

Electronic Health Records: Where are we now?

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Evolution of Clinical Computing @ BIDMC

Acid-Base Therapy Advisor
Patient-Computer Dialogue
CCC System (ADT, Labs, Rx, Lookup, Security) Hospital Information System
Hospital Email
PaperChase – Self-service bibliographic retrieval
CCC to BWH including financials
ClinQuery – Self-service searching of clinical data
BeWell – Employee health risk appraisal
Online Medical Record (OMR) – Electronic Health Records
Knowledge-based Guidelines
CareWeb – secure internet medical records
Baby CareLink – telemedicine
Cancer CareLink
PatientSite – Personal Health Records
ED Performance Dashboard
Physician Order Entry
Web-based OMR



Why is health IT hard?

- Doesn't solve the physician's problem
- Little attention to workflow
- Introducing technology is disruptive
- Benefits accrue to others
- Incentives are misaligned
- Lack physicians and nurses with informatics training



Disruptive Technology

- *Clinical IT Systems* are designed to be:

- Objective
- Rational
- Linear
- Solitary
- Single minded

Document & Bill



- *Clinical Work* is fundamentally:

- Interpretative
- Multitasking
- Collaborative
- Distributed
- Opportunistic
- Reactive
- **Interrupted frequently**



Tasks

Computing systems can help with clinical and administrative tasks

So does automating prescription writing help and who?



Total Prescriptions* (U.S. Millions)

Chain Stores	1,811.0
Independent	779.7
Food Stores	469.6
Long-Term Care	245.2
Mail Service	213.9
Total U.S. Market	3,519.4



*Source: IMS Health, National Prescription AuditTMPlus, 1/2005

Does it take more time or less time to eRx?



Steps in electronic prescribing

- Find a computer or PDA
- Authenticate yourself
- Identify the patient
- Pick the drug, dose, route, frequency & duration
- Decision Support (drug drug interaction)
- Pick the pharmacy
- Get authorization from payer
- Confirmation
- Signature



Mix a tablespoonful with a tablespoonful of water three times a day after meals



What is the Cost of 1 Second?

- 3,519,400,000 seconds
- 58,656,667 minutes
- 977,611 hours
- 40,734 days
- 470 full time physicians for 1 year
- \$78,208, 888



20 min per physician per day

*handwritten prescription events took fractionally less time than e-prescription events (adjusted mean difference 12.0 seconds (CI -1.6, 25.6))
Hollingsworth et al. JAMIA 2007;14:722-30



What do we know about Electronic Health Records?



Pharmacy Savings with EHR

- 20% reduction in total costs
 - ♦ Plan specific formulary compliance
 - ♦ Correct Rx the first time
 - ♦ Time savings on refills
 - ♦ No call backs from pharmacist
 - ♦ Point of care interaction assessment
 - ♦ Decreased ADEs by 55% (Bates JAMA 1998)
 - ♦ Improved utilization review



Operational Savings with EHR

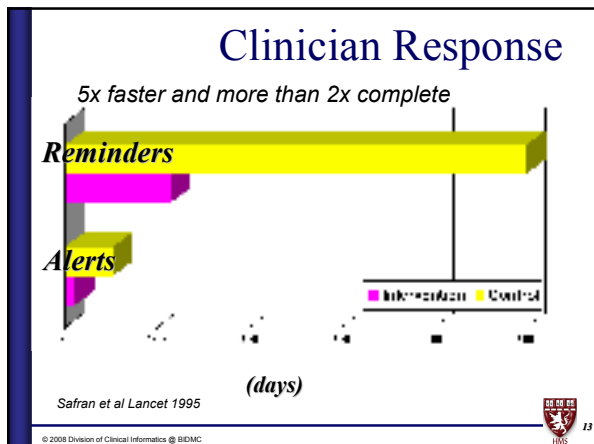
- 10% reduction in overhead costs
 - ♦ Medical record personnel down 50%
 - ♦ Transcription costs down 20-50%
 - ♦ Clinical personnel time savings 15%
 - ♦ Malpractice costs down 5%

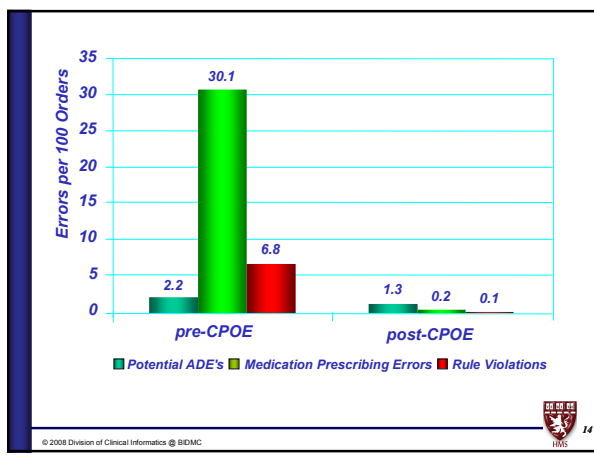


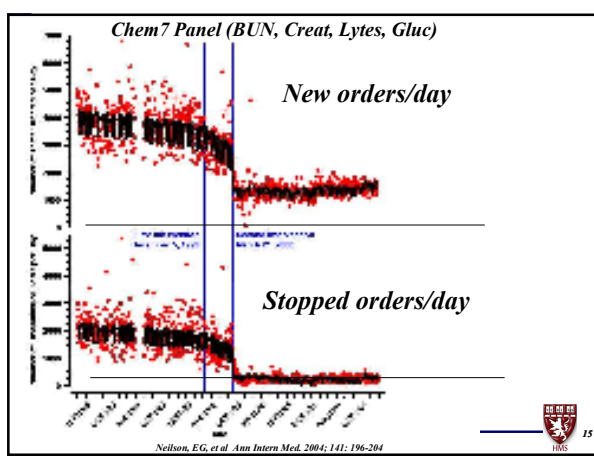
Clinical Savings with EHR

- Improved longitudinal disease management
- Reduce admissions caused by adverse drug events
- Eliminate unnecessary duplication caused by unavailable results/records









Information Technology

Intended	Unintended
↑ Quality & Safety Rind DM et al. Arch Int Med 1994; 154:1511-17	↑ Mortality in ICU Han, YY et al. PEDIATRICS 2005; 116:1506-12
↑ Adherence & Timeliness Safran et al. Lancet 1995; 346:341-6	↑ Tests & ↑ Time in ED Roukema J et al. JAMA 2008; 15:107-13
↓ Medication Errors Bates et al. JAMA 1998; 280:1311-16	↓ Time with Patients Hollingworth W et al. JAMA 2007;14:722-30



Transformation

Making the current healthcare system more automated will not fix its problems.

An electronic **paper** record is not the solution



Research means to **look again**

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