

CENTER FOR EDUCATION



# Shapiro Institute

BETH ISRAEL DEACONESS MEDICAL CENTER  
HARVARD MEDICAL SCHOOL

## Education Research



Newsletter  
December 2023

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## LETTER FROM THE EXECUTIVE DIRECTOR

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*"As physicians, we practice evidence based medicine; we don't change our treatment just because it seems like a good idea. We require data from well-designed trials to demonstrate that patient outcomes will improve. One of the missions of the Shapiro Institute for Education and Research is to perform and help others to conduct high quality research in order to contribute to the evidence base for educational methods in the training of medical students, residents and fellows."*

Dear friends,

Many of you may remember growing up and being introduced to "the new Math" program in school. It seemed as if new theories would spring up about the best ways to teach math every few years and curriculum changes would follow. It was never clear if there were real data to support the change (could students actually "do" math better?), but the ideas sounded good.

It seems at times that medical education is subject to the same tendencies. Pre-clerkship curricula change about every 10-15 years and typically do not have evaluations or assessments of learning or performance. Approaches to residency training are similar. Outcome measures, when they are obtained, tend to focus on what one of my colleagues once called, "happiness indices;" did the learners or faculty "like" the new approach? Another common outcome is "self-efficacy;" does the learner feel more confident about a procedure or taking care of a patient? We frequently don't measure what they can actually do, just their confidence level. Of course, one truly has to be concerned if an individual is confident but not actually competent.

As physicians, we practice evidence based medicine; we don't change our treatment just because it seems like a good idea. We require data from well-designed trials to demonstrate that patient outcomes will improve. One of the missions of the Shapiro Institute for Education and Research is to perform and help others to conduct high quality research in order to contribute to the evidence base for educational methods in the training of medical students, residents and fellows. The process is not easy; learning is a complex task and the medical environment in which we teach has many variables that may be difficult to control. Nevertheless, we need to make efforts to do the research well.

This issue of our newsletter will highlight some of the educational research being done at the Institute and BIDMC to expand our knowledge of how people learn medicine and to ensure the best doctors possible for the future.

- Richard M. Schwartzstein, MD

# NURSES AS EDUCATORS FOR ICU RESIDENTS

By Camie Petri, MD

The following is taken from the published paper: "A Lot to Offer: Nurses as Educators for Medical Residents in an Academic Medical Center Intensive Care Unit" by Camille Petri, Christine Beltran, Kristin Russell, Jacqueline FitzGerald, Amy Sullivan and Asha Anandaiah

Reflecting on your training, can you remember a time that an interprofessional provider taught you something? Of course you can! Interprofessional teaching is all around us all the time, but we may not recognize it, or highlight it as such. In fact, interprofessional interactions are key to a successful #ICU team both with regards to patient care and learning. We sought to learn more about how nurses perceive the role as educators for ICU residents.

## Introduction

The role of fully trained interprofessional clinicians in educating residents has not been rigorously explored. The intensive care unit (ICU), where multiprofessional teamwork is essential to patient care, represents an ideal training environment in which to study this role. This study aimed to describe the practices, perceptions, and attitudes of ICU nurses regarding teaching medical residents and to identify potential targets to facilitate nurse teaching.

## Methods

Using a concurrent mixed-methods approach, we administered surveys and focus groups to ICU nurses from September to November 2019 at a single, urban, tertiary, academic medical center. Survey data were



Camie Petri, MD

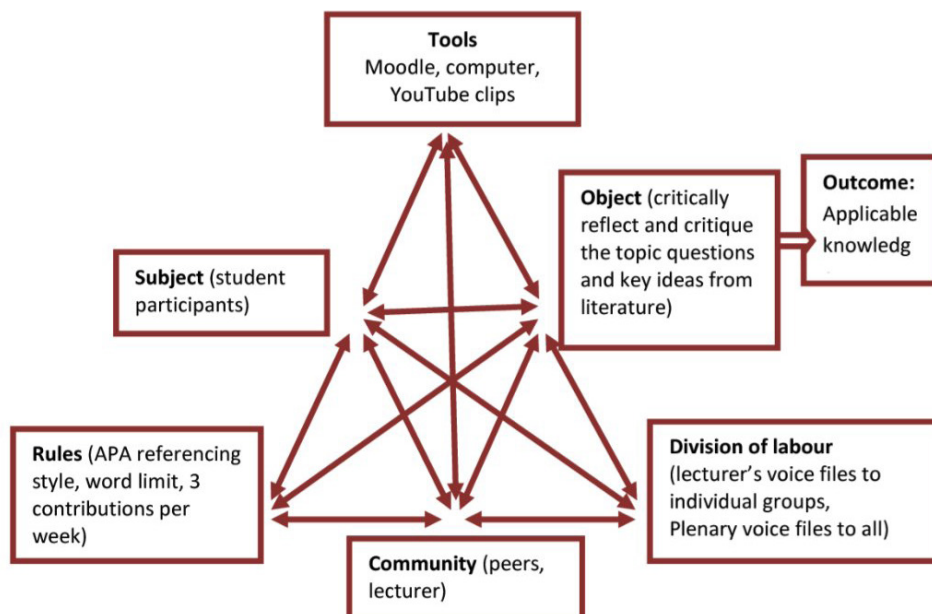
analyzed with descriptive and comparative statistics. Focus group data were analyzed using the Framework method of content analysis.

