Transforming the Public's Health Through Medical Education Research

SimReC
Ben Gurion University and Affiliated Hospitals
Member of International Advisory Council to Goldman School of Medicine
June 21, 2021

Adina Kalet, MD, MPH
Preferred Pronouns: She, Her, Hers
akalet@mcw.edu

Stephen and Shelagh Roell Endowed Chair
Robert D. and Patricia E. Kern Institute for the Transformation of Medical Education
Medical College of Wisconsin
@MCW_Kern
Author, *Remediation in Medical Education*

Co-Director, US site, Masters in Health Professions Education, University of Maastricht School of Health Professions Education
Adjunct Professor, New York University School of Medicine

"The goal of medical education is to produce physicians who are prepared to serve the fundamental purposes of medicine"

— The Association of American Medical Colleges, 2009

Assertions

- Educating physicians is critical to the health of the public
- Medical Education Research plays a key role in this mission.
- Bigger questions and new methods needed to provide the needed evidence base to inform practice and policy to meet the challenges facing society
- Leadership capacity is needed

Transformation through Character·Competence·Caring

DREAM | Meaningful Measures | Important Outcomes

Building a program of medical education simulation-based research

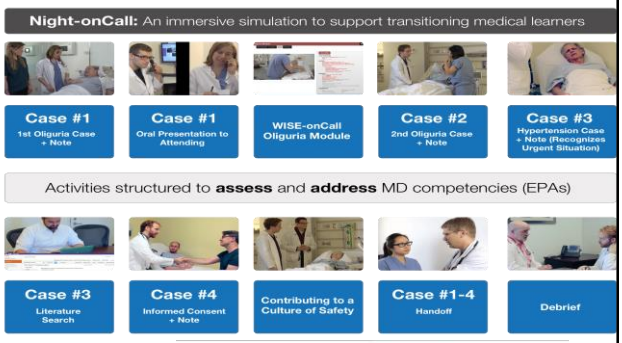
- Longitudinal data sets
- Meaningful/multi-purpose educational measures
- Patient and System Important outcomes

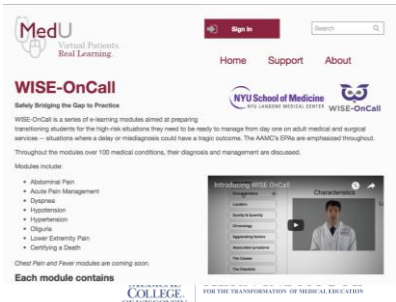
Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Assessment Drives Learning

- Longitudinal linked and Holistic immersive simulations
- Valid data
- Make "trust judgments"
- Ensure "readiness for practice"
- Enables Outcomes Based Medical Education
- Improve patient and systems outcomes





Transformation through Character·Competence·Caring

ACGME

Calls for accountability and return on investment…

The ACGME Outcomes Project

"It is incumbent upon us as medical educators to demonstrate the effectiveness of our educational programs and to be held accountable for our work."

Competencies/Standards have been established

Little evidence linking what we train physicians to do and it's impact on the public's health to guide this work…..

Transformation through Character·Competence·Caring

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Graduate Medical Education

Institute of Medicine
Of the National Academies

"Graduate medical education that meets the nation's health needs."

— Washington, DC: The National Academies Press.

Transformation through Character·Competence·Caring

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Align financial incentives to:

Encourage education of physicians who are better prepared to work in, challenge and lead, and continually improve an evolving health care delivery system.

Encourage innovation in the structures, process and outcomes of medical education.

Will this Transform Medicine, Health and Health Care?

If we have the **courage** and know how to accomplish these goals there **is** growing evidence to guide practice and policy

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Medical Education Research

A multidisciplinary field of scientific investigation that studies how the structure and process of learning and individual characteristics of learners and instructional designs affect individual learning outcomes…

…. **and the impact of this learning on the safety, effectiveness, efficiency, and the patient-centeredness, costs of the care ultimately provided by the health care professionals educated.**

With the moral clarity, meaning, joy and purpose needed to sustain a career.

Will this Transform Medicine, Health and Health Care?

