

eHealth is Changing Health Care Culture

Smarter Health Seminar Series: June 22, 2005

University of Waterloo Institute for Health Informatics Research

Sam Marafioti, Vice Chair, Ontario Hospital eHealth Council

Vice President, Strategy & Development, and CIO

Sunnybrook & Women's College Health Sciences Centre

The Current System is not Sustainable

Physician and staff shortages

- Burnout, fatigue, long-term disability
- Erosion of skill base and morale

Access & Quality gaps

- Discontinuous & fragmented care
- Waiting lists
- Patient safety concerns

Knowledge & technology advancements and informed consumers

- Higher consumer expectations and greater demand
- Information management challenges
- Training and education requirements

Fiscal constraints

- Provincial under funding
- Insufficient capital investments

As of 2005

- Under-investment in Information, Communication Technology (ICT)
- Primarily paper-based information management
- Varying technological capabilities across health care sectors
- Fragmented data collection, storage and management
- Lack of transformation agenda

Access, Safety and Sustainability are Compromised

- **Prone to error** – paper records difficult to read
- **Tests are duplicated** – Difficult to share
- **Care is compromised** – Information does not usually follow a patient from one provider to the next
- **Data cannot be easily analyzed** for health system planning
- **Inefficient scheduling and time wasted** due to lack of automation
- **Providers overwhelmed** with medical literature which doubles every 19 years

① Decreased effort - - - - - decreased medical
time: - - - - - much improved
speed: - - - - - quickly up
feels: - - - - - people, be a, Decapital

What Stakeholders Want

Patients want access to the care they need and timely, accurate, information for them and their providers to make informed decisions

Providers want a better quality of worklife through access to knowledge and communication tools in safe and supportive workplaces

Government wants accountability to ensure funds are used efficiently and effectively

