



# 2021 CDIM Update in Medical Education

Irene Alexandraki, MD, MPH  
Nicholas S. Duca, MD  
Jackcy Jacob, MD  
Amy Weinstein, MD, MPH

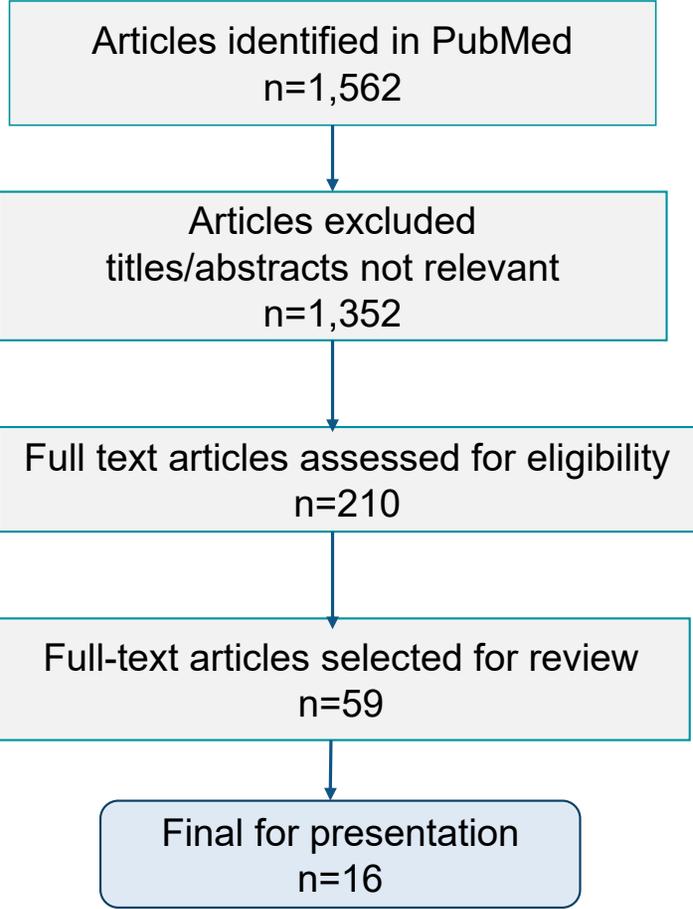


April 1, 2021

Even Better Together



## Study Selection Process



**Ranking sheet for Medical Education Review**



**Ranking Rubric**

**Reference:**  
**Total Score:**  
**Article sub-specialty (if applicable):**  
**Reviewer Initials:**

**Brief summary of article (include strengths and limitations):**

Category	Points			
<b>Outcome</b>				
Absence of outcome	0 point			
Satisfaction outcome	1 point			
Learning	2 points			
Behavior	3 points			
Impact (patient outcome)	4 points			
<b>Data analysis</b>				
Descriptive stats	0 points			
Beyond descriptive	2 points			
<b>Reviewer rating</b>	<b>Strongly Disagree</b>			<b>Strongly agree</b>
Clarity of research statement	1 point	2 points	3 points	4 points
Study design is rigorous (consider: control groups, randomization, validated survey instrument, power analysis; for qualitative - triangulation, member checks, multiple independent coders, etc)	1 point	2 points	3 points	4 points
Results answer stated question	1 point	2 points	3 points	4 points
Would be of interest to educators in other specialties	1 point	2 points	3 points	4 points
Relevance/Timeliness	1 point	2 points	3 points	4 points
Innovative/Novel	1 point	2 points	3 points	4 points
<b>Number of institutions</b>				
Single institution	0 points			
Multiple institutions	4 points			
<b>TOTAL POINTS</b>				

# Themes

**Student Learning**  
LICs  
Continuity

**Assessment**  
EPA  
Clerkship Grades  
IM Exam  
NBME Performance

**Curriculum**  
Health Systems  
Science  
Telephone MED  
Clinical Skills

**Transitions of Training**

**Feedback & Coaching**

**Professionalism**

**Equity  
Mistreatment  
Wellness**

ALLIANCE  
for ACADEMIC INTERNAL MEDICINE

Even Better Together



# Student Learning and Assessment

Longitudinal Integrated Clerkship (LIC)

Entrustable Professional Activities (EPAs)

Even Better Together



## Question

- Does your school offer longitudinal integrated clerkships (LICs)?
  
- A. Yes
- B. No
- C. Unsure



## Question

➤ Does the medicine clerkship at your school use entrustable professional activities (EPAs) as a method for evaluation?

- A. Yes
- B. No
- C. Unsure



# Longitudinal Integrated Clerkships

Even Better Together



## We Know LICs Work but Why Do They Work?

Research Report

### Same but Different: Exploring Mechanisms of Learning in a Longitudinal Integrated Clerkship

Maria Mylopoulos, PhD, Kulamakan (Mahan) Kulasegaram, PhD, Karen Weyman, MD, Stacey Bernstein, MD, and Maria Athina (Tina) Martimianakis, PhD



*Acad Med. 2020 Mar;95(3):411-416*

Even Better Together



## Overview

**Research Question:** What are the mechanisms of learning in the LIC clerkship compared with the block clerkship?

**Design:** Qualitative study of students' understanding of their learning experience and how it impacted learning outcomes

**Setting:** LIC urban integrated training model at the University of Toronto

**Participants:** 7 LIC students and 6 Block clerkship students, 1-3 interviews during the clerkship.



## Results

### Themes:

***Learning Outcome: Integration and application of previous knowledge***

***Learning Experience: Longitudinal Variable Practice***

***Learning Experience: Continuity of Relationships***



## *Learning Experience: Longitudinal Variable Practice*

### **Block students**

- High volume in a particular clinic or rotation

*“I probably saw inside 200 ears, maybe 300... and that is the only way to master a skill”*

### **LIC students**

- Same condition multiple times in same patient

*“I saw her 3 times during that process. It was really cool to see the evolution of, at least, that 1 short treatment.”*



## *Learning Experience: Continuity of Relationships*

### **Block students**

- Short-term intensive periods of training with one preceptor

*“...they see you for 3 weeks, they get to know you really well and they can really comment on how you’ve grown.”*

### **LIC students**

- Continuity with preceptor over the year was a strength

*“Our relationship may be stronger ...they see us throughout the year, rather than just the 1 week, or couple of months, and then change students.”*



## Take Home Points For Both LIC and Block Clerkship Directors

- **Variation is a key learning experience in both models**
  - Consider how you might increase systematic variation depending on clerkship model
- **Continuity with patients and preceptors is key to developing clinical skills**
  - Whether block or LIC, identify areas where continuity can be promoted
  - There is value in continuity for both block and LIC models
- **Future work should focus on optimizing variation and continuity in both block and LIC models**



## How Should I Structure My LIC?

Research Report

### **Continuity With Patients, Preceptors, and Peers Improves Primary Care Training: A Randomized Medical Education Trial**

Bruce L. Henschen, MD, MPH, David T. Liss, PhD, Blair P. Golden, MD, Kenzie A. Cameron, PhD, MPH, Jennifer A. Bierman, MD, Elizabeth R. Ryan, EdD, Lauren A. Gard, MPH, Eric G. Neilson, MD, Diane B. Wayne, MD, and Daniel B. Evans, MD



*Acad Med. 2020 Mar;95(3):425-434.*

Even Better Together



## Hypothesis

### ***ECMH compared to IP will result in:***

- 1. Improved primary care experience and higher satisfaction with the learning environment
  
- 1. Higher patient-centered and team-oriented attitudes with comparable medical knowledge acquisition
  
- 1. Higher professional efficacy and more therapeutic relationships with patients





## Description of Clerkships

### ECMH

- 4 year, team-based
- 16 students (4 from each class) assigned to 1 preceptor
- Students attend clinic bimonthly
- M1/M2 paired with M3/M4
- Preceptors recruit a panel of medically complex and high-risk patients

### IP

- 2 year, 1:1 preceptor apprenticeship model
- Attend clinic bimonthly
- Patients are chosen at preceptor's discretion
- Continuity with patients is not formally integrated as in ECMH



## Methods- Outcomes and Surveys Used



School course assessment and students likelihood to recommend ECMH



Attitudes Toward Health Care Teams Scale (ATHCT), Patient-Practitioner Orientation Scale (PPOS), Communication, Curriculum, and Culture (C3)



Maslach Burnout Survey-General Survey Inventory (MBSI-GS). Achievement of continuity



## Results- Kirkpatrick Level 1- Reactions

Kirkpatrick level	Category	Measure	Years 1-3 adjusted mean (95% CI)		P value
			ECMH	IP	
<b>Level 1: Reactions and learning environment</b>	Ratings of primary care experience	I look forward to going to my IP or ECMH clinic <sup>a</sup>	4.22 (4.12, 4.32)	3.83 (3.72, 3.94)	< .001
		I feel ownership for the patients that I see at my clinic <sup>a</sup>	3.80 (3.69, 3.91)	2.80 (2.67, 2.94)	< .001
		I am achieving continuity with patients at my clinic <sup>a</sup>	3.52 (3.37, 3.67)	2.41 (2.28, 2.55)	< .001
		I am developing rapport with patients at my clinic <sup>b</sup>	4.06 (3.97, 4.15)	3.48 (3.35, 3.61)	< .001
		I am able to balance my classwork with my clinic responsibilities <sup>b</sup>	4.16 (4.05, 4.26)	4.27 (4.19, 4.34)	.09
	Satisfaction with learning environment	The amount of mentoring/feedback you received from your attendings <sup>c</sup>	4.13 (4.02, 4.24)	4.04 (3.94, 4.14)	.21
		The atmosphere for learning during your primary care training <sup>c</sup>	4.45 (4.36, 4.54)	4.09 (3.99, 4.18)	< .001
		The quality of mentoring/feedback from attendings and student peers <sup>c</sup>	4.37 (4.28, 4.47)	3.99 (3.89, 4.09)	< .001
		The quality of your primary care training overall <sup>f</sup>	4.31 (4.22, 4.40)	3.79 (3.68, 3.91)	< .001



## Results- Kirkpatrick Level 2- Learning- Attitudes, Perceptions and Knowledge

Kirkpatrick level	Category	Measure	Years 1-3 adjusted mean (95% CI)		
			ECMH	IP	P value
Level 2: Attitudes, perceptions, and knowledge	Team orientation	ATHCT scale <sup>d</sup>	3.16 (3.08, 3.24)	3.01 (2.94, 3.08)	.007
	Patient-centered attitudes	PPOS subscale: caring <sup>d</sup>	4.54 (4.48, 4.61)	4.53 (4.48, 4.58)	.79
		PPOS subscale: sharing <sup>d</sup>	4.38 (4.31, 4.44)	4.44 (4.37, 4.50)	.21
	Perceptions of the hidden curriculum	C3 subscale: peer role modeling <sup>e</sup>	5.54 (5.39, 5.70)	3.27 (3.03, 3.52)	< .001
		C3 subscale: preceptor role modeling <sup>e</sup>	6.25 (6.15, 6.35)	5.95 (5.82, 6.07)	< .001
		C3 subscale: support for patient-centered behaviors <sup>e</sup>	4.64 (4.57, 4.72)	4.32 (4.21, 4.42)	< .001
	Perceptions of primary care as a career path	Current interest in primary care <sup>f</sup>	2.04 (1.92, 2.16)	1.96 (1.85, 2.07)	.34
		Change in primary care career interest as a result of your ECMH/IP clinic experience <sup>g</sup>	3.34 (3.22, 3.47)	3.01 (2.90, 3.13)	< .001
		Importance of physician-patient relationships in career choice <sup>h</sup>	3.80 (3.68, 3.92)	3.63 (3.52, 3.75)	.06

