TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

Approved by EMS Medical Director 2024

PIT CREW TEAM-FOCUSED CPR
CARDIAC PROTOCOL # 3 - 17

HISTORY
- ✓ Events leading to arrest
- ✓ Estimated downtime
- ✓ Past medical history
- ✓ Medications
- ✓ Existence of terminal illness
- ✓ Signs of lividity, rigor mortis
- ✓ DNR or Living Will

SIGNS AND SYMPTOMS
- ✓ Unresponsive
- ✓ Apneic
- ✓ Pulseless

DIFFERENTIAL
- ✓ Medical v. Trauma
- ✓ Vfib v. Pulseless Vtach
- ✓ Asystole
- ✓ Pulseless Electrical Activity (PEA)

Criteria for Death/No Resuscitation?

YES → **Deceased Person Medical Protocol 2-04**

NO → **Cardiac Arrest Protocol**

NO

Begin Continuous **CPR**
Push Hard(>2inches), Push Fast(>100)
Change compressor every 2 minutes
Changes and pulse checks < 5 s

First Arriving BLS/ALS Responder
Initiate Compressions Only CPR
Activate AED *if available*
Call for additional resources

Second Arriving BLS/ALS Responder
Assume Compressions or
Perform AED *if available*
Consider BIAD
Do not interrupt Compressions
Ventilate 10 breaths per minute

Third Arriving Responder
BLS or ALS

Criteria for Discontinuation

Go to **Dicontinuation of Prehospital Resuscitation Policy 2-13**

AT ANY TIME Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

BLS

Establish Team Leader/Commander

Rotate with Compressor
Take direction from Team Leader

Fourth/Subsequent Arriving Responders
Take direction from Team Leader

ALS

Establish Team Leader/Commander

Initiate Manual Defibrillation Procedure
Establish IV/IO
Continuous Cardiac Monitoring
Administer appropriate Medications
Establish Airway with BIAD in not in place
Monitor EtCO2

Pit Crew Position Functions:
#1: Cardiac Monitor Analysis, defibrillation
#2: CPR Team Leader, quality CPR coordinator, airway is secondary
#3: IV/IO Access, Medications, Fluids
#4: Checklist, History, Family
#5: Helper, rotational CPR

Consider use of Trinity EMS Pit Crew/Team-Focused CPR Checklist for documentation and direction of resuscitation

CARDIAC PROTOCOL # 3 - 17

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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LEFT VENTRICULAR ASSIST DEVICES
CARDIAC PROTOCOL # 3 - 18

HISTORY
- ✓ End Stage Heart Failure
- ✓ Surgically-Implanted device that assists action of one or both ventricles
- ✓ Anticoagulated

SIGNS AND SYMPTOMS
- ✓ Non-pulsitile blood flow
- ✓ LVAD and non-LVAD related emergencies
- ✓ Altered Mental Status
- ✓ Bleeding

DIFFERENTIAL
- ✓ Stroke
- ✓ Cardiac Arrest
- ✓ Dysrhythmia
- ✓ Bleeding
- ✓ Dehydration
- ✓ Cardiac Tamponade
- ✓ Device faillure
- ✓ Battery Depletion

CARDIAC PROTOCOL # 3 - 18

Universal Patient Care Protocol

Possible Device Failure or Malfunction?

Yes

Type of Device and assess alarms:
Consider:
- Change of batteries
- Reconnect Cables

Call VAD Coordinator
Discuss with Caregivers

Continuous Flow?
Auscultate for Whirring/Pumping?
Hypoperfusion

Continuous Flow?
Auscultate for Whirring/Pumping?

No pump sound, No pulse or BP, and Hypoperfusion?
Consider No CPR

No

Complaint Not Related to VAD
Treat per appropriate Protocol

Pulsatile Flow?
Measure Pulse and BP
If no pulse or BP, use the Devices Hand Pump

Yes

Hypoperfusion, Altered Mental Status, Arrhythmia?

A	**Normal Saline Bolus** **250 ml** May repeat x 2	A
A	**Cardiac Monitor**	A
T	**12 Lead EKG**	T

M — **Contact Medical Control and Notify Destination** — M

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

PEARLS
- ✓ Place defib pads away from ICD and VAD site. Discuss with caregivers/VAD coordinator
- ✓ Hypoperfusion will often be improved with a fluid bolus
- ✓ Ask if patient can have chest compressions, defibrillation? Do they have advanced directives? CPR may cause Death
- ✓ Transport with all device equipment, instructions, batteries, handpumps, controllers and knowledgeable caregivers

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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ASYSTOLE
CARDIAC PROTOCOL # 3 - 01

HISTORY
- ✓ Past medical history
- ✓ Medications
- ✓ Events leading to arrest
- ✓ End stage renal disease
- ✓ Estimated downtime
- ✓ Suspected hypothermia
- ✓ Suspected overdose
- ✓ DNR form

SIGNS AND SYMPTOMS
- ✓ Pulseless
- ✓ Apneic
- ✓ No electrical activity on EKG
- ✓ No auscultated heart tones

DIFFERENTIAL
- ✓ Medical or trauma
- ✓ Hypoxia
- ✓ Potassium (hypo/hyper)
- ✓ Drug overdose
- ✓ Acidosis
- ✓ Hypothermia
- ✓ Device (lead) error
- ✓ Death

Criteria for Withholding Resuscitation:
- ✓ **Valid DNR order**
- ✓ **Rigor Mortis and/or Dependent Lividity**
- ✓ **Decapitation**
- ✓ **Incineration**

Universal Patient Care Protocol

Cardiac Arrest Protocol

Criteria for Death/No Resuscitation?

