

Himss[®]18 *Eurasia*

EMRAM Educational Conference &
Health IT Exhibition



The EMRAM - Explained

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 @ Himssjohn

25-27 October 2018
Pullman Hotel Yenibosna
ISTANBUL, TURKEY

www.himsseurasia.com

 #HIMSSTurkey

Healthcare Information and Management Systems Society (HIMSS)

HIMSS is a global, cause-based, not-for-profit organization focused on better health through information and technology (IT). HIMSS leads efforts to optimize health engagements and care outcomes using information technology.



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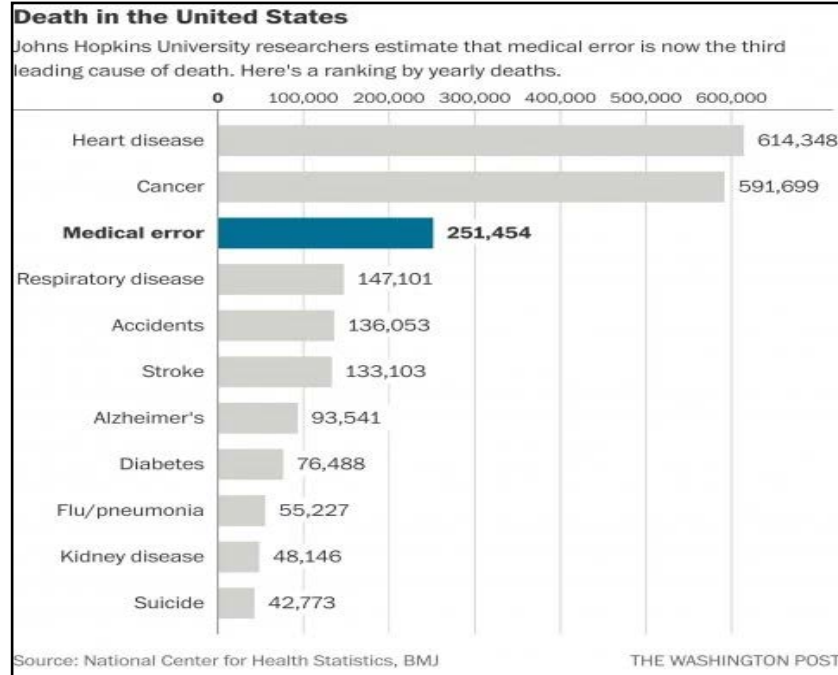
Plan for the session....

- **Background information**
- **The patient safety story** - Why we measure adoption
- **The EMRAM standards** – The requirement of each stage
- Questions

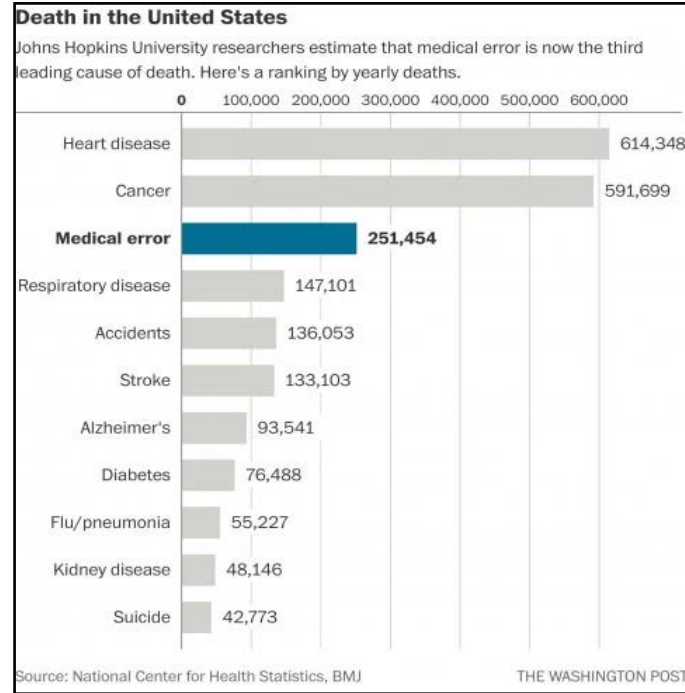
HimSS Analytics[®]

Enabling better health
through information
technology.

250,000 US Citizens die each year as a result of Medical Error.....



