Implementing An Onsite Longitudinal Point-of-care Ultrasound (POCUS) Training Curriculum in a Large Academic Neonatal Intensive Care Unit

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Objectives

1. To develop a longitudinal neonatal POCUS curriculum for NICU faculty and fellows focusing on both diagnostic and procedural applications using available institutional resources.
2. To evaluate trainee's progress towards achieving competency in six core diagnostic and procedural applications using the validated Objective Structured Assessment of Ultrasound Skills (OSAUS) scale.

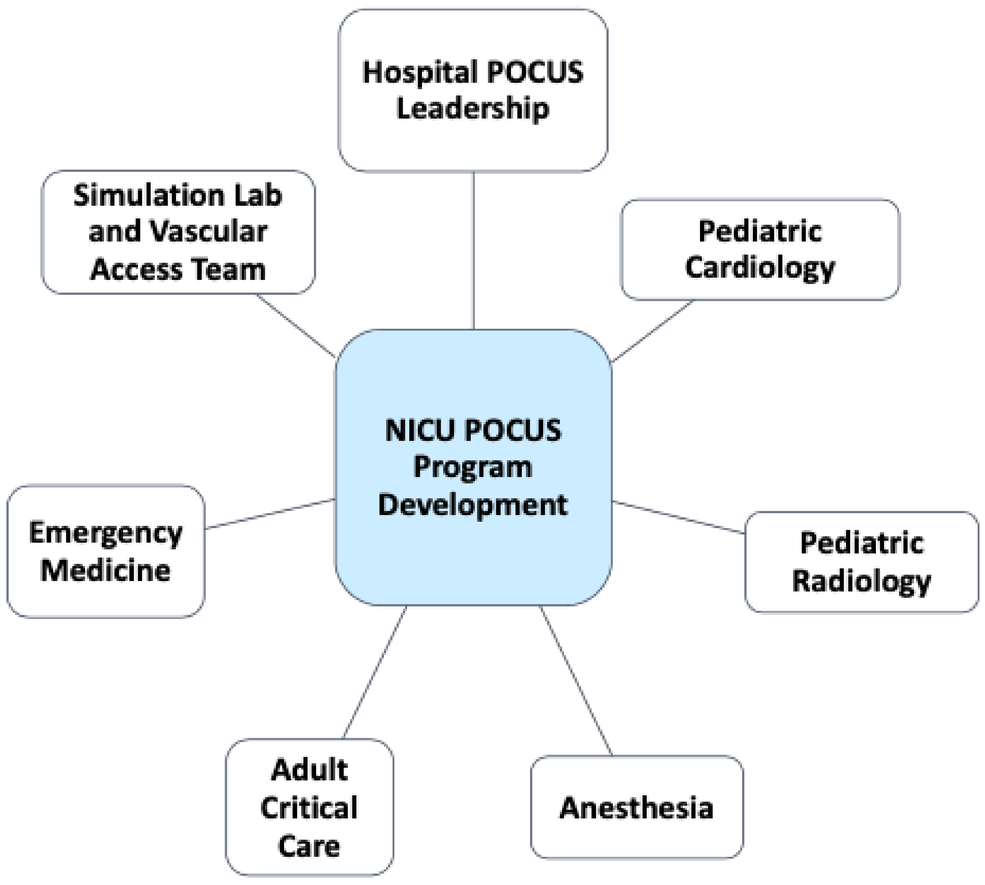
Methodology

Six core and advanced diagnostic and procedural applications of POCUS were identified. (Fig).

A 12-month onsite longitudinal neonatal POCUS curriculum developed through multi-departmental collaboration.

Three-tiered approach to training → third tier designed to develop competency.

Trainees in third-tier → progress in each area monitored over 9 hands-on supervised practice sessions using the validated Objective Structured Assessment of Ultrasound Skills (OSAUS) scale, scored from a scale of 0-3.



