Information and Communication Technology in Health Care
“To Infinity and Beyond”

Pam Bush, RN, BScN
Agenda

- Electronic Health Record - EHR - what is it
- EHR Requirements to Support Clinical Practice
- EHR how do we compare?
- Who are the NI leaders?
- What do they have?
- What do we need?
- What enabling technology is available?
Canadians and health care providers with timely, appropriate and secure access to the right information when and where they enter into the health system
Canada Health Infoway
- Completeness of Health Information
- Custodian of Information

EMR
- Component of EHR
- Health Provider custodian

EHR
- Complete EHR
- Region / Provincial ownership
eHealth Ontario

- Funded by MOHLTC
- Established in 2008
- Purpose to build IT infrastructure to support the delivery of health care to Ontarians
Pan-Canadian Nursing EHR Business and Functional Elements Supporting Clinical Practice

June 2012
Functional Requirements

- Access based on role
- Provides data details, date/time data entered and by who/role
- Ease of capture of actions accept, edit etc
- Ensures correct data for correct patient are transmitted to correct destination-EHR, provider, department, organization
- Ensure Data integrity
- Single sign on across all systems
Functional Requirements

- POC real time access to information
- Error checking-drug interactions, allergies, dosages
- Embedded BPGs / Clinical Pathways
- Alerts to BPG not followed/ errors/contradictory orders/ critical values
- Triggers alerts and notifications according to data entered and recommends prioritization of interventions
- Sends urgent and critical information with alerts and visual display
- Alerts can be modified based on patient
Functional Requirements

- Displays Patient Care plan, interventions, outcome data
- Captures information from different providers in shared health record, problem list, allergies, care plan
- Interdisciplinary integration of care through shared assessments and pathways to guide plan of care
- Seamless transfer of information and reuse of information
- Creates reports in shared health record
- Auto population of templates in real time
Functional Requirements.

- Embedded reference in EHR to push information to inform and support critical thinking/decision making
- Easy access to resource material within the EHR
- Allows nurses easy access to other functionality-ie appointment/scheduling
Functional Requirements

- Information captured, viewed, sent or received across continuum in real time
- Ability to view same information by multiple providers at same time
- Allows secure messaging and notifications within circle of care
Functional Requirements

- Accepts different data entry methods - touch, voice, text
- Integrates medical devices - self care
- Patient / family access to EHR
- Alerts patient/ family to self care tasks
Functional Requirements

- Links assessment and intervention data to patient education resources sends patient resources on request, and notes in EHR
- Ability for patients/families to ask questions online which alerts nurse
- Stores patients current and dated care directives ie. POA personal care
How do we compare?
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<tr>
<th>Stage</th>
<th>Cumulative Capabilities</th>
<th>F 2012 US</th>
<th>CAN</th>
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<tbody>
<tr>
<td>7</td>
<td>Complete EMR; CCD transactions to share data; Data Warehousing; Data Continuity with ED, ambulatory, OP</td>
<td>1.9%</td>
<td>0.0%</td>
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<tr>
<td>6</td>
<td>Physician Documentation (structured templates), full CDSS, full R-PACS</td>
<td>8.2%</td>
<td>0.5%</td>
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<td>5</td>
<td>Closed Loop Medication Administration</td>
<td>14.0%</td>
<td>0.3%</td>
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<td>4</td>
<td>CPOE, Clinical Decision Support (Clinical Protocols)</td>
<td>14.2%</td>
<td>2.3%</td>
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<td>3</td>
<td>Nursing/Clinical documentation, CDSS, PACS available outside Radiology</td>
<td>38.3%</td>
<td>33.8%</td>
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<td>2</td>
<td>CDR, Controlled Medical Vocabulary, CDS, have document imaging, HIE capable</td>
<td>10.7%</td>
<td>25.3%</td>
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<td>1</td>
<td>Ancillaries: Lab, Rad, Pharmacy - installed</td>
<td>4.3%</td>
<td>14.8%</td>
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<tr>
<td>0</td>
<td>All three ancillaries not installed</td>
<td>8.4%</td>
<td>23.0%</td>
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<td>South Okanagan General Hospital, Oliver, BC</td>
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<td>North York General Hospital, Toronto</td>
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<td>St. Michael’s Hospital, Toronto</td>
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<td>Ontario Shores Centre for Mental Health Sciences, Whitby</td>
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<td>HIMSS Stage 7 Designated Hospital</td>
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<td>UC San Diego</td>
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<td>North Shore University Health System *</td>
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<td>Stanford Hospital and Clinics *</td>
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<td>University of Wisconsin Medical Center *</td>
<td>Epic</td>
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<td>Boston Children's *</td>
<td>Cerner back end and Epic front end</td>
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<td>UPMC *</td>
<td>Epic/Cerner</td>
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<td>Kaiser Permanente</td>
<td>Epic</td>
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<td>Mayo Clinic</td>
<td>GE Centricity Enterprise</td>
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<td>Deaconess Health System *</td>
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<td>University of Iowa Medical Center *</td>
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What do they have?

