# UNIVERSITY OF KENTUCKY

College of Medicine Department of Pediatrics

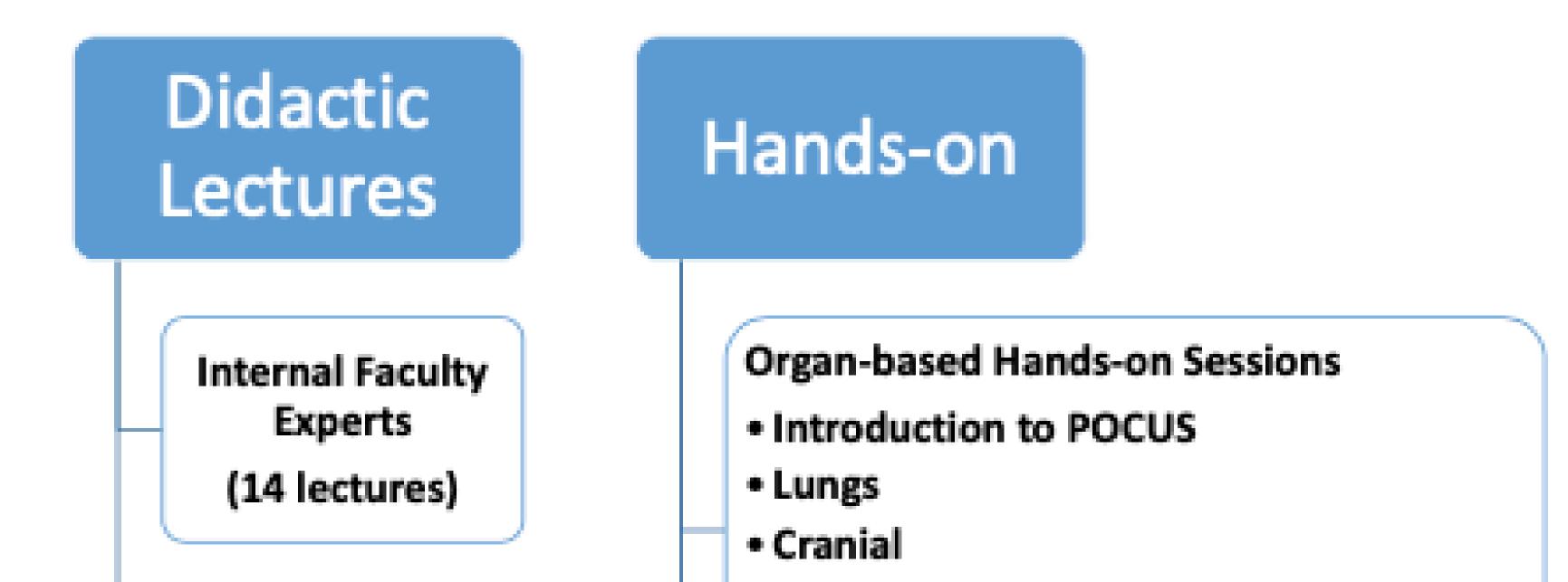
Implementing An Onsite Longitudinal Point-ofcare Ultrasound (POCUS) Training Curriculum in a Large Academic Neonatal Intensive Care Unit

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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 multidepartmental collaboration.

Three-tiered approach to training  $\rightarrow$  third tier designed to develop competency.

Trainees in third-tier  $\rightarrow$  progress in each area monitored over 9 hands-on supervised practice sessions using the validated Objective Structured Assessment of

External Faculty (8 lectures)

