

		MULTNOMAH COUNTY EMERGENCY MEDICAL SERVICES		
		EMS OPERATIONAL POLICIES		
EFFECTIVE DATE: February 7, 2005	POLICY NUMBER: 020795–OPS	SECTION: 1	REPLACES: None	PAGE: 1 OF 2
MEDICAL DIRECTOR: JON JUI MD, MPH		TITLE: UNRECOGNIZED PEA: AN UPDATE		

As you may or may not be aware, a number of instances have occurred in Multnomah County of patients presenting in cardiac arrest with *unrecognized* pulseless electrical activity (PEA). Recently, MCEMS received notification by both Fire and AMR of a cardiac arrest patient in whom the presenting rhythm was thought to be asystole. However, due to the presence of an excellent waveform end-tidal CO₂ of 27, the paramedics at the scene considered the possibility of the presence of a perfusing rhythm. Upon a closer examination, the rhythm was indeed PEA and orders were obtained from MRH for fluids and dopamine. The patient survived the arrest and was transported to the hospital with a blood pressure of 70 mmHg systolic, and with an organized rhythm.

A careful review of the LifePak 12 recording revealed the following:

1. The underlying intrinsic rhythm (sinus rhythm) was indeed masked by CPR and noise artifact.
2. A careful review of the underlying rhythm revealed a very low amplitude sinus rhythm. This rhythm had such a low amplitude that it was barely discernable at the default gain setting of 1 mm on the LP12.
3. When the gain was increased to 2 mm, this rhythm became identifiable by the reviewers. When the gain was increased to 4 mm, the rhythm was readily apparent to be normal sinus rhythm (NSR).
4. A review of Leads I, II, and III did not display enough change in the amplitude of the QRS to assist the observer in diagnosing the presence of NSR.

The following conclusions can be made from this event:

1. It is highly likely that the “unrecognized organized rhythms (primarily PEA) in the past year observed by the CQI committees are secondary to the presence of low gain and resulting of low QRS amplitude. The presence of artifact (CPR and noise) in the display screen to the field providers also makes this diagnosis more difficult.

2. The MCEMS CQI Committee reproduced the exact setting and circumstance by taking a LP12 monitor and attaching themselves to the monitor. In one MCEMS CQI member, the rhythm was barely noticeable with the current default gain of 1 mm.

Recommendations:

1. The committee will recommend to the MC EMS Operations Committee to change the default setting of the LP12 gain to **2.5 mm**.
2. Until this is accomplished, all MCEMS providers are advised to perform the following interventions to avoid missing an underlying PEA rhythm:
 - During a cardiac arrest where asystole is diagnosed, the paramedics **MUST** turn the gain up to **4 mm**.
 - Paramedics are urged to use extreme caution in the interpretation of asystole with leads attached to pacing / defibrillator pads. **Limb leads** should be used for all confirmations of asystole with the rhythm confirmed in all 6 limb leads.
 - The previous recommendations on the process discontinuation of cardiac arrest in asystole are unchanged and will need to be followed.