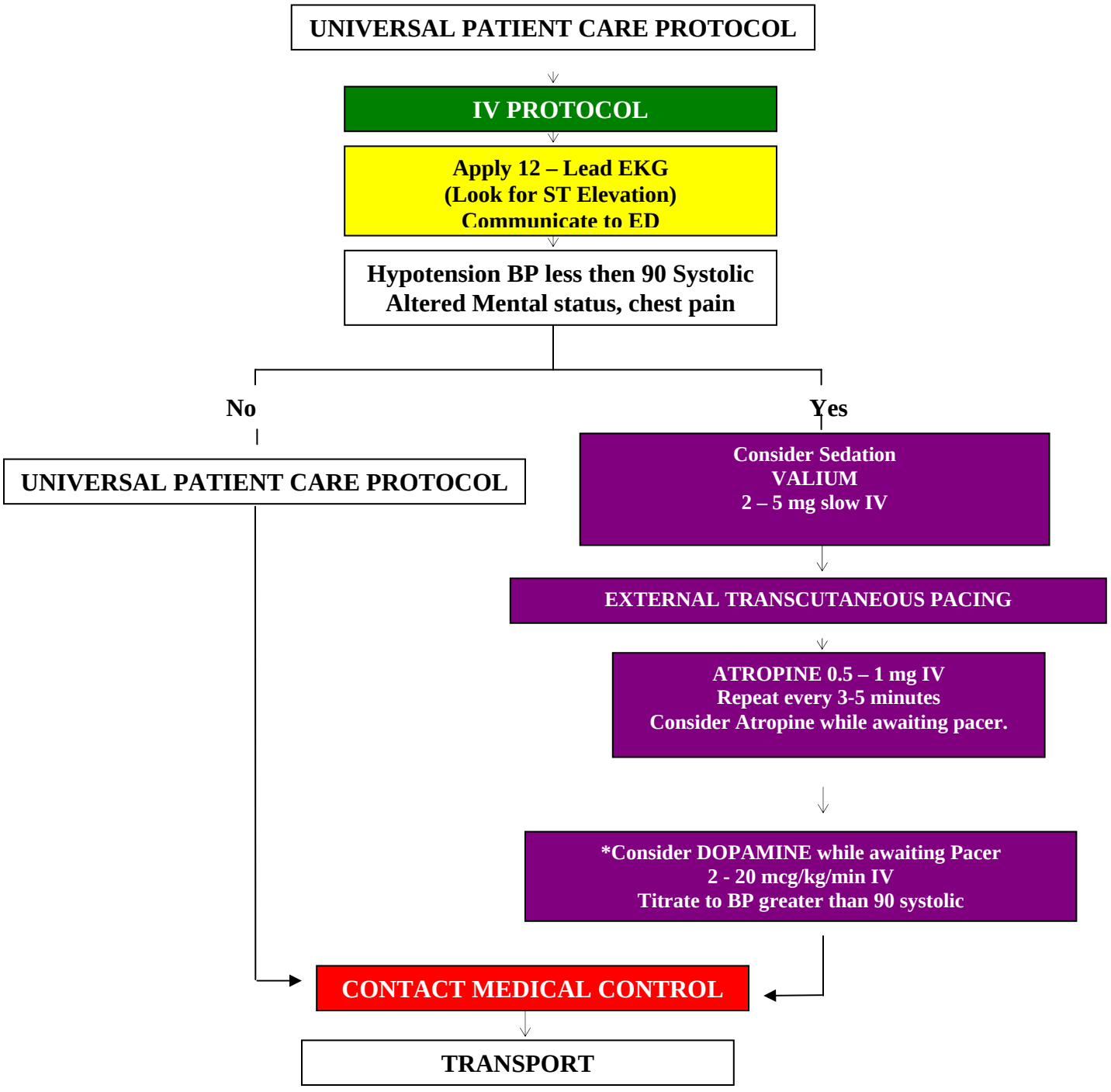
GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Be suspicious of a "Silent MI" in the elderly, diabetics, and women. Diabetics and geriatric patients often have atypical pain, or only generalized complaints.
- Consider other causes of chest pain such as aortic aneurysms, pericarditis, and pulmonary embolisms.
- Oxygen administration is first, 12-Lead EKG, continuous cardiac monitoring, and an IV are indicated for patient's who's chest pain was relieved prior to your arrival.
- All patients complaining of chest discomfort must be administered at least 4 lpm of oxygen by nasal cannula. Administer oxygen by non-rebreather or assist the patient's ventilations as indicated.
- Aspirin is administered to achieve a therapeutic dose of 324 mg (4 chewable, 81 mg tabs), unless allergic reaction or peptic ulcer disease.
- Nitroglycerin can be administered to a patient by EMS up to 3 doses. If the patient has already taken 3 of their own prior to your arrival, document if the patient had any changes in their symptoms or a headache after taking their own Nitroglycerin. **DO NOT** administer Nitroglycerin to a patient who took an erectile dysfunction medication (Viagra, Cialas, Levitra, etc.) within the last 48 hours due to potential severe hypotension.
- If patient has taken nitroglycerin without relief, consider potency of the medication. 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 or BP greater than 150 mmHg if over 70 years old.
- **DO NOT** treat the PVC's with Lidocaine or Amiodarone, if the patient is bradycardic.
- If positive ECG changes, establish a second IV while en route to the hospital.
- Monitor for hypotension after administration of nitroglycerin and morphine.
- If pain continues after O_2, ASA and Nitro, administer Morphine 2 mg IV every 4-5 minutes up to 10 mg. Titrate to response and respirations.
- If the patient becomes hypotensive from Nitroglycerin administration, place the patient in the Trendelenburg position and administer a 200 - 400 mL Normal Saline bolus.