YES → **Deceased Person Medical Protocol 2-04**

NO

R	5 Cycles of **CPR** unless arrest witnessed by **AED** equipped personnel	R
A	When IV/IO available **Epinephrine 1 mg IV/IO 1:10,000** Repeat every 3 – 5 minutes	A
A	Continue **Epinephrine** and **CPR** and address correctable causes	A
M	**Contact Medical Control and Notify Destination**	M

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

AT ANY TIME

Return of Spontaneous Circulation

Go to **Post Resuscitation Protocol**

Criteria for Discontinuation

Go to **Dicontinuation of Prehospital Resuscitation Policy 2-13**

PEARLS
- ✓ Always confirm asystole in more than one lead
- ✓ Successful resuscitation of asystole requires the identification and correction of a cause. Causes of asystole include:
  - **Acidosis**
  - **Hypovolemia**
  - **Hyperkalemia**
  - **Tension Pneumothorax**
  - **Hypoglycemia**
  - **Overdose** (Narcotics, Tricyclic Anti-depressants, Calcium Channel Blockers, Beta Blockers)

CARDIAC PROTOCOL # 3 - 01

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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ATRIAL FIBRILLATION CARDIAC PROTOCOL # 3 - 02

HISTORY
- ✓ Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- ✓ Diet (caffeine, chocolate)
- ✓ Drugs (nicotine, cocaine)
- ✓ Past medical history
- ✓ History of palpitations/heart racing

SIGNS AND SYMPTOMS
- ✓ HR >130/min
- ✓ QRS < .12 sec
- ✓ Dizziness, Chest pain, Shortness of breath
- ✓ Potential presenting rhythm
  - Sinus tachycardia
  - Atrial fibrillation/flutter
  - Multifocal atrial tachycardia
  - PSVT

DIFFERENTIAL
- ✓ 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

Unstable/Prearrest Signs and Symptoms:
- ✓ **Altered Mental Status**
- ✓ **Hypotension**
- ✓ **Chest Pain**
- ✓ **Syncope**
- ✓ **Pulmonary Edema**

Universal Patient Care Protocol

A — **IV Access Protocol** — **A**

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

STABLE

R	**Vital Signs**	R
T	**12 Lead EKG**	T
T	Consider **Aspirin 324 mg po**	T
A	**Cardiac Monitor**	A
P	Consider **Adenosine 6 - 12 mg IV** if SVT/Atrial Flutter suspected	P
T	**Repeat 12 Lead EKG with any rhythm change**	T
A	**Normal Saline Bolus 250 ml**	A

UNSTABLE/PREARREST

A	Consider analgesia for cardioversion with **Fentanyl 25-100 mcg** or **Morphine 2-5 mg IV/IO**	A
P	Consider sedation for cardioversion with **Versed 2-5 mg** or **Valium 5-10 mg** or **Ativan 1-2 mg IV/IO**	P
P	**Synchronized Cardioversion 120 J** x 1, then **200 J;** May repeat x **200 J** x 1	P
T	After conversion, **12 Lead EKG**	T

UNSTABLE

M — **Contact Medical Control and Notify Destination** — **M**

PEARLS
- ✓ Adenosine may not be effective in identifying atrial fibrillation, but it is not harmful
- ✓ Monitor for respiratory depression and hypotension associated with Versed
- ✓ Continuous pulse oximetry is required for all atrial fibrillation patients
- ✓ Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention

CARDIAC PROTOCOL # 3 - 02

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

Approved by EMS Medical Director 2024

BRADYCARDIA
CARDIAC PROTOCOL # 3 - 03

HISTORY
- ✓ Past medical history
- ✓ Medications
  - Beta blockers
  - Calcium channel blockers
  - Clonidine
  - Digoxin
- ✓ Pacemaker

SIGNS AND SYMPTOMS
- ✓ HR <60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- ✓ Chest pain
- ✓ Respiratory distress
- ✓ Hypotension or shock
- ✓ Altered mental status
- ✓ Syncope

DIFFERENTIAL
- ✓ Acute myocardial infarction
- ✓ Hypoxia
- ✓ Pacemaker failure
- ✓ Hypothermia
- ✓ Sinus bradycardia
- ✓ Athletes
- ✓ Head injury (increased ICP) or stroke
- ✓ Spinal cord lesion
- ✓ Sick sinus syndrome
- ✓ AV blocks (1º, 2º, 3º)
- ✓ Overdose

CARDIAC PROTOCOL # 3 - 03

Universal Patient Care Protocol

A	**IV Access Protocol**	A
P	**Cardiac Monitor**	P

HR <60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia

NO → Continue to monitor and reassess

YES

T	**12 Lead EKG**	T
A	**Atropine 1 mg IV/IO** – in setting of MI, DO NOT give atropine with wide-complex rhythm	A
A	**Normal Saline bolus 250 ml**	A
P	Consider **Dopamine 2 - 20 mcg/kg/min** if remains hypotensive Consider **Glucagon 1mg IV/IO** if still bradycardic and on beta blockers Consider **Calcium** if still bradycardic and on calcium channel blocker	P
P	Consider **external transcutaneous pacing** early in unstable patient unresponsive to medications and severely symptomatic	P
M	**Contact Medical Control and Notify Destination**	M