Ontario's Healthcare System: Strategic Directions

- **Episodic care**



- **Silo and fragmented**



- **Reactive and short-term**



- **Provider-centred**



- **Institutionally-centred**



- **Individual/Institutional Accountability**

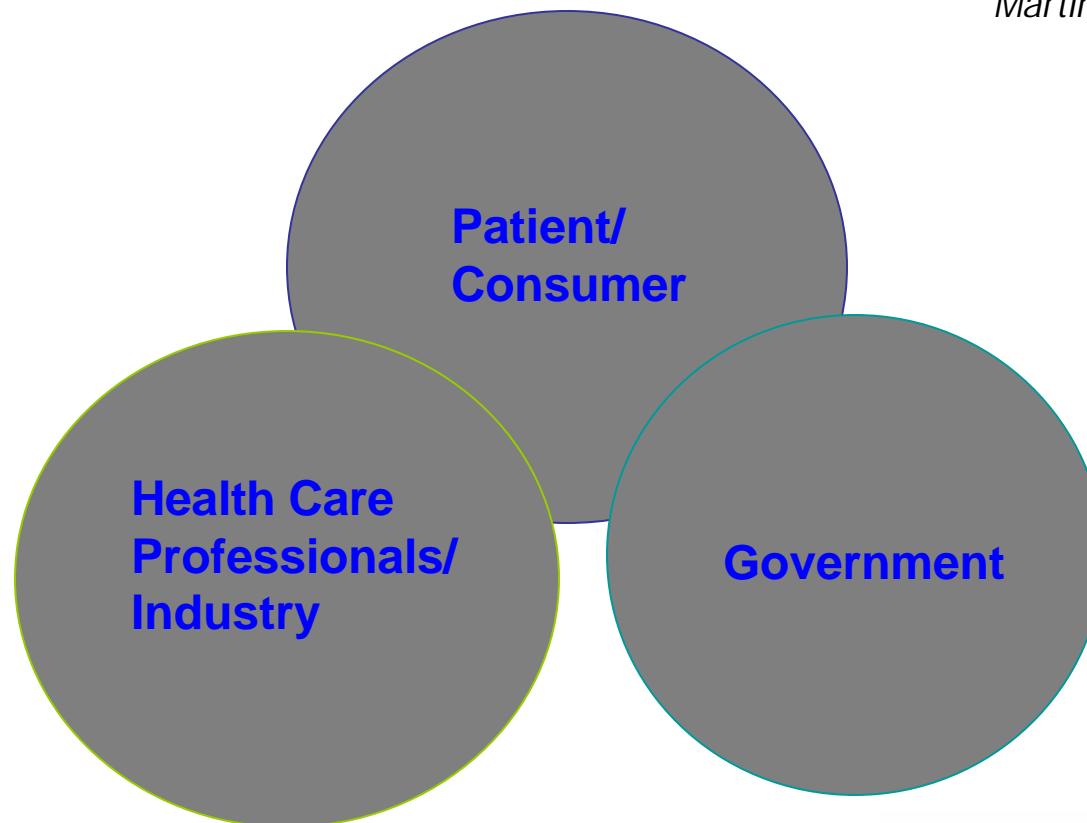


- **Comprehensive, patient-centred focussing on prevention and wellness**
- **Integrated continuum of health services**
- **Planned, enabled and evidence-based**
- **Interdisciplinary approaches**
- **Community-centred**
- **Individual + Community + System Accountability**

Integrated Approaches

“Whatever affects one directly, affects all indirectly”

Martin Luther King



So What ?

- eHealth strategies must play a ***key role*** in addressing health care challenges.
- Perhaps together they are one of the most important strategic levers in the future of the healthcare system.

Better Health Care and Public Health Requires... eHealth

*"eHealth is a consumer-centred model of health care where **stakeholders** collaborate utilizing ICTs including Internet technologies to manage health, arrange, deliver, and account for care, and manage the health care system."*

*Ontario Hospital eHealth Council,
December 2001*

Change Culture

- Increase awareness - drive improvements through quality, safety, and cost of health care services
- Lay foundation for an international eHealth Continuity of Care Record (CCR) – follows the consumer
- Promote adoption of common standards and systems
- Actively work with consumers – understand new expectations
- Assist clinical decisions through decision support tools/technology
- Consumer engagement strategies

Technology Solutions Toolkit: No Limits

Setting Context – Look Back - What Has Changed?

- **Patients expect “high-tech health care”**
 - Technology-savvy customers in every demographic group
- **Digital divide is being bridged by broadband**
 - Remote access users are commonplace
- **Wireless connectivity has expanded beyond being niche functionality**
 - PDA is ubiquitous
 - Home networks are commonplace
 - Personal health networks are emerging
- **Attention to accountability is front-and-centre**
 - measurable Patient Safety initiatives
 - BI and BPM are back in the spotlight in health care

Setting Context – Look Around - What Hasn't Changed?

- **Health care processes are still “black box”**
 - Patients still don't have access to participate in coordination of care
 - But commonplace in other industries, e.g. Federal Express “exposed” parcel tracking system to customers, Indigo customers can check in-store book inventories
- **Information management still important**
 - identifying key performance metrics
 - integrating financial and clinical information
 - filtering “white noise”
- **Support for front-line staff**
 - IT “super” projects save \$\$\$ or reduce risk, but how many translate into tangible improvements in workflow efficiency and therefore improved quality of work life?

Setting Context – Look Forward - What's Needed?

- **Serve stakeholders - patients**
 - Promote information independence
 - Provide information interfaces
 - customizable
 - bi-directional
 - portable
 - Provide full-service information
 - Push personalized information directly
 - Provide information on-demand
 - Provide mobile access
 - Provide rich content

Setting Context – Look Forward - What's Needed?

- **Serve stakeholders - providers**
 - Provide information context management
 - Automatically link-related information
 - Enable portability
 - Provide relevant information
 - Enable granular and/or integrated customization of requested information
 - Improve information sharing
 - Flexible standards for information exchange
 - Be “regionally-ready”

E-health Technology Solutions Toolkit: No Limits

- **Technologies that enable**
 1. Improving access to information for
 - patients
 - providers
 - researchers
 - educators
 2. Mobile access to information for providers
 3. Collaboration between providers
 4. Extending the reach of care delivery

1. Improving Information Access

- **PATIENT PORTALS – creating access**
 - Automated customization
 - Content and layout are personalized to disease condition
 - Self-registration
 - Self-scheduling including wait list monitoring
 - Secure messaging with providers
 - Personal and/or family health diary
 - Health assessment tools
 - Push technology - customized information subscriptions
 - Multimedia on-demand
 - Service-oriented architecture comprised of core standards providing international and multiplatform interoperability
 - Retrieve information for display (combines standards like HTTP, presentation formats like HTML, WHTML, and data formats like HL7, XML, DICOM)

