Educating Physicians Across the Continuum:
A Pilot of EPAs, Milestones, and Competency-Based Advancement in Pediatrics

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Disclosure

Neither we nor our immediate family members have personal financial relationships with manufacturers of pharmaceutical products or services that will be discussed in this presentation.
Plan for Today

- Current state of medical education in US
  - Where are the gaps
- Competency-Based Medical Education
  - Milestones
  - Entrustable Professional Activities (EPAs)
- EPAC: A pilot of competency-based advancement in pediatrics
- What next?
Medical Education in U.S.

Historical Perspective

- AMA survey (1904)
  - Quality of medical training was highly variable
  - Strong university-based medical schools
  - Weak proprietary schools

- Carnegie Foundation Report (Flexner 1910)
  - Flexner focused on “the public interest”
  - Based on model at Johns Hopkins
  - Foundation for medical education system we have today
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<td>• Lack of standard, rigorous curricula</td>
<td>• Insist on four years of college and a set of specific science courses as a prerequisite to medical studies</td>
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<td>• Poorly prepared students</td>
<td>• Create a standardized four-year curriculum in 2 + 2 design</td>
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<td>• Heterogeneity in student achievement</td>
<td>• Establish accreditation process for medical schools</td>
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<td>Integration</td>
<td>• Limited science and laboratory experience in the curriculum</td>
<td>• Incorporate laboratory learning into the curriculum and connect advances in the laboratory with clinical practice at the bedside</td>
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<td>• Limited or no interaction with patients and therefore minimal opportunity to apply knowledge from lectures to patient care</td>
<td>• Expand the curriculum by two years and provide clinical training in university teaching hospitals</td>
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<td>Habits of inquiry and improvement</td>
<td>• Excessive emphasis on rote memorization rather than on learning-by-doing in the laboratory and hospital</td>
<td>• Train physicians to “think like scientists” using scientific inquiry and research to solve clinical problems</td>
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<td>• Tradition-bound rather than scientifically oriented curriculum and faculty</td>
<td>• Require medical education to be taught by scientifically trained faculty members within university classroom and clinical settings</td>
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<td>Identity formation</td>
<td>• Teaching by unqualified faculty members</td>
<td>• Immerse medical education in university culture</td>
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<td>• Role modeling by variably competent physicians in many proprietary and for-profit schools</td>
<td>• Facilitate close and sustained contact between learners and scientifically based faculty role models</td>
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Medical Education in U.S.

Today’s perspective

- Rigorous, organized academic standards rooted in science
- Standardized accreditation and certification
- Tremendous advances in understanding and treatment/prevention of disease
- Great opportunities for good…and for errors
- Monumental change in health care system compared with 1910
Medical Education

*Calls for competency-based education*

1995  Pew Health Professions Commission
1997  Council on Graduate Medical Education
1997  ACGME Outcomes Project
1998  AAMC Learning Objectives for Medical Student Education
2000  CanMEDS Project
What is Competence?

Teaching (process) vs Learning (outcome)
Competency Frameworks

**ACGME (US)**
- Patient care
- Medical knowledge
- Practice based learning and improvement
- Interpersonal and communication skills
- Professionalism
- Systems-based practice

**The Scottish Doctor**
12 outcome domains by
- What doctor able to do
- How doctor approaches practice
- Doctor as professional

**Tomorrow’s Doctors (UK)**
The Doctor as:
1) Scholar and Scientist
2) Practitioner
3) Professional
Milestones

- ACGME/ABMS Milestones Project
  - Developmental roadmap for progression of knowledge, skills, attitudes
  - Benchmarks for assessment and feedback to learners

- Pediatric version published in early 2012
  - Addressed progression through UME, GME, and MOC
Patient Care Milestones

Gather essential and accurate information about the patient

**Developmental Milestones**

- *Either gathers too little information or exhaustively gathers information following a template regardless of the patient’s chief complaint, with each piece of information gathered seeming as important as the next. Recalls clinical information in the order elicited, with the ability to gather, filter, prioritize, and connect pieces of information being limited by and dependent upon analytic reasoning through basic pathophysiology alone.*

