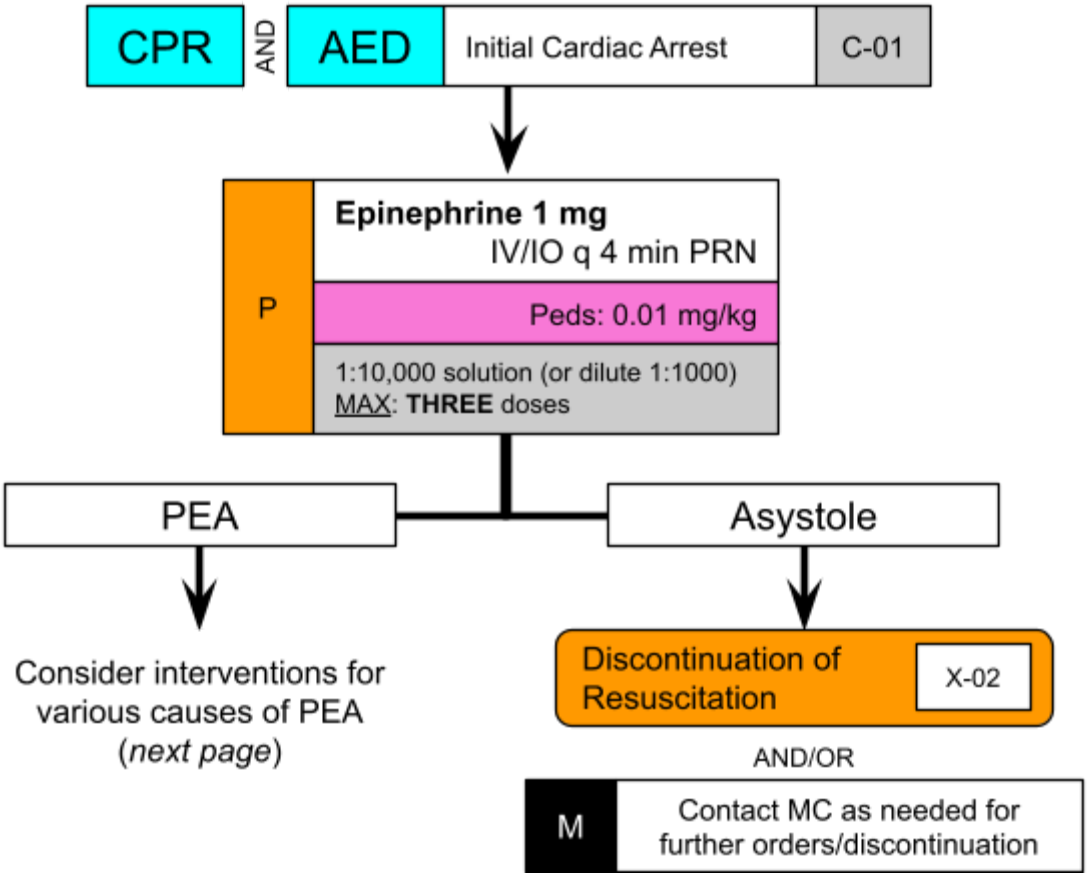
C-02 ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY		First Responder EMT AEMT Paramedic