ATHCT- Attitudes Toward Health Care Teams Scale, PPOS- Patient-Practitioner Orientation Scale, C3- Communication, Curriculum, and Culture



## Results- Kirkpatrick Level 3- Behavioral Outcomes

Kirkpatrick level	Category	Measure	Years 1-3 adjusted mean (95% CI)		P value
			ECMH	IP	
Level 3: Behavioral outcomes	Student wellness/ burnout	MBI professional efficacy score <sup>1</sup>	4.10 (3.97, 4.22)	3.89 (3.77, 4.01)	.02
		MBI cynicism score <sup>1</sup>	1.80 (1.63, 1.97)	1.80 (1.68, 1.93)	.98
		MBI emotional exhaustion score <sup>1</sup>	2.74 (2.58, 2.91)	2.64 (2.50, 2.78)	.35
	Continuity of care	How often have you established patient relationships that you would term meaningful? <sup>1</sup>	3.44 (3.33, 3.56)	3.04 (2.93, 3.15)	< .001
		How often have you seen the same patient back to close the loop on a chronic condition? <sup>1</sup>	3.23 (3.05, 3.40)	2.23 (2.10, 2.37)	< .001
		How often have you made a real difference in the health or well-being of a patient? <sup>1</sup>	3.33 (3.22, 3.43)	2.70 (2.60, 2.81)	< .001
		How many patients are you actively following in the capacity as a "health coach?"	2.22 (1.41, 3.03)	0.29 (0.09, 0.50)	< .001

MBI- Maslach Burnout Inventory



## Conclusion

*Continuity with patients, peers and preceptors represents a new paradigm for primary care education and results in superior educational outcomes compared to traditional LIC models*

*Future studies should focus on Kirkpatrick level 4 outcomes (patient and system outcomes)*



# Entrustable Professional Activities

Even Better Together



## Examples of EPAs

EPA 1- Gather a History and Perform a Physical Examination

EPA 2- Prioritize a differential diagnosis after an encounter

EPA 3- Recommend and interpret diagnostic tests and procedures

- 13 total EPAs
- Incorporates multiple ACGME core competencies
- Attending or resident assesses the level of entrustment/level of involvement for the specific activity



## EPA Assessment Scales

### Ottawa- Retrospective

*In supervising the student, how much did you participate in the task?*

- *I did it*
- *I talked them through*
- *I directed them from time to time*
- *I was available just in case*

### Chen- Prospective

*If you were to supervise this student again in a similar situation, which of the following statements aligns with how you would assign the task?*

- *Watch me do this.*
- *We'll do this together.*
- *I'll watch you.*
- *You go ahead and I'll double check all of your work*

<https://www.aamc.org/media/20166/download>

Even Better Together



## What are the Challenges of Implementing EPAs?

**EPA-based assessment: Clinical teachers' challenges when transitioning to a prospective entrustment-supervision scale**

Lieselotte Postmes , Femke Tammer, Indra Posthumus, Marjo Wijnen-Meijer ,  
Marieke van der Schaaf , and Olle ten Cate 



*Med Teach. 2020 Dec 11;1-14.*



## Overview

**Research question:** What are the challenges that clinical teachers face when transitioning from a retrospective to prospective EPA assessment scale?

**Design:** Descriptive qualitative study of semi-structured interviews with 12 clinical teachers after introducing a new prospective EPA assessment scale.

**Setting:** University Medical Center Utrecht (Netherlands). Recently introduced EPA scale in the 4<sup>th</sup> year of medical school (6 years total). 300 students total.

**Participants:** 12 attending physicians. 6 different specialties at University and affiliate sites who have had experience in previous student assessment



## EPA Scale

### Modified Chen- entrustment-supervision scale (ES-scale)

*Based on this EPA-WBA, I estimate that this student will be able to perform this activity at supervision level:*

- (1) presence allowed, no participation
- (2) direct supervision
- (3) indirect supervision
- (4) limited supervision



Based on this (EPA-WBA) assessment, I estimate that this student will be able to perform this activity at supervision level:



Information supervision levels

**1: Presence allowed, no participation in EPA**

**2: Direct supervision**

a: Task or activity performed as coactivity with clinical teacher

b: Task or activity performed by the student, provided that the clinical teacher is physically present in the room

**3: Indirect supervision: clinical teacher physically present in the workplace and immediately available for direct supervision**

a: Discussion and check shortly before (or/and) after activity. Supervisor repeats main aspects of the activity

b: Discussion and check of essentials shortly before (or/and) after activity. Key findings and decisions double checked

c: Key findings discussed at a moment estimated by the student. Double check only if the student wishes so.

**4: Limited supervision: clinical teacher only distantly available** (e.g. by phone)

The student is not allowed to function on this level. However, clinical teachers can deem students qualified to work at the supervision level.



## Results

### ***Clinical teachers' interpretation of the scale anchors***

- Difficulty interpreting sub-levels of entrustment (more granular, more difficult)

### ***Handling the prospective ES scale***

- Lack of norms, i.e “where should the student be” influenced assessment

### ***Challenges of the prospective nature of the ES-scale***

- Faculty still interpreted as a retrospective scale
  - i.e how much supervision was needed, rather than how much supervision they would need in the future



## Conclusion

- Correct interpretation of an EPA scale is imperative for accurate assessment of a student's future entrustment level
- When left to interpret, faculty may default to retrospective assessment, i.e. "how much oversight *did* the student need" rather than how much they will need in the *future*"
- Future EPA studies should indicate the type of scale used to ensure validity and reliability



## How Can We Create Opportunities for Entrustment Decisions?

### ASSESSMENT

### Entrustment decisions and the clinical team: A case study of early clinical students

Severin Pinilla<sup>1,2,3</sup>  | Alexandra Kyrou<sup>1</sup> | Norina Maissen<sup>2</sup> | Stefan Klöppel<sup>3</sup> |  
Werner Strik<sup>1</sup> | Christoph Nissen<sup>1</sup>  | Sören Huwendiek<sup>2</sup> 

medical education

*Med Educ. 2021 Mar;55(3):365-375.*

Even Better Together



## Overview

**Question:** What factors facilitate students' opportunities for entrustment decisions in the clinical learning environment?

**Design:** Descriptive qualitative study interviews with students and clinical teachers during a clerkship experience

**Setting:** University Bern (Switzerland). Clerkship.

**Participants:** 16 Clerkship students. Clinical supervisors sampled for triangulation.



## Results- 5 Themes/Factors

**Resident characteristics** (workload, clinical experience, didactic prep, teaching motivation, trust in student)

**Students' characteristics** (workplace performance, showing initiative, clinical experience of student, specialty-specific preparation, student's attitude)

**Student's professional relationships** (with residents, with patients, with health care team members)

**Clinical situation** (context, task)

**Safety** (Patient, personal)





## Conclusions

As EPAs are increasingly utilized in medical education, we must facilitate opportunities for students to engage in entrustment decisions.

1. Residents are gatekeepers- manageable work load, “residents-as-teachers”, educational leadership
1. Students play an active role- opportunities for clerkship directors to prepare students to engage with the learning environment and connect with stakeholders



## Poll Question:

**Which of the following do you think has the greatest impact on the NBME Internal Medicine Exam (Shelf Exam) score?**

1. Length of Clerkship
2. Longitudinal vs. Traditional Clerkship
3. Presence vs. Absence of an Ambulatory Experience
4. Presence vs. Absence of a study day before the exam
5. Presence vs. Absence of a Clerkship Honors grade cut off
6. None of the above

Even Better Together



# Transitions of Training

Even Better Together



Innovation Report

# Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance

Michael S. Ryan, MD, MEHP, Moshe Feldman, PhD, Cheryl Bodamer, PhD, RN, Joel Browning, Ellen Brock, MD, and Catherine Grossman, MD

## Abstract

### Problem

Medical students typically perform worse on clinical clerkships that take place early in their training compared with those that occur later. Some institutions have developed transition-to-clerkship courses (TTCCs) to improve students' preparedness

2015 academic year, they introduced a 2-week intersession TTCC. The goal was to improve students' readiness for clerkships by fostering the knowledge, skills, and attitudes required to care for patients throughout a hospitalization. The TTCC included panel discussions

reported improved comfort on entering clerkships. Summative performance evaluations across clerkships were higher for those students who received the TTCC with simulation compared with those students who received the standard clerkship orientation ( $P < .001$ )

Ryan, M., Feldman, M., et al. Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance. *Acad Med.* 2020;95(2):221-225.

Even Better Together

## Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance

Michael S. Ryan, MD, MEHP, Moshe Feldman, PhD, Cheryl Bodamer, PhD, RN, Joel Browning, Ellen Brock, MD, and Catherine Grossman, MD

Innovation Report



- **Question:** Do transition to clerkship courses impact medical student preparedness and performance?
- **Design:** Feasibility study; Authors describe the development of a course and its impact on clerkship performance.
- **Setting and Population:** Virginia Commonwealth University-SOM medical students from 2013-2016, approximately 150 students in each group

Ryan, M., Feldman, M., et al. Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance. *Acad Med.* 2020;95(2):221-225.

Even Better Together

## Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance

Michael S. Ryan, MD, MEHP, Moshe Feldman, PhD, Cheryl Bodamer, PhD, RN, Joel Browning, Ellen Brock, MD, and Catherine Grossman, MD

Innovation Report



- **Goals:** To bridge gap between preclinical phase (generally, “outpatient” doctoring skills) and the clinical phase (typically, acute care, inpatient doctoring) knowledge, skills, and attitudes.
- **Content:** Introduce foundational material (experiential learning opportunities later).
- **How:** Panel discussions, skill development sessions, case-based workshops, (simulation was added 2015-2016)
- **Outcomes:**
  - Convert summative, clinical performance scores to a standardized numerical score and compare
  - Feasibility : understand resources needed
  - Students' Reactions: survey after the simulation and 3 weeks after clerkship start date [5 point Likert scale]

Ryan, M., Feldman, M., et al. Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance. *Acad Med.* 2020;95(2):221-225.