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

PEARLS
- ✓ The use of Lidocaine, Beta Blockers, and Calcium Channel Blockers in heart block can worsen bradycardia and lead to asystole and death
- ✓ Pharmacological treatment of bradycardia is based upon the presence or absence of symptoms. If symptomatic, treat. If asymptomatic, monitor the patient
- ✓ In wide complex, slow rhythm, consider hyperkalemia
- ✓ Remember: The use of Atropine for PVC's in the presence of myocardial infarction may worsen heart damage
- ✓ Consider treatable causes for bradycardia: Beta Blocker overdose, Calcium Channel Blocker overdose, etc.
- ✓ Be sure to aggressively oxygenate the patient and support respiratory effort

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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CARDIAC ARREST
CARDIAC PROTOCOL # 3 - 04

HISTORY
- ✓ Events leading to arrest
- ✓ Estimated downtime
- ✓ Past medical history
- ✓ Medications
- ✓ Existence of terminal illness
- ✓ Signs of lividity, rigor mortis
- ✓ DNR or Living Will

SIGNS AND SYMPTOMS
- ✓ Unresponsive
- ✓ Apneic
- ✓ Pulseless

DIFFERENTIAL
- ✓ Medical vs. Trauma
- ✓ Vfib vs. Pulseless Vtach
- ✓ Asystole
- ✓ Pulseless Electrical Activity(PEA)

Universal Patient Care Protocol

Criteria for Death/No Resuscitation?

YES → Deceased Person Protocol

NO

Criteria for Discontinuation
Go to **Dicontinuation of Prehospital Resuscitation Policy 2-13**

R Begin CPR **R**

ALS available?

NO → **B** Automated Defibrillation Procedure **B**

Airway Protocol(Adult)

Interrupt compressions only as per AED procedure. Ventilate no more than 12 breaths per minute(1 breath every 6 seconds)

YES → **P** Cardiac Monitor **P**

Go to appropriate protocol:
- **Ventricular Fibrillation/Pulseless Ventricular Tachycardia**
- **Persistent Ventricular Fibrillation/Pulseless Ventricular Tachycardia**
- **Asystole**
- **Pediatric Pulseless Arrest**
- **Consider Discontinuation Protocol**

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

Criteria for Withholding Resuscitation:
- ✓ **Valid DNR order**
- ✓ **Rigor Mortis and/or Dependent Lividity**
- ✓ **Decapitation**
- ✓ **Incineration**

PEARLS
- ✓ Success is based on proper planning and execution. Procedures require space and patient access. Make room to work
- ✓ Reassess airway frequently and with every patient move
- ✓ Maternal arrest- Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport
- ✓ Adequate compressions with high quality CPR and timely defibrillation are the keys to success

CARDIAC PROTOCOL # 3 - 04

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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CHEST PAIN – CARDIAC AND STEMI
CARDIAC PROTOCOL # 3 - 05

HISTORY
- ✓ Age ≥35 years
- ✓ Medications
- ✓ Viagra, Levitra, Cialis
- ✓ Past medical history (MI, Angina, Diabetes, post menopausal)
- ✓ Allergies (Aspirin, Morphine, Lidocaine)
- ✓ Recent physical exertion
- ✓ **P**alliation/**P**rovocation
- ✓ **Q**uality (crampy, sharp, dull, etc.)
- ✓ **R**egion, **R**adiation, **R**eferred
- ✓ **S**everity (1-10)
- ✓ **T**ime (onset/duration/repetition)

SIGNS AND SYMPTOMS
- ✓ Chest pain (pain, pressure, aching, vice-like tightness)
- ✓ Location (substernal, epigastric, arm, jaw, neck, shoulder)
- ✓ Radiation of pain
- ✓ Pale, diaphoresis
- ✓ Shortness of breath
- ✓ Nausea, vomiting, dizziness
- ✓ **Time of onset**

DIFFERENTIAL
- ✓ Trauma v. Medical
- ✓ Angina v. Myocardial Infarction
- ✓ Pericarditis
- ✓ Pulmonary embolism
- ✓ Asthma/COPD
- ✓ Pneumothorax
- ✓ Aortic dissection/Aneurysm
- ✓ GE reflux or Hiatal hernia
- ✓ Esophageal spasm
- ✓ Chest wall injury or pain
- ✓ Pleural pain
- ✓ Overdose (cocaine) or methamphetamine

Universal Patient Care Protocol

P	**Cardiac Monitor**	P
T	**12 Lead EKG**	T
A	**IV Access Protocol**	A
R	**Aspirin 324 mg po**	R
T	**Nitroglycerin 0.4 mg SL* x 3 doses**	T
A	If Continued Pain: **Morphine 2-6 mg** or **Fentanyl 25-100 mcg**	A
A	Nausea and Vomiting: Consider **Zofran 4 mg IV/ODT po**	A
A	Protocols as needed: **Hypotension** **Pulmonary Edema**	A
M	**Contact Medical Control and Notify Destination**	M

POSITIVE ACUTE MI
(STEMI ≥ 1 mm ST SEGMENT ELEVATION IN 2 CONTIGUOUS LEADS)

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

Transport based on
STEMI ALERT DESTINATION PROTOCOL
With Early Notification
KEEP SCENE TIME <15 MINUTES

A	Consider **Normal Saline Bolus 250 ml** for **Inferior/ RV MI**	A
A	Consider 2nd IV en route	A

