The Electronic Medical Record and the Practicing Physician: an Oxymoron?

Carol Steltenkamp, M.D., MBA
Chief Medical Information Officer
KENTUCKY 2010
FEI WORLD EQUESTRIAN GAMES
Objectives

- Discuss the role of the Electronic Medical Record (EMR) in the office setting
- Identify what to look for in an EMR
- Review implementation challenges and understand post-implementation outcomes
Clinical Mission: Ambulatory

- A multispecialty group practice providing primary & specialty care
- 106 Best Doctors
- 80 specialized clinics, 150 outreach programs
- Provide services primarily in Lexington and Central and Eastern Kentucky
- 400,000+ outpatient visits (2007) at main campus locale
- Greater than 1 million outpatient visits across the Enterprise
Clinical Mission: Inpatient

- >800 beds
- >35,000 discharges
- Level 1 Trauma Center
- Centers of Excellence in Cardiology, Oncology, and Neurosciences
- Kentucky Children’s Hospital
Research Mission

- $127.5 million grants & contracts awarded at UK College of Medicine*;
- $62.8 million in NIH funding
- UK’s medical center colleges account for more than 55% of UK total research dollars
- Research figures prominently in quest for Top 20 status

*2007
Educational Mission

- Six colleges:
  - Medicine
  - Nursing
  - Pharmacy
  - Dentistry
  - Health Sciences
  - Public Health

- 1000 clinical faculty
- 500 physicians in residency
WHY Health Information Technology (HIT)?

- Implementation of HIT is proposed as a way to provide additional information to clinicians to facilitate a reduction in serious medical errors, rising healthcare costs and system inefficiencies. (Thompson, 2004)

- Estimate annual $10.6 billion outpatient savings and $31.2 billion inpatient savings based on HIT efficiency benefits (Girosi, Meili, & Scoville, 2005)

- President Bush State of the Union “we make wider use of electronic records and other HIT, to help control costs and reduce dangerous medical errors (Jan 2006)
Problem: Increased Costs

- In 2003, U.S. health spending per capita was $5,635, ~ two and a half times more than the comparable median for industrialized countries ($2,280 per capita). 15% of US GDP was spent on health care in 2003; other countries median was 8.4% (Anderson et al, 2005)

- Higher medical care prices make health care unaffordable for many Americans, yet the extra dollars spent are not yielding demonstrably better quality of care or patient satisfaction. (Gerard et al, 2005)

- U.S. spends 2.1 times as much on healthcare as Canada, France, Germany, Italy, Japan and the United Kingdom.

- Healthcare spending grew “faster than growth in both the aggregate economy and employee compensation, which suggests an increasing burden on sponsors and employers” (Smith et al., 2005, p. 193).
Problem: Information Explosion

- If only 1% of new literature in Medline is healthcare related, if the clinician reads 2 articles daily for a year, they will be 5 years behind the current state of knowledge. (Masys, 2002)

- Medline indexes >560,000 new articles, and Cochrane Central adds 20,000 new randomized trials annually

- ~ 1500 new articles and 55 new trials per day (Glaszious and Haynes, 2005)
Institute of Medicine

“despite more than 30 years of work and millions of dollars, patient care records are predominantly paper, which limits tools for effective decision-making from the bedside to national healthcare policy” (IOM, 1991).

“ A highly fragmented delivery system that largely lacks even rudimentary clinical information capabilities results in poorly designed care processes characterized by unnecessary duplication of services, and long waiting times and delays.” (IOM, 2001)

Medical errors, rising healthcare costs, and quality problems are cited as widespread issues that need to be addressed (Institute of Medicine, 2001)
The IOM presented eight core functions that should be provided in an electronic health record:

- health information and data
- results management
- order entry/management
- decision support
- electronic communication and connectivity
- patient support
- administrative support reporting
- population health management (Institute of Medicine, 2003).
Current Issues in Ambulatory Care

- Inability to find critical information quickly
  - 30% of physician time spent searching, up to 81% of time information is still not found in record. JAMA

