

# Failure to Translate: Why Have Evidence-Based EHR Interventions Not Generalized?

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## Failure to Translate

- Many problems in healthcare are information-related problems
- Some have evidence-based solutions, but these have not generalized well
- How do we move forward?

2



## Then and now, information problems in healthcare well-known

- Safety – IOM “errors report” documented 48-96K deaths per year due to medical errors (Kohn, 2000)
  - Still (Classen, 2011)
- Quality – patients received appropriate care only 55% of time (McGlynn, 2003)
  - Still (Levine, 2016)
- Cost – US pays much more for same or less amount of care (Anderson, 2006)
  - Still (Squires, 2015)
- Access to information – physicians unable to access known information about patients in 44% of ambulatory visits (Smith, 2005)

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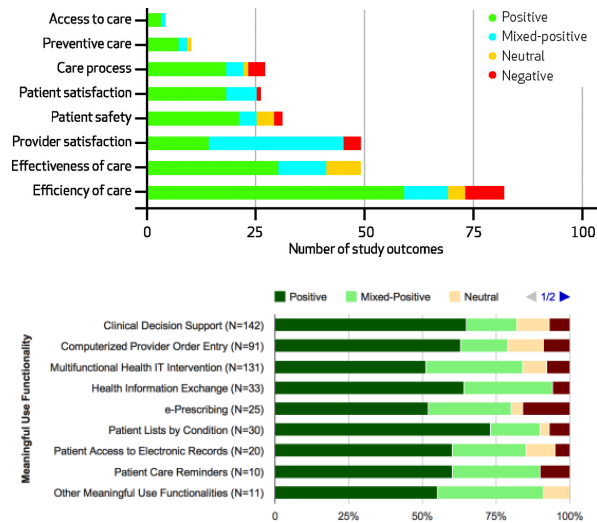
## Early interventions from informatics showed evidence of benefit

- 12.7% decrease in total charges, 0.9 days shorter length of stay (Tierney, 1993)
- Nonintercepted serious medication errors decreased 55%, from 10.7 events per 1000 patient-days to 4.86 events; preventable ADEs were reduced by 17% (Bates, 1998)
- Reduction in redundant laboratory tests (Bates, 1999)
- Improved prescribing behavior of equally efficacious but less costly medications (Teich, 2000)
- Improved use of “corollary orders” by 25% (Overhage, 1997)



## Systematic reviews followed and made evidence-based case for EHRs

- Chaudhry, 2006
- Ammenwerth, 2008
- Goldzweig, 2009
- Buntin, 2011
- Jones, 2014
- Some caveats
  - “Voting”
  - Benefits more likely to come from “HIT leader” institutions
  - Probably some amount of publication bias

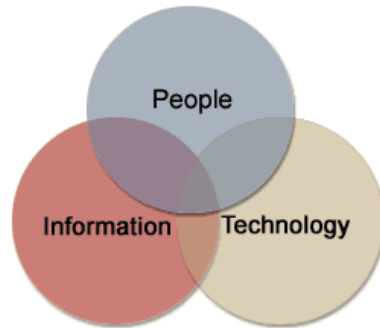


## Why have these evidence-based interventions not generalized?

- Well-intentioned circumvention of EHR function for other purposes
  - Cost reduction – global and local
  - Quality measurement
  - Meaningful use
- Less noble intentioned
  - Volume-based billing
  - EHR vendor pursuit of sales
- Informatics leader institutions impart more than just technology
  - Understand healthcare and IT in context of patients and practitioners
  - Eye to big picture: standards, interoperability, user engagement

# What is the role of informatics?

- Clinical informatics is the field concerned with the optimal use of information, often aided by technology, to improve individual health, healthcare, public health, and biomedical research (Hersh, 2009; Hersh, 2017)
- Large, diverse field, and (for physicians) ABMS-designated subspecialty of all specialties (Detmer, 2014) who understand benefits, limits, and best practices of applying information to health and healthcare



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## Informatics is fundamentally about people

Fundamental Theorem  
(Friedman, 2009) – based on  
“relentless pursuit of assisting  
people”

Goal of informatics is

$$\left( \text{brain icon} + \text{computer icon} \right) > \text{brain icon}$$

Goal is not

$$\text{computer icon} > \text{brain icon}$$

Golden Rule  
(Kuperman, personal  
communication, 2013):

“Never implement unto  
others that which you  
would not implement  
unto yourself”

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Requirement for competence in clinical informatics is not limited to informaticians (Hersh, 2014)