***EMT may administer Nitro SL when IV in place**

PEARLS
- ✓ It is Trinity policy to withhold Nitroglycerin from patients <30 years old without a history of heart disease and SBP<180
- ✓ Avoid Nitroglycerin in any patient who has used erectile dysfunction medications in the past 36 hours due to potential for severe hypotension
- ✓ Patients with STEMI (ST- elevation Myocardial Infarction) should be taken to the appropriate destination based on EMS System STEMI Plan
- ✓ If patient has taken nitroglycerin without relief, consider potency of medication
- ✓ Monitor for hypotension after administration of Nitroglycerin and narcotics (Morphine, Fentanyl) AND administer only for SBP > 100
- ✓ Nitroglycerin and narcotics may be repeated per dosing guidelines in Formulary
- ✓ Diabetics and geriatric patients often have atypical pain, or only generalized complaints
- ✓ Document the time of the 12-Lead EKG in the PCR as a Procedure along with the interpretation

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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HYPERTENSION
CARDIAC PROTOCOL # 3 - 06

HISTORY
- ✓ Documented hypertension
- ✓ Related diseases: diabetes, CVA, renal failure, cardiac
- ✓ Medications (compliance?)
- ✓ Erectile dysfunction medication
- ✓ Pregnancy

SIGNS AND SYMPTOMS
- ✓ Systolic BP ≥200
- ✓ Diastolic BP ≥110

*AND AT LEAST **ONE** OF THESE*
- ✓ Headache
- ✓ Nosebleed
- ✓ Blurred vision
- ✓ Dizziness

DIFFERENTIAL
- ✓ Hypertensive encephalopathy
- ✓ Primary CNS injury (Cushing's response = bradycardia with hypertension)
- ✓ Myocardial infarction
- ✓ Aortic dissection/Aneurysm
- ✓ Pre-eclampsia/Eclampsia

Universal Patient Care Protocol

R — Check BP in both arms — R

If respiratory distress, consider **Pulmonary Edema Protocol**

Consider **Chest Pain Protocol**

P — **Cardiac Monitor** — P

T — **12 Lead EKG** — T

Headache or mental status changes?

NO → M — **Contact Medical Control and Notify Destination** — M

YES

A — **IV Access Protocol** — A

T — **Nitroglycerin 0.4 mg SL* x 3 doses** — T

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

EMT may administer **nitroglycerin** SL if IV present*

Consider **ALS** intercept early.

PEARLS
- ✓ Avoid Nitroglycerin in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 36 hours due to potential severe hypotension
- ✓ Never treat elevated blood pressure based on one set of vital signs
- ✓ Nitroglycerin may be given to lower blood pressure in patients who have an elevated diastolic BP of ≥ 110 and are symptomatic with chest pain, respiratory distress, syncope, headache, or mental status changes
- ✓ Symptomatic hypertension is typically revealed through end organ damage to the cardiac, CNS, or renal systems
- ✓ All symptomatic patients with hypertension should be transported with head elevated

CARDIAC PROTOCOL # 3 - 06

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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HYPOTENSION
CARDIAC PROTOCOL # 3 - 07

HISTORY
- ✓ Blood loss – vaginal or gastrointestinal bleeding, AAA, ectopic
- ✓ Fluid loss – vomiting, diarrhea, fever
- ✓ Infection
- ✓ Cardiac ischemia (MI, CHF)
- ✓ Medications
- ✓ Allergic reaction
- ✓ Pregnancy
- ✓ History of poor oral intake

SIGNS AND SYMPTOMS
- ✓ Restlessness, confusion
- ✓ Weak, rapid, pulse
- ✓ Pale, cool, clammy skin
- ✓ Delayed capillary refill
- ✓ Hypotension
- ✓ Coffee-ground emesis
- ✓ Tarry stools

DIFFERENTIAL
- ✓ Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- ✓ Ectopic pregnancy
- ✓ Dysrhythmias
- ✓ Pulmonary embolus
- ✓ Tension pneumothorax
- ✓ Medication effect/overdose
- ✓ Vasovagal
- ✓ Physiologic (pregnancy)

CARDIAC PROTOCOL # 3 - 07

Universal Patient Care Protocol

A **IV Access Protocol** **A**

TRAUMA

Treatment per appropriate **Trauma Protocol**

NON-CARDIAC NON-TRAUMA

A **Normal Saline Bolus 250 ml** May repeat x 2 **A**

M **Contact Medical Control and Notify Destination** **M**

P Consider **Dopamine 5 - 20 mcg/kg/min** for SBP >90 **P**

CARDIAC

Treatment per appropriate **Cardiac Protocol**

A No rales present, **Normal Saline Bolus 250 ml** May repeat x 2 **A**

M **Contact Medical Control and Notify Destination** **M**

P Consider **Dopamine 5 - 20 mcg/kg/min** for SBP >90 **P**

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

PEARLS
- ✓ Hypotension can be defined as a systolic blood pressure of less than 90
- ✓ Consider performing orthostatic vital signs on patients in non-trauma situations if suspected blood or fluid loss
- ✓ Consider all possible causes of shock and treat per appropriate protocol
- ✓ For non-cardiac, non-trauma hypotension, Dopamine should only be started after 2 liters of NS have been given

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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THERAPEUTIC HYPOTHERMIA CARDIAC PROTOCOL # 3 - 08

HISTORY
- ✓ Non-traumatic cardiac arrests
- ✓ Drownings, hangings, and asphyxiation are permissible for this protocol

SIGNS AND SYMPTOMS
- ✓ Cardiac arrest
- ✓ Return of spontaneous circulation post cardiac-arrest

DIFFERENTIAL
- ✓ Continue to address specific differentials associated with the original dysrhythmia

RETURN OF SPONTANEOUS CIRCULATION

Criteria for **Therapeutic Hypothermia** and **initial temp >34ºC**

NO → **Post Resuscitation Protocol**

YES

Advanced airway **(ETT** or **BIAD)** in place with **ETCO2 >20mm Hg**?