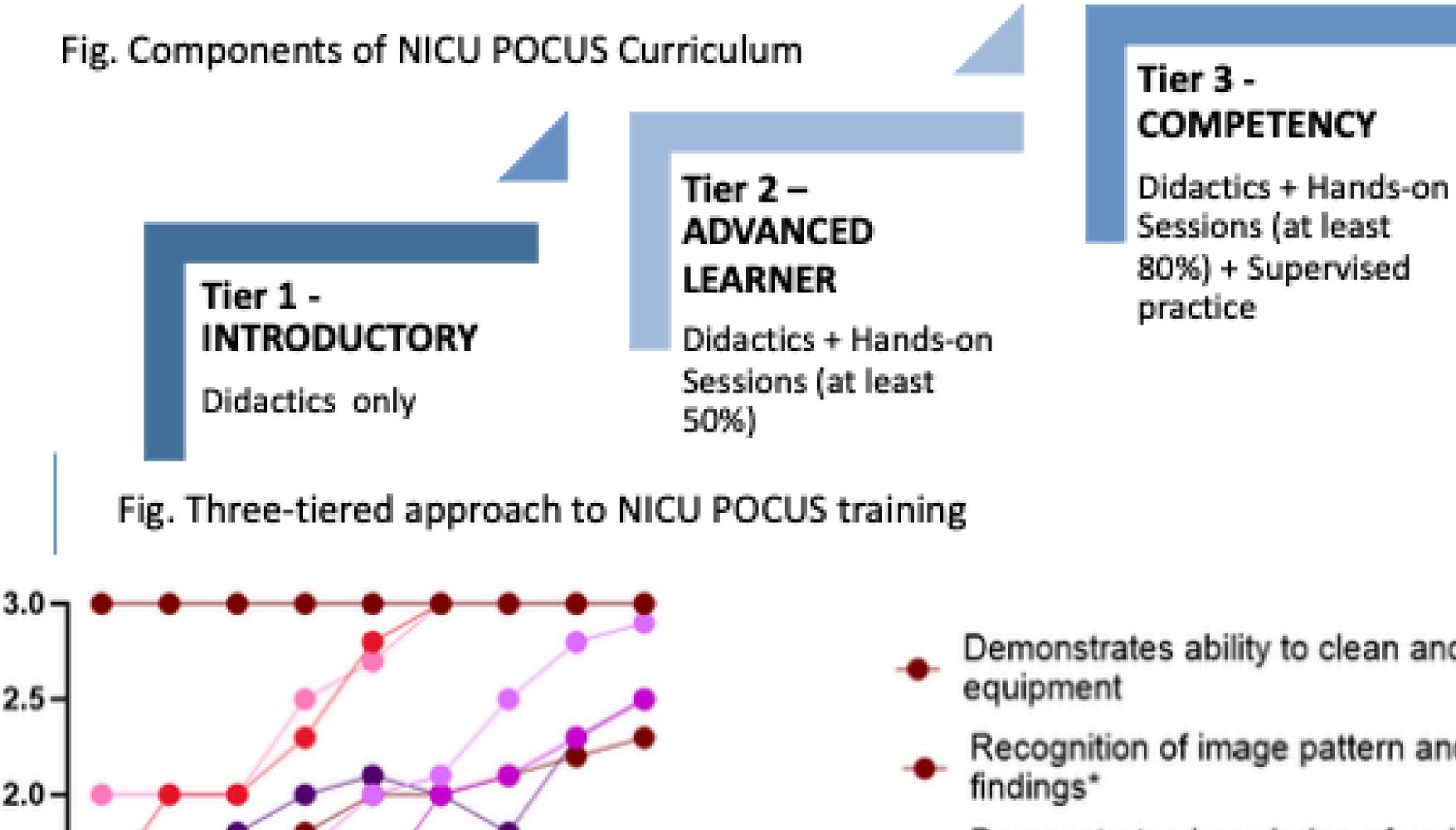
- Abdomen
- Central-lines (UAC, UVC, PICC)

