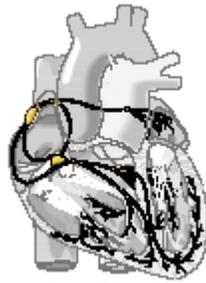


CARDIAC



PROTOCOLS

CARDIAC PROTOCOLS

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A
FULTON COUNTY EMS
CARDIAC ARREST PROTOCOL

PRIMARY **ABCD** SURVEY

- A** - Airway - open the airway
- B** - Breathing - provide positive pressure ventilations
- C** - Circulation - start chest compressions hard and fast (30:2)
- D** - Defibrillation - VF/VT

SECONDARY **ABCD** SURVEY

- A** - Airway - Advanced Airway, use adjunct, use capnography if available - reassess, reassess
- B** - Breathing - confirm breath sounds
- C** - Circulation - [IV/IO access](#)
- D** - Differential Diagnosis - search for treatable cause

Specific Information Needed:

A. Arrest History

1. Time of onset
2. Bystander CPR
3. Time lapse until CPR
4. Preceding symptoms
5. AED used

B. Medical History

1. Sample History
2. Diseases
3. Medications
4. Medical adjuncts, i.e. AID, Pacemaker
5. Establish known allergies
6. DNR - DNRCC in place

C. Environment

1. Evidence of drug ingestion
2. Evidence of any trauma
3. Note unusual presentations
4. Evidence of crime scene

Objective Findings

- A. Patient totally unresponsive
- B. Agonal Respirations or Apnea
- C. Absence of pulse, weak, thready
- D. Skin temperature vs. environment
- E. Evidence of dependent lividity (refer to DOA Protocol 700 Q)

Tab 800
Cardiac Protocol A-1

Treatment

- A. Scene safe, standard precautions
- B. Call for back-up early if needed
- C. Start CPR immediately
- D. Check rhythm with Defib/combo patch
 - After 2 minutes of CPR
 - Unless it is a witnessed arrest
- E. Treat according to appropriate protocol

Specific Considerations

- A. Cardiac arrest is a life threatening condition and initial treatment should preclude contact with **On-Line Medical Control**. **On-Line Medical Control** should be contacted where indicated in each specific protocol. **On-Line Medical Control** may be contacted earlier in the resuscitation than indicated in the protocol, but must be contacted no later than the point indicated in the protocol.
- B. Cardiac arrest in a significant trauma situation is not treated according to this protocol. In a trauma situation, following C-spine & airway control, transport should be rapid with all stabilization done enroute to the closest appropriate hospital. Refer to Trauma Arrest Protocol. Tab 800 D and Tab 1000 B
- C. Hypothermic cardiac arrest is not treated according to this protocol. Refer to Hypothermic Arrest Protocol. Tab 800 E
- D. Survival from cardiac arrest is related to both BLS and ALS treatment. With multiple responders, several treatments may be administered simultaneously. Assignments should be made so all resources are utilized to their fullest, i.e. CPR, packaging for Transport.
- E. See Pediatric Protocols (Tab 1100) for special pediatric treatments.
- F. Large peripheral veins (antecubital or external jugular) are preferred IV sites for cardiac arrest. 14-16ga catheters are optimum for peripheral vein cannulation. In the setting of peripheral collapse, multiple IV attempts and IO infusion be considered immediately. See IO Protocol, Tab 500 U).
- G. The first paramedic on scene should check and document the effectiveness of CPR while in progress. Pulselessness should also be checked since cardiac function could have returned after an arrhythmia or vasovagal episode.
- H. The EDD (Esophageal Detection Device) and **capnography** should always be utilized as standard adjuncts to determine endotracheal tube placement when equipment is available.

Tab 800
Cardiac Protocol A-2

I. Medications that may be given via the endotracheal tube if no IV/IO access, are:

1. **Narcan**
2. **Atropine 8mg/20ml concentration**
3. **Valium (non oil based)**
4. **Epinephrine - 1:1000 concentration only**
5. **Lidocaine (no Fulton Co.)**

The dosage of these medications, when administered into the tracheal bronchial tree, should be 2 times the dose otherwise given IV. Medications given endotracheally require a **10ml of saline flush**. This can be accomplished by drawing up 10ml of saline from the IV bag and injecting it into the ET tube after the medication is given.

J. It should be noted that **Amiodarone** and **Vasopressin** may not be administered endotracheally. Given the scenario that a patient is intubated with no IV or IO access, **Epinephrine** should be administered in lieu of **Vasopressin**. If **Epinephrine** is administered endotracheally and IV access then occurs, when the next dose of **Epinephrine** is indicated **Vasopressin** should be administered IV or IO in lieu of **Epinephrine**.

K. If any underlying cause of the arrest is suspected, i.e., hypothermia, diabetes, overdose, it is appropriate to integrate those treatment protocols during the resuscitation attempt. **Do not, however, delay administration of cardiac medications while integrating treatments from other protocols.**

L. **If the patient has any evidence of trauma e.g. small chin laceration or abrasion of the face. Full C-Spine precautions will be initiated.** It is strongly recommended prior to movement of the unconscious patient that an immobilization method is utilized to control the head. CID, towel rolls, or other appropriate methods as available should be utilized, and documented.

M. In post resuscitation scenarios with a perfusing rhythm a 12 lead will be done if possible. Administer I.C.E. Protocol (Cardiac S-1).

A. Ventricular Fibrillation / Ventricular Tachycardia
Unwitnessed (if witnessed, precordial thump is acceptable)

1. Safe scene, standard precautions.
2. Establish unresponsiveness, apnea, and pulselessness
3. Start CPR immediately, CPR should be hard and fast at (30:2) rate
4. Apply Defib/Combo Patch
 - i. Apply pads immediately if arrest is witnessed
 - ii. Perform 2 minutes of CPR prior to Defib for all unwitnessed arrests
5. Identify rhythm as V-fib or pulseless V-tach.
6. Defibrillation
 - i. Bi-phasic monitors (LP-12)
 1. Defibrillation should be performed utilizing escalating energy levels by starting at 200 J, then 300 J, followed by 360 J. **NOTE:** two minutes of CPR should be performed between defibrillation attempts.
 - ii. Mono-phasic monitors (LP-11)
 1. Defibrillation should be performed utilizing 360 J for all defibrillations. **NOTE:** two minutes of CPR should be performed between defibrillation attempts.
7. Resume CPR for 5 cycles of (30:2) or approximately 2 minutes
8. Insert advanced airway, use TubeChek, confirm bilateral breath sounds, and secure endotracheal tube, Reconfirmation mandated every time the patient is moved.
9. Establish IV of **1000ml Normal Saline** using large bore catheter and regular drip (10gtt) tubing in a large peripheral vein. **Consider IO use if peripheral IV access cannot be rapidly established.**
10. Administer **Vasopressin 40U** (one time dose) IV push, followed by a 20ml flush of saline. Raise extremity and circulate with CPR or **1 mg of Epinephrine 1:10000** IV push every 3-5 minutes for duration of rhythm*.

Tab 800
Cardiac Protocol B-1

Ventricular Fibrillation, cont.

11. Check pulse, if no change; administer **Amiodarone 300mg** IV push followed by a **20ml saline flush (one time dose)**. Raise extremity and circulate with CPR.

Repeat **Amiodarone 150mg** IV push in 3-5 minutes*.

12. Consider **Magnesium Sulfate infusion 1-2 g** IV/IO for Torsades de Pointes*.

*** All Medications should be administered concurrently with CPR being performed, then followed by defibrillation.**

13. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. CPR should be maintained during this time. It should also be considered that while the "Paramedic" is giving the assessment to **On-Line Medical Control** that other responders should ready patient for transport and move patient to vehicle.

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
ON-LINE MEDICAL CONTROL**

I. Epinephrine 1mg 1/10,000 every 3-5 minutes.

Tab 800
Cardiac Protocol B-2

**C
PULSELESS ARREST - ASYSTOLE / PEA**

This protocol applies to rhythms that present with **no pulse** except V-fib/V-tach. PEA can be caused by many underlying factors. The following possible causes should

Be considered and if verified, the appropriate treatment administered prior to Epinephrine or Atropine therapy. Use the 6 H's and 5 T's acronym.

A. Hypovolemia

1. Treat with volume infusion

B. Hypoxia

1. Treat with increase ventilation, consider intubation

C. Hydrogen ion - Acidosis

1. Increase ventilations
2. **1 mEq/kg Sodium Bicarb**; may be repeated **every 10min. at ½ dose**

D. Hyperkalemia

1. Unable to recognize in prehospital setting (proceed with PEA protocol)

E. Hypothermia

1. See Hypothermia Tab 800 F

F. Hypoglycemia

1. See Coma Tab 900

G. Tablets - Drug Overdose

1. **ONE mEq/kg Sodium Bicarb** and medications per Overdose Tab 900 C if tricyclic suspected.