1. Improving Information Access

- **PROVIDER PORTALS – personalizing access**
 - Empowering stakeholders (individuals or groups) through a service model that promotes information independence
 - Self-defined interface experience (channel choice and layout; skins)
 - Push technology - customized information subscriptions
 - Single sign on into multiple channels
 - Enterprise user authentication (focused via HL7 CCOW and Kerberos)
 - EPR, PAS, ADT, PACS
 - E-mail, HR, Financials, web applications
 - Context portability (last screen remembered regardless of location)
 - Patient synchronized applications – channels switch focus depending on which context is selected (focused via HL7 CCOW)
 - Patient ID cross-referencing for MPI (focused via HL7 2.4 patient management standard)

1. Improving Information Access

- **SMART INTERFACING – customizing access**
 - eHealth means sharing of clinical information with a broad range of partners with varying degrees of technical sophistication - some fully HL7 capable, others have no idea what HL7 even is.
 - interface engines that can process against complex business rules through multiple steps in complex workflow processes that:
 - **filter**
 - E.g. all current oncology patients with diagnosis X under treatment Y
 - **aggregate**
 - E.g. all oncology patients with diagnosis X under treatment Y born between 1945 and 1965
 - **compare and contrast**
 - E.g. outcomes of all oncology patients with diagnosis X born between 1945 and 1965 under treatment Y vs. all oncology patients with diagnosis X born between 1945 and 1965 under treatment Z
 - **transform**
 - E.g. tag all oncology patients with diagnosis X and comorbidity of diabetes born between 1945 and 1965 as endocrinology patients and attach complete inpatient medication histories before sending to ancillary application or research service

2. Mobile Access to Information

- **ROAMING AND REAL-TIME WIRELESS PORTALS**
 - Medication Alerts
 - Diagnostic Alerts
 - Clinical Best Practices
 - EPR
 - ADT
 - PAS
 - Dictation
- **ANYWHERE IN HOSPITAL**
 - PDA/laptop + Wireless infrastructure
- **ANYWHERE IN THE WORLD**
 - PDA/laptop + Cellular access

3. Collaboration Between Providers

- **GROUPWARE – removing siloes of information**
 - web applications (Cold Fusion MX) that
 - virtualize care paths
 - Incorporate and coordinate input from multiple providers
 - **automatically** assemble and transmit reports via fax or e-mail, e.g. discharge summaries, medication lists
- **DOCUMENT MANAGEMENT PORTALS – removing restrictions on information
(Sharepoint)**
 - **unlimited** storage capacity
 - documents securely accessible from **anywhere**
 - content that is **searchable**
- **E-LEARNING – providing education on-demand**
 - Customized clinical multimedia libraries – Alexandria content – also available to portal users
 - Interactive teaching tools – CME, certifications, online surveys, quizzes

4. Extending the Reach of Care Delivery

- **TELEHOMECARE – eliminating travel**
 - Connectivity via POTS (AMD, American Telecare)
 - Live consults
 - Visual assessment, remote diagnostic and lab tests
 - Integration of results into EPR
 - **personal access via patient portal**
- **REMOTE MONITORING – providing 7x24 care**
 - Connectivity via Smart Systems for Health Network
 - ICU (VISICU)
 - diabetes patients (American Telecare)
 - Integration of results into EPR
 - **personal access via patient portal**

“Thinking Like The Customer”

eHealth is Driving Change

Today eHealth delivers a new message....

eHealth is recognized as a consumer-centred model where consumers are key stakeholders in the transformation and long term visioning of health care services.

Patients/Consumers are interested in how their care is managed, arranged, delivered, and accounted for.

The New Health Care Experience

e-Consumers must be recognized as valuable new resources –

- able and interested in managing much of their own care
- provide care for others
- help improve quality of health care services
- participate in collaborative initiatives between patients and providers

Change is Needed

S&W is taking a lead role in consumer focused strategies - the e-Health Continuity of Care Record.

This initiative will set the foundation for a ***new model of electronic health records***. Consumers can take more responsibility over their own health and health information.