ACLS

SINUS BRADYCARDIA

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



ACLS	2A
SINUS BRADYCARDIA	

History	Signs and Symptoms	Differential Diagnosis
• Past medical history • Medications • Beta Blockers • Calcium channel blockers • Digitalis • Pacemaker	• HR less than 60 per min. • Chest pain • Respiratory distress • Hypotension • Altered mental status • Syncope	• Acute MI • Hypoxia • Hypothermia • Sinus Brady • Athletes • Head Injury (elevated ICP) or Stroke • Spinal cord lesion • Sick Sinus Syndrome • AV blocks (1st, 2nd or 3rd degree)

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Neck, Heart, Lungs, 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

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

UNIVERSAL PATIENT CARE PROTOCOL

IV PROTOCOL

Stable

Vagal Maneuvers

ADENOSINE 6 mg IV push followed by 20 mL NS rapid flush (Not for atrial fibrillation)

No Response 1 – 2 minutes

ADENOSINE 12 mg IV followed by 20 mL NS rapid flush

No Response 1 – 2 minutes

Repeat ADENOSINE 12 mg IV, push followed by 20 mL NS rapid flush

No Response

Monitor and Reassess

Unstable

May go directly to Cardioversion

Consider Sedation VALIUM 2 – 5 mg slow IV

CARDIOVERSION Synchronized 50 – 100 J

No Response 1 – 2 minutes

Repeat Synchronized CARDIOVERSION 200, 300, 360 J

If rhythm changes, Go to Appropriate Protocol

CONTACT MEDICAL CONTROL

TRANSPORT

NARROW – COMPLEX TACHYCARDIA

History	Signs and Symptoms	Differential Diagnosis
• Past medical history • Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin) • Diet (caffeine, chocolate) • Drugs (nicotine, cocaine) • History of palpitations / heart racing • Syncope / near syncope	• HR greater than 150 per min • QRS 0.12 sec • Dizziness, CP, SOB • Potential presenting rhythm • Sinus Tachycardia • Atrial fibrillation / flutter • Multifocal atrial tachycardia	• Heart disease (WPW, Valvular) • Sick Sinus Syndrome • Myocardial infarction • Electrolyte imbalance • Exertion, pain, emotional stress • Fever • Hypoxia • Hypovolemia or anemia • Drug effect / overdose • Hyperthyroidism • Pulmonary embolus

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Adenosine may not be effective in identifiable atrial flutter / fibrillation, yet is not harmful.
- Continuous pulse oximetry is required for all SVT 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.
- Consider applying the Combo patches prior to Adenosine administration.
- When administering Adenosine, raise the patient's arm and immediately follow the bolus with 20 mL rapid bolus of normal saline.
- Record 3-Lead 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, refer to the appropriate protocol and treat accordingly. Be sure to switch the Life Pak 12 to PADDLES before defibrillating.
- Give a copy of the EKGs and code summaries to the receiving facility upon arrival.

