



Simulation-Based Mastery Learning for Internal Medicine Residents in Procedures

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Background

Procedural competency is an integral component of Internal Medicine clinical practice and resident training. However, insufficient procedural training during residency particularly in ambulatory settings has been reported as a consistent concern by residents and program directors.

Deliberate practice through simulation-based mastery learning (SBML) of inpatient IM procedures improves long-term skill retention and patient outcomes. This learning is reinforced when temporally paired with clinical experience.

Purpose

- Bedside procedures are an essential component of internal medicine (IM) ambulatory care, but rates of procedures performed and self-perceived procedural confidence continue to decline among IM faculty and residents.

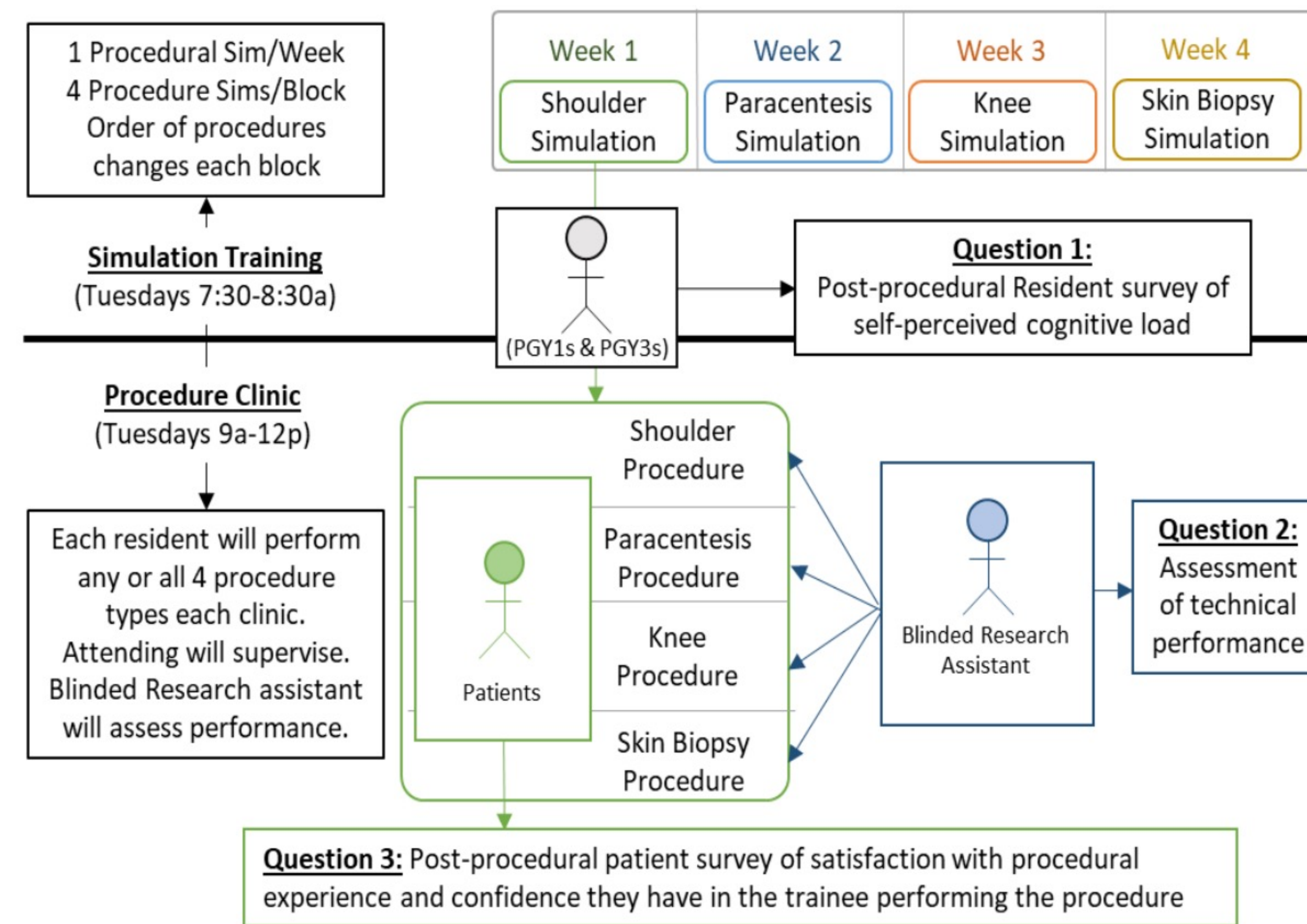
Questions

Does JiT (same-rotation) and JiP (similar environment) SBML for procedures:

- Reduce trainee self-perceived cognitive load during procedures?
- Improve technical performance?
- Improve patient experience and/or the confidence they have in the proceduralist?

Methods

Figure 1 – Example of weekly simulation schedule for one of the eleven 4-week blocks.



Results

	Number of observed encounters	Average number of observed mistakes (total possible)
Subacromial Injection	30	2.5 (23)
Knee injection	45	2.3 (23)
Paracentesis	38	3.2 (39)
Totals	113	

- Reduced anxiety and increased confidence.
- Most effective learning occurred when residents performed the same procedure that they had simulated that same day.

Discussion

- Just-In-Time and Just-in-Place Simulation Based Mastery Learning could catalyze changes to resident procedural education.
- Data could support curriculum development.
- Beyond training and education, improved patient safety and healthcare quality.
- Limitations: medical student RAs, assessment burden on residents, checklist assessment variability

Conclusion and Future Directions

- A same-day simulation-paired procedural clinic with standardized educational materials and clinic protocols may provide a psychologically safe and effective learning environment for IM PGY-1s to acquire common ambulatory IM procedural skills.
- Measure trainees' long-term retention of these procedural skills

References