- While quality of care is improving, ambulatory care shows the least overall improvement (1.4% between 2003 and 2004). AHRQ
Better Information = Better Quality

Example: VA vs Best Performers on Quality

<table>
<thead>
<tr>
<th>Year</th>
<th>Any EMR</th>
<th>Comprehensive EMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>18.2</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>20.8</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>23.9</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>29.2</td>
<td></td>
</tr>
</tbody>
</table>

NOTES: EMR is electronic medical record. Trend for “Any EMR” is significant. “Any EMR” is medical records that are either fully or partially electronic. Comprehensive EMR system includes four minimum features: computerized orders for prescriptions, computerized orders for tests, test results (lab or imaging), and clinical notes. Includes nonfederal, office-based physicians who see patients in an office setting. Excludes radiologists, anesthesiologists, and pathologists.


Detailed features of electronic medical record systems were not included in the 2003–2004 surveys.

NOTES: EMR is electronic medical record. Trend for “any EMR” is significant. “Any EMR” is medical records that are either fully or partially electronic. Comprehensive EMR system includes four minimum features: computerized orders for prescriptions, computerized orders for tests, test results (lab or imaging), and clinical notes. Medical practices were estimated using a multiplicity estimator (See reference 4 for details). Medical practice estimates were based on nonfederal, office-based physicians who see patients in an office setting. Excludes radiologists, anesthesiologists, and pathologists.

Percentage of physicians using electronic medical records and using comprehensive electronic medical record systems by practice size: United States, 2006

NOTES: EMR is electronic medical record. Both trends are significant. "Any EMR" is medical records that are either fully or partially electronic. Comprehensive EMR system includes four minimum features: computerized orders for prescriptions, computerized orders for tests, test results (lab or imaging), and clinical notes. Includes nonfederal, office-based physicians who see patients in an office setting. Excludes radiologists, anesthesiologists, and pathologists.

Estimated Percentage of Office-Based Physicians Using Selected Electronic Medical Record (EMR) Features

National Ambulatory Medical Care Survey, United States, 2006

Based on responses from 1,311 office-based physicians, excluding radiologists, anesthesiologists, and pathologists.
Percent distribution of physicians planning new or replacement electronic medical record systems within next 3 years by whether current system is fully or partially electronic: United States 2006

NOTES: Includes nonfederal, office-based physicians who see patients in an office setting. Excludes radiologists, anesthesiologists, and pathologists.
Barriers to Adoption

- Capital costs*
- Not finding a system that meets their needs*
- Uncertainty about return on investment*
- Concern that a system would become obsolete*

DesRoches, et. al., NEJM, July 3, 2008
Facilitators of Adoption

- Financial incentives for purchase
- Payment for use of an electronic records system
- Protecting physicians from personal liability

DesRoches, et. al., NEJM, July 3, 2008
Effect of Adoption of Electronic Health Records Systems

DesRoches, et. al., NEJM, July3, 2008
QuickStats: Estimated Percentage of Office-Based Physicians Using Selected Electronic Medical Record (EMR) Features* --- National Ambulatory Medical Care Survey, United States, 2006
Case for Change
If you can read it, how long did it take you to decipher the handwriting?
A Moment in the Physician Office

While promoting medical quality and E/M compliance, in **15 minutes MD must be able to:**

Perform and complete documentation of a medically indicated, audit-proof, level 4 or level 5 initial patient visit with individualized narrative information in all appropriate areas of the medical record including completion of counseling the patient, ordering tests, ordering treatment, and charge entry.
The Cost/Benefit Ratio

**Costs**
- Cash outlay
- High *initial* physician time and decreased patient volume

**Benefits**
- Improved quality of care
- Improved throughput
- Charge capture

An Equal Opportunity University
Getting Started

- Announce the goal—even if it’s ambitious
- Test big ideas on a small scale
- Find best practices and use them as measurements (internal and external)
- Build the discipline and methods of Project Management into the work

Together with the progress in medicine, which provides for an earlier diagnosis and intervention, healthcare information technology for process optimization will be the prerequisite to further improve the quality of care while reducing costs.
EMR Barriers