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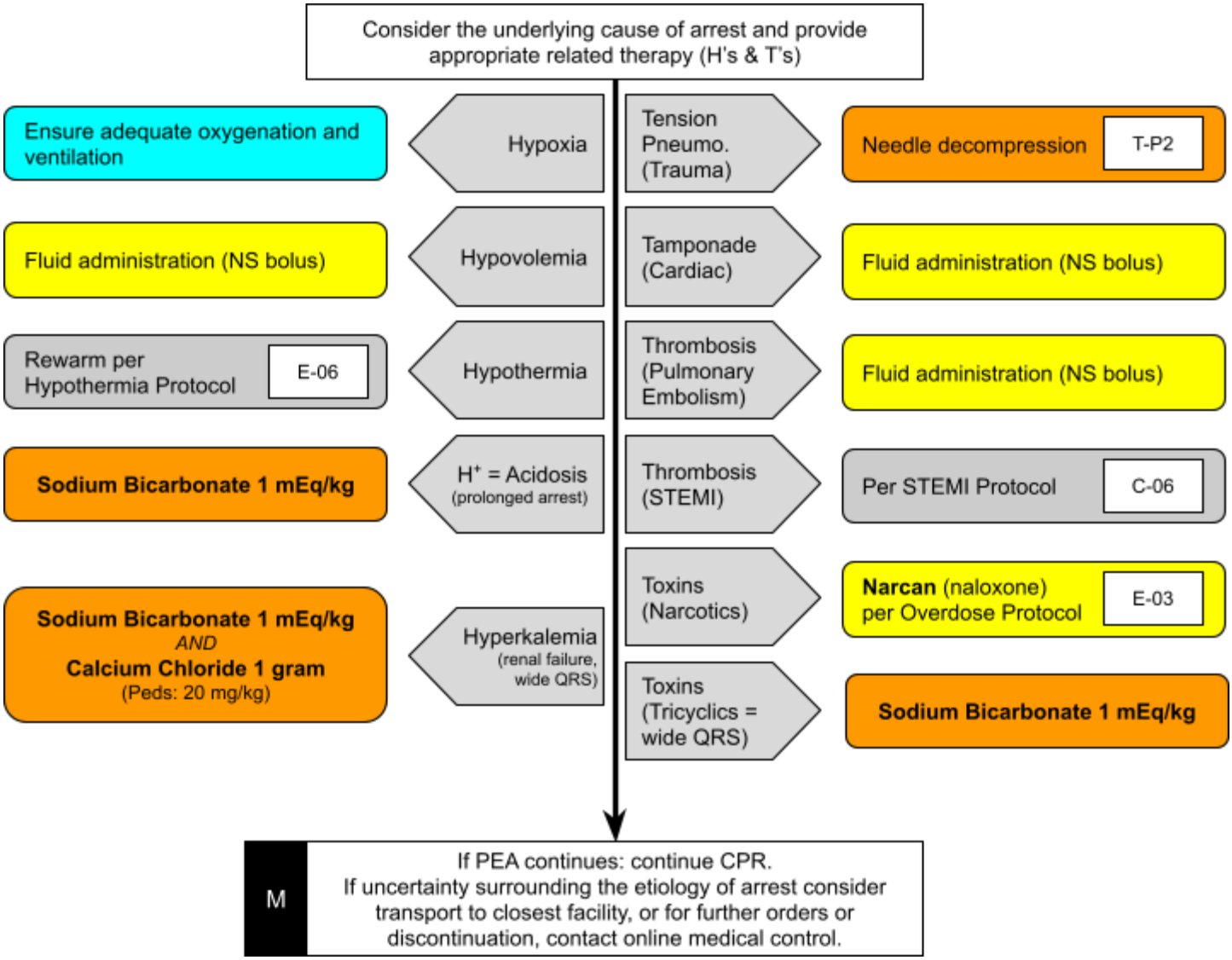

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ASYSTOLE NOTES:

Treatment of asystole = “turn on” the electricity:

- The primary goal with asystole is to get an electrical rhythm that is able to…
  - 1: be defibrillated, or
  - 2: (preferably) cause “mechanical capture”.
- ...that is to say, you must have electricity running through the pump before you can get a pulse.
- Always check multiple leads as well as the placement and contact of the leads before assuming that the rhythm is asystole.

To accomplish this, you must get oxygen and nutrients to the coronary arteries (i.e. perfuse them), and hope the heart’s electrical system is able to respond.

- Resuscitation **first and foremost** should focus on **high quality continuous CPR**.
- Oxygenation = high-flow O2
- Ventilation = Use the quickest available method that effectively provides appropriate ventilatory volume to the patient.
  - This should be started with a BVM and (generally) a BIAD (Blind Insertion Airway Device, i.e. iGel or King-LT) should be placed as soon as possible.
  - Endotracheal Intubation should only be attempted if adequate medical personnel are on scene and **CPR is not interrupted** during placement, or if other methods of ventilation fail.
- IV access should always be obtained on a cardiac arrest that does not meet presumed Death-on-Arrival [X-01] guidelines.
- IO should be placed on most cardiac arrests unless very rapid peripheral or external jugular (EJ) access can be obtained.
- Perfusion should be assisted with IV fluid bolus as soon as possible.