H. Tamponade, cardiac

1. No prehospital field treatment available (proceed with PEA protocol)

I. Tension Pneumothorax

1. See Needle Decompression Protocol Tab 500, G.

J. Thrombosis, Coronary or Pulmonary

1. Unable to treat in prehospital setting (proceed with PEA protocol)

K. Toxins

1. Treat per tab 900, C - Poisoning and Overdose

Tab 800
Cardiac Protocol C-1

Asystole / PEA, cont.

Asystole / Pulseless Electrical Activity

1. Safe scene, standard precautions.

2. Established unresponsiveness, apnea, and pulselessness.
3. Start manual CPR immediately, CPR should be hard and fast at (30:2) rate, for duration of arrest. Apply AutoPulse if pt. meets size requirements.
4. Apply combo patch
5. Identify rhythm,
 - Absence of palpable pulses confirms PEA.
 - Consider early in all PEA pts.
 - Fluid Bolus
 - **D50 25 grams IV/IO**
 - **Narcan 4mg IV/IO**
 - Absence of electrical activity in 2 or more contiguous leads confirms Asystole
6. Advanced Airway, use TubeCheck, confirm bilateral breath sounds and secure tube. Reconfirmation is mandated every time patient is moved. **DO NOT STOP CPR FOR ADVANCED AIRWAY PLACEMENT.**
7. Hard wire patient monitor lead II.
8. Establish IV of **1000ml Normal Saline** using large bore catheter and regular drip (10gtt) tubing in a large peripheral vein. Consider IO use if peripheral IV access cannot be rapidly established.
9. Administer **40 units Vasopressin** or **1mg 1:10,000 Epinephrine** (every 3-5 minutes) IV push followed by a **20ml saline flush**. Raise extremity and circulate with CPR.
10. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. CPR should be maintained during this time. It should also be considered that while the "Paramedic" is giving the assessment to **On-Line Medical Control** that other responders should ready patient for transport and move patient to vehicle.

Tab 800
Cardiac Protocol C-2

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
On-Line MEDICAL CONTROL**

- I. Check pulse, if no change and **Sodium Bicarb** has not been given before **Epinephrine** (i.e., drug overdose); **administer Sodium Bicarb 1mEq/kg.**

Raise extremity and circulate with CPR.

- II. Paramedics should note that patients with persistent asystole, **On-Line Medical Control** may be contacted and asked if the paramedics may discontinue efforts after two full rounds of **Epinephrine**. Resuscitative measures may only be discontinued in this scenario with **On-Line Medical Control** permission.

Tab 800
Cardiac Protocol C-3

D
TRAUMA CARDIAC ARREST

This protocol applies to the patient who has sustained a cardiac arrest from significant trauma. The emphasis in this protocol will be to load and go. Trauma arrest patients are difficult to handle in the pre-hospital setting. Traumatic cardiac arrest should be transported A.S.A.P. to the closest hospital. The patient should have no delay in transport after extrication, except as needed for c-spine, uncontrollable hemorrhage and airway control. It should also be considered to contact **On-Line Medical Control** early and notify of treatments done thus far

so they can be ready to accept patient.

1. Minimal Radio Report

- a. Contact with **On-Line Medical Control** is required
- b. Four elements are required when reporting a traumatic arrest patient. The acronym **TEAM** should be used.
 1. **T. Trauma Protocol:** The paramedic must state that "the patient meets State of Ohio Trauma Triage Protocol criteria".
 2. **E. ETA:** Provide an ETA to the closest facility and identify that facility
 3. **A. Age:** Age of patient.
M. Matter: - What's the matter: Briefly describe what injuries or physiologic changes are present that include patient or trauma protocol. The "Paramedic" should utilize other responders for extrication and other tasks, i.e., setting up IVS in the squad during extrication. "Patients, who survive prehospital cardiopulmonary arrest associated with trauma, generally have received early "prehospital" Advanced Airway, and undergo prompt transport by highly skilled paramedics to a definitive care facility." (JAMA p2247) For other specific information regarding traumatic cardiac arrest, refer to Tab 1000 B-1,B-2.

Traumatic Death

A. Trauma Arrest

1. Safe scene, standard precautions.
2. Manual C-spine control, (patient should be C-collared and back boarded with CID as soon as possible)
3. Establish unresponsiveness, apnea, and pulselessness.
4. Start CPR immediately, CPR should be hard and fast at (30:2) rate, for duration of arrest.
5. Apply combo patch
6. **Treat rhythm per appropriate protocol.**
7. Move patient to vehicle, all other treatments performed enroute to hospital.

Tab 800
Cardiac Protocol D-1

Trauma Cardiac Arrest, cont.

8. An Advanced Airway should be inserted as soon as possible and breath sounds confirmed every time the patient is moved. However, do not withhold ventilation until equipment is available. The patient should be ventilated immediately. Advanced Airway placement must be accomplished maintaining C-spine control. Reconfirmation is mandated every time the patient is moved.
9. **Enroute, establish two IVS of 1000ml Normal Saline using a large bore catheter and regular drip (10gtt) tubing in large peripheral vein or IO needle.**

10. Contact **On-Line Medical Control** and notify of treatments done thus far. CPR should be maintained during this time.
11. Check pulse, if none, continue CPR and continue to **treat rhythm according to appropriate protocol**. (If asystole, refer to Tab 1000 B-1, B-2)

Tab 800
Cardiac Protocol D-2

E
HYPOTHERMIC CARDIAC ARREST PROTOCOL

This protocol applies to patients with suspected hypothermia. These patients are load and go situations. **It should be noted:** that cardiac medications should not be administered to hypothermic patients unless directed by **On-Line Medical Control**. Rewarming attempts should be done enroute to hospital.

- A. Patient with suspected hypothermia
 1. Safe scene, standard precautions.

2. Remove patient from environment (maintain horizontal position and avoid rough movement and excess activity).
3. Remove all wet garments.
4. Protect against heat loss and wind chill (use blankets and insulating equipment).
5. Establish unresponsiveness, apnea, and pulselessness.
6. Start CPR immediately, CPR should be hard and fast at (30:2) rate, for duration of arrest
7. Apply Combo Patch and identify rhythm.
8. If no pulse and V-fib/V-tach, apply AED, or defibrillate at 200J bi-phasic or 360J mono-phasic, (If rhythm other than V-fib/V-tach, go to 8)
9. Check pulse, if no pulse resume CPR.
10. Place Advanced Airway, use capnography, confirm bilateral breath sounds, and secure tube. Reconfirmation is mandated every time the patient is moved.
11. Attach cardiac monitor and monitor lead II
12. Establish IV 1000ml Normal Saline utilizing WARM IV fluids if available, using a large bore catheter and regular drip (10gtt) tubing in a large peripheral vein enroute to hospital.
13. Continue warming efforts and contact **On-Line Medical Control** with assessment and for medications administration intervals.

Tab 800
Cardiac Protocol E-1

F
BRADYCARDIA PROTOCOL
(Patient is not in cardiac arrest)

This protocol applies to the following rhythms:

1. Sinus Bradycardia
2. First Degree AV Block
3. Relative Bradycardia
4. Absolute Bradycardia
5. Second Degree Mobitz I (Wenckebach)

Treatment may not be required if patient is not symptomatic. Your key clinical question should be is the bradycardia making your patient ill or is an illness making your patient bradycardic. If the patient displays any of the following symptoms and is symptomatic, treatment should be initiated. It should also be noted that if the patient is severely symptomatic, go immediately to TCP (Transcutaneous Pacing). Denervated transplanted hearts (patients who have had a heart transplant) will not respond to **Atropine** and TCP as indicated as initial response to Bradycardia.

- A. Chest Pain
- B. Shortness of Breath
- C. Decreased/Altered Level of Consciousness
- D. Hypotension
- E. PVC's

A. Bradycardia

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation
4. Start **oxygen** therapy, as indicated.
5. Attach cardiac monitor and monitor lead II.
6. Identify rhythm as Bradycardia.
7. Establish an **IV of 1000ml Normal Saline** using a regular drip tubing (10gtts)
8. Take vitals, pulse, BP, respirations, pulse oximeter, **12 lead**

Tab 800
Cardiac Protocol F-1

Bradycardia, cont.