Best to view in context of larger health systems science (Skochelak, 2017; Hersh, 2017)

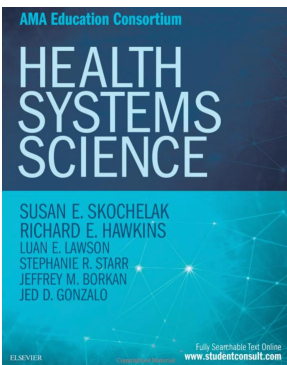


Table 9.2 Competencies in Clinical Informatics for Health Care Professionals

1. Find, search, and apply knowledge-based information to patient care and other clinical tasks	
a. Information retrieval/search: Choose correct source for specific task, search using advanced features, apply results	
b. Evaluate information resources (e.g., literature, databases) for their quality, funding sources, biases	
c. Identify tools to assess patient safety (e.g., medication interactions)	
d. Utilize knowledge-based tools to answer clinical questions at the point of care (e.g., text resources, calculators)	
e. Formulate an answerable clinical question	
f. Determine the costs/charges of medications and tests	
g. Identify deviations from normal (laboratory tests/radiographs/results), and develop a list of causes of the deviation	
2. Effectively read and write from the electronic health record for patient care and other clinical activities	
a. Graph, display, and trend vital signs and laboratory values over time	
b. Adopt a uniform method of reviewing a patient record	
c. Create and maintain an accurate problem list	
d. Recognize medical safety issues related to poor chart maintenance	
e. Identify a normal range of results for a specific patient	
f. Access and compare radiographs over time	
g. Identify inaccuracies in the problem list/history/medication list/allergies	
h. Create usable notes	
i. Write orders and prescriptions	
j. List common errors with data entry (e.g., drop-down lists, copy and paste)	
3. Use and guide implementation of clinical decision support (CDS)	
a. Recognize different types of CDS	
b. Be able to use different types of CDS	
c. Work with clinical and informatics colleagues to guide CDS use in clinical settings	
4. Provide care using population health management approaches	
a. Utilize patient record (data collection and data entry) to assist with disease management	
b. Create reports for populations in different health care delivery systems	
c. Use and apply data in accountable care, care coordination, and the primary care medical home settings	
5. Protect patient privacy and security	
a. Use security features of information systems	
b. Adhere to HIPAA privacy and security regulations	
c. Describe and manage ethical issues in privacy and security	
6. Use information technology to improve patient safety	
a. Perform a root-cause analysis to uncover patient safety problems	
b. Become familiar with safety issues	
c. Use resources to solve safety issues	
7. Engage in quality measurement selection and improvement	
a. Recognize the types and limitations of different types of quality measures	
b. Determine the pros and cons of a quality measure, how to measure it, and how to use it to change care	
8. Use health information exchange (HIE) to identify and access patient information across clinical settings	
a. Recognize issues of dispersed patient information across clinical locations	
b. Participate in the use of the HIE to improve clinical care	
9. Engage patients to improve their health and care delivery through personal health records and patient portals	
a. Instruct patients in the proper use of a personal health record (PHR)	
b. Write an e-mail to a patient using a patient portal	
c. Demonstrate appropriate written communication with all members of the health care team	
d. Integrate technology into patient education (e.g., decision-making tools, diagrams, patient education)	
e. Educate patients to discern quality of online medical resources (e.g., websites, apps, patient support groups, social media)	
f. Maintain patient engagement while using an EHR (e.g., eye contact, body language)	
10. Maintain professionalism through use of information technology tools	
a. Describe and manage ethics of media use (cloud storage issues, texting, cell phones, social media professionalism)	
11. Provide clinical care via telemedicine, and refer those for whom it is necessary	
a. Be able to function clinically in telemedicine/telehealth environments	
12. Apply personalized/precision medicine	
a. Recognize the growing role of genomics and personalized medicine in care	
b. Identify resources enabling access to actionable information related to precision medicine	
13. Participate in practice-based clinical and translational research	
a. Use EHR alerts and other tools to identify patients and populations for offering clinical trial participation	
b. Participate in practice-based research to advance medical knowledge	

## How do we move forward?

- All we have discussed at this conference
  - Practice and IT system redesign
  - Best practices for patient-practitioner-computer triad
  - Practitioner well-being
- Reformulation, especially in context of EHR, of
  - Cost containment
  - Quality measurement
  - Billing via documentation
- Meaningful use – declare victory and go home?
- Leverage informatics experience and expertise