Measuring Digital Maturity

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Amsterdam
Plan..

• HIMSS Analytics Overview
• Introduction to the Acute Hospital EMRAM
• Measuring maturity in other settings
• Focus on the Acute Hospital EMRAM
• Comparing the standards
• Q&A
HIMSS Overview...

- Non-Profit – Cause-based, mission driven
- Founded in 1961
- 64,000+ Individual Members
- 650 Corporate members
- 440 Organisational Affiliates
- 250 Non-Profit Partners
HIMSS – UK......

HIMSS Vision

• Improve health through the better use of technology and information.
Global presence and influence.
Data collection, analysis and reporting..

• HIMSS Collects hospital data worldwide
  • 6,000 hospitals in USA & Canada
  • 2,000 hospitals in Europe
  • Plus Asia, ME, Australia, New Zealand, Canada, and others

• Information on:
  • EMRAM requirements
  • Demographics
  • Finance
  • Vendors
  • Usage of IT
The HIMSS USP...

- Only internationally recognised evidence-based model of its kind.

- Provides roadmap on how to progress towards a paperless EMR environment.

- Informs current status and possible future directions by neutral organisation.

- Global benchmarking tool.

- Reflects the way many hospitals build their capability.
<table>
<thead>
<tr>
<th>STAGE</th>
<th>EMR Adoption Model Cumulative Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Complete EMR: external HIE, data analytics, governance, disaster recovery, privacy and security</td>
</tr>
<tr>
<td>6</td>
<td>Technology enabled medication, blood products, and human milk administration; risk reporting</td>
</tr>
<tr>
<td>5</td>
<td>Physician documentation using structured templates; full CDS; intrusion/device protection</td>
</tr>
<tr>
<td>4</td>
<td>CPOE; CDS (clinical protocols); Nursing and allied health documentation; basic business continuity</td>
</tr>
<tr>
<td>3</td>
<td>Nursing and allied health documentation; eMAR; role-based security</td>
</tr>
<tr>
<td>2</td>
<td>CDR; Internal interoperability; basic security</td>
</tr>
<tr>
<td>1</td>
<td>Ancillaries - Lab, Rad, Pharmacy, PACS for DICOM &amp; Non-DICOM - All Installed</td>
</tr>
<tr>
<td>0</td>
<td>All Three Ancillaries Not Installed</td>
</tr>
</tbody>
</table>
The EMR Adoption Model

• Acute care EMRAM is 11 years old
• Small changes periodically to Stage 7 criteria
• Launching significant changes in 2017.
• Make changes to lower stages to raise the bar
• Coincide with significant changes to HA software tool that supports data gathering and scoring
The EMR Adoption Model

- Stages used to indicate increasing levels of clinical computing sophistication
- All the criteria of one stage must be met to “earn” that stage
- One world-wide global standard, no variation by region or continent
- Centrally managed with regional input
- Focuses more on functions accomplished through e-health and less on description of technology itself
- Focuses on the workflow implications as well as what technology is installed
Maturity Models....

- EMRAM (acute hospital)
- CCMM (whole system)
- AMAM (analytical capability)
- O-EMRAM (out-patient / Ambulatory)
- Value Score (financial, operational, clinical)
- DIAM (digital imaging)
Benchmarks

- **EMRAM**: A model to track and benchmark EMR adoption and utilization.
- **AMAM**: An industry standard for maturing healthcare analytics providing a structured, prescriptive standard and offerings to develop and advance analytics maturity.
- **CCMM**: Insight and guidance on how to better align healthcare resources to deliver optimal care across care settings.
- **Value Score**: A tool to document the financial, operational, and clinical value of investment in information and management systems.

*Joint Commission International*
Focus on the acute EMRAM\textsuperscript{SM}
### Stage 1 – Main Diagnostic Systems Results

**Current Requirements**

- Does have all three:
  - Radiology information system, and
  - Laboratory information system, and
  - Pharmacy information system

- **Note:** there has never been a definition of what is in a pharmacy information system ... in the US it has included Clinical Decision Support ... we do not see that in Europe ...

- **Note:** We do not define which portions of a Laboratory Information System are present: Chemistry, anatomic pathology, etc.