Results: Of nurses surveyed, 75 of 96 (78%) responded. Nurses generally held positive attitudes about teaching residents, describing it as both important (52%, 36/69) and enjoyable (64%, 44/69). Nurses reported confidence in both clinical knowledge base (80%, 55/69) and teaching skills (71%, 49/69), but identified time, uncertainty about teaching topics, and trainee receptiveness as potential barriers. Ten nurses participated in focus groups. Qualitative analysis revealed three major themes: nurse-specific factors that impact teaching, the teaching environment, and facilitators of teaching.

## Discussion

ICU nurses carry positive attitudes about teaching residents, particularly when facilitated by the attending, but this enthusiasm can be attenuated by the learning environment, unknown learner needs, and trainee attitudes. Identified facilitators of nurse teaching, including resident presence at the bedside and structured opportunities for teaching, represent potential targets for interventions to promote interprofessional teaching.

Below is how we mapped the factors that impact a nurse teaching residents in the ICU through the lens of activity theory.



## MEDICAL EDUCATION SCHOLARSHIP

Our Shapiro Institute program on Medical Education Scholarship is well underway! We have over 40 residents, fellows, and attendings enrolled this year, and we have just completed our second Module of the year on Survey Development. Are you thinking about developing a survey so you can publish on your current teaching? If you are interested in learning more about how to develop a survey to assess your educational activities, here are some tips drawn from Artino et al:

1. Start with a review of literature on your topic. What has already been written on the subject? Are there surveys or other measures available that you can use or adapt for your project? In addition to PubMed, consider using education and psychology databases like ERIC and PsycINFO for your literature searches.
2. If you need to create your own survey, conduct some interviews or focus groups with learners who are similar to your study subjects. Learn about their experiences of the subject and what language they use to describe it: this will help you create a survey that is relevant and understandable to your audience.
3. Synthesize what you have learned from your literature review and interviews/focus groups to begin outlining your survey.
4. Develop items for your survey using best practices: items should be brief, understandable, and should address attitudes, knowledge, skills, and/or behaviors. If you are evaluating an educational intervention, make sure that your items align with your learning objectives.
5. Line up some experts to review the survey you develop. These can be content area experts and survey development experts. They can give you feedback on clarity, relevance, and content of your survey.
6. Carry out cognitive interviews, or “think-alouds,” where you recruit volunteers to walk through your draft survey and interview their survey experiences. Volunteers share with you how they interpret each question item and how they choose their responses based on that understanding. Ideally, volunteers are

similar to the study participants you want to target but won't be participating in the study. Cognitive interviews can help you identify items that are confusing or difficult to answer.

7. Pilot test your survey – ideally again with a group of colleagues similar to your study subjects. This can give you a sense of whether there are any problems with administration of the survey and how well your items may be measuring what you want to measure.

If you want to learn more, read the AMEE GUIDE 87 or click on this link for a 1-page summary:

<https://pubmed.ncbi.nlm.nih.gov/20520050/>.

If you are working on a survey and want some feedback, contact us and schedule a consultation by going to:

[www.shapiroinstitute.org/education-research-consult](http://www.shapiroinstitute.org/education-research-consult)

Be on the lookout for announcements of the Fall 2024 Scholarship Program in early summer.