Renal/Bladder

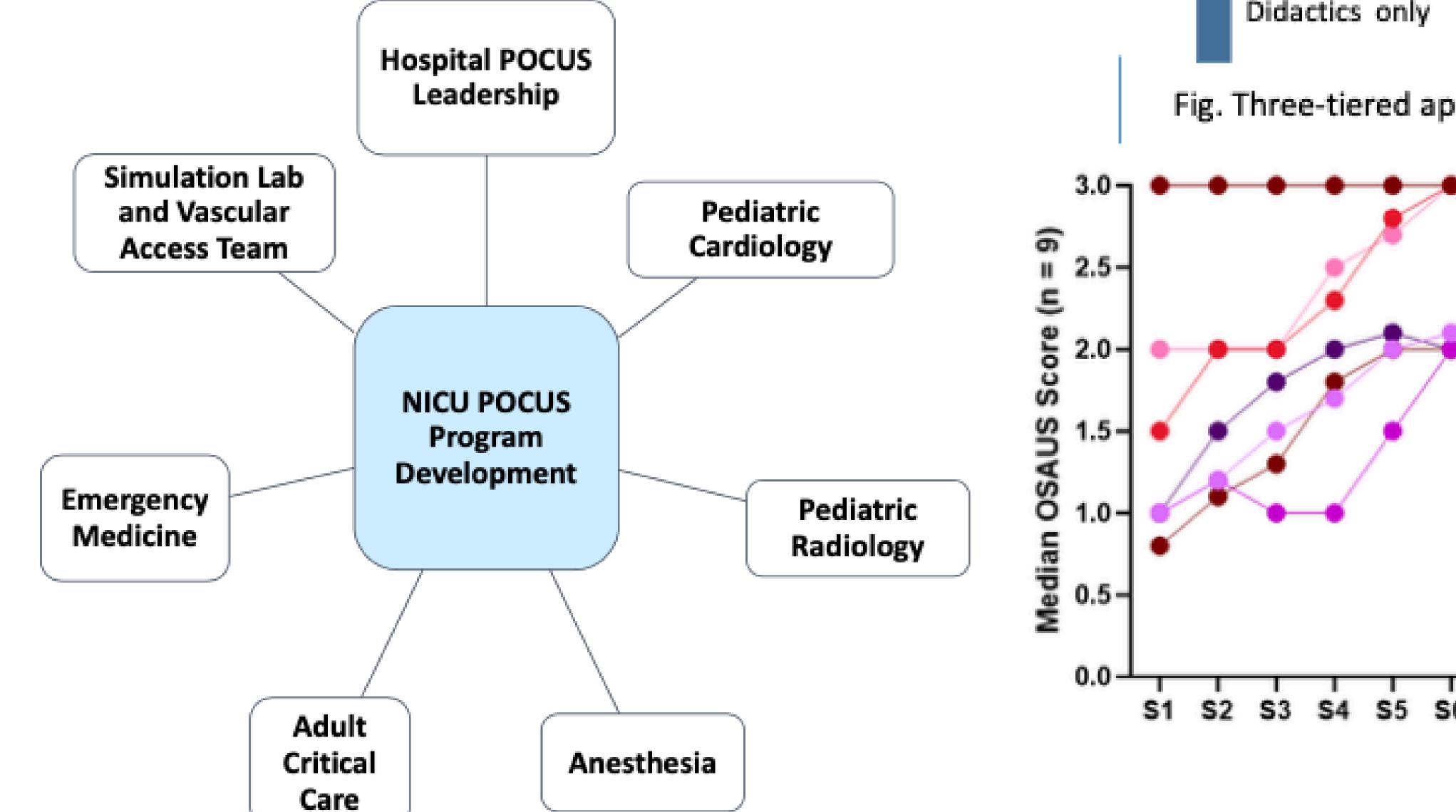
Cardiac POCUS Workshop

Procedural workshop with mannikins and simulation

- Paracentesis
- Pericardiocentesis
- Lumbar Puncture
- Vascular Access
- Thoracentesis



Ultrasound Skills (OSAUS) scale, scored from a scale of 0-3.



80%) + Supervised

- Demonstrates ability to clean and sterilize
- Recognition of image pattern and
- Demonstrates knowledge of various probes and related applications\*
- Is able to turn the machine on and select the correct preset\*
- Demonstrates knowledge of scanning
- planes and approaches exam in a systematic way\*
- Able to optimize image using gain and depth controls\*
- Systematically approaches exam using checklist/guidelines\*



#### Results

- $\succ$  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).

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

#### Six Core Diagnostic and Procedural Applications

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