EMR - EHR: Defining the Concepts and Realizing the Outcomes

Pat Wise, RN, MS, MA COL (USA Ret'd)
Vice President, Healthcare Information Systems, HIMSS

Cynthia Spurr, MBA, RN, C, FHIMSS
Corporate Director, Clinical Systems, Partners HealthCare System
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Defining the EMR - EHR
4.3.1 Definition Basic Generic-EHR
- The basic-generic definition for the EHR is a repository of information regarding the health status of a subject of care, in computer processable form.

4.5 The shareable EHR
- The sharing of EHR information can take place at three different levels:
  a) level 1 - between different clinical disciplines or other users, all of whom may be using the same application, requiring different or ad hoc organisation of EHRs,
  b) level 2 - between different applications at a single EHR node (i.e. at a particular location where the EHR is stored and maintained), and
  c) level 3 - across different EHR nodes (i.e. across different EHR locations and/or different EHR systems).

International Standards Organization
ISO

HIMSS
The electronic health record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports and images. The EHR automates and streamlines the clinician’s workflow. The EHR has the ability to generate a complete record of a clinical patient encounter, as well as supporting other care-related activities directly or indirectly via interface, including evidence-based decision support, quality management, and outcomes reporting. See also CPR, EMR, and the EHR Appendix.45

HIMSS Dictionary of Healthcare Information Technology Terms, Acronyms and Organizations


"I'm prescribing a squiggly line, two slanted loops, and something that looks like a P or a Z."

ISO/TR 20514:2005(E) 10 © ISO 2005 – All rights reserved
NAHIT Definitions

- **Electronic Medical Record (EMR)**
  An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.

- **Electronic Health Record (EHR)**
  An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.


Meaningful EHR

- Use of Certified EHR Technology
- Includes patient demographic and clinical health information, such as medical history and problem lists and has the capacity to provide clinical decision support, support physician order entry, capture and query relevant information and exchange and integrate electronic health information

Davies Awards of Excellence and HIMSS Analytics EMRAM

Compare and Contrast
HIMSS Nicholas E. Davies Awards of Excellence

- Since 1994, the HIMSS Nicholas E. Davies Awards of Excellence has been the most prestigious award for excellence in the implementation and derived value of health information technology.
- Original and continuing intent is to promote the value of and provide education in full implementation of electronic health records (EHRs).
- Original awards were for hospitals and health systems, and expanded in recent years to include physician practices, public health organizations, and most recently community health organizations.

HIMSS Analytics - EMRAM

- In 2005, HIMSS Analytics launched the EMR Adoption Model™ (EMRAM) to track EMR adoption progress at hospitals and health systems.
- EMRAM scores hospitals in the HIMSS Analytics™ Database on their progress in completing 8 stages (0-7), culminating in a paperless patient record environment where summary clinical data can be shared via Continuity of Care Document (CCD) transactions with other care sites that treat the patient, and where the clinical data is being analyzed to improve clinical outcomes, protocols, and clinical decision support.
- Beginning in 2009, HIMSS Analytics plans to recognize hospital organizations that have achieved EMRAM Stage 7 by launching the Stage 7 Award.

EMR Adoption Model™ Trends 2007 - 2008

<table>
<thead>
<tr>
<th>Stage 0</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
<th>Stage 5</th>
<th>Stage 6</th>
<th>Stage 7</th>
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</thead>
<tbody>
<tr>
<td>Ancillaries – Lab, Rad, Pharmacy – All Installed</td>
<td>Ancillaries – Lab, Rad, Pharmacy – All Installed</td>
<td>Clinical Data Repository, Controlled Medical Vocabulary</td>
<td>Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
<td>CPOE, CDSS (clinical protocols)</td>
<td>Closed loop medication administration</td>
<td>Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
<td>Medical record fully electronic, HCO able to contribute CCD as byproduct of EMR, Data warehousing in use</td>
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<tr>
<td>19.3%</td>
<td>16.0%</td>
<td>31.4%</td>
<td>35.7%</td>
<td>2.2%</td>
<td>25.1%</td>
<td>37.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>15.6%</td>
<td>11.5%</td>
<td>31.4%</td>
<td>35.7%</td>
<td>2.2%</td>
<td>25.1%</td>
<td>37.2%</td>
<td>0.3%</td>
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Data from HIMSS Analytics™ Database © 2009 HIMSS Analytics
### Purpose of the Program

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<tr>
<td>Assesses EMR implementation, use, and value derived in key areas of management, functionality, technology and overall value. Provide inspiration through example and best practice guidance through lessons learned to aspiring EMR implementers.</td>
<td>EMRAM identifies and scores hospitals using an 8-step scale that charts the path to a fully-paperless clinical environment that also supports sharing patient data through CCD transactions and using clinical data to improve clinical outcomes and protocols. The Stage 7 Award recognizes those hospitals who demonstrate the presence and use of technologies enumerated in each of the stages of the EMRAM.</td>
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### What Does the Program Measure?