Even Better Together

**Curricular Elements in the Transition-to-Clerkship Course (TTCC), Virginia Commonwealth University School of Medicine, 2014-2016**

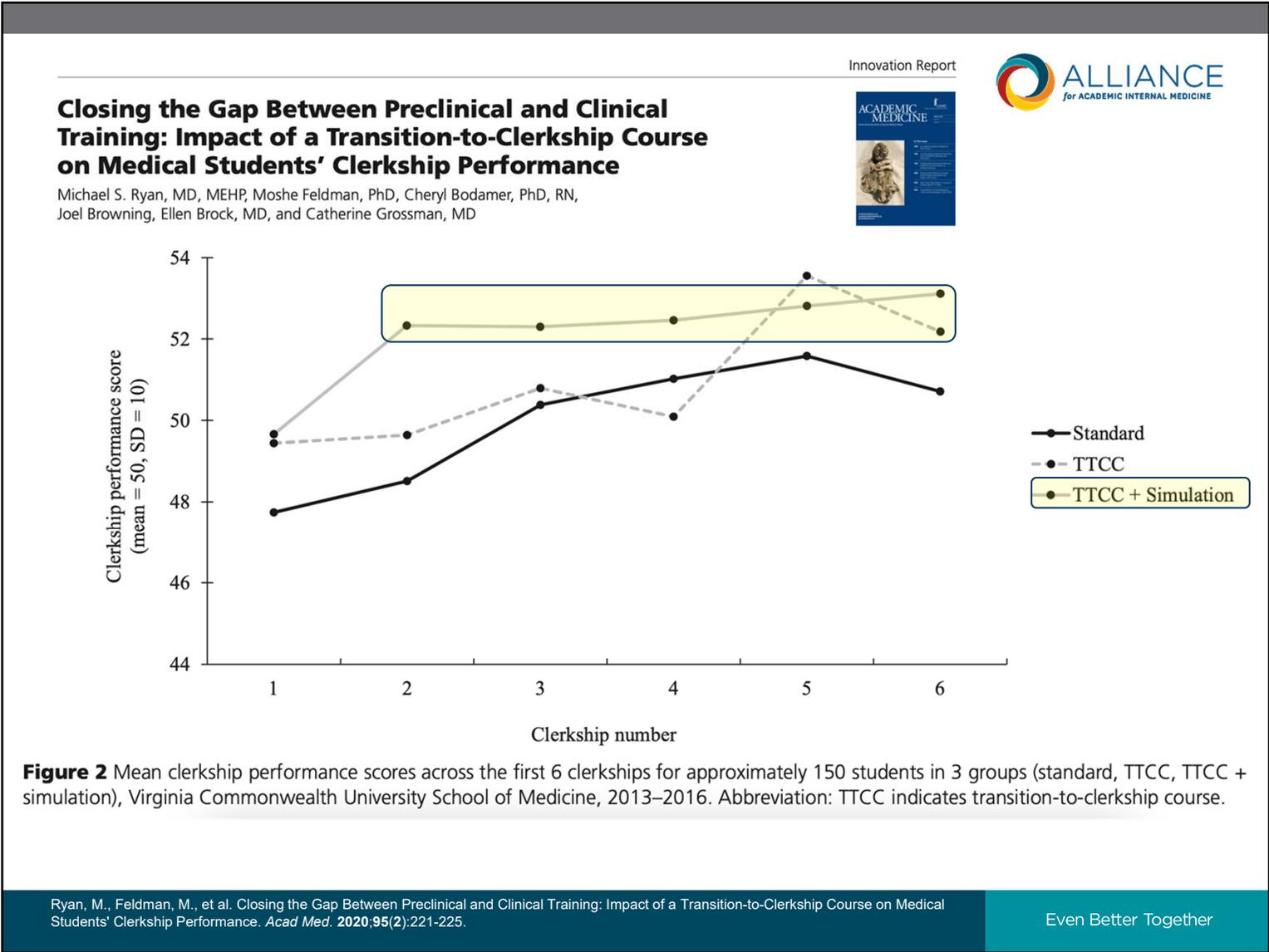


Curriculum element	Title	Instructional method	Duration
Preparation for clerkships	Policies and Procedures	Didactic	2 hours
	Clerkship Director Discussion	Panel Discussion	1 hour
	Introductory Ward Skills*	Small Group Workshop	2 hours
	Introduction to Operating Room	Video	30 minutes
	Succeeding in Clerkships*	Student Panel Discussion	1 hour
	Remote Access	Interactive Didactic	1 hour
	Advanced Ward Skills*	Small Group Workshop	2 hours
	Hospital Tour	Student-led tour	1.5 hours
	Electronic Health Record	Interactive Didactic	1 hour
	Use of Interpreter Services*	Didactic	1 hour
	Learning Climate Workshop*	Workshop	2 hours
	Ward Simulation (including pre-brief and debrief)**	Standardized Patient-Based Simulation	3 hours
	Introduction to Veteran's Affairs Hospital	Didactic	45 minutes
	Introduction to Clinical Radiology*	Interactive Didactic	1 hour
	Electronic Health Record Training	Workshop	2 hours
	Succeeding on Shelf Examinations	Interactive Didactic	1 hour
Feedback, Evaluation, and Grading	Interactive Didactic	2 hours	

**KEY**

- Original Orientation
- Added in 2014
- Added in 2015

Ryan, M., Feldman, M., et al. Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance. *Acad Med.* 2020;95(2):221-225.



Innovation Report



## Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance

Michael S. Ryan, MD, MEHP, Moshe Feldman, PhD, Cheryl Bodamer, PhD, RN, Joel Browning, Ellen Brock, MD, and Catherine Grossman, MD



### ➤ Results:

- Standardized summative performance score better across all clerkships with TTCC+simulation compared to standard curriculum
- Feasibility: Resources needed (\$3500, 100 faculty hours)
- Favorable Students' Reactions

### ➤ Limitations:

- Clerkship performance may have been affected by curriculum reform (rather than the TTCC alone)
- Single institution

### ➤ Future Studies:

- Evaluate impact of TTCC on student well-being and incorporate elements of TTCC into preclinical curriculum

Ryan, M., Feldman, M., et al. Closing the Gap Between Preclinical and Clinical Training: Impact of a Transition-to-Clerkship Course on Medical Students' Clerkship Performance. *Acad Med.* 2020;95(2):221-225.

Even Better Together



# Assessment: What if Clerkship Grades were pass/fail?

Even Better Together



TEACHING AND LEARNING IN MEDICINE  
<https://doi.org/10.1080/10401334.2020.1847654>



Check for updates

EDUCATIONAL CASE REPORTS

# From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback

Lee Seligman<sup>a</sup>, Abdikarin Abdullahi<sup>b</sup>, Arianne Teherani<sup>b,c</sup>, and Karen E. Hauer<sup>b,c</sup>

<sup>a</sup>Internal Medicine, NewYork-Presbyterian Hospital, Columbia University Irving Medical Center, New York, New York, USA; <sup>b</sup>University of California, San Francisco School of Medicine, San Francisco, California, USA; <sup>c</sup>Department of Medicine, University of California, San Francisco, California, USA

**ABSTRACT**

*Problem:* Medical students perceive honors grading during core clerkships as unfair and inequitable, and negatively impacting their learning and wellbeing. Eliminating honors grading, a powerful extrinsic motivator, and emphasizing formative feedback may address these problems and promote intrinsic motivation and learning. However, it is unknown how transitioning from honors to pass/fail grading with enhanced formative feedback in the core clerkship year may affect student learning experiences, wellbeing, and perceptions of the learning environment. *Intervention:* Core clerkship grading was transitioned from honors/pass/fail to pass/fail at one US medical school. In addition, the requirement for students to obtain formative supervisor feedback was formalized to twice per week. *Context:* This qualitative study utilized semi-structured interviews to

**KEYWORDS**

Assessment; core clerkships; grading; motivation; feedback

Seligman, L., Abdullahi, A. et. al. From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback, Teaching and Learning in Medicine, 2020.

Even Better Together



TEACHING AND LEARNING IN MEDICINE  
<https://doi.org/10.1080/10401334.2020.1847654>

EDUCATIONAL CASE REPORTS

**From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback**

Lee Seligman<sup>a</sup>, Abdikarin Abdullahi<sup>b</sup>, Arianne Teherani<sup>b,c</sup>, and Karen E. Hauer<sup>b,c</sup> 




[Check for updates](#)

- **Question:** Will transition from honors (tiered grading) to pass/fail with enhanced formative feedback in the core clerkship affect
  - student motivation
  - student learning experiences,
  - wellbeing, and
  - perceptions of the learning environment?
  
- **Design:** Qualitative study using inductive thematic analysis approach with sensitizing concepts. Used an interpretivist paradigm.
  
- **Population:** UCSF medical students who completed 12 months of core clerkships, Convenience sample of 18 students

Seligman, L., Abdullahi, A. et. al. From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback, Teaching and Learning in Medicine, 2020.

Even Better Together



TEACHING AND LEARNING IN MEDICINE  
<https://doi.org/10.1080/10401334.2020.1847654>

Routledge  
Taylor & Francis Group



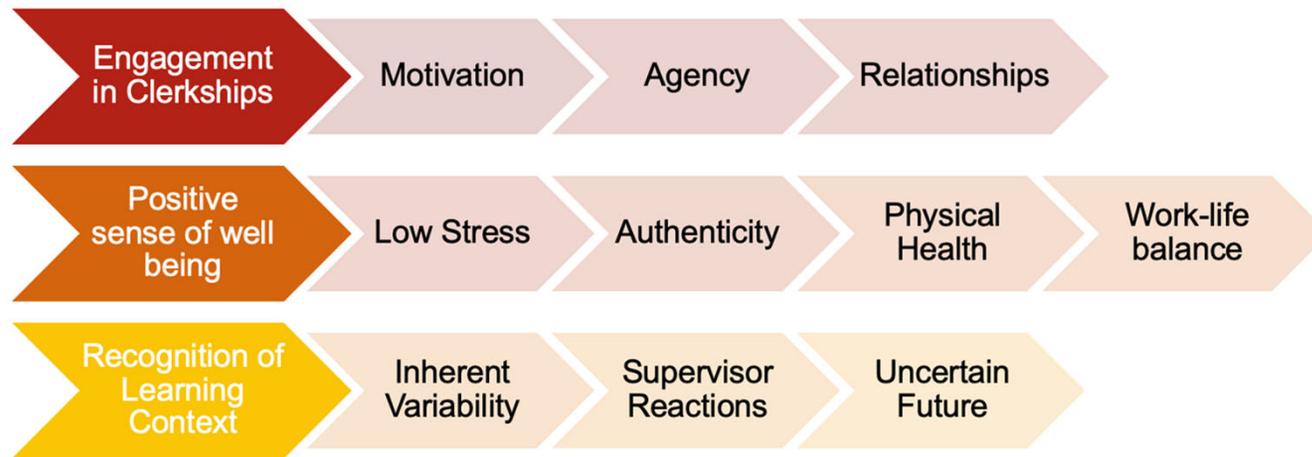
Check for updates

EDUCATIONAL CASE REPORTS

### From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback

Lee Seligman<sup>a</sup>, Abdikarin Abdullahi<sup>b</sup>, Arianne Teherani<sup>b,c</sup>, and Karen E. Hauer<sup>b,c</sup>

#### Themes and Sub-Themes Identified:



Seligman, L., Abdullahi, A. et. al. From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback, Teaching and Learning in Medicine, 2020.

Even Better Together



TEACHING AND LEARNING IN MEDICINE  
<https://doi.org/10.1080/10401334.2020.1847654>

EDUCATIONAL CASE REPORTS

**From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback**

Lee Seligman<sup>a</sup>, Abdikarin Abdullahi<sup>b</sup>, Arianne Teherani<sup>b,c</sup>, and Karen E. Hauer<sup>b,c</sup> 




[Check for updates](#)

- **Conclusions:** Pass/Fail Grading in core clerkships may create a positive learning environment that promotes learning.
- Motivation becomes intrinsic : “...desire to improve clinically and contribute to patients and teams more than from trying to impress supervisors....”
- Positive sense of wellbeing : ”...we were surprised by the magnitude of this finding...”. Spanned multiple domains (subthemes on prior slide)

Seligman, L., Abdullahi, A. et. al. From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback, Teaching and Learning in Medicine, 2020.

