Development and Efficacy of a 1-d Thoracic Ultrasound Training Course

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Additional course details

Each thoracic ultrasound course was advertised via the British Thoracic Society website (www.brit-thoracic.org.uk) and printed material. All major manufacturers of portable ultrasound machines, suitable for the ward environment, were invited to provide machines for the day. Their representatives attended, but did not provide any input to the course apart from dealing with machine-related technical queries. Patients were recruited predominantly from local Pleural Clinics and their chest X-rays &/or axial CT slices were displayed alongside patients. Privacy was ensured using screens and participants were asked to use alcohol gel between each station.

Acknowledgements

The authors are very grateful to Jackie Ford, Joan Thompson and Andi Morgan and the other staff of the British Thoracic Society for their assistance in course organisation.
### e-Table 1 – Minimum requirements for pleural ultrasound competency stipulated by selected authorities

<table>
<thead>
<tr>
<th>Standard attained</th>
<th>Royal College of Radiologists (RCR), UK</th>
<th>European Federation of Societies for Ultrasound in Medicine and Biology</th>
<th>Australian Society for Ultrasound in Medicine (ASUM)</th>
<th>American College of Emergency Physicians (ACEP)</th>
<th>American College of Chest Physicians (ACCP) Certificate of Completion of Critical Care Ultrasonography Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum number of examinations to observe</td>
<td>20</td>
<td>25</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Minimum number of examinations to perform</td>
<td>NS</td>
<td>20</td>
<td>25</td>
<td>NS</td>
<td>25-50</td>
</tr>
<tr>
<td>Examinations on normal patients</td>
<td>20</td>
<td>100</td>
<td>20</td>
<td>NS</td>
<td>5</td>
</tr>
<tr>
<td>Examinations on patients with pleural effusions</td>
<td>5</td>
<td>50</td>
<td>5</td>
<td>NS</td>
<td>10</td>
</tr>
<tr>
<td>Number of interventional examinations</td>
<td>25</td>
<td>25</td>
<td>10</td>
<td>NS</td>
<td>10</td>
</tr>
<tr>
<td>Requirements for supervision</td>
<td>Mentor with level 1 or level 1 with 2 years experience</td>
<td>Mentor with level 2 or level 1 with 2 years’ experience</td>
<td>Mentor who is a recertified CCPU holder</td>
<td>Emergency Medicine Faculty supervision</td>
<td>NS</td>
</tr>
<tr>
<td>Requirements for theoretical course</td>
<td>Attendance required; duration not stated</td>
<td>15 hour theoretical course</td>
<td>3 hours (+ separate physics and instrumentation tutorial)</td>
<td>Integral to residency curriculum or as part of 3-4 hour of theory and 2-4 hour practical course</td>
<td>Attendance at three courses (and one online course) required to achieve competency in Critical Care Ultrasound</td>
</tr>
<tr>
<td>Requirements to maintain competency</td>
<td>20 examinations per year, ≤ 3 months between scans</td>
<td>100 examinations per year, ≤ 3 months between scans</td>
<td>NS</td>
<td>5 hours of continuing educational activities per credentialing cycle (usually 2 years)</td>
<td>NS</td>
</tr>
<tr>
<td>Final competency sign-off</td>
<td>By mentor</td>
<td>By mentor</td>
<td>Application to ASUM</td>
<td>Residency director/ Ultrasound coordinator or local review of experience and documentation</td>
<td>Awarded by ACCP if meets requirements and successful in end of training exam</td>
</tr>
<tr>
<td>Comments</td>
<td>Guidelines describe a number of ‘core emergency ultrasound applications’, including thoracic ultrasound</td>
<td>Critical Care Ultrasound competency includes pleural, cardiac and vascular ultrasound</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS = Not stated
e-Box 1 – Construction of phantoms

A variety of techniques were used including;

*Pleural fluid phantoms*

- Large food storage container with the following layers;
  1. Simulated pleural fluid – plastic food bag filled with water. Ensure no free air.
  3. Simulated soft tissues – container filled using modified gelatin/psyllium husk mixture\(^7\) (ratio of ingredients – 3 sachets gelatin in 500ml boiled water, with gradual addition of 1 tablespoon purified powdered psyllium husk with continuous stirring). Psyllium husk available from ‘health food’ shops.
  4. Single layer of gauze swabs to preserve model longevity
- Chicken breast (simulating soft tissue) wrapped over a cardboard urine bottle using ‘cling film’, filled with water (simulating pleural fluid).
- Large plastic food bag containing set jelly (simulating pleural fluid).

*Lymph node phantoms*

- Small food storage container with the following layers;
  1. Simulated necrotic lymph nodes – layer of olives with pimento pepper
  2. Simulated soft tissues – gelatin/psyllium husk mixture (as above)
  3. Single layer of gauze swabs to preserve model longevity
- Chicken breast (simulating soft tissue) in which olives are forcibly embedded (simulating necrotic lymph nodes).
References


