Building Competence - An Active-Learning Approach

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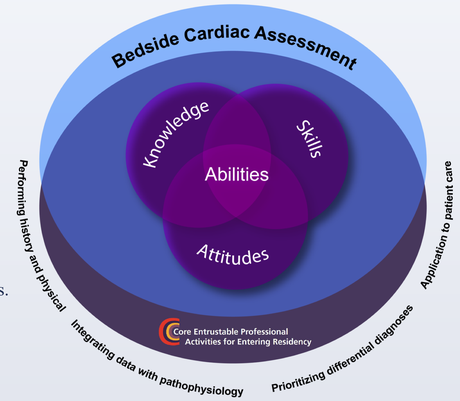
Introduction

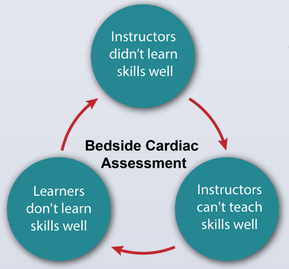
Background

The performance of bedside cardiac assessment (BCA), a core clinical ability,[1] is deteriorating. Fewer clinical instructors feel comfortable teaching BCA, making the problem urgent and self-perpetuating.[2,3]

We hypothesized that a systematic,[4] active-learning approach to teaching BCA would improve student performance and designed a multi-institutional study to test that hypothesis.



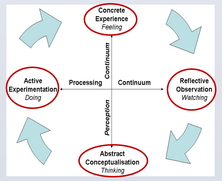
The Problem



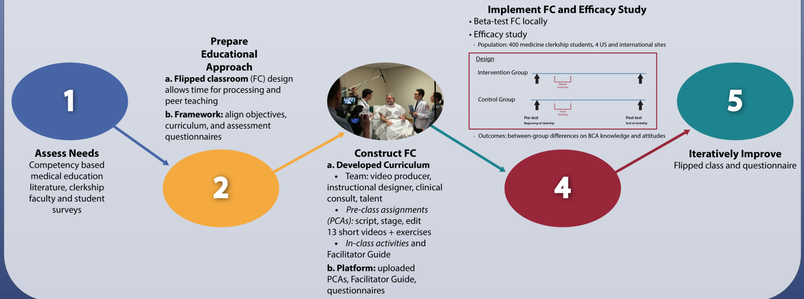
The Purpose

- Active-learning theories (e.g., Kolb): **learners need not just to *watch* and to *think*, but to *do* and to *feel*!**
- Hypothesis: a systematic approach, taught with **active-learning** instruction, will increase competence in BCA abilities

Kolb – Experiential Learning[5,6]



Approach[7,8]

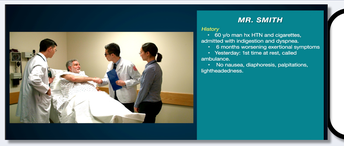


Outcomes

Active-Learning Resource - Flipped Classroom

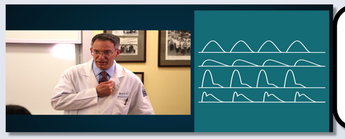
Learning Objectives

- Explain clinical significance of each skill
- Recognize specific physical exam findings
- Use approach to improve diagnostic reasoning
- Determine need for confirmatory testing
- Integrate knowledge, skills and attitudes to communicate with patients in a simulated encounter



Online Pre-Class 1:
View A-E videos each sandwiched between practice questions

In-Class Session 1:
a) Think-pair-share case discussion
b) JVP peer exercises
c) Question Pool

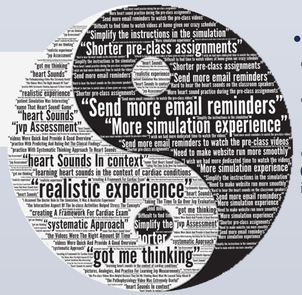


Online Pre-Class 2:
View F-M videos each sandwiched between practice questions

In-Class Session 2:
a) *Name That Heart Sound* Team Game
b) Simulated Clinical Encounter exercise

Formative Assessment to Date[9]

- Qualitative
  - In post-class evaluations, learners rated the JVP exercises and heart sound games most highly. Some felt pre-class time constraints.
  - Facilitators actively incorporated feedback into in-class activities



- Quantitative
  - Pilot data analysis: convenience sample of BCA medical knowledge items
  - 81 pre-intervention and 23 pre-control; 20 post-intervention and 6 post-control participants
  - Both groups increased significantly ($p < 0.006$): control 62% to 78%, intervention 63% to 75%

Discussion

- Cognitive science-based instructional design: encourages self-directed study and peer collaboration
- Curriculum fosters day-to-day clinical competencies, thoughtful use of diagnostic technology, notions of patient trust
- Flipped classroom v2.0 incorporates extensive learner and facilitator feedback
- Pilot data showed just non-inferiority: is "medical knowledge" *not* the primary effect?

Limitations

- **Flipped classroom**
  - Considerable upfront development effort but easily deployed for successive classes
  - Need pre-class buy-in and motivation, internet access, willing clinician-facilitators
- **Research-in-progress**
  - Heterogeneous research sites (culture, control group curricula, etc.) but may increase generalizability
  - Durability of learning is not captured

Next Steps

- Submit flipped classroom educational resource to MedEdPortal®
- Collect and analyze responses to date
- Validate new questionnaire items querying skill mastery and workplace transfer

Critical Impact

Increase effectiveness of clinical skills training to help reverse cycle of clinical skill deterioration

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Disclaimer: *Views and content are those of the authors and do not reflect the official policy or position of any agency of the U.S. government.*

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