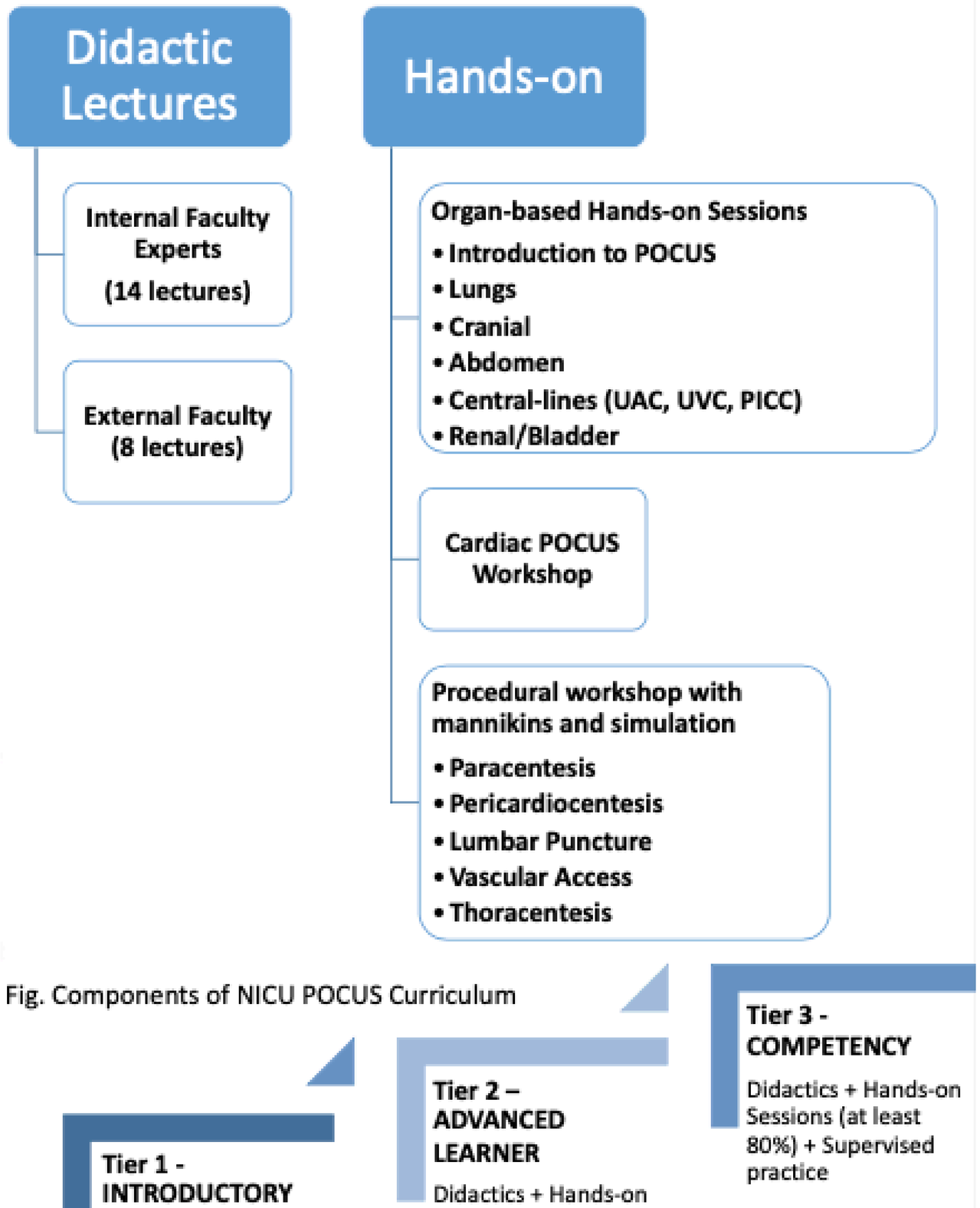


Fig. Components of NICU POCUS Curriculum

Fig. Three-tiered approach to NICU POCUS training

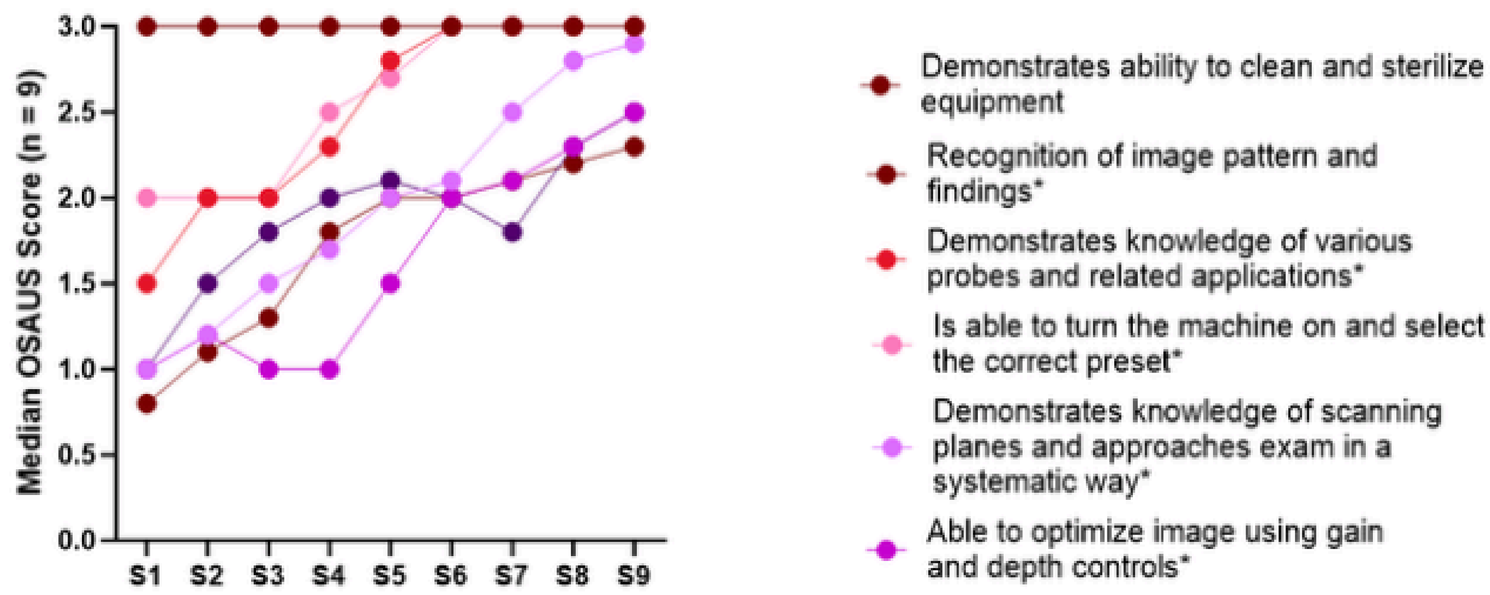


Fig. Median OSAUS scores over nine hands-on supervised practice sessions (S1-9), *p<0.05

Results

- A total of 9 trainees (5 faculty, 4 fellows) elected to participate to train in Tier-3 of training.
- Median OSAUS score at the beginning of training was 1.3 [0.8-2] and at the end of training was 2.6 [2.0-2.8].
- Median OSAUS score per participant increased by 77% [56 – 90].
- There was no significant difference in median scores of faculty [2.3 (1.1-2.8)] vs fellow trainees [2.4 (1.3-3)].
- Statistically significant improvement was noted in six out of seven domains tested in the OSAUS scale (Fig).

Six Core Diagnostic and Procedural Applications

1. Identification and verification of central line tip position and placement (UVC, UAC and PICC)
2. Identification of pneumothorax and pleural effusion on lung ultrasound.
3. Identification of a large IVH on cranial ultrasound.
4. Identification of large pericardial effusion and tamponade.
5. POCUS-assisted lumbar puncture and peripheral arterial line placement.
6. Identification of free fluid in abdomen.

Conclusion

We have demonstrated a feasible approach to implementing an onsite longitudinal POCUS curriculum integrated into the NICU fellowship program using a multi-disciplinary approach with available institutional resources. Progress towards achieving proficiency in pre- specified domains can be measured objectively using the OSAUS scale, although criteria to achieve competency is yet to be established.