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PEA NOTES:

Unlike in asystole, the problem in PEA is that there is an organized electrical rhythm, but for some reason the heart is unable to create enough (or any) cardiac output to produce a pulse.

- Historically, this has been termed “electromechanical dissociation” for obvious reasons, but this over simplifies the breadth of potential underlying problems.
- While the pathophysiology is a decreased or absent cardiac output, the ultimate reason for the decreased output can be divided into three different types.
    a. Pump failure = This is the classic “electromechanical dissociation” where there is electricity pumping through the heart, but there is no (or limited) response from the myocardium.
        - Often this is due to a myocardial infarction or some metabolic cause (i.e. hypoxia or acidosis) that prevents the myocardium from responding.
    b. Preload problem = the heart is not receiving enough blood to maintain cardiac output.
        - This is often due to **inadequate blood volume** from dehydration, hemorrhage, or vasodilation (i.e. sepsis).
        - Obstruction of venous return from the body (or lung) can also prevent blood from getting to the heart--this occurs most commonly with pulmonary embolism or tension pneumothorax.
    c. Afterload problem = something is obstructing the flow of blood out of the heart.
        - Most commonly we think of an aortic aneurysm/dissection.
- Always consider there may be more than one pathology causing the problem (i.e. sepsis with decreased preload and decreased myocardial contractility).

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H'S & T'S IN PEA ARREST:

- There are several mnemonics for listing the potential causes of PEA cardiac arrest--the 5 H's and T's being the most common.

Hypoxia	Tension PTX
Hypovolemia	Tamponade (Cardiac)
Hypothermia	Thrombosis (PE)
(H+) Acidosis	Thrombosis (STEMI)
Hyperkalemia	Toxins

- When we break down the treatment of the potential causes of PEA arrest, *most* can be treated with our most basic resuscitation techniques--<u>oxygenation, ventilation and fluid resuscitation</u>.
    - These basic interventions should address **Hypoxia (oxygen)** and **Hypovolemia (fluids)**.
- The treatment for **Acidosis (H+)** is to **perfuse the acidotic tissues** (CPR and fluids) and to get rid of CO2 (i.e. ventilate the patient).
    - With prolonged downtime or resuscitation, Bicarb can be considered but should never supercede basic interventions.
- **Thrombosis (PE or STEMI)** and **Cardiac Tamponade** will almost never receive specific care in the field.
    - 12-lead EKG should be performed ASAP after ROSC if STEMI is suspected.
    - Tamponade and Pulmonary Embolism should generally present like Tension PTX as preload is decreased = narrow complex tachycardia.
    - STEMI can present with a variety of cardiac rates and rhythms (from normal sinus rhythm to various bradyarrhythmias/blocks to various tachyarrhythmias) depending on location and severity of occlusion.
- **Hyperkalemia**
    - Potassium elevation severe enough to cause cardiac dysfunction should almost always present with a **wide, slow rhythm**.
    - If suspected, treatment with Bicarb and Calcium should be initiated.
- **Tension PTX**
    - Always should be suspected with chest trauma and decreased breath sounds.

- Generally, these patients rapidly decline with increasing pulse rate and decreasing O2 sats as preload rapidly decreases.
- Treatment should be by needle decompression per guidelines.

- **Hypothermia** should be suspected by history of exposure and rewarmed per protocol.
- **Toxins** almost are almost always treated by basic supportive care.
  - Most respiratory and ALL cardiac arrests with **opiate overdose** (or other respiratory depressant) should be treated with **<u>oxygenation and ventilation</u>**.
  - Narcan will not work until the brainstem is reperfused in arrest.
  - One overdose that can be potentially treated in the field is any drug that has *sodium-channel blocking properties*.
    - Most commonly this is going to be with a **tricyclic antidepressant**.
    - Should see a **WIDE QRS complex** PEA.
    - Treatment is with Bicarb.

QI Review Parameters:

1.