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Benjamin Monge
Anna Baillie
Jenna White

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EDUCATIONAL METHODS UTILIZED IN TEACHING PREHOSPITAL PROVIDERS TO USE ULTRASOUND – A REVIEW OF THE LITERATURE

Benjamin Monge², Anna Baillie², Jenna White¹
¹Department of Emergency Medicine, University of New Mexico, Albuquerque, NM, United States; ²School of Medicine, University of New Mexico, Albuquerque, NM, United States

BACKGROUND

While point-of-care ultrasound (POCUS) is being taught to emergency medical services (EMS) providers and is being utilized in the prehospital environment, a clear educational standard has not been established for this group. We conducted a review of the literature pertaining to prehospital ultrasound education in order to classify common educational themes and techniques, and to attempt to identify best practices in POCUS education for prehospital providers.

METHODS

We conducted a review of the literature pertaining to prehospital ultrasound education. We analyzed the research studies in order to determine the types of educational methods utilized, how providers’ learning was assessed, and how providers were judged on competency in performing ultrasound. Trends and variations in these techniques were identified.

RESULTS

Ten articles discussing prehospital provider ultrasound education were identified and reviewed. We identified the types of educational methods used, the ultrasound exams being taught, how provider proficiency was measured, and whether or not skill retention was assessed. Authors uniformly concluded that prehospital providers could be taught to perform POCUS with accuracy and with a generally high degree of agreement with ultrasound experts. Lecture portions of training programs ranged in length from 25 minutes to 5.5 hours. Practical components ranged in length from 25 minutes to 4 hours. Exams frequently taught included Focused Assessment with Sonography for Trauma (FAST), resuscitative limited echocardiography, and pneumothorax assessment. Pre-tests and post-tests were commonly employed. Proficiency assessments were based on image acquisition and image interpretation. Five of the studies reviewed included an assessment of providers’ retention of ultrasound skills over time. The time interval for any kind of follow-up contact with learners ranged from one week to 9 months.

CONCLUSIONS

Prehospital providers are using POCUS and are being trained to do so via a variety of educational approaches.

• There is inadequate research in this field and we recommend more real-world studies of EMS providers using POCUS be done to provide more accurate and practical data.

• We recommend that leaders in prehospital education determine an educational standard for POCUS use among field providers.

• We advocate that prehospital providers using POCUS be held to a similar proficiency standard as emergency physicians in both obtaining images and interpreting them, as this group is tasked with performing ultrasound exams in a challenging environment and with the need to make decisions regarding the care of critically ill patients.

• POCUS exams that focus on the identification and treatment of life-threatening conditions remain most relevant for prehospital providers.

Table 1: Educational Methods and Assessment

<table>
<thead>
<tr>
<th>Author</th>
<th>Participants</th>
<th>Length</th>
<th>Proficiency Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booth</td>
<td>9</td>
<td>1 day</td>
<td>Pre-test &amp; Post-test.</td>
</tr>
<tr>
<td>Bhat</td>
<td>57</td>
<td>1 hour</td>
<td>Pre-test &amp; Post-test:</td>
</tr>
<tr>
<td>Brooke</td>
<td>10</td>
<td>6.5 hours</td>
<td>30 video clips: Assess for</td>
</tr>
<tr>
<td>Chin</td>
<td>20</td>
<td>2 hours</td>
<td>Image recognition and acquisition tests. CUSAS score.</td>
</tr>
<tr>
<td>Heggard</td>
<td>40</td>
<td>6 hours</td>
<td>CUSAS written test, expert</td>
</tr>
<tr>
<td>Lyon</td>
<td>8</td>
<td>25 minutes</td>
<td>Evaluate for sliding lung sign on echocardiographic</td>
</tr>
<tr>
<td>Noble</td>
<td>n/a</td>
<td>2 hours</td>
<td>Pre and Post-test: video clips assessment.</td>
</tr>
<tr>
<td>Press</td>
<td>33</td>
<td>6 hours</td>
<td>Written Pre and Post test. CUSAS.</td>
</tr>
<tr>
<td>Rooney</td>
<td>20</td>
<td>3 hours</td>
<td>Written exam, matrix operation, identification of cardiac metastases.</td>
</tr>
<tr>
<td>Wuicher</td>
<td>99</td>
<td>1 day</td>
<td>Timed FAST exam assessed for accuracy.</td>
</tr>
</tbody>
</table>

REFERENCES