- *Clinical experience allows linkage of signs and symptoms of a current patient to those encountered in previous patients. Still relies primarily on analytic reasoning through basic pathophysiology to gather information, but the ability to link current findings to prior clinical encounters allows information to be filtered, prioritized, and synthesized into pertinent positives and negatives as well as broad diagnostic categories.*

- *Advanced development of pattern recognition leads to the creation of illness scripts, which allow information to be gathered while it is simultaneously filtered, prioritized, and synthesized into specific diagnostic considerations. Data gathering is driven by real-time development of a differential diagnosis early in the information-gathering process.*

- *Well-developed illness scripts allow essential and accurate information to be gathered and precise diagnoses to be reached with ease and efficiency when presented with most pediatric problems, but still relies on analytic reasoning through basic pathophysiology to gather information when presented with complex or uncommon problems.*

- *Robust illness scripts and instance scripts (where the specific features of individual patients are remembered and used in future clinical reasoning) lead to unconscious gathering of essential and accurate information in a targeted and efficient manner when presented with all but the most complex or rare clinical problems. These illness and instance scripts are robust enough to enable discrimination among diagnoses with subtle distinguishing features.*
Patient Care Milestones

- Gather essential and accurate information about the patient
  - Gathers info using template, no info filtering
  - Begins to link info, synthesize pertinent +/-
  - DDx drives info gathering
  - Uses pattern recognition, gathers essential info
  - Unconsciously gathers essential info, targeted and efficient
Risk of Reductionism

- Competencies as deconstruction of practice
  - Yet whole is greater than individual parts
  - Original aim of targeting real outcomes can be lost

- Meta-competency
  - Complex mix of individual knowledge, skills, and attitudes, and competency domains
  - Cultural and social contexts
  - Application in actual health care environments
Driving a Car

- Competency
  - Can accelerate and brake smoothly
  - Can approach an intersection and can turn left

- Assessment of competency
  - Passes driver’s education classes
  - Passes driver’s exam to get the license

- Meta-competency
  - Drives safely on interstate or during bad weather, avoids accidents, no traffic tickets
When Is the Learner Ready?
A New Approach

- Synthesize competencies into workplace activities
  - Start with concrete clinical activities you want physician to be able to perform
  - Work backwards to link these to competency domains

- Incorporate professional judgment of competence by clinicians
  - Make deliberate decisions around trust for concrete activities

- Build collection of mastered activities (portfolio) to document full competence
Entrustable Professional Activities (EPAs)

- Part of essential professional work in given context for qualified individual
  - Independently executable within a time frame
  - Requires integration of specific knowledge, skills, attitude acquired through training
- Leads to recognized output
  - Observable and measurable, leading to conclusion (well done or not well done)
- Reflects important competencies
- EPAs together constitute core of the profession

- Ten Cate & Scheele, Acad Med 2007
Sample EPA

- Manage patients with acute, common single system diagnoses in an ambulatory, emergency, or inpatient setting

  - Gathers info thru hx, PE, and initial labs
  - Clinical reasoning drives DDx allowing proper diagnostic testing and initial therapy
  - Knows evidence related to primary problem
  - Applies evidence to management plan
  - Provides patient & family-centered care with bidirectional communication
  - Documents plan and reasoning that is transparent to other healthcare team members
Link to Competencies

- **Patient care**
  - Perform complete and accurate PE
  - Make informed diagnostic and therapeutic decisions that result in optimal clinical judgment
  - Develop and carry out management plan

- **Medical knowledge**

- **Interpersonal and communication skills**
  - Communicate effectively with patients, families, and the public as appropriate, across a broad range of socioeconomic and cultural backgrounds
  - Maintain comprehensive, timely, and legible medical records
## Competencies and EPAs

- Ten Cate & Scheele, Acad Med 2007

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**Inferred**

**Observable**
Performs essentially the same rote head-to-toe physical examination of the patient regardless of presenting complaint; does not use diagnostic hypotheses from the history to anticipate or look for specific positive or negative findings on physical examination.

With a broad list of diagnostic hypotheses after the history, uses a head-to-toe approach to the physical examination to anticipate and look for a myriad of potential positive and negative physical examination findings for multiple diagnostic considerations. This approach can lead to failure to identify pertinent and important physical findings that are present, misinterpretation of physical findings, and attribution of importance and meaning to irrelevant findings.

