

Scholarship in Medical Education: It's MORE Than Rocket Science

David W. Musick, PhD

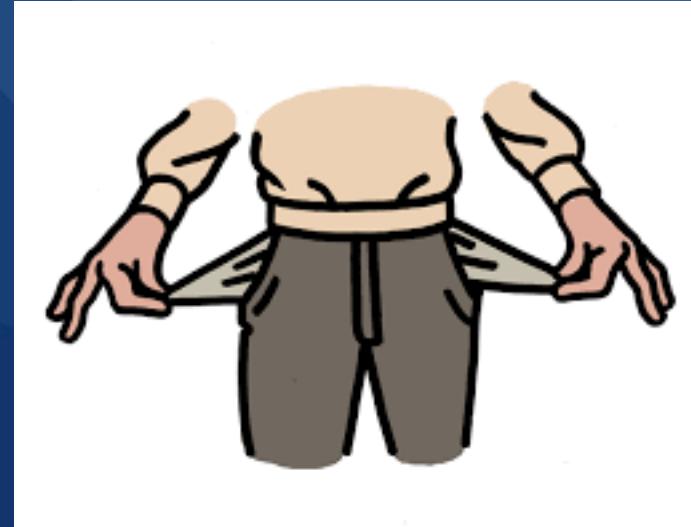
May 23, 2016



Disclosures

Nothing to formally disclose

Except.....



- “I not only use all the brains that I have, but all that I can borrow”

(Woodrow Wilson)

“Teaching Isn’t Rocket Science. It’s Harder”

“To solve engineering problems, you use your brain. Solving classroom problems uses your whole being.”

Ryan Fuller, 2013



“I experience more failure every five minutes of teaching than I experienced in an entire week as an engineer.”

“Easier than teaching algebra!”

Today's Objectives

- Define medical education research and scholarship
- Distinguish medical education research from other types of research
- Describe why medical education research matters
- Develop a research question for a medical education study

What is Medical Education Research?



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A Broad Definition

- “....any investigation related to the education of **medical** professionals, including research related to undergraduate (medical school), graduate (residency) and continuing medical education.”
 - *Jannette Collins, Radiology 2006: 240 (3): 639-47*
- We could change “medical” above to “**health**” and further broaden our definition.

Another Broad Definition

- “....the critical, systematic study of teaching and learning in medicine” with a focus on the “scholarly analysis of the context, processes and **outcomes** of all phases of medical education.”

Bligh and Parsell, 1999

Quoted in Traynor and Eva, 2010

What is Scholarship?

- “Any material, product, or resource originally developed to fulfill a specific educational purpose that has been successfully peer-reviewed and is subsequently made public through appropriate dissemination for use by others.”
 - *Association of American Medical Colleges, 2013*

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What is Scholarship?

Boyer, 1990

Type	Purpose	Measure
Discovery	Build new knowledge	<ul style="list-style-type: none">• Publish research in peer-reviewed forum• Create infrastructure for future studies
Integration	Interpreting/sharing Knowledge	<ul style="list-style-type: none">• Prepare a comprehensive lit review• Write a textbook chapter
Application	Bringing knowledge to bear in addressing societal needs	<ul style="list-style-type: none">• Develop practice standards• Assess the effectiveness of different techniques
Teaching	Systematically study teaching & learning process	<ul style="list-style-type: none">• Develop/test instructional methods• Design/implement/evaluate an educational program

Expanded Edition

How People Learn



Brain,



Mind,

Experience,

and



School

NATIONAL RESEARCH COUNCIL

- **SOTL:** Scholarship of Teaching and Learning
- Engagement in SOTL provides an opportunity for personal and professional reflection on teaching and learning

Glassick et al, 1997

**What interests
you in your
own teaching
and learning
that you want
to study?**

Continuum of Growth Toward SoTL

<i>Develop personal knowledge about one's own teaching and student learning</i>		
Reflect on teaching		
Intentionally evaluate teaching to make improvements		
Read and learn about underlying principles of teaching and learning		
Engage in teaching development activities		
Can demonstrate validity of teaching/learning knowledge through assessment by students, peers, etc.		

Continuum of Growth Toward SoTL

<i>Develop personal knowledge about one's own teaching and student learning</i>	<i>Develop and exchange knowledge about teaching/learning with colleagues</i>	
Reflect on teaching	Engage colleagues in conversation that make explicit pedagogical content knowledge	
Intentionally evaluate teaching to make improvements	Mentor other teachers	
Read and learn about underlying principles of teaching and learning	Provide leadership in teaching such as organizing events for faculty development	
Engage in teaching development activities	Engage in disciplinary and multidisciplinary teaching associations	
Can demonstrate validity of teaching/learning knowledge through assessment by students, peers, etc.	Grow in the understanding of the complexity of teaching/learning	