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<td>Actual use of HIT based on a complex set of rigorous criteria including pervasive use of EMR as the primary source of care information; CPOE and CDS must be in use organization-wide. Actual documented ROI of implemented IT for both financial and clinical outcomes.</td>
<td>Deployment of EMR environment applications, including the ability to exchange Continuity of Care Document (CCD) or other interoperability standard transactions. Metrics for percent of medical orders entered by physicians, percentage of the EMR that is paperless and closed loop medication administration processes are measured and validated.</td>
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### How do Organizations Become Eligible?

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<tr>
<td>Submit a preliminary or Threshold application. Pass Threshold criteria and receive an invitation to submit a Full application. Be selected as a finalist and complete a site visit (verifying the breadth and depth of the implementation and clarifying the application content to determine awardee(s).</td>
<td>Hospitals must contribute data to the HIMSS Analytics annual hospital study and complete a site visit to verify and document the attainment of all eight stages of the EMRAM.</td>
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How are Top Achievers Selected?

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<td>Multidisciplinary, volunteer Committee of peers (previous Davies Organizational recipients) evaluates Threshold and Full applications; performs site visits, and selects recipients</td>
<td>For Stage 7 hospitals only, staff from HIMSS Analytics and volunteer, independent industry professionals perform a site visit validating the hospital’s IT environments and capabilities.</td>
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What Is Assessed?

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<td>Documented commitment of the Executive Leadership team to realizing a vision of an organization-wide EMR</td>
<td>Hospital-reported presence of EMR environment applications from completing the HIMSS Analytics annual hospital study (exception: HIMSS Analytics EVP calls Stage 6 candidates to validate that status, and staff &amp; volunteers perform site visits to validate Stage 7 hospitals)</td>
</tr>
<tr>
<td>Gathers evidence of EMR’s positive impact on quality, safety, revenue, and workflow</td>
<td>Hospitals are assigned a stage level score after completing the annual study derived from the EMR environment applications that have been implemented and are live and operational in at least one hospital inpatient service area</td>
</tr>
<tr>
<td>Assesses applicants’ potential contribution of lessons learned and value-based case studies to the body of Davies knowledge (this ensures the ongoing Davies mission to equip others to achieve).</td>
<td>Actual use of the EMR based upon a complex set of rigorous criteria</td>
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<td>Integral to achieving the organization’s strategic objective, with all major clinical areas using the EMR; EMR should be the primary source of care information, preferably the only source, in most if not all of the organization’s care settings; CPOE should be utilized throughout the organization by all providers in most care settings;</td>
<td>All lower stages must have been achieved before HIMSS Analytics will move a hospital to a higher level</td>
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<td>Hospitals can update their data as frequently as they desire to ensure they have the most accurate EMRAM score.</td>
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<td>Stage 6 hospitals are validated via a phone interview with the CIO, CMO, directors of IT, clinician managers, or a combination of the above. Once validated, these facilities are listed on the HIMSS Analytics web sites with CIO contact information so that they can assist in mentoring other organizations relative to their EMR environment accomplishments.</td>
<td>Stage 6 hospitals are validated via a phone interview with the CIO, CMO, directors of IT, clinician managers, or a combination of the above. Once validated, these facilities are listed on the HIMSS Analytics web sites with CIO contact information so that they can assist in mentoring other organizations relative to their EMR environment accomplishments.</td>
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Stage 7 organizations are evaluated with onsite visits with HIMSS Analytics and volunteer, independent healthcare professionals to validate accomplishments of all stages of the EMRAM. Stage 7 organizations must have complete EMR implementations across the entire hospital, not just one inpatient service area.

Clinical decision support within the EMR systems is used in real time to make patient care decisions, to meet quality, efficiency and safety goals.

The organization must demonstrate documented return on investment as a result of the EMR implementation. This includes presenting evidence that business and quality improvement goals were set at the outset of the EMR process; and that most of its goals have been met, or that significant progress has been made.

