Out of hospital cardiac arrest (OHCA) without return of spontaneous circulation (ROSC) requires a decision to terminate resuscitative efforts vs transport. Persistently high end-tidal CO$_2$ or PEA present a challenge in identifying ROSC. Ultrasound (US) for cardiac wall motion may assist in identifying ROSC.

Problem Identification

• Out of hospital cardiac arrest (OHCA) without return of spontaneous circulation (ROSC) requires a decision to terminate resuscitative efforts vs transport.
• Persistently high end-tidal CO$_2$ or PEA present a challenge in identifying ROSC.
• Ultrasound (US) for cardiac wall motion may assist in identifying ROSC.

Needs Assessment

A text message survey of paramedic supervisors gauged familiarity with and interest in US. Paramedics were asked which US exams they felt might be useful prehospital. Funding requested for two EMS fellow handheld devices, single portable unit currently on loan from US Fellowship. Other paramedic US curricula were reviewed to build our OHCA US curriculum.

Goals and Objectives

Upon completion of the US program, paramedics should be able to:
• Describe the basics of US technology
• Display the ability to perform POC cardiac US in OHCA
• Recognize important cardiac findings
• Integrate findings into decision to terminate or transport

Educational Strategies

• Didactics
  • Paramedics will learn the basics of US technology and specifics of the cardiac exam
  • Workshops
  • Paramedics will learn and demonstrate practical skills on standardized patients
  • Progressive practicals
  • Progression from EMS fellow demonstration to direct oversight of paramedic by fellow to independent paramedic exam

Paramedics complete didactic training session on US theory and OHCA exam
• US skills are practiced and assessed in standardized patient workshop
• Portable US deployed to EMS fellows who respond to OHCA with paramedic supervisors and demonstrate ten US patient encounters.
• Paramedics perform US exams under fellow direct supervision.
• Upon completion of above steps, paramedic supervisors are issued a handheld US device with recording capacity.

Evaluation

• Kirkpatrick Model of Evaluation was used to examine program success:
  • Didactic post-test
  • Supervised US exams in the skills lab and field
  • Medical director review of image quality, documented findings, OHCA characteristics triggering US use
  • Post-implementation OHCA review: Was there a measurable change in high end-tidal or PEA code termination vs transport?
<table>
<thead>
<tr>
<th>Needs Assessment Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erin: If we learn how to give this training we can eventually get it on every ambulance.</td>
</tr>
<tr>
<td>Allan: I can see the use in finding tamponade or pending tension pneumo.</td>
</tr>
<tr>
<td>Rami: I think the learning curve would be pretty steep for someone that’s only going to use this occasionally.</td>
</tr>
<tr>
<td>Susan: I’d keep it with the CPR devices (on supervisor trucks). Then you have a team of CPR/US experts.</td>
</tr>
<tr>
<td>Joe: This needs to be rolled out with preceptors like with paramedic students.</td>
</tr>
</tbody>
</table>

Selected Needs Assessment Comments:
- Erin: We can learn how to give the training and eventually get this on every ambulance.
- Allan: I can see the use in finding tamponade or pending tension pneumothorax.
- Rami: I think it would be a pretty steep learning curve for someone that’s only going to use this occasionally.
- Susan: I’d keep it with the CPR devices. Then the supervisors are your CPR/US experts.
- Joe: This needs to be rolled out with preceptors like the paramedics do. 