Do Electrocardiogram Rhythm Findings Predict Cardiac Activity During Cardiac Arrest? A SHoC Series Study

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Introduction
Electrocardiographic (ECG) rhythms are used during resuscitation (ACLS) to guide resuscitation, and often to determine futility. Survival rates to hospital discharge have been reported to be higher for patients with PEA than asystole in out-of-hospital cardiac arrest. This study examines how well the initial ECG cardiac rhythm represents actual cardiac activity as determined by point of care ultrasound (PoCUS).

Methods
A database review was completed for patients arriving to a tertiary ED in asystole or PEA arrest, from 2010 to 2014. Patients under 19y or with a previous DNR were excluded. Patients were grouped into those with cardiac activity (PEA) and asystole on ECG; as well as whether cardiac activity was seen on PoCUS during the arrest. Data was analyzed for visualized cardiac activity on PoCUS.

Results
186 patients met the study criteria. Those with asystole on ECG were more likely to have no cardiac activity than those with PEA (Odds 7. 21 for initial PoCUS; 5. 45 for any PoCUS). The sensitivity of ECG rhythm was 80. 49% and 82. 12%, specificity was 77. 91% and 54. 28%, positive predictive value was 94. 28% and 88. 57%, and negative predictive value was 30. 43% and 41. 30% for cardiac activity on initial PoCUS and on any PoCUS respectively. The positive and negative likelihood ratios for ECG were 3. 47 and 0. 25 for activity on initial PoCUS. The positive and negative likelihood ratios for activity on any PoCUS were 1. 78 and 0. 33.

Conclusion
Our results suggest that although most patients with asystole on ECG demonstrate no cardiac activity, a small number actually had activity on PoCUS. This supports the use of PoCUS during cardiac arrest, in addition to ECG, to identify patients with ongoing mechanical cardiac activity.