Strategies for Success: Getting Your Education Scholarship Published

Nicole Deiorio, MD & Lainie Yarris, MD, MCR
Faculty Development in Clinical Teaching
2/20/13
Format

- Large group overview: study designs with examples
- Large group Q&A
- Small group coaching sessions
- Large group wrap-up
- Handout as resource
We have no conflicts of interest to report
Education research barriers:
- Limitations of applying the researcher “model” to educators
- Logistical challenges of studying learners
- Ethical challenges
- Limited training, networks, mentors
General Approach

- Select research question
- Develop conceptual framework
- Select outcomes
- Select appropriate design
- Select well-matched forum for publication
Generating a Research Question

- Start with a research *problem*
  - Current issues, controversies, concerns

- Sources
  - Experience
  - Literature
  - Theories
  - External sources
Generating a Research Question

- Feasible
- Interesting
- Novel
- Ethical
- Relevant

Research

Policy
Develop a conceptual framework

- A theory, model, or approach for how things work
- Helps establish the question’s importance
- Allows others to build on and adopt findings
- Helps you select outcomes and interpret results
Selecting Outcomes: **Meaningful, congruent with rationale & objectives**

Behaviors, Performance
Skills, Attitudes
Knowledge
Satisfaction, Confidence
Selecting a Study Design

- Systematic Review
- Instrument Development
- Curriculum Development
- Qualitative
- Quantitative (Descriptive)
- Quantitative (Analytic)
Selecting a Study Design

- Curriculum Development
- Qualitative
- Quantitative (Descriptive)
- Quantitative (Analytic)
Create the curriculum with publication in mind

IRB approval
Employ established method
What can be published?

Needs Assessments (new data, systematic review)
Description of Educational Intervention (novel)
Evaluation of Educational Intervention (RCT)
Outcome assessment
General Tips for Curriculum Publication

- Increase reproducibility:
  - Submit all tools, instruments
  - Report time, cost

- Increase generalizability:
  - Multiple sites

- Peer review & revise

- If outcome-based, broader pool of target journals
Brief curriculum to teach residents study design and biostatistics

Donna M Windish

Abstract
Physicians have minimal understanding of common statistical tests and limited ability to interpret study results. These deficits may lead to incorrect study interpretation with erroneous application of results in clinical practice. This study describes the content and a preliminary evaluation of a curriculum aimed at providing resident physicians-in-training with the tools necessary to effectively interpret common study designs and statistics.

The four-session curriculum included readings, journal articles, seminars and presentations by learners. The curriculum covered exploratory data analysis, confirmatory data analysis and study designs. 52 internal medicine residents from one residency programme completed the course. Residents took a 20-item multiple-choice knowledge test after the course and results were compared with historical controls; residents in the same programme 1-year prior to the study had higher knowledge test scores. The curriculum was designed using a six-step approach for teaching study design and biostatistics.

Methods
The curriculum was designed using a six-step approach:
Done Well

- Followed Kern’s Six-Step model
  - Needs assessment
  - Details of curriculum reported
  - Analyzed meaningful outcomes
How Could They Improve?
How Could They Improve?

- Expand to multiple sites
- Test retention beyond 2 weeks
- Complete the feedback loop and restudy
Development and Evaluation of a Simulation-Based Pediatric Emergency Medicine Curriculum

Mark D. Adler, MD, John A. Vozenilek, MD, Jennifer L. Trainor, MD, Walter J. Eppich, MD, Ernest E. Wang, MD, Jennifer L. Beaumont, Pamela R. Aitchison, Timothy Erickson, MD, Marcia Edison, PhD, and William C. McGaghie, PhD
Abstract

**Purpose**
The infrequency of severe childhood illness limits opportunities for emergency medicine (EM) providers to learn from real-world experience. Simulation offers an evidence-based educational approach to develop and practice clinical skills.