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Critiques of Medical Education Research

- Not guided by theory
- No comparisons or controls (<50%)
- Conducted in single institutions (>80%)
- Small, homogenous samples
- Predominately cross-sectional
- Focused on questions that have marginal significance for actual practice
- Justly been attributed to lack of funding
- Heterogeneity makes synthesis impossible.

Transformation through Character·Competence·Caring

Reed, Cook, Beckman, et .al. 2007, Berger et. al. 2019

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Medical Education Matters to Patient Outcomes

Large and Larger Data Sets…

- Where you trained matters
  Cost conscious care & Obstetrical outcomes
- How you do on licensing exams matters
  Primary care practice quality
- Communication skills are unique from knowledge scores.
  Both matter a lot!
- Community Orientated Curriculum Matters!
- The Learning Climate/Environment Matters!

Transformation through Character·Competence·Caring

Sirovich, B. JAMA 2014, Tamblyn, JAMA, 2007, DA Asch, JAMA 2009, DA Asch, Academic Medicine, 2014, Smirnova 2019

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Simulation Based Medical Education improves competence and patient outcomes (23 studies)

Technical (e.g. Procedural) Cognitive (e.g. decision making) & Communication (e.g.teamwork) skills

High cost hospital-based outcomes (complications, OR time)
Catheter related infections, saves $7:$1 spent

- ✓ Coupled with mastery learning and deliberate practice
- ✓ Involve skillful faculty
- ✓ Curriculum integration
- ✓ institutional endorsement

Study	Findings
1. Sroka et al. 2010[19]	Training on the fundamentals of laparoscopic surgery (FLS) simulator led to improved operating room performance in lap cholecystectomy compared to controls
al. 2010[20]	S-B mastery learning improves medical students' cardiac auscultation skills that transfer to actual patients
al. 2008[21]	Simulation trained residents responded to real hospital cardiac arrest events with greater compliance to American Heart Association protocols than more experienced team leaders not trained with simulation
4. Ahlberg et al. 2007[22]	Resident surgeons trained on a virtual reality (VR) laparoscopic cholecystectomy simulator made fewer errors and were faster during their first 10 cholecystectomies compared to a control group
5. Park et al. 2007[23]	"Residents trained on a colonoscopy simulator prior to their first patient-based colonoscopy performed significantly better in the clinical setting than controls, demonstrating skill transfer to live patients."
6. Banks et al. 2007[24]	Simulation training in laparoscopic tubal ligation improved resident knowledge and performance in the operating room (OR) compared to controls.
7. Chaer et al. 2006[25]	Training on a VR endovascular simulator led to improved clinical performance during catheter-based interventions for lower extremity occlusive disease compared to controls
8. Banks et al. 2006[26]	Training in episiotomy repair in the skills laboratory improved residents' knowledge and performance in the clinical setting compared to controls

McGaghie, William C., et al. "Evaluating the impact of simulation on translational patient outcomes." *Simulation in healthcare: journal of the Society for Simulation in Healthcare* 6.Suppl (2011): S42.
Cohen, et. al. *Simulation in healthcare* 5.2 (2010): 98-102., McGaghie (2014).

Research that needs to be done

Will this transform medicine & health care?

Not in and of itself

Builds "grand" theory to guide implementation!

Measures all important competencies/capacities (e.g. Procedural, Social and Intrapersonal)

Compares effectiveness (length, structure, instructional strategies)

Informs the adaption to individual characteristics (e.g. prior knowledge) what, for whom, under what circumstances?

Links to important patient outcomes

Measures costs (financial and human)

Addresses the barriers of inertia and arrogance (Oslerian Model)

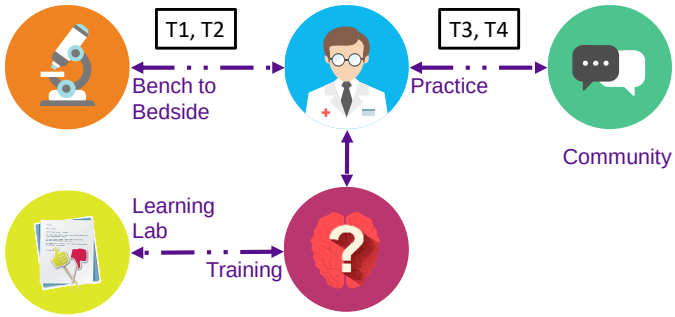
Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Medical Education Research

We have been building a laboratory, developing new methods and influencing practice and policy….

