Online Medical Control (OLMC) for Field Cardiac Arrest

Chicago Region XI EMS System

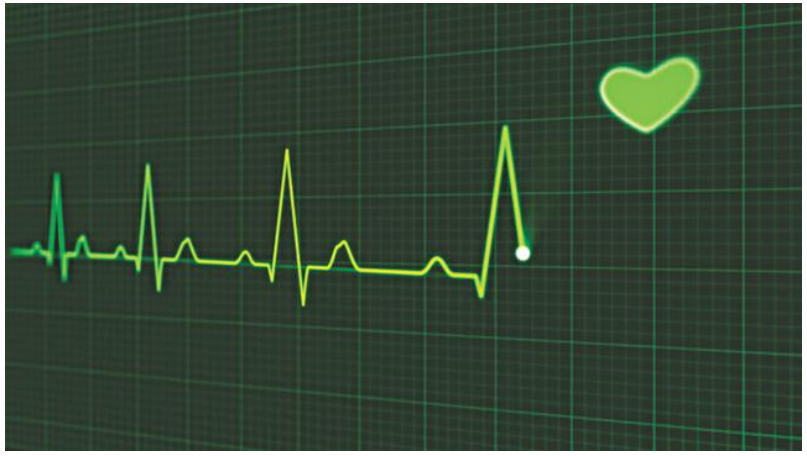
January 2017

Background

- In the Region XI EMS System, there are about 8 cardiac arrests per day
- Each of these incidents require contact with online medical control
- Consultation with the ECRNs/ECPs at the Base Station is an important component in the resuscitation

Background

- Cardiac Arrest calls are situations where the base station can positively impact the prehospital care!



Online Medical Control (OLMC)

- The EMS Medical Directors have identified the online medical control (OLMC) process as a quality improvement goal for 2017
  - Provide ECRN specific continuing education
  - Focus on systems of care (i.e. STEMI, stroke, trauma, cardiac arrest)
  - Encourage critical thinking and good communication between EMS and the base station

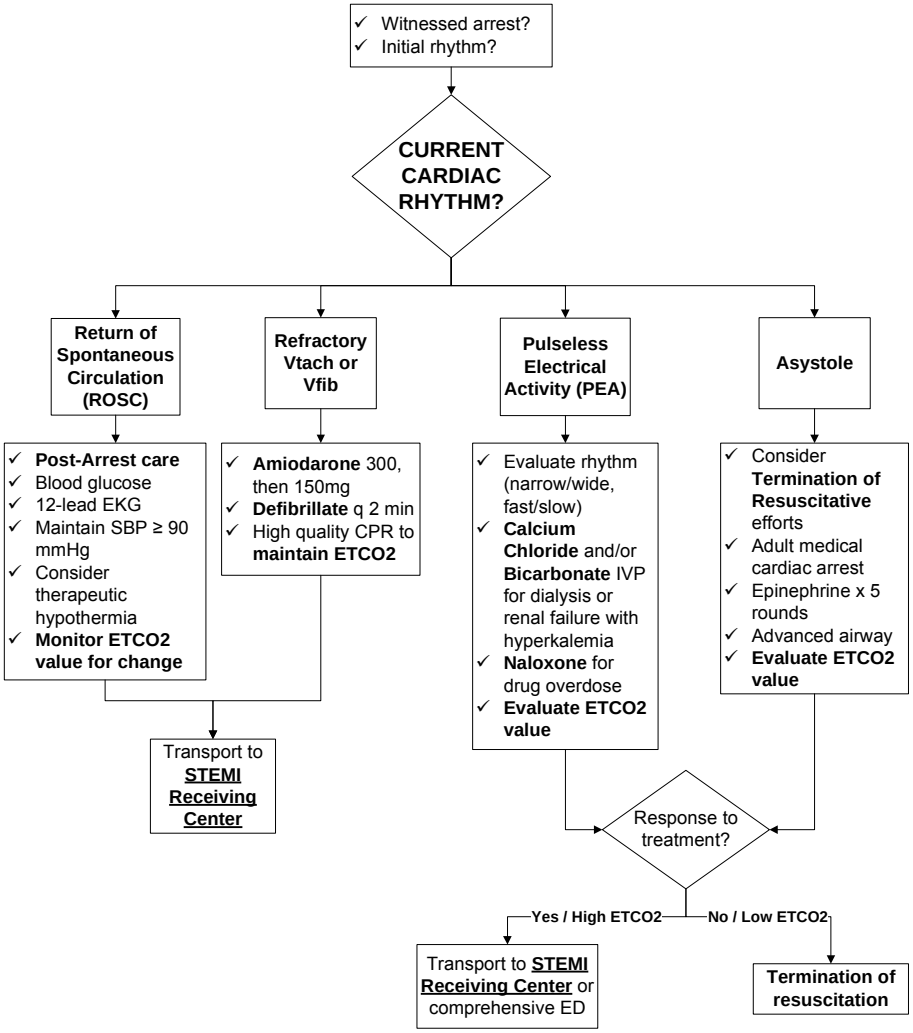
Online Medical Control (OLMC)