- Many hospitals in the United States are working with second generation of EHRs
- The hospitals acknowledged the quality benefits of EHR
- Now focusing on efficiency
- Seamless transitions for patients due to the real-time availability of information throughout the continuum of care (in-patient, out-patient, primary care)

- Hospitals that are leaders in NI are leaders for all clinicians, and in particular, are leaders in safe, patient-centered care
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<th>UPMC</th>
<th>U Wisconsin</th>
<th>U Iowa</th>
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<tr>
<td>Where is information entered into the EHR?</td>
<td>WOWs in hallways and pt rooms.</td>
<td>WOWs outside pt’s rooms. Rover.</td>
<td>Bedside PCs in room</td>
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<td>How do nurses communicate with their team?</td>
<td>Spectra Link phones Blackberry pilot</td>
<td>Pagers but are moving to phones</td>
<td>Pagers except for pilot using iPhones with Voalte communication software</td>
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<td>Barcode scanning?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Medication administration process (All 3 hospitals have fully functioning CPOE systems and eMAR)</td>
<td>Meds scanned when they leave pharmacy and when they are received on the unit Meds stored in drawers on WOWs Robots in pharmacy</td>
<td>Locked med drawers outside pt’s room.</td>
<td>Medication room.</td>
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<td>Simulation rooms to pre-determine effect of technology changes on nursing workflow?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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The ideal –What do we need?

- National/ Provincial /Regional EHR system
- Enterprise wide system
- Medical Device integration into EHR
- Information and Communication technology access when/where required -mobility
- Enabling Technologies-simulation
- Connectivity of devices/ equipment/ people and efficiency
- RFID - tracking of people and equipment
- RTLS-associating equipment with people
- Unlimited cash
Medical Device integration into EHR

- Physiologic monitors
- Vital Signs-episodic
- Anaesthetic Gas machines
- Infusion pumps
- Glucometers
- Beds
- Scales
- Dialysis machines
- Smart Alarms
- Impact on Wifi
Information and Communication technology access when/where required

- Current workflow
- Workflow optimization
- Bedside
- Inside room
- Outside of room
- Unit station
- WOWs
- Pocket
Point of Care
Communication Considerations

- Multipurpose devices
- Reduction in walking
- Alerts to pocket
- Applications - paging /escalation/ Voalte (http://www.voalte.com/Products.aspx)
- Infrastructure impact
- Cellular impact to medical devices
- Perceptions patient/ family
- Leadership concerns
- Cleaning-CHICA-Canada recommendations
Enabling Technology

- Bar code scanners - positive patient identification, laboratory specimens, Medication, blood products, breast milk
- Information - access/view - AIRSTRIP
- Documentation - where-size-how voice, touchscreen text
- Communication - alerts audible/visible
- Medical device integration - to EHR, to transformation (change in process)
- RFID - passive - active tracking
- RTLS - association of devices/equipment to patients
- Smart rooms
- Simulation
## Visual Cues

<table>
<thead>
<tr>
<th>Location</th>
<th>Out</th>
<th>Name/Age/Gender</th>
<th>Alert</th>
<th>BVC</th>
<th>MRP</th>
<th>Res</th>
<th>Nurse</th>
<th>Order</th>
<th>MD Task</th>
<th>App</th>
<th>Results</th>
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Other NI considerations

- Nursing involvement in all levels of Clinical Information Systems and technology decision making
- Evaluation framework
- Nursing workflow assessment before implementation-simulation centres
Resources

- Canada Health Infoway- www.infoway-inforoute.ca
- eHealth- www.ehealthontario.on.ca
- Ontario Nurses Informatics Group- www.onig.on.ca
- www.himss.org
- www.KLASresearch.com
- www.chica.org
Questions?