**Method**
This was a two-phase, randomized trial with a wait-list control condition. The development phase (2005–2006) involved systematic curriculum and rating checklist creation, producing a six-case, simulation-based curriculum linked to three evaluation cases.

In the validation phase (2006–2007), the authors randomized 69 residents from two EM residencies to either an intervention group that received the curriculum one month before the first assessment of all participants or a wait-list control group that received the identical curriculum three months later. A final assessment of all residents followed one month after that. Two raters evaluated all residents. Primary outcome measures are percentages of items completed correctly. The authors assessed rater agreement using intraclass correlation (ICC) and compared group performance using mixed-model analysis of variance.

**Results**
ICCs surpassed 0.78. The instructional intervention produced a statistically significant effect for two of three evaluation cases for the validation phase.
Done Well

- First phase: systematically developed curriculum
  - Multiple reassessments
  - Multiple programs

- Second phase: analytic testing of outcomes

- Included a CONSORT flow diagram
Figure 1 CONSORT participant flow diagram.
Online publication...

- On-line, peer-reviewed options:
  - MedEdPortal (AAMC)
  - MERLOT

Every paper has a home!
Selecting a Study Design

- Curriculum Development
- Qualitative
- Quantitative (Descriptive)
- Quantitative (Analytic)
<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positivism</td>
<td>Phenomenology</td>
</tr>
<tr>
<td>Describe/Explain Relationship</td>
<td>Explore/Understand a phenomenon</td>
</tr>
<tr>
<td>Theory–testing</td>
<td>Theory–building</td>
</tr>
<tr>
<td>Deductive Reasoning</td>
<td>Inductive Reasoning</td>
</tr>
</tbody>
</table>
Example: you want to better understand why female residents choose community jobs over an academic career when they graduate

A multiple-choice survey could miss reasons you hadn’t considered
Learning in a Chaotic Environment
Done Well

- Followed specific qualitative research steps
  - Transcribed
  - Analyzed for themes
- May consider involving a non-physician qualitative researcher
Selecting a Study Design

- Curriculum Development
- Qualitative
- Quantitative (Descriptive)
- Quantitative (Analytic)
RCT

COHORT

CASE–CONTROL

CROSS–SECTIONAL, CASE, CORRELATIONAL
RCT
COHORT
CASE–CONTROL
CROSS–SECTIONAL, CASE, CORRELATIONAL

ANALYTIC

DESCRIPTIVE
Surveys: 4 sources of error

- Coverage Error
- Sampling Error
- Measurement Error
- Nonresponse Error
Surveys: Social Exchange

Dillman, D. The Tailored Design Method of Survey Administration.
General Tips for Descriptive Research

- Use multiple sites
- For survey research:
  - Optimize instrument
    - Read about survey design
    - Pilot
  - 70% response rate ideal
Pediatric Emergency Medicine Fellowship Research Curriculum

A Survey of Fellowship Directors

M. Olivia Titus, MD, Joseph D. Losek, MD, and Timothy G. Givens, MD
Done Well

- Instrument not previously validated, but piloted
- Described how participants identified
- Follow up mailings—67% response
- Plan for avoiding multiple responses from same institutions
Another type of descriptive study...

- Consensus proceedings
Example

Original communications

Patient safety curriculum for surgical residency programs: Results of a national consensus conference

Ajit K. Sachdeva, MD, FRCSC, FACS,a Ingrid Philibert, MBA, MHA,b David C. Leach, MD,b
Patrice Gabler Blair, MPH,a Linda K. Stewart, BS,a Ilan S. Rubinfeld, MD,c and
L.D. Britt, MD, MPH, FACS,b Chicago, Ill, Detroit, Mich, and Norfolk, Va

Background. The American College of Surgeons (ACS) and the Accreditation Council for Graduate Medical Education (ACGME) are committed to promoting patient safety through education. In view of the critical role of residents in the delivery of safe patient care, the ACS and ACGME sponsored jointly a national consensus conference to initiate the development of a curriculum on patient safety that may be used across all surgical residency programs.