Continuum of Growth Toward SoTL

<i>Develop personal knowledge about one's own teaching and student learning</i>	<i>Develop and exchange knowledge about teaching/learning with colleagues</i>	<i>Develop and exchange knowledge about teaching/learning that has significance and impact</i>
Reflect on teaching	Engage colleagues in conversation that make explicit pedagogical content knowledge	Draw on existing literature to inform conceptual and hypothesis-driven research
Intentionally evaluate own teaching to make improvements	Mentor other teachers	Obtain funding for research on teaching
Read and learn about underlying principles of teaching and learning	Provide leadership in teaching such as organizing events for faculty development	Carry out research on teaching using an approach consistent with its goals
Engage in teaching development activities	Engage in disciplinary and multidisciplinary teaching associations	Publish and make presentations about teaching/learning
Can demonstrate validity of teaching/learning knowledge through assessment by students, peers, etc.	Grow in the understanding of the complexity of teaching/learning	Develop comprehensive knowledge of the research and literature on teaching and learning
Weston & McAlpine (2001)		

Possible Areas of Inquiry

- Curriculum Development
- Teaching Methods
- Assessment Methods
- Teacher Evaluation
- Course Evaluation
- Faculty Development
- Admissions
- Use of Technology
- Factors Influencing Career/Specialty Choice
- Interprofessionalism
- Theory
- To name but a few!

Much Is Written About....

- Purpose of Education Research
- How to Conceptualize It
- How to Go About It
- How to Write About It
 - NOT so much written about.....
 - How to Fund It!!

My purpose today is not so
much the “how”.....but rather
the “why” of education
scholarship



Annual Education Day!

Oct 13, 2016

Title:

Harvest the Low-Hanging Fruit: Strategies for Submitting (and Re-Submitting) Educational Innovations for Publication

Objectives:

- Identify the facilitators and barriers to innovation in the medical education culture
 - Develop your innovation(s) in preparation for publication
- Discuss colleagues' innovations and discuss best practices for preparing innovations for publication

CME: Continuing Medical Education (CME) credit is awarded upon completion of a post-session evaluation.

Speaker: Rebecca Blanchard, PhD,

Director Medical Education and Research

University of Massachusetts Medical School – Baystate Health



Three Duplicate Sessions – Choose One!

7am

12pm

5:30pm

The Three Sessions will be held at VTCSOM in The Commons (M210)

Can You Define Medical Education Research & Scholarship?

What Makes Medical Education Research Different?

Conceptual Challenges

- “Educators’ uncertainty principle”: the length of time which elapses between learning and practice, and the accompanying confounding variables
- *“The vast number of variables impacting upon human behavior, affecting one’s ability to accurately predict an educational outcome, provides another example of the challenges inherent in such work.”*

- *Traynor & Eva, 2010*

Lack of Funding

- Most health professions education research is carried out in the absence of external funding
- Many researchers (especially clinicians) are not offered protected research time, so studies must be carried out during whatever time is left after other duties

Collaborative Challenges

- Many problems related to medicine and medical education require input from a variety of different sciences if they are to be solved:
 - Basic science
 - Clinical science
 - Behavioral science
 - Safety/systems science
 - Social science
 - Epidemiology/biostatistics

And, collaboration is often the only way to achieve large enough sample sizes!

Not QA/QI

- Education research is often a hybrid between truly “classic” experimental design (hypothesis driven) research and QA/QI
- It can be difficult to determine whether a given project requires informed consent
- Many IRBs are not experienced with education research methods (particularly qualitative)

DeMeo, Nagler & Heflin, Academic Medicine, 2015

Research Design Issues

- There is a difference between doing research that demonstrates that an educational process “worked” or was “effective”.....AND....
- Doing research that illuminates **how** or **why** things “worked” or were “effective”

Research Design Issues

- Some suggest that most medical education research focuses on the former, i.e., did recipients of the education like it or feel that it worked well?
- “....merely establishing that students like a new educational innovation is unconvincing evidence for its educational value....” (Scott et al, 2015)
- In medical education, we do this all the time!!

Research Design Issues

- Often lacking is **comparative effectiveness research** (where side by side comparisons are made between two or more educational interventions, in an effort to determine which are better)
- Medical education grappled for many years with this one: which type of curriculum is better?
- **More recent example = simulation**

Educational Outcomes by Level

- Kirkpatrick, Moore, Dreyfuss, Miller, etc.....

Start with the End in Mind - Outcomes Framework

Outcome: the result of an action or activity.

Educational outcome: the result of an educational activity.

Seven levels of outcomes:

1. Participation
2. Satisfaction
3. Learning
4. Competence
5. Performance
6. Patient Health Status
7. Community Health

Adapted from Moore, Green, Gallis, 2009, who synthesized frameworks from Moore, 2003, Kirkpatrick, 1998, Miller, 1991, Walsh, 1984, Abrahamson and Lloyd, 1979, Dixon, 1978

- 
- Community Health
 - Patient Health
 - Performance
 - Competence
 - Learning
 - Satisfaction
 - Participation

Medical Education Research

- IS DIFFERENT.....it ain't rocket science.....it's much more difficult!!!!
- Presents some unique challenges.....
- But also provides a rich environment in which to work!!

Quotable Quote

- “Researchers working in this field....need to act as commuters, constantly traveling back and forth between the educational field, their home disciplines and the disciplines of colleagues, while trying to avoid getting stuck in the traffic that can result.”

