Reform and Competency-based Medicine Education: Changing Forces and Realities

Eric S. Holmboe
Disclosures

- Employed by the American Board of Internal Medicine
- I receive royalties from Mosby-Elsevier for a textbook on assessment
- I am a member of the board of NBME and Medbiquitous
- I serve on committees at the AAMC, ABMS, ACGME and NBME
Outline

- Historical and current forces in medicine and education
- External forces driving change
- Reform and implications of CBME
- Moving forward
The “Big Assumption as Truth”

- We operate on many assumptions that over time become “truth” without our testing or questioning the veracity of those assumptions
  - Test assumptions as assumptions

- Immunity to change
  - Preservation of status quo through fear
  - More comfortable to stay with familiar even when status quo isn’t effective

Kegan and Lahey. *The Way We Talk Can Change the Way We Work; Immunity to Change.*
Medical Education Architecture

The “Miracle” of Medical Education

“I Think You Should Be More Explicit Here In Step Two.”
Nostalgialitis Imperfecta

- Syndrome characterized by the following signs and symptoms:
  - “When I was an intern…<insert superlative>”
  - “Medicine was so much better 25 years ago”
    - Reality: Not really…
  - “Younger physicians today are less professional, skilled, etc. because of <insert favorite complaint>”

[Images of television shows]
“Evidently it is not deemed necessary to assay students’ and residents’ clinical performance once they have entered the clinical years. Nor do clinical instructors more than occasionally show how they themselves elicit and check the reliability of the clinical data…”
Faculty and Clinical Skills

To a degree that is often at variance with their own professed scientific standards, attending staff all too often accept and use as the basis for discussion, if not recommendations, findings reported by students and residents without ever evaluating the reporter’s mastery of the clinical methods utilized or the reliability of the data obtained.”
Faculty and Clinical Skills

From George Engel

1976 editorial on JAMA paper highlighting deficiencies in student and resident basic clinical skills
Harvard Medical Practice Study

- **Methods:**
  - Investigated prevalence of adverse events due to medical management
  - Review of 30,121 medical records from 51 randomly selected acute care hospitals

- **Results:**
  - Adverse events occurred in 3.7% of hospitalizations
    - 27.6% due to medical negligence
    - 13.6% resulted in death
Harvard Medical Practice Study

- Study conducted in 1984 in the state of New York
  - My senior year (1984-85) as a medical student at the University of Rochester
Autonomy

- Professional autonomy has traditionally meant the individual has substantial control over their professional practice and judgment.

- Two key aspects\(^1\):
  - Capacity for self-governance
  - Non-interference with the professional’s control over their lives and actions.

\(^1\)MacDonald C. Nurse autonomy as relational. Nursing Ethics. 2002; 9: 194-201
Culture in the United States

American culture developmentally still in adolescent phase

- Strong streaks of independence
- Rebellious
- Optimistic (usually)
- Power of dreams
Codes for Health and Medicine

- Health and wellness = *Movement*
- Doctors = *Hero*
  - Remember the GE commercial during the Winter Olympics in Vancouver?
- Nurses = *Mother*
- Hospitals = *Processing Plant*

Physicians: *Knights, Knaves or Pawns?*\(^1\)

Julian LeGrand (British Sociologist)

- **Knights (virtue)**
  - "Trusted to wisely use and deploy resources, minimize waste, and look beyond their narrow individual and specialty interests to protect the system as a whole. Individual physician decision-making and autonomy are preserved as the highest-end. It is the physician who is the ultimate champion of the patient and policies are structured to support the physician’s work."

\(^1\)Jain S and Cassel CK. Physicians: Knights, Knaves, or Pawns? JAMA. 2010.
Physicians: *Knights, Knaves or Pawns?*¹

- **Knaves (rigid self-interest)**
  - “*Fraud, abuse, and waste are the behaviors that come most naturally to the knave—and it the role of society to monitor for these behaviors and impose stiff personal and financial penalties to deter them.*”

- **Pawns (passive victims)**
  - “The pawn physician is merely a function of the environment and incentives he or she is given; accordingly, physicians must be given guidelines to follow and policymakers and regulators must decide clinical priorities.”

Our Reality and External Forces
AHRQ Report 2010

- **Quality is improving slowly**
  - Across all 179 measures of health care quality tracked in the reports, almost two-thirds showed improvement. However, median rate of change was only 2.3% per year, with the median rate of change in outcomes was only 1.6% per year.