250,000 US Citizens die each year as a result of Medical Error....



9.5% of the total number of annual deaths

8000 of those are drug errors

60,000 die each year without appropriate health care.

Many of these deaths are preventable.

The NHS in the UK causes 40,000 deaths a year.....



The NHS in the UK causes 40,000 deaths a year.....



**7% of the total
number of annual
deaths**

**900 of those are
drug errors**

**Many of these
deaths are
preventable**

Elsewhere?



PJ Salaman FRCS....

- “I need technology to make it easy for me to do the right thing – and difficult for me to do the wrong thing”



How easy?



An easy mistake to make!!



And easy to do the right thing....

Cyclobenzaprine
is a muscle
relaxant used to
treat spasm and
skeletal pain



Cyproheptadine
is an
antihistamine
used to treat
allergic
reactions

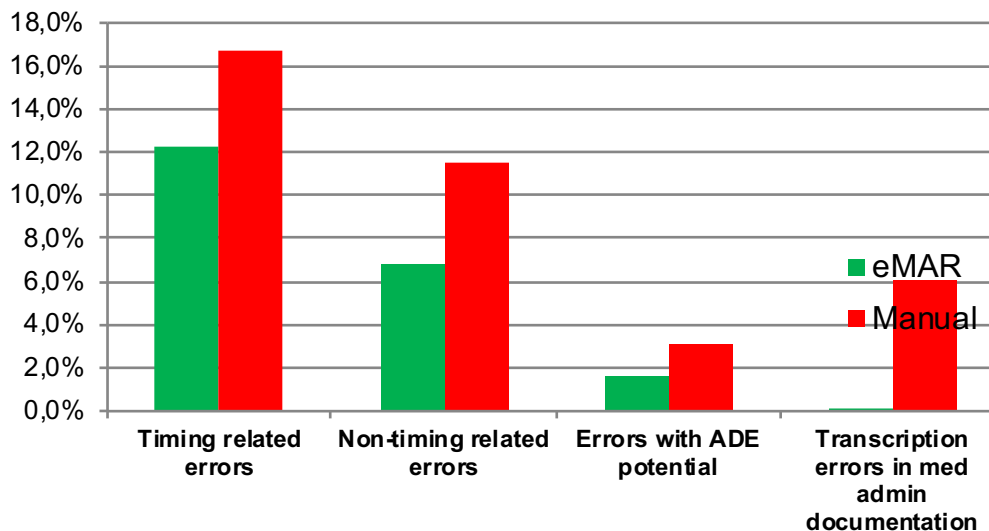
Making the news...





Closed Loop Medication Administration

A Key Element of Patient Safety Improvement



Source: Effect of Bar-Code Technology on the Safety of Medication Administration;
Poon, Keohane, Bates, Lipsitz, et al, New England Journal of Medicine, 2010;362:1698-707, May 6, 2010

Blood Administration..

- Mis-transfusion errors accounted for nearly 40% of the ABO-incompatible transfusions reported by Linden et al (2000) who estimated that 1 in 14 000 transfusions involved ABO errors⁸
- A Hong Kong health system reported **100% reduction** in administration errors of 27,000 units administered⁹
- **100% accuracy** of patient identification obtained for blood samples and blood products administration with bar code enablement¹⁰

⁸ British Journal of Haematology Volume 136, Issue 2, pages 181–190, January 2007

⁹ Hong Kong Med J Vol 10 No 3 June 2004, pgs 166- 171

¹⁰ TRANSFUSION 2003;43:1200-1209

Paperless by 2018 /2020/ 2022...



Case study...

- Patient admitted over the weekend.
- Case notes were not immediately available
- Patient was slightly confused and a poor historian
- Given 6 drugs in the first 24 hours
- Allergic to 4 of them
- Patient died



Could it happen again?



Focus on the acute EMRAM..SM



EMR Adoption Model (EMRAM) - 2005

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


Times have changed

- It was time for more significant changes
 - Needed to better reflect current state of an advanced EMR environment
 - All stages were affected
 - Time to raise the bar globally
- Focus more on functions accomplished and less on technology itself
 - How is technology used to improve care quality and patient safety?