Traynor and Eva, 2010

Hopefully, you are now aware of
at least a few differences
between medical education
research and other types of
research?

But Why Does This Type of Research Matter?

Academic Reasons for Why Should You Publish

- **STUDENTS BENEFIT** from innovative teaching strategies
- **INSTITUTIONS BENEFIT** from new content and solutions to problems
- **FACULTY BENEFIT** from peer review and discussion AND the record of scholarship

Public Investment in Med Ed

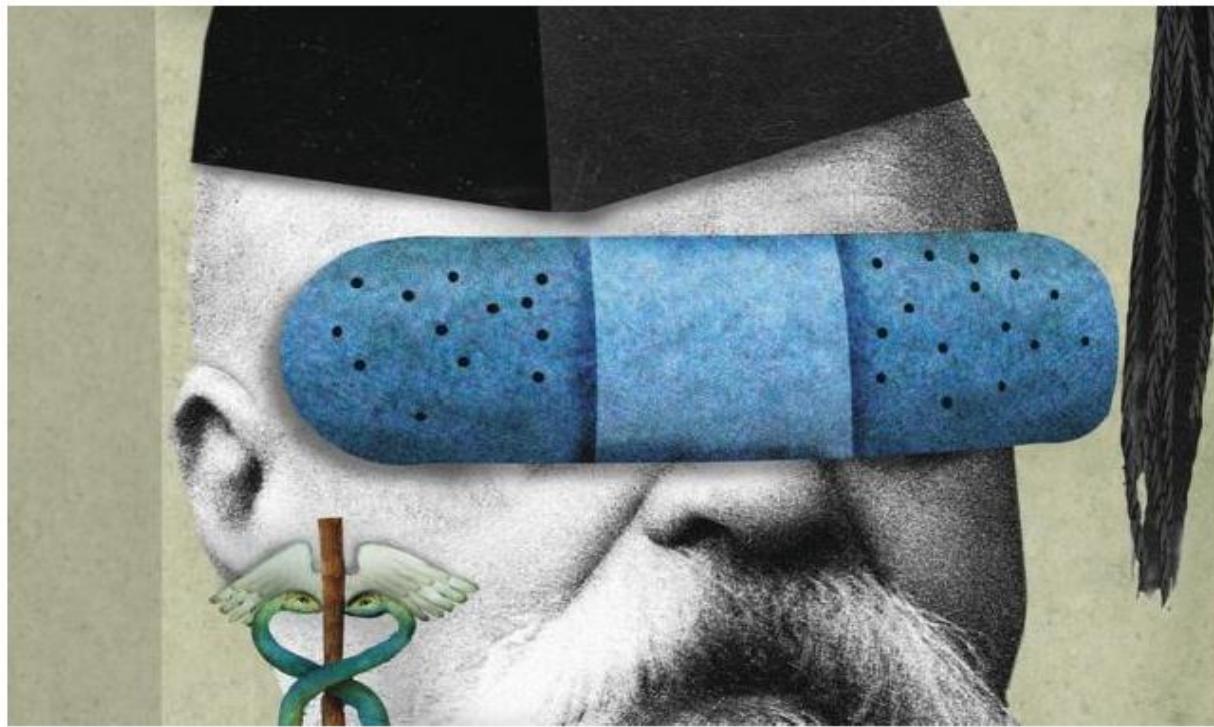
- Medicare pays in excess of \$8 billion annually to support training of residents.
 - More than $\frac{3}{4}$ of medical schools receive public funding (approx. \$2 billion).
 - We can expect increasing scrutiny and calls of accountability i.e., “return on investment.”
- AMA, 2007

<http://chronicle.com/article/A-Prescription-for-What-Ails/143623/>

THE CHRONICLE OF HIGHER EDUCATION

[Commentary](#)

A Prescription for What Ails Medical Education



The Patient Outcomes Imperative

- “Medical care is the ultimate outcome of medical education.”

Gonnella et al, 2004

The Patient Outcomes Imperative

- “The greatest challenge in medical education research is linking the content and method of medical education to the quality of physician care and patient health outcomes.” (Collins, 2006)
 - Do you agree?
 - Why or why not?

Patient Outcomes

Factors Likely Controlled by Physician

- Physician knowledge, skills and attitudes
- Delivery of services
- Personal characteristics (e.g., adequate self-care)
- Duty hours (at least some of the time!)

Factors Not Controlled by Physician

- Contributions to care by other team members
- Patient adherence
- Available technologies for use in treatment
- Constraints imposed by insurance
- Health care regulatory environment

Gonnella et al, 2004



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Gonnella et al, 2004



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

Abstract

Researchers lack the rich evidence base and benchmark patient outcomes needed to evaluate the effectiveness of medical education practice and guide policy. The authors offer a framework for medical education research that focuses on physician-influenced patient outcomes that are potentially sensitive to medical education. Adapting the concept of ambulatory care sensitive conditions, which provided traction to health services research by defining benchmark patient outcomes to measure health system performance, the authors introduce the concept and propose the

adoption of educationally sensitive patient outcomes and suggest two measures: patient activation and clinical microsystem activation. They assert that the ultimate goal of medical education is to ensure that measurement of future physicians' competence and skills is based not only on biomedical knowledge and critical clinical skills but also on the ability to translate these competencies into effective patient- and systems-level outcomes. The authors consider methodological approaches and challenges to measuring such outcomes and argue for large, multiinstitutional,

prospective cohort studies and the development of a national Database for Research in Education in Academic Medicine to provide the needed infrastructure. They advocate taking the next steps to establish an educational evidence base to guide the academic medical centers of the 21st century in aligning medical education practice with health care delivery that meets the needs of individuals and populations.

