

## Pulseless Electrical Activity

### Scenarios:

1. A 36 year-old male collapses in the orthopedic clinic waiting room while waiting for his follow-up appointment 2 weeks after his Achilles tendon repair.
2. A 32 year-old male feels weak for several days and then collapses in the emergency room waiting area. He has missed his last 2-dialysis appointments.
3. A 68 year-old male with hypertension who is complaining of back pain collapses as he is pulled from the car by his family.
4. A 62 year-old female who complains of shortness of breath suddenly becomes unresponsive.

- Cause of PEA (the search for a reversible cause)
- Why is this patient in PEA at this time?
- Use heart rate and QRS shape as clues to the cause of PEA

Cause	Hint	Rhythm Strip	Treatment
Hypoxia	Cyanosis	Bradycardia	Airway, oxygen
Hypovolemia	Vomiting, bleeding, flat neck veins	Narrow complex Tachycardia	Fluids, Blood
Hypothermia	Cold exposure	Osborne "J" waves, bradycardia	Bear hugger
H+ Ions (acidosis)	Dialysis, shunt	Low voltage	Sodium bicarbonate
Hyperkalemia/ Hypokalemia	Dialysis, shunt	Wide QRS	Calcium, Insulin, Glucose, kayexelate
Hypoglycemia	Accucheck	Sinus bradycardia	Dextrose

Tamponade	Chest trauma, ESRD	Electrical alternans Low voltage	Pericardiocentesis
Tension Pneumothorax	Chest trauma	Low voltage, bradycardia from hypoxia	Needle thoracocentesis, Chest Tube
Toxins	Pill bottles	Wide QRS (TCA)	Antidote if appropriate
Thrombosis (MI)		ST-segment elevation	Reperfusion therapy, Fluids
Thrombosis (PE)		Tachycardia, S1Q3T3	Thrombolytic therapy, fluids

## PEA by rate and Complex Width

Rate	Narrow Complex – likely non cardiac	Wide Complex – cardiac likely
Fast >60 beats/min	Sinus PSVT	VT VF
Slow		Hypothermia Hyperkalemia

### General treatment of PEA (after treatment of the cause)

1. CPR (ABC)
2. Oxygen
3. epinephrine 1 mg every 3-5 minutes
4. atropine
5. Sodium Bicarbonate

### Pitfalls

1. Failure to adequately assess the patient
2. Failure to consider other causes of PEA
3. Treat with epinephrine only
4. Not trouble-shooting oxygenation/ventilation
5. Failure to give fluids
6. Defibrillation
7. Not performing chest compressions

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## **Asystole** Silent Heart Algorithm

### Scenarios:

1. A 36 year-old male is found by the police on a park bench. He is unconscious. Empty narcotic pill bottles are found in his belongings.
2. A 16 year-old male falls from the back of a pick-up truck striking his head on the pavement. You find him 10 minutes after the event, unconscious on the street.
3. A 68 year-old male with hypertension is found by his neighbors inside his house on a cold morning in late fall. His pet bird is also dead.
4. A 62 year-old female who complains of shortness of breath suddenly becomes unresponsive.

Asystole for 10 minutes with no potential reversible cause = death = stop resuscitation

### Assessment

1. Verify asystole

- a. Monitor on
  - b. Leads placed
  - c. Monitor gain up
  - d. Check another lead
2. ABCs
  3. Ventilation at the primary buffer therapy
  4. Reversible conditions for asystole = reversible conditions for PEA

#### Treatment

1. CPR
2. Oxygen
3. Definitive Airway
4. Transcutaneous Pacing
5. Epinephrine
6. Atropine
7. Sodium Bicarbonate (1 mEq/kg)
  - a. Hyperkalemia
  - b. TCA Overdose
  - c. Alkalanization of Urine

#### Do not Start

1. well documented order
2. bracelet
3. obvious signs of death

#### Termination of ACLS efforts

1. Failure of effective CPR
2. VF eliminated
3. Airway adequate
4. IV established
5. Intervention maintained for 10 minutes
6. Appropriate drugs administered
7. Family informed