9. If patient is **SEVERELY SYMPTOMATIC OR HISTORY OF CARDIAC TRANSPLANTATION, go to #10**. Administer **Atropine 0.5mg** IV push for mildly symptomatic bradycardia followed by a **20ml saline flush**, use **1mg** for severe symptoms if TCP not effective. (**repeat dose every 3-5 minutes to a total dose of 0.03mg./kg** is given or a perfusing heart rate is achieved).
10. **TCP** (Transcutaneous Pacing). Explain procedure to patient, **set rate at 80**, start pacing at **20 milliamps**, and increase in increments of **5 milliamps** until capture. If patient cannot tolerate pacer, weighs over 50kg, and has a systolic BP >110 mm. Hg. administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push. If weight is less than 50kg, BP <110mm Hg or a second analgesic dose is required, contact **On-Line**

Medical Control for choice and dose of sedation medication.

11. Repeat set of vitals, if no change, administer a **Dopamine drip (400 mg in 250 ml of D5W) and start at 5 ug/kg/min. Titrate drip up to 10 ug/kg/min** or until a perfusing heart rate and BP are achieved.
 12. Repeat set of vitals, if no change, administer an **Epinephrine drip (2 mg of 1:1000 Epinephrine in 250 ml of D5W) and start the drip of 2 ug/min (15 gtts/min). Titrate up to 10 ug/min** or until a perfusing heart rate and BP are achieved. **A second IV line is desired, however, do not withhold medication if second IV is unobtainable.**
 13. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving the assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.
- * Search for and treat any possible contributing factors. (6 H's and 5 T's)

Tab 800
Cardiac Protocol F-2

Bradycardia, cont.

BRADYCARDIA

1. Safe scene standard precautions
2. Reassure patient
3. ABC (airway, breathing, circulation)
4. **Oxygen**
5. Attach cardiac monitor (monitor lead II)

6. Identify rhythm
7. IV Normal Saline 1000ml bag
8. Vitals/pulse oximeter, 12 lead
9. If **SEVERELY SYMPTOMATIC OR HISTORY OF CARDIAC TRANSPLANTATION**, go to #10.. **Atropine 0.5mg.** (mild bradycardia) **1mg** if severe bradycardia (if TCP ineffective) IV push every 3-5 minutes up to a total dose of **0.03mg/kg.**
10. Repeat vitals, if not change, **TCP (Transcutaneous Pacing) set rate at 80 and 20 milliamps, increase in increments of 5 milliamps until capture.** If weight is greater than 50kg and BP >110mm Hg., Administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push. If weight is less than 50kg, BP <110 mm Hg, or a second analgesic dose is required, contact **On-Line Medical Control** for choice and dose of sedation medication.
11. Repeat vitals, if no change, start **Dopamine drip at 5 ug/kg/min and titrate up to 10 ug/kg/min for effect.**
12. Repeat vitals, if no change, **Epinephrine 2ug/min IV drip, titrate up to 10ug/min for effect starting at 15gtt a minute.** (2 ug/min) Second IV desired.
13. Contact **On-Line Medical Control**, move patient

Tab 800
Cardiac Protocol F-3

G
THIRD DEGREE HEART BLOCK
TYPE II SECOND-DEGREE AV BLOCK
(Patient is not in cardiac arrest)

Treatment may not be required if the patient is not symptomatic. If patient displays any of the following symptoms and is symptomatic, treatment should be initiated. Moving as quickly as possible to TCP.

- A. Chest Pain
- B. Shortness of Breath

- C. Decreased Level of Consciousness
- D. Hypotension
- E. PVC's

A. Third Degree AV Block

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation.
4. Start **oxygen** therapy as indicated.
5. Attach cardiac monitor and monitor lead II.
6. Identify rhythm
7. Establish an IV of **1000ml Normal Saline** using a regular drip tubing 10gtts).
8. Take vitals, pulse, BP, respirations, pulse oximeter, 12 lead
9. **TCP (Transcutaneous Pacing). Explain procedure to patient, set rate at 80, start pacing at 20 milliamps, and increase in increments of 5 milliamps until capture.** If patient cannot tolerate pacer, weighs over 50kg, and has a systolic BP >110 mm Hg administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push. If weight is less than 50kg. BP <110mm Hg or a second analgesic dose is required, contact **On-Line Medical Control** for choice and dose of sedation medication.

Tab 800
Cardiac Protocol G-1

Third Degree Heart Block, cont.

10. Repeat set of vitals, if heart rate has not increased enough to provide adequate perfusion, administer **Dopamine drip at 5 ug/kg/min and titrate to obtain a perfusing heart rate or a maximum of 10 ug/kg/min.**
11. Repeat set of vitals, if no change, administer an **Epinephrine drip at 2 ug/min mix 2mg 1:1000 Epinephrine in 250ml D5W** (this gives you a concentration of 8ug per ml) and **titrate to a maximum of 10 ug/minute** or until a perfusing heart rate is achieved. Start at **15 gtts a minute to achieve low-end dose of 2ug/min.** A second IV line is desired; however do not delay administration of medication if second IV is unobtainable.

12. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving the assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

Tab 800
Cardiac Protocol G-2

Third Degree Heart Block, cont.

THIRD DEGREE AV BLOCK

1. Safe scene, standard precautions
2. Reassure patient
3. ABC (airway, breathing, circulation)
4. **Oxygen**
5. Attach cardiac monitor (monitor lead II)
6. Identify rhythm
7. **IV Normal Saline 1000ml bag**

8. Vitals, pulse oximeter, 12 lead
9. **TCP (Transcutaneous Pacing) set rate at 80 and 20 milliamps, increase in increments of 5 milliamps until capture.** If weight is greater than 50kg and BP >110mm Hg, **Versed 5mg** slow IV push or **Valium 5mg** slow IV push. If weight is less than 50kg, BP <110 mm Hg, or a second analgesic dose is required, contact **On-Line Medical Control** for choice and dose of sedation medication.
10. Repeat vitals, if no change **Dopamine 5 ug/kg/min IV drip; titrate for effect up to 10 ug/kg/min.**
11. Repeat vitals, if no change **Epinephrine 2ug/min IV drip, titrate for effect (start at 15 gtt/s a minute) up to 10 ug/minute.**
12. Contact **On-Line Medical Control**, move patient

Tab 800
Cardiac Protocol G-3

H
UNSTABLE TACHYCARDIA PROTOCOL
(Not in cardiac arrest)

This protocol applies to the following rhythms with **rates >150 and unstable signs and symptoms.**

1. Atrial Fibrillation or flutter.
2. Wide complex tachycardia of uncertain type.
3. PSVT (Paroxysmal Supraventricular Tachycardia).
4. VT (Ventricular Tachycardia).
5. Polymorphic Ventricular Tachycardia.

Signs and symptoms of the unstable patient are as follows:

- A. Chest Pain
- B. Shortness of Breath

- C. Decreased Level of Consciousness
- D. Hypotension (systolic BP <100 mmHg with other indicators of inadequate perfusion)
- E. Pulmonary Congestion from heart failure
- F. Evidence of Acute Myocardial Infarction

A. Tachycardia

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation. (Take suction and intubation precautions).
4. Start **oxygen** therapy as indicated.
5. Attach cardiac monitor, monitor lead II and attach Defib patches.
6. Identify rhythm as tachycardia.
7. Establish an **IV of 0.9% Normal Saline** using a regular drip tubing. (10gtt)
8. Take vitals, pulse, BP, respirations, pulse oximeter
9. If patient weight is greater than 50kg and systolic BP is >110 mm Hg, administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push. If weight is less than 50kg or BP <110 mm Hg, contact **On-Line Medical Control** for choice and dose of sedation medication.

Tab 800
Cardiac Protocol H-1

Unstable Tachycardia, cont.

10. Synchronized cardioversion:
 - a. For Monomorphic VT: **100J**, if no change **200J**, if no change **300J**, if no change **360J**, if no change, treat per Borderline V-Tach Protocol: J beginning at #9.
Polymorphic VT (irregular form and irregular rate) Treat as VF with high energy shock (Defibrillation doses)
 - b. For SVT or Atrial Flutter: **50-100J**, if no change **200J**, if no change **300J**, if no change **360J**, if no change then treat per Borderline PSVT Protocol: I beginning at #10.
 - c. For Atrial Fibrillation: **100J**, if no change **200J**, if no change, **300J**, if no change, **360J**, if no change treat per borderline Atrial Fibrillation Protocol: L, beginning at 10.
11. Repeat vitals, acquire 12 lead.
12. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving

assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

Tab 800
Cardiac Protocol H-2

I
NARROW COMPLEX TACHYCARDIA AND
PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA (PSVT)
(Stable or borderline)

This protocol applies to the patient who is slightly symptomatic or whose condition has deteriorated since initial assessment.

