Hot Trends in Medical Education

Ellen Cosgrove, MD FACP
Alaska ACP AKOMA Meeting
May 18, 2013

What would YOU like to Know?

1. Hot Trends sound like alphabet soup. Will MOOCs, LMS, ‘flipped classroom’, Vodcasts, LIC, IPE, TBL, MOC, context learning mean anything to me?
2. What are the long-term outcomes of WWAMI?
3. What are the implications of the NEW MCAT starting in 2015?
4. What is UW doing with Curriculum renewal?
Hot Trends in Medical Education

- Competency-based (MOC)
- Contextual (integration of clinical / basic science)
- ‘Active’ learning (“Flipped” classroom)
- Technology-enabled curriculum
  - Podcast / Vodcast; “Khan” Academy; TED talks; MOOCs
- Team-based learning (TBL)
- Interprofessional education (IPE)
- Longitudinal Integrated Clerkships (LIC)

The practice of medicine requires:

- Scientific knowledge and principles, as well as understanding how knowledge is justified and evolves
- Understanding of biological complexity, genetic diversity, interactions of systems in the body, human development, and the influence of the environment
- The ability to synthesize information and collaborate across disciplines
- The ability to evaluate competing claims in medical and scientific literature
- Caring for the patient and the ability to let the patient know that you care

100th Anniversary of Flexner Report
Educating Physicians: Cooke, Irby, O’Brien

- Standardize learning outcomes (Competency-based assessment)
- Integrate formal knowledge & clinical experience
- Focus on learning in context—closer integration with clinical medicine
- More Active vs. passive learning (lecture)
- Learning should be longitudinal
- Develop “habits of inquiry”
From Courses to Competencies

A competency is a general body of knowledge, skills and/or attitudes that enables an individual to learn and perform.

Advantages:
• Focus on student not teacher/syllabus
• Encourage flexibility in curriculum
• Encourage integrative thinking

ACGME COMPETENCIES: 15 Years!
Adopted by ABMS for practicing physicians
Now influencing medical school

1. Medical Knowledge
2. Patient Care
3. Communication
4. Ethics/Professionalism
5. Practice-based Learning & Improvement
6. Systems-based Care
Measuring Competency:
ACGME Milestones Project

- Specialty-specific
- Span the continuum
- Entry-level
- Intermediate markers through training
- Graduation
- **NEW** Concept: Milestones to be achieved in Practice

Maintenance of Certification: MOC

- Affects every board-certified MD who graduated from med school after 1998
- Complex mix of activities based on the competencies
  - Standardized test (medical knowledge)
  - Modules (patient care)
  - Quality Improvement project (practice-based learning & improvement)

Contextual learning

- Integration of basic science & clinical learning
- Full integration of the clinical application of science during the foundation years
  integrated blocks, case-based learning
  new test question format on USMLE Step 1
- Revisiting science during the clinical clerkships
Active learning

Education is transformative; Data collection is not.

There is overwhelming evidence that engaging students actively in the learning process produces better outcomes.

PRIOR KNOWLEDGE

DISSONANCE

CONSTRUCTION OF NEW KNOWLEDGE

How People Learn, NRC; Ausubel, 1978

With straight transmission of information, students don’t learn to transfer knowledge to novel situations, and don’t develop good reasoning skills.

Graphic evidence for the dire need to change educational paradigms – a week of a student’s electrodermal activity, showing flatlines during class. As MIT Media Lab’s Joi Ito points out, it’s just a single student’s activity and thus generalization would be frivolous, but it still gives one pause.
Modalities of active learning: individual & small group

• Case-based discussion
• Hands-on workshops
• Problem-solving exercises (individual & group)
• Problem-based learning (PBL)

Active Learning in Large Group?