- Your role is to provide medical oversight to EMS
  - Did they follow Region XI protocols and policies?
  - Are there any critical interventions needed?
  - What is the appropriate destination for the patient?

Base Station Cardiac Arrest Algorithm

- Look for this resource at your telemetry station!
- Use it to help guide your online medical control

Region XI EMS Base Station Adult Cardiac Arrest Algorithm



How to interpret End-Tidal CO2 (ETCO2) values:

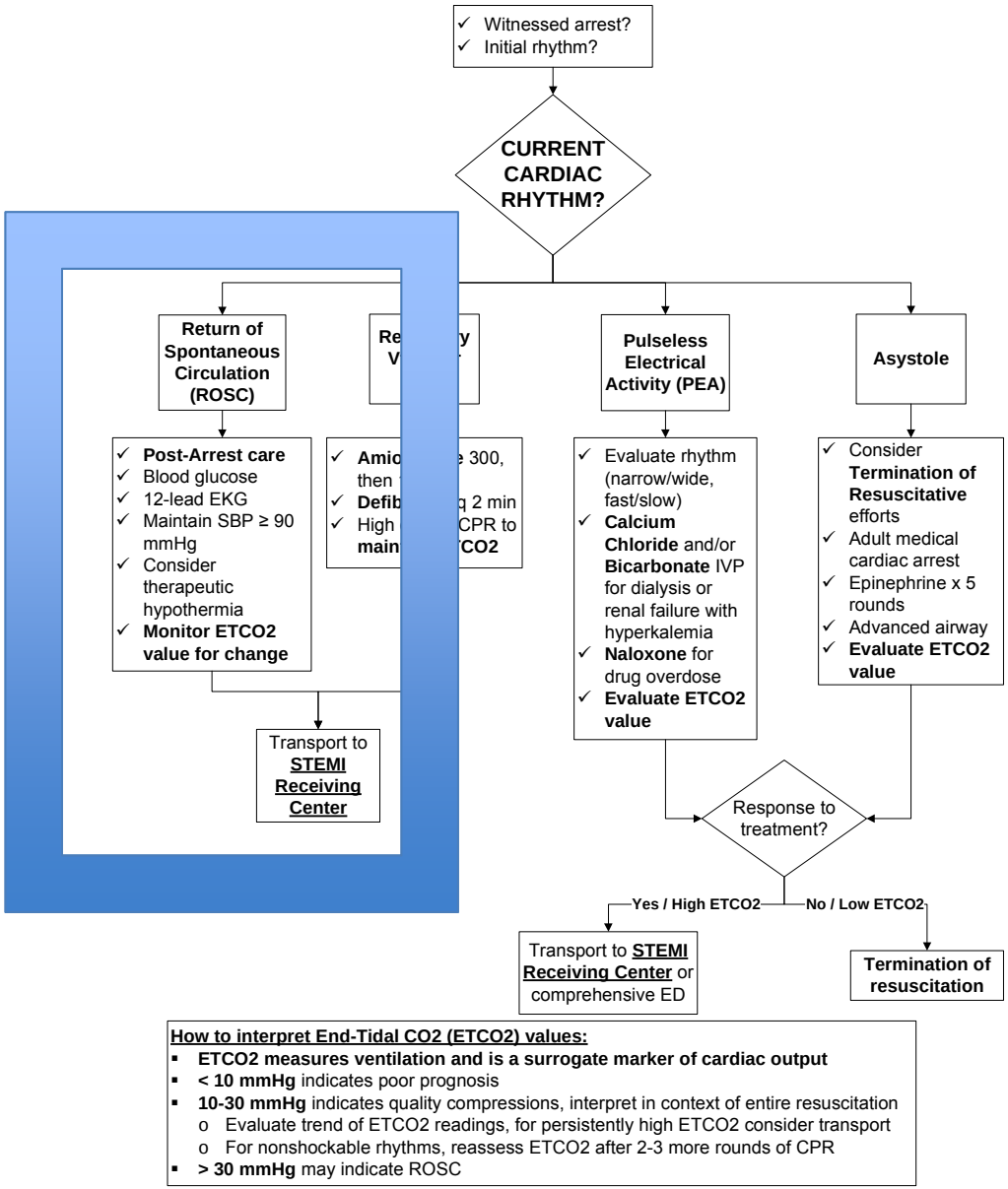
- **ETCO2 measures ventilation and is a surrogate marker of cardiac output**
- **< 10 mmHg** indicates poor prognosis
- **10-30 mmHg** indicates quality compressions, interpret in context of entire resuscitation
  - Evaluate trend of ETCO2 readings, for persistently high ETCO2 consider transport
  - For nonshockable rhythms, reassess ETCO2 after 2-3 more rounds of CPR
- **> 30 mmHg** may indicate ROSC

