EMR innovations: a challenging solution for patient safety improvement

Jocelyne Ziadeh Assaf
Outline

• Introduction
  – Definition (EMR/EHR)
  – Evolution

• Integrated Model for Patient Centered Care

• Advantages of EMR: Improving Patient Care and Patient Safety

• Potential Risks

• Challenges

• Recommendations
Introduction

Definition: Electronic Health/Medical Record (EHR/EMR)

- EMR “An application environment composed of the clinical data, repository, clinical decision support, controlled medical vocabulary, order entry, computerized provider order entry, pharmacy, and clinical documentation applications.”
  - The EMR supports the patient’s electronic medical record across inpatient and outpatient environments.
  - The EMR is used by healthcare practitioners to document, monitor, and manage health care delivery within a care delivery organization (CDO).
  - The EMR is owned by the CDO

- EHR “A subset of each care delivery organization’s EMR is owned by the patient and has patient input and access that spans episodes of care across multiple CDOs within a community, region, or state”
  - The EHR is owned by the patient or stakeholder
  - The EHR can be established only if EMRs of the various CDOs have evolved to a level that can create and support a robust exchange of information

Source: https://app.himssanalytics.org/docs/WP_EMR_EHR.pdf
EMR Evolution

- Application and Development (Silos)
- Electronic Medical Records (EMR)
- Hospital Resource Planning (HRP)
- Health Information Exchange (HIE) + Personal Health Record
- Connectivity, Mobile technology
Integrated Model for Patient Centered Care

- LAB
- Operating Theater
- Radiology
- Pharmacy
- Admin
- Planning--Scheduler
- Inventory
- Automated Billing
- Ordering
- Nursing

Patient EMR
# Advantages of EMRs

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate and universal access to the patient record</td>
<td>Increased efficiency (reduced time spent pulling charts, and duplicate history-taking etc..).</td>
</tr>
<tr>
<td></td>
<td>Increased quality (better information at the point-of-care)</td>
</tr>
<tr>
<td>Easier and quicker navigation through the patient record</td>
<td>More efficient point of care assessment and data abstraction</td>
</tr>
<tr>
<td>Increased legibility and comprehensiveness, through computer-aided history taking systems and better formatting (templates)</td>
<td>Better quality information to aid clinical decision-making and shared care; fewer errors in patient management (eg mis-prescribing)</td>
</tr>
</tbody>
</table>
# Advantages of EMRs

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure record keeping</td>
<td>No lost records, fewer unnecessary waits or missed appointments, aiding informed patient care. Patient satisfaction.</td>
</tr>
<tr>
<td>Standardization of care among providers within the organization</td>
<td>Through better recording and sharing of information and linkage to CDSS</td>
</tr>
<tr>
<td>Reduction of paperwork, documentation errors, filing activities</td>
<td>Removes duplication, reduces processing time, decreases personnel costs</td>
</tr>
<tr>
<td>Coding efficiency and efficacy</td>
<td>Improved data quality</td>
</tr>
<tr>
<td>Alerts for medication errors, drug interactions, patient allergies</td>
<td>Safer patient care</td>
</tr>
</tbody>
</table>
## Advantages of EMRs

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to electronically transmit information to other providers (assessments, history, treatments ordered, prescriptions, etc.)</td>
<td>Fewer delays, more efficient and integrated patient care. Enhanced patient satisfaction.</td>
</tr>
<tr>
<td>Availability of clinical data for use in quality, risk, utilization, analyses</td>
<td>Better monitoring of quality and efficiency</td>
</tr>
<tr>
<td>Availability of non-clinical data</td>
<td>Easier management of costs, performance and workflow</td>
</tr>
<tr>
<td>Availability of data for research</td>
<td>With downstream benefits for patient care</td>
</tr>
</tbody>
</table>

*Adapted from: Healthcare Information and Management Systems Society*
Examples on safety improvement

• EMRs don't just contain or transmit information; they "compute" it. That means that EMRs manipulate the information in ways that make a difference for patients. For example:

  – A qualified EMR doesn’t only keep a record of a patient's medications or allergies, it also automatically checks for problems whenever a new medication is prescribed and alerts the clinician to potential conflicts.

  – Information gathered by a primary care provider and recorded in an EMR tells a clinician in the emergency department about a patient's life-threatening allergy, and emergency staff can adjust care appropriately, even if the patient is unconscious.

  – EMRs can expose potential safety problems when they occur, helping providers avoid more serious consequences for patients and leading to better patient outcomes.
Potential Risks

• Creating new paths to failure.

• Distraction → miscommunication

• Human-Computer Interaction Issues → Erroneous or missing data, delaying treatments

• Limit interactive conversation, and restrict creative thinking. This may depersonalize and weaken the doctor-patient relationship
Potential Risks

• New risks that may lead to harm due to **Poorly designed, implemented, or applied** EMRs (adding steps to accomplish tasks, or presenting data in a non-intuitive format, dosing errors, auto-populated fields,)

• Example: Because of **“alert fatigue,”** there is a danger that doctors may **ignore, override, or disable alerts,** warnings, reminders, and embedded practice guidelines. If it can be shown that following an alert or a guideline would have prevented an adverse patient event, the doctor may be found liable for failing to follow it.
Challenges

• Implementation Strategy/Costs
• Patient care time
• Privacy & Security:
  – Potential for breach
  – User access/disclosure
  – Stricter definition of secure
• Availability of data
• Technical Infrastructure (downtime, crashes, viruses..)
Recommendations

• Vendor choice:
  – Smart, flexible, integrated systems:
    • Assessment tools rather than input tools
    • Certified for interoperability: ability to interface
    • Ergonomics
  – Engage the vendor/integrator in a partnership

• Implementation process quality:
  – Engagement of all the healthcare providers (decision making/validation), user education rather than trainings.
  – Change management
  – Communication, Communication & Communication
Recommendations

• Infrastructure readiness: Mobility, business continuity and disaster recovery, security

• Information security: authorizations/profiles

• Continuous auditing and Outcome analysis

• Most importantly: Clinical systems readiness
  – Procedures/Protocols
  – Guidelines with decision driven flowcharts
  – Workflows
EMR: A building process

Technology tools
CDSS and BI
Clinical Documentation
Certified EHR
Technology Infrastructure
Clinical Systems: Procedures, Protocols, Workflows
EMR: Provider Learning Curve

- Provider learning curve /Adoption/Engagement

- Bugs with potential for patient harm
- Usability issues that could result in, or fail to prevent, errors
- Reduction of provider & practice risk
- Improvement of outcomes

Patient Safety

Need for clinician engagement
“Productivity in the healthcare system cannot increase without patient safety first being assured. A key benefit to establishing an EHR system is a corresponding increase in patient safety.”

Philip Hassen, President,
International Society for Quality and Safety in Health Care
Q&A