Challenges and Opportunities facing American Graduate Medical Education

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What Currently Drives the Structure and Content of our Residency Programs?

In the context of local service needs, Choose Educational Experiences within Institution, Faculty

“Curriculum” ACGME Standards

Identify/Develop Evaluation Idiosyncratic Tools
- Formative and Summative
- Experience Tracking

“Educate” Residents

Guarantees that education is institutionally idiosyncratic, and lags rather than anticipates change in the delivery system

“Circumstantial Practice”
Disclaimers

• Not a *Predictor* of the Future
• My *Personal* Thoughts
• Mostly Questions
• By No Means an Exhaustive List
• Please make Your List!
Of this, I am sure

“Strangely, this is the past that someone in the future... is longing to go back to.”

Ashliegh Brilliant
Trends of Importance in the Graduate Medical Education Phase of the Continuum

• The Explosion in Medical Knowledge, Impact of Technology, Genomics, and External Factors on the Learning Environment
• The Importance of the Quality of Patient Care in the Learning Environment on the Educational Outcomes of Residents and Fellows
• Standardization of Outcomes, yet Individualization of Educational Programs, and the Importance of Faculty in the Journey from the Use of Circumstantial Practice to Deliberative Practice in Medical Education
• Maintenance of the Public Trust in Medical Education – Accountability, Funding, and Conflicts of Interest
Hawking, S. The Universe in a Nutshell. 2001
Are We Getting Ready for Watson?

Getting Ready for Watson

Start laying the groundwork now with fast ROI smarter analytics and big data capabilities that can accelerate the time to value of a solution.

heathcare

Watson is currently in pilots with leading healthcare and financial services organizations and will be expanding to production-level deployments in new use cases and industries going forward. Getting ready to deploy a Watson solution takes thoughtful planning and selection of where and how to apply its power. Laying the groundwork often involves building strong big data and analytics capabilities which are complementary to Watson itself. Doing so on project-by-project basis ensures that each step is justifiable on its own from a financial and business value perspective and also brings you closer to readiness to apply the transformative power of Watson to your business.
How Do We *Use* Digested Knowledge?

- Preparation
- “Meta-Knowledge”
- Required “Wisdom”, “Virtue”

**Ethical Application**
- Autonomy
- Justice
- Beneficence
- Non-Maleficence

**Systems of Application**
- Individual
- Inter-Professional Team
- Microsystem
- Interdisciplinary
- Institutional
- National Aims

- Harder to *Know What You Don’t Know*
$1,000 Genome Sequencing and the Advent of Personalized Genomic Medicine

Cost of Gene Sequencing Falls, Raising Hopes for Medical Advances

By JOHN MARKOFF
Published: March 7, 2012 | 76 Comments

MOUNTAIN VIEW, Calif. — In Silicon Valley, the line between computing and biology has begun to blur in a way that could have enormous consequences for human longevity.

Bill Banyai, an optical physicist at Complete Genomics, has helped make that happen. When he began developing a gene sequencing machine, he relied heavily on his background at two computer networking start-up companies. His digital expertise was essential in designing a factory that automated
Emerging Genomic Based Diagnostics and Therapeutics

- Theory in Medical School
- Specialty Based Application in GME
- Continuous Learning for the Practicing Physician

- Faculty Development Imperative!
Should Doctors Unionize?

Jeff Brown, MD, Friday, February 8th 2013

I grew up in the first Mayor Daley's Chicago in the heyday of the unions. Since then the unions have been fading away, largely having done their job to neutralize the untrammeled exploitation of people by corporations and thus raise the living and workplace standards for most Americans.

In health care we have seen the unionization of hospitals and nurses continue as the economic power of the health care sector has relentlessly grown. Physicians — traditionally independent business people — by and large haven't felt the need. But the times "they are a-changin'!"

Now more than half of all docs in the U.S. are employed by someone else. All estimates of the future percentage of employed physicians say that number can only go up. Inevitably — with the shift from independent professional to employed service worker (get used to it) — doctors will be monitored and regulated as never before.