- Implementations are costly
  - Start up, maintenance, workflow changes
- Organizational influences
  - Level of integration - what user wants globally vs what user expects personally
  - Types of practices
  - Leadership
- High initial physician time
  - Customization

Miller & Sim. Physician’s Use of Electronic Medical Records: Barriers and Solutions. Health Affairs. Vol 23, No 2
Why the reluctance by clinicians to adopt IT systems

- May partially be a generational issue
- Main reason may be that so far EMR has not delivered time savings for physicians and nurses, in fact, in many circumstances when not fully deployed, costs time
- Main justification may be in addressing cost, quality and safety issues
Busy Building the Core

- Smart Pumps
- CPOE
- Handheld PDA
- Clinical Documentation
- PACS
- Clinical Decision Support
- Single Sign-On
- Electronic Medication Administration Record (eMAR)
- Pharmacy Automation
- Remote Monitoring
- Wireless Technology
- Speech Recognition

Source: Clinical Advisory Board interviews and analysis.
Leadership, Communication, and Training

- Dealing with smaller staffs
- Cooperation and input by all is a ‘must’
- Just-in-time training
Current State Workflow

- Customization for clinics is Key - filters, lists, etc.
- Role identification
- Maximize efficiency and clinician focus while patient is in clinic.
- More chronic, episodic care in clinic
Patient Focused Interaction

- Schedule appointment
- Register
- In room
- Patient/clinician encounter
  - Clinical Documentation
  - Immunizations
  - Pharmacopeia
- Check-out
Scheduling and Arrival

- Patient self-scheduling
- Registration
- Completion of intake information
## Tracking Board

### Sunrise Clinical Manager

![Image of Tracking Board](image)

### Status Board

<table>
<thead>
<tr>
<th>Department</th>
<th>View</th>
<th>Refreshing...</th>
<th>Completed Successfully at 19:22</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGHR</td>
<td>Clinic View</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Active Patients: 0  Waiting Room: 0

<table>
<thead>
<tr>
<th>Location</th>
<th>Patient</th>
<th>Appit Time</th>
<th>Check In</th>
<th>Pry Appit</th>
<th>US Appit</th>
<th>NST Appit</th>
<th>Gen Appit</th>
<th>Diab Appit</th>
<th>OB Nurse Visit Reason</th>
<th>Comment</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGHR</td>
<td>DGHR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DGH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DGH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DGH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DGH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DGH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Settings

- Refresh
- Personnel Assignment
- Apply Shift
- Find Patient
- Add Patient
- Triage

### Ready

- Johanek, Carol L (Attending)

### Start Menu

- Programs
- Sunrise
- CHARTS
- Microsoft
- Search Desktop
- Time: 6:27 PM
In Room

- Not all “clinicians” are created equal
  - What type of data entry
  - Considerations about data validity
- Not all patients or clinicians are comfortable with computer in room
- Match hardware to clinician job
Patient/Clinician Encounter

- Clinical Documentation
- Patient Care Orders
- Pharmacopeia
  - Immunizations
  - Medications
  - Prescriptions
- Check-Out
Clinical Documentation

- Phone note(s)
- Dictation/transcription or clinical documentation
- Copy forward
- Ability to access other clinical data
- Attestation statements
Clinical Documentation

I can type anything in this text box.
Clinical Documentation
### Review of Systems

<table>
<thead>
<tr>
<th>Section</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Skin/Breast</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Ophthalmologic</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Ears, Nose, Mouth, Throat</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Respiratory and Thorax</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>non-contributory</td>
</tr>
<tr>
<td></td>
<td>unobtainable due to...</td>
</tr>
<tr>
<td></td>
<td>positive...</td>
</tr>
<tr>
<td></td>
<td>not asked</td>
</tr>
</tbody>
</table>
Automated Expansion of Note
Output of Structured Note

27-May-08 18:48 BGHR08 Diabetic Evaluation Note Qlayun, Jennifer R (Nurse)

