Patient Management Systems

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Background Interests

- Interest in clinical informatics with training in pharmacy, medicine and medical informatics and currently a practicing physician in the Veterans Administration system (17 year training program)
- Inspired to do medical informatics after a summer pharmacy internship in the pharmaceutical industry
- Interest in use of information technology to improve medication safety
- Prior work in IT consulting—data reporting for a managed care organization
- Involved in implementation of computerized provider order entry in a major integrated hospital/clinic (Mayo Arizona)
- Interest in patient management systems with prior experience as a clinical user in pharmacy and medicine, development and evaluation of a patient monitoring system (lung transplant), use of secondary data for surveillance applications and evaluation of HIT for its effect on quality

Patient Management Systems

- Definition: Any tool used to assist in the delivery of clinical care from the point of care initiation to completion
- Tools include paper-based systems, telecommunications capabilities, health care organizations and information technology systems
- Will focus primarily on the use of health information technology (HIT) systems and their potential to improve care delivery and their historical evolution in the US
- Identify potential impacts of major recent legislation to effect implementation and use of health information technology

Patient Management Systems

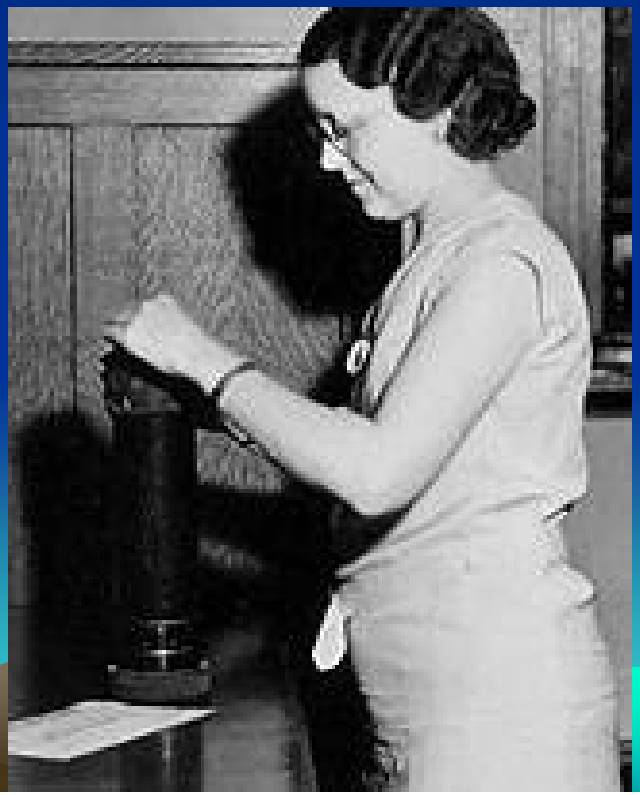
- Revolve around clinical encounters and charts
- Historically limited role for documentation
- Limited Treatments and Diagnostics
- With growing medical complexity came the need for effective documentation
  - Billing
  - Professional Communications
- Medical Legal document

Development of Documentation

- Part of slow evolutionary process
- Plummer Chart at Mayo—one of early efforts to create and maintain a clinical database
- Designed a “dossier” archive
  - First Exam
  - Provider Notes
  - Admission and discharge information
  - Laboratory and Radiology report information
  - Summary of problems and visit on cover (index)

Clinical Charts (paper)

- Problems with paper chart
  - Only one copy—emergent consult problem
  - If not immediately available—as if it never existed (even if cost $20k)
  - Lost components
  - Privacy-no tracking
  - No decision support
  - Legibility
  - Getting the chart (timing)->



Paper Chart Advantages

- One stop source of information
- Quicker to document information (sometimes)
- Ability to integrated shortcuts and abbreviations (fishtails and X's)(Neuro exam)
- Ease of use—WYSIWYG—limited training requirements except the black arts of chart and data hoarding (Informatics solutions?)

Information Technology Revolution

- Historical trend of new technical capabilities and rapid advancement in computing power paralleling advancing medical technology
- Enticing enough for many industries to buy mainframes and then later minicomputers and microcomputers
- Increasing computing power and lower costs led to increasing use of the microcomputer (PC) and decentralization
- Many industries adopting IT and making changes in workflow and enhancing efficiency

Information Technology in Health Care

- Health care slower to adapt general IT applications
- Billing was on paper—check boxes and put a number on the bill—each specific to an insurance company
- Key IT solution was fast and detail oriented clerks to avoid insurance rejections
- Creation of Medicare created a large pool with a single payor in common and corresponding billing system in common
- Need for review of billing process

IT Application Development

- Primarily focused on billing
- Mix of home built versus vendor purchased software
- Early mainframes and minicomputers only useful for hospital practices given the high costs of purchase and significant need for support
- Once mainframes in hospitals people began to get creative

First movers in HIT

- Costar system in Boston at Harvard (1968)
- HELP—Health Evaluation through Logical Processing at Intermountain Health Care/Latter Day Saints Hospital in Salt Lake City
- Regenstrief Electronic Medical Record
- CPRS—Computerized Patient Record System—in Department of Veterans Affairs

Changing Focus of HIT

- Started in 1970s on large mainframe systems primarily as tools for billing
- Later development of minicomputer based systems in departments tied to mainframe
  - Radiology
  - Pharmacy
  - Laboratory
- HIT historically started with information systems of a hospital but later also includes health systems and clinics
- What is HIT?

