Electronic Medical Record Adoption Model (EMRAM)℠

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HIMSS – UK......

HIMSS Vision

• Improve health through the better use of technology and information.
Do we believe that technology can improve health?
## Progressively sophisticated model ...

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cumulative Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>Complete EMR, CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full R-PACS</td>
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<tr>
<td>Stage 5</td>
<td>Closed loop medication administration</td>
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<tr>
<td>Stage 4</td>
<td>CPOE, Clinical Decision Support (clinical protocols)</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
</tr>
<tr>
<td>Stage 2</td>
<td>CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable</td>
</tr>
<tr>
<td>Stage 1</td>
<td>Ancillaries - Lab, Rad, Pharmacy - All Installed</td>
</tr>
<tr>
<td>Stage 0</td>
<td>All Three Ancillaries Not Installed</td>
</tr>
</tbody>
</table>

... 7 Stages that lead to Highest Quality in Patient Care
History of the Acute Care EMRAM

• Created in 2005
• To reflect a typical manner in which a hospital progresses towards a paperless EPR environment
• Introduces the concept of a roadmap
• To inform government policy
• OPD / Ambulatory EMRAM created in 2010, same purpose
• CCMM for whole systems analysis
The Acute Care EMRAM....

• This is inpatient oriented
  – All standards in stages 1 to 6 relate to wards and inpatient services
  – At Stage 7, we expect A&E to be the same as all inpatient units
  – Observation beds treated the same as A&E
  – We do not consider OPD or other hospital based clinics
Stage 0....

• Does not have all three:-

  – General Laboratory Information System
    • ? Anatomic Pathology
  – Radiology Information System
    • Not PACS (But all the UK has PACS)
  – Pharmacy Information System
Stage 1....

- Has all three: Lab, Rad & Pharm
- Low level expectations
  - Lab produces discrete data for rules & trend tracking
  - Pharmacy has drug to drug, cumulative dosing, drug to allergies, etc. We ask what CDSS is working with Pharmacy
- Anatomical Pathology
  - If present, we expect Clinical Document Architecture (CDA) at Stage 7 for HIE
- “General lab” – we do not distinguish
- Blood Bank provision is at Stage 7
Stage 1 continued....

- Outsourcing Lab, Rad and Pharmacy
  - Very common in central Europe
    - As long as an order can be electronically transmitted, and discrete results (laboratory) can be posted to EMR, then we are OK. The service does not need to be in the building
      - Reference lab process is like this
    - Radiology would expect a Text file interface
      - CDA for Stage 7
    - Pharmacy outsourcing for stock management, high expense, low volume meds
Stage 2:

• Has a single clinical data repository (CDR) into which all orders and all results are written so staff are not having to sign into other systems to see results
  – Exception: images are expected to be in an image repository – radiology, pathology, VNA – linked from main system

• Controlled Medical Vocabulary (CMV)
  – This is basic HL-7 expectation when OE and Lab, Rad, or Pharm are different vendors

• Basic Clinical Decision Support
  – Duplicate tests, rudimentary conflict checking

• Basic HIE enabled by HL7 and other standards
Stage 3....

- Nursing documentation: (Knowledge Based Charting) nursing orders, tasks, initial assessment, ongoing assessments, medicines reconciliation, eMAR, vital signs, flow sheets
Stage 4....

• Order Comms (CPOE) available with appropriate Clinical Decision Support (CDS)
  – This needs to be available on one ward at Stage 4
    • All units at Stage 7
    • At Stage 4, we are not expecting every order type being entered – just that CPOE is live & in use on one inpatient ward
    • We do not have specifications on degree and depth of CDS – just that it is appropriate
  – Are there any exceptions to types of orders?
    • We get into that Stage 7
    • Typical exceptions: complex chemotherapy orders, TPN orders
Stage 5....

• Full Radiology PACS
  – Radiology exams are stored in PACS and are available over the intranet and available off the main hospital site
  – Is the hospital filmless or not?
  – Cardiology PACS scored with extra points (Cath, CCT, Echocardiology, Intravascular ultrasound, nuclear cardiology)
Stage 6....

