Better Outcomes Through IT

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GCIO

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Patients. At the heart of all we do.

SingHealth Healthcare Management Congress 2012

Partners in Academic Medicine

Members of the SingHealth Group:
- Singapore General Hospital
- KK Women’s and Children’s Hospital
- National Cancer Centre Singapore
- National Dental Centre Singapore
- National Heart Centre Singapore
- National Neuroscience Institute
- Singapore National Eye Centre
- Polyclinics SingHealth
Presentation Outline

Leveraging IT to Improve Outcomes

Listening to the Future
It’s all about information ........

• Providing tools to collect and process
  • Spreadsheet, Analytics
  • Applications – EMR, HIS,
  • Decision Support

• Enabling devices to access and process
  • Desktop, laptops
  • Tablets, mobile phones

• Allowing access
  • Relevancy, Privacy, Confidentiality
  • Presentation – charts, graphs, images, pictures, etc

• Tying all these information together using technology
  • Laboratory results, X-ray reports, patient’s vital signs, medication, diet,
    clinical notes, rehabilitation notes, etc
Advances in IT allow new ways .......

For us to collect, process, access and consolidate information

What was previously not possible, is now possible; what is currently not possible, will be possible in the future
Imagine implementing EMR on this ..........
Leveraging IT to Improve Outcomes

✓ Improved clinical outcome and patient safety
  Faster diagnoses, prevent errors, reduce duplication

✓ Better experience for patients and relatives
  Friendly service, reduce queueing and waiting, convenience

✓ Increased productivity for staff
  Communication, collaboration, access to information and knowledge
Improved Clinical Outcome and Patient Safety

In Crossing the Quality Chasm (March 2001), the Institute of Medicine (IOM) calls for nationwide changes in information technology (IT) infrastructure as a means of decreasing medical errors and improving quality of care.

2012 HIMSS Analytics Report (April 2012) – “Analysis of hospitals in all stages of implementation of EMR systems has shown that hospitals in advanced stages (Stages 5 and above) are significantly more likely to set national benchmarks for balanced performance than are peer hospitals.” and “hospitals at a high level on the EMRAM model are more likely to demonstrate top performance on both how patients are cared for through clinical measures and how the hospital performs as an efficient business.”
HIMSS EMR Adoption Model

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cumulative Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0</td>
<td>All Three Ancillaries Not Installed</td>
</tr>
<tr>
<td>Stage 1</td>
<td>Ancillaries – Lab, Rad, Pharmacy - All Installed</td>
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<tr>
<td>Stage 2</td>
<td>Clinical Data Repository, Controlled Medical Vocabulary, Clinical Data Support System, may have Document Imaging</td>
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<tr>
<td>Stage 3</td>
<td>Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
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<tr>
<td>Stage 4</td>
<td>CPOE, CDSS (clinical protocols)</td>
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<tr>
<td>Stage 5</td>
<td>Closed loop medication administration</td>
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<tr>
<td>Stage 6</td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full R-PACS</td>
</tr>
<tr>
<td>Stage 7</td>
<td>Medical record fully electronic; HCO able to contribute CCD as byproduct of EMR; Data warehousing in use</td>
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Stage 6: Hospital EMR Adoption Model

- National University Hospital
- KK Women’s and Children’s Hospital, SingHealth
- Singapore General Hospital, SingHealth
- Tan Tock Seng Hospital

Singapore Healthcare Management Congress 2012
Computerized Physician Order Entry (CPOE) and Results Reporting

Improved clinical outcome and patient safety

In addition to reducing potential duplication of tests and examinations, and eliminating issues associated with illegibility:

- Improve patient safety
  - ePrescription – patient drug allergy, drug-to-drug interaction, dosage to weight, past medication history
  - eRadiology – for female patient, system prompts to check for pregnancy

- Improve patient care
  - eLaboratory – preliminary diagnosis is required for some tests so that pathologist will know what look out for
  - Alerts for abnormal results
Closed Loop Medication Management

Improved clinical outcome and patient safety

0
Pharmacist Verify orders

1
CPOE

2
Pill Pick System creates automatically
the patient therapy (ring)

3
Integration of therapy through manual picking of drugs not managed by Pill Pick

4
Dispatch to wards

5
eMAR

Medication Admin

Electronic prescription

Pharmacist verification

INPATIENT PHARMACY

Preparation of medication trolley

Pick & Pack
Mobile Applications
Improved clinical outcome and patient safety

With the wide adoption of smart phones, we introduced mobile applications for patients and public to co-manage their conditions and to access health information.

