

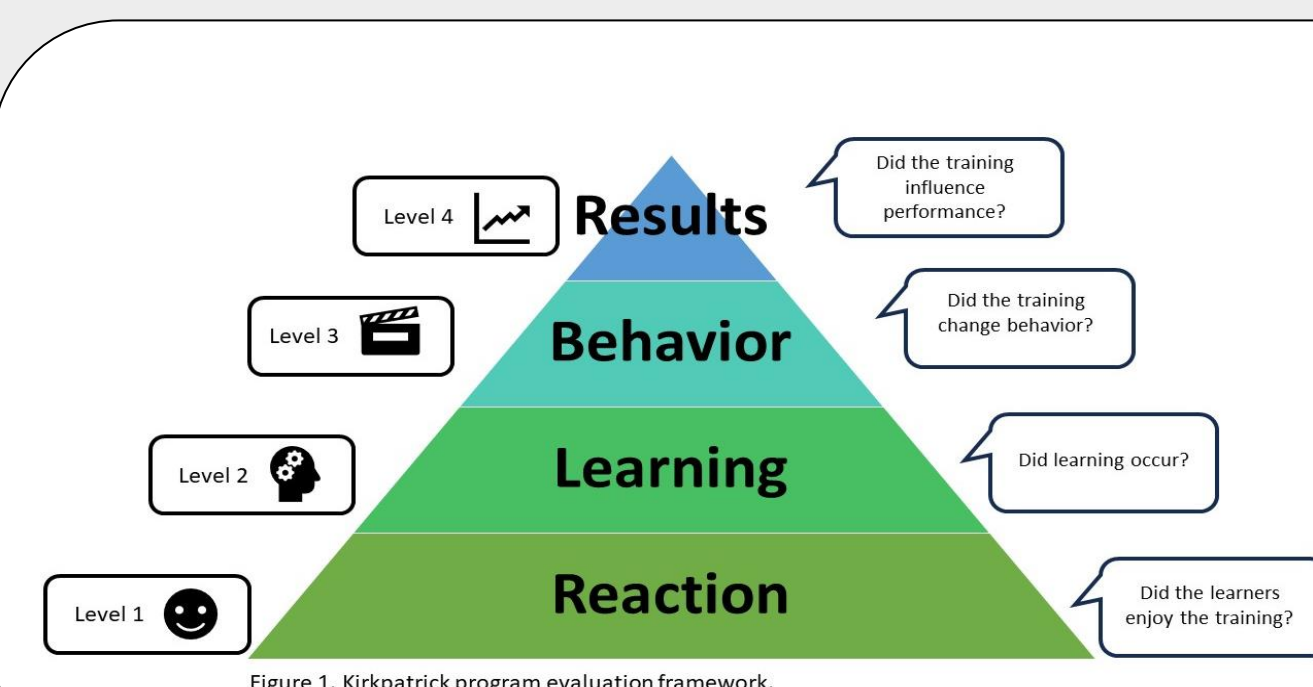
Feasibility of a novel, self-directed point-of-care ultrasound (POCUS) curriculum using a portable ultrasound: a “proof of concept” study

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INTRODUCTION

Point of care ultrasound (POCUS) is an increasingly used diagnostic modality. However, **hands-on skill sessions in lung and focused cardiac ultrasound can be resource-intensive.**

We describe a **take-home, guided curriculum using a portable ultrasound to provide deliberate practice in POCUS skills** to anesthesiology resident trainees while **minimizing ongoing time commitment from faculty.**



Kirkpatrick Model of Program Evaluation

- An outcomes-focused method of program evaluation
- Emphasizes shifts from subjective to objective assessment of medical education curriculum
- Involves four levels: reaction, learning, behavior, and results

STUDY OBJECTIVES



Is this novel take-home ultrasound program **feasible**?



Is the program **effective** as defined by **knowledge acquisition, perceived usefulness, and trainee self-efficacy** using the 4-level Kirkpatrick evaluation model?