Uses a narrow list of diagnostic hypotheses generated through the history to anticipate and look for specific positive or negative physical examination findings of only the most relevant diagnostic considerations; open to new diagnostic possibilities in the process of performing a survey physical examination to elicit unexpected abnormalities but may dismiss these as unimportant when it is difficult to integrate these findings into the working differential diagnosis.

Uses a narrow list of diagnostic hypotheses generated through the history as well as through extensive clinical experience to anticipate and look for key specific physical examination findings that will discriminate between competing similar diagnoses; uses surprises that result from a survey physical examination to rethink and retest diagnostic hypotheses; actively looks for physical exam findings that disconfirm the working diagnosis or rule in or out rare but high-risk alternative diagnoses.
EPAs

Competencies

Milestones

- Carraccio
## Competencies vs EPAs

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<td><em>person-descriptors</em></td>
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<td>knowledge, skills, attitudes, values</td>
<td>essential parts of professional practice</td>
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<td>content expertise, collaboration ability, communication ability, management ability, professional attitude, scholarly approach</td>
<td>perform a vena puncture, perform an appendectomy, lead a family meeting, manage a ventilated patient, request organ donation, design a treatment plan</td>
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- Hauer
Advantages of EPAs

- Grounds competencies in the everyday tasks of physicians
- Aligned with how clinicians interact with learners and what they already take ownership for
- Decisions about competence based on clinician-learner encounters
- Easier to understand and evaluate/rate than competencies (e.g., professionalism)
When is Competence Reached

- When the professional activity is mastered
  - ...at threshold level
  - ...that permits unsupervised practice
  - ...and full entrustment

Think of competence as a stage on a continuum
Development of Competence

- novice
- advanced
- competent
- proficient
- expert

Dreyfus & Dreyfus, 1986
Example Competent Learner

- 2 yo with wheezing, resp distress
  - Reassurance provided during hx
  - Has FB aspiration on ddx, focuses on differential BS plus wheezing and WOB
  - Presents focused hx/PE with reasoned assess/plan c/w family’s wishes and health literacy, including SW referral for loss of insurance
Competence and Trust

- Faculty already make entrustment decisions every day while working with learners
- EPAs formalizes mechanism
  - Observe pre-determined EPAs vs random aspects of performance
  - Decide to entrust based on degree of needed supervision
  - Award entrustment when learner can perform EPA without direct supervision
- Decisions can be deliberate and individualized
Sample EPA Competency Curve

Justified entrustment decisions

Ten Cate
Adapted Levels of Supervision

- Level 1: not allowed to practice the EPA
- Level 2: practice with full supervision
- Level 3: practice with supervision on demand
- Level 4: “unsupervised” practice allowed
- Level 5: supervision task may be given

Competence threshold reached; formal entrustment decision, “STAR” (Statement of Awarded Responsibility) is documented in portfolio and in institutional registers, after confirmation by three staff members.

Ten Cate.
Use of EPAs

- Netherlands
  - GME
  - PA training
- International CBME Collaborative
- ABIM
  - UCSF Dept of Medicine
- AAMC
Summary...so far

- Drive toward competency based training
  - More purposeful curricula and assessments
- Milestones projects in many specialties
  - Provide description of expected development of competencies over time
  - UME developing competency-based milestones
- EPAs synthesize competencies into workplace activities
Medical Education in 21st Century
Looking forward

Calls for Reform of Medical Education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010
David M. Irby, PhD, Molly Cooke, MD, and Bridget C. O’Brien, PhD

Preparing Medical Students to Improve Health Care

Preparing Medical Students for the Continual Improvement of Health and Health Care: Abraham Flexner and the New “Public Interest”
Donald M. Berwick, MD, MPP, and Jonathan A. Finkelstein, MD, MPH

