EHR Configuration Challenges and Opportunities

Dr. Dean Sittig
A Socio-technical Model for Safe and Effective HIT Implementation & Use

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How to use a paper towel

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An EHR is not an ATM
SHARP-c Clinical Summarization

- Started with a grand plan

- Quickly realized that there were many obstacles in our path...
  - Data availability and interpretability issues
  - Gaps in computer-readable knowledge bases
  - Limitations of current EHR interfaces
  - No clear agreement on what summarization even meant!

- Didn’t even have the tools – theories or frameworks – to address these sorts of complex, socio-technical problems
Modern healthcare system is a complex adaptive system

- Non-linear and dynamic: does not reach a steady state
- Composed of independent agents whose behavior based on physical, psychological or social rules
- Independent agents are not the same

The Bridge, Spring 2008; 17-25
Modern healthcare system is a complex adaptive system

- Agents are intelligent

- Adaption and change leads to self-organizing behaviors

- Result in systems which are unpredictable and uncontrollable

The Bridge, Spring 2008; 17-25
HIT can improve safety and effectiveness of healthcare.

Randomized clinical trial of pressure-controlled inverse ratio ventilation and extracorporeal CO2 removal for adult respiratory distress syndrome.

A H Morris, C J Wallace, R L Menlove, T P Clemmer, J F Orme, Jr, L K Weaver, N C Dean, F Thomas, T D East, N L Pace, M R Suchyta, E Beck, M Bombino, D F Sittig, S Böhm, B Hoffmann, H Becks, S Butler, J Pearl, and B Rasmusson
8-dimension Socio-Technical Model of Safe & Effective EHR Use
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- Content
- Hardware & Software
- User Interface
- Personnel

JAMA 2009; 302(10):1111-3
Quality & Safety in Healthcare 2010; 3:i68-74
8-dimension Socio-Technical Model of Safe & Effective EHR Use

- Workflow & Communication
- People
- User Interface
- Content
- Hardware & Software
- JAMA 2009; 302(10):1111-3
- Quality & Safety in Healthcare 2010; 3:i68-74
8-dimension Socio-Technical Model of Safe & Effective EHR Use

Organizational Policies, Procedures, & Culture

Workflow & Communication

User Interface

Content

Hardware & Software

People

JAMA 2009; 302(10):1111-3
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8-dimension Socio-Technical Model of Safe & Effective EHR Use

- Organizational Policies, Procedures, & Culture
- Workflow & Communication
- User Interface
- Content
- Hardware & Software
- People
- External Rules & Regulations

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8-dimension Socio-Technical Model of Safe & Effective EHR Use

Organizational Policies, Procedures, & Culture

Workflow & Communication

People

Measurement & Monitoring

Hardware & Software

Content

User Interface

External Rules & Regulations

JAMA 2009; 302(10):1111-3
Quality & Safety in Healthcare 2010; 3:i68-74
Clinical Summarization

- A key unaddressed Grand Challenge in clinical informatics
- Requires multiple steps, each with major socio-technical obstacles:
  - *Aggregate* – data interchange standards / HIPAA / organizational resistance
HL-7 Reference Information Model
Clinical Summarization

A key unaddressed Grand Challenge in clinical informatics

Requires multiple steps, each with major socio-technical obstacles:

- **Aggregate** – data interchange standards / HIPAA / organizational resistance
- **Organize** – problem – medication knowledge bases / user interfaces
- **Reduce / Transform** – clinical knowledge of key concepts
- **Interpret** – clinical knowledge / FDA regulations?
- **Synthesize** – knowledge re: combining data / FDA regulations? / clinician resistance
Clinical Summarization

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- Failure to address this challenge is NOT an option

- Require long-term commitment using a socio-technical approach

Thank you!

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