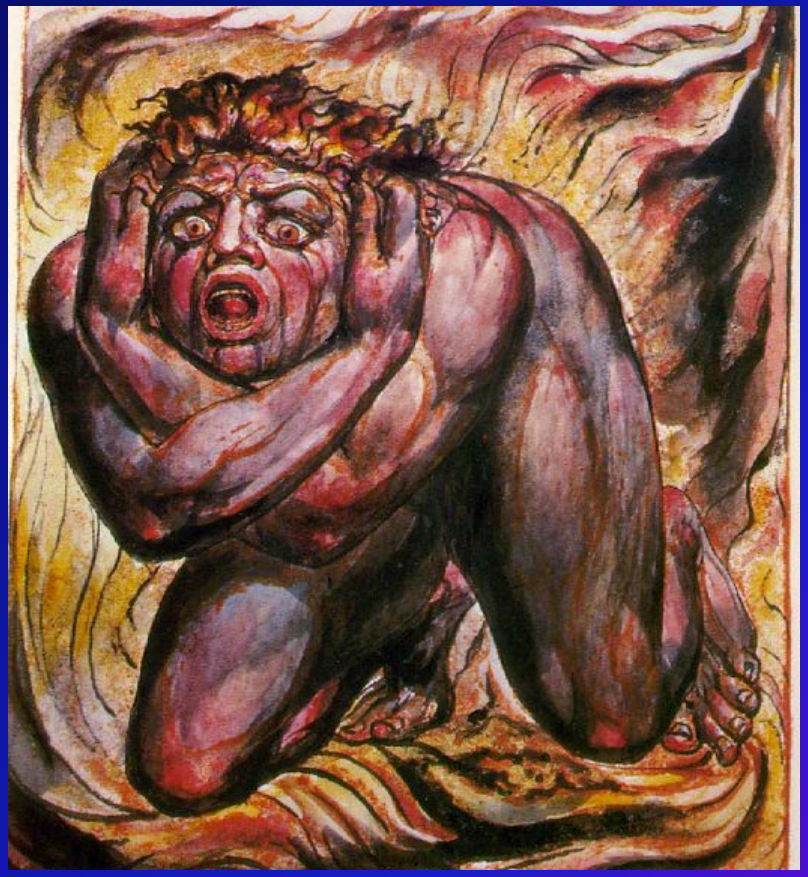
# Electronic [Medical, Patient, Health] Records

Richard Rathe, MD
University of Florida

# The Bad News

It appears we have an impossible task!



# The Good News

Let’s redefine the task!

Learn to think like an Informatician…

# Terminology

Start with Paper Medical Records

Computerized vs Electronic

Medical vs Patient vs Health vs Personal

Depends on your point of view!

# A Working Definition

## Electronic Health Record (EHR)

Record = A formal record of care.

Health = Concerns both the biomedical and the psychosocial functioning of human beings.

Electronic = Broadly defined, includes computers, networks, smart cards, and associated paper documents.

# What's Left Out?

Communication

May be key function for clinicians!

Social Construct/Social Contract

Users work within a social context.

Process

Does not address quality or optimization.

Computers can easily make things worse!

# An Example

Problem: In an ambulatory clinic, new lab results and follow-up such as repeat mammograms are falling through the cracks.

Solution: An automated alert system?

Right?

# Cedars-Sinai Experience

Not so fast…

...the biggest complaint -- with potentially dangerous implications -- involved the automatic alerts that flashed on the screen every time a doctor made an out-of-the-ordinary request. Designed to catch errors before they occur, the alerts became an unending series of questions, reminders and requests on fairly basic decisions.…

# A Simpler Solution?

Bottom Line: Any automated reminder system must either a) be as simple to use as an accordion file or b) add significant value for the folks who have to use it.

# What’s Going On Here?

“Norman’s Law”

A major problem occurs when those who suffer from technology's deficits and those who benefit are not the same people.

Donald Norman, Usability Expert

# What's Going On Here?

"Horky's Law"

We generally deploy computers because we want to control something [or somebody!].

Ralph Horky, Hospital VP

# Learning from Failure

Ambulatory Example

1996 article describes a $500K mistake. Users elected to enter bogus information just to "make the system happy" so they could get their work done.

Inpatient Example

In 2003 Cedars-Sinai Medical Center withdrew a computer-based physician order entry system because it was too disruptive and too slow for clinicians to use.

Error Reduction

2005 U Penn study found that computerization did decrease certain types of errors, but it introduced entirely new classes of errors that hadn't been anticipated.