Health Diary for Rheumatoid Arthritis

We’ll be launching a few more mobile applications in the coming months.
TeleHealth – SiDRP Singapore Integrated Diabetic Retinopathy Program

1. Image capture sites
   - Outram
   - Bukit Merah
   - Clementi
   - Jurong

2. Image transmitted to SAILOR

3. Image grading

4. Report and recommendation to polyclinic

Web-based Platform

Reduces turnaround time for image grading from 3 days to about 1 hour. Patients do not need to come back on another day.
Remote consultation for stroke patients – fast treatment improves outcome
Analytics

- Healthcare Analytics
- Research
- Evidence Based Medicine
- Manage cost; discover inefficiencies
- Plan for the future
- Resourcing
- Predictive Analytics ……..
## Analytics

<table>
<thead>
<tr>
<th>Analytics Area</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualisation, Information</td>
<td>- Daily Workload Dashboard with drill-downs available since Aug-2009</td>
</tr>
<tr>
<td>Availability &amp; Self service</td>
<td>- “Convenience” and reducing time to obtain information – Quality Management</td>
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<tr>
<td></td>
<td>- eHints is able to provide data not easily available in Clinical applications needed for research - Neurosurgery</td>
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<tr>
<td>Analysis &amp; Research Support</td>
<td>- A&amp;E turned Inpatient Analysis: Difficult to analyse previously due to different SAP case numbers. This is now automated</td>
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<tr>
<td></td>
<td>- Day Surgery turned Inpatient Analysis is now automated</td>
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<td></td>
<td>- Data to support DEM-MI Analytics Study for A&amp;E Frequent Attenders; A&amp;E Discharge profile to potentially free up beds; NSF Impact on A&amp;E workload</td>
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<tr>
<td></td>
<td>- Data to support research studies (e.g.):</td>
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<td></td>
<td>- Hospital Planning: Design and build of Hospital to meet aging population needs – workload projects to 2040</td>
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<tr>
<td></td>
<td>- Improving Adherence in Patients with Disease X</td>
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<td></td>
<td>- Reducing readmissions by risk stratifying patients</td>
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<tr>
<td>Clinical Analysis</td>
<td>- Data to support Research requirements</td>
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<td></td>
<td>- Drugs analysis for orders, dispensing and billing</td>
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<td></td>
<td>- Lab analysis for General, Micro, Histology and Blood bank</td>
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<tr>
<td>Data Quality</td>
<td>- Code standardisation to enable cross systems analysis</td>
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</table>
Better Experience for Patients and Relatives

Less queues and reduce waiting time for registration and payment

Self-payment Kiosks

Self-registration Kiosks
Welcome to SingPass Authentication Service

Security Advisory

SingPass is a common password that allows you to access Government e-services. It is important for you to be vigilant in protecting the confidentiality of your SingPass.

Please click here for tips on online security. You may also find useful guides on how to safeguard your online security and other cyber security related information at www.gosafeonline.sg.

SingPass ID
(Enter your Identification Number)
e.g. S1234567G, G1234567G

SingPass
(6-24 characters, CASE-SENSITIVE)

Tick here to change your SingPass

Submit Cancel

By clicking on the Submit button, you agree to be bound by the terms specified in the Terms of Use and Important Notes below.

For tips on Online Security, Click here.

Do not have a SingPass? Apply here.

Forgot your Password? Reset here.

Important Notes

a. You understand that SingPass is intended to help you authenticate yourself on the Internet. As there are inherent security risks on the Internet, you must carefully consider the degree to which you choose to rely on your SingPass.
Other IT-enabled patient services

- Means Testing
- Automated Visitor Management System
- Medication Assistance
- Information Kiosks
- Mobile Applications
  - Woman & Child Healthpedia
  - SMS Reminders for Appointments and Queues
Increased Productivity for Staff

"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?' icon."
A common email platform for public healthcare institutions accessible through web browser, Outlook, mobile devices and tablets.

Additional features:
- Web conferencing
- Instant Messaging
- eFax
ERP, eForms and Workflow
Increased productivity for staff

Enterprise Resource Planning (ERP) system supporting Finance, HR, Materials Management operations

Employee and Manager Self-Service

Electronic Item Requisition Form (eIRF)

Electronic Workplan and Budget System

......... And many more
Technologies improve for understanding and managing chronic illnesses, cell phones may help people monitor their conditions, delivering text messages with information about what's going on in the body.
Increasingly more innovations are harnessing the power of mobile phones, applications, SMS and social media to redefine and improve doctor patient relations and our overall healthcare system.

The upcoming technology trends:
Users are empowered to manage their health and adopt healthier behavior.
Implantable RFID Microchips to Monitor Blood Sugar
Is IT possible?

- Implants
- Microchips
- From Telecare to Telecure
2013 and beyond

Paper-less

Script-less

Film-less

Chart-less

Cash-less

Environment
Thank you

For more information on SingHealth, please visit www.singhealth.com.sg