Clinical Case #1

- “This is Ambulance 53 to Northwestern
- We have a 60 year old male that was a witnessed arrest at the gym, he received bystander CPR and when we arrived he was in ventricular fibrillation.
- He received 2 shocks and then converted to a sinus rhythm with a rate of 74.
- Our ETA to your hospital is 5 minutes”

What should be included in your Online Medical Control (OLMC) to this crew?

Region XI EMS Base Station Adult Cardiac Arrest Algorithm



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ROSC

- ✓ Obtain and transmit a 12-lead EKG
- ✓ Check a blood glucose and treat appropriately
- ✓ Administer a fluid bolus to maintain SBP of 90 mmHg
- ✓ Evaluate the patient for therapeutic hypothermia
- ✓ Transport to a STEMI Receiving Center

ROSC Clinical Pearls

- Patients that have ROSC after cardiac arrest often have a blocked coronary artery that may need to be opened by an interventional cardiologist
- Region XI designates “STEMI Receiving Centers (SRC)” as hospitals with the capability to perform percutaneous cardiac intervention (PCI) and post-resuscitation management 24/7

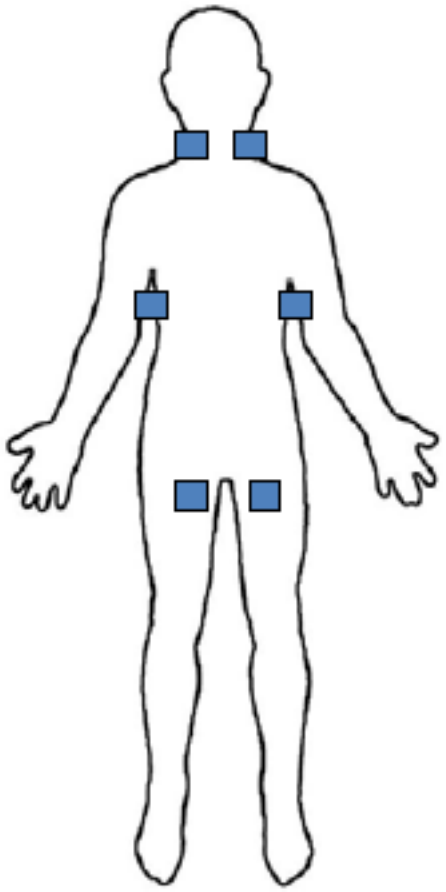
- Make sure to ask for the 12-lead EKGs!
- ALL ROSC patients should be transported to SRCs!