Conclusions. National leaders in surgery with expertise in surgical care and surgical education, patient safety experts, medical educators, key stakeholders from national organizations, and surgical residents were invited to participate in the conference. Attendees considered patient safety issues within the context of the 6 core competencies defined by the ACGME and American Board of Medical Specialties (ABMS). Discussions resulted in the development of a curriculum matrix that includes listings of patient safety topics, teaching and learning strategies, and assessment methods. Guidelines for implementation and dissemination are also provided. The curriculum content underscores the need to create an organizational culture of safety and focuses on both individuals and systems. Individual residency programs may prioritize the curriculum content based on their specific needs. The ACS and ACGME will pursue development of educational modules to address the curriculum content, disseminate helpful information, and assist in implementation of new educational interventions. This effort has the potential to positively impact residency education in surgery, help surgical program directors address the core competencies, and enhance patient safety. (Surgery 2007;141:427-41.)

From the American College of Surgeonsa and the Accreditation Council for Graduate Medical Educationb Chicago, Ill, the Henry Ford Health Systemc Detroit, Mich, and Eastern Virginia Medical Schoold Norfolk
Done well

- Included and described broad variety of stakeholders
- Described how consensus achieved, detailed “methods”
Analytic Studies

- Case Control
- Cohort Studies
- Randomized Controlled Trials

True experiment (new vs. standard)

+Establish causality, “truth”, confounders

- Expensive, hard to randomize educational intervention
Cohort

+ monitor multiple exp./outcomes
- expensive, LTF

Exposure → Outcome

No Exposure → Outcome

Case Control:

+ more efficient than cohort
- limited to one outcome, systemic bias

Exposure ← Outcome
Using SNAPPS to Facilitate the Expression of Clinical Reasoning and Uncertainties: A Randomized Comparison Group Trial
Wolpaw, Terry MD, MHPE; Papp, Klara K. PhD; Bordage, Georges MD, PhD. Academic Medicine 2009
Done Well

- Multi-center
- 3 groups
- Structured analysis of taped interactions
- Meaningful outcomes: real presentations
General Tips for Analytic Studies

- Have a hypothesis
- Perform sample size calculation
- Check CONSORT criteria
- Collaborate
CONSORT CRITERIA

CONSORT 2010 checklist of information to include when reporting a randomised trial*

<table>
<thead>
<tr>
<th>Section/Topic</th>
<th>Item No</th>
<th>Checklist item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and abstract</td>
<td>1a</td>
<td>Identification as a randomised trial in the title</td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)</td>
</tr>
<tr>
<td>Introduction</td>
<td>2a</td>
<td>Scientific background and explanation of rationale</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>Specific objectives or hypotheses</td>
</tr>
<tr>
<td>Background and objectives</td>
<td>3a</td>
<td>Description of trial design (such as parallel, factorial) including allocation ratio</td>
</tr>
<tr>
<td>Methods</td>
<td>3b</td>
<td>Important changes to methods after trial commencement (such as eligibility criteria), with reasons</td>
</tr>
<tr>
<td>Trial design</td>
<td>4a</td>
<td>Eligibility criteria for participants</td>
</tr>
<tr>
<td></td>
<td>4b</td>
<td>Settings and locations where the data were collected</td>
</tr>
<tr>
<td>Participants</td>
<td>5</td>
<td>The interventions for each group with sufficient details to allow replication, including how and when they were actually administered</td>
</tr>
<tr>
<td>Interventions</td>
<td>6a</td>
<td>Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed</td>
</tr>
<tr>
<td>Outcomes</td>
<td>6b</td>
<td>Any changes to trial outcomes after the trial commenced, with reasons</td>
</tr>
<tr>
<td></td>
<td>7a</td>
<td>How sample size was determined</td>
</tr>
<tr>
<td>Sample size</td>
<td>7b</td>
<td>When applicable, explanation of any interim analyses and stopping guidelines</td>
</tr>
<tr>
<td>Randomisation:</td>
<td>8a</td>
<td>Method used to generate the random allocation sequence</td>
</tr>
<tr>
<td>Sequence</td>
<td>8b</td>
<td>Type of randomisation; details of any restriction (such as blocking and block size)</td>
</tr>
<tr>
<td>generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allocation</td>
<td>9</td>
<td>Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned</td>
</tr>
<tr>
<td>concealment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mechanism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>10</td>
<td>Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions</td>
</tr>
<tr>
<td>Blinding</td>
<td>11a</td>
<td>If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes)</td>
</tr>
</tbody>
</table>
COLLABORATE