Even Better Together



TEACHING AND LEARNING IN MEDICINE  
<https://doi.org/10.1080/10401334.2020.1847654>

EDUCATIONAL CASE REPORTS

**From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback**

Lee Seligman<sup>a</sup>, Abdikarin Abdullahi<sup>b</sup>, Arianne Teherani<sup>b,c</sup>, and Karen E. Hauer<sup>b,c</sup> 






- **Limitations:**
  - Data from a single institution
  - Transitional period between grading systems
  - Convenience sample of volunteers
- **Strengths:**
  - In-depth interviews
  - Member checking allowed for credibility
  - Attending to reflexivity
- **Future Studies :** Understand the effect of core clerkship grading on student performance after 3<sup>rd</sup> year clerkships.

Seligman, L., Abdullahi, A. et. al. From Grading to Assessment for Learning: A Qualitative Study of Student Perceptions Surrounding Elimination of Core Clerkship Grades and Enhanced Formative Feedback, Teaching and Learning in Medicine, 2020.

Even Better Together



# Assessment: Clinical Reasoning

Even Better Together



TEACHING AND LEARNING IN MEDICINE  
2021, VOL. 33, NO. 1, 28–35  
<https://doi.org/10.1080/10401334.2020.1749635>



VALIDATION

## Gathering Validity Evidence on an Internal Medicine Clerkship Multistep Exam to Assess Medical Student Analytic Ability

Dario M. Torre<sup>a</sup>, Paul A. Hemmer<sup>b</sup> , Steven J. Durning<sup>c</sup> , Ting Dong<sup>a</sup>, Kimberly Swygert<sup>d</sup>, Deanna Schreiber-Gregory<sup>a</sup>, William F. Kelly<sup>a</sup>, and Louis N. Pangaro<sup>a</sup>

<sup>a</sup>Department of Medicine, Uniformed Services University of Health Sciences, Bethesda, Maryland, USA; <sup>b</sup>Educational Programs, Uniformed Services University of Health Sciences, Bethesda, Maryland, USA; <sup>c</sup>Departments of Medicine and Pathology, Uniformed Services University of Health Sciences, Bethesda, Maryland, USA; <sup>d</sup>Professional Services, National Board of Medical Examiners, Philadelphia, Pennsylvania, USA

**ABSTRACT**

*Construct:* The definition of clinical reasoning may vary among health profession educators. However, for the purpose of this paper, clinical reasoning is defined as the cognitive processes that are involved in the steps of information gathering, problem representation, generating a differential diagnosis, providing a diagnostic justification to arrive at a leading diagnosis, and formulating diagnostic and management plans. *Background:* Expert performance in clinical reasoning is essential for success as a physician, and has been difficult for clerkship directors to observe and quantify

**KEYWORDS**

Clinical reasoning; assessment; validity



## Gathering Validity Evidence on an Internal Medicine Clerkship Multistep Exam to Assess Medical Student Analytic Ability



Dario M. Torre<sup>a</sup>, Paul A. Hemmer<sup>b</sup> , Steven J. Durning<sup>c</sup> , Ting Dong<sup>a</sup>, Kimberly Swygert<sup>d</sup>, Deanna Schreiber-Gregory<sup>a</sup>, William F. Kelly<sup>a</sup>, and Louis N. Pangaro<sup>a</sup>

- **Purpose (question):** Gather validity evidence for the Multistep exam (MSX) format to assess analytical clinical reasoning abilities (Is there an association between the MSX and the USMLE Step 2 CS for assessing clinical reasoning of students)?
- **Design:** Use the extrapolation inference from Kane's conceptual validity framework to examine the relationship between MSX scores and Step 2 Clinical Skills Integrated Clinical Encounter (ICE) score;
- **Setting and Population:** Uniformed Services University of the Health Sciences students graduating in 2015-2017 (n=477) AND took MSX (2012-2016) and Step 2 CS (2013-2017)

Torre, D., Hemmer, P., et. al. Gathering Validity Evidence on an Internal Medicine Clerkship Multistep Exam to Assess Medical Student Analytic Ability, *Teaching and Learning in Medicine*, 33:1, 28-35 (2021).

Even Better Together



### Gathering Validity Evidence on an Internal Medicine Clerkship Multistep Exam to Assess Medical Student Analytic Ability



Dario M. Torre<sup>a</sup>, Paul A. Hemmer<sup>b</sup>, Steven J. Durning<sup>c</sup>, Ting Dong<sup>a</sup>, Kimberly Swygert<sup>d</sup>, Deanna Schreiber-Gregory<sup>a</sup>, William F. Kelly<sup>a</sup>, and Louis N. Pangaro<sup>a</sup>

#### MSX score and ICE scores:

**Table 1.** Descriptive statistics and Pearson correlations between internal medicine clerkship measures analytic ability and reasoning with the USMLE Step 2 ICE score for graduating classes of 2015-2017 (N = 477), Uniformed Services University.

Measures	Mean	SD	Overall MSX score	MSX Step 1 overall score	MSX Step 2 semantic sub-score	MSX Step 3 overall score	IM clerkship NBME subject exam score	IM clerkship OSCE final score
USMLE Step 2 ICE score	536.04	68.46	.26**	.21**	.10*	.21**	.30**	.27**
Overall MSX score	934.53	128.43		.76**	.41**	.83**	.16**	.16**
MSX Step 1 overall score	110.80	19.89			.28**	.41**	.04	.06
MSX Step 2 semantic sub-score	21.01	8.24				.10*	.11*	.04
MSX Step 3 overall score	146.62	27.97					.11*	.21**
IM clerkship NBME subject exam score	74.09	7.48						.24**
IM clerkship OSCE final score	69.41	6.23						

\*P<.05.

\*\*P<.01.

ICE = USMLE Step 2 Integrated Clinical Encounter; IM = internal medicine; MSX = MultiStep Examination; NBME = National Board of Medical Examiners; OSCE = Observed Structured Clinical Examination.



## Gathering Validity Evidence on an Internal Medicine Clerkship Multistep Exam to Assess Medical Student Analytic Ability



Dario M. Torre<sup>a</sup>, Paul A. Hemmer<sup>b</sup> , Steven J. Durning<sup>c</sup> , Ting Dong<sup>a</sup>, Kimberly Swygert<sup>d</sup>, Deanna Schreiber-Gregory<sup>a</sup>, William F. Kelly<sup>a</sup>, and Louis N. Pangaro<sup>a</sup>

- **Results:** There is an association between the overall MSX score and the ICE score to support Kane's extrapolation inference as validity evidence for the MSX
- **Conclusions:** The stepwise format of the MSX can be a tool to observe a students' clinical reasoning ability and can be used to assess and provide feedback to students about the analytical clinical reasoning.
- **Limitations:**
  - Step 2 CS ICE score includes scores from all disciplines
  - Single institution, single clerkship
  - OSCE includes communication skills scores , ICE does not have this
- **Future Studies:** Gather additional validity evidence across different learners and multiple medical schools.

Torre, D., Hemmer, P., et. al. Gathering Validity Evidence on an Internal Medicine Clerkship Multistep Exam to Assess Medical Student Analytic Ability, *Teaching and Learning in Medicine*, 33:1, 28-35 (2021).

Even Better Together



# Assessment: NBME IM Exam Performance

Even Better Together



Research Report



## Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis

Matthew M. Fitz, MD, MSc, William Adams, PhD, Steven A. Haist, MD, MS, Karen E. Hauer, MD, PhD, Linette P. Ross, MA, Amanda Raff, MD, Gauri Agarwal, MD, T. Robert Vu, MD, Jonathan Appelbaum, MD, Valerie J. Lang, MD, MHPE, Chad Miller, MD, Cyril Grum, MD, and the Clerkship Directors in Internal Medicine–NBME EXPRESS Study Group



- **Question:** Which IM clerkship characteristics relate to the NBME exam?
- **Design:** linear mixed effects models (univariable and multivariable) to determine associations between NBME exam performance and clerkship characteristics
- **Population:** 24,542 examinees from 62 Medical Schools from 2011-2014

Fitz, M., Adams, W., et al. Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis. *Acad Med.* 2020;95(9):1404-1410.

Even Better Together

Research Report



## Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis

Matthew M. Fitz, MD, MSc, William Adams, PhD, Steven A. Haist, MD, MS, Karen E. Hauer, MD, PhD, Linette P. Ross, MA, Amanda Raff, MD, Gauri Agarwal, MD, T. Robert Vu, MD, Jonathan Appelbaum, MD, Valerie J. Lang, MD, MHPE, Chad Miller, MD, Cyril Grum, MD, and the Clerkship Directors in Internal Medicine–NBME EXPRESS Study Group



### Study Characteristics of IM Clerkships at 62 Medical Schools

1. Longitudinal students (No, Yes)
2. Clerkship Length (6, 8-11, 12-20 weeks)
3. Academic Start Month (Jan, July, June, May)
4. Ambulatory Clinical Experience (No, Yes, Mixed)
5. Study Day (No, Yes)
6. Combined Clerkship (No, Yes)
7. Pass Cutoff (No, Yes)
8. Honors Cutoff (No, Yes)
9. Pre-Clinical Curriculum (Hybrid, Organ Based, Traditional, Other)
10. Quarter (First, Second, Third, Fourth)

Fitz, M., Adams, W., et al. Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis. *Acad Med.* 2020;95(9):1404-1410.

Even Better Together

Research Report



## Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis

Matthew M. Fitz, MD, MSc, William Adams, PhD, Steven A. Haist, MD, MS, Karen E. Hauer, MD, PhD, Linette P. Ross, MA, Amanda Raff, MD, Gauri Agarwal, MD, T. Robert Vu, MD, Jonathan Appelbaum, MD, Valerie J. Lang, MD, MHPE, Chad Miller, MD, Cyril Grum, MD, and the Clerkship Directors in Internal Medicine–NBME EXPRESS Study Group



Outcomes: there are no differences in the way students score on the NBME Medicine Subject Exam – the scores were all comparable for students in all but:

1. Longitudinal students (No, Yes)
2. Clerkship Length (6, 8-11, 12-20 weeks)
3. Academic Start Month (**Jan**, July, June, May) – if Jan start date was 18 mos. after pre-clinical start, students scored lower than July Students (1 institution, new program)
4. Ambulatory Clinical Experience (No, Yes, Mixed)
5. Study Day (No, Yes)
6. Combined Clerkship (No, Yes)
7. Pass Cutoff (No, **Yes**) – students with pass cutoff had higher scores but were not considered a meaningful difference
8. Honors Cutoff (No, Yes)
9. Pre-Clinical Curriculum (Hybrid, Organ Based, Traditional, Other)
10. Quarter (First, Second, Third, Fourth)

Fitz, M., Adams, W., et al. Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis. *Acad Med.* 2020;95(9):1404-1410.