• Audience response: “Clickers”
• Team-based learning (TBL)
• Think-Pair-Share

‘Flipped’ Classroom

Traditional Lecture:
no expectation of ‘prep’ by learners
information transfer
students master content after the lecture

Flipped Prep DEMANDED: vodcast &/or reading
Class time devoted to interaction
Technology-enabled Education

- Podcast/ Vodcast
- Khan Academy
- TED talks (Technology, Entertainment & Design)  18 minute max
- MOOC (Massive open online courses) the current 'bright, shiny, object'

Technology & Education:

*You can have 2 out of 3:*

- Fast
- Cheap
- Good

Longitudinal Integrated Clerkship

- Relationships take central importance:
  - with mentor
  - with patients
- Supports student altruism
- May enhance student interest in Primary Care
- UW a pioneer in this: 10% of current students; up to 50% in new curriculum
WWAMI: An Audacious Experiment in Decentralized Medical Education

- Emerged from the social ferment of the 1960s
- Also a time of expansion of medical education
- Driven by a rural doctor shortage

WWAMI sought to expand medical education at a reasonable cost in the most rural states

- UW School of Medicine is the sponsoring institution for WWAMI, the five state regional medical school for Washington, Wyoming, Alaska, Montana and Idaho (28% of the land mass of the US)
- WAMI is a 41-year partnership (Wyoming joined in 1996 as the second “W”) providing high-quality, cost-effective medical education
- Partner universities include Washington State University, University of Wyoming, University of Alaska, Montana State University, and University of Idaho

Founding Goals 1971

- Provide access for citizens of the Northwest to publicly supported medical education
- Increase number of primary care physicians and address maldistribution of physicians
- Create community-based medical education
- Expand graduate medical education and continuing medical education
- Avoid excessive capital costs and duplication of resources by using existing educational infrastructure
The WWAMI Model

- Each partner state has an admission committee
- Students complete first year at their home state university
- All students are in Seattle for second year
- Students able to complete clinical rotations in their 3rd and 4th years in locations across the region
- GME opportunities across the WWAMI region

WWAMI includes some very rural areas: Alaskan Village

WWAMI return rates

<table>
<thead>
<tr>
<th>WWAMI student return rate:</th>
<th>State-specific student return rate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Washington – 64%</td>
<td>– Washington 54%</td>
</tr>
<tr>
<td>– Wyoming – 68%</td>
<td>– Wyoming – 66%</td>
</tr>
<tr>
<td><strong>Alaska – 71%</strong></td>
<td><strong>Alaska – 51%</strong></td>
</tr>
<tr>
<td>– Montana – 51%</td>
<td>– Montana - 41%</td>
</tr>
<tr>
<td>– Idaho – 72%</td>
<td>– Idaho – 49%</td>
</tr>
</tbody>
</table>
Residents in WWAMI

<table>
<thead>
<tr>
<th>State</th>
<th>Retention of residents who complete training in state</th>
<th>U.S. Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>74.0%</td>
<td>1</td>
</tr>
<tr>
<td>Montana</td>
<td>59.7%</td>
<td>3</td>
</tr>
<tr>
<td>Idaho</td>
<td>55.8%</td>
<td>9</td>
</tr>
<tr>
<td>Washington</td>
<td>48.5%</td>
<td>17</td>
</tr>
<tr>
<td>U.S. Average</td>
<td>47.4%</td>
<td></td>
</tr>
<tr>
<td>Wyoming</td>
<td>29.3%</td>
<td>49</td>
</tr>
</tbody>
</table>

New MCAT 2015

- Updating the exam’s two natural sciences sections to reflect current science and test how examinees solve scientific problems (more emphasis on Human Biology; new inclusion of Biochemistry; less emphasis on Chemistry & Physics)
- Adding a new test of the behavioral and social sciences concepts
- Revising the verbal section to test the way examinees reason through passages in ethics and philosophy, cross-cultural studies, population health, and other subjects

MCAT: Why change now?

- Pre-med requirements have been static for a long time.
- Pre-med requirements “may not accurately reflect” what entering medical students need to have mastered.
- Increasing volume of scientific knowledge needed for successful practice as a physician – can we shift more of burden to college years?
The 8 Pre-Medical Science Competencies

1. Apply quantitative reasoning and mathematics...
2. Demonstrate process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Basic physical principles & their applications to understanding living systems.
4. Demonstrate knowledge of chemistry and applications to...
5. Demonstrate knowledge of how biomolecules contribute to structure and function of cells.
6. Apply knowledge of molecular and cell assemblies, organs, and organisms develop structure and carry out function.
7. Explain how organisms sense and control their internal environments & respond to external change.
8. Demonstrate an understanding of how evolution by natural selection explains diversity of life on earth.