EMR Adoption Model (EMRAM)

- Designed initial “strawman” in July 2015 – several iterations
 - Continued to refine as we progressed towards implementation
- Focused discussions with international stakeholders individually and in groups
 - Global listening sessions
 - Stage 6 & 7 and Davies organizations
 - HIMSS Executive Institute
 - Suppliers of local & international EMR systems and vendors in general

EMR Adoption Model (EMRAM)

STAGE	 EMRAM EMR Adoption Model Cumulative Capabilities
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS
5	Physician documentation using structured templates; Intrusion/Device Protection
4	CPOE with CDS; Nursing and Allied Health Documentation; Basic Business Continuity
3	Nursing and Allied Health Documentation; eMAR; Role-Based Security
2	CDR; Internal Interoperability; Basic Security
1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management
0	All three ancillaries not installed

The Changes....

New Standards
Some elements have moved
Increased compliance

Stage 1 – Main Diagnostic Systems Results On-Line

- Radiology information system
- Laboratory information system
- Pharmacy management system
- PACS (radiology & cardiology) for DICOM
 - 100% filmless
- Non-DICOM images are available via the network

Stage 2 – Core Clinical Data Store

- Clinical Data Repository – Single or multiple fully integrated 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)
- **Data availability $\geq 95\%$** - CDR provides access to 95% of lab results and radiology and cardiology reports
 - Remote access – Information is accessible from outside the hospital
- **Security:**
 - Physical access policy in place; security training program
 - Acceptable use policy in place with training program
 - Mobile security in place
 - Data destruction policy in place
 - Device encryption in place
 - Anti-virus, anti-malware tools in place
 - Prevention of PHI storage on assets owned by the organization and BYOD (if allowed)

Possible Questions....

- Do you have a Physical access policy in place and enforced?
- How often is the physical access policy reviewed and updated?
- Do you have an acceptable use policy in place and enforced?
- How often is the acceptable use policy reviewed and updated?
- Do you provide EMR Security training for new users?
- Do you provide EMR Security refresher training for existing users?
- How often do you provide EMR Security refresher training for existing users?
- What percentage of existing users have received EMR Security refresher training within 12 months of their previous training?

Possible Questions....

- Are you encrypting data stored on data storage devices such as workstations, laptops, and other mobile devices (e.g., hard drives, SSDs, external storage devices, etc.)?
- Do you have a data destruction policy in place and enforced?
- Do you have antivirus and antimalware programs in place on all devices connected to your network?

Possible Questions...

- Are all mobile devices (owned by the organization) that are in use and operating on the network registered/authorized for use? This includes all Laptops, Tablets, PDAs, Mobile/Smart Phones.
- Can you prevent the storage of protected health information (e.g., patient data) locally on assets owned by the organization and user-owned devices (BYOD). (This includes stationary and mobile workstations, storage devices such as CD, memory sticks etc.)

Stage 3 – Care Documentation is On-Line

- Clinical Documentation - Nurses and **allied health professionals** (not physicians) documenting in the EMR using structured templates and capturing discrete information
 - Vitals, nursing notes, nursing tasks, etc.
- eMAR is implemented
- **Clinical Documentation $\geq 50\%$** – Hospital chooses calculation method (50% of all wards, patient days, inpatient cases, etc.)
- **Clinical Documentation live in ED** (if ED exists) – Excluded from 50%
- **Security**: Role-based access control (RBAC)

Possible Questions...

- Is role-based access control (RBAC) live and in use?
- How are vital signs being captured and documented?
- Is electronic clinical documentation live in the ED?
- Is electronic clinical documentation live in 50% of inpatient areas?
- Are allied health professionals documenting electronically?

Stage 4 – Physician Orders Are On-Line

- **CPOE $\geq 50\%$** (Use same metric previously used) with second level clinical decision support capabilities related to evidenced-based pathways & protocols
- **CPOE live in the ED** (if ED exists) – Excluded from 50%
- **Clinical Documentation $\geq 90\%$** - Nursing / Allied Health documentation increases to 90% (use same calculation method from Stage 3)
- **National / Regional patient database connection** - Where publically available, physicians use access to public databases for decision making (e.g., medications, images, immunizations, lab results, etc.)
- **Business continuity** - Access to patient allergies, problem & Dx list, medications, and recent lab results when EMR is down
- **Intrusion detection** – Hospital can detect possible network intrusions

Possible Questions...