Even Better Together

Research Report



## Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis

Matthew M. Fitz, MD, MSc, William Adams, PhD, Steven A. Haist, MD, MS, Karen E. Hauer, MD, PhD, Linette P. Ross, MA, Amanda Raff, MD, Gauri Agarwal, MD, T. Robert Vu, MD, Jonathan Appelbaum, MD, Valerie J. Lang, MD, MHPE, Chad Miller, MD, Cyril Grum, MD, and the Clerkship Directors in Internal Medicine–NBME EXPRESS Study Group



- **Results:** There was no significant association between length of clerkship and score on the NBME. There are no major associations between numerous clerkship variables and the medicine exam performance.
- **Limitations:**
  - US LCME accredited medical schools only – cannot apply to international or DO granting med schools
  - Old data at this point (2011-2014)
  - Some schools now start their clerkships before students have even taken the Step 1 exam
- **Future Studies:** Will changing the assessment technique affect students' performance on the NBME subject exam?

Fitz, M., Adams, W., et al. Which Internal Medicine Clerkship Characteristics Are Associated With Students' Performance on the NBME Medicine Subject Exam? A Multi-Institutional Analysis. *Acad Med.* 2020;95(9):1404-1410.

Even Better Together



# Curriculum

Even Better Together



## Teaching and Learning in Medicine

An International Journal

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/htlm20>

### Medical Student Attitudes toward USMLE Step 1 and Health Systems Science – A Multi-Institutional Survey

J. Bryan Carmody , Lauren M. Green , Patti G. Kiger , Jared D. Baxter , Todd Cassese , Tonya L. Fancher , Paul George , Erin J. Griffin , Yolanda C. Haywood , David Henderson , Nancy A. Hueppchen , David J. Karras , Andrea N. Leep Hunderfund , Janet E. Lindsley , Paul G. McGuire , Mimoza Meholli , Chad S. Miller , Seetha U. Monrad , Kari L. Nelson , Kristin A. Olson , Amit K. Pahwa , Stephanie R. Starr , Allan R. Tunkel , Richard N. Van Eck , Julie H. Youm , Deborah J. Ziring & Senthil K. Rajasekaran

Even Better Together



## Medical Student Attitudes Towards USMLE Step 1 and Health Systems Science

### Questions:

- What are students' perspectives on the appropriate use of USMLE Step 1 data and its role in undergraduate medical education?
- What is the impact of the exam on engagement with non-test health systems science (HSS) curricular content?

**Design:** Cross-sectional survey of medical students at 19 medical schools from March-July 2019

**Sample:** 2,856 students participated, 23.5% of those invited



## Survey Development

- Major themes developed in student focus groups were used to create the survey draft. Survey piloted by focus group students. Items were revised based on student feedback.
- Final survey: 51 items
  - 46 multiple choice items based on a 7-point Likert scale (1-3: strongly disagree, disagree, somewhat disagree, 4: neither, 5-7: somewhat agree, agree, strongly agree), 1 free text, 4 demographic items
- Questions were categorized into:
  - Impact of and attitudes toward the USMLE Step 1 exam
  - Equity of Step 1 exam & impact on residency competitiveness
  - Health Systems Science-related non-test curricular content



Medical Student Attitudes Towards Step 1	Agree*
I feel like residency programs see me as a USMLE score and not as an individual	66%
Performance on Step 1 demonstrates test taking skills but not skills as a physician	86%
In my medical school I have faculty who say “In the real world we do X, but for USMLE purposes you have to answer Y.”	95%
Before taking Step 1 I was less engaged in non-Step 1 content	64%

\*Agree includes somewhat agree, agree & strongly agree



Equity & Residency Competitiveness	Agree*
The USMLE equitably evaluates all students including those who come from a low income background	35%
If Step 1 was pass/fail, competitive residencies would use other criteria that may give preference to medical students from top US schools	64%
If Step 1 was pass/fail it would make me less competitive for residency	35%

\*Agree includes somewhat agree, agree & strongly agree



New Health Systems Science Curricular Content	Agree
In general, I am more motivated to study a topic if it will make me a better physician in the future	97%
Receiving grades for the curriculum content related to health system science would incentivize me to study this content	69%
As a medical professional I would like to have the skills to reduce health care costs and improve health care outcomes	96%

\*Agree includes somewhat agree, agree & strongly agree

Even Better Together



## Subgroup Analyses

- Higher vs. lower ranked school students & M3/4 vs. M1/2
- Similar interest in new content including HSS
- Students from lower-ranked schools & M1/M2 were:
  - More likely to see Step 1 as equitable and to benefit those from lower ranked schools
- Students from lower-ranked schools were less likely to agree that the scoring for Step 1 should be pass/fail (50% vs. 60% of higher-ranked)



## Attitudes Towards the Step 1 Exam Discussion

**Limitations:** Survey response rate was 23.5%, 19 schools were surveyed, respondents and non-respondents may differ

### **Conclusions:**

- Majority of students supported Pass/Fail grading of Step 1
- Majority of students disagreed that achieving a high Step 1 score demonstrated future ability as a doctor
- Students noted substantial buy in for HSS topics
- Majority perceived Step 1 performance as essential to residency selection process success and agreed that they could spend more time on issues relevant to patient care if it was not required for residency selection



# Improving Medical Students' OSCE Performance in Telehealth: The Effects of a Telephone Medicine Curriculum

Daniel J. Hindman, MD, MPH, Suzanne R. Kochis, MD, Ariella Apfel, MPH, Joshua Prudent, MD, Tina Kumra, MD, MPH, W. Christopher Golden, MD, Julianna Jung, MD, and Amit K. Pahwa, MD



## Abstract

### Purpose

To report on the implementation of a telephone medicine curriculum as part of the core clerkship in pediatrics for students at Johns Hopkins University School of Medicine and evaluate the curriculum's effect on student performance on a telephone medicine case as part of a required objective structured clinical exam (OSCE).

### Method

Using a prospective cohort design with a convenience sample of third-year medical students during the 2016–2017 and 2017–2018 academic years, the authors compared the OSCE scores of students

of students who had not received the curriculum. Additionally, the authors compared the costs of the recommended testing by students in each group using the 2018 Centers for Medicare and Medicaid Services Clinical Laboratory Fee Schedule.

### Results

Students assigned to the telephone medicine curriculum (students in the intervention group) had a significantly higher mean overall score on the simulated OSCE telephone medicine case compared with the students in the control groups who did not receive the curriculum (the mean score for students

$P = .02$ ). Additionally, the intervention group had statistically significantly lower costs for their recommended testing compared with the control groups (the median value for tests ordered by students in the intervention group was \$27.91 vs \$51.23 for students in the control groups,  $P = .03$ ).

### Conclusions

Implementing a dedicated telephone medicine curriculum for medical students improves their overall performance and delivery of high-value care via telephone medicine as part of an OSCE. Medical educators should pursue ongoing research into effective methods for

Even Better Together



## Improving Medical Students' OSCE Performance in Telehealth: The Effects of a Telephone Medicine Curriculum

**Question:** Does a telephone medicine curriculum improve medical students' OSCE performance in telehealth?

**Methods:**

- Prospective cohort design with a convenience sample of 245 3rd year medical students. 67 students received the intervention in AY2017-18.
- Compared OSCE scores and cost of testing ordered based on the 2018 Medicare and Medicaid Laboratory Fee Schedule.



## Telemedicine Curriculum & OSCE Methods

### **One hour classroom session each quarter of the Pediatric Core Clerkship**

- Prework: Review a one sentence summary of a cough and fever case and textbook reading on conducting a telephone interview on a patient with a cough
- Classroom session: 10 minute introductory lecture and 2 observed simulated cases  
~80% of the clerkship students attended (most did not attend post-call)

### **Telephone medicine OSCE case post encounter note was graded by single faculty on a 10-point scale**

- Modeled on the USMLE Step 2 Clinical Skills
- History (4 points), Diagnoses (3.5 points), Diagnostic tests (0.5 points), Management plan (2 points)



## Student Scores on the Telephone Medicine OSCE Case

**Student Scores on the Telephone Medicine Case Section of a Required Objective Structured Clinical Exam, Johns Hopkins University School of Medicine, 2016–2018**

Variable	Historical control group (n = 130)	Concurrent control group (n = 48)	H + C control groups (n = 178)	Intervention group (n = 67)	P value <sup>a</sup>		
					H vs I	C vs I	H + C vs I
<b>Mean overall score (SD)</b>	6.97 (1.33)	6.76 (1.38)	6.92 (1.34)	7.38 (1.53)	.05	.03	.02
<b>Mean score for diagnoses (SD)</b>	2.19 (0.71)	2.18 (0.72)	2.19 (0.71)	2.43 (0.64)	.02		.02
<b>Diagnostic tests score, no. (%)</b>					.05	< .01	.01
0	81 (62)	37 (77)	118 (66)	32 (48)			
0.5	49 (38)	11 (23)	60 (34)	35 (52)			
<b>Management plan score, no. (%)</b>					.40	.34	.33
0	12 (9)	6 (13)	18 (10)	7 (10)			
1	30 (23)	12 (25)	42 (24)	10 (15)			
2	88 (68)	30 (63)	118 (66)	50 (75)			
<b>History score, no. (%)</b>					.02	.07	.01
1	0 (0)	0 (0)	0 (0)	1 (1)			
2	21 (16)	11 (23)	32 (18)	12 (18)			
3	62 (48)	22 (46)	84 (47)	19 (28)			
4	47 (36)	15 (31)	62 (35)	35 (52)			

Abbreviations: H, historical; C, concurrent; I, intervention; SD, standard deviation.

<sup>a</sup>P values were obtained using Student's t test for continuous variables and a chi-square test for categorical variables.



## Cost of Tests Ordered by Students Participating in a Telephone Medicine OSCE

**Costs for Tests<sup>a</sup> Ordered by Students Participating in the Telephone Medicine Case Section of a Required Objective Structured Clinical Exam, Johns Hopkins University School of Medicine, 2016–2018**

Group	Mean costs <sup>b</sup> (SD)	Median costs <sup>b</sup> (IQR)	P value compared with intervention <sup>c</sup>
Historical control	80.56 (95.14)	37.27 (12.64–116.70)	.11
Concurrent control	95.86 (98.78)	74.14 (31.56–118.35)	< .01
Historical + concurrent control	84.68 (96.10)	51.23 (18.42–116.70)	.03
Intervention	61.93 (83.74)	27.91 (0.00–81.72)	—

Abbreviations: SD, standard deviation; IQR, interquartile range.

<sup>a</sup>Test costs were based on the 2018 Medicare Physician Fees Schedule.

<sup>b</sup>In U.S. dollars.

<sup>c</sup>P values were calculated using a Kruskal–Wallis test.