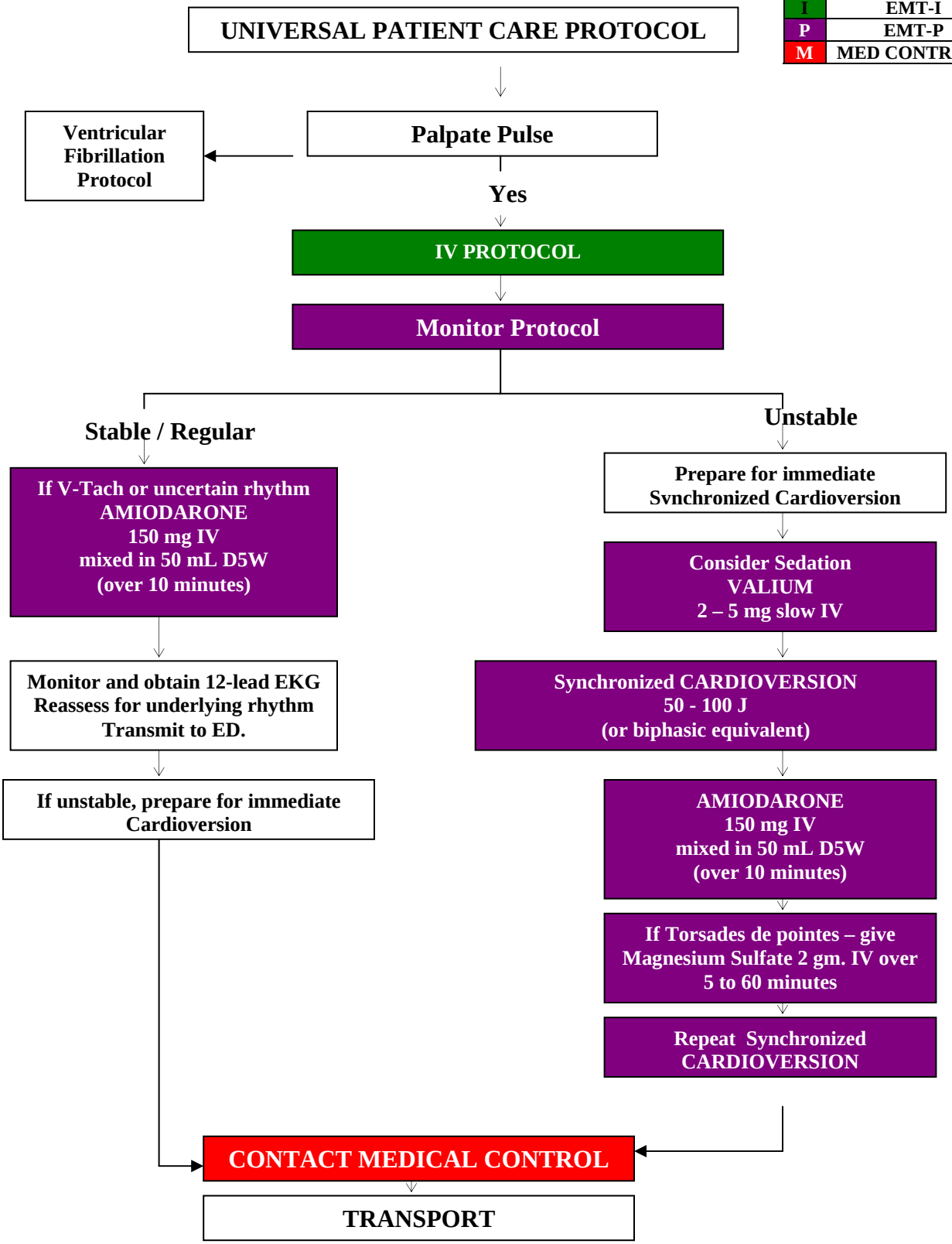
Synchronized Cardioversion (mono and biphasic monitors)