- Amy Sullivan, Director, and Ling Hsiao, Associate Director Shapiro Institute Office for Research

*“The Shapiro Institute Medical Education Scholars Program provided me with a fantastic foundation in the fundamentals of medical education theory and scholarship. In particular, Amy’s sessions on survey development and incorporating conceptual frameworks into medical writing helped me advance and publish several projects. The Shapiro Institute Medical Education Scholars Program served as a springboard for my application to the Rabkin Fellowship in Medical Education.”*



**Ryan Nelson, MD**

Ryan E. Nelson, MD FHM FACP  
Associate Site Director, Core I Medicine Clerkship  
Instructor in Medicine, Harvard Medical School



*The following is ... (more explanatory text coming from Ling)*

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### Study Purpose and Research Objectives

The purpose of this study is to gather validity evidence for the use of mechanism maps (MMs), a variant of concept maps, as a formative assessment tool to assess, provide feedback to, and predict the performance of first-year medical students in a system-based course in physiology and pathophysiology. We address four questions:

1. What is the validity evidence for the use of MMs as a formative assessment tool for evaluating students' integration of knowledge of respiratory, cardiovascular, and hematologic physiology and pathophysiology with case descriptions of patient signs, symptoms, and tests?
2. Can MMs provide early prediction of student performance and identify specific challenges with inductive reasoning?
3. How do faculty raters describe the feasibility and value of scoring MMs?
4. How do students describe the value of MMs as formative assessments?

### Background and Rationale

Clinical reasoning lies at the core of medical teaching and practice, requiring cognitive skills, knowledge, and experience as well as strategies to minimize cognitive biases that contribute to medical errors. Approaches to cultivate higher-order thinking and enhance metacognition are essential for faculty and students. We propose to develop a novel formative assessment approach to test, foster, and make visible medical students' clinical reasoning skills.

Current teaching and assessments in medical education often prioritize pattern recognition and rote memorization through use of hypothetico-deductive reasoning and illness scripts. Overreliance on these approaches may promote System 1 thinking and increase risk of cognitive bias. In contrast, inductive reasoning, based on deeper understanding of pathophysiological principles, employs System 2 thinking and aids in the development of adaptive expertise.

To enhance inductive and System 2 thinking for clinical reasoning, we propose using mechanism maps (MMs) as a formative assessment tool. MMs are graphic representations of students' thinking about complex, interrelated concepts. MMs stimulate Systems 2 thinking as students inductively generate hypotheses rooted in their understanding of physiological principles. Students work through a clinical case, linking elements of patient history, physical findings and laboratory results to underlying pathophysiological mechanisms, ultimately leading to a diagnosis. Students use conceptual knowledge to formulate "intermediate hypotheses" about disease mechanisms, explaining how elements integrate pathophysiologically to generate the observed symptoms. Through this process, students explore a range of potential diagnoses, learning to mitigate cognitive biases.

### Intervention

Students are provided with a short case comprising patient history, exam and laboratory findings: cases demonstrate principles and concepts of the course including cardiopulmonary anatomy, physiology, pathophysiology and pharmacology. Student charge is to identify and map key elements of the case as clues to the underlying pathophysiology and demonstrate relationships between these findings and underlying pathobiology.

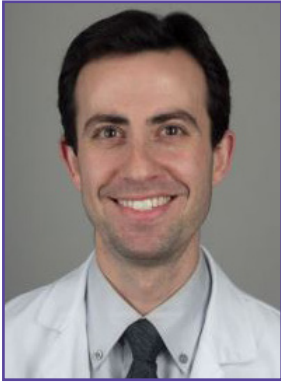
### Scoring system

Our assessment tool represents a holistic approach, scoring the content and organization of concepts (nodes) and linkages based on a rubric that relies on inferences about overall quality of knowledge content and knowledge organization. Because of the somewhat idiosyncratic nature of the maps, a holistic scoring approach is particularly appropriate for these data.

### Data Collection and Analysis

We will collect student-generated MMs and assess their quality using the rubric. Rater scoring, surveys, focus groups with faculty and students, and quiz data will be analyzed using interrater reliability statistics, descriptive and inferential statistics, and qualitative thematic analysis.

### Dr. Jeff William Receives Stone Award



The 2023 S. Robert Stone Award for Excellence in Teaching was recently presented to Dr. Jeff William by The Carl J. Shapiro Institute. This prestigious accolade was bestowed upon Dr. William at the Daniel D. Federman Teaching Award ceremony held at Harvard Medical School in November.