## Telehealth Curriculum & OSCE Discussion

### Limitations:

- Simulated clinical environment, single medical school

### Conclusions:

- There is good potential for dedicated medical student teaching in telephone medicine, which requires its own unique skillset
- The curriculum improved quality of care, specifically history taking and diagnostic test ordering
- The curriculum improved the value of care by minimizing the ordering of unnecessary tests
- Further research should include using randomized methods in the clinical environment to better understand the effect of dedicated curricula



TEACHING AND LEARNING IN MEDICINE  
2020, VOL. 32, NO. 4, 380-388  
<https://doi.org/10.1080/10401334.2020.1749636>



VALIDATION



## Medical Students' Progress in Detecting and Interpreting Visual and Auditory Clinical Findings

Heeyoung Han<sup>a</sup>, Reed Williams<sup>b</sup>, Susan Hingle<sup>c</sup>, Debra L. Klamen<sup>a</sup>, Gary M. Rull<sup>c</sup>, Ted Clark<sup>d</sup>, and James Daniels<sup>e</sup>

<sup>a</sup>Department of Medicine Education, Southern Illinois University School of Medicine, Springfield, Illinois, USA; <sup>b</sup>J. Roland Folse Professor of Surgical Education, Southern Illinois University School of Medicine, Springfield, Illinois, USA; <sup>c</sup>Department of Internal Medicine, Southern Illinois University School of Medicine, Springfield, Illinois, USA; <sup>d</sup>Department of Emergency Medicine, Southern Illinois University School of Medicine, Springfield, Illinois, USA; <sup>e</sup>Department of Family and Community Medicine, Quincy, Illinois, USA

**ABSTRACT**

*Phenomenon:* Detection of visual and auditory clinical findings is part of medical students' core clinical performance abilities that a medical education curriculum should teach, assess, and remediate. However, there is a limited understanding of how students develop these skills. While training physical exam technical skills has received significant attention and emphasis, teaching and assessing medical students' ability to detect and interpret visual

**KEYWORDS**

Visual and auditory clinical findings; progress test; clinical skills

Even Better Together



## Medical Students' Progress in Detecting and Interpreting Visual and Auditory Clinical Findings

**Question:** How does medical students' ability to detect and interpret visual and auditory clinical findings progress over 4 years of medical school?

**Methods:** Observational, longitudinal, and cross-sectional investigation. 60-item multiple choice exam instrument was developed by clinical faculty and medical educators based on the curriculum and required text:

- Dermatology; chest x-ray; heart & lung sounds; EKG; orthopedic and musculoskeletal; neurology; HEENT; and vascular
- Faculty collaborators achieved consensus on these areas as essential

**Sample:** >98% of students at the four levels of training completed the exam at the beginning of academic years 2014-2018, 65-75 students per class



## Methods

- **Exam instrument:** 65 items were piloted. Discrimination and item difficulty indices were reviewed and exam was refined
- **Process:** Required 60-minute, computer based exam, for formative learning only
- **Data Analysis:** Scores were converted to percent correct and an analysis of variance (ANOVA) was performed.
- **Tests for validity:**
  - Internal item reliability was high across all training years
  - Graduating 4<sup>th</sup> years scores correlated with other academic performance (USMLE, Clinical competency exam)



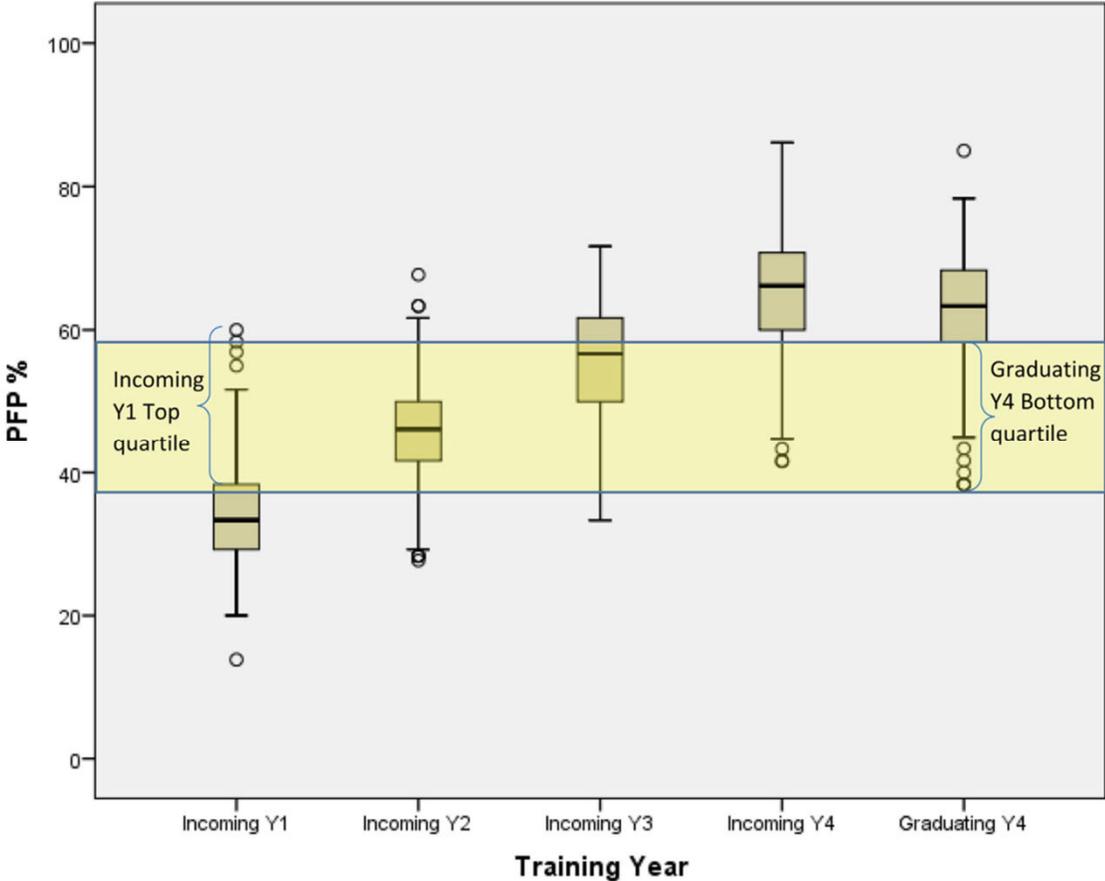
**Table 1.** Descriptive statistics (cross-sectional data).

Training Year		Incoming Y1	Incoming Y2	Incoming Y3	Incoming Y4	Graduating Y4
Academic Year						
2014-2015	Mean	Class of 2018 32.85	Class of 2017 43.27	Class of 2016 55.25	Class of 2015 65.40	
	SD	7.15	7.71	7.98	8.77	
	N	77	71	67	67	
2015-2016	Mean	Class of 2019 34.16	Class of 2018 46.75	Class of 2017 55.50	Class of 2016 65.27	
	SD	6.94	6.84	7.69	7.45	
	N	75	78	66	69	
2016-2017	Mean	Class of 2020 35.78	Class of 2019 46.55	Class of 2018 56.78	Class of 2017 65.54	Class of 2017 63.87
	SD	6.69	6.99	7.23	7.18	8.52
	N	73	73	74	66	65
2017-2018	Mean	Class of 2021 34.89	Class of 2020 46.77	Class of 2019 *Not Available	Class of 2018 64.37	Class of 2018 60.58
	SD	7.01	6.40	Available	8.53	9.38
	N	75	79		69	66
<b>TOTAL</b>	Mean	Incoming Y1 <b>34.06</b>	Incoming Y2 <b>45.73</b>	Incoming Y3 <b>55.85</b>	Incoming Y4 <b>65.15</b>	Graduate Y4 <b>62.21</b>
	SD	<b>6.90</b>	<b>7.19</b>	<b>7.57</b>	<b>7.98</b>	<b>9.07</b>
	N	<b>300</b>	<b>301</b>	<b>207</b>	<b>271</b>	<b>131</b>

\*Note: The computer lab where Class of 2019 took the exam encountered a technical problem. So, their exam data were not available for this academic year.



### Box plots of cross-sectional data, academic year 2016–2017



Even Better Together



## Progress Detecting & Interpreting Findings Discussion

- **Limitations:** Single institution, did not include all aspects of non-verbal clinical cues, use of repeated test annually
- **Conclusions:**
  - A longitudinal physical findings skills progress test can help explore curricular effectiveness and support student learning
  - Current medical education curricula may not be effective in advancing all students' visual and auditory clinical skills
  - Curricula and assessment tools should be re-examined to improve skill development
  - Further research on how medical students can develop visual and auditory skills is needed



# Feedback & Coaching

Even Better Together



**Does your school have a longitudinal coaching program for your medical students?**

- A) Yes, we have a program that is run throughout all 4 years of the curriculum
- B) Yes, we have a program that is run over part of the 4 year curriculum
- C) No
- D) Unsure



# Fostering a Feedback Mindset: A Qualitative Exploration of Medical Students' Feedback Experiences With Longitudinal Coaches

Brian M. Bakke, Leslie Sheu, MD, and Karen E. Hauer, MD, PhD



## Abstract

### Purpose

Feedback is important for medical students' development. Recent conceptualizations of feedback as a dialogue between feedback provider and recipient point to longitudinal relationships as a facilitator of effective feedback discussions. This study illuminates how medical students experience feedback within a longitudinal relationship with a physician coach.

### Method

In this qualitative study, second-year medical students from the University of California, San Francisco, School of

Interviews occurred between May and October 2018. Interview questions addressed students' experiences receiving feedback from their coach, how and when they used this feedback, and how their relationship with their coach influenced engagement in feedback discussions. Interviews were analyzed using constructivist grounded theory.

### Results

Seventeen students participated. The authors identified 3 major themes. First, students' development of a feedback mindset: Over time, students came to view feedback as an invaluable

clinical skills were important facilitators of effective feedback discussions. Third, interpreting and acting upon feedback: Students described identifying, receiving, and implementing tailored and individualized feedback in an iterative fashion. As students gained comfort and trust in their coaches' feedback, they reported increasingly engaging in feedback conversations for learning.

### Conclusions

Through recurring feedback opportunities and iterative feedback discussions with coaches, students came to view feedback as essential for growth

Even Better Together



## Fostering a Feedback Mindset: A Qualitative Exploration of Medical Students' Feedback Experiences with Longitudinal Coaches

**Question:** Do longitudinal coaches influence how students engage in and perceive feedback? How do students interpret, apply and seek feedback in these coaching relationships?