If:	Sequence:			
Atrial Fibrillation	100 to 200 J	300 J	360 J	
Stable monomorphic VT	100 to 200 J	300 J	360 J	
Other SVT Atrial Flutter	50 J	100 to 200 J	300 J	360 J
Polymorphic VT (irregular form and rate) and unstable	Treat as VF with high-energy shock (defibrillation doses)			

ARRHYTHMIAS / ACLS

WIDE – COMPLEX TACHYCARDIA

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



ACLS ACLS/ARRHYTHMIAS
WIDE – COMPLEX TACHYCARDIA

4A

History	Signs and Symptoms	Differential Diagnosis
• Past medical history / medications, diet, drugs • Syncope / near syncope • Palpitations • Pacemaker • Allergies: lidocaine / novacaine	• Ventricular tachycardia on ECG (Runs or sustained) • Conscious, rapid pulse • Chest pain, shortness of breath • Dizziness • Rate usually 150 - 180 bpm for sustained V-Tach	• Artifact / Device failure • Cardiac • Endocrine / Metabolic • Drugs • Pulmonary

GENERAL CONSIDERATIONS:

- 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.
- 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 12- Lead EKG prior to and after Amiodarone conversion or synchronized cardioversion of wide complex tachycardia / ventricular tachycardia.
- Perform a Code Summary and attach it to the patient run report.
- Be sure to treat the patient and not the monitor.
- Magnesium Sulfate can be mixed with NS or D5W.
- Amiodarone is only compatible with D5W.

Synchronized Cardioversion (mono and biphasic monitors)

If	Sequence			
Atrial Fibrillation	100 to 200 J	300 J	360 J	
Stable monomorphic VT	100 to 200 J	300 J	360 J	
Other SVT Atrial Flutter	50 J	100 to 200 J	300 J	360 J
Polymorphic VT (irregular form and rate) and unstable	Treat as VF with high-energy shock (defibrillation doses)			

CARDIAC ARREST

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

UNIVERSAL PATIENT CARE PROTOCOL

↓

Criteria for Death / DNR

- **Yes** → **Withhold Resuscitation Contact Medical Control**
- **Yes** → **Review DNR Comfort Care Guidelines**

  Contact Medical Control
- **No** ↓

***** If down time *less* than 4 min. Defibrillator / AED immediately**
***** If down time *over* 4 min. CPR x 5 cycles / 2 minutes, then check pulse and rhythm**

↓

CPR x 5 cycles / 2 minutes

↓

Attach Cardiac Monitor Defibrillator / AED → **Go to Appropriate Protocol**

↓

Deliver Shock x 1 if indicated

↓

CPR x 5 cycles / 2 minutes

↓

Airway Protocol

↓

Deliver Shock x 1 if indicated

↓

Maintain CPR / Airway

↓

Follow AED Prompts (If applicable)

↓

Continue CPR

↓

IV / IO PROTOCOL

↓

CONTACT MEDICAL CONTROL

↓

TRANSPORT

AT ANY TIME

Return of Spontaneous Circulation

GO TO POST RESUSCITATION CARDIAC CARE PROTOCOL

CARDIAC ARREST

History	Signs and Symptoms	Differential Diagnosis
• Events leading to arrest • Estimated downtime • Past medical history • Medications • Existence of terminal illness • Signs of lividity, rigor mortis • DNR or Living Will	• Unresponsive • Apneic • Pulseless	• Medical vs. Trauma • V. fib vs. Pulseless V. tach • Asystole • Pulseless electrical activity(PEA)

GENERAL CONSIDERATIONS:

- Exam: Mental Status
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- If witnessed arrest - administer a precordial thump. If unwitnessed, 2 min CPR x 5 cycles / 2 min.
- 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.
  1) estimated down time 2) medical history 3) complaints prior to arrest
  4) bystander CPR prior to EMS arrival 5) AED / CPR prior to EMS arrival
- Administer Dextrose only if the patient has a Glucose Level less than 80 with associated symptoms and is to 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.