Problem List

SMA, age 40, 19-May-2008 / Active
Chronic Illness

Type 2 DM: 19-May-2008 / Active
Chronic Illness

Home Medications

One Touch Ultra Test strips: Active
Quantity: 0 Refills: 0

Novolog 100 units/mL subcutaneous solution: Active
8 units subcutaneous 3 times a day x 30 days. Do not drink alcoholic beverages when taking this medication.
Keep in refrigerator. Do not freeze.
Obtain medical advice before taking any non-prescription drugs as some may affect the action of this medication.
Quantity: 1 Refills: 0

Lantus 100 units/mL subcutaneous solution: Active
10 subcutaneous 2 times a day x 30 days. Do not drink alcoholic beverages when taking this medication.
It is very important that you take or use this exactly as directed. Do not skip doses or discontinue unless directed by your doctor.
Keep in refrigerator. Do not freeze.
Quantity: 1 Refills: 0

Allergies

- No Known Allergies
Attestation Statements

UK Physician Attestation Statements In the SoftMed Transcription Platform

- I was present for the key portions, which were ____________________________ and immediately available throughout the case.
- I was present for the entire case except for ____________________________ and immediately available throughout the case.
- I was present for the entire procedure.
- I saw the patient with the fellow. I discussed the case with the fellow and agree with the fellow’s findings and plan as documented in the fellow’s note.
- I saw and evaluated the patient. I discussed the case with the resident and agree with the resident’s findings and plan as documented in the resident’s note.
- I saw the patient with the resident. I discussed the case with the resident and agree with the resident’s findings and plan as documented in the resident’s note.
- I have discussed the case with the resident and agree with the findings and plan as documented.
- I saw the patient with the PA-C. I discussed the case with the PA-C and agree with the PA-C’s findings and plan as documented in the PA-C’s note.
- This patient was seen by the PA-C. I did not personally see the patient at this visit, but I have reviewed and agree with the plan of treatment.
- I saw the patient with the ARNP. I discussed the case with the ARNP and agree with the ARNP’s findings and plan as documented in the ARNP’s note.
- This patient was seen by the ARNP. I did not personally see the patient at this visit, but I have reviewed and agree with the plan of treatment.
- I reviewed the Review of Systems and Past /Social/Family History obtained by the medical student and agree with the student’s note as documented.
Patient Care Orders

Does this add value to the outpatient visit?

- Future dated
- Legal question- who can “take off order”
- “CPOE” in Ambulatory
- Order sets
Medications and Immunizations

- Documenting medication administration
- Sample management
- Central repository across all locations
- Who enters
- Policy for historical entry
- Reports
Prescriptions

- Prescriptions workflow is critical
- Refill request process
- Who can enter “on behalf of”
Check-out

- Superbill (Fee Sheet)
  - Patient Name
  - Date of service
  - Level of service/procedure code(s)
  - Diagnosis

- Goals:
  - Interface with clinician documentation
  - Electronic feed to billing
Clinician Workflow

- Inbox/Mailbox
  - Results Review
  - Alerts
  - Documents
  - Prescriptions
  - Health Messaging
- Staffing
- Billing
  - Encounter Reconciliation
  - Reports
Inbox/Mailbox