A. Paroxysmal Supraventricular Tachycardia

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation.
4. Start **oxygen** therapy as indicated.

5. Attach cardiac monitor and monitor lead II.
6. Identify rhythm.
7. Establish an **IV of 0.9% Normal Saline** using regular drip tubing. (10gtt)
8. Take vitals, pulse, BP, respirations, pulse oximeter, **12 lead**
9. Institute vagal maneuvers: i.e.
 - a. Baring down
 - b. Coughing
 - c. Breath holding (if possible)
 - d. Carotid sinus pressure is contraindicated
 - e. Avoid ice in patients with ischemic heart disease
10. Repeat set of vitals, if no change administer **Adenocard 6mg rapid IV** push over 1-3 sec. **Adenocard** requires a saline flush **simultaneously** during the injection. With a second syringe draw up **20 ml of saline** and flush the line while injecting the **Adenocard. (Adenocard must reach the heart in 5 seconds once it's intravenous.)**
11. Repeat set of vitals, if no change, administer **Adenocard 12mg rapid IV** push over 1-3 sec with an **immediate 20ml saline flush** (squeeze bag). This **12 mg dose** may be repeated one time in 1-2 minutes.

Tab 800
Cardiac Protocol I-1

PSVT, cont.

12. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving assessment to **On-Line Medical Control** other responders should ready patient for transport and move patient to vehicle.

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
On-Line Medical Control**

- I. Administer **2.5-5mg Verapamil IVP** over 2-3 minutes.
- II. **Calcium Chloride** should be available in case of Calcium Channel Blocker Toxicity, **Dose 2-4 mg/kg IVP**
- III. Repeat set of vitals, if no change and patient weight is greater

than 50kg and BP >110mm, administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push and **Morphine Sulfate 2-4 mg** slow IVP

- IV. Repeat set of vitals, if no change, **synchronized cardioversion** at **100J**, if no change **200J**, if no change **300J**, if no change **360J**.

Tab 800
Cardiac Protocol I-2

J
MONOMORPHIC OR POLYMORPHIC VENTRICULAR TACHYCARDIA
(Stable or Borderline)

This protocol applies to the patient who has a pulse and heart rate of <150 and is symptomatic or who's condition has deteriorated since initial assessment.

A. Ventricular Tachycardia

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation.
4. Start **oxygen** therapy as indicated.
5. Attach cardiac monitor and monitor lead II.

6. Identify rhythm as Ventricular Tachycardia.
7. Establish an IV of **0.9% Normal Saline** using a regular drip tubing. (10gtt).
8. Take vitals, pulse, BP, respirations, pulse oximeter, 12-lead.
9. Administer **Amiodarone 150mg** over 10 min. This is accomplished by putting **150mg in a 50ml bag of D5W** with a regular 10 gtts administration set and set your drip rate at 50 gtts per minute. Dose may be repeated in 10-15 min.
10. Repeat set of vitals, 12-lead.
11. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
On-Line Medical Control**

- I. Repeat set of vitals, if no change and patient weight is greater than 50kg and BP >110, administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push
- II. **Synchronized cardioversion 100J**, if no change **200J**, if no change **300J**, if no change **360J**.

Tab 800
Cardiac Protocol J-1

K
WIDE COMPLEX TACHYCARDIA OF UNCERTAIN TYPE
STABLE OR BORDERLINE

This protocol applies to the patient who has a pulse and heart rate of <150 and is symptomatic or who's condition has deteriorated since initial assessment.

A. Wide Complex Tachycardia of uncertain type

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation.
4. Start **oxygen** therapy as indicated.
5. Attach cardiac monitor and monitor lead II.
6. Identify rhythm as Ventricular Tachycardia.

7. Establish an IV of **0.9% Normal Saline** using a regular drip tubing. (10gtt)
8. Take vitals, pulse, BP, respirations, pulse oximeter, **12-lead**
9. Administer **Amiodarone 150mg** over 10 min. This is accomplished by putting **150mg in a 50ml bag of D5W** with a regular 10 gtts administration set and setting your drip rate at 50 gtts per minute. Dose may be repeated in 10-15 min.
10. Repeat set of vitals, **12 lead**.
11. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
On-Line Medical Control**

- I. Repeat set of vitals, if no change, and patient weight is greater than 50kg and BP >110, administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push
- II. **Synchronized cardioversion at 100J**, if no change **200J**, if no change **300J**, if no change **360J**.

Tab 800
Cardiac Protocol K-1

L

**ATRIAL FIBRILLATION/FLUTTER TACHYCARDIA
(Borderline/Symptomatic)**

This protocol applies to the patient who is mildly symptomatic or who's condition has deteriorated since initial assessment. Keep in mind that Atrial Fibrillation is a normal chronic condition for many of our geriatric patients, and these patients are not treated under this protocol unless symptomatic.

A. Atrial Fib/Flutter Tachycardia

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation.
4. Start **oxygen** therapy as indicated.

5. Attach cardiac monitor and monitor lead II.
6. Identify rhythm as Atrial Fib/Flutter Tachycardia.
7. Establish an IV of **0.9% Normal Saline** using regular drip (10gtt) tubing.
8. Attach Pulse Oximeter.
9. Take vitals, pulse, BP, respirations, 12 lead.
10. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
On-Line Medical Control**

- I. Administer **Verapamil 2.5-5mg** Slow IVP over 2-3 minutes
- II. **Calcium Chloride** should be available in case of calcium channel blocker toxicity, dose **2-4 mg/kg** IVP
- III. If patient weight is greater than 50kg. and BP >110 mm Hg, administer **Versed 5mg** slow IV push or **Valium 5mg** slow IV push.
- IV. Repeat set of vitals, if no change, synchronized cardioversion at 100J, if no change 200J, if no change 300J, if no change 360J.

Tab 800
Cardiac Protocol L-1

M
CARDIOGENIC SHOCK

Hypotension and shock may be caused by volume, pump or rate problems. Rate problems should be treated according to appropriate protocol, i.e., Bradycardia, Tachycardia.

A. Blood Pressure <70 and patient symptomatic.

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation. (Take suction and intubation precautions).
4. Start **oxygen**.
5. Establish an IV of **0.9% Normal Saline 1000ml** using a large bore catheter and regular drip (10gtt) tubing in a large peripheral vein.
6. Attach cardiac monitor and monitor lead II.
7. Identify rhythm and treat according to appropriate protocol.

8. Take vitals, pulse, BP, respirations, pulse oximeter, 12-lead
9. If BP <110 systolic, administer a **fluid bolus of 250-500ml**. Continue monitoring BP.
10. Repeat set of vitals, administer **Dopamine** drip starting at **5 ug/kg/minute (400mg in 250ml D5W)** and **titrate up to 15ug/kg/min.** to target BP. Target BP is 110 systolic with signs and symptoms of adequate perfusion.
11. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while the "Paramedic" is giving assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

Tab 800
Cardiac Protocol M-1

N ACUTE CORONARY SYNDROME (With or Without Chest Pain)

- I. Acute Coronary Syndromes (ACS)

The Acute Coronary Syndromes are not only related, they represent a continuum of a disease process. **Emergency pre-hospital cardiac care places patients into one of three coronary syndromes.** Each syndrome is associated with specific strategies in prognosis and management. The three syndromes are:

 - A. **ST-Elevation MI (STEMI)**
 - B. **High-Risk Unstable Angina (UA)/Non-ST-Elevation MI (NSTEMI)**
 - C. **Intermediate/Low-Risk Unstable Angina (UA)**

Distinguishing among coronary syndromes requires integration of clinical information and the evolution over time of the 12-lead EKG.
- II. Clinical Presentation

Acute Coronary Syndromes may present with many different symptoms and they often pose a dilemma for pre-hospital caregivers. Pre-hospital presentations can vary greatly because of individual differences ranging from "classical angina" to silent (no pain) ischemia. It is the goal of this protocol to initiate pre-hospital treatment of all clinically evident Acute Coronary Syndromes. The major clinical descriptors used to describe chest pain are:

- A. Classic Angina:
Described as a dull substernal discomfort, a pressure or tightness in the chest, it may radiate to the left arm or into the neck. Classic angina may or may not be associated with shortness of breath, palpitations, sweating, nausea or vomiting.
- B. Anginal Equivalent:
Presents with no specific chest pain or discomfort, however, the patient presents with sudden or decompensated ventricular failure (Dyspnea) or ventricular arrhythmias (palpitations, pre-syncope, syncope).
- C. Atypical Chest Pain:
Presents with a discomfort or pain that is localized to the precordial area, but has musculoskeletal, postural, or pleuritic features.