IS a Translational Science



Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

Database for Research on Education in Academic Medicine (DREAM)

- Prospective cohort for studying medical education outcomes (IRB approved)
- Align diverse educational assessments of trainees over time (Data linkage)
- Link educational assessments to physician behaviors in clinical settings and ultimately to patient outcomes

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

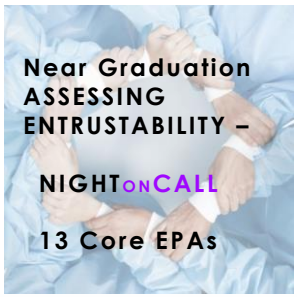
Standardized Patient Experiences

performance-based assessment & feedback

All Medical students
12 Residency Programs
(from first week)

40+ Standardized Patient experiences for medical students, OME

Lots of Feedback & Summative Assessments



Case bank > 500 Cases

Behaviorally anchored assessment tools with evidence of reliability and validity

2,000 + students and residents enrolled in Medical Education Research Registry

Transformation through Character·Competence·Caring

Kalet, Gillespie, Zabar, Tewksbury, Ogilvie, Hanley, Crowe, Hochberg, OME

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

Learners often say….

"But that's not how I am with real patients!"

SPs ARE SIMULATION

REAL WORLD OF PRACTICE

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

Unannounced Standardized Patients

Highly trained actors who portray, incognito, a standardized clinical scenario in actual practice

The SPs have the real patient experience

Standardized	Unannounced	Independent Assessment	Actual Practice Settings

• Portray
  • same clinical conditions
  • same patient characteristics
	• Captures provider practices free from observation bias	• Highly trained and experienced raters	• The real world of clinical practice

Transformation through Character·Competence·Caring

AHRQ 5 R18 HS 021176–02 (Zabar, Gillespie) "Patient Safety in the Outpatient Setting"

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

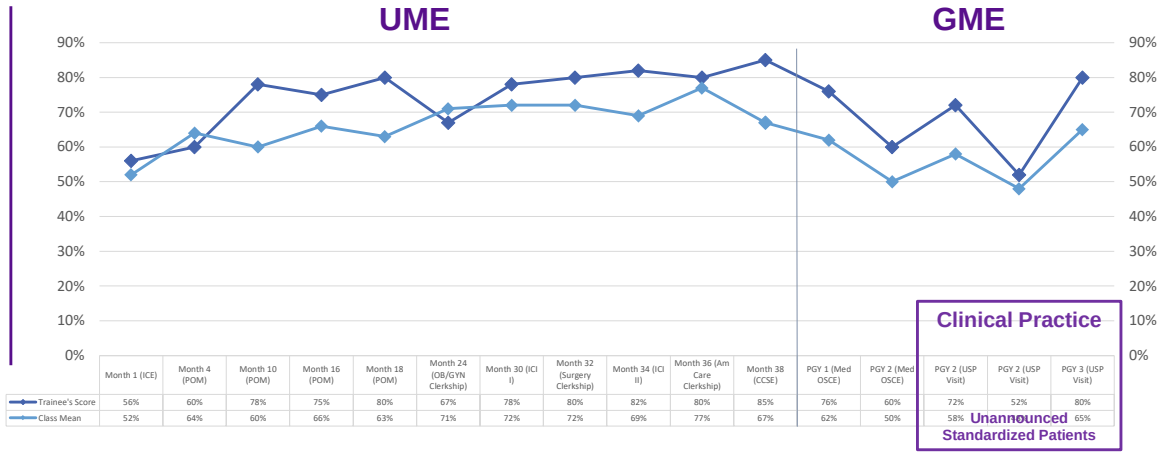
Unannounced Standardized Patients

1. Give feedback to residents and students.
2. Provide actionable quality improvement data to clinic leaders.
3. Answer core research questions about clinical competence, practice, and outcomes.