- Are doctors using CPOE in 50% of inpatient areas?
- Is CPOE live in the ED?
- Are nurses and ALP's using electronic clinical documentation in 90% of inpatient areas?
- How is business continuity maintained in the event of an outage?
- Does the Doctor access regional or national databases?
- Is an Intrusion Detection System live and in use?

Stage 5 – Physician Documentation

- Physician Documentation using structured templates – Capturing discrete data or derived via NLP for alerts, clinical guidance and to serve analytical capabilities
- Physician Documentation $\geq 50\%$ – Use same calculation method used for clinical documentation in Stage 3
- Physician Documentation live in ED (if ED exists) – Excluded from 50%
- Order/Task Timeliness Monitoring – Hospital can track and report timeliness of nurse order completion.
 - Recommended goal (not scored): $\geq 90\%$ of orders are completed within two hours of scheduled time.
- Security:
 - Intrusion prevention – Hospital can prevent network/EMR intrusions
 - Portable device (hospital owned) security
 - Devices recognized & authorized to operate on network
 - Devices can be remotely wiped

Possible Questions...

- Are Doctors using electronic clinical documentation in 50% of inpatient areas?
- Are Doctors using electronic clinical documentation in the ED?
- Is an Intrusion Prevention System live and in use?
- Is there a process to monitor and manage task completions?
- Are all mobile devices (owned by the organization) that are in use and operating on the network registered/authorized for use? This includes all Laptops, Tablets, PDAs, Mobile/Smart Phones, Storage Devices/USB Sticks, and Cameras in use.
- Can all registered/authorized mobile devices (owned by the organization) that are in use and operating on the network be remotely controlled/wiped if they are lost or stolen?

Stage 6 – Verification at POC via Technology

- **Technology** is used to ...
 - Order medications and **blood products** ($\geq 50\%$)
 - Verify medication / **blood product orders** ($\geq 50\%$)
 - Verify patient ($\geq 50\%$)
 - Verify medications / **blood product** at the point of administration (medication, dose, route, patient, time) ($\geq 50\%$)
 - **Verify human milk mother-baby match where there is communal storage of milk ($\geq 50\%$)**
 - **Collect and track specimens ($\geq 50\%$)**
- Technology-enabled **medications / blood products / human milk administration live in ED** (if ED exists) – Excluded from 50%
- Clinical Decision Support – Background algorithms generate at least one alert for physicians triggered by physician documentation and/or other variables
- **Security:**
 - Mobile device security policies applied to BYOD
 - BYOD devices must be registered/authorized for use
 - Security risk assessment performed annually
 - Risk assessments reported to governing authority

Possible Questions.....

- Is there a policy in place and enforced relating to allowing the use of devices not owned by the organization (e.g., BYOD)?
- Show some examples of clinical decision support?
- Are all devices not owned by the organization (e.g., BYOD) that are in use and operating on the network registered/authorized for use?
- Can all registered/authorized devices not owned by the organization (e.g., BYOD) that are in use and operating on the network provide restricted access to patient records and be remotely controlled/wiped of all critical patient information if they are lost or stolen?

Possible Questions.....

- Does the organization conduct periodic security risk assessments and report the results to the organization's appropriate governing authority?
- How often does the organization conduct security risk assessments?
- Is technology being used at the POC across 50% of the inpatient areas?