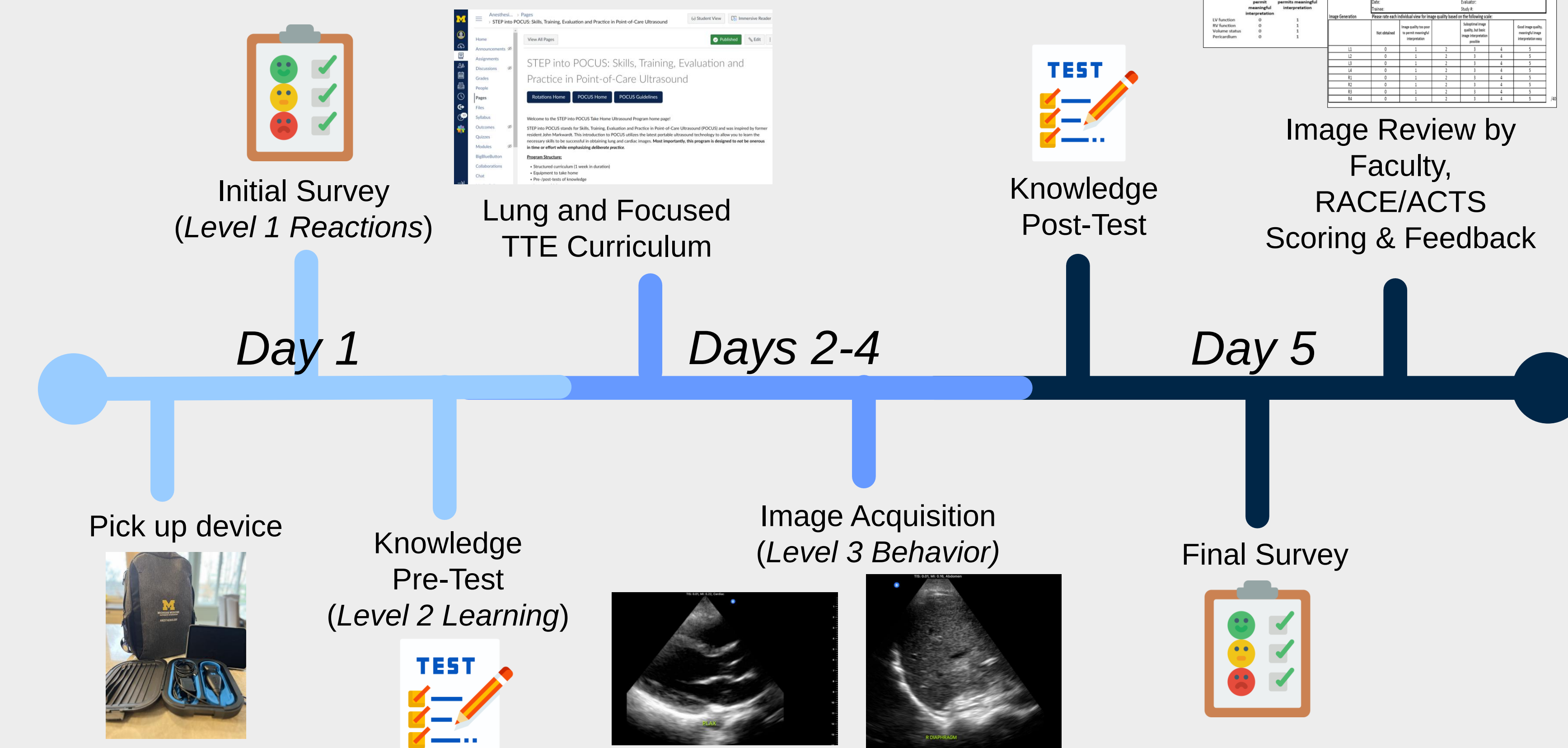
METHODS

Deliberate Practice Model



1 Week Duration **15** Minutes per Day

Curriculum Timeline



RESULTS

33% Completion Rate

- **No difference** in pre- and post-curriculum image recognition and knowledge
 - Participants in **earlier stages of training** had **notably greater increases** compared to near-graduates
- **Pleural and parasternal views** were approaching “good image quality with meaningful image interpretation”
- **Basic interpretation of LV and RV function, volume status, and pericardium** was possible in the majority of submitted images

Image Generation	PLAX	PSAX	A4C	S4C	IVC	Cumulative Score (Max 25)
	4.6	4.1	4.4	3.4	3.9	16.1

LV function	RV function	Volume status	Pericardium	Cumulative Score (Max 4)
0.86	0.86	1.00	0.71	3.4

Image Generation Scoring: 0 - not obtained; 1 - image quality too poor to permit meaningful interpretation; 3 - suboptimal image quality, but basic image interpretation possible; 5 - good image quality, meaningful image interpretation easy
Overall Quality Scoring: 0 - image quality does not permit meaningful interpretation; 1 - image quality permits meaningful interpretation

Image Generation	Left Diaphragm	Right Diaphragm	Pleural view B-mode	Pleural view M-mode	Cumulative Score (Max 20)
	3.33	3.50	4.20	4.00	15.4

Image Generation Scoring: 0 - not obtained; 1 - image quality too poor to permit meaningful interpretation; 3 - suboptimal image quality, but basic image interpretation possible; 5 - good image quality, meaningful image interpretation easy
Table 1. Image acquisition scores using RACE and ACTS scales.^{1,2}

Highly Valued

>90% of Participants

- ✓ Desired to include permanently
- ✓ Felt motivated to learn more POCUS
- ✓ Recommended to colleagues

DISCUSSION

- ✦ Harness **innovative technology** to provide high-quality education
- ✦ Able to **evaluate Kirkpatrick Levels One, Two and Three**
- ✦ Means to **obtain images *outside* clinical environment or live models** (i.e., to submit for ASA Certificate in Diagnostic POCUS)
- ✦ **Minimize time commitment** from faculty



Safe, feasible, and effective