Acad Med. 2010; 85:844–851.

New Wave of Scholarship?

- **ESPO: Educationally Sensitive Patient Outcomes (Kalet et al, 2010)**
 - “Medical education research is a translational science....[and] must be translated from the educational and social sciences to the classroom, and from the classroom to the clinic through associations with meaningful patient outcomes.”
 - “We envision ESPOs as pathways that link educational interventions to patient health outcomes.”

Two Types of ESPOs

Patient Activation

- Health outcomes depend on the degree to which patients are “activated” to assume personal responsibility for participating in their care
- Four stages of patient activation can be measured

Clinical Microsystem Activation

- Health care services are delivered in small groups of people who work together frequently
- Aligned with “systems-based practice” as described by ACGME

Patient Activation

- Four Stages, Patients:
 1. Come to believe their role in their own care is important
 2. Learn and develop confidence to act on their own behalf
 3. Act on their own behalf
 4. Reach the point where they can act even under stress



Shared Decision Making: The Art & Science

Learn how-to engage your patients in their health care.



Join us for the first session of this three part series
May 25, 2016 at Noon eastern
Register Today

Shared Decision Making: The Art & Science

presented by Victor Montori, MD, MSc, Professor of Medicine Mayo Clinic

Shared decision making occurs when a health care provider and a patient work together to make a health care decision that is best for the patient. The optimal decision takes into account evidence-based information about available options, the provider's knowledge and experience, and the patient's values and preferences. Emerging evidence suggests that shared decision making benefits the patient (improves satisfaction with care) and the provider organization (improves quality and may reduce costs). In this webinar, Victor Montori, MD, MSc, Professor of Medicine from the Mayo Clinic, will share his expertise in translating shared decision making into practice. Dr. Montori will highlight shared decision making tools and resources that can set your practice up for success.

Patient Activation

- These 4 Patient Activation Stages are measureable and can be associated with clinical outcomes (e.g., A1c levels/diabetes; peak flow measures/asthma)
- “We propose that educating physicians to employ strategies, such as motivational interviewing, that measurably increase PA will be strongly linked to other meaningful patient outcomes.”

Clinical Microsystems

- Examples of aspects of CMSA are:
 - Team members knowledge/skills/attitudes
 - Processes of care within a given context
 - Referral processes
 - Handoffs between shifts
 - Supervision levels
 - Interdisciplinary communications

Patient Outcomes are ultimately.....

- “.....the result of interactions between physician, patient and microsystem competencies.....”
- “**the physician’s contribution** to the CMS is to ensure that it serves the needs of the patient....[is] the ability to activate the CMS to provide patients with optimal experiences and outcomes....”