Stage 7 – Pervasive of Use and Management

- 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

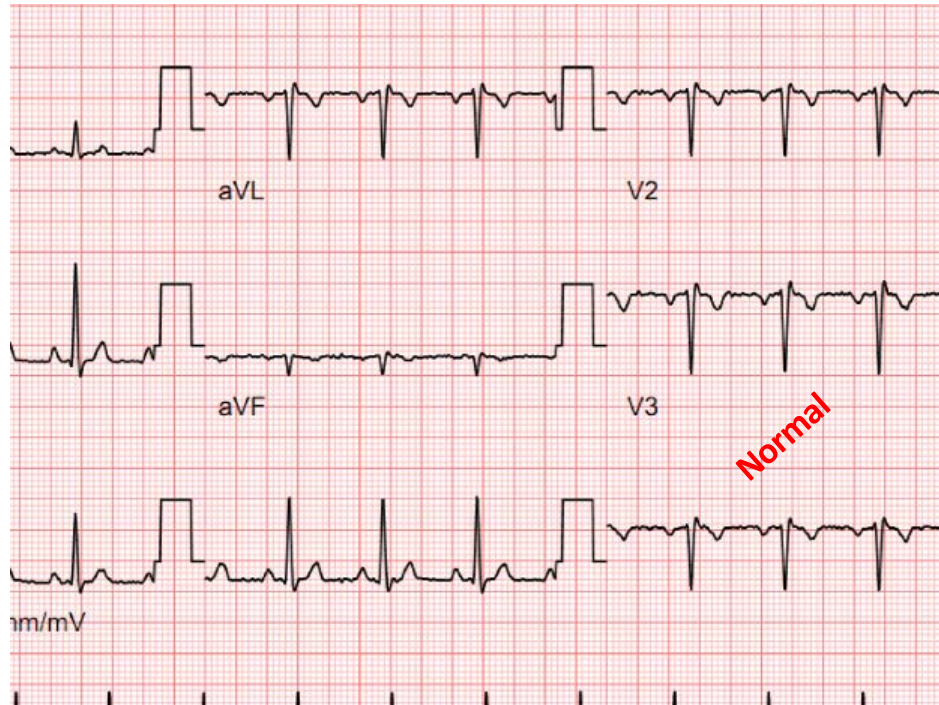
Stage 7 – Pervasive of Use and Management

- CPOE $\geq 90\%$ - use same calculation method used in Stage 4
- **Physician Documentation $\geq 90\%$** - use same calculation method from Stage 3
- **Privacy and security program** – Present overview of strategy, infrastructure, policy and procedures
- **NON-SCORED:**
 - Implementation & use of **Anesthesia Information System** (five to seven years' notice)
 - **CPOE-enabled infusion pumps** (seven to ten years' notice)
 - **Order/Task Timeliness $\geq 90\%$** – All orders are completed within two (2) hours of schedule 90% of the time

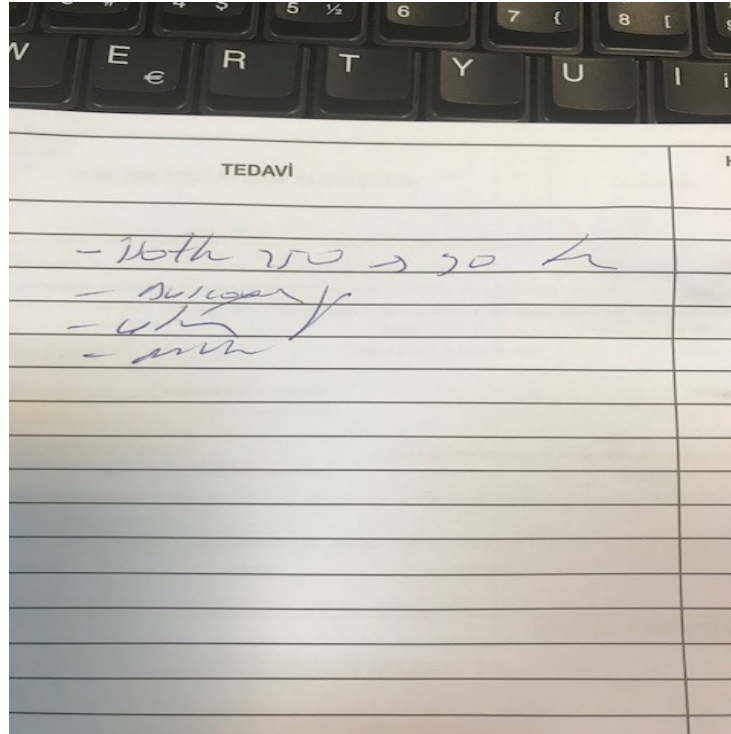
Picture Quiz...



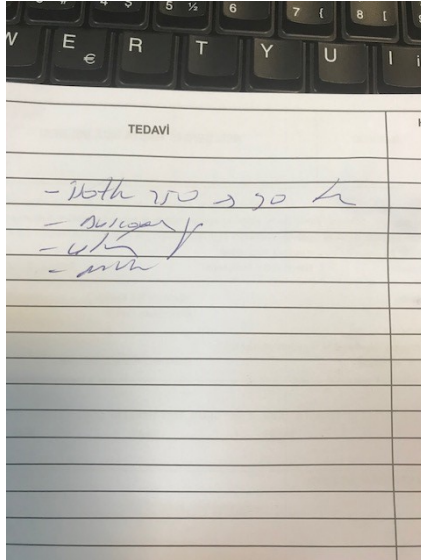
Picture Quiz...