Tab 800
Cardiac Protocol N-1

Acute Coronary Syndromes, cont.

III. History - Risk Factors

Many factors may put patients into a high-risk group. Paramedics need to obtain a reliable history and relay this information to **On-Line Medical Control** and document their findings. Five of the most important risk factors are listed below and are to be determined from coherent patients.

- A Diabetes Mellitus
- B Smokers
- C Hypertension
- D Prior Cardiac History
- E Family Cardiac History

IV. Treatment

In the protocol, specific treatments are listed prior to contact with **On-Line Medical Control**. However, **On-Line Medical Control** may be contacted earlier if so desired, but must be contacted no later than indicated. **It is also protocol for the paramedic to continue the full treatment course with nitroglycerin, EKG and narcotic analgesia as indicated; regardless when On-Line Medical Control occurs, unless On-Line Medical Control specifically orders standing orders to be suspended, or further treatment is contraindicated because of changes in patient's condition, i.e., hypotension secondary to nitroglycerin.** It is expected that, **oxygen, aspirin** and possibly **one nitroglycerin** may be administered prior the initial **12-lead EKG**. ALS First Responders may initiate the protocol to the extent available equipment and medications allow. It is expected in the absence of **12-lead EKG** capability, where myocardial infarction is suspected via assessment and history, that **oxygen,**

aspirin, nitroglycerin and **Morphine** therapies will be initiated per the appropriate protocol without a 12-lead EKG. In the protocol when **Morphine** is indicated, it may be administered to patients without pain if the patient displays anxiety thought to be associated with ischemia. If the patient is allergic to **Morphine, Fentanyl Citrate** can be administered. **Control Note:** serial 12-lead EKG's are indicated, however, transport should be initiated as soon as possible after completion of the initial 12-lead EKG. 12 lead EKG is **mandated when appropriate equipment is available** and it is practical to obtain one. When time permits every attempt should be made to obtain 12-lead EKG's as this is an important diagnostic tool and 12-lead EKG may show changes over time. 12-lead EKG's may be obtained rapidly and patches and leads should be left in place.

Tab 800
Cardiac Protocol N-2

Acute Coronary Syndromes, cont.

V. Documentation

Documentation is crucial. **It is mandated by the Fulton County EMS Medical Director**, the following items must be documented on your run report.

- A. Times of all vital signs between medication administrations.
- B. What group you placed this patient
 - a. ST segment elevation (injury)
 - b. ST segment depression (ischemia)
 - c. Non-diagnostic EKG
- C. What the patient graded the pain 0-10, 10 being the worst.

VI. Procedure

The following procedures **are to be completed**.

- A. Printed copies of all **12 Lead EKG's**
- B. Fill out the Thrombolytic Check Sheet and give to hospital personnel

VII. Treatment Acute Coronary Syndromes (with or without chest pain)

This protocol applies to patients suspected of suffering one of the three (3) acute coronary syndromes. With the current progress being made in thrombolytic therapy and angioplasty, it should be emphasized that the ACS patient requires early recognition and intervention. Scene times should be less than 15 minutes when possible. Patients exhibiting evidence of one of the Acute Coronary Syndromes should be transported with the same urgency as Trauma Protocol patients.

A. Acute Coronary Syndromes (with or without chest pain)

1. Safe scene, standard precautions
2. Reassure patient (position of comfort)
3. Assess airway, breathing, and circulation
4. Attach pulse oximeter (if available)
5. Start **oxygen** therapy. If no signs of hypoxia and observations of normal respiratory pattern. (Pulse Ox of SpO₂>95% if available) **nasal cannula at 4-6 lpm**. In presence of hypoxia, increased respiratory difficulty or SpO₂ not available, **non-rebreather mask at 8-15 lpm**.
6. Vitals, grade pain, obtain risk factors.
7. **Administer two (2) 81mg** chewable **aspirin**. If known allergies to **aspirin**, **ibuprofen**, **Motrin**, or if patient is on **coumadin**, or has recent history of bleeding disorders, withhold **aspirin**.
8. **Attach cardiac monitor and monitor lead II (treat life threatening arrhythmias per protocol)**. Identify rhythm and treat according to appropriate protocol. If ST elevation in leads II, III or AVF (in diagnostic mode).

Tab 800
Cardiac Protocol N-3

Acute Coronary Syndromes, cont.

9. Acquire a **12-lead EKG** (supine if possible).
10. Classify patients into one of three groups for **On-Line Medical Control** and run report.
 - a. **ST segment elevation (injury)**
 - b. **ST segment depression (ischemia)**
 - c. **Non-diagnostic EKG**
11. **Start an IV of Normal Saline, 1000ml bag** (consider second IV enroute to hospital). If Pulmonary Edema, refer to Tab 800 O-1 (if on **Viagra**, contact **On-Line Medical Control** before **nitroglycerin** administration).
12. Treat according to signs and symptoms
 - a. for the patient with chest pain of cardiac origin:
 - (1) Insure systolic blood pressure is >110mmHg.
 - (a) **Nitro - administer one (1) sublingual nitroglycerin (1/150 gr dose)**
 - (b) Administration of subsequent doses of **nitroglycerin q5x2** as dependant upon both of the following clinical improvements:
 - (i) Complete resolution of chest pain and
 - (ii) Complete resolution of EKG changes
 - (c) A systolic BP must be obtained between each dose of **nitroglycerin** and prior to any **Morphine (MS)** administration.
 - (d) If the patient is not pain free after the second 1/150 gr of **nitro**:
 - (i) And systolic BP is >110mmHg
 - (ii) And patient weight >50kg
 - (iii) **Administer 2mg of Morphine, IVP, IM is not to be**

used for cardiac pain patients

(e) A second **2mg Morphine** dose may be administered after the third dose of 1/150 gr nitro if:

(iv) The patient is not pain free and

(v) The systolic BP is >110mmHg.

(f) All subsequent dose **2mg of Morphine** require:

(vi) **On-Line Medical Control** order

(vii) A systolic BP >110mmHg.

b. For the Patient who is not complaining of classic angina pain and/or:

(1) Is complaining of an anginal equivalent

(2) Is complaining of atypical chest pain

(3) Has EKG findings indicative of ischemia or injury

(4) Is experiencing anxiety associated with ischemia

(5) Treat as in Item 12a starting at step a (1)

Tab 800

Cardiac Protocol N-4

Acute Coronary Syndromes, cont.

13. Repeat vitals, 12-lead.

14. Some patients will respond well to **nitro** alone, others will continue to experience discomfort and will benefit from analgesia. For patients who respond poorly to **Nitroglycerin** alone, **Morphine** may be added to the treatment: Administer **Morphine 2-4mg** (slow IV push) if patient weight >50Kg and systolic BP >110 mmHg. If weight <50Kg or systolic BP <110 mmHg, contact **On-Line Medical Control**. Dose may be repeated in five (5) minutes if above vitals parameters maintained. If allergic to **Morphine**, a dose of **Fentanyl Citrate 50-100** administered (slow IV push).

15. Repeat set of vitals. The "paramedic" should **contact On-Line Medical Control** and notify of treatments done thus far. It should be considered that while the "Paramedic" is giving the assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to the vehicle. If a patient's serial EKG changes from one group's characteristic to another, change the therapeutic approach to follow the new classification.

16. Continued titration of patient discomfort utilizing **Nitroglycerin** and **Morphine** if vitals are stable.

17. Repeat vitals.

Acute Coronary Syndromes, cont.

Acute Coronary Syndromes

1. Safe scene, standard precautions
2. Position of comfort
3. ABC (airway, breathing, circulation)
4. Pulse oximeter
5. **Oxygen**
6. Vitals (12-lead, grade pain, risk factors)
7. **Aspirin 162 mg.**
8. Cardiac monitor (treat rhythm if indicated)
9. 12-Lead EKG
10. Classify patient
11. **IV Normal Saline 1000ml**
12. Treat according to signs and symptoms
 - a. Choose a treatment sequence based upon symptoms and patient response (Page O-4) *
 - b. Choose a treatment sequence for those patients with out classic anginal pain (Page O-4)*
13. Vitals, 12-lead **

14. **Morphine 2-4mg**, systolic BP >110, weight >50kg *

15. Contact **On-Line Medical Control**

16. Continue titration of treatment based upon patient response to treatment. ***

17. Vitals

* See protocol determination (pages O1-O4) for administration of medications prior to obtaining a 12 lead EKG.

