Ultrasound Treasure Hunt: A Novel Teaching Method That Overcomes Direct Patient Care Restrictions Brought on by the COVID-19 Pandemic

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Prioritizing trainee safety during the COVID-19 era is paramount. In March 2020, the Association of American Medical Colleges recommended prohibiting medical students from direct patient care in significantly affected regions. Guidelines continue evolving; however, the American Medical Association continues to recommend that clinical experiences, not requiring direct patient care, be achieved through virtual formats.

Point-of-care ultrasound (POCUS) requires hands-on practice manipulating the probe. Identifying correct ultrasound windows and anatomy is challenging for novice sonographers without structured direction. During the pandemic, PPE shortages, hospital crowding, and quarantine due to infection or exposure may restrict learners from interacting with patients or attending workshops. Balancing safety and education requires adaptation of traditional bedside POCUS teaching. Goldsmith et al. encourage “educational distancing” and self-directed POCUS education in the COVID-19 era. The ultrasound treasure hunt (UTH) utilizes handheld ultrasound technology, cloud services, and videoconferencing to teach POCUS while maintaining physical distance.

EXPLANATION

The UTH is a map for trainees to learn hands-on POCUS at home. Student and resident rotators are provided handheld ultrasound devices, tablets, disinfectant wipes, and the “treasure map,” a guided list of essential images (Appendix S1, available as supporting information in the online version of this paper, which is available at http://onlinelibrary.wiley.com/doi/10.1002/aet2.10541/full) to obtain during a 2-week rotation. This map is organized by common organ systems traditionally taught at bedside. Learners watch previously available institutionally produced videos and then follow the treasure map’s step-by-step instructions on movement and probe orientation. After obtaining verbal consent, students practice finding treasure map items (Figure 1) on persons with whom they are already in contact: themselves, roommates, or family. Learners label relevant anatomy to demonstrate understanding of maneuvers and basic interpretation. These files are saved to a cloud server. Faculty provide feedback on trainees’ own images and clips, utilizing conferencing application screen sharing. A policy was in place to report incidental findings in a HIPAA-compliant manner and refer for follow-up.

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DESCRIPTION

The UTH rapidly developed to continue POCUS education, while minimizing COVID-19 exposure, but was only required for one block. However, current rotators continue to utilize UTH to cover essential POCUS learning points and the platform remains accessible for learners placed on home isolation. The next generation of this model will include real-time tele-ultrasound guidance and will be integrated with the current ultrasound rotation.

Two emergency medicine interns with minimal ultrasound experience completed the 2-week UTH and submitted 174 images/clips. Trainees and cohabitants freely consented to storing images in a proprietary cloud. In oral exit interviews with faculty, both interns indicated that they enjoyed the opportunity for safe, kinesthetic learning during the pandemic. Both reported increased comfort performing POCUS following the rotation and recommended the course to colleagues. To improve the rotation, one trainee requested real-time feedback while scanning remotely.

Tele-ultrasound or remotely guided ultrasound has been successfully utilized in neonatal units, aerospace medicine, and other austere locations and facilitates acquisition of high-quality POCUS studies by novice sonographers. Future rotators will be offered tele-ultrasound guidance for challenging (i.e., ECHO) and less common (i.e., musculoskeletal) examinations. This real-time supervision will also decrease the image quantity each faculty reviews. The UTH is a feasible educational roadmap that facilitates remote, hands-on, POCUS training for novice sonographers during the COVID-19 pandemic.

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Supporting Information

The following supporting information is available in the online version of this paper available at http://onlinelibrary.wiley.com/doi/10.1002/aet2.10541/full

Appendix S1. Treasure map.