Transformation through Character·Competence·Caring

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes



	Month 1 (ICE)	Month 4 (POM)	Month 10 (POM)	Month 16 (POM)	Month 18 (POM)	Month 24 (OB/GYN Clerkship)	Month 30 (ICI I)	Month 32 (Surgery Clerkship)	Month 34 (ICI II)	Month 36 (Am Care Clerkship)	Month 38 (CCSE)	PGY 1 (Med OSCE)	PGY 2 (Med OSCE)	PGY 2 (USP Visit)	PGY 2 (USP Visit)	PGY 3 (USP Visit)
Trainee's Score	56%	60%	78%	75%	80%	67%	78%	80%	82%	80%	85%	76%	60%	72%	52%	80%
Class Mean	52%	64%	60%	66%	63%	71%	72%	72%	69%	77%	67%	62%	50%	58%	48%	65%

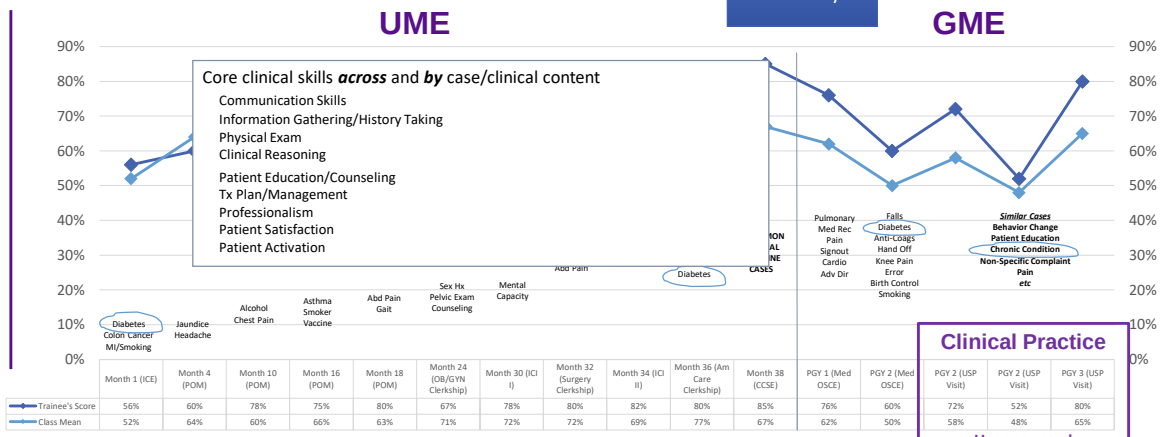
COMMUNICATION SKILLS FROM UME TO GME

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Will this transform medicine & health care?

Readiness for Residency?

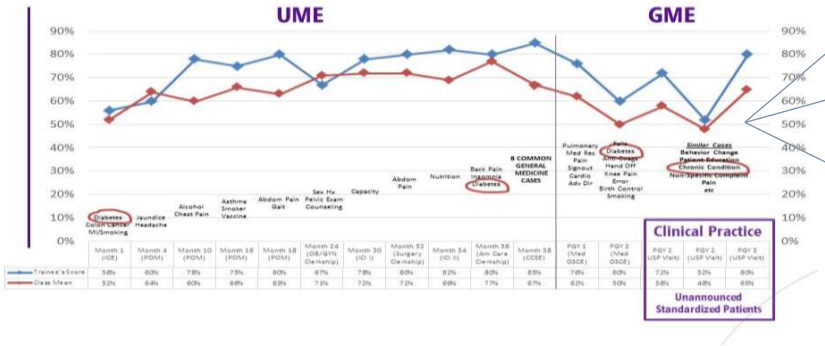


	Month 1 (ICE)	Month 4 (POM)	Month 10 (POM)	Month 16 (POM)	Month 18 (POM)	Month 24 (OB/GYN Clerkship)	Month 30 (ICI I)	Month 32 (Surgery Clerkship)	Month 34 (ICI II)	Month 36 (Am Care Clerkship)	Month 38 (CCSE)	PGY 1 (Med OSCE)	PGY 2 (Med OSCE)	PGY 2 (USP Visit)	PGY 2 (USP Visit)	PGY 3 (USP Visit)
Trainee's Score	56%	60%	78%	75%	80%	67%	78%	80%	82%	80%	85%	76%	60%	72%	52%	80%
Class Mean	52%	64%	60%	66%	63%	71%	72%	72%	69%	77%	67%	62%	50%	58%	48%	65%