**Design:** Qualitative study, students from a single institution participated in semi-structured interviews from May-Oct 2018, analyzed with a constructivist grounded theory approach

**Intervention:** Longitudinal, nonevaluative coaching relationships

**Sample:** 17 second year medical students



## Roles and Responsibilities of Coaches

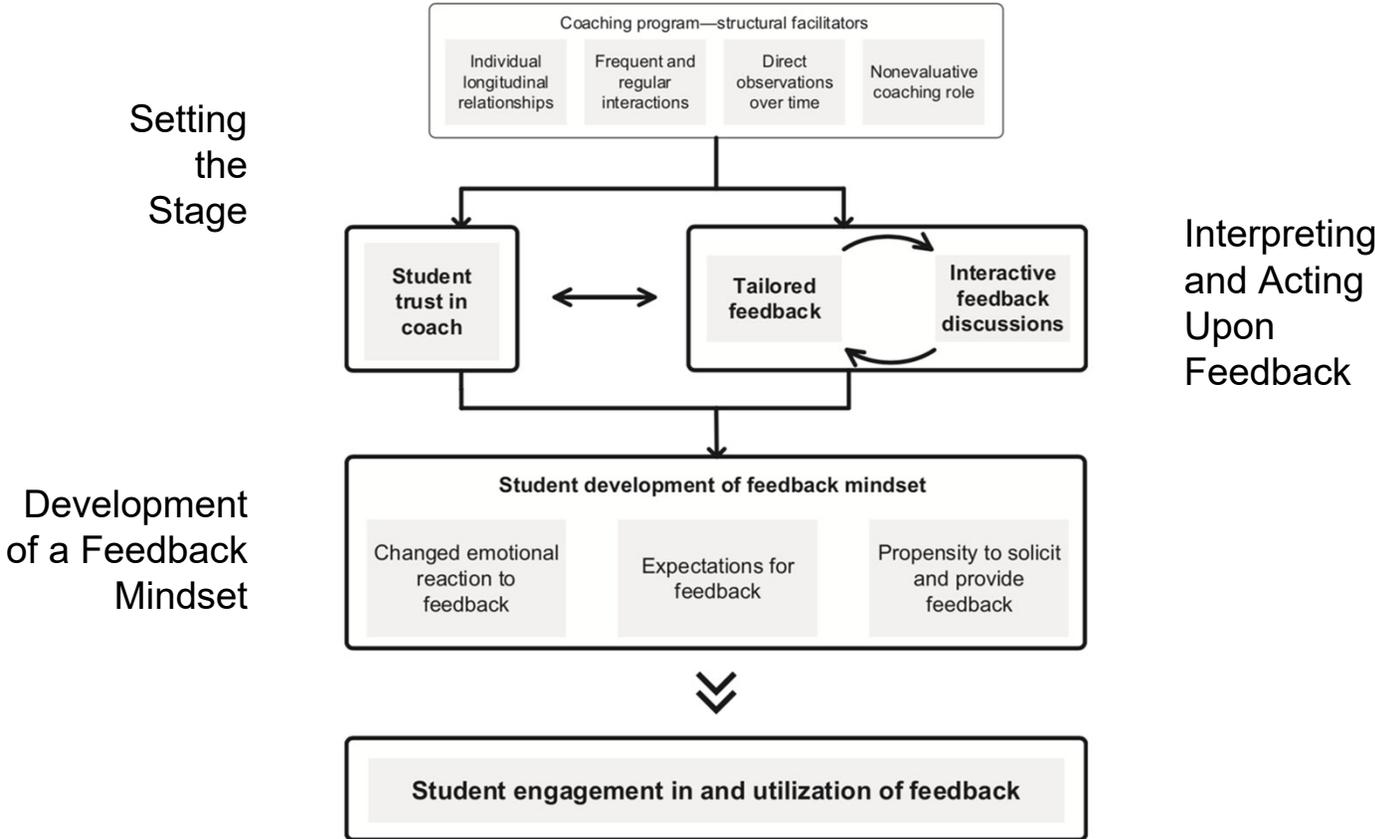
Program Feature	Rationale
<b>Role:</b> Coach provides academic guidance throughout medical school	Alignment of coach and learner supports feedback acceptance
<b>Support:</b> Coach receives 20% FTE to work 1 day/week	Support for coaching can encourage lifelong learning
<b>Faculty Development:</b> 2-3 sessions/year, handbook	Build expertise for successful coaching
<b>Teaching:</b> Coach teaches clinical skills 1 day/wk 1 <sup>st</sup> 18 mo of school in small groups	Longitudinal relationship builds trust and credibility
<b>Meetings:</b> Individual progress & planning meetings 2x/year	Establishes shared goals



## Research Methods

- Interview guide was developed, piloted and refined by investigators
- Investigators developed a code book and used Dedoose to organize & retrieve coded data. At least 2 investigators reviewed each transcript to identify themes and quotes.
- 149 eligible students, 17 students participated
  - 14 (82%) women, compared with 58% of eligible students
  - Average age was 25 years (SD = 2.5)

# Model for Engagement & Utilization of Feedback





## Fostering Feedback with Coaching Discussion

**Limitations:** Single institution, students from 1 class, self reported outcomes by students, rather than observed or corroborated by coaches

### Conclusions

- Longitudinal coaching relationships can facilitate student engagement in feedback discussions
- Recurring feedback discussions allowed students to see feedback as an essential tool for growth and learning
- Longitudinal coaching relationships can have a powerful positive influence on how students view and engage in feedback & play an important role in training
- Future directions include studying the long-term benefits of the coaching relationship & the impact on clinical learning and performance later in training



# Diversity & Inclusion

## Racial Microaggressions

Even Better Together

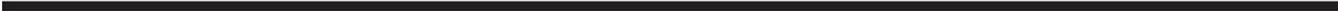


Research Report

**OPEN**

## **Seeking Inclusion Excellence: Understanding Racial Microaggressions as Experienced by Underrepresented Medical and Nursing Students**

Kupiri Ackerman-Barger, PhD, RN, Dowin Boatright, MD, MBA, MHS,  
Rosana Gonzalez-Colaso, PharmD, MPH, Regina Orozco, MSN, RN, and Darin Latimore, MD



Even Better Together



Racial microaggressions are subtle statements and behaviors that unconsciously communicate condescending messages to people of color.

**Study Purpose:** To explore how underrepresented Health Professions (HP) students experienced racial microaggressions, and how these experiences affected their learning, academic performance, and well-being.

**Design:** Qualitative study; focus groups and individual interviews (Nov 2017 - June 2018)

**Setting and Population:**

- UC Davis and Yale University
- 37 students (22 medical, 14 nursing, 1 PA); 24 women & 13 men
  - 17 Black, 6 bi/multiracial, 12 Latinx, and 2 Southeast Asian students
  - Focus groups w/15 students; interviews w/22 students

**Analysis:** Thematic analysis

## Themes



- **Students felt devalued by microaggressions**
  - Underrepresented and isolated
  - Discounted and devalued contributions
  - Assumptions of intellectual inferiority
  - The hidden curriculum: Taught biological inferiority
- **Impact on learning, academic performance, and well-being**
  - Stress, anxiety, and concentration
  - Divesting in discourse
  - The diversity tax
  - Faces of resilience and coping
- **Student suggestions for promoting inclusion**
  - Diversity and allyship
  - Curriculum reform
  - Open conversations
  - Safe spaces



Even Better Together

## Conclusions



Microaggressions detracted underrepresented HP students from their learning and academic performance, and affected their overall well-being, especially when unmitigated by peers, faculty, and/ or the institutional cultural climate.

HP schools need to implement policies and practices that promote inclusive learning environments and student well-being.

Additional research is needed to better understand microaggressions as experienced by URM students and whether curricula on social determinants of health & health equity mitigate the prevalence of microaggressions.

### Limitations

Small sample from 2 universities  
Limited to MD, Nursing, PA  
Focus racial microaggressions



# Student Mistreatment Reporting

Even Better Together



You are asked to review your school's graduation questionnaire (GQ), address any areas of concern, and present your findings to the Dean. You notice several students from your school reported mistreatment in the GQ although you have been unaware of any student mistreatment reports at your school. You wonder why your students have not reported their experiences of mistreatment to the administration.

You think the most likely reason is:

- A. Lack of familiarity with the school's reporting system
- B. Mistrust in the educational institution
- C. Prefer to talk to peers instead
- D. You are not sure



ORIGINAL RESEARCH

# Why do few medical students report their experiences of mistreatment to administration?

Amanda Bell<sup>1,2,3</sup>  | Alice Cavanagh<sup>3,4</sup>  | Catherine E. Connelly<sup>5</sup> | Allyn Walsh<sup>1</sup> | Meredith Vanstone<sup>1,3</sup> 

<sup>1</sup>Department of Family Medicine, McMaster University, Hamilton, ON, Canada

<sup>2</sup>Undergraduate MD Program, Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada

<sup>3</sup>McMaster Program for Education Research, Innovation and Theory, Hamilton, ON, Canada

<sup>4</sup>MD/PhD Program, Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada

<sup>5</sup>Michael G. DeGroote School of Business, McMaster University, Hamilton, ON, Canada

## Abstract

**Introduction:** Over 50% of medical students worldwide report experiencing mistreatment and abuse during their clinical education, yet only a small proportion of students report these concerns to administration. It is unknown how medical students make sense of their experiences of mistreatment and come to decide whether to formally report these experiences. Improved understanding of this phenomenon will facilitate changes at the administrative and institutional levels to better support students.

**Methods:** Using Constructivist Grounded Theory, we interviewed 19 current and former medical students from one institution about their experiences with mistreatment and reporting. Data were analysed in an iterative fashion, using focused and

Even Better Together



**Research Question:** When medical students experience mistreatment in the learning environment, how do they make decisions about reporting that mistreatment?

**Design:** Constructivist Grounded Theory; used semi-structured interviews

- Constructivist epistemological framework (the way each person experiences and understands mistreatment is forged by their cumulative experiences)

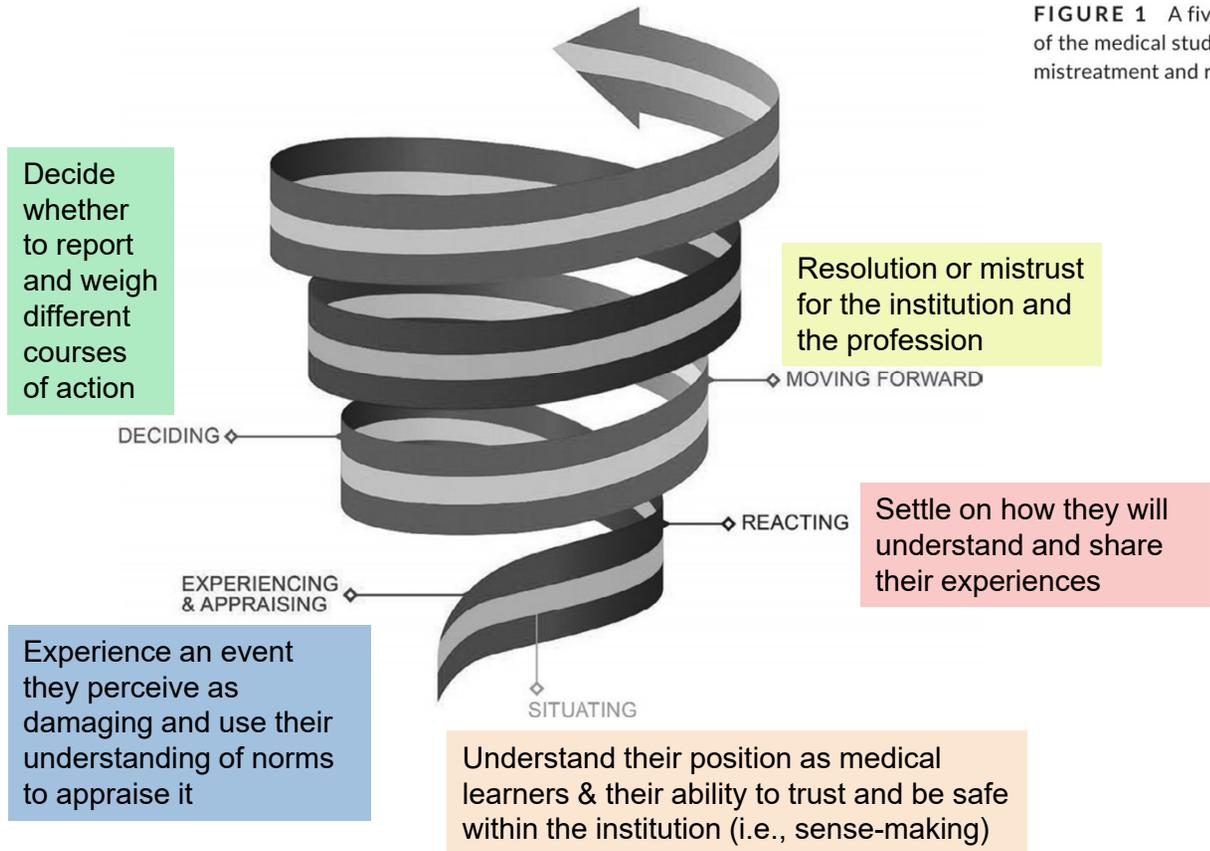
**Setting and Population:**

- Single institution
- 19 medical students (15 current & 4 former) who had experienced or witnessed mistreatment during their medical training; 13 women

**Data collection & Analysis:** Collection past point of saturation; themes with a consistent order and pattern were conceptualized as 'stages'



FIGURE 1 A five-phase description of the medical student journey through mistreatment and reporting





## Conclusions

- Student decision to report mistreatment is conceptualized as a journey with five phases that occur iteratively and contribute to a student's self-situation within the program.
- Student perceptions of trust or mistrust in their educational institution are highly influential when it comes to reporting mistreatment.
- Institutional leaders must seek to:
  - Build trust with students
  - Simplifying reporting mechanisms
  - Improving transparency and student support
- Future research is needed to study interventions that address mistreatment.