**Proposed Requirements**

- Does have all four:
  - Radiology information system,
  - Laboratory information system,
  - Pharmacy information system, and
  - PACS for DICOM
  - Patient centric storage of Non-DICOM images

New or changed requirements are noted with a ✓
Stage 2 – Core Clinical Data Store

Current Requirements

• Clinical Data Repository (CDR) is installed and is fed by major ancillary systems

• CDR contains a controlled medical vocabulary

• Clinical Decision Support for basic conflict checking is present

• Internal interoperability exists

Proposed Requirements

• Clinical Data Repository installed or other multiple data stores installed in such a way that users DO NOT have to sign into different systems

• Such linkages are context aware (i.e. patient does not need to be re-selected in each disparate data store)

✓ Security : description of data center security & user security training
✓ Description of encryption & disposal policy
✓ Description of antivirus, antimalware & firewall program

• All other requirements remain consistent
Stage 3 – Care Documentation is On-Line

**Current Requirements**

- Has “classic” order entry
- Nursing documentation: vitals, nursing notes, nursing tasks, e-MAR, etc. available for at least one inpatient service
- eMAR is implemented
- First level Clinical Decision Support implemented (i.e. drug/drug, drug/food, etc.)
- Image access from PACS available to physicians outside Radiology department

**Proposed Requirements**

- Documentation typically performed by nursing is on-line such as: admission processing, care documentation, nursing orders & tasks related to Dx & procedure, e-MAR, discharge planning etc.
- Routine Allied Health documentation completed on-line
- >50% criteria for all wards/ patient days/ inpatient cases – client chose % method
- It must also be live in the ED, if any
- Security: Role based security is in place
- Description of intrusion detection program
- Other criteria is unchanged
## Stage 4 – Physician Orders

### Current Requirements

- CPOE used by any clinician with second level clinical decision support capabilities related to evidenced-based pathways & protocols
- CPOE implemented with physicians entering orders in at least one inpatient service area

### Proposed Requirements

- CPOE usage criteria increased to >50% criteria for all wards/ patient days/ inpatient cases – client chose % method
- CPOE live in the ED, if any
- Documentation by nursing & allied health usage criteria at 90%
- Where publically available, physicians use access to public data bases for medications, images, immunizations & lab results
- Business continuity services: access to: Pt allergies, Problem & Dx, medications, recent lab results
- Other criteria is unchanged
Stage 5 – Physician Documentation

<table>
<thead>
<tr>
<th>Current Requirements</th>
<th>Proposed Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PACS – Radiology, Cardiology and storage of patient DICOM images</td>
<td>✓ Physician Documentation creating discrete data or derived via NLP for alerts, clinical guidance and to serve analytical capabilities</td>
</tr>
<tr>
<td></td>
<td>✓ Or background processes that are watching multiple variables that fire alerts to physicians</td>
</tr>
<tr>
<td></td>
<td>✓ &gt;50% criteria for all wards/ patient days/ inpatient cases – client chose % method</td>
</tr>
<tr>
<td></td>
<td>✓ Physician Documentation <strong>must be live in ED</strong>, if any</td>
</tr>
<tr>
<td></td>
<td>✓ Description of intrusion prevention system</td>
</tr>
<tr>
<td></td>
<td>✓ Description of portable device security</td>
</tr>
<tr>
<td>Current Requirements</td>
<td>Proposed Requirements</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>• Bar code enabled Closed Loop Medication Administration</td>
<td>✓ Technology is used to order medications</td>
</tr>
<tr>
<td>• Physician documentation with structured templates creating some discrete data to feed a rules &amp; alerts engine</td>
<td>✓ Technology is used to verify medication orders</td>
</tr>
<tr>
<td></td>
<td>✓ Technology is used to verify medication orders</td>
</tr>
<tr>
<td></td>
<td>✓ Technology is used to verify medications at the point of administration (medication, strength, route, patient, time)</td>
</tr>
<tr>
<td></td>
<td>✓ Technology is used to verify blood products administration</td>
</tr>
<tr>
<td></td>
<td>✓ Technology is used to verify human milk mother-baby match where there is communal storage of milk</td>
</tr>
<tr>
<td></td>
<td>✓ Bar code technology is used at point of care for specimen collection</td>
</tr>
<tr>
<td></td>
<td>✓ &gt;50% criteria for all wards/ patient days/ inpatient cases – client chose % method</td>
</tr>
<tr>
<td></td>
<td>✓ ED must also meet these criteria but no % required</td>
</tr>
<tr>
<td></td>
<td>✓ Security risk assessments reported to governing authority</td>
</tr>
</tbody>
</table>
# Stage 7 – On-Site Validation

## Current Requirements

- Paper charts no longer used to deliver & manage care
- Mixture of discrete data, medical images, document images available within the EMR
- Data analytics leveraged to analyze patterns of clinical data to improve quality of care, patient safety, and care delivery efficiency
- Clinical data can be readily shared in a standardized, electronic manner as appropriate
- Summary data continuity for all services is demonstrated
- Blood products & human milk included in closed-loop med admin process

## Proposed Requirements

- Implementation & use of Anesthesia Information System (five years’ notice)
- CPOE-enabled infusion pumps (seven to ten years’ notice)
- Provide an overview of the Privacy and security program
- Other criteria unchanged or in earlier stages
Validation process...