ROSC Clinical Pearls

- Which patients should receive therapeutic hypothermia (TH) in the field?
  - Adult cardiac arrest with ROSC
  - Sustained ROSC for 5 minutes
  - Comatose with GCS ≤ 8
- NOT for patients with: trauma, pregnancy, DNR status, bleeding disorders or active bleeding, or significant liver disease

ROSC Clinical Pearls

- **Therapeutic Hypothermia** should be started by EMS and *continued at the STEMI Center*
- For EMS: apply ice packs to neck, axilla, groin (6 total)



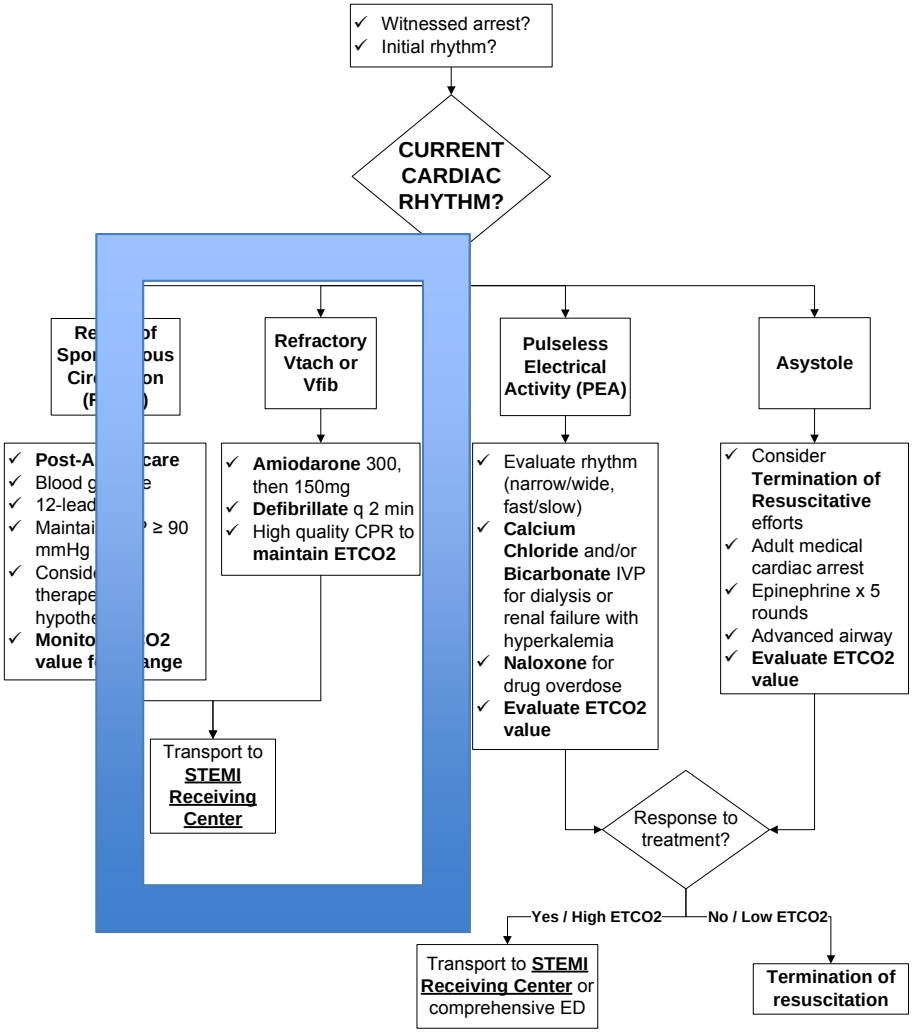
- Goal: prevent elevation of body temperature

Clinical Case #2

- “Ambulance 55 to University of Chicago, we are on the scene of a cardiac arrest
- 47 year old female with h/o CAD recent stent placed last week, complaining of generalized weakness
- We did an EKG and it showed a STEMI, then she went into cardiac arrest.
- The initial rhythm was ventricular fibrillation
- She has received 5 defibrillations, 5 rounds of epi and is still in vfib
- We have a King Airway in place and her ETCO2 is 30 mmHg
- Our closest hospital is Jackson Park with an ETA of 2 minutes, how do you copy?”

What should be included in your Online Medical Control (OLMC) to this crew?

Region XI EMS Base Station Adult Cardiac Arrest Algorithm



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Refractory Vfib-Vtach

- ✓ Anti-arrythmics!
  - ❑ Amiodarone 300 mg IVP, then 150 mg
- ✓ High-quality CPR with rhythm checks and defibrillation for shockable rhythms every 2 minutes
- ✓ Transport to a STEMI Receiving Center
  - ❑ Why???