HIT Components

- Patient Identification Component
- Scheduling
- Admission Discharge and Transfer
- Electronic Medical Record (EMR)
- Medical Records administration
- Intensive Care and Operating Room systems
- Pharmacy
- Radiology and Picture Archiving and Communication Systems (PACS)
- Pathology and Lab Systems
- Billing and Financial
- Practice Management, messaging, security, etc

HIT Record Keeping

- Data collected in hospital stay can be voluminous and multifaceted
- Use HIT to provide repositories of information
- Mechanism to do reporting—for current and future needs
- Tracking of tests and orders—radiology, pathology and laboratory—Bar code ex.
- First major application was storing data for patient billing

Communication and Integration

- Information systems provides common link for divergent medical specialists, nurses, technicians, etc
- Goal is to have all relevant information available—key advantage to electronic system is ability to have immediate access to more than one copy **key productivity gain**
- Potential for geographically disparate data sharing—potential for cost savings to system (and patient)
- Common interface allows for enterprise messaging and alerts for clinical and logistical needs (Ex. Critical data, Appointment availability, traffic alerts, down time, bed needs)

Surveillance

- Many patterns in medicine are predictable and need action plan
  - Blood cultures turning positive
  - Critical laboratory values
  - Concerning radiological findings
- Use of artificial intelligence systems for decision support and also for data surveillance
  - Sweep system for relevant data
  - Report data out for needed action and decision support
  - Order entry and clinical result alerts
  - Preventive medicine needs (Cancer screening)

HIT Implementation Trend

- Certain components very high market penetration—radiology, pharmacy, lab
- Others—limited—computerized provider order entry, decision support
- Historically—off the shelf product purchased as “best of breed”
- Several problems ensued—mainly workflow and compatibility

HIT Implementation Trend

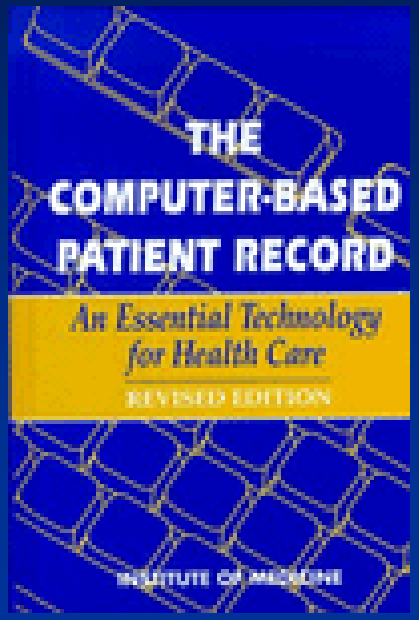
- Change to integrated purchasing
- Goal to have best suite of products
- Tradeoffs
  - Not have the best individual components
  - Need to change from prior systems
    - Reimplementation
    - Loss of backward compatibility
- Advantages
  - Less need for local customization and implementation
  - Simplified support infrastructure and maintenance
- Potential to drive industry consolidation

Adoption is slow but steady

- Keys to implementation success:
- A thorough analysis of clinical workflow
- Define the key problems to address
- Get early and active involvement of providers
- Anticipate how HIT affects workflow
- Identify how care delivery is enhanced
- Define a long-term budgetary plan for deployment
- Get administrative commitment for deployment
- Understand the limitations of current technology

Ubiquitous HIT/EMR will be adopted (someday)

- Institute of Medicine—First published in 1991 with update in 1997
- Predicted in 1991—we will have widespread use of electronic HIS/EMR by 2001
- Reiterated in 1997 but identified need for greater national effort with goal in 5 years
- Now in 2009 the Obama Administration has a target of 2014—Good luck...



http://www.nap.edu/books/0309055326/html/index.html

What is the current HIT landscape?

Does it work?

Does HIT Effect Care Quality?

- Evaluation of the effect of health information technology on clinical quality measures
- Expectation that health information technology implementation improves clinical care
- Use of Health Quality Alliance measures to assess for care quality (national data set)
- Assess the types of information system in place around the country (HIMSS Analytics survey data)
- Preliminary results…

US System and HIT

- Great deal of overall fragmentation of types of systems used.
- Growing trend of consolidation to single provider solutions vs (inpt and outpt)
- Limited use the higher order function that are most likely to have an impact: decision support, alert system, surveillance systems, order entry
- Growing data on quality improvement associated with HIT
  - Specific measure improvements
  - Aggregate positive effect
- New national policy initiatives may help…

2009 Stimulus Bill

How to spend 800 billion dollars

Federal Stimulus Package

- Significant potential impact on patient management systems with goal of universal EMR by 2014.
- 58/407 pages in stimulus bill
- Significant authority to National Coordinator
- 1 year to review and provide substantial new recommendations if needed

Federal Stimulus Package

- 19.2 billion in spending
- 17.2 billion for implementation of “certified” electronic health record (EHR)
  - Question of definition of certified EHR
  - Tiered payment—first movers get more $
  - Need to provide interconnectivity
  - Provide quality measures

Federal Stimulus Package

- $2 Billion for Office of National Coordinator
  - Money for development of regional health information organizations
  - Establish best practices on adoption, deployment and use of HIT
- State grants to facilitate HIT
- Integrate EHR into clinical education
- Restrictions on data disclosures and sale of health information to minimal data sets

Federal Stimulus Package

- Other goals of implementation
  - Reduce health care costs
  - Improve clinical decision making
  - Improve clinical care coordination
  - Facilitate research
  - Reduce health disparities
  - Improve identification and response to public health threats
  - Promote competition and choice
  - Establish chief privacy officer
- Major goals to achieve

Questions?