1. Apply quantitative reasoning and appropriate mathematics to describe or explain phenomena in the natural world

Old

2 semesters calculus

New

Integrated mathematics

Statistics

5. Demonstrate knowledge of how biomolecules contribute to the structure and function of cells.

Old

Some schools require, many recommend biochemistry

New

Biochemistry

&/or more biology

Part of 2 semesters of Bio?
How does the content of the competencies differ from current prerequisites?

- More Statistics
- More Biochemistry
- Less Organic Chemistry
- Less Calculus
- More psychology (Human, developmental)
- Focus of chem and bio is on application to living systems
- Preference for interdisciplinary, integrative approaches

Challenges

Challenges for School of Medicine:
- Establishing standards to evaluate applicants’ ‘competency’ that are not course-based
- MORE emphasis on MCAT?

Challenges for undergraduate colleges:
- Curriculum reform
- Best preparation/packaging of students
- Individualized advising and preparation for medical school

Courses to Competencies

- Pre-Medical Competencies
  - Biology: 51%
  - Chemistry: 21%
  - Physics: 14%
  - Math/Statistics: 14%

- Current Pre-Med Course Requirements
  - Biology: 20%
  - Chemistry: 40%
  - Physics: 20%
  - Math: 20%

Challenges
Who is the UW Doctor of the Future

Skilled, caring, engaged in community

How do we measure this?
Competencies?
‘Milestones’?

New UWSOM curriculum process

• Pre-curriculum review 2009-2011
  Comprehensive, inclusive, concluded Fall 2011
• Visioning committee: Jan-June 2012
  Principles as basis of new curriculum
  
  Steering Committee: December 2012- June 2013
  Develop new curriculum course/clerkship structure

• Working groups: July 2013- May 2014
  Develop specific courses/clerkships
• Continuous curriculum renewal
  Fall 2014 begin new curriculum and continuous improvement process

Reasons for curriculum renewal

• Last curriculum review was in 1998
• Changes in MCAT exam
• Changes in USMLE exam: clinical integration
• Changes in GME: Competencies & ‘milestones’
• 75% of U.S. medical schools have had curriculum reform in the last 3 years: shortened basic science, more clinical exploration
• Applicant feedback / student feedback:
  more active learning, individualized opportunities
**UW SOM**

**Continuous Curriculum Improvement**

- Pre-curriculum review 2009-2011  
  Comprehensive, inclusive, concluded Fall 2011
- Visioning committee: Jan-June 2012  
  Principles as basis of new curriculum
  - Steering Committee: December 2012- June 2013
  - Develop new curriculum course/clerkship structure
  - Continuous improvement as ideas emerge
- Working groups: July 2013- May 2014  
  Develop specific courses/clerkships & continuous improvement
- Continuous curriculum renewal  
  Fall 2014: begin new curriculum continuous improvement process

---

**Who’s involved with curriculum renewal?**

14 committees:

- Over 300 committee members
- Over 40 students
- Diverse faculty and staff
- All five states represented
## New UWSOM curriculum

<table>
<thead>
<tr>
<th>Scientific Foundations Phase</th>
<th>Clinical Foundations Phase</th>
<th>Career Preparation &amp; Scholarship Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical sciences w/ clinical integration 15-18 months</td>
<td>Required clerkships</td>
<td>Career exploration</td>
</tr>
<tr>
<td>Meaningful clinical experience</td>
<td>Integrated basic science—more LIC</td>
<td>Specialty-specific preparation</td>
</tr>
<tr>
<td><strong>Our UW Culture</strong></td>
<td>Specific rotations in Seattle</td>
<td>Research &amp; scholarship</td>
</tr>
</tbody>
</table>

**Meaningful clinical experience**

**Our UW Culture**

## How can YOU make a difference?

**Role model** (preceptor, clinical faculty)

**Advocate** for medical students

**Sounding Board** for the transformational change: can we call on you?

**Scholarship donor**