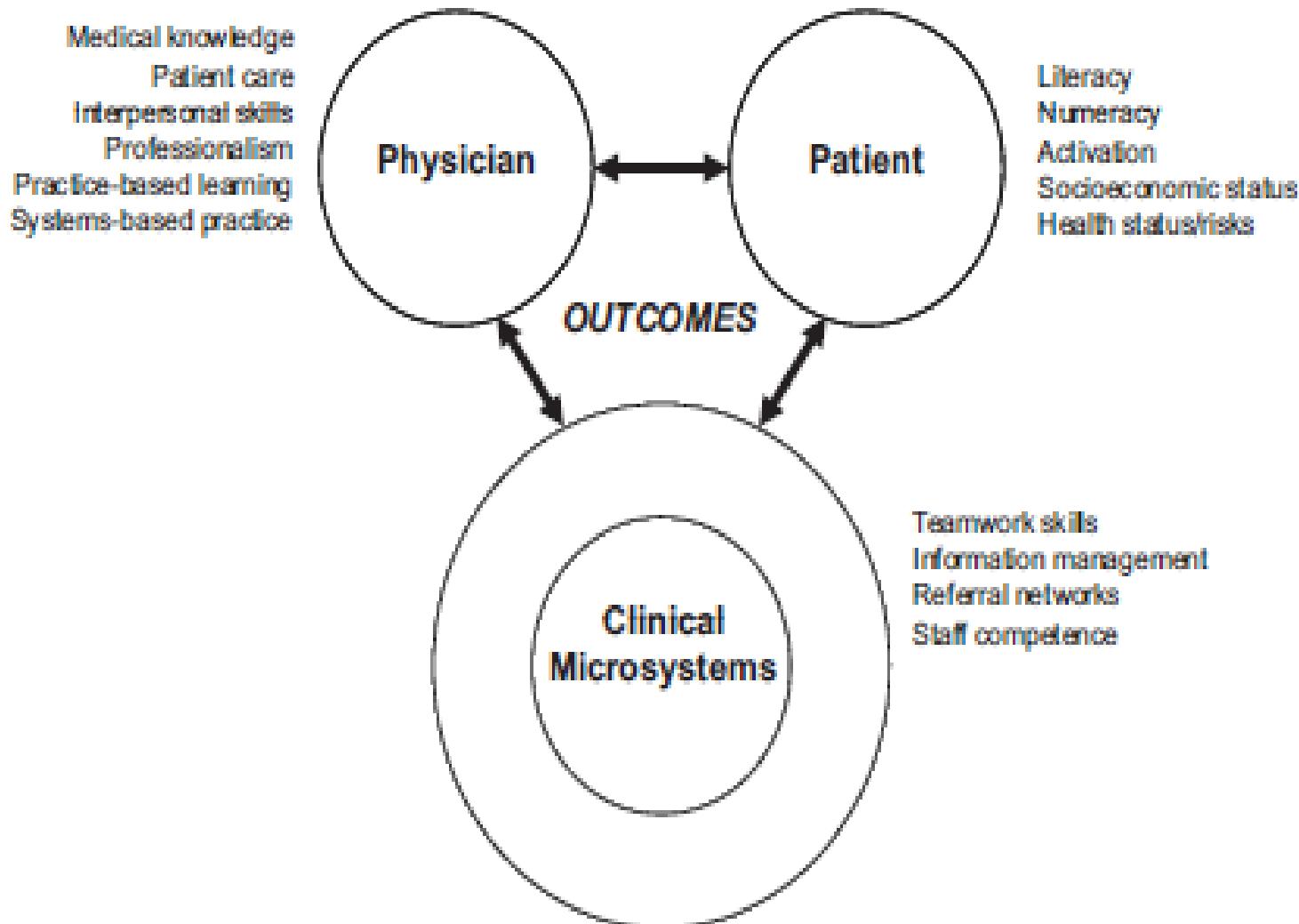


Figure 2 Competency triangle. Health care quality depends on the interactions among physicians, patients, and clinical Microsystems. Adapted from Holmboe²⁹ (Figure 2. The Competency Triangle). Used with permission of the *Journal of Continuing Education in the Health Professions*.

“The ultimate goal of medical education is to ensure that measurement of future physicians’ competence and skills is based not only on biomedical knowledge and critical clinical skills but also on the ability to translate these competencies into effective patient- and systems-level outcomes.”

Kalet et al, 2010

However.....A Respectful Dissent

Perspective

Perspective: **Reconsidering the Focus on “Outcomes Research” in Medical Education: A Cautionary Note**

David A. Cook, MD, MHPE, and Colin P. West, MD, PhD

Abstract

Researchers in medical education have been placing increased emphasis on “outcomes research,” or the observable impact of educational interventions on patient care. However, although patient outcomes are obviously important, they should not be the sole focus of attention in medical education research. The purpose of this perspective is both to highlight the limitations of outcomes research in medical education and to offer suggestions to facilitate a proper balance between learner-centered and patient-

centered assessments. The authors cite five challenges to research using patient outcomes in medical education, namely (1) dilution (the progressively attenuated impact of education as filtered through other health care providers and systems), (2) inadequate sample size, (3) failure to establish a causal link, (4) potentially biased outcome selection, and (5) teaching to the test. Additionally, nonpatient outcomes continue to hold value, particularly in theory-building research and in the evaluation of

program implementation. To educators selecting outcomes and instruments in medical education research, the authors offer suggestions including to clarify the study objective and conceptual framework before selecting outcomes, and to consider the development and use of behavioral and other intermediary outcomes. Deliberately weighing the available options will facilitate informed choices during the design of research that, in turn, informs the art and science of medical education.

Cook and West, 2013

- Non-patient outcomes have value (e.g., theory building, program evaluation, comparing instructional methods).
- “Dilution”: the link between what a physician does and patient outcomes is **indirect**.
- Because of this fact, complex educational interventions may point to improved outcome but the ability to explain **how** it happened is illusive.
- “**Patient outcomes warrant emphasis, but they should not constitute the sole focus of attention in medical education.**”

Can We Apply these Concepts to Medical Education?

- “Patient activation” has a parallel in research and theory in CME (continuing medical education)
- We might label this “learner activation”
- “Will this educational presentation impact your clinical practice?”

(Lifelong) Learner Activation

- Four Stages, Learners:
 1. Come to believe my role in my own learning is important (assume responsibility)
 2. Develop self-awareness to recognize personal limitations (i.e., to “know what I don’t know”)
 3. Based on self-awareness, learn!
 4. Reach the point where I can test and apply what I’ve learned in real world patient care settings

Recent Examples at Carilion

- CKMB (enzyme found in blood, marker which supports diagnosis of acute MI)
- Neuroimaging education
- Blood transfusion education

How About the Educational Program or Medical School as a Variable?