A hospital can be assigned to Stages 3-6 if it reports meeting all of the application requirements for a single patient care service (e.g. single nursing floor, cardiology service, but not the emergency department).

Using the rules above, HIMSS Analytics awards additional points for reported implementation of applications in stages higher than the level to which the healthcare organization is assigned. In this fashion, other implementation paths than those prescribed by the EMRAM stages can be taken into consideration for correlation with outcomes and financial research.

Computerized practitioner order entry must be utilized throughout the organization by all providers in most care settings. Clinical decision support within the EMR systems is used in real time to make patient care decisions, and to meet quality, efficiency and safety goals. The organization must demonstrate documented return on investment as a result of the EMR implementation. This includes presenting evidence that business and quality improvement goals were set at the outset of the EMR process; and that most of its goals have been met, or that significant progress has been made.

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Objectives

- Outline the need and benefits associated with automation and nursing practice
- Describe the essential planning and implementation activities needed to achieve a successful outcome
- Identify the Leadership role Nursing has in achieving the objectives of a successful EHR implementation

Next Generation Healthcare - Preparing for the Not So Distant Future: Advanced Clinical Systems

- Implementing advanced clinical systems is the single most disruptive and resource-intensive technology initiative for a hospital or health system
- The success or failure of the implementation depends as much on organizational factors as it does on the technology itself
- Organizations need to focus on workflow integration and be sure to understand in detail how current processes for all caregivers will change
- Implementing advanced clinical systems is no longer an option; it is a basic requirement for patient safety and operational efficiency

Implementing Clinical Systems is Very Hard and Requires Great Skill

- There can be a significant initial operational impact
- System selection is difficult and complex due to a "high stress" workflows
- Very diverse and idiosyncratic workflow exists across organizations
- The value proposition can be difficult to articulate
- It’s expensive
- It requires significant time
- Complex championship and governance structures can make decision-making cumbersome
The overall safety and effectiveness of technology in health care ultimately depend on its human users. Any form of technology may adversely affect the quality and safety of care if it is designed or implemented improperly or is misinterpreted.

Nursing Must Take a Front Row Seat and Active Role if the Transformation to a Digital Patient Record – the EHR - is to Succeed.

KLAS: Nursing Adoption of IT (2007)

- Hardest Areas to Automate:
  - ICU Flowsheets
  - Care Plans
- Top 3 Adoption Challenges:
  - Missing functions and/or software quality
  - Process change, inflexible/workflow
  - Device issues
- Vendors Vary Greatly with Patient Safety and Efficiency Components
"Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted."
Albert Einstein

A 36 Hospital Time Motion Study: How Do Med-Surg Nurses Spend Their Time?
- The time and motion study identified three main targets for improving the efficiency of nursing care:
  - Documentation
  - Medication Administration
  - Care Coordination
- Changes in technology, work processes, and unit organization and design may allow for substantial improvements in the use of nurses’ time.


The Documentation Process in many Hospitals is Rife with Inefficiencies:
- Often must transfer information between data collection systems, consuming nursing time and contributing to transcription errors.
- Often duplicated between departments and disciplines. The result is:
  - fragmentation of care
  - duplication of data sets
  - inability to quantify the outcome of the care provided.

### Medication Administration - an Essential Component of Nursing Practice

- Hospital medication processes may be affected by the fragmentation of the informatics infrastructure.
- In an ideal patient care nursing unit, medications would be administered as part of a seamless closed-loop system that provides accurate and timely information about the patient, including patient identification, order verification, allergies, laboratory values, potential reactions, and preferences.

### Care Coordination accounts for approximately one-fifth of nursing practice time

- Inefficiencies in communication may consume nurses’ time and put patients at risk.
- The efficient flow of patient information and status updates could reduce wasted time and the potential for errors.
- Proposed technology solutions include wireless networks, handheld and ear devices, and intelligent systems that automatically track the physical location of a medical provider.

### Technology Drill Down (TD2) – American Academy of Nursing

- Identified work environment factors that could be improved with the deployment of technology.
- Espoused a more efficient work environment that not only reduces waste but also improves working conditions and the care they provide.
- These represented eight major workflow categories of concern:
  - Admission, discharge and transfer (ADT)
  - Care coordination
  - Care delivery
  - Communication
  - Documentation
  - Medication
  - Patient movement
  - Supplies and equipment
- Each of these workflows can benefit from using technology.
American Nurses Association (ANA) Position Statement - EHR 2009

The ANA believes the public has a right to expect that healthcare data and information will be correctly and efficiently collected, recorded, stored, utilized, analyzed, and reported:
- Be centered on patient safety and improved outcomes throughout all segments of the healthcare system
- That principles of privacy, confidentiality, and security cannot be compromised

It is ANA’s position that the registered nurse must be involved in the product selection, design, development, implementation, evaluation and improvement of information systems used in patient care, including those that create and support the EHR.

