

Ted Freedman Award for Innovation in Education 2017

Project Name: 'Just-In-Time' Procedural Simulation Program

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The Innovation

The Just-In-Time Procedural Simulation Program is a comprehensive, ubiquitously available training initiative to improve the teaching and performance of common hospital-based medical procedures. It is comprised of self-directed, interactive teaching modules in paracentesis, thoracentesis, and lumbar puncture, chosen for their often-urgent indication, potential for significant adverse events, and documented resident discomfort (1). Trainees can access concise, instructional computer modules that outline materials, contraindications, suggestions for appropriate investigations, as well as video-guided, step-by-step instructions for procedures based on existing best practices. After reviewing the modules, trainees can practice their hands-on skills with ultrasound compatible simulators, available within a 24-hour per day simulation centre. Consent sheets, standardized procedure checklists, and documentation notes are automatically printed to ensure quality patient care. The result is a novel 'one-stop' method of teaching procedural competencies to medical trainees and ensuring safe, evidence-based procedural performance.

The Evidence to Substantiate the Innovation

Proficiency in procedural skills is an essential competency in postgraduate medical training (2), and an integral component to safe medical practice. However, there is evidence that trainees do not have exposure to adequate learning opportunities or practice simulations (3).

The current model for procedural training in medicine largely relies on an apprenticeship model, colloquially known as the 'see one, do one, teach one' approach (4,5,6). After a single training session at the beginning of the first year of residency, many trainees will observe only a single live procedure before acting as the operator.

Moreover, It is commonplace for months to lapse before trainees get the opportunity to apply their skills.

As a result, residents lack comfort in at least one aspect of 50% of the procedures they perform (7), and 25% of residents have supervised a procedure before feeling comfortable with their own skills (7). Perhaps even more concerning is the implication for procedural performance. Resident-focused hospitals may have procedural success rates as low as 50%, with frequent lapses in recognized quality checkpoints, inappropriate ordering of investigations, and frequent omission of key investigations (8).

It is no wonder that experts have called for an “urgent need for quality improvement interventions” in the realm of procedural competence (8).

The Value of the Innovation as an Agent of Change

Traditional procedural curricula rely on infrequent, large group sessions, leaving trainees without a chance to apply their knowledge for months thereafter; in the intervening time, there is a natural degradation of skills. The Just-In-Time Initiative shifts this paradigm with student-directed access to procedural training. Modeled after efficiency practices in the manufacturing industry, the Just-In-Time Initiative provides immediate skills and information at the time those resources are most pertinent; trainees now take 5-10 minutes before performing a live procedure to refresh their skills. This new model of education allows trainees to decide when knowledge acquisition is of highest yield.

The second novel component to the Just-In-Time Program is the ‘one-stop’ organization of its content. Recognizing that optimal patient care relies on more than medical knowledge, the provision of procedure notes, consent sheets, and materials checklist within our modules innovates by emphasizing and ensuring the meticulous documentation, appropriate communication, and flow of processes that are part of any successful medical intervention.

Finally, rather than housing procedural modules locally, the Just-In-Time Program has made all of its content available online, to be freely accessed without barrier to entry. In contrast to traditional educational programming, the Just-In-Time Initiative models a desire for broader, more accessible impact, and strives to educate an exponentially larger population of motivated learners.

The Outcomes to Substantiate the Innovation

In the five months since the launch of the Just-In-Time Simulation Program, approximately 700 sessions utilizing nearly 2000 pageviews of content have occurred as medical trainees strive to improve their skills. The majority of utilization takes place

either after business hours or on weekends, attesting to the increased support that medical students and residents are receiving at times when they do not have direct oversight. While the majority of Just-In-Time program usage has been at the academic Toronto hospitals, online analytics have demonstrated a more geographically dispersed impact, with practitioners utilizing Just-In-Time modules in cities across Ontario. The scope of impact is only increasing with the recent launch of mobile compatible modules. Finally, with the widespread success of the thoracentesis, paracentesis and lumbar puncture modules, the Just-In-Time program will be expanding to other procedures, such as arthrocenteses and central venous catheter insertion.

Utilizing comprehensive, available, resident-focused training, the Just-In-Time Procedural Simulation Program continues to improve medical education and make bedside procedures safer.

References:

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