** It is assumed that vitals will be taken between all **nitro** and **morphine** dosages

*** See protocol determinations (pages O1-O4) for administration of **morphine** prior to obtaining a 12-lead EKG.

Tab 800
Cardiac Protocol N-6

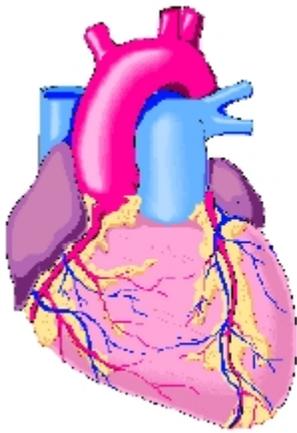
Acute Coronary Syndromes, cont.

RIGHT VENTRICULAR INFARCT

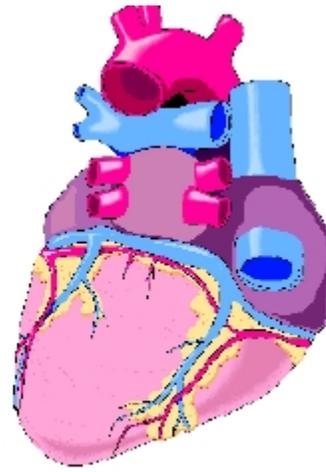
When the paramedic recognizes that a patient has an elevated ST segment in leads II, III or AVF of at least 1mm (one small box) above the baseline, 12-lead EKG and a V4R should be obtained. V4R is obtained by moving the precordial lead V4 to the right of the sternum, fifth intercostal space mid clavicular line. If all four leads show elevation in the ST segment and the patient is symptomatic, there should be a high degree of suspicion that a left ventricular inferior wall MI with an associated right ventricular MI is occurring. If patient presents with relative or absolute hypotension, a **fluid bolus of 250ml** should be administered prior to **Nitroglycerin** or **Morphine** administration. Right ventricular ischemic patients may become hypotensive rapidly from vasodilators and may require a **200-1000ml fluid** challenge or a **Dopamine** drip. The **Dopamine** should be in place but not running before administering **Nitroglycerin** or **Morphine**.

PHYSIOLOGY

The right ventricle is fed by the proximal portion of the right coronary artery. This artery also circumvents the heart and feeds the left ventricle posteriorly. Therefore, this artery is feeding both ventricles. Patients having an Acute Right Ventricle infarct, may be preload (volume) dependent, will be more sensitive to vasodilators and will usually need fluid resuscitation



ANTERIOR VIEW



POSTERIOR VIEW

Tab 800
Cardiac Protocol N-7

O ACUTE PULMONARY EDEMA

This protocol applies to the patient who is symptomatic and it is suspected that they are in Pulmonary Edema. Acute Pulmonary Edema can become life threatening very quickly and the need for intervention must be recognized early. Signs and symptoms of Pulmonary Edema may include the following:

- A. Air Hunger
- B. Orthopnea
- C. Dyspnea
- D. Cyanosis
- E. Diaphoresis
- F. Rales

A. Pulmonary Edema

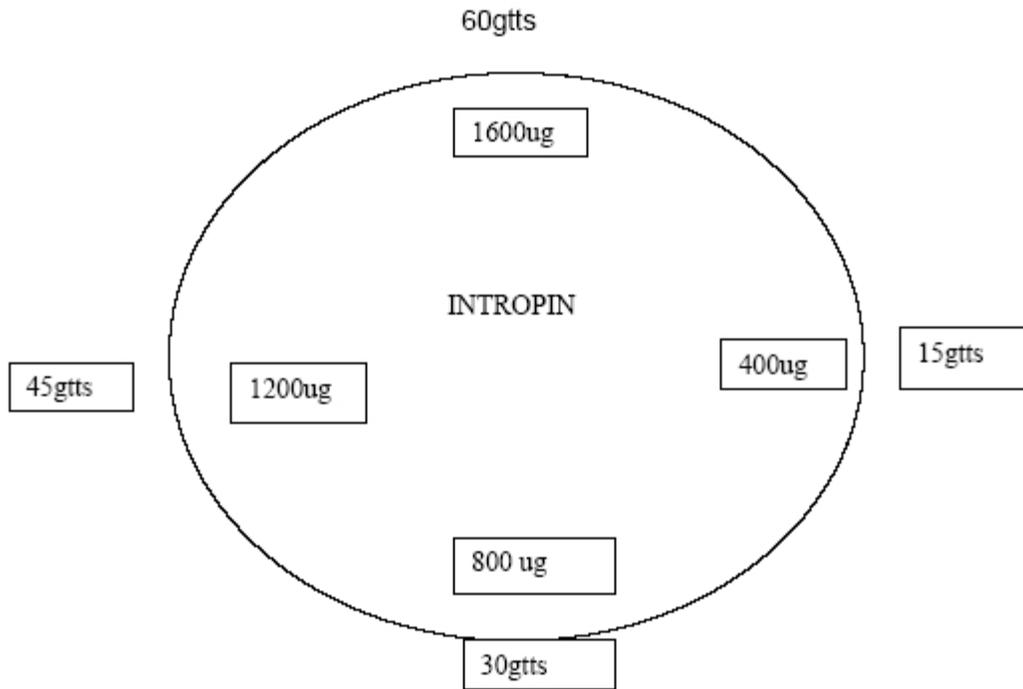
1. Safe scene, standard precautions.
2. Reassure patient (Fowler position if possible).
3. Assess airway, breathing, and circulation. (Take suction and intubation precautions).
 - a. Consider using **CPAP**

- b. Patients who remain anxious after CPAP application, or after the correction of hypoxia, may benefit from anxiolytic therapy. **Consider Versed 1-2mg IV if SBF > 110mmHg.** Absent IV access, **administer Versed IN.** Versed is more effective on anxiety than **Morphine** and does not have the adverse vascular effects. **Maximum dose of Versed is 2mg IV / IN.** Any additional **Versed** dosing must be authorized by **On-Line Medical Control.**
4. Start **oxygen** therapy as indicated (may be helpful to assist ventilations)
5. Establish an IV **0.9% Normal Saline** using 10gts tubing (use caution on fluid infused, use slow TKO)
6. Attach cardiac monitor and monitor lead II.
7. Identify rhythm and treat per protocol.
8. Take vitals, pulse, BP, respirations, pulse oximeter, **12-lead.** Take special care in assessing lung sounds.
9. Repeat set of vitals, Nitrates should not be used in patients who have taken one of the erectile dysfunction (ED) drugs in the prior 24hours. or in the prior 48 hours. Fatal hypotension has been reported when NTG has been administered to patients taking ED medications. **Contact On-Line Medical Control if nitroglycerin is to be administered).**

Tab 800
Cardiac Protocol O-1

Pulmonary Edema, cont.

10. Repeat set of vitals, if BP >110mm Hg., administer **one (1) sublingual Nitroglycerin 1/150gr.** (If BP <110mm Hg., go to 12).
11. Captopril administration should be considered after the initiation of Nitro therapy and application of CPAP. **Captopril is administered sublingually. A 25 mg pill can be wetted and placed under the tongue and will begin working within 15 minutes. Administer Captopril SL only if BP > 110mm Hg.** Some patients with decompensated CHF need inotropic support (**Dopamine**) to maintain any blood pressure.
12. Repeat set of vitals and if BP <110mm Hg., in response to (subsequent) **nitro,** administer **Dopamine 5-15ug/kg/min. (400mg in 250ml D5W, calculate gtts rate) IV drip piggyback and titrate to effect.** Target BP 110 systolic with signs and symptoms of adequate perfusion.
13. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while "Paramedic" is giving assessment to **On-Line Medical Control,** other responders should ready patient for transport and move patient to vehicle.



400 mg Dopamine in 250ml D5W
 Multiply patient weight in kilograms X desired ug.
 Example: 5ug x70kg = 350ug per min.

Tab 800
 Cardiac Protocol O-2

Acute Pulmonary Edema, cont.

ACUTE PULMONARY EDEMA

1. Safe scene, standard precautions
2. Reassure patient
3. ABC (airway, breathing, circulation)
4. **Oxygen** (may have to assist ventilations), **Consider applying CPAP** (Ref. Tab 500, T-1)
5. **IV 0.9% Normal Saline** (slow TKO rate)
6. Attach cardiac monitor (monitor lead II)
7. **Identify rhythm/treat per protocol**
8. Vitals, pulse oximeter, **12-lead**
9. Vitals, If patient weight is >50kg and BP >110mm Hg, administer **one nitroglycerin**. If BP <110mm Hg., go to 12. (If on erectile dysfunction (ED), contact **On-Line Medical Control** if **nitroglycerin** is to be administered).