- **Disparities remain persistent**
  - Fewer than 20% of disparities faced by Blacks, American Indians and Alaska Natives, Hispanics, and poor people showed evidence of narrowing.
### Exhibit ES-1. Overall Ranking

<table>
<thead>
<tr>
<th>Country Rankings</th>
<th>AUS</th>
<th>CAN</th>
<th>GER</th>
<th>NETH</th>
<th>NZ</th>
<th>UK</th>
<th>US</th>
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</thead>
<tbody>
<tr>
<td>Overall Ranking (2010)</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>7</td>
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<tr>
<td>Quality Care</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Effective Care</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Safe Care</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Coordinated Care</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Patient-Centered Care</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>4</td>
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<tr>
<td>Access</td>
<td>6.5</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>6.5</td>
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<tr>
<td>Cost-Related Problem</td>
<td>6</td>
<td>3.5</td>
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<td>2</td>
<td>5</td>
<td>1</td>
<td>7</td>
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<tr>
<td>Timeliness of Care</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Efficiency</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>7</td>
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<td>Equity</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Long, Healthy, Productive Lives</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Health Expenditures/Capita, 2007</td>
<td>$3,357</td>
<td>$3,895</td>
<td>$3,588</td>
<td>$3,837*</td>
<td>$2,454</td>
<td>$2,992</td>
<td>$7,290</td>
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</tbody>
</table>

Note: * Estimate. Expenditures shown in $US PPP (purchasing power parity).
Exhibit 1. International Comparison of Spending on Health, 1980–2007

Average spending on health per capita ($US PPP)

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<tbody>
<tr>
<td>United States</td>
<td>$7,290</td>
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<tr>
<td>Canada</td>
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<td>$2,454</td>
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<tr>
<td>Netherlands</td>
<td></td>
<td></td>
<td>$16%</td>
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<tr>
<td>Germany</td>
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<td></td>
<td></td>
<td>$8%</td>
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<tr>
<td>Australia</td>
<td></td>
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<tr>
<td>United Kingdom</td>
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<tr>
<td>New Zealand</td>
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</tbody>
</table>

Total expenditures on health as percent of GDP

Note: $US PPP = purchasing power parity.
Figure 6. Life Expectancy at Birth over Time, 1980–2006

Source: OECD 2008 Health Data (June 2008).
Mortality Amenable to Health Care by State
Deaths* per 100,000 Population

Quartile (range)
- Top (63.9–76.8) Best: MN
- Second (77.2–89.9)
- Third (90.7–107.5)
- Bottom (108.0–158.3) Worst: DC

* Age-standardized deaths before age 75 from select causes; includes ischemic heart disease.
** Excludes District of Columbia.
DATA: Analysis of 2001–02 and 2004–05 CDC Multiple Cause-of-Death data files using Nolte and McKee methodology, BMJ 2003
SOURCE: Commonwealth Fund State Scorecard on Health System Performance, 2009
What’s New: Substantial External Pressure

- Institute of Medicine (2008)
  - Resident Duty Hours: Enhancing Sleep, Supervision, and Safety
  - Retooling for an Aging America

- MedPAC
  - June 2009 Report
  - October 2009 Hearing
  - June 2010 Report

- Congress (2011)
  - Reductions in GME funding
Recommendation: To increase patient safety and enhance education for residents, the ACGME should ensure that programs provide adequate, direct, onsite supervision for residents.
Traditional Approach to Supervision

- Execution of trainee clinical decisions and actions and subsequent review by faculty separated by variable time and space
  - The late night phone call with subsequent visit by the attending hours later during morning rounds (time and space)
  - Precepting in clinic without seeing the patient (space)
Underlying Beliefs and Assumptions

- Physician autonomy
- Graduated independence
  - Trainees have to make and execute decisions on their own, without interference, in order to “learn” (including mistakes)
- Supervision = “taking over” for the trainee; interference; dependence.
Problems with Traditional View

- Faculty inaccuracy in knowing trainee’s ability in key clinical skills
  - Multiple studies highlighting deficits
- Discordance between trainee and faculty judgment
  - Implications for patient care and safety
- Delayed feedback and learning
Effective Supervision

AMEE Guide (Kilminister; *Med Teach*, 2007)

- Empirical evidence supports:
  - Direct supervision helps trainees gain skills faster, and behavior changes more quickly
  - Quality of relationship affects effectiveness of supervision
    - Continuity and reflection
  - Self supervision not effective
  - Better supervision associated with improved patient safety and quality of care.
MedPAC Report: June 2009

- **Rationale:** CMS and Public not getting appropriate ROI on 9+ billion dollar investment

- **Findings:** residencies fall far short in
  - Outpatient care coordination
  - Multi-disciplinary teamwork
  - Awareness of health cost
  - Comprehensive health IT
  - Pt care in non-hospital setting

- **Plans:** MedPAC to explore how changes to current GME payment policies can be leveraged to accelerate change
MedPAC Chair:

- “The system is on the wrong track and is not self-correcting – to me that cries out for a policy intervention”.