This is not all bad. There has never been either a good way to assess what we are doing and how effectively we are doing it nor a practical means to use such information to: a) improve the results of what we do and b) intelligently manage the cost. This increased regulation will require us to sacrifice our (precious) autonomy on the altar of (hopefully, rational) standardization — like it or not.

Of course there will be one-sided injustices and foolish distortions as this process governed by big corporate entities plays out around the country over time. And there will be a natural pushback, including the increasing unionization of physicians. When I recently saw The Wall Street Journal op-ed place by David Leffell, MD, of Yale University speaking to this revealed insight, it immediately rang true.

For those of you who do not know, the Union of American Physicians and Dentists (UAPD-AFL-CIO) has existed since 1972 but, I'm told, it has only about 3,000 members, mainly in California, who pay dues. Up to now, the union has made a living, largely, off of local brush fires with small employers, insurance companies and legislators. But it looks like they are positioned to grow their numbers and clout as large employers increasingly corral and dictate to doctors. Injustices and disconnects are inevitable, and there really has to be a unified entity to speak on economic and workplace issues for the newly disenfranchised, formerly self-employed professionals.
If One is Saying It
Many are Thinking It

The ultimate weapon beyond a new emphasis on collective bargaining is the threat, and use if need be, of the strike...

.... but also for our own perceived best economic and work-condition interests.
Traditions Contributing to the American Concept of Professionalism and the Moral and Ethical Practice of Medicine

Justice Based Equitable Distribution of the “Good” of Health Care in Society

Hippocratic Tradition Medicine as a Moral Enterprise “Physician as Moral Agent”

Virtue Based Ethics as the Basis of Medical Practice

Aristotle
Aquinas
Maimonides
Pellegrino
Thommasa

Justice Based

Evolution from Guild to Profession

John Rawls
Paul Ricoeur
Powers and Fadden

The Virtuous Physician—Character Based Driven by Principles:
• Beneficence
• Autonomy
• Justice
• Non-Malificence

Guiding Virtue: Effacement of Self Interest

Robert Veatch
“Professional Behavior,” not Character

Governed By Contract, Rules and Regulations, Normative Behaviors

Social Justice

Professionalism Commitment to:
• Competency
• Altruism
• Public Trust
• Self-Replicate

Voluntary Oath To Society

Social Contracts

Social Justice

Commercial Contract

Patient “Customer”

Public

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What are among recent events/factors that have disrupted the GME Environment?

- Medicare and Medicaid Programs
- Prospective Reimbursement
- “Privatization” of intellectual property derived from federally funded research
- Influence of industry on clinical and research missions
- I.L. 372 and related PATH Audits
- Medical Liability Insurance Crisis
- Willingness of members of the profession and our hospitals to “advertize” using partial scientific data
- Chronic “Overpromising and Under-delivering”
- Technologic Advances in Imaging and Surgical Technique
- Exponential expansion of knowledge and complexity of care in clinical environment
- Resident Duty Hour Standards

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Factors impacting General Surgery Resident Education and Sub-Specialization Rates

- Environmental and Technological Change in Disease Management
  - Benign Peptic Ulcer Disease
  - Biliary Tree Stone Disease
  - Abdominal Vascular Surgery
  - Trauma
  - Laparoscopic Surgery
- Graded Responsibility, Autonomy, and Independent Functioning in Residency
  - Medical Liability Insurance Crisis of 2000-2004
  - IRS IL-372 and Path Audit Impact
  - Protection of Operative Experience
  - Cost in acute, unstructured care and pre/post-operative mgmt.
- Transition to Practice TTP year
  - ACS Announcement 2/2013

Underlying “Drivers” of the Fraying of the Social Contract(s) in Medical Education

- The complexity and dramatic advance and expansion of medical and surgical science
- Clinical productivity volume pressure on faculty
- The “delivery system” responses to environmental factors
- Surpassing the limits of society to afford the range of services provided (in our current configuration)
- The expectations of the public and physicians
- The Biomedicalization of Society¹

- The “Anticipatory Outcome Expectation” of the Public for GME
  - Don’t want to pay to educate tomorrow’s doctors in yesterday’s care
  - Willing to pay to educate tomorrow’s doctors in tomorrow’s care