Refractory Vfib/Vtach

- Definition: sustained shockable rhythm after 3 rounds of CPR
- Often culprit lesion in coronary arteries that requires PCI from interventional cardiologist

Refractory Vfib/Vtach

- Which patients should go to the cardiac cath lab?
  - STEMI on pre-arrest EKG
  - ROSC with STEMI
  - Initial rhythm vfib or vtach
  - Other select cases of suspected ACS

****each STEMI center has specific defined criteria*

Clinical Case #3

- “Ambulance 15 to Cook County-
- We have a 40 year old male that was found down at a gas station, unknown history but he does have a dialysis catheter in his chest
- His initial rhythm was idioventricular without pulses-we’re treating as PEA. We started CPR, established an IV and have him intubated
- We’ve given 5 rounds of epi with no response
- What would you like us to do?”

What should be included in your Online Medical Control (OLMC) to this crew?

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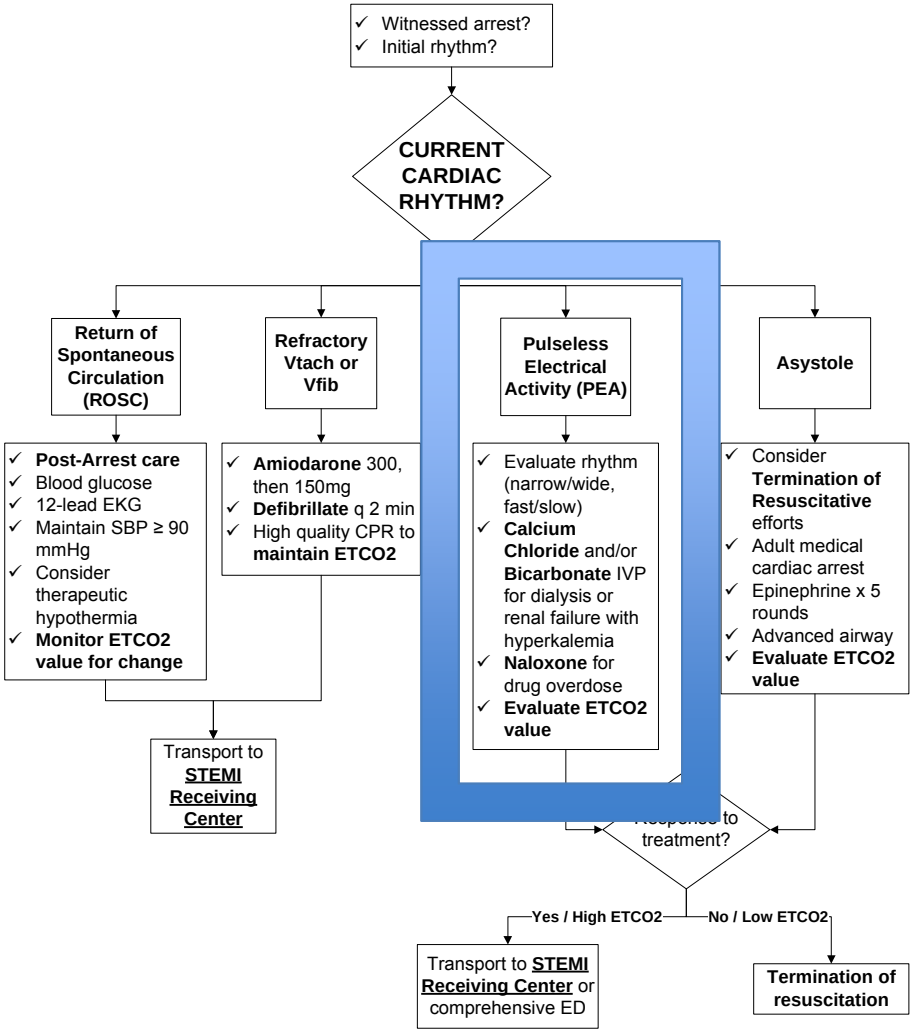