# Learning from Failure

"There are two possible outcomes:

If the result confirms the hypothesis, then you've made a measurement. If the result is contrary to the hypothesis, then you've made a discovery."

- Enrico Fermi

# Big Themes

- Structure vs Free Text
  - Coding and Classification
  - Role of Paper?
    - Computers create more paper, not less!
- Direct Input vs Proxy Input vs Data Capture
- Scope? How much to include?
- Distributed vs Federated vs Monolithic

# Structure vs Free Text

The Ideal

Information is recorded systematically and precisely using a single term for each concept.

The Reality

Humans communicate with sentences and paragraphs, language is ambiguous, terms go in and out of favor, etc.

# Structure vs Free Text

A not so recent example…

Barnett GO, Winickoff R, Dorsey JL, et al

Quality assurance through automated monitoring and concurrent feedback using a computer-based medical information system.

Med Care. 1978 Nov;16(11):962-70.

Describes the COSTAR system.

# Input / Data Capture

Ideal: Direct data entry by the person who is responsible for it.

Reality: Data entry is often delayed and done by a proxy.

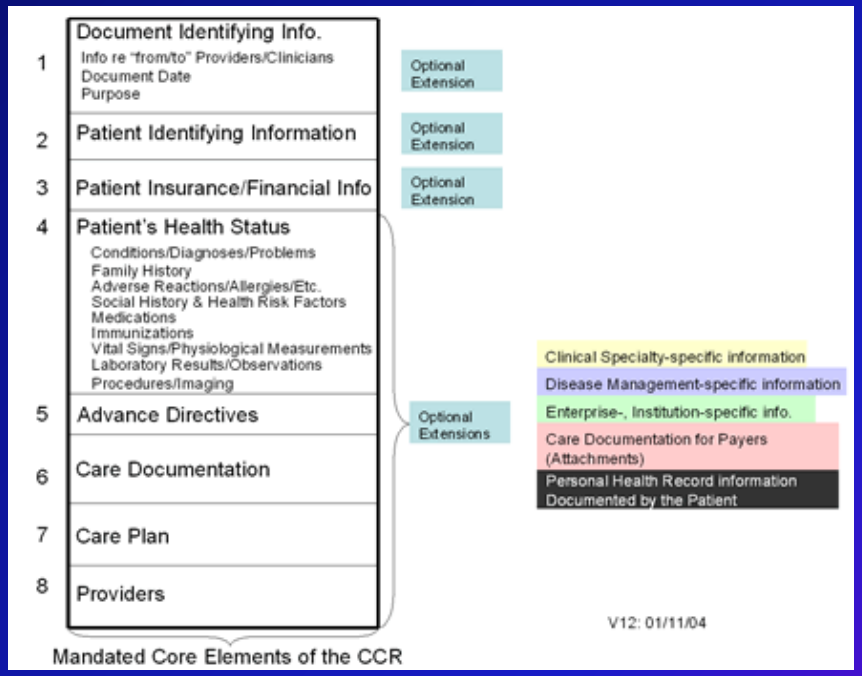
Reality: Data entry is time consuming and clinician time is valuable.

Example: Cost of transcription transferred from a hospital to the radiologists working there.

# Scope?

Collecting Everything vs The Minimal Necessary

Example: The Continuity of Care Record




www.continuityofcarerecord.org

# Architecture

Distributed (from many, many)

Federated (from many, one)

Monolithic/Repository (THE ONE!)

Most real systems are a mixture.

# Take Home Ideas

1. EHRs are not just computerized paper medical records:

   Clinical/Economic/Political Aspects

   Definition Varies by Point of View

   The more interesting aspects have less to do with record keeping and more to do with process improvement.

# Take Home Ideas

2. Good intentions are often overwhelmed by one or more of the "big problems" faced by those who implement EHRs:

Data Capture Hurdles

Misalignment of Work/Benefit

Garbage In/Garbage Out

Lack of Standards

Unintended Consequences are Everywhere!

# Take Home Ideas

3. Use “Grudin’s Razor” to see more clearly:

When those who benefit [from a technology] are not those who do the work, then the technology is likely to fail or, at least be subverted.

Jonathan Grudin, Interface Researcher

# Take Home Ideas

4. Consider Norman's Four Efficiencies:

Does a proposed innovation allow someone to:

1) Do more in less time?
2) Increase the diversity of what is done?
3) Communicate with others?
4) Transform the work process itself?

# Take Home Ideas

5. Should systems be modified to fit users needs, or should users change to fit the systems' needs?

We hope for the former.

We generally get the latter.

Thank You!

rrathe@ufl.edu