From Student to Specialist: The Value of Competency-based Education and Training Across the Continuum
With your immediate neighbors, discuss what competency-based education and training means to you?
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 competencies

- the unit of progression is *mastery* of specific knowledge, skills and attitudes

So What are the Outcomes and Who Determines Them?

The Profession?
The Public?
Policy Makers?
Traditional versus Competency-based: Start with System Needs

U.S. Institute of Medicine Competency Framework

Overlap of Core Competencies for Health Professionals

IOM, 2003
Implications of CBME

- Curriculum and assessment follows from the competencies and outcomes, not vice versa
- Requires:
  - Definition of milestones of competency
    - What does competency look like?
  - Robust assessment methods, tools & systems
<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</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.*
Competency Frameworks: The Need for a Shared Understanding
Frameworks

- Webster’s New Collegiate Dictionary:
  - A skeletal or structural frame
  - A basic structure (as of ideas)
  - Frame of reference
CanMEDS Framework
Eight Domains of Good Professional Practice

- Patient Safety and Quality of Patient Care
  - Relating to Patients
  - Communication and Interpersonal Skills
  - Collaboration and Teamwork
  - Management (including self)
  - Scholarship
  - Professionalism
  - Clinical Skills
Assessment Across the Continuum: Challenges and Principles
Nostalgialitis Imperfecta

- Syndrome characterized by the following signs and symptoms:
  - “When I was an student…<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>”
Current Model of Training and Practice
Change in Performance Over Time

Lower Performance All Outcomes

Experience ≠ Expertise
“Experienced Non-experts”
Dreyfus Developmental Model

- **Novice** – Don’t know what they don’t know
- **Advanced Beginner** – Know what they don’t know
- **Competent** – Able to perform the tasks and roles of the discipline – restricted breath and depth
- **Proficient** – Consistent and efficient in performance of the tasks and roles of the discipline - know what they know and don’t know
- **Expert** – In depth knowledge concerning the discipline – often rule based – know what they know
- **Master** – Expert who relishes the unknown, or the situation that breaks the rules – who the experts go to for help – don’t know what they know

1 as presented by Leach, D., modified by Nasca, T.J. American Board of Internal Medicine Summer Retreat, August, 1999
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".
Design and Sequencing of Training Activities

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

Professional teachers and coaches

From Anders Ericsson: Used by Permission
Assessment Strategies in Undergraduate and Postgraduate Training
Milestones Definition

- A significant point in development
  *Merriam-Webster*

- A scheduled event signifying the completion of a major deliverable or a set of related deliverables.

  *mariosalaexandrou.com*
Milestones and Trajectories

- Milestones should enable the trainee, program and the regulatory bodies to know an individuals trajectory of competency acquisition.

- The focus is *developmental*
## Patient Care

### ACGME Competency

#### Clinical skills and reasoning

- Manages patients using clinical skills of interviewing and physical examination

#### Sub-competency

<table>
<thead>
<tr>
<th>Developmental Milestones Informing ACGME Competencies</th>
<th>Approximate Time Frame Trainee to Achieve Stage</th>
<th>Assessment Methods/Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Historical Data Gathering</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Acquire accurate and relevant history from the patient in an efficiently customized, prioritized, and hypothesis driven fashion</td>
<td>6 months</td>
<td>Standardized patient Direct Observation Simulation</td>
</tr>
<tr>
<td>2. Seek and obtain appropriate, verified, and prioritized data from secondary sources (e.g. family, records, pharmacy)</td>
<td>9 months</td>
<td></td>
</tr>
<tr>
<td>3. Obtain relevant historical subtleties that inform and prioritize both differential diagnoses and diagnostic plans, including sensitive, complicated, and detailed information that may not often be volunteered by the patient</td>
<td>18 months</td>
<td></td>
</tr>
</tbody>
</table>
Milestones Benefits

- Provide the learner with a clear path of progression. There are no surprises.
- Allow for rich formative feedback. Learners know where they are and where they need to go.
- Define specific behaviors that can focus assessment.
Milestones Challenge

- Synthesizing milestones into larger global representations of competency that reflect those activities that define the profession.
- These activities have been described as entrustable professional activities or EPAs.
Entrustable Professional Activities

- EPAs represent the routine professional-life activities of physicians based on their specialty and subspecialty.

- The concept of “entrustable” means:
  - “a practitioner has demonstrated the necessary knowledge, skills and attitudes to be trusted to independently perform this activity.”

Entrustable Trainee Activities

- ETAs, or entrustable resident or student activities, can help to define important benchmarks in a trainee’s development.

- ETAs in a training program may mean:
  - A trainee has demonstrated the necessary knowledge, skills and attitudes to be trusted to perform this activity without constant or direct supervision.
Why “ETAs” to Assess Competence?