A portal where consumers can:

- create
- access
- manage
- record
- communicate
- share

S&W Promise of eHealth

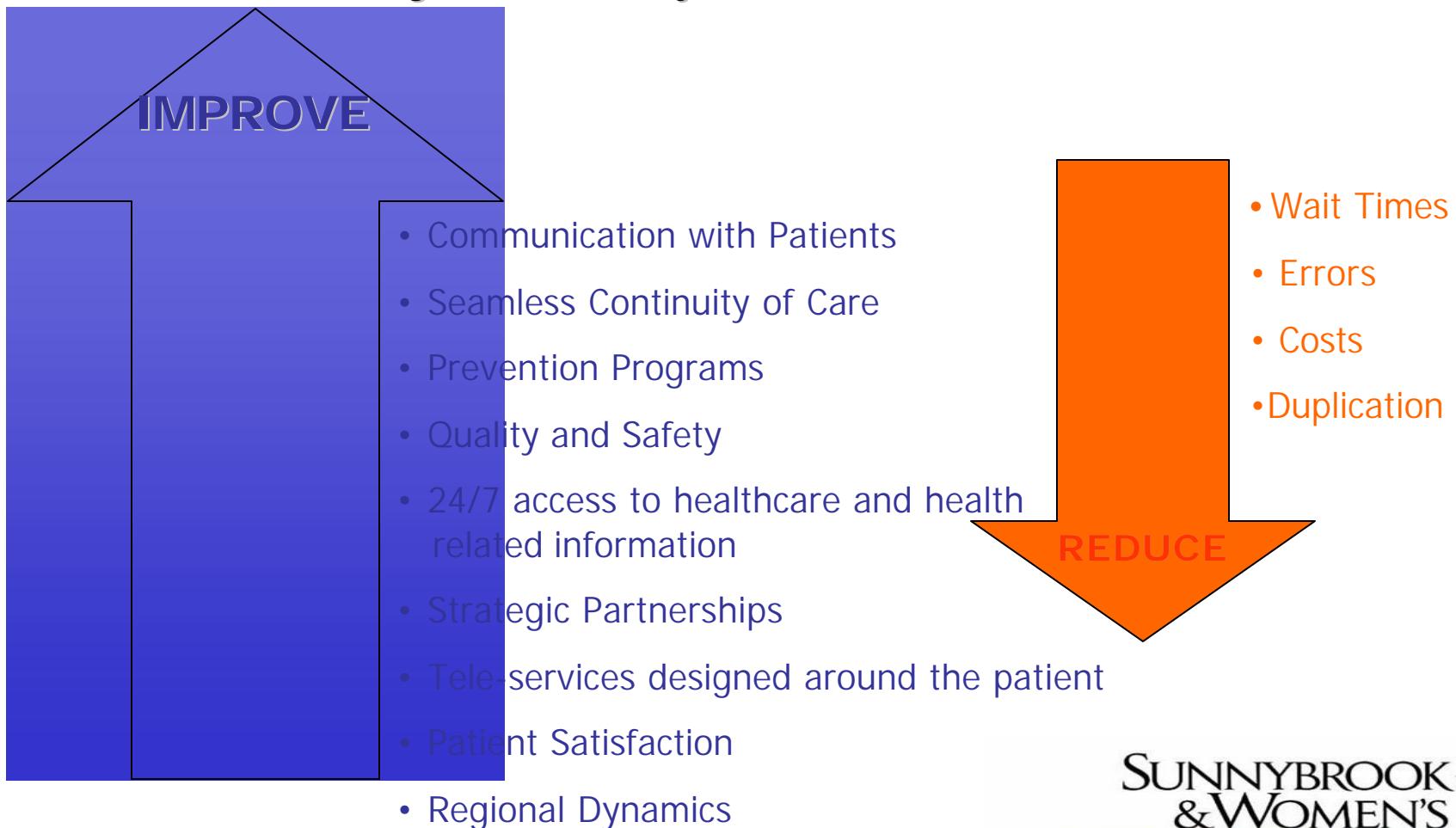
Organization : Effective balance between patient/consumer needs and service delivery. Strategic partnerships and integration initiatives align to MOH Transformation agenda and LHIN Model.

Patient: Positioned as a key stakeholder. Allows consumer to create and manage their own health care information. Provides access when they need it for better decision making and interactive communication.

Provider: Workflow optimization through access to real time information. Creates an evidence based model and enhances professional development.