NO → **Airway Management Protocols (Adult or Pediatric)**

UNSUCCESSFUL → **Airway Management Protocols (Adult or Pediatric)**

SUCCESSFUL → Perform **Neuro Exam** to obtain GCS

YES

Perform **Neuro Exam** to obtain GCS

Expose patient
Apply ice packs to **Axilla**, **Groin**, and **Neck**

P — **Dopamine 5-20 mcg/kg/min** — P
Target SBP >90

Reassess temperature

<33ºC → Discontinue cooling measures → Go to **Post-Resuscitation Protocol**

>33ºC AND PATIENT SHIVERING

P — **Consider Etomidate 20 mg IV** — P

STILL SHIVERING?

P — **Consider Rocuronium 0.6-1.2 mg/kg IV** — P → M — **Contact Medical Control and Notify Destination** — M

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

CARDIAC PROTOCOL # 3 - 08

PEARLS
- ✓ Criteria for **Induced Hypothermia:**
  - Age ≥18 years
  - Arrest related to trauma, hemorrhage, drug overdose, stroke, or seizures are excluded
  - Temperature after ROSC greater than 34ºC
  - Advanced airway in place with no purposeful response to pain, no eye opening or GCS <9
- ✓ If no advanced airway can be obtained, cooling may only be initiated on order from 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

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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PULSELESS ELECTRICAL ACTIVITY
CARDIAC PROTOCOL # 3 - 10

HISTORY
- ✓ Past medical history
- ✓ Medications
- ✓ Events leading to arrest
- ✓ End stage renal disease
- ✓ Estimated downtime
- ✓ Suspected hypothermia
- ✓ Suspected overdose
- ✓ DNR Form

SIGNS AND SYMPTOMS
- ✓ Pulseless
- ✓ Apneic
- ✓ Electrical activity on the EKG
- ✓ No heart tones on auscultation

DIFFERENTIAL
- ✓ Hypovolemia (Trauma, AAA, other)
- ✓ Cardiac tamponade
- ✓ Hypothermia
- ✓ Drug overdose
- ✓ Massive myocardial infarction
- ✓ Hypoxia
- ✓ Tension pneumothorax
- ✓ Pulmonary embolus
- ✓ Acidosis
- ✓ Hyperkalemia

Criteria for Discontinuation?

NO

Cardiac Arrest Protocol

R	**CPR**	R
P	**Cardiac monitor**	P
A	**Airway Protocol**	A
	IV Access Protocol	
A	**Epinephrine 1 mg IV/IO** Repeat every 3-5 minutes	A

Consider early in all **PEA** patients:

A	✓ **Normal Saline Bolus** ✓ **D50 IV/IO** ✓ **Narcan 2mg IV/IO** ✓ **Glucagon 1 mg IV/IO** (Beta Blocker overdose)	A
P	✓ **Calcium** (hyperkalemia) ✓ **Bicarbonate** (tricyclic overdose, hyperkalemia) ✓ **Dopamine 2 - 20 mcg/kg/min IV** ✓ **Chest Decompression(Needle)**	P

M	**Contact Medical Control and Notify Destination**	M

AT ANY TIME

RETURN OF SPONTANEOUS CIRCULATION

GO TO POST-RESUSCITATION PROTOCOL

Yes

Criteria for Discontinuation

Go to **Dicontinuation of Prehospital Resuscitation Policy 2-13**

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

Criteria for Withholding Resuscitation:
- ✓ **Valid DNR order**
- ✓ **Rigor Mortis and/or Dependent Lividity**
- ✓ **Decapitation**
- ✓ **Incineration**

PEARLS
- ✓ 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: consider 5 H's and 5 T's

CARDIAC PROTOCOL # 3 - 10

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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SUSPECTED STROKE
CARDIAC PROTOCOL # 3 - 11

HISTORY
- ✓ Known cardiovascular history
- ✓ Medications
- ✓ History of trauma
- ✓ Change in condition

SIGNS AND SYMPTOMS
- ✓ Decreased mental status or lethargy
- ✓ Change in baseline mental status
- ✓ Bizarre behavior
- ✓ Hemiparesis, hemiplegia
- ✓ Facial droop
- ✓ Slurred speech
- ✓ Confusion
- ✓ Aphasia

DIFFERENTIAL
- ✓ Head trauma
- ✓ CNS (stroke, tumor, seizure, infection
- ✓ Cardiac (MI, CHF)
- ✓ Diabetes (hypo/hyperglycemia)
- ✓ Toxicological or Ingestion
- ✓ Acidosis/Alkalosis
- ✓ Environmental Exposure
- ✓ Electrolyte Abnormality
- ✓ Mental Health disorder

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

Universal Patient Care Protocol

T	Neurological Screen **Cincinnati Stroke Scale Procedure**	T
T	Check **Blood Glucose**	T
T	**Glucagon 1 mg IM** if no IV	T
A	**If Glucose <60** **D50 IV/IO** for Adults **D25 IV/IO** for Pediatrics	A