During CPR Remember:

<table>
<tr><td>Push hard and fast</td><td rowspan="4">After an advanced airway is placed, rescuers no longer deliver “cycles” of CPR. Give continuous chest compressions without pauses for breaths. Give 8 - 10 breaths / min. Check rhythm every 2 min.</td><td rowspan="4">Search for and treat possible contributing factors:
Hypoxia, Hypovolemia, Hydrogen (acidosis), Hypo-Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac),Tension Pneumothorax, Thrombosis (coronary or pulmonary), Trauma</td></tr>
<tr><td>Ensure full chest recoil</td></tr>
<tr><td>Minimize interruptions in chest compressions</td></tr>
<tr><td>One cycle of CPR:
30 compressions then 2 breaths
5 “cycles” = 1-2 min.</td></tr>
<tr><td>Avoid hyperventilation</td><td>Rotate compressions every 2 min. with rhythm checks</td></tr>
<tr><td>Secure airway and confirm placement</td><td></td></tr>
</table>

- Medications down the endotrachael tube is to be used only if IV / EJ / IO routes can not be established

Endotrachael Guidelines - *Adult and Peds*

1) Lidocaine, Epi., Atropine, Narcan and Vasopressin can be given down the ET Tube
2) The optimal dose of most drugs given by ET is unknown
3) ET drugs deliver low blood levels. All drugs except Epi are given 2-3x’s normal dose.
4) Epi in low levels may produce transient, detrimental vasodilatation thus Epi down the ET Tube are given 10 x’s the normal dose
5) Instill the drug while briefly holding compressions, follow with 5 mL (smaller with neonates) of NS flush, followed by 5 positive-pressure ventilations.

CARDIAC ARREST / ACLS

ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

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

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for Death / DNR

Yes → **Withhold Resuscitation CONTACT MEDICAL CONTROL**

Criteria for DNR

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

No

CPR for 5 cycles

Airway Protocol

IV / IO PROTOCOL

Apply Cardiac Monitor (AED)

ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

Resume CPR for 5 cycles

EPINEPHRINE
1 mg IV / IO 1:10,000 Solution Repeat every 3-5 minutes
OR
VASOPRESSIN 40 units IV / IO. Give ONE Dose
****** Meds given IV / IO when available during CPR**

IF PEA HR less than 60
CONSIDER
ATROPINE 1 mg IV
Repeat every 3-5 minutes
TO 3 DOSES

Consider Termination if Jurisdiction Authorizes → **CONTACT MEDICAL CONTROL**

TRANSPORT

CARDIAC ARREST / ACLS

ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

History	Signs and Symptoms	Differential Diagnosis
• Past medical history • Medications • Events leading to arrest • End stage renal disease • Estimated downtime • Suspected hypothermia • Suspected overdose • DNR or Living Will • Tricyclics • Digitalis • Beta blockers • Calcium channel blockers	• Pulseless • Apneic • No electrical activity on ECG • Cyanosis	• Medical or Trauma • Hypoxia • Potassium (hypo / hyper) • Acidosis • Hypothermia • Device (lead) error • Death • Hypovolemia • Cardiac tamponade • Drug overdose (Tricyclics, Digitalis, Beta blockers, calcium channel blockers) • Massive Myocardial infarction • Tension pneumothorax • Pulmonary embolus

CONSIDER TREATABLE CAUSES	
• Hypovolemia • Hypoxia • Hydrogen ion (acidosis) • Hypo-hyperkalemia • Hypoglycemia • Hypothermia	• Tamponade, cardiac • Tension Pneumothorax • Thrombosis (coronary or pulmonary) • Trauma • Toxins

GENERAL CONSIDERATIONS:

- Exam: Mental Status
- Always confirm asystole in more than one lead.
- Consider each possible cause listed in the differential. Survival is based on identifying and correcting the cause!
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- Early identification and treatment of reversible causes of PEA, increases the chance of a successful outcome.
- Consider volume infusion for all patients in PEA. Be alert for fluid overload.
- Treat as ventricular fibrillation if you cannot differentiate between asystole and fine ventricular fibrillation.
- Medical Direction must be contacted prior to administering antidotes for all poisonings / overdoses except for narcotic overdoses.
- Dextrose 50% should only be administered to a patient with a confirmed blood glucose level less than 80 with associated symptoms.
- Vasopressin 40 units IV / IO / ET may be given x 1 to replace first or second dose of Epi.