• Closed Loop Medication Administration (CLMA)
  – Step 1: Order is entered by the Doctor and the order is sent to pharmacy
  – Step 2: Pharmacist verifies the order
  – Step 3: Pharmacist dispenses the medication – unit dose oral, IV, ointment, etc...
  – Step 4: At the bedside technology assisted identification of the patient and the medication
  – Verification of the “5 Rights” by the system (alerts fire if any of the rights are not met)
  – Overrides are expected – late meds, early meds, meds without an order
Stage 6 Continued...

• 2014 requirements:
  – Technology assisted identification of blood products
  – Technology assisted identification of breast milk if hospital has a NICU or milk bank

• The future: IV Pumps receive the order from CPOE, only needs to have patient & meds & channel scanned to initiate flow
Stage 6 Continued....

• Physician Documentation is live and supported with CDS on at least one inpatient ward
  – Progress notes, consultation notes, operative notes, discharge summary, problems, diagnoses
  – In the process of creating this documentation, discrete data is generated which can feed a rules engine that can fire clinical advice to the physician
    • We require examples of such rules and the clinical advice provided
    • Failure to do so results in failure of Stage 6 validation

• Clinical Document Scanning – optional?
Stage 7 Overview.....

• Stages 3, 4, 5, 6 now must be hospital-wide
• A&E included for Stages 3, 4, 5, 6
• % Requirement for CPOE
  – => 90% inpatient for at least four months
  – Must be live in the A&E
• % Requirement for CLMA
  – => 95% positive patient ID and medication for inpatient
  – Must be live in the A&E
• Essentially paperless
• Quality and analytics program with strategy & governance; disaster recovery/business continuity
The assessment process....

• Stage 0 to 5 is self assessment and mostly online
• Stage 6 is on site visit typically with one reviewer from HIMSS
• Stage 7 is on site visit typically with up to three reviewers; one from HIMSS and two from other hospitals
Typical visit agenda....

• 09.00   Presentation from the Trust on EPR infrastructure, architecture and governance.
• 10.00   Visit to a ward, ICU, and A&E: interview with a nurse, observe documentation and CLMA; interview a doctor, observe documentation and alerts. Look for paper.
• 12.00   Observations in pharmacy and a pharmacist on a ward.
• 14.00   Radiology department & Blood Bank
• 15.00   Medical records department
• 16.00   Consider the evidence
• 17.00   Present the final decision
# Cross Regional EMRAM Score Distribution (2015 Q1)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Asia Pacific</th>
<th>Middle East</th>
<th>United States</th>
<th>Canada</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>0.4%</td>
<td>0.0%</td>
<td>3.7%</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Stage 6</td>
<td>3.2%</td>
<td>11.5%</td>
<td>22.2%</td>
<td>0.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Stage 5</td>
<td>7.4%</td>
<td>16.9%</td>
<td>30.8%</td>
<td>0.9%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Stage 4</td>
<td>1.7%</td>
<td>3.8%</td>
<td>13.6%</td>
<td>3.3%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Stage 3</td>
<td>0.5%</td>
<td>17.7%</td>
<td>19.7%</td>
<td>31.4%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>33.9%</td>
<td>20.8%</td>
<td>4.3%</td>
<td>30.6%</td>
<td>32.7%</td>
</tr>
<tr>
<td>Stage 1</td>
<td>4.6%</td>
<td>10.8%</td>
<td>2.2%</td>
<td>14.2%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Stage 0</td>
<td>48.2%</td>
<td>18.5%</td>
<td>3.5%</td>
<td>18.7%</td>
<td>17.6%</td>
</tr>
</tbody>
</table>

N = 757  N = 130  N = 5,467  N = 641  N = 1,196
Summary Profile of a Stage 6 and 7 Organization

• Use data to drive improved outcomes related to ...
  – Process, Financial, Clinical, Quality & Safety

• Are paperless, or near paperless (create no paper)
  – All clinically relevant data is in the EMR

• Are fully committed to continuous process improvement through collaboration
  – Strong IT leadership and executive champions
  – Clinician / end-user champions
Belgium, Brazil, Canada, Chile, China, Denmark, France, Germany, India, Italy, Malaysia, Norway, Pakistan, Singapore, Spain, Switzerland, Taiwan, The Netherlands, Turkey, UAE, UK, USA
Thank You...

Any questions?

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