Original Investigation

Spending Patterns in Region of Residency Training and Subsequent Expenditures for Care Provided by Practicing Physicians for Medicare Beneficiaries

Candice Chen, MD, MPH; Stephen Petterson, PhD; Robert Phillips, MD, MSPH;
Andrew Bazemore, MD, MPH; Fitzhugh Mullan, MD

IMPORTANCE Graduate medical education training may imprint young physicians with skills and experiences, but few studies have evaluated imprinting on physician spending patterns.

OBJECTIVE To examine the relationship between spending patterns in the region of a physician's graduate medical education training and subsequent mean Medicare spending per beneficiary.



Supplemental content at
jama.com

Spending Patterns Influenced by Where Residents Were Trained

- Clinical training environment patient care expenditures are reproduced in clinical practice of graduates (primary care physicians)
- This effect persists even when the graduate practices in a different setting
- This effect persisted for up to 15 years post graduation
- Study did not measure care quality; but other literature indicates no relationship between variable spending patterns and quality
 - *Chen et al, 2014*

Evaluating Obstetrical Residency Programs Using Patient Outcomes

David A. Asch, MD, MBA

Sean Nicholson, PhD

Sindhu Srinivas, MD, MSCE

Jeph Herrin, PhD

Andrew J. Epstein, PhD, MPP

MANY PHYSICIANS AND NON-physicians likely assume that some residency programs tend to produce better physicians than others—either because those residency programs train physicians better or because those residency programs can recruit more capable trainees. Although plausible, these intuitions have not been empirically tested. This information could be useful in at least 2 different ways.¹ First, identifying which training programs produce better physicians and separating out the effects that are due to the ability to attract better trainees might indicate what makes better programs better. Some of these factors might be exportable to other programs, raising the quality of medical education more broadly. Second, by

Context Patient outcomes have been used to assess the performance of hospitals and physicians; in contrast, residency programs have been compared based on non-clinical measures.

Objective To assess whether obstetrics and gynecology residency programs can be evaluated by the quality of care their alumni deliver.

Design, Setting, and Patients A retrospective analysis of all Florida and New York obstetrical hospital discharges between 1992 and 2007, representing 4 906 169 deliveries performed by 4124 obstetricians from 107 US residency programs.

Main Outcome Measures Nine measures of maternal complications from vaginal and cesarean births reflecting laceration, hemorrhage, and all other complications after vaginal delivery; hemorrhage, infection, and all other complications after cesarean delivery; and composites for vaginal and cesarean deliveries and for all deliveries regardless of mode.

Results Obstetricians' residency program was associated with substantial variation in maternal complication rates. Women treated by obstetricians trained in residency programs in the bottom quintile for risk-standardized major maternal complication rates had an adjusted complication rate of 13.6%, approximately one-third higher than the 10.3% adjusted rate for women treated by obstetricians from programs in the top quintile (absolute difference, 3.3%; 95% confidence interval, 2.8%-3.8%). The rankings of residency programs based on each of the 9 measures were similar. Adjustment for medical licensure examination scores did not substantially alter the program ranking.

Conclusions Obstetrics and gynecology training programs can be ranked by the maternal complication rates of their graduates' patients. These rankings are stable across individual types of complications and are not associated with residents' licensing examination scores.

Patient Outcomes by Residency Training Program

- Nine measures of maternal complications from child birth
- OB residency program was associated with substantial variation in complication rates
- Adjustment for medical licensing scores did not alter the program ranking
 - *Asch et al, 2014*

These results may also have important implications for medical educators. Stating that one residency program is good or is better than another residency program may mean many different things to different persons, but it should ultimately mean that good programs produce physicians who take care of patients well, and better programs produce physicians who take care of patients better. By that reasoning, judging medical training programs by subsequent patient outcomes places the evaluation of medical training much closer to its purpose than do evaluations based on admission selectivity, board scores, or rankings by news magazines or leaders in the field. A study by Hartz et al.

Effect of a community oriented problem based learning curriculum on quality of primary care delivered by graduates: historical cohort comparison study

Robyn Tamblyn, Michal Abrahamowicz, Dale Dauphinee, Nadyne Girard, Gillian Bartlett, Paul Grand'Maison, Carlos Brailovsky

Abstract

Objective To assess whether the transition from a traditional curriculum to a community oriented problem based learning curriculum at Sherbrooke University is associated with the expected improvements in preventive care and continuity of care without a decline in diagnosis and management of disease.

Design Historical cohort comparison study.

Setting Sherbrooke University and three traditional medical schools in Quebec, Canada.

Participants 751 doctors from four graduation cohorts (1988-91); three before the transition to community based problem based learning ($n = 600$) and one after the transition ($n = 151$).

Outcome measures Annual performance in preventive care (mammography screening rate), continuity of care, diagnosis (difference in prescribing rates for specific diseases and relief of symptoms), and management (prescribing rate for contraindicated drugs) assessed using provincial health databases for the first 4-7 years of practice.

