Use of Electronic Data for Feedback in Learning and Practice

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1

Who said this and when?

- "I am fain to sum up with an urgent appeal for adopting … some uniform system of publishing the statistical records of hospitals. There is a growing conviction that in all hospitals, even in those which are best conducted, there is a great and unnecessary waste of life … In attempting to arrive at the truth, I have applied everywhere for information, but in scarcely an instance have I been able to obtain hospital records fit for any purposes of comparison … If wisely used, these improved statistics would tell us more of the relative value of particular operations and modes of treatment than we have means of ascertaining at present."

2

Who and when...

- Florence Nightingale, *Notes on Hospitals*, London: Longman, Green, Roberts, Longman, and Green, 1863
  - The first informatician?
- She does have a Web site (and museum in London)
  - www.florence-nightingale.co.uk

3

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Some more recent wisdom

- Stead (2011)
  - Quantity and complexity of information in medicine requires a fundamental paradigm shift as the number of facts per decision rises
- Shortliffe (2010)
  - Focus of medical practice is as much on information as patients, yet we teach much less about it, including its acquisition (electronic health record [EHR], searching) and use (quality, safety)
- Blumenthal (2010)
  - Information is "the lifeblood of medicine" and health information technology (HIT) is destined to be "the circulatory system for that information"

4

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Toward a "continuously learning healthcare system" (Smith, 2012)

- Records immediately updated and available for use by patients
- Care delivered the has been proven "reliable at the core and tailored at the margins"
- Patient and family needs and preferences are a central part of the decision process
- All healthcare team members are fully informed about each other's activities in real time
- Prices and total costs are fully transparent to all participants in the care process
- Incentives for payment are structured to "reward outcomes and value, not volume"
- Errors are promptly identified and corrected
- Outcomes are routinely captured and used for continuous improvement

5

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21st century physicians will interact with data in many ways (Safran, 2007)

- In addition to documentation using the electronic health record (EHR), will need competency in "secondary" uses of data, including
  - Health information exchange
  - Personal health records
  - Quality measurement and improvement
  - Predictive analytics to identify and act upon outliers
  - Clinical and translational research
  - Public health surveillance

6

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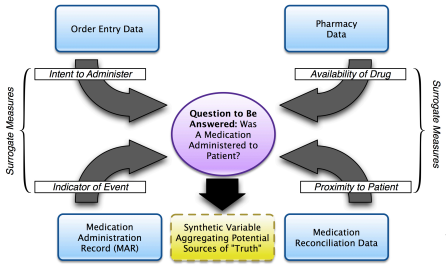
They will need to recognize the limitations of such data

- Caveats (Hersh, 2013)
  - Inaccurate
  - Incomplete
  - Transformed in ways that undermine meaning
  - Unrecoverable for secondary uses
  - Unknown provenance
  - Insufficient granularity



- Recommendations (Hersh, 2013)
  - Adaptation of "best evidence" approaches
  - Processes to evaluate availability, completeness, quality, and transformability
  - Creation of tools to manage data and their attributes
  - Development of methods for comparative validation of data
  - Standardized reporting methods for data and their attributes
  - Appropriate use of informatics expertise

7

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This will require new physician competencies

- In addition to being able to use the EHR and other HIT for patient care, physicians will need to
  - Find and apply the most recent information and best evidence
  - Provide population-based health management
  - Engage patients in their care, including via electronic means
  - Identify patients at risk for complications and/or higher resource use
  - Participate in quality measurement and improvement efforts
- Physicians will need to adapt to having their decisions, performance, activities, etc. monitored

8

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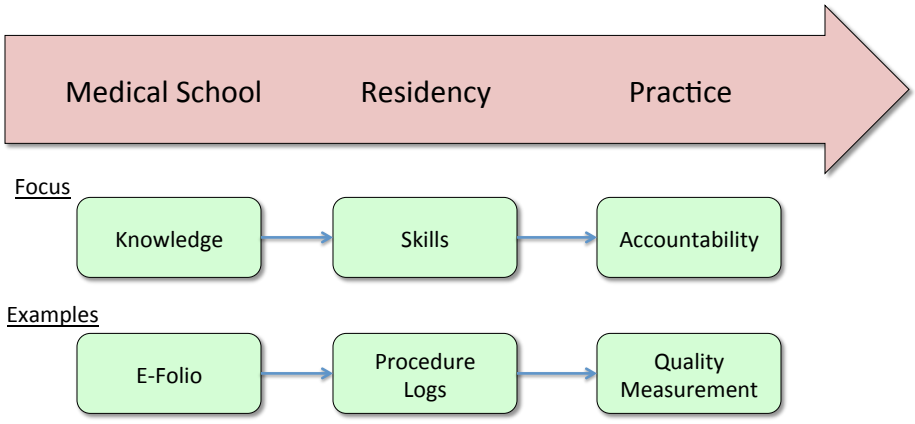
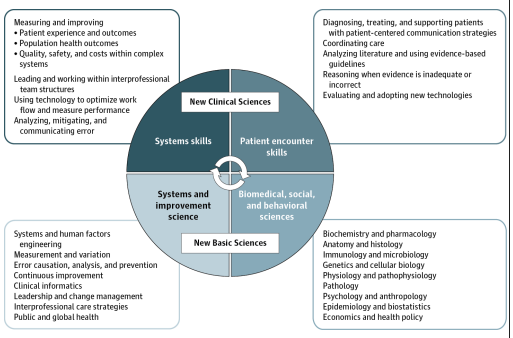
Along the spectrum of electronic data for feedback in learning and practice



9

Requirements for this data-driven future (Lucey, 2013)

- Need "a fundamental reframing of the medical school and residency experience: one in which knowledge and skills in patient-centered, data-driven, collaborative, continuous improvement of clinical microsystems are integrated with and are of equal importance to traditional basic science and clinical skills"



10

Aligning informatics with curriculum transformation

- How and where to integrate into curriculum?
- How to optimize student learning and workflow while maintaining professionalism and patient privacy? (Ellaway, 2013)
- How to align with other competency frameworks, such as ACGME and entrustable professional activities? (Tierney, 2013; Ten Cate, 2013)

11

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Also need to develop capacity in clinical informatics

- Recognized as subspecialty (of all specialties) by ABMS in 2011 (Shortliffe, 2011)
  - Area of biomedical informatics focused on healthcare and individual health (Hersh, 2009)
- Administered by American Board of Preventive Medicine (ABPM)
- Training pathways
  - "Grandfathering" (practice and non-traditional fellowship pathways) through 2018
  - ACGME-accredited fellowships starting in next 1-2 years, required after 2018
- Clinical informatics subspecialists will be members of healthcare team leading use of data and information

12

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