Potential focus of 2010 report

- Fund teaching program demonstration projects
- Shift portion of IME from hospital to program
- Provide greater support to other federal programs to address pipeline issues
The Congress should authorize the Secretary to change Medicare’s funding of graduate medical education (GME) to support the workforce skills needed in a delivery system that reduces cost growth while maintaining or improving quality.

The indirect medical education (IME) payments above the empirically justified amount should be removed from the IME adjustment and that sum would be used to fund the new performance-based GME program.
Educating Physicians: The “2010 Flexner Report”

Cooke, Irby and O’Brien
“Can medical education’s illustrious past serve as an adequate guide to a future of excellence? Flexner asserted that scientific inquiry and discovery, not past traditions and practices, should point the way to the future in both medicine and medical education…”

“…Medical training is inflexible, excessively long, and not learner-centered. We found that clinical education is overly focused on inpatient clinical experience, supervised by clinical faculty who have less and less time to teach and who have ceded much of their teaching responsibilities to residents, and situated in hospitals with marginal capacity to support their teaching mission.”
Recommendations

- Standardize learning *outcomes* through assessment of competencies
- Individualize learning *process* within and across levels
- Incorporate interprofessional education and teamwork into curriculum
- Prepare learners to attain both routine and adaptive forms of expertise
Recommendations

- Engage learners in initiatives focused on population health, quality improvement and patient safety
- Locate clinical education in settings where quality patient care is delivered, not just in university teaching hospitals
- Address the underlying messages expressed in the hidden curriculum
Francisco Varela (1946-2001)

“The blind spot of contemporary science (and education) is experience”

– How can we hold the paradox of learning from past experience and the need to let go?
Competency-based Medical Education
World Health Organization (1978):

“The intended output of a competency-based programme is a health professional who can practise medicine at a defined level of proficiency, in accord with local conditions, to meet local needs.”

Traditional versus CBME: Start with System Needs

Frenk J. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Lancet. 2010
Competency-Based Medical Education

...is an outcomes-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies¹

Mandates of Outcomes-based Training

- Programs must be able to demonstrate that students, residents and fellows graduate with high levels of knowledge, skills and attitudes.
  - Must also be able to determine with high degree of accuracy that trainee is ready to advance
  - Exposure and dwell time are not sufficient proxies for competence
  - Not shooting for “the floor” of competence
<table>
<thead>
<tr>
<th>Variable</th>
<th>Structure/Process</th>
<th>Educational Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving force: curriculum</td>
<td>Content-knowledge acquisition</td>
<td>Competency-based</td>
</tr>
<tr>
<td>Driving force: process</td>
<td>Teacher</td>
<td>Outcome-knowledge application</td>
</tr>
<tr>
<td>Path of learning</td>
<td>Hierarchical (Teacher→student)</td>
<td>Non-hierarchical (Teacher↔student)</td>
</tr>
<tr>
<td>Responsibility: content</td>
<td>Teacher</td>
<td>Student and Teacher</td>
</tr>
<tr>
<td>Goal of educ. encounter</td>
<td>Knowledge acquisition</td>
<td>Knowledge application</td>
</tr>
<tr>
<td>Typical assessment tool</td>
<td>Single subject measure</td>
<td>Multiple objective measures</td>
</tr>
<tr>
<td>Assessment tool</td>
<td>Proxy</td>
<td>Authentic (mimics real tasks of profession)</td>
</tr>
<tr>
<td>Setting for evaluation</td>
<td>Removed (gestalt)</td>
<td>Direct observation</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Norm-referenced</td>
<td>Criterion-referenced</td>
</tr>
<tr>
<td>Timing of assessment</td>
<td>Emphasis on summative</td>
<td>Emphasis on formative</td>
</tr>
<tr>
<td>Program completion</td>
<td>Fixed time</td>
<td>Variable time</td>
</tr>
</tbody>
</table>

*Carraccio, et al. 2002.*
State of Clinical Skills

Vukanovic-Criley (2006)

- Study of cardiac examination skills
  - Computer-based, 50 question exam
    - Integrated visual and auditory skills
  - Med students (Y1-4), FP and IM residents, full time faculty, volunteer faculty, cardiac fellows (N=860)

- Results
  - No improvement after MS3 year except cardiac fellows
    - Range of mean scores:
      - 58.5% (MS3) – 60.2% (Faculty)
      - Cardiac fellows: 71.75%
## Faculty Clinical Skills - OSCE (N=44)