### Limitations

- Single institution
- Recall bias



# Medical Student Wellness

## Psychological Needs & Stress

Even Better Together



## Medical Teacher



ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/imte20>

# Basic psychological needs, more than mindfulness and resilience, relate to medical student stress: A case for shifting the focus of wellness curricula

Adam Neufeld , Annik Mossière & Greg Malin

To cite this article: Adam Neufeld , Annik Mossière & Greg Malin (2020) Basic psychological needs, more than mindfulness and resilience, relate to medical student stress: A case for shifting the focus of wellness curricula, Medical Teacher, 42:12, 1401-1412, DOI: [10.1080/0142159X.2020.1813876](https://doi.org/10.1080/0142159X.2020.1813876)

To link to this article: <https://doi.org/10.1080/0142159X.2020.1813876>

Even Better Together



- Mindfulness and resilience have important stress-protective qualities for medical learners.

**Study Purpose:** To explore

- The association between medical student mindfulness, resilience, basic psychological needs, and perceived stress
- The role of gender and year of study in medical student basic psychological need satisfaction and frustration, resilience, mindfulness, and perceived stress
- **Self-determination theory\*** posits *three universal psychological needs*: autonomy, competence, and relatedness
- **Basic Psychological Needs Theory:** a person requires *satisfaction* of autonomy, competence, and relatedness in order to thrive, while *frustration* of any of these needs comes at significant functional costs

\*Ryan R, Deci E. 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am Psychol. 55(1):68–78.



**Design:** Online survey at end of academic year

- Basic Psychological Needs Satisfaction and Frustration Scale
- Mindfulness Attention Awareness Scale
- Connor Davidson Resilience Scale
- Perceived Stress Scale

**Setting and Population:**

400 students (MS1-MS4) from one medical school in Canada

**Statistical Analysis:**

- Correlational analyses (relationships between all variables)
- Hierarchical regression (extent demographics, mindfulness, resilience, and basic psychological needs contributed to changes in perceived stress)
- MANOVA (effect of gender and year of study on the variables); post-hoc analysis to unpack any significant effects

## Results



- 54% response rate; 47% males and 53% females
- Mean age: 25.9 y (SD: +/- 3.7); MS1: 36%, MS2: 28%, MS3: 18%, and MS4: 18%
- Basic need **satisfaction**, mindfulness, and resilience were positively correlated with one another and negatively correlated with perceived stress
- Basic need **frustration** was negatively correlated with mindfulness and resilience and positively correlated with perceived stress
- Mindfulness, resilience, and overall need satisfaction (but not gender or year) contributed uniquely to the variance (63.6%) in perceived stress
- When overall need frustration was added, the contributions of the other factors were reduced, with basic need frustration accounting for the most unique variance (12.2%) in perceived stress



- **Year of training** had a significant effect on perceived stress (p: 0.040) and autonomy (p: 0.002), but not on competence (p:0.064) or relatedness (p:0.254)
  - MS3 reported the highest level of autonomy frustration and differed significantly from MS1 and MS2, but not MS4
- **Gender** had a significant effect on perceived stress (p: 0.001); mindfulness (p<0.001), resilience (p=0.004), competence satisfaction (p=0.003), and competence frustration (p=0.018); specifically in 2<sup>nd</sup> and 4<sup>th</sup> year
  - Female students reported higher perceived stress, lower resilience and mindfulness, less competence satisfaction, and more competence frustration (specifically in 4<sup>th</sup> year)



## Conclusions

- While mindfulness and resilience have important stress-protective qualities for medical learners, taking basic psychological needs (autonomy, competence, and relatedness) into the equation is particularly important for understanding their well-being.
- Promoting students' need fulfilment in medical school may help reduce their perceived stress and facilitate their ability to be mindful and resilient.
- Future research should focus on studying interventions that account for medical students' perceptions of the learning environment and not only personal attributes, such as mindfulness and resilience.

### Limitations

Single medical school  
Cross-sectional  
Self-reports

Even Better Together



# Professionalism Lapses in Medical School

Even Better Together



Research Report

## **Do Professionalism Lapses in Medical School Predict Problems in Residency and Clinical Practice?**

Edward Krupat, PhD, Jules L. Dienstag, MD, Susan L. Padrino, MD, John E. Mayer Jr, MD, Miles F. Shore, MD, Aaron Young, PhD, Humayun J. Chaudhry, DO, Stephen R. Pelletier, PhD, and Ben Y. Reis, PhD

Even Better Together



### Research Questions:

- Do students who appeared before their schools' review boards (RBs) differ from their peers on professionalism-related outcomes at 2 subsequent points in time?
- To what extent are professionalism problems in medical school predictive of negative outcomes in residency and practice?

**Design:** prospective

### Setting and Population:

- 165 students from Harvard Medical School (55 RB & 110 NB)
- 159 students from Case Western Reserve (53 RB & 106 NB)
  - Latest graduation date 2007
  - Records back as far as 1993



**Data:** From 4 time periods:

- Time 1 (T1): pre-matriculation data
- Time 2 (T2): performance in medical school (6 clerkship grades & USMLE Step 1 & 2CK)
- Time 3 (T3): performance in residency (survey to PD & USMLE Step 3)
- Time 4 (T4): post-training information (FSMB & NPDB) from 1993-2013

**Analysis:**

- Phase 1: univariate analysis
- Phase 2: multivariate logistic regression for 2 dichotomous outcomes
  - Remediation or disciplinary review during residency
  - Sued or sanctioned during clinical practice



## Results

- **Pre-matriculation (T1):** no significant differences between RB and controls
  - Parental level of education, US born or not, undergraduate education, college major, total MCAT
- **During medical school (T2):** controls outperformed RB cases
  - USMLE Step 1 & 2 CK and grades for all 6 clerkships

## During Residency (T3)



Variable	RB cases n/total (%)	NB controls n/total (%)	P value
<b>Treated colleagues with respect</b>			<b>0.008</b>
Exceeded standards	7/27 (26)	57/96 (59)	
Met standards	16/27 (59)	33/96 (34)	
Did not meet standards	4/27 (15)	6/96 (6)	
<b>Incorporated feedback</b>			<b>0.029</b>
Exceeded standards	7/27 (26)	35/95 (41)	
Met standards	15/27 (56)	52/95 (55)	
Did not meet standards	5/27 (19)	4/95 (4)	
<b>Honest in representing actions</b>			<b>0.041</b>
Exceeded standards	12/27 (44)	51/96 (53)	
Met standards	10/27 (37)	41/96 (43)	
Did not meet standards	5/27 (19)	4/96 (4)	

Even Better Together



During Residency (T3)

Variable	RB cases n/total (%)	NB controls n/total (%)	P value
<b>Functioned well as a team-member</b>			<b>0.020</b>
Exceeded standards	7/27 (26)	52/96 (54)	
Met standards	16/27 (59)	39/96 (41)	
Did not meet standards	4/27 (15)	5/96 (5)	
<b>Took responsibility for errors</b>			<b>0.005</b>
Exceeded standards	7/27 (26)	40/95 (42)	
Met standards	13/27 (48)	50/95 (53)	
Did not meet standards	7/27 (26)	5/95 (5)	
<b>Always trustworthy/responsible</b>			<b>0.004</b>
Exceeded standards	9/27 (33)	53/94 (56)	
Met standards	11/27 (41)	36/94 (38)	
Did not meet standards	7/27 (26)	5/94 (5)	

## During Residency (T3)



Variable	RB cases n/total (%)	NB controls n/total (%)	P value
<b>How feel if resident had applied for staff position</b>			<b>0.040</b>
Strongly enthusiastic	8/28 (29)	54/96 (56)	
Mildly enthusiastic	13/28 (46)	31/96 (32)	
Mildly unenthusiastic	3/28 (11)	7/96 (7)	
Strongly unenthusiastic	4/28 (14)	4/96 (4)	
<b>Did resident require remediation or counseling?</b>			<b>0.003</b>
Yes	9/26 (35)	8/91 (9)	
No	17/26 (65)	83/91 (91)	
<b>Did resident undergo disciplinary review?</b>			<b>0.057</b>
Yes	4/25 (16)	3/92 (3)	
No	21/25 (84)	89/92 (97)	

Even Better Together



### During Independent Practice (T4):

- Malpractice suits – RB: 6% vs. NB controls: 4%
- State med boards sanctions – RB: 4% vs. NB controls: 1%
- Combined “sued and sanctioned” – RB: 10% vs. NB controls: 5%

### For T3 outcome (required remediation or review)

- The explanatory variables ( $R^2$ : 0.17;  $F$  = 4.64;  $P$  = 0.0009)
  - RB vs NB; Step 2 CK; MCAT; and IM & Ob/Gyn clerkship grades

### For T4 outcome (sued-or-sanctioned)

- The explanatory variables ( $R^2$ : 0.24;  $F$  = 2.20;  $p$  < .04)
  - Step 2 CK & 3; MCAT; Neurology clerkship grade; fulfilled responsibilities in timely manner; treated colleagues with respect; received recognition for clinical work; leadership position; remediation or counseling; disciplinary review

## Conclusions



- Medical students with professionalism lapses during medical school were more likely to require remediation or counseling and undergo disciplinary review than controls.
- Once in practice, RB cases were sued or sanctioned at a ratio of 2:1 compared with controls.
- However, early lapses in professionalism may not be the only or most important predictor of problems once in practice
- Future research is needed to design evidence-based approaches to both prevention and treatment of non-professionalism.

### Limitations

- Sample from 2 schools
- PD recall bias
- Limited to early career
- Some data collected after the fact

Even Better Together



**Thank you  
Questions?**

Even Better Together