Educating physicians for the future: Carnegie’s calls for reform

DAVID IRBY
University of California-San Francisco School of Medicine, USA
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<td>without also promoting knowledge-building and an enduring commitment to excellence</td>
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<td>• Limited and often pro forma engagement in scientific</td>
<td>• Engage learners in challenging problems and allow them to participate authentically in inquiry, innovation, and improvement of care</td>
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<td>• Inadequate attention to patient populations, health</td>
<td>• Engage learners in initiatives focused on population health, quality improvement, and patient safety</td>
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<td>Identity formation</td>
<td>• Lack of clarity and focus on professional values</td>
<td>• Provide formal ethics instruction, storytelling, and symbols (honor codes, pledges, and white coat ceremonies)</td>
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<td>• Failure to assess, acknowledge, and advance professional behaviors</td>
<td>• Address the underlying messages expressed in the hidden curriculum and strive to align the espoused and enacted values of the clinical environment</td>
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<td>• Inadequate expectations for progressively higher levels of</td>
<td>• Offer feedback, reflective opportunities, and assessment on professionalism, in the context of longitudinal mentoring and advising</td>
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<td>nature of health care</td>
<td>• Create collaborative learning environments committed to excellence and continuous improvement</td>
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## Carnegie Report 2010

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Major Challenges and Gaps

- Competency-Based Medical Education only partially realized
  - Outcomes not standardized across UME/GME/MOC
  - Advancement primarily process, not competency based
  - Assessment system not up to the task

- Current educational experience too fragmented
  - Insufficient continuity with faculty, patients, system and across UME/GME/MOC
  - Inhibits quality of mentoring, feedback, and professional development
Education in Pediatrics Across the Continuum (EPAC)

- New approach to curriculum and assessment supported by AAMC
- Early entry into specialty training pathway with alignment across UME/GME (pediatrics as model)
- Create “true” competency-based advancement system using EPA (and Milestone) framework
- Transitions based on demonstration of competence, not only time
- Emphasis on longitudinal relationships
- Lessons learned could be applied to other specialties
Partners in EPAC

- AAMC
- Other Medical Schools
  - Colorado/Denver Children’s
  - Minnesota
  - Utah
- ACGME/Pediatric RC
- American Board of Pediatrics
- NBME
- Other investigators
  - Olle ten Cate
  - David Hirsch
  - Tara Kennedy
Why UCSF?

- Known for our innovation
- Excellent building blocks
  - Longitudinal curricula (preclerkship, clerkship, and residency)
  - UME milestones aligned with ACGME competencies
  - UME/GME curricula in Pathways program
  - Long history of innovation in Pediatric GME
Why Pediatrics?

- **American Board of Pediatrics (ABP)**
  - Innovations in Pediatric Education (IIPE) project
  - Openness to alternative training pathways

- **Pediatric Review Committee (ACGME)**
  - New and more flexible program requirements
  - Plan to incorporate EPAs

- **Pediatric Milestones Project**
  - Developed across UME/GME/CME continuum
Why do it?

A Rare Opportunity to…

- Break extraordinary new ground in competency-based training across the UME/GME continuum
- Develop enhanced assessment methods
- Develop enhanced models for longitudinal training
- AAMC support to help with
  - Regulatory agencies (ACGME, RRC, specialty board)
  - Unique funding opportunities
  - Access to expertise and resources (e.g. NBME, etc)
  - Build partnerships at other schools
Initial Process at UCSF

First Steps

- Explored interest in Department of Pediatrics
  - Pediatrics Chair
  - Pediatrics Residency Program and clerkship
  - Core pediatric educators

- Pediatric educators
  - Developed broad outline of possible curriculum
  - Initial ideas for curriculum structure consistent with UCSF vision
Initial Process at UCSF

School of Medicine

- Dean
- Vice Dean for Education
- Associate Dean for Curriculum
- UME curriculum committees (ECCC, CCOC, ICSC, CCEP)
- GME leaders
- AME
- Key educational leaders
Initial Feedback

- Positive interest
- Compelling reasons to proceed
  - Competency-based education, test of theory
  - Integration of UME/GME
- Concerns
  - Logistics
  - Learner consequence (off ramps, other learners, unintended consequences)
  - Integration with existing programs
  - Regulatory agencies
Guiding Principles at UCSF

- Must be patient and society centered
  - Address the *public interest*
- Must be consistent with and complement broader UCSF vision
  - Serve to inform the broader vision
- Must be interdisciplinary
  - Take into account perspectives of others
- Must be simple, efficient, and respectful of faculty time
EPAC Primary Aims

- Develop set of standardized outcomes across UME/GME
- Develop a curriculum to achieve outcomes
  - Longitudinal and aligned across UME/GME
  - Adaptable at different sites
- Create an assessment system to measure achievement of outcomes
  - EPA and Milestones
  - Competency-based advancement
What would EPAC look like at UCSF?