- Sampling of events that:
  - are critical moments in medical training
  - inform developmental progression
  - faculty and leaders already implicitly assess
  - are manageable for busy training programs
  - are logical of assessment for stakeholders

- Supported by generalizability theory
  - 8-12 focused assessments can potentially allow a generalized statement of competency
Entrustments in Ireland

- With a neighbor(s), discuss an entrustment you make either with medical students or post-graduate trainees
- How do you arrive at this entrustment judgment?
Assessment System for Structured Training: Components

**Clinical Competency Committee**
- Periodic review – professional growth opportunities for all
- Early warning systems

**Structured Portfolio**
- ITE (formative only)
- Monthly Evaluations
- MiniCEX
- Medical record audit/QI project
- Clinical question log
- Multisource feedback
- Trainee contributions (personal portfolio)
  - Research project

**Program Summative Assessment Process**

**Licensing and Certification**
- USLME
- American Boards of Medical Specialties

**Advisor**
- Trainee
  - Review portfolio
  - Reflect on contents
  - Contribute to portfolio

**Program Leaders**
- Review portfolio periodically and systematically
- Develop early warning system
- Encourage reflection and self-assessment
Multi-modal Assessment

- No single “tool” or method sufficient to evaluate all components of competence
  - Pick best combination for context and purpose
  - **Utility Index** as a guide (van der Vleuten):
    - \[ \text{Utility} = V \times R \times A \times EI \times CE / \text{Context} \]
    - Where \( \text{context} = \sum \text{Microsystems} \)

- Whenever possible, assessment should be non-redundant and embedded in what the physician does.
Model For Programmatic Assessment
(With permission from CPM van der Vleuten)

- ○ = learning task
- ○ = learning artifact
- △ = single assessment data-point
- △ = single certification data point for mastery tasks
- • = learner reflection and planning
- • = social interaction around reflection (supervision)
- Undotted ○ = learning task being an assessment task also
Context and Culture Matter (A lot)

- Truism: Culture eats strategy every day for breakfast, lunch and dinner
  - Favorable and pernicious effects of the hidden and informal curriculum
- The quality of care delivered by the institution will often “imprint” on trainees.
Clinical Care and Quality Triangle

- Physician
- Patient

Competencies – MCI Framework

Outcomes

Literacy
Numeracy
Activation
Advocacy

Ward
Clinic

Community

Systems of care

American Board of Internal Medicine
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# Teaching Vs. Non-Teaching Hospital Quality Performance Ind.

<table>
<thead>
<tr>
<th>Performance Ind.</th>
<th>COTH Teaching</th>
<th>Non-COTH Teaching</th>
<th>Non-Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>30-day Mortality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• AMI</td>
<td>15.1%</td>
<td>15.9%</td>
<td>16.3%</td>
</tr>
<tr>
<td>• Pneumonia</td>
<td>10.8%</td>
<td>11.1%</td>
<td>11.7%</td>
</tr>
<tr>
<td><strong>30-day Readmission</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• AMI</td>
<td>20.3%</td>
<td>19.7%</td>
<td>19.6%</td>
</tr>
<tr>
<td><strong>HCAHPS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Nurse communicated well</td>
<td>70.5%</td>
<td>70.9%</td>
<td>74.9%</td>
</tr>
<tr>
<td>• MD communicated well</td>
<td>76.2%</td>
<td>77.0%</td>
<td>81%</td>
</tr>
<tr>
<td>• Help when wanted</td>
<td>55.0%</td>
<td>57.0%</td>
<td>64.1%</td>
</tr>
</tbody>
</table>

## Care of the Vulnerable Elderly Study

### Performance on Geriatric Process of Care

<table>
<thead>
<tr>
<th></th>
<th>Resident Clinics Mean %</th>
<th>Practicing Physicians Mean %</th>
<th>Univariate F</th>
<th>Structure coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documentation of:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gait evaluation</td>
<td>28.4%</td>
<td>74.2%</td>
<td>77.53**</td>
<td>.90</td>
</tr>
<tr>
<td>Balance evaluation</td>
<td>21.6%</td>
<td>66.4%</td>
<td>65.51**</td>
<td>.82</td>
</tr>
<tr>
<td>Medical surrogate</td>
<td>28.0%</td>
<td>54.4%</td>
<td>24.00**</td>
<td>.65</td>
</tr>
<tr>
<td>End-of-life preferences</td>
<td>29.5%</td>
<td>49.3%</td>
<td>12.85**</td>
<td>.55</td>
</tr>
<tr>
<td>Vision testing done</td>
<td>40.0%</td>
<td>64.7%</td>
<td>19.09**</td>
<td>.55</td>
</tr>
<tr>
<td>Hearing assessment</td>
<td>23.3%</td>
<td>40.3%</td>
<td>8.06*</td>
<td>.41</td>
</tr>
<tr>
<td><strong>Screens for:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falls risk</td>
<td>18.6%</td>
<td>60.8%</td>
<td>49.60**</td>
<td>.67</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>18.3%</td>
<td>52.0%</td>
<td>29.02**</td>
<td>.60</td>
</tr>
<tr>
<td>Depression</td>
<td>33.7%</td>
<td>62.6%</td>
<td>24.09**</td>
<td>.57</td>
</tr>
</tbody>
</table>