The Stone Award is the first Harvard teaching award established at one of the academic affiliates and symbolizes BIDMC's unwavering commitment to its educational mission. Established in memory of the late past board chair of Beth Israel Hospital by his children, the award underscores the institution's dedication to fostering excellence in teaching.

Dr. William has long exhibited a profound passion for and dedication to teaching. His curriculum innovations were recognized on a national level when he received the top prize in the American Society of Nephrology's Innovations in Kidney Education Contest.

### Rabkin Fellowship RFA

The Shapiro Institute for Education and Research is currently seeking applications for a one-year Rabkin Fellowship in Medical Education. The Fellowship begins July 1, 2024 and ends June 30, 2025. The application deadline is Friday, February 16, 2024.

This Fellowship was established in 1998 to provide HMS faculty the opportunity to develop necessary skills to launch or advance academic careers in medical education and/or academic leadership. The program is well suited for physicians whose careers include, or will include, a substantial amount of teaching.

Instructions on how to apply are available by visiting [www.shapiroinstitute.org/rabkin-fellowship-application](http://www.shapiroinstitute.org/rabkin-fellowship-application)

### Shapiro Institute Presents at AAMC

On November 8th, several Shapiro Institute faculty members attended the annual meeting of the Association of American Medical Colleges in Seattle, Washington. During this meeting, the Shapiro Institute was granted a significant slot in the program to present the outcomes of the Millennium Conference 2023, which focused on Professionalism in medical education.

Dr. Richard Schwartzstein moderated and introduced the audience to the Millennium Conference series and the Shapiro Institute's most recent work. The session featured four speakers representing Washington University in St. Louis, Morehouse School of Medicine, the Larner School of Medicine at the University of Vermont, and our own Dr. Carrie Tibbles, representing Harvard Medical School and Beth Israel Deaconess Medical Center.

The session, which highlighted the recommendation that we shift from the concept of professional identity formation to a new construct, professional value integration, was well-received, although a bit controversial at times. The discussion was wide-ranging and stimulating, and the audience was clearly intrigued by the new formulation.



AAMC 2023 Conference

## DEPARTMENT NEWS

### Doctoral Sustainability & Climate Lunch-and-Learn

On November 8, the Environmental Sustainability Committee & GME program brought together residents and physicians for lunch to highlight sustainability and climate-related research, projects and opportunities that are underway or have been conducted at BIDMC.



### Join Us March 20-22, 2024

The Shapiro Institute will hold its biannual Principles of Medical Education "Maximizing Your Teaching Skills" course on March 20-22, 2024. The course provides techniques and strategies that significantly improve student engagement, and teaching and mentoring effectiveness. For more information go to: <https://medicaleducators.hmscme.com>



**HARVARD**  
MEDICAL SCHOOL

This course sells out every year. To be assured a spot in the 2024 program, early registration is strongly advised.

PRINCIPLES OF MEDICAL EDUCATION  
**MAXIMIZING YOUR TEACHING SKILLS**

March 20-22  
**2024**

Best Practices to Teach, Engage, and Inspire  
Medical Students, Residents, Fellows, Faculty, Allied Health Students



Strategies, Best Practices and Techniques to Improve:

- Interactive Lecturing
- Bedside Teaching
- Effective Mentoring
- Impactful Feedback
- Developing Curriculum
- Assessing Learners
- Procedural Teaching
- Learner Engagement

**REGISTER TODAY!**

### Join Us for CPGR

Join us for Clinical Physiology Grand Rounds (CPGR), a monthly evening session held at BIDMC that's open to all HMS students. The sessions are directed toward PCE-year students on their clinical rotations.



### CLINICAL PHYSIOLOGY GRAND ROUNDS Wednesdays from 5:00-6:30pm

January 24, 2024

Student Presenters: Ashish Dahal, Malikiya Hinds,  
Diviya Rajesh, Edgardo Duran,  
Naira Ikram, Kelly O'Connor

February 14, 2024

Student Presenters: Mercy Mazurek, Amanda Chen,  
Katherine Dunn, Christiana Oshotse, Cindy Won

March 13, 2024

Student Presenters: William Shen, Harry Shanmugam,  
Anthony Zong, Ryan Benavente, William Callison

Facilitated by:

Drs. K. Meredith Atkins, Michael Ferrera,  
Richard Schwartzstein, and Adam Strauss

Beth Israel Deaconess Medical Center

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### Happy Holidays!

From all of us at The Shapiro Institute for Education and Research, we wish you a happy holiday season and a joyful 2024!



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