ANA Eleven EHR Position Principles (Proposed)

1. Registered nurses are prepared to serve as advocates for patients... are absent from discussions and decision-making activities related to EHRs.
2. All settings and authorized stakeholders are serviced by the EHR without barriers or discrimination.
3. Technology is a tool, not the driver, to support and assist in clinical care and decision-making.
4. Write once and read many times.
5. Use of standardized terminologies.
6. Data and information maintained in the EHR can be easily accessed, analyzed, and reported to authorized users.
7. Access to data and information is limited to those legitimately authorized with need to know...
8. Role-based access...
9. Audit trails are included...
10. Interoperability permits and promotes... transmission of data, information, and knowledge.
11. Research provides an evidence-based approach for use of EHRs.

A goal without a plan is just a wish.
Antoine de Saint-Exupéry (1900 - 1944)
Achieving the Successful Transition to the EHR

- Examine workflow processes and procedures for risks and inefficiencies and resolve these issues prior to any technology implementation.
- Actively involve clinicians and staff who will ultimately use or be affected by the technology, along with IT staff with strong clinical experience, in the planning, selection, design, implementation, and ongoing quality improvement of technology solutions.
- Assess your organization’s technology needs beforehand and investigate how best to meet those needs.
- During the introduction of new technology, continuously monitor for problems and address any issues as quickly as possible.
- Establish a training program for all clinicians and staff.
- Develop and communicate policies delineating staff authorized and responsible for technology implementation, use, oversight, and safety review.
- To improve safety, provide an environment that protects staff involved in data entry from undue distractions when using the technology.

Success

- Successful EHR adoption equals realization of expected benefits and follows successful implementation.
- Successful EHR implementations are characterized by:
  - Leadership: strong, engaged, continual
  - Change Management: constant
  - Teamwork: Engaged and cohesive clinical and IS teams
  - Preparation: coupled with a culture of “learn-try-improve”
  - Communication, communication, communication

Change

- Change is considered major when it is perceived to be so by those affected.
- Major change is the result of significant disruption in established expectations.
- Major change occurs when people believe they have lost control over some important aspect of their lives or their environment.
- Know and understand the magnitude of the change the EHR brings.
- EHR is only one of many concurrent changes an organization and its staff must deal with.
- Reaction to change can be managed and dysfunction minimized.
  - Requires Lots of Attention & Skill.
Teams

- The organization must reward teams for being teams
  - small group of people committed to a common purpose
  - specific performance goals for which the team members hold themselves mutually accountable
- Teams
  - have open and honest discussions and not try to sugarcoat difficult messages
  - exhibit finesse in complex, often angry, situations
- Clinicians must be Leaders on the Team
  - they understand the culture, language, professional image, workflow and issues that surround the day-to-day delivery of care
  - they can be great designers, trainers, analysts, process engineers and managers

Leadership

- Leaders who are smart, honest, seasoned, committed and value the healthy exchange of ideas are a treasure
- Leadership engages in the clinical systems conversation and once committed has the strength to stay the course
- Leadership asks hard questions and is pragmatic but it never loses sight of its beliefs and value
- The leadership has focus and stamina and endures

The Journey: the Implementation of the EHR

- EHR adoption is truly a journey; it begins the day you start planning, not when the technology is turned on
- EHR must Not be driven by IT; Clinicians must own the process
- An EHR (or any of its components) is not a fix for a flawed process

Teamwork makes the Dreamwork

John C. Maxwell

You know you will never get to the end of the journey. But this, so far from discouraging, only adds to the joy and glory of the climb.
Sir Winston Churchill (1874 - 1965)
Conclusion

Success requires:
- An effective linkage between organizational strategy and IT strategy
- Talented and Committed Leadership
- Recognizing the skill required to effectively implement these systems
- Understanding of the “value proposition”
- Great teams with providers as essential members
- Prowess at implementations and projects
- A willingness to experiment and learn

An invasion of armies can be resisted, but not an idea whose time has come.
Victor Hugo (1802 - 1885), ‘Histoire d’un crime,’ 1852