- Results Delegates - “the BOOK”
- Alerts
- Documents
- Rx Refills
- Health Messaging
<table>
<thead>
<tr>
<th>Rx to be Approved</th>
<th>Patient Name</th>
<th>Subject</th>
<th>Author(s) By</th>
<th>Date Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPERBILL, BGHR4</td>
<td>SUPERBILL, BGHR4</td>
<td>Macrolid capsule macrolide mon</td>
<td>Model, AMPhysician</td>
<td>22-Aug-08 11:11</td>
</tr>
<tr>
<td>Rx Verify Patient</td>
<td>abe, vera</td>
<td>naproxen 250 mg oral tablet</td>
<td>Happy backers always superresource Rx</td>
<td>26-Aug-08 14:57</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>Funtest, Rafa</td>
<td>Acetaminphen Propoxyphene Naps</td>
<td>Happy backers always superresource Rx</td>
<td>26-Aug-08 14:54</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>testrino, Saha</td>
<td>Flurazepam 0.5mg/ml nasal spray tab</td>
<td>Happy backers always superresource Rx</td>
<td>26-Aug-08 14:44</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>SUPERBILL, BGHR4</td>
<td>Metaproterenol tablet 10 mg/2 tab(s)</td>
<td>Model, AMPhysician</td>
<td>25-Aug-08 14:19</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>SUPERBILL, BGHR4</td>
<td>Levothroid tablet 25 mcg (0.025 mg)</td>
<td>Model, AMPhysician</td>
<td>25-Aug-08 14:09</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>SUPERBILL, BGHR4</td>
<td>Carbapenem tablet 25 mg/1 tab(s) oral</td>
<td>Model, AMPhysician</td>
<td>20-Aug-08 16:14</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>TESTPHARM, CWH</td>
<td>Ethinyl estradiol-norethindrone tabl</td>
<td>Model, AMPhysician</td>
<td>14-Aug-08 16:01</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>Certify, Testing Fun</td>
<td>Penicillin tablet V potassium 250 mg</td>
<td>Model, AMPhysician</td>
<td>14-Aug-08 15:51</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>TESTPHARM, CWH</td>
<td>Lopressor tablet 50 mg/1 tab(s) oral</td>
<td>Model, AMPhysician</td>
<td>14-Aug-08 15:51</td>
</tr>
<tr>
<td>Rx Renewal to be Approved</td>
<td>TESTPHARM, CWH</td>
<td>Albuterol tablet 25 mg/1 tab(s)</td>
<td>Model, AMPhysician</td>
<td>14-Aug-08 15:51</td>
</tr>
<tr>
<td>Rx to be Approved</td>
<td>SUPERBILL, BGHR4</td>
<td>Ethinyl estradiol-norethindrone tabl</td>
<td>Model, AMPhysician</td>
<td>14-Aug-08 09:51</td>
</tr>
<tr>
<td>Rx to be Approved</td>
<td>SUPERBILL, BGHR2</td>
<td>Zyrtec tablet 10 mg/1 tablet orally o</td>
<td>Model, AMPhysician</td>
<td>14-Aug-08 09:50</td>
</tr>
<tr>
<td>SUPERBILL (1, Unviewed 1)</td>
<td>Rhythm obstetrics-gynecology</td>
<td>Hycmn oral</td>
<td>Model, AMPhysician</td>
<td>13-Aug-2008</td>
</tr>
</tbody>
</table>
"The Book"

- Labor intensive
- Re-work
- End of day process
- Single assigned task
- Margin for error
Results Delegates

- Real-time
- Clinic centric
- Who can be delegate?
- Protocols for normal/abnormal
Alerts/Decision Support

- Management
- Acknowledgement
- “on behalf”
- Maintenance
Documents, Rx Refills, Messaging

- Documentation
- Incomplete vs "complete"
- Rx Refill
- Clinic protocols
- Scope of practice
- Appropriateness of messages
- Policy & procedure
Staffing

- Scope of Practice
  - Rx refills
- Hardware Considerations
  - Types of devices
  - Number of devices
  - Device location
Hardware

Capability required to be user's main PC
Other Considerations

- Timing of implementation
- Decision-making authority
- Budget/Resources
- Fighting desire for ‘over customization’
Conclusion

"We can't solve problems by using the same kind of thinking we used when we created them."
- Albert Einstein
Common eHealth Projects

- Electronic Prescribing
- HIT Grant Programs
- Hub for Administrative & Financial Transactions
- Disease Reporting or Registries
- Regional/State Health Information Exchange
- Medical and/or Drug History
- Record Locator & Master Patient Index
- Clinical Messaging

Common Projects for Statewide eHealth Efforts
President-Elect Obama and Healthcare IT

- $10 Billion/year for 5 years to help physicians and other providers adopt healthcare IT
- After the first 5 years, phase in requirements for providers to adopt IT
- Small providers and those serving rural and underserved populations would receive top priority for financial support