Results After transition to a community oriented problem based learning curriculum, graduates of Sherbrooke University showed a statistically significant improvement in mammography screening rates (55 more women screened per 1000, 95% confidence interval 10.6 to 99.3) and continuity of care (3.3% more visits coordinated by the doctor, 0.9% to 5.8%) compared with graduates of a traditional medical curriculum. Indicators of diagnostic and management performance did not show the hypothesised decline. Sherbrooke graduates showed a significant fourfold increase in disease specific prescribing rates compared with prescribing for symptom relief after the transition.

learning.^{4 5-8 w2-w9} has been the subject of recent editorials and reviews.^{2 3 w1 w2} In problem based learning, fundamental changes are made in the way in which medical knowledge and skills are acquired (through problem based education rather than by discipline specific education), the method of learning professional development skills (self directed, small group), and the environment within which experience of practice is acquired (greater emphasis on community based practice compared with hospital based practice). Community oriented problem based learning was expected to better prepare graduates to provide comprehensive preventive, acute, and chronic disease care through community oriented patient centred learning. Yet concerns have been expressed that such a curriculum might reduce core competencies in medical diagnosis and treatment through gaps in relevant medical knowledge and diluted experience of acute care.^{4 8 9 w5} These concerns have been buttressed by evidence of lower licensing examination scores and suboptimal diagnostic reasoning in some studies of graduates of a problem based learning curriculum, but the effects have not been assessed in practice.^{9 w5 w6 w10 w11}

In 1987 the University of Sherbrooke in Quebec, Canada, was one of the first medical schools to undergo a reform from a traditional curriculum (system based or disciplinary based) to a problem based learning curriculum.¹⁰ We tested the hypothesis that graduates of a problem based learning curriculum would provide better continuity of care and preventive care in primary care than graduates of a traditional curriculum. We also assessed whether the Sherbrooke graduates exhibited a decline in performance in selected indicators of diagnosis and disease management.

Tamblyn et al

- Graduates from a medical school who underwent a Problem-Based curriculum were compared with prior graduates from the same school who had traditional curriculum
- Improved performance regarding preventive care, continuity of care and indicators of diagnostic and prescribing performance
- Some increases in performance were four-fold!

So, Given All of this
Information.....

What Research Question do YOU want to examine?

Ten steps to conducting health professional education research

Karen Scott¹, Patrina Caldwell² and Lambert Schuwirth³

¹Discipline of Paediatrics and Child Health, The University of Sydney, Australia

²Discipline of Paediatrics and Child Health, The University of Sydney, and Centre for Kidney Research, The Children's Hospital at Westmead, Australia

³Health Professional Education, Flinders University, Adelaide, Australia

SUMMARY

Background: The approaches used to educate future clinicians must be continually improved through evidence-based methods. Clinicians interested in conducting education research need to understand the terminology and conventions of health professional education, in the same way that health professional educators from education backgrounds need to be aware of clinical practices and scientific mores and jargon. This article provides clinicians with 10 steps to conducting health professional education research, and encourages collaboration between

clinicians interested in education and health professional educators.

Summary: The basic steps in conducting education research are introduced, beginning with literature searches, using appropriate terminology and writing conventions, and finding research collaborators. We encourage researchers to ask themselves, 'So what?' about their research idea to ensure it is interesting and relevant to a journal's readers. The nuts and bolts of educational research are then presented, including research questions and methodologies, outcome measures,

theoretical frameworks and epistemologies. The final two steps aim to foster internationally relevant and well-designed research studies.

Conclusion: Conducting and publishing education research is often difficult for clinicians, who struggle with what is required. Yet clinicians who teach are ideally placed to identify the knowledge gaps about how we can more effectively educate future clinicians. These 10 steps provide clinicians with guidance on how to conduct education research so relevant research findings can inform the education of future clinicians.

Defining Features of Scholarship (aka Template for Starting With a Problem)

Questioning

How can I improve care for this patient population?

How can I address a teaching challenge?

How can I address a challenge in the clinic?

Gathering & Exploring Evidence

What evidence do I have?

What evidence can I collect and how?

What do I do with this evidence?

Trying Out & Refining Insights

How can I make improvements based on what I'm learning?

How can I assess changes in my teaching or patient care?

Going Public

Where can I share my findings?

Steps in Research

1. Identifying a problem
2. Examining relevant variables through a literature review
3. Constructing a hypothesis
4. Creating a research design to investigate the problem
5. Gaining IRB approval
6. Collecting & analyzing data
7. Drawing conclusions about the relationships among the variables
8. Writing & publishing the results

Tuckman, 1994

Tips for Success

- **PASSION:** what part(s) of your work are you passionate about? What gives you the most satisfaction? Clarity about what you will say “yes” to....and what you won’t
- **PLANNING:** build a structured approach to doing research:
 - Schedule
 - Data Retention
 - Document Your Efforts
 - Keep Your CV up to date continually

Tips for Success

- PARTNERSHIPS:
 - Identifying mentor(s) and/or collaborators
 - Identifying those with similar interests
 - Negotiating with authority structure (for time needed)
- PUBLISHING:
 - Must identify key resources for your interests (journals, meetings, societies)
 - Do “trial runs” of presentations/posters

Tips for Success

- Develop mindset: “can I write about this?”
- Use small bits of time **SYSTEMATICALLY**
- If it helps, get out of your office
- If you identify partners, meet as a group for discussion/refinement
- Use a facilitator
- Turn off email & cell phone if possible

**What interests
you in your
own teaching
and learning
that you want
to study?**

Template is yours to
take and use!!