- Begin with 1st year of medical school
- Progressively increased Pediatric focus
  - Learning medicine through specialty lens
  - As Pediatric focus increases number of students involved decreases
- Pediatric-based Longitudinal Integrated Clerkship
  - Mid-third year students make commitment to Pediatrics
- Guaranteed residency position (4 positions)
- Key transitions would be competency-based
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<td>* Integrate basic, clinical, and social sciences</td>
</tr>
<tr>
<td></td>
<td>Poorly understood nonclinical and civic roles of physicians</td>
<td>* Engage learners at all levels with a more comprehensive perspective on patients’</td>
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<tr>
<td></td>
<td></td>
<td>experience of illness and care, including more longitudinal connections with patients</td>
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<tr>
<td></td>
<td>Inadequate attention to the skills required for effective team care in a</td>
<td>* Provide opportunities for learners to experience the broader professional roles of</td>
</tr>
<tr>
<td></td>
<td>complex health care system</td>
<td>physicians</td>
</tr>
<tr>
<td>Habits of inquiry and</td>
<td>Focused on mastering today’s skills and knowledge without also promoting</td>
<td>* Prepare learners to attain both routine and adaptive forms of expertise</td>
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<tr>
<td>improvement</td>
<td>knowledge-building and an enduring commitment to excellence</td>
<td></td>
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<tr>
<td></td>
<td>Limited and often pro forma engagement in scientific inquiry and</td>
<td>* Engage learners in challenging problems and allow them to participate authentically in</td>
</tr>
<tr>
<td></td>
<td>improvement exercises</td>
<td>inquiry, innovation, and improvement of care</td>
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<tr>
<td></td>
<td>Inadequate attention to patient populations, health promotion, and</td>
<td>* Engage learners in initiatives focused on population health, quality improvement, and</td>
</tr>
<tr>
<td></td>
<td>practice-based learning and improvement</td>
<td>patient safety</td>
</tr>
<tr>
<td></td>
<td>Insufficient opportunity to participate in the management and improvement</td>
<td>* Locate clinical education in settings where quality patient care is delivered, not just</td>
</tr>
<tr>
<td></td>
<td>of the health care systems within which they learn and work</td>
<td>in university teaching hospitals</td>
</tr>
<tr>
<td>Identity formation</td>
<td>Lack of clarity and focus on professional values</td>
<td>* Provide formal ethics instruction, storytelling, and symbols (honor codes, pledges,</td>
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<td></td>
<td></td>
<td>and white coat ceremonies)</td>
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<td></td>
<td>Failure to assess, acknowledge, and advance professional behaviors</td>
<td>* Address the underlying messages expressed in the hidden curriculum and strive to align</td>
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<tr>
<td></td>
<td></td>
<td>the espoused and enacted values of the clinical environment</td>
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<tr>
<td></td>
<td>Inadequate expectations for progressively higher levels of professional</td>
<td>* Offer feedback, reflective opportunities, and assessment on professionalism, in the</td>
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<tr>
<td></td>
<td>commitments</td>
<td>context of longitudinal mentoring and advising</td>
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<td></td>
<td>Erosion of professional values because of pace and commercial nature of</td>
<td>* Promote relationships with faculty who simultaneously support learners and hold them</td>
</tr>
<tr>
<td></td>
<td>health care</td>
<td>to high standards</td>
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<td></td>
<td>* Create collaborative learning environments committed to excellence and continuous</td>
</tr>
</tbody>
</table>

EPAC at UCSF

Current status

- Working/Advisory group
  - Faculty input (other departments, course & clerkship directors)
  - Learner input (students, residents)
  - Collaboration with others/stakeholders
  - Develop designs for pilot curriculum

- Implementation status
  - Grant from Macy Foundation
  - First cohort started Fall 2013
  - Additional pediatric-focused learning activities
  - Accepted 17/30 applications for enhance FPC preceptor activities
Summary

- Drive to competency-based medical education is incomplete
- EPAs and related Milestones provide new assessment framework
- EPAC pilot will be aligned across UME/GME and push the concept of competency-based advancement
- Anticipate many opportunities for your participation