DETERMINE TIME ZERO
LAST KNOWN WELL(LKW)

P	**Cardiac Monitor**	P
T	**12 Lead EKG**	T
A	**IV Access Protocol**	A

M	**Contact Medical Control and Notify Destination**	M

PEARLS
- ✓ Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Neuro, Extremities
- ✓ It is vital to determine Time Zero, the time the patient was last known to be neurologically normal
- ✓ Bring a family member or witness to confirm Time Zero LKW
- ✓ **Checking the glucose level is crucial**

CARDIAC PROTOCOL # 3 - 11

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

Approved by EMS Medical Director 2021

SUPRAVENTRICULAR TACHYCARDIA CARDIAC PROTOCOL # 3 - 12

HISTORY
- ✓ Medications - aminophylline, diet pills, thyroid supplements, decongestants, digoxin
- ✓ Diet – caffeine, chocolate
- ✓ Drugs – nicotine, cocaine
- ✓ Past medical history
- ✓ History of palpitations/heart racing
- ✓ Syncope/near syncope

SIGNS AND SYMPTOMS
- ✓ HR >150/min
- ✓ QRS < .12 sec (if QRS >.12 sec, go to Wide-Complex Tachycardia protocol)
- ✓ If history of WPW, go to Wide-Complex Tachycardia protocol
- ✓ Dizziness, CP, SOB
- ✓ Potential presenting rhythm - Atrial/Sinus tachycardia, Atrial fibrillation/flutter, Multifocal atrial tachycardia

DIFFERENTIAL
- ✓ Heart disease (WPW, Valvular)
- ✓ Sick sinus syndrome
- ✓ Myocardial infarction
- ✓ Electrolyte imbalance
- ✓ Exertion, pain, emotional stress
- ✓ Fever
- ✓ Hypoxia
- ✓ Hypovolemia or Anemia
- ✓ Drug Effect/Overdose (see History)
- ✓ Hyperthyroidism
- ✓ Pulmonary Embolus

CARDIAC PROTOCOL # 3 - 12

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

Universal Patient Care Protocol

Unstable/Prearrest Signs and Symptoms:
- ✓ **Altered Mental Status**
- ✓ **Hypotension**
- ✓ **Chest Pain**
- ✓ **Syncope**
- ✓ **Pulmonary Edema**

A | **Cardiac Monitor** | A

A | **IV Access Protocol** | A

STABLE

T | **12 Lead EKG** | T

T | May attempt Valsalva's or other vagal maneuver initially and after each drug administration if indicated | T

P | **Adenosine 6 mg, then 12mg IV if needed** | P

M | **Contact Medical Control and Notify Destination** | M

UNSTABLE/PREARREST

P | **Adenosine 6 mg, then 12 mg IV/IO if needed** | P

P | Consider sedation with **Versed 2-5 mg IV/IO** or **Valium 5-10 mg IV/IO** or **Ativan 1-2 mg IV/IO** | P

A | Consider analgesia with **Fentanyl 25-100 mcg** or **Morphine 2-10 mg IV/IO** | A

P | **Synchronized Cardioversion 50-100 J** May repeat as needed | P

If rhythm changes go to appropriate protocol

T | **12 Lead EKG** | T

M | **Contact Medical Control and Notify Destination** | M

PEARLS
- ✓ If patient has history of or if 12 Lead EKG reveals Wolfe-Parkinson-White (WPW), DO NOT administer a calcium channel blocker (e.g., Diltiazem) or Beta Blockers
- ✓ Adenosine may not be effective in identifying atrial flutter/fibrillation, yet is not harmful
- ✓ Monitor for hypotension after administration of calcium channel blockers or beta blockers
- ✓ Monitor for respiratory depression and hypotension associated with Midazolam
- ✓ Continuous pulse oximetry is required for all SVT patients
- ✓ Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention

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SYNCOPE
CARDIAC PROTOCOL # 3 - 13

HISTORY
- ✓ Cardiac history, stroke, seizure
- ✓ Occult blood loss (GI, ectopic)
- ✓ Females: LMP, vaginal bleeding
- ✓ Fluid loss: nausea, vomiting, diarrhea
- ✓ Past medical history
- ✓ Medications

SIGNS AND SYMPTOMS
- ✓ Loss of consciousness with recovery
- ✓ Lightheadedness, dizziness
- ✓ Palpitations, slow or rapid pulse
- ✓ Pulse irregularity
- ✓ Decreased pulse pressure

DIFFERENTIAL
- ✓ Vasovagal
- ✓ Orthostatic hypotension
- ✓ Cardiac syncope
- ✓ Micturition/Defecation
- ✓ Syncope
- ✓ Psychiatric
- ✓ Stroke
- ✓ Hypoglycemia
- ✓ Seizure
- ✓ Shock
- ✓ Toxicological (Alcohol)
- ✓ Medication effect (hypertension)

CARDIAC PROTOCOL # 3 - 13

Universal Patient Care Protocol

↓

Spinal Immobilization Procedure

↓

T	Check **Blood Glucose**	T
A	**12 Lead EKG**	A
P	**Cardiac Monitor**	P
A	**IV Access Protocol**	A