¹ Beck, S. Medicalizing Culture(s) or Culturalizing Medicine(s).
  In Burri, RV, Dumit, J. Biomedicine as Culture. pgs. 17-35.
“The Educators Prayer”

Lord, give me the knowledge to know what needs to change, and what must not change…

And the wisdom to know the difference
Some Numbers First
ACGME Accredited
Pipeline and Continuing GME (Fellowship) Programs
11 Year Trend


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Sets of Program Requirements
(“Pipeline” or “Core Residency” Programs = 23 + 1 (MP))

- Urogynecology
- Medical Informatics
- Brain Injury
- Facial Plastic Surgery (ENT Fellowship)

ACGME Data Resource Book, 2010-2011
Available at www.acgme.org, last accessed 1/14/2012

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That Tells Us About Programs…

What about Occupied Positions?
Number of Residents Entering Pipeline and Continuing GME (Fellowship) Programs 2002-2012\textsuperscript{1,2}

\begin{itemize}
  \item \textbf{“R1 positions”}
  \begin{itemize}
    \item 2002-2012 \(\Delta = 2,213\) \[\text{occupied positions}\]
    \item We Have Added 1.4 F1 Fellowship Positions For Each R1 Position Added \[\Delta F1/ \Delta R1 = 141\%\]
  \end{itemize}
  \item \textbf{“F1 positions”}
  \begin{itemize}
    \item 2002-2012 \(\Delta = 3,128\)
  \end{itemize}
\end{itemize}

\textsuperscript{1} ACGME Data Resource Book, 2011-2012 \hspace{1cm} \textsuperscript{2} Occupied Positions

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Monthly Prevalence Estimates of Illness in the Community and the Roles of Physicians, Hospitals, and University Medical Centers in the Provision of Medical Care.

US Medical Schools
Full and Part Time Clinical Faculty

Total Active Physicians | 441,935 | 562,768 | 738,602 | 829,753

1 AAMC Databook, pgs. 41 and 127, 2009. Association of American Medical Colleges
Nasca, T.J., Miller, R.S., Holt, K.D.

Figure 1. Actual and Projected Numbers of Medical School Graduates Entering Graduate Medical Education (GME) Training Positions, as Compared with Three Scenarios of Available Positions (2001–2020).

Health Policy Report. The Uncertain Future of Medicare and Graduate Medical Education.
Iglehart, J. NEJM (10.1056/NEJMhpr1107519)
Published on September 7, 2011, at NEJM.org.
The Goal of the Continuum of Professional Development

- Novice
- Advanced
- Competent
- Proficient
- Expert
- Master

- Undergraduate Medical Education
- Graduate Medical Education
- Clinical Practice

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2010-2012 Singapore Mid and End PGY-1, Mid and End PGY-2 Year Evaluation, Mean Overall Rating of Six Competencies across All Specialties

- **Professionalism**
- **Communication Skills**
- **Medical Knowledge**
- **Patient Care**
- **Practice Based Learning and Improvement**
- **Systems Based Practice**

**Means and Standard Error of the Mean (SEM)**

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Singapore End PGY-1, Mid PGY-2, End PGY-2 Milestone Data, by Resident (First Cohort)

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The Real Challenges
Temporal Trends in Rates of Patient Harm Resulting from Medical Care

Christopher P. Landrigan, M.D., M.P.H., Gareth J. Parry, Ph.D., Catherine B. Bones, M.S.W., Andrew D. Hackbarth, M.Phil., Donald A. Goldmann, M.D., and Paul J. Sharek, M.D., M.P.H.

ABSTRACT

BACKGROUND
In the 10 years since publication of the Institute of Medicine’s report *To Err Is Human*, extensive efforts have been undertaken to improve patient safety. The success of these efforts remains unclear.
Temporal Trends in Rates of Patient Harm Resulting from Medical Care, 2002-2007
Landrigan, C.P., et al. NEJM 2010; 363:2124-34

The North Carolina Experience

- No significant change in:
  - All Harms
  - Preventable Harms
  - High-Severity Harms

- …whether evaluated by external or internal reviewers
Evaluating Obstetrical Residency Programs Using Patient Outcomes

David A. Asch, MD, MBA
Sean Nicholson, PhD
Sindhu Srinivas, MD, MSCE
Jeph Herrin, PhD
Andrew J. Epstein, PhD, MPP

Context Patient outcomes have been used to assess the performance of hospitals and physicians; in contrast, residency programs have been compared based on nonclinical measures.