Healthcare Culture is Changing

New Expectations - to help respond S&W will launch initiatives that bring together innovative strategies, ICT solutions and partnerships to meet the needs of an evolving health care system.



S&W eHealth Strategies

Focus on..

- **Quality** – Clinical leadership, Patient Safety, Best practices, Effective services, Consumer focused
- **Safety** – Timely, Accurate Information, Clinical Decision Support Tools
- **Access** – 24/7, common communication models, ICT leaders
- **Continuity of Care** – Personal Health record, Coordinated care, Telehealth Services
- **Research & Education** – Online Learning, eHealth Innovation centre, Health System leaders
- **Stakeholder Engagement & Strategic Alliances** – Strategic partnerships, Collaborative Initiatives, Regional networks, Public/private funding , Corporate accountability

Healthcare Information Challenge



Dentist



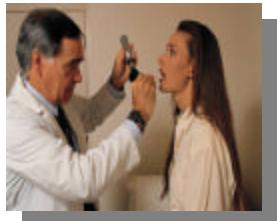
Laboratories



Medical Images



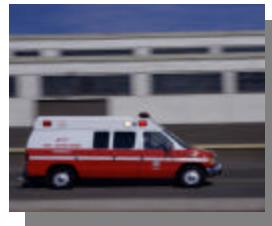
Hospital



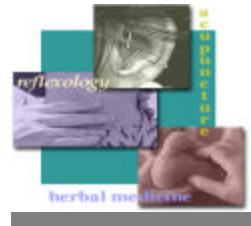
Primary Care Physician

Today...

“Islands” of care unable to offer integrated, coordinated and efficient delivery of information with no incentive to link.