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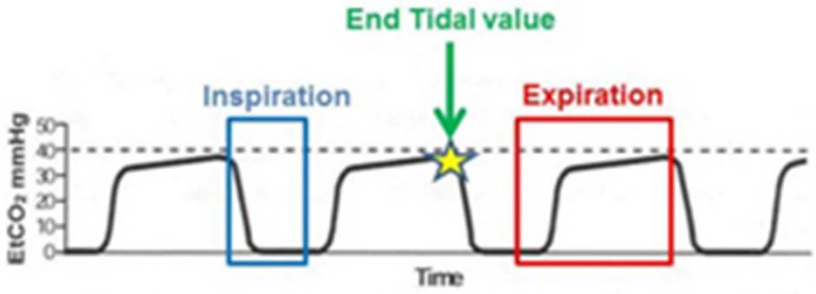
PEA

- ✓ Ask EMS to interpret the rhythm
  - ❑ Is it fast or slow?
  - ❑ Is it narrow or wide?
- ✓ If there is concern for hyperkalemia in a ESRD or dialysis patient administer:
  - ❑ Bicarbonate
  - ❑ Calcium Chloride
- ✓ If there is concern for opiate overdose administer:
  - ❑ Naloxone

PEA

- ✓What is the end-tidal CO2 (ETCO2) value?
  - ❑ ETCO2 < 10 mmHg indicates poor prognosis
  - ❑ETCO2 10-30 mmHg indicates quality compressions and should be interpreted in the context of the entire resuscitation, monitor trend
  - ❑ETCO2 > 30 mmHg may indicate ROSC

★ETCO2 is a surrogate of cardiac output



Case #3 Continued

- “Cook County, the PEA is wide, low amplitude and not organized. The patient received calcium, bicarb, and narcan. The ETCO2 is 20 mmHg. We’ve been doing CPR for 25 minutes”

- What should you advise?

Case #3 Continued

- An ETCO2 of 20 can indicate quality compressions, think about the entire resuscitation
  - Are there other reversible causes?
  - Ask for the initial ETCO2 and assess for trend
  - For most cases, this is a poor prognosis and CPR can be continued for 1-2 more rounds to assess for status change
  - The ETCO2 is only one component to the clinical scenario
- Consultation with an ECP is recommended

Clinical Case #4

- “Ambulance 56 to Illinois Masonic-
- We are on scene with an approximately 60 year old male at the train station, he was found in the bathroom unresponsive
- His initial rhythm was asystole
- We established an IV and gave him 5 rounds of epi, he has a King Airway in place and his ETCO2 is 15
- We’re calling for permission to terminate”

What should be included in your Online Medical Control (OLMC) to this crew?

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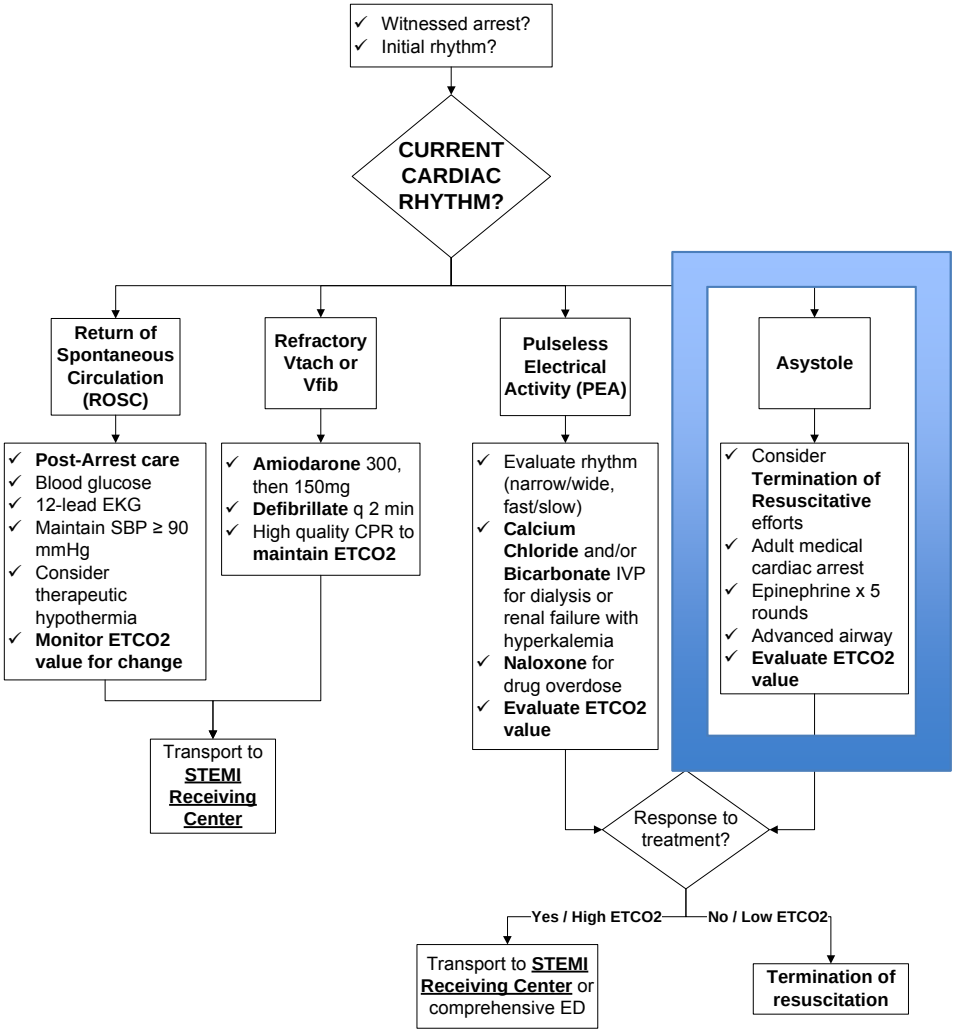