COMMUNICATION SKILLS FROM UME TO GME

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION



Bellevue Adult Ambulatory Clinical Dashboard
- Diagnoses
- BP control
- LDL
- Utilization
- ER Use
- Hospital admission/re-admission

Health and Hospital's Chronic Disease Registry
- Blood pressure control
- T2DM/A1c

Bellevue Electronic Medical Record Audit Tool
- HPI
- Past Med Hx, Past Surg Hx
- Problem List
- Management Plan
- Prescriptions
- Medicine Reconciliation
- Labs/Tests
- Follow-up Visits
- Billing

COMMUNICATION SKILLS FROM UME TO GME

Transformation through Character·Competence·Caring

CTSI Innovation Grant (Kalet) Accelerating knowledge discovery in health professions education to improve care for the underserved: Proof of concept, 2016.

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

Educationally Sensitive Patient Outcomes (ESPOs)

CRITERIA

- Likely to be sensitive to clinician skill
- Measured accurately and reliably
- Significant influence on important clinical outcomes

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

New Measures to Establish the Evidence Base for Medical Education: Identifying Educationally Sensitive Patient Outcomes

Adina L. Kalet, MD, MPH, Colleen C. Gillespie, PhD, Mark D. Schwartz, MD, Eric S. Holmboe, MD, Tavinder K. Ark, MSc, Melanie Jay, MD, MS, Steve Paik, MD, EdM, Andrea Truncali, MD, MPH, Julia Hyland Bruno, Sondra R. Zabar, MD, and Marc N. Gourevitch, MD, MPH

We have proposed a conceptual framework and are building theory

Acad Med. 2010;85(5):844-851.

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Physician Education

DREAM | Meaningful Measures | Important Outcomes

Ability to…

ACTIVATE CLINICAL MICROSYSTEM	ACTIVATE PATIENT	ADDRESS PATIENT HEALTH LITERACY
Use microsystem awareness and competencies to • Be aware of clinical unit as interdependent group of people • Recognize role in improving • performance of microsystem • Connect routine daily work to goal of patient-centered care • Implement process improvement cycles • Understand and respond to • information and feedback • Work effectively within the team	Use patient-centered skills to • Assess patient's stage of activation • Provide counseling • appropriate to stage • Support patient's confidence to act and maintain action	Use patient-centered skills to • Assess patient understanding and close the loop of communication • Support patient understanding through use of written materials and other visual aids to supplement verbal counseling • Provide counseling using a universal precautions approach • Support patient's confidence to act and maintain action

HEALTH LITERACY Environment

Prepared and proactive clinical microsystem ↔ Patients have confidence and motivation to take action ↔ Patients have knowledge and skills to make informed health decisions and take action

Patients who are engaged in shared decision making and management of their health, with sustained behavior change

Quality | Safety | Biological/ Physiological | Functional Status | Quality of Life

Inform curriculum design and policy

Inform curriculum design and policy

Maximized Health for Patients (Educationally sensitive)

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

DREAM | Meaningful Measures | Important Outcomes

ESPO: Clinical Microsystem Activation

Clinical microsystems

- Small groups of people who work together regularly–or assemble around the patient as needed–to provide care
- Share processes of care, information, and needs, and generates measurable performance outcomes
- Building blocks of larger health care organizations,
- Locus of clinical work and patients' experience of health care
- Context in which most medical education occurs beyond the first 2 years of medical school

Hypothesis

Learners' (e.g., residents') effectiveness in activating aspects of the CMS in which they are working in order to serve patients' specific needs is an important patient-centered outcome of medical education.