Paramedics



Alternative Medicine

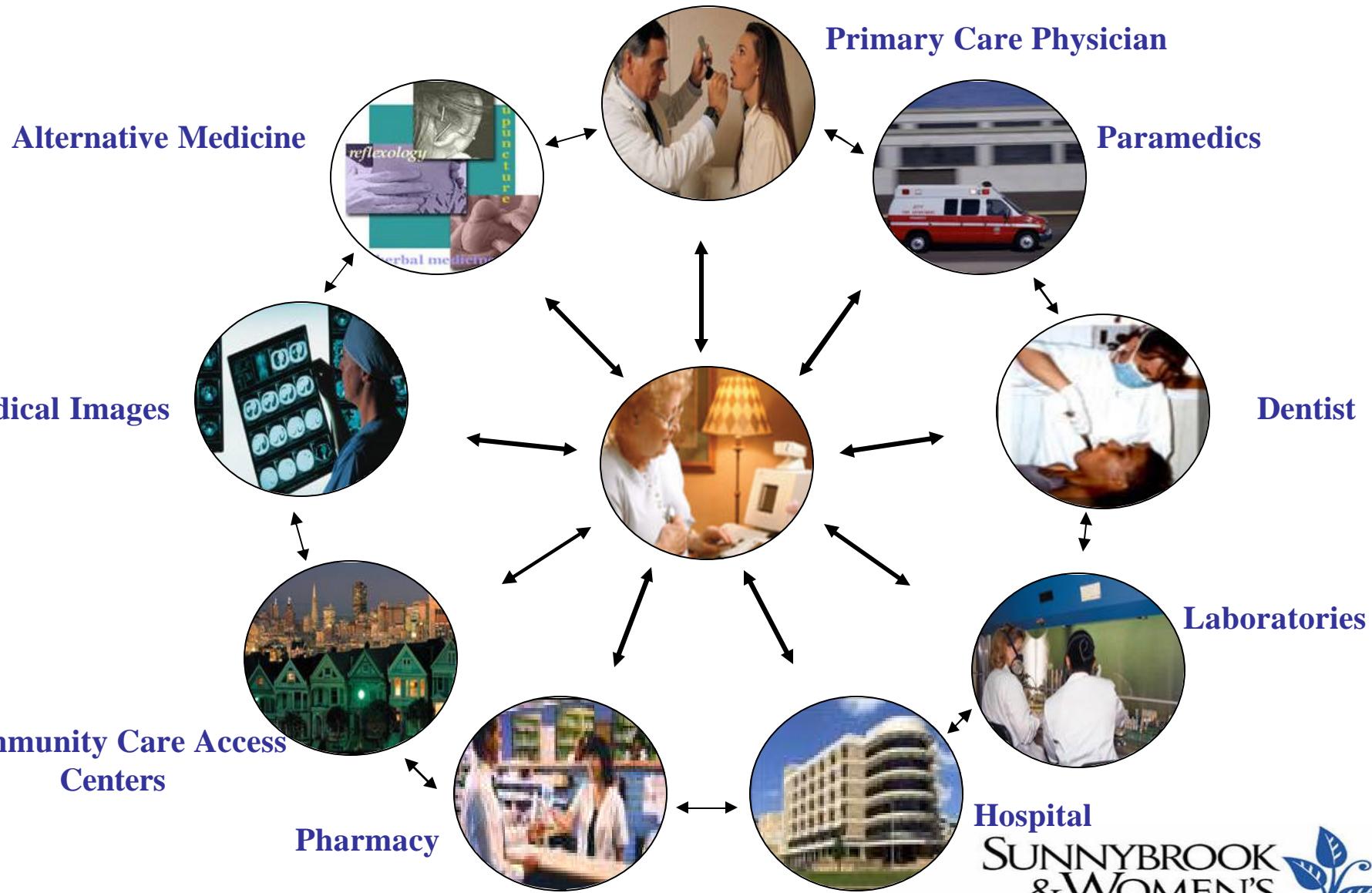


Pharmacy



Community Care Access Centers

eHealth Care Solution



Quality Initiatives

Patient Navigator/Coordinator - Inpatient and Outpatient Setting

A web based tool solution that provides a method of information sharing among care teams to work together more effectively, and respond more quickly with information delivered and tracked electronically as patient moves through multiple visit encounters. The Navigator allows instant access to patient information with fewer resources managing patient notes and delivery. This will coordinate multiple care team work flows, action lists will compile patient information for the discharge summary report. The summary will consist of the patient's in or outpatient visit, medication list, disease specific information, and direct them to informative online resources. Upon discharge the patient will receive a hard copy for their reference, e-copy for personal record and electronic copy mailed to the next care provider as instructed by the patient.

Patient Safety Initiatives

ePrescribing

Using PDA solution - Physicians e-prescribe at point of care. Reduce potential errors of hand written scripts, prescriptions are electronically submitted to the pharmacy for patient pick up. This model avoids errors and promotes the ongoing evolution of point of care access such as evidence based guidelines.

Continuity of Care Initiative

Continuity of Care Record – Osteoporosis in Women’s Health

Enables patient/consumer to create and manage own health record information. Provider/patient access to shared health portal where patient can view test results and discuss any concerns with provider from home. This will encourage/empower patients to take on a more participatory role in their health and health information to help make better decisions. Access to information and resources can reduce the frequency of follow up visits. The health portal/CCR will include health specific information, available services, on line referrals, on line scheduling, coordinated hand offs among providers, electronic delivery of discharge summaries to the next care provider.

eHealth: CCR Portal for Patients

- 4 major types of functionality for patients
 - **Health Status**
 - Current medications
 - Current health problems
 - Allergies
 - Latest test results, abstracted as desired by clinicians
 - Personal health diary
 - **Requests**
 - appointments
 - prescription renewals
 - care referrals
 - **Communications**
 - Automated and manual reminders
 - Secure messaging between providers and patient
 - **Education**
 - Customizable health education WWW links

CCR Patient Portal: Home Page

SUNNYBROOK & WOMEN'S
Sunnybrook and Women's College Health Sciences Centre

[Oliver Tsai] Update My Info | My Family ?

Home My Health Care Team My Allergies My Results My Health Diary My Medications Procedures/Assessments Mon, Jun 20, 2005

Appointment Reminders/Calendars ?

> Specialist Appointment on Jun 28, 2005 at 800 am

[Add Reminder | Request Appointment]

Suggestions

Request an Appointment - Microsoft Internet Explorer

[Request an Appointment]

Reason: Skin rash

Time of Appointment: 09:00 - 10:00 07/05/2005 (mm/dd/yyyy)

Doctor: Dr. Bykerk, Vivian

Submit Request

> Patient Education/Video

News & Updates:

June >> << 2005 >>

				1	2	3	4
5	6	7	8	9	10	11	
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	
26	27	28	29	30			

© 2005 Sunnybrook and Women's College Health Sciences Centre. All Rights Reserved.