Picture Quiz...



Picture Quiz...



OR

Isotonic
Buscopan
Ulcram
Metpamid

Picture Quiz....

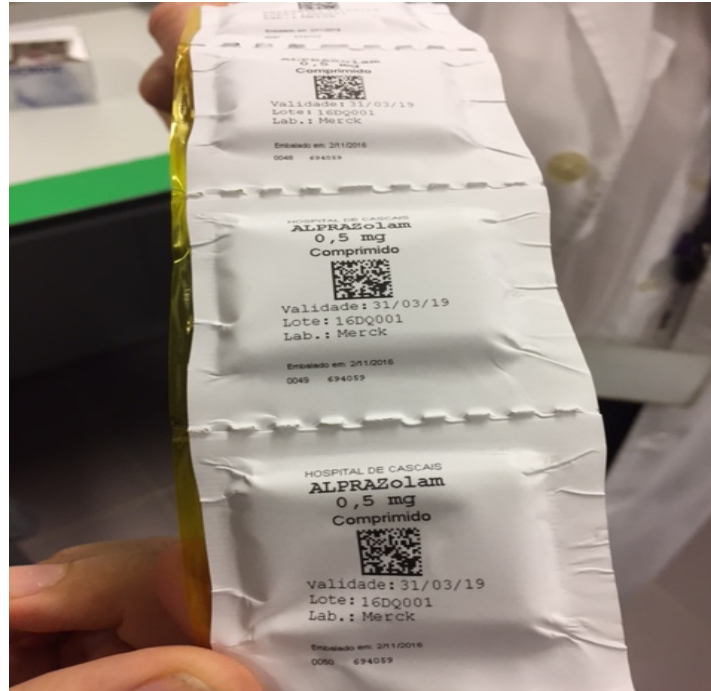


[dreamstime.com](https://www.dreamstime.com/)

Picture Quiz....



Picture Quiz....



Picture Quiz....



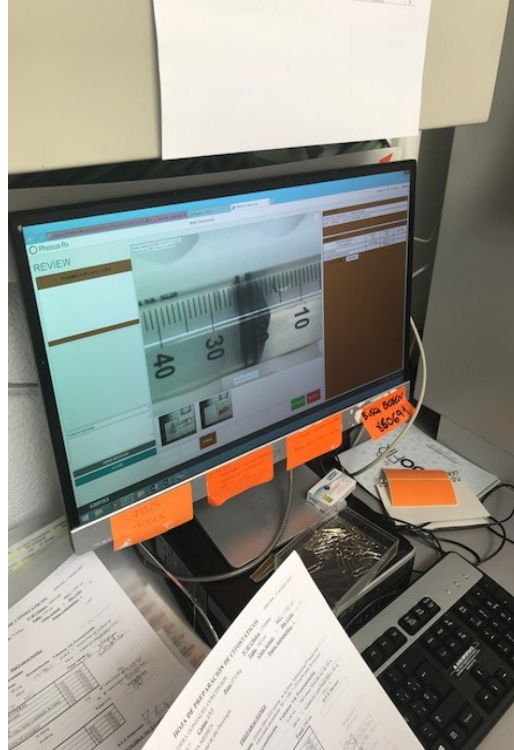
Picture Quiz....



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Picture Quiz....