- And use it to plan your next study!!
- THANK YOU for your time and attention!!
- dwmusick@carilionclinic.org

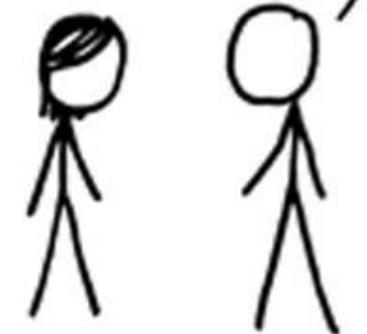
I USED TO THINK
CORRELATION IMPLIED
CAUSATION.



THEN I TOOK A
STATISTICS CLASS.
NOW I DON'T.



SOUNDS LIKE THE
CLASS HELPED.
WELL, MAYBE.



References

- Teaching Isn't Rocket Science, It's Harder. *Slate.Com.* http://www.slate.com/articles/life/education/2013/12/teaching_in_america_s_highest_need_comunities_isn_t_rocket_science_it_s.html. Accessed May 11, 2016.
- Collins J. Medical Education Research: Challenges and Opportunities. *Radiology*, 2006; 240 (3): 639-47.
- Bligh J and Parsell G. Research in Medical Education: Finding Its Place. *Medical Education*, 1999; 33: 162-63.
- Association of American Medical Colleges (2013). *Educational Scholarship Guides*. [https://www.memedportal.org/download/190392/data/educational_scholarship_guide.pdf](https://www.mededportal.org/download/190392/data/educational_scholarship_guide.pdf). Accessed May 11, 2016.
- Boyer EL. *Scholarship Reconsidered: Priorities for the Professoriate*. The Carnegie Foundation for the Advancement of Teaching (1990), Princeton, NJ.
- Glassick CE, Huber MR, Maeroff GI. *Scholarship Assessed: Evaluation of the Professoriate* (1997). Jossey-Bass Publishers, San Francisco, CA.
- Weston CB and McAlpine L. Making Explicit the Development Toward the Scholarship of Teaching. *New Directions for Teaching and Learning*, 2001; 86: 89-98.
- Traynor R and Eva KW. The Evolving Field of Medical Education Research. *Biochemistry and Molecular Biology Education*, 2010; 38 (4): 211-5.
- DeMeo SD, Nagler A, Heflin MT. Development of a Health Professions Education Research-Specific Institutional Review Board Template. *Academic Medicine* 2016; 91 (2): 229-32.
- Moore DE, Green JS, Gallis HA. Achieving Desired Results and Improved Outcomes by Integrating Planning and Assessment Throughout a Learning Activity. *Journal of Continuing Education in the Health Professions* 2009; 29 (1): 5-18.

References

- Blanchard RD. Harvest the Low-Hanging Fruit: Strategies for Submitting (and Re-Submitting) Educational Innovations for Publication. Presentation at AAMC Northeast Group on Educational Affairs Annual Meeting, Providence, RI., April 8, 2016.
- Kalet A. The State of Medical Education Research. *AMA Journal of Ethics* 2007; 9 (4): 285-9.
- Gunderman RB. A Prescription for What Ails Medical Education. *Chronicle of Higher Education* (2013). <http://chronicle.com/article/A-Prescription-for-What-Ails/143623/>. Accessed May 11, 2016.
- Gonnella JS, Callahan CA, Louis DZ, Hojat M, Erdmann JB. Medical Education and Health Services Research: The Linkage. *Medical Teacher* 2004; 26 (1): 7-11.
- Kalet AL, Gillespie CC, Schwartz MD, Holmboe ES, Ark T, et al. New Measures to Establish the Evidence Base for Medical Education: Identifying Educationally Sensitive Patient Outcomes. *Academic Medicine* 2010; 85 (5): 844-51.
- Cook DA and West CP. Reconsidering the Focus on “Outcomes Research” in Medical Education: A Cautionary Note. *Academic Medicine* 2013; 88 (2): 162-7.
- Chen C, Petterson S, Phillips R, Bazemore A, Mullan F. Spending Patterns in Region of Residency Training and Subsequent Expenditures for Care Provided by Practicing Physicians for Medicare Beneficiaries. *Journal of American Medical Association* 2014; 312 (22): 2385-93.
- Asch DA, Nicholson S, Srinivas S, Herrin J, Epstein AJ. Evaluating Obstetrical Residency Programs Using Patient Outcomes. *Journal of American Medical Association* 2009; 302 (12): 1277-83.
- Tamblyn R, Abrahamowicz M, Dauphinee D, et al. Effect of a Community Oriented Problem Based Learning Curriculum on Quality of Primary Care Delivered by Graduates: Historical Cohort Comparison Study. *BMJ* October 2015: 1-7.
- Scott K, Caldwell P, Schuwirth L. Ten Steps to Conducting Health Professional Education Research. *The Clinical Teacher* 2015; 12: 272-6.
- Tuckman BW. *Conducting Educational Research*, Fourth Edition (1994). Harcourt Brace Publishing, Orlando, FL.