Stage 6 validation

• Hospital must submit requested data to be scored
• Data undergo quality review process for completeness
• When completed, EMRAM score is calculated and basic gap assessment report provided
• If scored at 6, hospital must undergo an on-site validation before Stage 6 is granted
• Must be validated at Stage 6 to be eligible for Stage 7

Stage 6 validation

• On-site; focused on criteria only through Stage 6
• One reviewer from HIMSS Analytics
• Decision is made at end of visit with written report sent within two weeks of visit
Validation process...

Stage 7 validation

• On-site visit to review all criteria through Stage 7

• Three reviewers
  • HA Inspector
  • CIO from another stage 7 hospital (or Stage 6 hospital if Stage 7 CIO not available)
  • Physician from another stage 7 hospital (or Stage 6 hospital if Stage 7 CIO not available)

• Decision given at end of visit with final report sent within two weeks of visit

• HA recommends and provides on-site pre-validation consultations for both Stage 6 and Stage 7 preparations
Validation process....

- System Overview & Pervasiveness of Use
- Governance
- Clinical & Business Intelligence
- Health Information Exchange
- Disaster Recovery & Business Continuity
- Privacy & Security

Validation is good for three (3) years; revalidation required to maintain Stage 6 or 7 status
### EMR Adoption Model℠ (2006-2015) United States

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<td>0.7%</td>
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<td>0.5%</td>
<td>1.6%</td>
<td>3.2%</td>
<td>5.2%</td>
<td>8.2%</td>
<td>12.5%</td>
<td>17.9%</td>
<td>27.1%</td>
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<tr>
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<td>2.5%</td>
<td>3.8%</td>
<td>4.5%</td>
<td>8.4%</td>
<td>14.0%</td>
<td>22.0%</td>
<td>32.8%</td>
<td>35.9%</td>
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<tr>
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<td>2.5%</td>
<td>7.4%</td>
<td>10.5%</td>
<td>13.2%</td>
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<td>15.5%</td>
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<td>5.8%</td>
<td>3.7%</td>
<td>2.1%</td>
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N = 4,237  N = 5,073  N = 5,166  N = 5,281  N = 5,337  N = 5,458  N = 5,458  N = 5,449  N = 5,467  N = 5,460
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<tr>
<th>Stage</th>
<th>Asia Pacific</th>
<th>Middle East</th>
<th>United States</th>
<th>Canada</th>
<th>Europe*</th>
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</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>0.5%</td>
<td>0.0%</td>
<td>4.2%</td>
<td>0.2%</td>
<td>0.1%</td>
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<tr>
<td>Stage 6</td>
<td>3.9%</td>
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<td>3.4%</td>
<td>17.5%</td>
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<td>Stage 4</td>
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</tr>
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</table>

N = 770   N = 142   N = 5,460   N = 641   N = 2,395
Profile of a stage 7 hospital...

• 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
What drives our mission?

• 44,000 and 98,000 Americans die in hospitals each year as the result of medical errors

• 7,000 estimated to die from medication errors alone

• 57,000 die each year without appropriate healthcare

• In the EU, missed healthcare opportunities have a €70 billion cost to European society

• These challenges are shared Worldwide
Common Issues for Global Health

- Doing more with less
- Reducing hospital admissions
- Reducing hospital mortality
- Reducing hospital acquired infection
- Reducing ‘never’ events
- Reducing LOS
- The aging population with multiple LTC
- Improving patient safety
- Improving efficiency and productivity
- Improving staff morale and retention
- Reducing inequality
- Justifying the investment in Technology
- Protecting those most at risk
- And many others......
Our Products and Programmes...

- Onsite Gap analyses
- Stage 6 on site validations
- Stage 7 on site validations
- Certified Educator
- Certified Consultant
Q&A
Measuring Digital Maturity

John Rayner Regional Director
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Amsterdam