Transformation through Character·Competence·Caring

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Program for Medical Education Innovations and Research PrMEIR

Using Unannounced Standardized Patients (USPs) to Assess Quality of Care

Sondra Zabar, Lisa Altshuler, Kathleen Hanley, Amara Shaker-Brown, Andrew Wallach, Barry Bateman, Colleen Gillespie

AHRQ 5 R18 HS 021176–02 "Patient Safety in the Outpatient Setting"
HRSA 11-02247 Residency Training in Primary Care
HRSA 15-A0-00-004497 Primary Care Training and Enhancement

Transformation through Character·Competence·Caring

Medical College of Wisconsin | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Unannounced Standardized Patient Cases Focused on Safety in Outpatient Care

	HepB	Asthma	Knee Pain	Well Visit	Back Pain	Fatigue
1	"Stomach pain"	"Trouble breathing"	"Joint pain"	"*Frequent heartburn*"	"Back Pain"	"Tired all the time"
2	Educate patient about dx	Teach patient to take meds correctly	Explore non-specific symptom	Counsel to change behavior	Come up with pain management strategy	Identify symptoms to make new dx
3	Prevent transmission	Medication adherence	Safe use of medication	Smoking cessation	Safe use of medication	Recognize and respond to depression (follow-up)
VISITS	**86**	**144**	**83**	**86**	**119**	**43**

Unannounced Standardized Patient Program

March 2009 – present Resident Physician Visits (Internal Medicine)

Total 561	**208 Residents**	**2-5 Visits/Resident**	**2 Sites**

Using USPs to Answer Research Questions

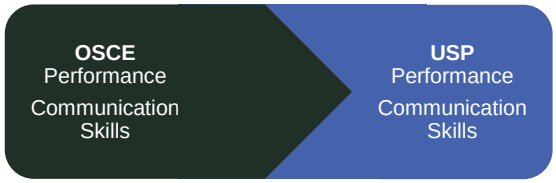
Transfer of Skills
Outpatient Safety
Charting/Documentation
Treatment Variation
EHR/HIT Use

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

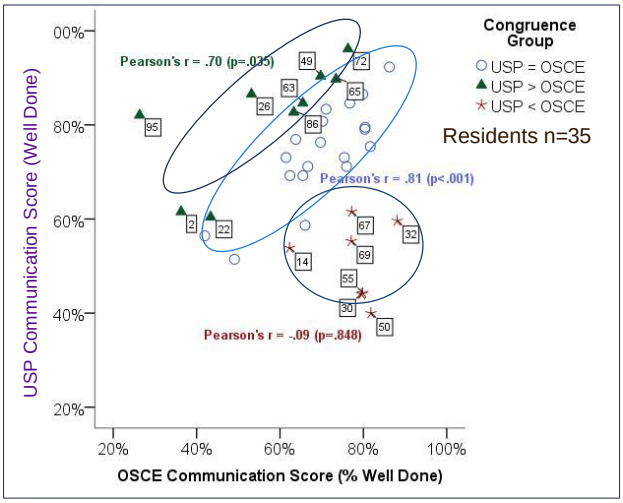
Do Skills Transfer From OSCE to USP?

(from "Bench to Clinic")