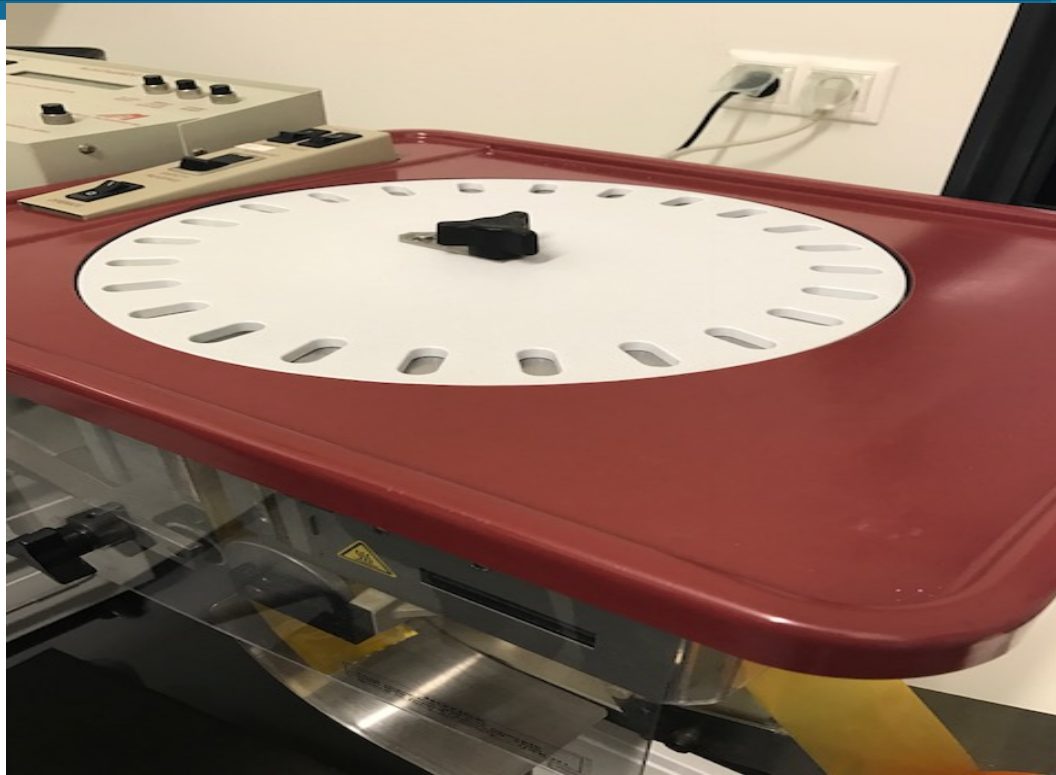
Picture Quiz....



Picture Quiz....



Picture Quiz....



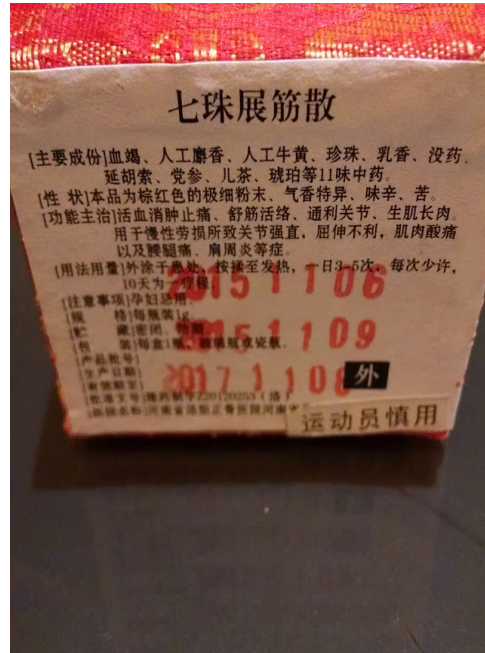
Picture Quiz....



TCM....



Ingredients....



Patient Instructions



Voila !!



The Online Survey.....

[EMRAM PDF](#)

Stage 6 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 [Gap Analysis](#)
- 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

Stage 7 Validation Process

- **Three parts**
- Part I – Logistical prep call
- Part II – Video conference presentation by candidate on ...
 - IT Security
 - Disaster Recovery/Business Continuity
- Part III – On-site validation
 - 2 Full days onsite visit
 - Opening candidate presentations followed by department visits
 - Closing session with validation decision & findings

Stage 7 Preparatory Guide

[Stage 7 Preparatory Guide](#)

Onsite validation (Typical agenda)...

- Introduction and welcome
- Organisation overview
 - System Overview & Pervasiveness of Use
 - Governance
 - Clinical & Business Intelligence
 - Health Information Exchange
 - Disaster Recovery & Business Continuity
 - Privacy & Security
- Clinical observations
 - Medical and Surgical area
 - ICU
 - Medical and Surgical area
 - ER
 - Pharmacy
 - Laboratory and Blood bank
 - Imaging department
 - Medical records and clinical coding
- Review team discussion and final validation decision

Benefit and Value....