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Termination of Resuscitation

- ✓ Is the patient hypothermic?
  - ❑ Cold winter temperatures may lead to severe hypothermia and patients in cardiac arrest should be rewarmed and resuscitated unless found in a frozen state
- ✓ Are there any signs of trauma?
  - ❑ Traumatic arrest should NOT be worked on scene and should be transported immediately to a trauma center unless there are injuries incompatible with life

Termination of Resuscitation

- This patient meets criteria for field termination of resuscitation (TOR)
- When a paramedic is on scene with a patient that meets TOR criteria, they are the confirming that the patient meets the Region XI EMS criteria for TOR
  - ❑Initial rhythm PEA or asystole
  - ❑IV/IO established with 5 rounds epi given
  - ❑Advanced airway established
  - ❑Capnography reading

Termination of Resuscitation

- The ECRN may approve termination if the clinical situation meets criteria as defined in Region XI policies
- The ECRN should provide his/her name for documentation
- Any concern or deviation should be discussed with an ECP

Termination of Resuscitation

- For documentation, only the name of the ECRN is needed
- The name of the ECP is only needed if they were directly consulted in the care of the the patient
- **There is no ‘pronouncement’ or ‘time of death’ needed**
  - The base station is only verifying that the EMS providers are following Region XI policies and are not present on scene to declare the patient dead

Termination of Resuscitation

- When a TOR occurs in a ***home or private residence***, Chicago Police Department takes custody of the body for processing
- When a TOR occurs in a ***public place or unsafe scene,*** EMS may need to transport the body to the closest ED
  - Rare situation but occasionally needed
  - Resuscitative efforts should not continue
- When a TOR occurs in a ***nursing home***, the facility manages body processing

TOR vs. DOA

- Use the correct terminology!
- For clinical situations in which *resuscitation is withheld* due to signs of death incompatible with life such as rigor mortis or lividity, these patients are considered **Dead On Arrival (DOA)**
- When *resuscitation is initiated* and there is no response to treatment, these patients are considered to have **Termination of Resuscitation (TOR)**

A note about BYPASS

- ***Hospital bypass is a status request to the EMS system***
- Critical patients such as those in cardiac arrest, ROSC patients, or STEMI patients should be approved for bypass override unless the hospital has declared an internal disaster
- Remember, if the next closest appropriate hospital is greater than 5 minutes additional transport time **(T+5 rule),** EMS may transport to a hospital on bypass

Keys to Success

- As an ECRN or ECP in Region XI, you are expected to understand the policies and protocols and provide online medical control for EMS
- For cardiac arrest, use the algorithm to guide consultation

Keys to Success

- Listen carefully
- Ask only pertinent questions
- If there are questions, consult a senior ECRN or ECP
- Any complex cases should be sent to your EMS Coordinator for review

Questions? Contact your hospital EMS Coordinator or EMS Medical Director