AT ANY TIME
If relevant signs/symptoms found, go to appropriate protocol

ALTERED MENTAL STATUS
HYPOTENSION
CHEST PAIN
SUSPECTED STROKE

↓

M	**Contact Medical Control and Notify Destination**	M

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

PEARLS
- ✓ Assess for signs and symptoms of trauma if associated or questionable fall with syncope
- ✓ Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope
- ✓ These patients should be transported
- ✓ More than 25% of geriatric syncope is cardiac dysrhythmia based

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VENTRICULAR FIBRILLATION/ PULSELESS VENTRICULAR TACHYCARDIA CARDIAC PROTOCOL # 3 - 14

HISTORY
- ✓ Estimated down time
- ✓ Past medical history
- ✓ Medications
- ✓ Events leading to arrest
- ✓ Renal failure/dialysis
- ✓ DNR or living will

SIGNS AND SYMPTOMS
- ✓ Unresponsive, apneic, pulseless
- ✓ Ventricular fibrillation or ventricular tachycardia on EKG

DIFFERNTIAL
- ✓ Asystole
- ✓ Artifact/Device failure
- ✓ Cardiac
- ✓ Endocrine/Metabolic
- ✓ Drugs
- ✓ Pulmonary

Cardiac Arrest Protocol

DEFIBRILLATE X1
After defibrillation, resume CPR without pulse check

A	**IV Access Protocol, consider IO Procedure first line**	A
A	**Epinephrine 1 mg IV/IO** 1:10,000 Repeat every 3 – 5 minutes	A

After 5 cycles of CPR, check rhythm and pulse

Repeat **Defibrillation**
After defibrillation, resume CPR without pulse check

P	**Amiodarone** 1st dose is **300 mg** and may be repeated once at **150 mg**	P
P	Consider **Sodium Bicarbonate IV**	P
A	Establish a secondary circulatory access point	A

After 5 cycles of CPR, check rhythm and pulse

Repeat **Defibrillation**
After Defibrillation, resume CPR without pulse check

P	Consider **Magnesium Sulfate 2 grams IV/IO** if rhythm is polymorphic	P

Repeat **Defibrillation**
After Defibrillation, resume CPR without pulse check

P	Consider **Sodium Bicarbonate IV**	P

Airway Protocol Adult

Repeat **Defibrillation**
After Defibrillation, resume CPR without pulse check

Persistent V-fib/V-Tach Protocol

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

AT ANY TIME Rhythm Changes to Non-shockable Rhythm

GO TO APPROPRIATE PROTOCOL

AT ANY TIME Return of Spontaneous Circulation

GO TO APPROPRIATE PROTOCOL

PEARLS
- ✓ Reassess and document advanced airway placement and ETCO2 frequently, after every move, and at transfer of care
- ✓ Calcium chloride and sodium bicarbonate if hyperkalemia is suspected (renal failure, dialysis)
- ✓ Treatment priorities: uninterrupted compressions, defibrillation, then IV access and airway control
- ✓ Polymorphic ventricular tachycardia(Torsades de Pointes) may benefit from administration of Magnesium Sulfate
- ✓ Do not stop CPR to check for placement of ET tube or to give medications
- ✓ If arrest not witnessed by EMS, then 5 cycles of CPR prior to first defibrillation
- ✓ Effective CPR and prompt defibrillation are the keys to successful resuscitation
- ✓ If BVM is ventilating the patient successfully, intubation should be deferred until rhythm change or 4 or 5 defibrillation sequences completed

TRINITY EMS SYSTEM PREHOSPITAL GUIDELINES

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V-FIB/PULSELESS V-TACH (PERSISTENT) CARDIAC PROTOCOL # 3 - 15

HISTORY
- ✓ Verified execution of resuscitation checklist

SIGNS AND SYMPTOMS
- ✓ Unresponsive, pulseless
- ✓ Persisted in ventricular fibrillation/tachycardia or returned to this rhythm post ROSC/other rhythm changes

DIFFERENTIAL
- ✓ Artifact/Device failure
- ✓ Cardiac
- ✓ Endocrine/Metabolic/Drugs
- ✓ Pulmonary

V-fib/V-tach Protocol complete and V-fib/V-tach still present?

YES

P **Lidocaine 1-1.5 mg/kg IV/IO** **P**

Apply new defib pads or new site

Repeat **Defibrillation**
Pause 5 secs max to check rhythm/pulse, resume **CPR**

Did VF/VT break?

YES → **Appropriate Protocol**

NO

P **Lidocaine 0.5-0.75 mg/kg IV/IO** **P**

After 5 cycles of **CPR**, check rhythm and pulse

Repeat **Defibrillation**
Pause 5 secs max to check rhythm/pulse, resume **CPR**

Max dose of **Lidocaine** reached?