CARDIAC ARREST / ACLS

VENTRICULAR FIBRILLATION (V-FIB)
PULSELESS VENTRICULAR TACHYCARDIA

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

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for Death / DNR

Yes → **Withhold Resuscitation and review DNR Comfort Care Guidelines**

*****If down time *less* than 4 min. Defibrillator / AED immediately**
*****If down time *over* 4 min. CPR x 5 cycles / 2 minutes, then check pulse and rhythm**

Apply Cardiac Monitor Defibrillator / AED → **Confirm V-Fib / Pulseless V-Tach**

Defibrillate 360 J or biphasic equivalent

Resume effective CPR x 5 cycles / 2 minutes, then check pulse & rhythm

AIRWAY PROTOCOL — **IV / IO PROTOCOL**

Continue effective CPR x 5 cycles / 2 minutes, then check pulse & rhythm

EPINEPHRINE 1 mg IV / IO
1:10,000 Solution
Repeat every 3-5 minutes
OR
VASOPRESSIN 40 units IV / IO GIVE ONE DOSE
******** Meds given IV / IO when available during CPR (before and after shock)

Defibrillate 360 J or biphasic equivalent

Continue effective CPR x 5 cycles / 2 minutes then check pulse & rhythm

Give Antiarrhythmic during CPR

Defibrillate 360 J after 5 cycles of CPR or biphasic equivalent

AMIODARONE
300 mg IV once
May repeat @150 mg IV once in 3-5 minutes
OR

LIDOCAINE
1-1.5 mg/kg IV
Repeat 0.5 – 0.75 mg/kg
In 3-5 minutes

CONSIDER

MAGNESIUM SULFATE
1 - 2 g slow IV
(Torsades, ONLY)

Continue effective CPR x 5 cycles / 2 minutes then check pulse & rhythm.
Continue CPR/Defib/Drug sequence as stated above

Consider Termination if Jurisdiction Authorizes → **CONTACT MEDICAL CONTROL**

TRANSPORT

VENTRICULAR FIBRILLATION (V – FIB)
PULSELESS VENTRICULAR TACHYCARDIA

History	Signs and Symptoms	Differential Diagnosis
• Estimated down time • Past medical history • Medications • Events leading to arrest • Renal failure / dialysis • DNR or Living Will	• Unresponsive, apneic, pulseless • Ventricular fibrillation or ventricular tachycardia on ECG	• Asystole • Artifact / Device failure • Cardiac • Endocrine / Metabolic • Drugs • Pulmonary