- Your departmental general research group
- Brown bag for education research within your department
- GME at OHSU
- Education groups within your national specialty societies
- National education research interest group
General Recommendations for Publication Success

- Contact target journals ahead of time
- Begin writing the paper early
- Follow Instructions for Authors
  - Format correctly, citation style
Manuscript Preparation

- Make sure your hypothesis matches the study design and results
- Limit your Introduction—it’s not a literature review
- Results:
  - Report percentages AND numerator/denominator
  - Results must be reported in the Results section to be fair game for the Discussion section
Manuscript Preparation

- Consider tables and figures to efficiently report results, but...
- Don’t duplicate what is in the body of the paper
- Spend the most effort on the Discussion section
- Only conclude what you can from the study
Final Advice

- Check the handout!
  - Project checklist
  - Action plan template
  - Writing guide
  - Useful resources
Questions
Small Group Facilitators

- Anna Marie Chang, MD, MSCE
- Nicole Deiorio, MD
- Amy Miller Juve, EdD
- Ben Sun, MD
- Lainie Yarris, MD, MCR
Potential Table Topics

- Assessment of curricula and teaching
- Learner assessment
- Program evaluation

- Qualitative methods
- Survey design
- Technology-based education
Assessing Clinical Reasoning in Pediatric Emergency Medicine: Validity Evidence for a Script Concordance Test

Benoit Carrière, MD, MHPE
Robert Gagnon, MSC
Bernard Charlin, MD, PhD
Steven Downing, PhD
Georges Bordage, MD, PhD

From the Section of Pediatric Emergency Medicine, Department of Pediatrics, Centre Hospitalier Universitaire Sainte-Justine, Montréal, Quebec, Canada (Carrière); the Office of Medical Education, Université de Montréal, Montréal, Quebec, Canada (Gagnon, Charlin); and the Department of Medical Education, University of Illinois at Chicago, Chicago, IL (Downing, Bordage).
Study objective: Clinical reasoning is a crucial skill for all residents to acquire during their training. During most patient encounters in pediatric emergency medicine, physicians and trainees are challenged by diagnostic, investigative, and treatment uncertainties. The Script Concordance Test may provide a means to assess reasoning skills in the context of uncertainty in the practice of pediatric emergency medicine. We gathered validity evidence for the use of a pediatric emergency medicine Script Concordance Test to evaluate residents’ reasoning skills.

Methods: A 1-hour test containing 60 questions nested in 38 cases was administered to 53 residents at the end of their pediatric emergency medicine rotation at 1 academic institution. Twelve experienced pediatricians were part of a reference panel to establish the basis for the scoring process.
Done Well

- Multiple specialties represented
- Test item discrimination performed
- Addressed threats to validity
Descriptive Studies

- **Case Series, Case Reports**
  + Quick, interesting, tip of iceberg
  - No comparison, rare

- **Correlational Studies (Ecologic)**
  + Quick, cheap, generate hypotheses
  - Need dataset, no individual data

- **Cross-sectional Studies**
  + Quick, cheap, generate hypotheses, OR
  - no causality, selection issues