Evaluating Residency Programs Using Patient Outcomes


Rate of Major Obstetric Complications by Graduates (%)

Residency Program of Origin, Ranked (Quintile) by Program Complication Rate

Difference remains after correction for USMLE performance

Excess Risk $\Delta$ 32%
Q1 vs Q5

$\Delta$ Q1-Q5
Hospital Comparisons on Quality and Resource Use
(Higher scores represent better performance)

Non-teaching (N= 997)  Teaching (N=186)

Source: L. Binder, CEO of Leapfrog Group, email communication, March 2010
“Every system is perfectly designed to achieve the results it generates.”

Paul Batalden
Premise

- Physicians have long enjoyed substantial autonomy and social standing that is now being questioned in many parts of the world because of perceived conflicts of interest, poor quality and safety and failure to effectively police ourselves, to name just a few.
A rededication to professionalism, viewed through the lens of competency-based medical education, potentially provides a powerful lever for medical educators to lead the transformation of medical education and train future physicians and others for the needs of an increasingly mobile population in the 21st global economy.
Premise

- This will require a re-emphasis on some traditional elements of professionalism, but also a new focus of professionalism in the context of complex adaptive systems, inter-professional teamwork, and redefinition of roles.
Fundamental Principles
– Primacy of patient welfare
– Patient autonomy
– Social justice

Lancet 2002; 359:520-522
Ann Intern Med 2003; 138:839-841
28 other national and international medical journals
Physician Charter

A Commitment to:

- Professional competence
- Honesty with patients
- Patient confidentiality
- Maintaining appropriate relations with patients
- Improving quality of care
- Improving access to care
- A just distribution of finite resources
- Scientific knowledge
- Maintaining trust by managing conflicts of interest
- Professional responsibilities
Professional Transformation

- Autonomy ➔ Collaboration
- Authority ➔ Evidence
- Assertion ➔ Measurement
- Control ➔ Transparency

Professionalism = Accountability
Model of Physician Responsibility in Relation to Influences on Health

Maintenance of Certification

Designed to ensure that physicians keep current and practice high quality medicine

– Employs active learning rather than passive lectures

– Performance improvement focuses on behavior, not just knowledge

▪ Currently required once every 10 years in internal medicine and subspecialties

▪ Requirement for maintaining underlying IM certificate varies among specialties of IM
MOC: A Reflection of Professionalism

- Rapid advances in biomedical science
- Evolution of evidence based practice
- Continued gaps in both process and outcomes of care
- Public demands for accountability
MOC Components – All Diplomates

☑ Verification of Credentials
  - Medical license

☑ Pass a secure examination

☑ Complete 100 points of self-evaluation in:
  - Medical Knowledge (minimum 20 points)
  - Practice Performance (minimum 20 points)
  (Remaining 60 points in any combination)
MOC Exam and Quality of Care

- Proximity of exam correlates with intensification of therapy for DM patients with hypertension\(^1\)
  - The closer, the better

- Physicians in top 25% are approximately 15% more likely (OR 1.14 - 1.17) to perform mammography and diabetic processes of care\(^2\)


Practice Improvement Module

Chart review
Patient survey
Practice review

Performance Report
Improvement

Impact

plan
act
study
do
PIMs Make a Difference

- Five studies, including 2 controlled studies, have demonstrated positive changes in care.

- Over twenty (20) PIM studies published or in press to date.

- Diplomate self-reported experience in 2011:
  - 85% of physicians who completed PIMs report they have changed their practice.
  - 85% would recommend the PIM to a colleague.

1ABIM Post PIM Survey, 2011, N= 2,582
Multi-faceted Evaluation: Practicing MD

```
Quality, Safety and Teamwork
```

```
Simulation: VR& Procedures
```

```
Interpersonal & Communication Skills
```

```
Medical Record Audit and QI project
```

```
Point-of-care Question Log
```

```
Secure Exam and MCQs
```

```
MSF: Patient, Peer, Nurse, others
```

```
Patient Care
```

```
Medical knowledge
```

```
Professionalism
```

```
Scholarship and Quality
```

```
"Portfolio"
```

```
Medical knowledge
```

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Patient Care
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Questions?