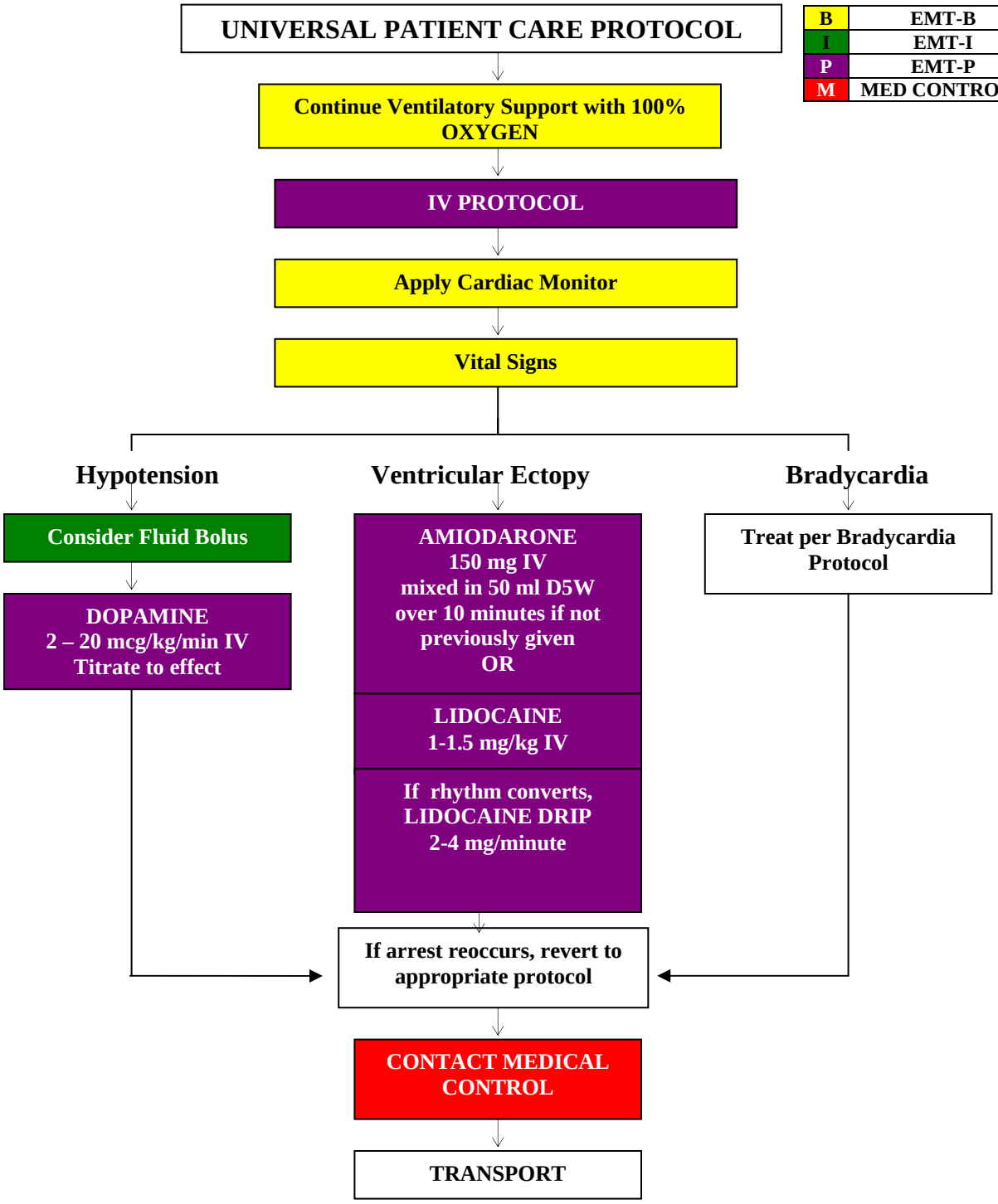
GENERAL CONSIDERATIONS:

- Exam: Mental Status
- Effective CPR should be as continuous as possible with a minimum of 5 cycles or 2 minutes.
- Reassess and document at least two methods of confirming endotracheal tube placement and end tidal CO_2 frequently, after every move, and at discharge.
- 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 40 units IV / IO / ET may be given x1 to replace first or second dose of Epi.
- Magnesium Sulfate should be administered early in the arrest if hypomagnesium (chronic alcoholic or malnourished patients) is suspected.
- Magnesium Sulfate can be mixed with NS or D5W.
- Amiodarone is the antiarrhythmic of choice in treating VF, Pulseless VT. Lidocaine is considered an alternative if amiodarone is not available.
- Amiodarone is only compatible with D5W.

CARDIAC ARREST / ACLS

POST – RESUSCITATION CARDIAC CARE

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



POST – RESUSCITATION CARDIAC CARE

History	Signs and Symptoms	Differential Diagnosis
• Respiratory arrest • Cardiac arrest	• Return of pulse	• Continue to address specific differentials associated with the original dysrhythmia

GENERAL CONSIDERATIONS:

- 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.
- Post resuscitation SVT should initially be left alone, but routinely monitor the patient. Follow Narrow Complex Tachycardia Protocol or contact Medical Control if the patient becomes hypotensive.
- If the patient is profoundly bradycardic, refer to the Sinus Bradycardia Protocol and treat accordingly.
- Adequate oxygenation is the key to a good outcome.
- Amiodarone is only compatible with D5W.