<table>
<thead>
<tr>
<th>Competency</th>
<th>Mean (SD)</th>
<th>Range</th>
<th>Generalizability</th>
</tr>
</thead>
<tbody>
<tr>
<td>History Taking</td>
<td>65.5% (9.6%)</td>
<td>34% - 79%</td>
<td>0.80</td>
</tr>
<tr>
<td>Physical Exam</td>
<td>78.9% (13.6%)</td>
<td>36% - 100%</td>
<td>0.52</td>
</tr>
<tr>
<td>Counseling</td>
<td>77.1% (7.8%)</td>
<td>60% - 93%</td>
<td>0.33</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td>5.62 (0.48)</td>
<td>4.43 – 6.63</td>
<td>0.60</td>
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</tbody>
</table>

¹On 7-point scale

Deliberate Practice

Ericsson & Lehmann, 1996:

- “Individualized training activities especially designed by a coach or teacher to improve specific aspects of an individual's performance through repetition and successive refinement.

  – To receive maximal benefit from feedback, individuals have to monitor their training with full concentration, which is effortful and limits the duration of daily training.”
Deliberate Practice and Expertise

The Challenge of Deliberate Practice

Task difficulty

Optimal

Self-monitoring
Problem solving

Too easy

Too difficult

4-5 Hour Limit of full concentration

From Anders Ericsson: Used by Permission
Design and Sequencing of Training Activities

* Monitor students’ development
* Design and select training tasks for individual students

Expert performance

Performance

Amount of Deliberate practice

Deliberate practice

Gradual improvement in some specific aspect

Professional teachers and coaches

From Anders Ericsson: Used by Permission
The Impact and Experience of Frequent Transitions

- Qualitative design; 12 focus groups with residents, faculty, nurses, and mixed group.
  - 3 sites purposefully chosen
  - N=97 participants
  - Grounded theory

- Goals to better understand:
  - How trainees transition between systems,
  - Barriers and facilitators to transitions,
  - Strategies trainees use to transition, and
  - The impact of transitions on patients.

Impact of Transitions on Patient Care

- Some examples of positives (e.g. ‘fresh eyes theory’).
- Mostly negative implications:
  - “putting patients last”,
  - Inefficient, burdensome, redundant care,
  - Faulty communication processes, often due to complicated rotation schedule (e.g. paging trainees no longer in hospital),
  - Delayed or omitted treatment or interventions.
Faculty Involvement

- Participants, including the faculty themselves, described an extremely low level of involvement in supporting residents through transitions.

- **1 to 4 different** attendings per 4 week block common

- Many faculty disclosed that they didn’t explicitly teach goals and expectations
  - “it is much more time-efficient to tell [residents] what you want them to do than it is to ask them what they think is going on”

- Faculty acknowledged they often hold residents to “standards that may not exist”
# QoL, Burnout, Debt and Competence

<table>
<thead>
<tr>
<th></th>
<th>High emotional exhaustion</th>
<th>High depersonalization</th>
<th>High in either domain</th>
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</thead>
<tbody>
<tr>
<td>% with Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGY-1</td>
<td>52%</td>
<td>27%</td>
<td>55%</td>
</tr>
<tr>
<td>PGY-2</td>
<td>46%</td>
<td>30%</td>
<td>52%</td>
</tr>
<tr>
<td>PGY-3</td>
<td>41%</td>
<td>30%</td>
<td>49%</td>
</tr>
<tr>
<td>Δ IM-ITE score (Top-bottom of scale)</td>
<td>- 4.2% (Absolute % correct)</td>
<td>+1.2 (Absolute % correct)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Δ IM-ITE score for QoL = -2.7%; Δ IM-ITE score for work-life balance = -2.2%; Δ IM-ITE score for debt = -5.0%

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1West CP, Shanafelt TD, Kolars JC. Quality of life, burnout, educational debt, and medical knowledge among internal medicine residents. JAMA. 2011; 306: 952-60
Medical Education “Architecture”

Is this still the best educational model?
“Every system is perfectly designed to achieve the results it generates.”

Paul Batalden
“If you want to make enemies, try to change something.”

Woodrow Wilson
Change and the Grief Reaction

- Denial
  - "Unfunded mandate"
  - "I can’t and we shouldn’t"

- Anger
  - "We need better tools"
  - "Evolution, not transformation"

- Bargaining

- Depression
  - "I need help to do this"

- Acceptance
  - "I can do this – it is an opportunity"
Leadership is Dangerous

“People do not resist change per se. People resist loss. You appear dangerous to people when you question their values, beliefs or values of a lifetime. You place yourself on the line when you tell people what they need to hear rather than what they want to hear. Although you may see with clarity and passion a promising future of promise and gain, people will see with equal passion the losses you are asking them to sustain.”

Moving Forward

“If we pull this off, we’ll eat like kings.”

UPMC
Questions