YES

M **Contact Medical Control and Notify Destination** **M**

NO → **Appropriate Protocol**

AT ANY TIME
Rhythm changes to non-shockable rhythm

GO TO APPROPRIATE PROTOCOL

AT ANY TIME
Return of Spontaneous Circulation

GO TO POST RESUSCITATION PROTOCOL

Criteria for Discontinuation

Go to **Dicontinuation of Prehospital Resuscitation Policy 2-13**

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

CARDIAC PROTOCOL # 3 - 15

PEARLS
- ✓ Recurrent ventricular fibrillation/tachycardia is successfully broken by standard defibrillation techniques, but subsequently returns. It is managed by ongoing treatment of correctable causes and use of anti-arrhythmic medication therapies
- ✓ Refractory ventricular fibrillation/tachycardia is an arrhythmia not responsive to standard external defibrillation techniques. It is initially managed by treating correctable causes and antiarrhythmic medications.
- ✓ Prolonged cardiac arrests may lead to tired providers and decreased compression quality. Ensure compression rotation, summon additional resources as needed, and ensure provider rest and rehab during and post-event
- ✓ If available, automated CPR devices are encouraged for prolonged cardiac arrests

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WIDE-COMPLEX TACHYCARDIA CARDIAC PROTOCOL # 3 - 16

HISTORY
- ✓ Past medical history/medications, diet, drugs
- ✓ Syncope/near syncope
- ✓ CHF
- ✓ Palpitations
- ✓ Pacemaker
- ✓ Allergies: Lidocaine/Novocain

SIGNS AND SYMPTOMS
- ✓ Ventricular tachycardia on EKG (runs or sustained)
- ✓ Conscious with rapid pulse
- ✓ Chest pain, shortness of breath
- ✓ Dizziness
- ✓ Rate usually 150 – 180 bpm for sustained v-tach
- ✓ QRS > .12 sec

DIFFERENTIAL
- ✓ Artifact/device failure
- ✓ Cardiac
- ✓ Endocrine/Metabolic
- ✓ Drugs
- ✓ Pulmonary

Universal Patient Care Protocol

APPROPRIATE PROTOCOL ← NO — Palpable Pulse? **Wide, regular rhythm with QRS > 0.12 seconds**

YES

Unstable/Prearrest Signs and Symptoms:
- ✓ Altered Mental Status
- ✓ Hypotension
- ✓ Chest Pain
- ✓ Syncope
- ✓ Pulmonary Edema

A **IV Access Protocol** **A**

STABLE

T **12 Lead EKG** **T**

P **Amiodarone 150 mg IV** or **Lidocaine 1-1.5 mg/kg IV** or **Procainamide 17 mg/kg IV** (Consider in this order if available) **P**

If **Polymorphic VT/Torsades Magnesium Sulfate 2 gm IV**

IF UNSUCCESSFUL RAPID TRANSPORT WITH EARLY DESTINATION NOTIFICATION

Becomes unstable?

NO

M **Contact Medical Control and Notify Destination** **M**

P Repeat Dose or Choose another drug: **Amiodarone** **Lidocaine** **Procainamide** **P**

YES

UNSTABLE/PRE-ARREST

P Consider Sedation with **Versed 2-5 mg** or **Valium 5-10 mg** or **Ativan 1-2 mg IV/IO** **P**

A Consider analgesia with **Fentanyl 25-100 mcg** or **Morphine 2-6 mg IV/IO** **A**

P **Synchronized cardioversion 100 – 200 J** May repeat as necessary **P**

P **Amiodarone 150 mg IV/IO** or **Lidocaine 1-1.5 mg/kg IV/IO** or **Procainamide 17 mg/kg IV/IO** (Consider in this order if available) **P**

T **12 Lead EKG** After Conversion **T**

M **Contract Medical Control and Notify Destination** **M**

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

CARDIAC PROTOCOL # 3 - 16

PEARLS
- ✓ For witnessed/monitored ventricular tachycardia, try having the patient cough
- ✓ Polymorphic V-tach(Torsades de Pointes) may benefit from the administration of Magnesium Sulfate if available
- ✓ If presumed hyperkalemia (end stage renal disease, dialysis, etc.) administer sodium bicarbonate
- ✓ Procainamide is no longer second line agent and should not be given if there is history of CHF

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POST-RESUSCITATION CARDIAC PROTOCOL # 3 - 09

HISTORY
- ✓ Respiratory Arrest
- ✓ Cardiac Arrest

SIGNS/SYMPTOMS
- ✓ Return of Spontaneous Circulation(ROSC)

DIFFERENTIAL
- ✓ Continue to address specific differentials associated with the original dysrhythmia

LEGEND	
R	EMR
T	EMT
A	AEMT
P	PARAMEDIC
M	MEDICAL CONTROL

Repeat Primary Assessment

Therapeutic Hypothermia Protocol for Return of Spontaneous Circulation

R — **Continue ventilatory support** — R
- ✓ 100% oxygen
- ✓ Respiratory rate < 12
- ✓ **DO NOT HYPERVENTILATE**

R	**Vital Signs**	R
R	**Pulse Oximetry**	R
T	**12 Lead EKG** **Capnography**	T
A	**IV Access Protocol**	A
P	**Cardiac Monitor**	P

HYPOTENSION — TACHYARRHYTHMIA — BRADYCARDIA

HYPOTENSION

A — Consider **Normal Saline Bolus*** — A

P — Consider **Dopamine 2 - 20 mcg/kg/min** if hypotensive after fluid bolus — P

TACHYARRHYTHMIA

Wide-Complex Tachycardia Protocol

BRADYCARDIA

Bradycardia Protocol

If arrest reoccurs, revert to appropriate protocol and/or initial successful treatment

M — **Contact Medical Control and Notify Destination** — M

PEARLS
- ✓ Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs
- ✓ Most patients immediately post resuscitation will require ventilatory assistance
- ✓ The condition of post-resuscitation patients fluctuates rapidly and continuously; they require close monitoring
- ✓ Appropriate post-resuscitation management may best be planned in consultation with medical control
- ✓ Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ACLS drugs
- ✓ Titrate Dopamine to maintain SBP>90. Ensure adequate fluid resuscitation is ongoing