10. Vitals, **Dopamine 5-15ug/kg/min IV drip**. If BP <110mm Hg titrate to effect. Target BP is 110mm Hg.
11. Contact **On-Line Medical Control**, move patient

Tab 800
Cardiac Protocol O-3

P
PREMATURE VENTRICULAR CONTRACTIONS
(PVCs)(VPBs)

This protocol applies to the patient who is displaying some form of ventricular ectopy. With the 2001 AHA guidelines regarding the treatment of ACS arrhythmias, we may be better serving our patients by treating underlying causes of arrhythmias in lieu of suppressing the arrhythmia by pharmacological intervention and reducing cardiac output. You will note in the protocol that 12-lead is acquired early and you should put the patient into one of your ACS groups and treat appropriately. These patients need to be monitored closely

A. Premature Ventricular Contractions

1. Safe scene, standard precautions.
2. Reassure patient (may be helpful to put in position of comfort).
3. Assess airway, breathing, and circulation.
4. Start **oxygen** therapy as indicated.
5. Establish an IV of **1000ml Normal Saline** using regular drip (10gtt) tubing.
6. **Attach cardiac monitor and monitor lead II, 12-lead, group patient. Treat per appropriate protocol.**

7. Take vitals, pulse, BP, respirations, pulse oximeter, 12-lead.
8. Repeat set of vitals. The "Paramedic" should contact **On-Line Medical Control** and notify of treatments done thus far. It should also be considered that while "Paramedic" is giving the assessment to **On-Line Medical Control**, other responders should ready patient for transport and move patient to vehicle.

**ANTICIPATE THE FOLLOWING POTENTIAL ORDERS FROM
On-Line Medical Control**

- I. **Administration of an antiarrhythmic.**

Tab 800
Cardiac Protocol P-1

Q
AUTOMATIC IMPLANTABLE CARDIOVERTER DEFIBRILLATOR
(AICD)

There are a growing number of patients in Fulton County who have had a AICD implanted. The AICD device continuously monitors the patient's cardiac electrical activity. IF the AICD detects V-fib or V-tach above its pre set rate (i.e., 190), the device will charge and deliver a shock to the heart.

- A. If the AICD patient becomes pulseless, it is safe and appropriate to start CPR. While doing CPR if the AICD fires a slight tingling may be felt by the responder doing compressions.
- B. Treat all rhythms per protocols. Avoid patch placement over the AICD. If external defibrillation is unsuccessful, change patch placement position to either an anterior/posterior placement or reversing the positive/negative electrode placement on the anterior lateral chest.

R
12-LEAD EKG PROTOCOL
RATIONAL

The potential for identification of some patients with Acute Coronary Syndromes (ACS) in the field exists with the acquisition of serial prehospital 12-lead EKG. For treatment of Acute Coronary Syndromes see Tab 800 N-1 through N-7.

A. 12-Lead acquisition **is mandated by the Fulton County EMS Medical Director** on the following (if equipment available):

1. Adults who access the emergency medical system with a complaint of nontraumatic, heart related symptoms.
2. Persons who access the emergency medical system whom the paramedic suspects ACS for any reason.
3. Persons who access the emergency medical system and on whom a physician requests paramedics acquire a 12-lead EKG for evaluation.
4. All patients with previous cardiac history.
5. All medical patients over 40 years of age.

B. Criteria for exclusion of 12-lead EKG acquisition:

1. A patient for whom the acquisition of a prehospital 12-lead EKG will cause a significant time delay or other circumstance that is not in the best interest of patient care at that time.

2. A patient who refuses to allow a 12-lead EKG to be performed.

C. Acquisition

1. Lead Placement - Limb leads (augmented leads)
The limb leads are the paramedic's first response to acquire rate and rhythm. Four patches are required for this procedure. (See Tab 800 Refer to S-4)
 - a. Left anterior axillary line - Left anterior shoulder
 - b. Right anterior axillary line - Right anterior shoulder
 - c. Left anterior superior iliac crest - left hip
 - d. Right anterior superior iliac crest - right hip
2. Lead Placement, Precordial leads
 1. V-1, fourth intercostal space just to the right of the sternum.
 2. V-2, fourth intercostal space just to the left of the sternum.
 3. V-3, in between V2 and V4
 4. V-4, fifth intercostal space mid clavicular line.
 5. V-5, anterior axillary line level with V4
 6. V-6, mid axillary line level with V4 and V5.
 7. V4R, fifth intercostal space in right mid-clavicular line.

Tab 800
Cardiac Protocol R-1

12-Lead Protocol, cont.

All patches must be of the same style and manufacturer. For information regarding quick combo patch placement.

2. What each lead sees

- | | | |
|----|----------------------|-------------------------------|
| 1. | Leads I, AVL, V5, V6 | lateral wall, left ventricle |
| 2. | Leads II, III, AVF | inferior wall, left ventricle |
| 3. | Leads V1, V2 | septal wall, left ventricle |
| 4. | Leads V3, V4 | anterior wall, left ventricle |
| 5. | Lead V4R | right ventricle |

D General Description of Procedures

1. **A 12-lead EKG with standard limb lead electrode placement will be performed on all eligible patients.**
2. 12-lead EKG interpretive findings should be reported to **On-Line Medical Control** during transmission of patient assessment. If an ACS is suspected, the thrombolytic check sheet **will** be filled out on the way to the hospital, as time permits. (Refer to Tab 800, R-5).
3. A copy of the 12-lead EKG will be hand delivered to the receiving hospital with the patient's name appearing on the 12-lead EKG.
 - a. Attach precordial electrodes and acquire 12-lead EKG while patient assessment and or treatment is taking place, to keep scene time from being

- adversely affected.
- b. Acquisition of early and serial 12-lead EKGs should be performed when possible.
 - c. Carry towels and blankets in the squad for the modesty benefit of female patients on whom 12-lead EKG's are acquired. This allows you to acquire the 12-lead EKG in the privacy of a patient's home. **Note:** In the female patient, chest leads must be positioned under the breast. This may be accomplished by lifting the breast with the back of a gloved hand.
 - d. **Enter all pertinent data in the LifePak Data Entry system.**

Tab 800
Cardiac Protocol R-2

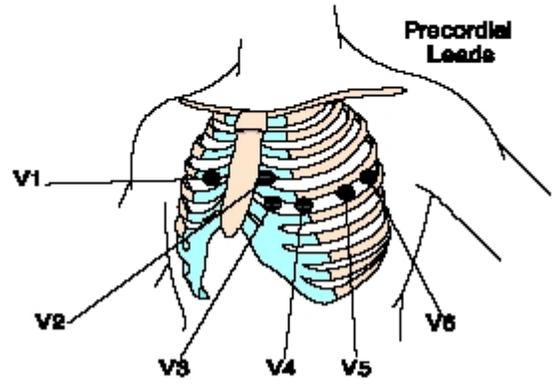
12-Lead Protocol, cont.

- e. If defibrillation, synchronized cardioversion or pacing is necessary, quickly remove the necessary precordial leads to allow for quick-combo patch placement and proceed with appropriate protocol.
- f. If feasible, the 12-lead EKG should be acquired with the patient in the supine position. Do not, however, compromise your patient to acquire it. Many of your cardiac patients may be orthopneic and unable to tolerate the supine position. Write on the 12-lead EKG what position it was acquired in.