Objective To assess whether obstetrics and gynecology residency programs can be evaluated by the quality of care their alumni deliver.


Main Outcome Measures Nine measures of maternal complications from vaginal and cesarean births reflecting laceration, hemorrhage, and all other complications after vaginal delivery; hemorrhage, infection, and all other complications after cesarean delivery; and composites for vaginal and cesarean deliveries and for all deliveries regardless of mode.

Results Obstetricians’ residency program was associated with substantial variation in maternal complication rates. Women treated by obstetricians trained in residency programs in the bottom quintile for risk-standardized major maternal complication rates had an adjusted complication rate of 13.6%, approximately one-third higher than the 10.3% adjusted rate for women treated by obstetricians from programs in the top quintile (absolute difference, 3.3%; 95% confidence interval, 2.8%-3.8%). The rankings of residency programs based on each of the 9 measures were similar. Adjustment for medical licensure examination scores did not substantially alter the program ranking.

Conclusions Obstetrics and gynecology training programs can be ranked by the maternal complication rates of their graduates’ patients. These rankings are stable across individual types of complications and are not associated with residents’ licensing examination scores.
Evaluating Residency Programs Using Patient Outcomes

- 4124 physician program graduates of 107 residency programs

Rate (%) of Major Obstetric Complications by Graduates in their Clinical Practice

![Chart showing the rate of major obstetric complications by quintile of residency program complication rate.](chart)

- Difference remains after correction for USMLE performance
- Excess Risk Δ 33%
  - Q1 vs Q5

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

Asch, DA, et.al., JAMA 2009;302(12):1277-1283. from data in Table 4
One Acetaminophen Tablet Costs 1.5¢.

You Hospital Marks It Up 10,000%

Our $1,000.00 Toilet Seat???
Physician (Faculty) Development Imperative
The GME and CME Challenge

- Informatics
- Genomics
- “Physician Centered” to Patient Centered Care
- Teamwork in Microsystems of Care
- Reduce Cost, Increase Value
- The Quality and Safety Imperative
- The Education/Evaluation Imperative
- The Accountability Imperative
The Professionalism Imperative

• Re-Commit to Professionalism and Altruism

• Re-Commit to Medicine as a Public Trust
The Educational System Imperative

- Rectify Systems that Actively Discourage Effective GME
- Insist on Faculty and Institutional Competence in Patient Safety, Quality Improvement, and Inter-Professional Microsystems of Care
- Drive Faculty Development in Genomics
- Imbed Faculty in Systems that Foster Professionalism
- Accelerate the Incorporation of Deliberative Practice in GME
What Will Drive the Structure and Content of our Residency Programs in the Near Future?

Needs of Patients and the Public

The Required Outcomes in Each Clinical Competency (Milestones)

Design Educational Experiences

Select Faculty

National Evaluation Tools to Track Outcomes

- Formative and Summative
- Clinical Outcomes Tracking (not just counting)

“Deliberative Practice”
“Standardize the Outcomes, Individualize the Education

External Accountability For Outcomes

Expert Physicians who aspire to Mastery (Outcomes)

Guarantees that education has the opportunity to anticipate patient needs, and change in the delivery system

Introduction of New Competencies

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In Closing…. 
Another Thing I Am Sure About…

“The Future ain’t what it used to be!”

Yogi Berra
New York Yankees Catcher, Philosopher
Optimism

“What lies behind us and what lies before us are tiny matters compared to what lies within us.”

Oliver Wendell Holmes
Issues with “Competency Based” Threshold Decisions for Completion of Training


Expert Performance
Continue Deliberative Practice
Continue Complex Cognitive/Associative

Arrested Development
Cease Deliberative Practice
Automated Performance

Everyday Skills
Cognitive/Associative Development
Automated Performance

EXPERIENCE

Performance
Deliberative Practice in the Development of Professional Violinists