CCR Patient Portal: Family Page

SUNNYBROOK & WOMEN'S
Sunnybrook and Women's College Health Sciences Centre

[Oliver Tsai] Update My Info | My Family ?
Home My Health Care Team My Allergies My Results My Medications Procedures/Assessments Mon, Jun 20, 2005

My Family

- Carmen, Wife
- Caressa, Child
- Pascale, Child
- Raewyn, Child

[Add new | Remove]

About Me

Blood Type:
Date of Birth:
Advanced Directive:
Organ Donor
[Update]

Patient Education/Video

Add Family Member - Microsoft Internet ...

[Add Family Member]

Firstname:	<input type="text"/>
Lastname:	<input type="text"/>
Relationship :	<input type="text"/>
Blood Type :	<input type="text"/>
Advanced Directive:	<input type="text"/>
Organ Donor:	<input type="text"/>
Date of Birth:	<input type="text"/> (mm/dd/yyyy)

Save

05 >>

12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

© 2005 Sunnybrook and Women's College Health Science Centre. All Rights Reserved.



CCR Patient Portal: Procedures Page

The screenshot shows the Sunnybrook & Women's CCR Patient Portal interface. At the top left is the hospital logo. To the right are links for Privacy, Discussion, and Contact Us. The main menu includes Home, My Health Care Team, My Allergies, My Results, My Health Diary, My Medications, and Procedures/Assessments (which is currently selected). The date displayed is Mon, Jun 20, 2005.

The left sidebar features a yellow box titled "Procedures/Assessments" containing links for Add New Procedure, Update Procedure, Physical Activity Questionnaire, Nutrition Questionnaire, Food List Questionnaire, Falls Questionnaire, and Baseline Questionnaire.

A modal window titled "Add Procedure Info - Microsoft Internet Explorer" is open in the center. It contains fields for Procedure Description (with a text input box), Medical Coding (with a text input box), Procedure Code (with a text input box), Procedure Date (with a date input field and a calendar icon), Procedure Time (with a time input field and radio buttons for A.M. and P.M.), Procedure Location (with a text input box), Procedure Result (with a large text area and a character count indicator: "350 characters remaining on your input limit"), and Performed By (with a dropdown menu).

On the right side of the screen, there is a vertical calendar view showing dates from June 5 to June 25, 2005. The bottom right corner features the hospital's logo and the text "Sunnybrook and Women's College Health Sciences Centre".

eHealth: CCR Portal for Providers

- 4 major types of functionality for all providers (hospital, primary care, community care, pharmacy, allied health)
 - **Health Status of each patient**
 - **Communications**
 - Automated message routing amongst providers
 - Automated and manual reminders
 - Secure messaging between providers and patient
 - **Education**
 - Pre-populating health education WWW links for patients
 - **Security**
 - Complete user audit trails

CCR Provider Portal: Appointment Notifications

The screenshot shows the Sunnybrook & Women's CCR Provider Portal. At the top, there is a navigation bar with links: Appointment/Schedule Reminder, Care Documentation, News & Updates, Suggestions, Related Links, and Test Results/Codes. Below this, a sub-menu titled "Administristrate Appointment/Schedule Reminder" offers options to Add or Update/Delete. A Microsoft Internet Explorer window is open, displaying a form titled "[Add Appointment Reminder/Calendar]". The form fields include:

- Name of Patient: Tsai Oliver
- Title: Skin Rash appointment
- Description: (Large text area)
- Date: (Input field) (mm/dd/yyyy)
- Time: (Input field) (A.M. / P.M.)

A "Save" button is located at the bottom right of the form.

CCR Portal: Technology Features

- **Web-based**
 - accessible anywhere on the Internet
- **Device independent**
 - any device with a browser
 - Future versions will be optimized for PDA or smartphone
- **Software independent**
 - data stored in XML format
- **Security and privacy**
 - equal to Internet banking
- **Data model standards**
 - emerging CCR specification (ASTM's CCR, HL7's CDA)
- **Open interfacing**
 - exposed through a Web Services interface
 - application-to-application transactions easily and securely accommodated
- **RESULT:**
 - CCR portals has instant regional/global presence for clinical data exchange amongst providers and patients

“Determine that the thing can and shall be done, and then we shall find the way.”

Abraham Lincoln