**Standard
Limb Leads**



**Precordial
Leads**

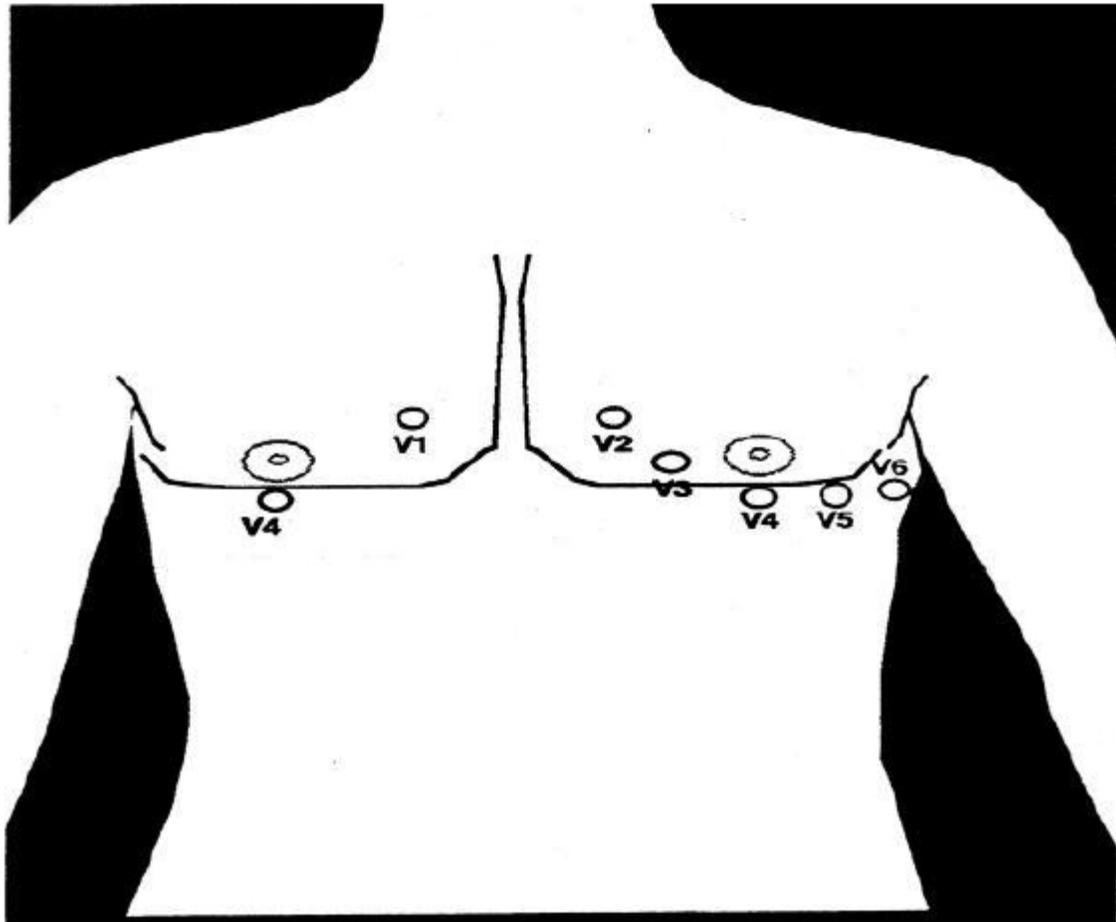


Tab 800
Cardiac Protocol R-3

12-Lead Protocol, cont.

Limb Leads

Precordial Leads



(Rate/rhythm)

(12-lead)

RA
LA
RL
LL

V1
V2
V3
V4
V5
V6

Tab 800
Cardiac Protocol R-4

S
I.C.E.

Induced Cooling by EMS

Current research has shown, almost universally, that therapeutic hypothermia reduces brain damage following cardiac arrest. It is well known that the brain responds poorly to hypoxic events. In most situations, the 4-6 minute “point of no return” still applies. Part of the problem (perhaps not realized by many responders) is that brain damage will continue for several hours following resuscitation; it doesn't simply stop because the patient's heart starts beating again. Therapeutic hypothermia can help increase the odds of these patients recovering completely.

Paramedics play an important role in beginning the therapeutic hypothermia process, which usually must continue for a minimum of 12 hours following cardiac arrest. Since therapeutic hypothermia benefits decrease drastically after a delay of even a few minutes following successful cardiac arrest resuscitation, EMS may be in the best position to begin immediate treatment.

Criteria for Induced Hypothermia:

1. ROSC after cardiac arrest not related to trauma or hemorrhage
2. Age > 18
3. Initial temperature > 34°C
4. Patient has advanced airway in place (e.g., ETT, KING) and remains comatose (no purposeful response to pain)
 - a. If unable to secure an advanced airway in place, **DO NOT** initiate induced hypothermia
5. Not obviously pregnant

Special Considerations:

1. In patients with return of spontaneous circulation (ROSC), the first visualized sign may be a significant increase in capnographic waveform and capnogram value. CO₂ washout through the lungs upon return of mechanical circulation proves a valuable sign of ROSC and should prompt the paramedic in the field to assess patient circulation (pulses).
2. When exposing patient for purpose of cooling with cold packs, undergarments may remain in place. Be mindful of your environment and take steps to preserve the patient's modesty.
3. The hypothermia process *may* be initiated on the scene. Do not delay transport to initiate the cooling process. Patient assessment is critical upon achieving ROSC. Assure sustained perfusing rhythm and vital signs before initiation of sedation and chilled saline administration. Patient should be prepared for transport to the closest assigned hypothermia center.

Tab 800
Cardiac Protocol S-1

Ice protocol, cont.

4. Measure patient temperature with tympanic thermometer and document. Assure

- temperature > 34°C. For temperature measurements < 34°C do not initiate cooling measures. Consider periodic temperature measurements throughout care. If temperature measurements fall below 33°C at any time during post-resuscitation care, discontinue cold saline infusion.
5. **Two (2) IV/IO access points are desired for purposes of administering chilled saline in the field. Consider 14ga or 16ga catheter placement in the AC (antecubital) area or EJ (external jugular).** In the setting of vascular collapse and IV attempts fail or are futile, insert IO for fluid and/or medication administration.
 6. **Fentanyl 100mcg IV/IO** is administered for patient sedation during the therapeutic hypothermia process.
 7. During the hypothermic process, patient assessment is critical for ongoing care: With any witnessed signs of patient movement (i.e., gasping, , shivering, seizure activity, or movement) during ICE therapy, administer **20mg Etomidate IV/IO** and consider **Vecuronium (Norcuron) 0.1mg/Kg IV/IO (max. 10mg)**. Additional sedative or paralytic therapy, if necessary, may be administered through **On-Line Medical Control** order.
 8. Maintaining cerebral perfusion is essential during the therapeutic hypothermia process. Maintain MAP (Mean Arterial Pressure) at 90-100. Cold saline is a strong vasoconstrictor. MAP values below 90 after cold saline infusion may require **pressor administration (Dopamine)** for adequate perfusion pressures.
 9. Reassess the patient's airway frequently and with every patient movement.
 10. Patients develop metabolic alkalosis with cooling. **DO NOT** hyperventilate.
 11. Monitor EtCO₂ frequently and target value at 40mm Hg. If EtCO₂ values fall below 20mm Hg, consider possible loss of pulses.
 12. If there is a loss of ROSC at any time, continue chilled saline infusion and go to appropriate protocol for treatment.
 13. **Chilled saline is infused at 30mL/kg to a maximum of 2000mL.** With extended transport times, and maximum saline infusion met based upon patient's body weight, continue hypothermia process by hanging additional chilled saline bags
 14. Continue to address specific differentials associated with original dysrhythmia or cause of arrest (H's and T's).
 15. Patients with ROSC and/or induced hypothermia should be triaged to the closest "Hypothermia" Center. A ROSC or "ICE" Alert should be communicated as quickly as possible to the receiving hospital.
 16. "Hypothermia" Centers include Fulton County Health Center and in Lucas County, St. Lukes, St. Vincent Mercy Medical Center (SVMMC), The Toledo Hospital (TTH), and the University of Toledo Medical Center (UTMC).
 17. If a ROSC develops, an air ambulance should be utilized for transport if weather conditions allow.

FULTON COUNTY EMS
PRE-HOSPITAL THROMBOLYTIC CHECK SHEET

PATIENT NAME _____ AGE _____ SQUAD _____

DATE _____ PARAMEDIC NAME _____

Circle

- | | | |
|---|-----|----|
| 1. Oriented | Yes | No |
| 2. Chest Pain < 6 hours?..... | Yes | No |
| 3. Active internal bleeding or known blood disorder?.... | Yes | No |
| 4. History of CVA, intracranial or aneurysm?..... | Yes | No |
| 5. Neurosurgery, head or spine trauma?..... | Yes | No |
| 6. Major surgery or biopsy within 6 weeks?..... | Yes | No |
| 7. Chest or abdominal trauma within 6 weeks?..... | Yes | No |
| 8. CPR within the past 10 days?..... | Yes | No |
| 9. GI or GU bleeds within 3 months?..... | Yes | No |
| 10. Acute pericarditis, acute aortic dissection, and esophageal varices?..... | Yes | No |
| 11. Pregnant?..... | Yes | No |
| 12. Severe renal or hepatic disease?..... | Yes | No |
| 13 . Diabetic?..... | Yes | No |
| 14. Retinopathy?(eye disorders)..... | Yes | No |
| 15. BP (>180 systolic, >120 diastolic)?..... | Yes | No |
| 16. Taking anticoagulants?..... | Yes | No |

COMMENTS:
