

# 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?



# Canada Health Infoway Vision

Canadians and health care providers with timely, appropriate and secure access to the right information when and where they enter into the health system



# Electronic Medical Record Electronic Health Record

- 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

A decorative graphic consisting of six circles arranged in two rows. The top row has three circles: a solid light purple circle, a hollow light purple circle, and a solid light purple circle. The bottom row has three circles: a solid light purple circle, a hollow light purple circle, and a solid light purple circle.

- Funded by MOHLTC
- Established in 2008
- Purpose to build IT infrastructure to support the delivery of health care to Ontarians



# CHI Nursing Reference Group

- 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

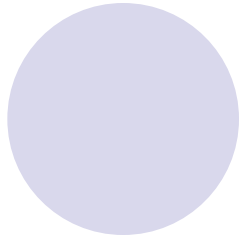
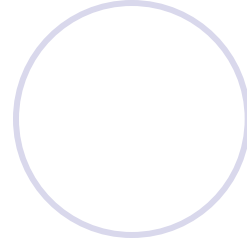
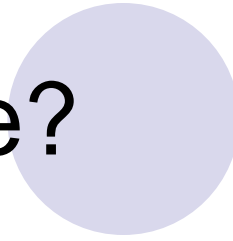
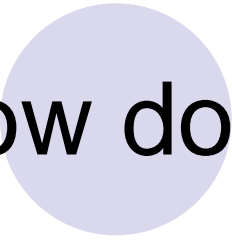
- Accepts different data entry methods-touch, voice, text
- Integrates medical devices-self care
- Patient / family access to EHR
- Alerts patient/ family to self care tasks



# 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 on line which alerts nurse
- Stores patients current and dated care directives ie. POA personal care

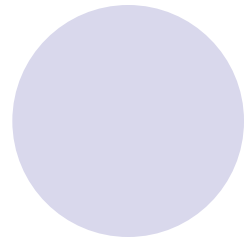
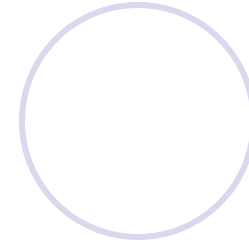
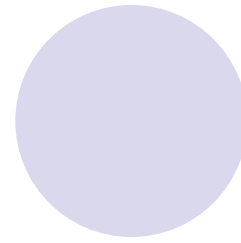
How do we compare?



# Healthcare Information and Management Systems Society

HIMSS Analytics' EMR Adoption Model <sup>SM</sup>			
Stage	Cumulative Capabilities	F 2012 US	CAN
7	Complete EMR; CCD transactions to share data; Data Warehousing; Data Continuity with ED, ambulatory, OP	1.9%	0.0%
6	Physician Documentation (structured templates) full CDSS, full R-PACS	8.2%	0.5%
5	Closed Loop Medication Administration	14.0%	0.3%
4	CPOE, Clinical Decision Support (Clinical Protocols)	14.2%	2.3%
3	Nursing/Clinical documentation, CDSS PACS available outside Radiology	38.3%	33.8%
2	CDR, Controlled Medical Vocabulary, CDS, have document imaging, HIE capable	10.7%	25.3%
1	Ancillaries: Lab, Rad, Pharmacy - installed	4.3%	14.8%
0	All three ancillaries not installed	8.4%	23.0%

# HIMSS Stage 6



## HIMSS Stage 6 Designated Hospital

South Okanagan General Hospital, Oliver, BC

North York General Hospital, Toronto

St. Michael's Hospital, Toronto

Ontario Shores Centre for Mental Health Sciences, Whitby



# Nursing Informatics Leaders

HIMSS Stage 7 Designated Hospital	Vendor
Sentara Healthcare	Epic
UC San Diego	Epic
North Shore University Health System *	Epic
Stanford Hospital and Clinics *	Epic
University of Wisconsin Medical Center *	Epic
Boston Children's *	Cerner back end and Epic front end
UPMC *	Epic/Cerner
Kaiser Permanente	Epic
Mayo Clinic	GE Centricity Enterprise
Deaconess Health System *	Epic
University of Iowa Medical Center *	Epic

# 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

	<b>UPMC</b>	<b>U Wisconsin</b>	<b>U Iowa</b>
Where is information entered into the EHR?	WOWs in hallways and pt rooms.	WOWs outside pt's rooms. Rover.	Bedside PCs in room
How do nurses communicate with their team?	Spectra Link phones Blackberry pilot	Pagers but are moving to phones	Pagers except for pilot using iPhones with Voalte communication software
Barcode scanning?	Yes	Yes	Yes
Medication administration process  (All 3 hospitals have fully functioning CPOE systems and eMAR)	Meds scanned when they leave pharmacy and when they are received on the unit Meds stored in drawers on WOWs Robots in pharmacy	Locked med drawers outside pt's room.	Medication room.
Simulation rooms to pre-determine effect of technology changes on nursing workflow?	Yes	Yes	Yes



# 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

Application CWB Roster List Datasheet Order Resources Reports User Feedback Help

Number of Active Patients: 50 Number of Off Service Patients: 23

Location	Out	Name/Age/Gender	Alert	SVC	MRP	Res	Nurse	Order	MD Task	Appt	Results
5213	(A)	CPOELAB-TACB...O 34 yr M		HEM	ALLA	NC	andree,w/Kelly,L		C	STAT	36d
5214		CPOELAB-TACB...T 46 yr M		HEM	ALLA	KL	Peggy,O/Kelly,L			R	36d 96d
5215		CPOELAB-TACB...T 55 yr F		MEA	ATKJ		Sylvain,D/Kelly,L			STAT	36d
5216	(D)	CPOELAB-TACB...F 24 yr F		HMB	BENC	NC	Sylvain,D/Kelly,L			STAT	91d
5217	(C)	CPOELAB-TACB...F 40 yr F		RAD	MACR	NC	Natasha,M		C	STAT	36d 91d
5218	(C)	CPOELAB-TACB...S 72 yr F		HMB	BENC	NC	DerekRN1,J			R	36d
5219		CPOELAB-TACB,S 43 yr M		HMA	HUEB		Peggy,O/Janet,T		C	R	10d
5220		CPOELAB-TACB...E 26 yr M		MEB	ATKJ	KL	Robin,B		C	R	
5221	(C/D)	CPOELAB-TACB...N 18 yr F		HEM	BENC	KL	Kamm,T/Peggy,G			STAT	36d
5222	(C)	CPOELAB-TACB...T 31 yr F		HEM	ALLA	KL	Robin,B		C	NCW	
5223		CPOELAB-TACB...E 78 yr M		ME	ATKJ		Sylvain,D/Kelly,L			R	
5224	(D)	CPOELAB-TACB...T 40 yr M		HME	BENC	KL	Robin,B				
5225	(A)	CPOELAB-TACB...T 72 yr M		HEM	SABL		Robin,B				
5226		CPOELAB-TACB...F 62 yr F		MEA	ATKJ		Robin,B				
5227		CPOELABSD, S 44 yr M		HEM	HUEB		Robin,B			R	7d 8d
5228		CPOEDI, P 33 yr F		HMB	HUEB	NC	Natasha,M/Sylvain,D		C		71d
5228		CPOEDI, P 33 yr F		HMB	HUEB	NC	Natasha,M/Sylvain,D		C		71d
5229	(A)	CPOELABSC11, S 82 yr F		HEM	HUEB		Stephanie,S			R	
5230		MACKENZIE1, K 36 yr F		ORT	OVAC		Peggy,O/Janet,T				90d
5231		CPOEDI, P 34 yr M		HMB	HUEB		renee,p			R	
5232	(D)	CPOELABSC12, S 38 yr F		HEM	ALLA		StaceyOPN1,C				
5233		CPOEDI, P 43 yr M		HMB	HUEB		renee,p		C	R	
5234		CPOEDI, P 26 yr M		HMB	HUEB		renee,p				
508MAH		CPOELAB-SS5W...S 72 yr F		BMT	SCHN					R	8d



# 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](http://www.infoway-inforoute.ca)
- eHealth- [www.ehealthontario.on.ca](http://www.ehealthontario.on.ca)
- Ontario Nurses Informatics Group- [www.onig.on.ca](http://www.onig.on.ca)
- [www.himss.org](http://www.himss.org)
- [www.KLASresearch.com](http://www.KLASresearch.com)
- [www.chica.org](http://www.chica.org)

Questions?