- Benefits of using an Electronic Patient / Medical Record System
- Benefits being able to benchmark and compare
- Benefits and value of being a Stage 6/7 hospital



Value and Benefit....

- **Benefits of using technology**

- Reducing sepsis and sepsis related mortality
- Reducing Length of Stay
- Reducing the number of in patient falls and harm from falls
- Reducing the number and severity of adverse drug events
- Reducing the number of inappropriate investigations and X ray examinations

Value and Benefit...

- **Measurement and Benchmarking**
 - Investment in technology and patient safety
 - Investment in technology and improved clinical care
 - Higher levels of patient and staff satisfaction
 - Improved staff retention and recruitment
- **Third party attestation**
 - The EMRAM score helps to measure and compare

Value and Benefit...

- **Being an EMRAM Stage 6/7 hospital**

- Paying lower insurance premiums in those countries where such schemes exist (NHS Resolution formerly NHS Litigation Authority)
- Members of staff are less likely to move from Stage 7 hospitals to Stage 4 hospitals than they are between Stage 6 hospitals thus staff retention is a factor
- Being more likely to withstand legal claims involving record keeping, data loss and medical negligence
- Being more attractive to those who pay and commission (CCG's and insurance companies) Regulators in some countries require hospitals to be at Stage 6
- Being more competent, safe and outwardly sophisticated to those who regulate (CQC, JCI)
- Greater levels of patient satisfaction and patient confidence in those countries who measure these parameters (Higher NPS and Family and Friends score)

Value and Benefit...

- **Being an EMRAM Stage 6/7 Hospital**

- Modernisation, managing successful change, innovation, clinical engagement, strong leadership and the ability to successfully invest
- Attracting positive attention from others who wish to learn, emulate and use for reference purposes
- Potential financial remuneration from system suppliers in return for reference site status
- The ability to withstand ministerial, MoH and other forms of political scrutiny
- Kudos, respect and other forms of reward and privilege. (Invited to join national committees, reference opportunities, speaking and presenting opportunities, councils etc)
- Stage 7 hospitals in some countries often have the ability to influence thinking, strategy and product development

Stage 6 / 7 Hospitals in Europe...



Europe and Latin America...

Country	Awardees	Stage 6	Stage 7
Argentina	2	1	1
Brazil	29	26	3
Chile	1	1	
Colombia	1	1	
Austria	1	1	
Belgium	2	2	
Denmark	1	1	
Germany	2	2	
Ireland	1	1	
Italy	6	6	
Netherlands	4	2	2
Norway	1	1	
Portugal	2	1	1
Russia	1	1	
Slovenia	1	1	
Spain	11	8	
Switzerland	1	1	
Turkey	166	165	1
United Kingdom	3	3	

EMR Adoption ModelSM (2006-2015) United States

Stage	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Stage 7	0.0%	0.0%	0.3%	0.7%	1.0%	1.2%	1.9%	2.9%	3.6%	4.2%
Stage 6	0.1%	0.8%	0.5%	1.6%	3.2%	5.2%	8.2%	12.5%	17.9%	27.1%
Stage 5	0.5%	1.4%	2.5%	3.8%	4.5%	8.4%	14.0%	22.0%	32.8%	35.9%
Stage 4	3.1%	2.2%	2.5%	7.4%	10.5%	13.2%	14.2%	15.5%	14.0%	10.1%
Stage 3	18.7%	25.1%	35.7%	50.9%	49.0%	44.9%	38.3%	30.3%	21.0%	16.4%
Stage 2	40.0%	37.2%	31.4%	16.9%	14.6%	12.4%	10.7%	7.6%	5.1%	2.6%
Stage 1	17.4%	14.0%	11.5%	7.2%	7.1%	5.7%	4.3%	3.3%	2.0%	1.7%
Stage 0	20.4%	19.3%	15.6%	11.5%	10.1%	9.0%	8.4%	5.8%	3.7%	2.1%

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

Ministerial Leadership...



- All hospitals completed an EMRAM survey
- Many hospitals quickly improved
- The relationship continues

Good practice visits....



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Thank you!

John Rayner
Regional Director – Europe and Latin America

 @Himssjohn

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