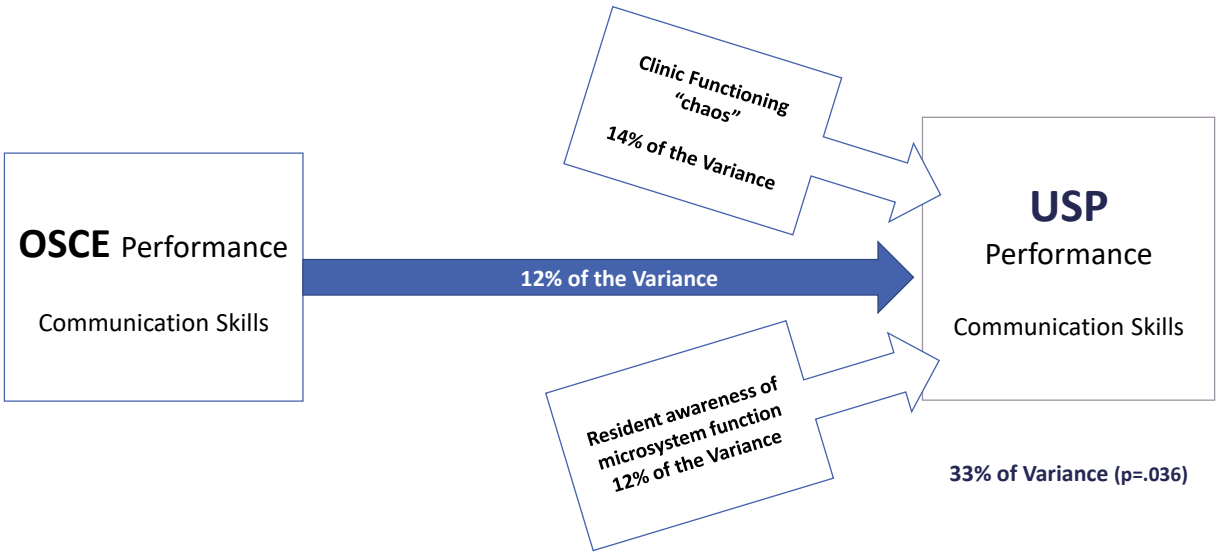


Transformation through Character·Competence·Caring

Can we be confident that OSCE performance tells the whole story?



Resident Attitudes and Clinic Functioning Do Influence USP Performance



Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

ORIGINAL RESEARCH

Check for updates

Opioid vs nonopioid prescribers: Variations in care for a standardized acute back pain case

Kathleen Hanley, MD[a,b], Sondra Zabar, MD[a,b], Lisa Altshuler, PhD[b], Hillary Lee, BA[b], Jasmine Ross, BA[a,b], Nicomedes Rivera[b], Christian Marvilli[b], and Colleen Gillespie, PhD[a,b,c]

[a]Division of General Internal Medicine and Clinical Innovation, NYU School of Medicine, New York, New York, USA; [b]Research on Medical Education Outcomes (ROMEO) Unit, Program for Medical Education Innovation and Research (PrMEIR), NYU School of Medicine, New York, New York, USA; [c]Institute for Innovations in Medical Education, NYU School of Medicine, New York, New York, USA

Transformation through Character·Competence·Caring

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

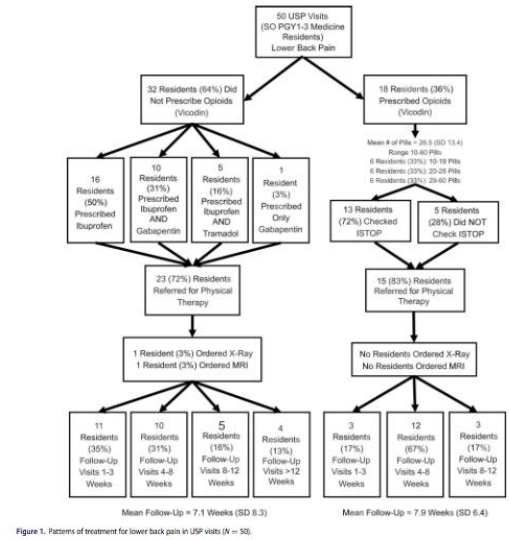


Figure 1. Patterns of treatment for lower back pain in USP visits (N = 50).

Transformation through Character·Competence·Caring

- 36% who gave effective pain relief treatment plan had significantly better communication skills.
- Most did ***not*** do a through assessment of other substance use even when prompted by EMR
- Few followed guidelines for safe opiate use in acute pain (more than 3 days supply)
- Documentation was poor.
- Need to guide residents in using a systematic approach to pain management and prescribing opioids safely.

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

Will this transform medicine & health care?

Maybe…..

…..As the light spreads

Judgement and Courage to ask the important questions!

Tighter links between MER, Pop Health, Informatics, research designs needed

Identify more ESPOs, RSQMs

Build infrastructure and leadership capacity

The Danger
We will only look under the light….

Transformation through Character·Competence·Caring

van der Leeuw, Renée M., et al. "A systematic review of the effects of residency training on patient outcomes." *BMC medicine* 10.1 (2012): 65

MEDICAL COLLEGE OF WISCONSIN | KERN INSTITUTE FOR THE TRANSFORMATION OF MEDICAL EDUCATION

MEDICAL COLLEGE OF WISCONSIN
KERN INSTITUTE

THANK YOU