

Nurse Educator eHealth Resource

Nurses taking a leadership role in the adoption of communication and information systems.



Integrating eHealth into the Undergraduate Nursing Curriculum

April 2012

This resource is designed to assist nursing faculty with the integration of core concepts related to eHealth into the undergraduate nursing curriculum. Designed as a guide for educators, this resource kit is not meant to be prescriptive nor presumed to be all inclusive of teaching and learning methodologies related to the use of information and communication technologies in the provision of health services.

Nurse Educator eHealth Resource

Disclaimer:

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Nurse Educator eHealth Resource

Overview of the Nurse Educator eHealth Resource

The purpose of the Nurse Educator eHealth Resource is to support faculty with the integration of eHealth knowledge and skills into entry-level curricula and to raise awareness among nursing faculty as to the significance of national and provincial eHealth directions and their impact on nursing practice. This Resource is timely since in 2012 the Canadian Association of Schools of Nursing (CASN) released the *Entry-to-Practice Nursing Informatics Competencies for Registered Nurses*. These competencies will direct curriculum in entry level nursing programs to enable graduates to “use information and communication technologies to support information synthesis in accordance with professional and regulatory standards in the delivery of patient/client care” (CASN, 2012). This Resource will be useful to nurse educators as they prepare to address the CASN nursing informatics competencies throughout the nursing curricula.

This Resource is divided into EIGHT sections that are outlined below. Each section includes the purpose and objectives for the nurse educator user, the content with key messages and tips highlighted, and suggestions for application to the curriculum and a set of relevant references. Each of the eight sections is related to one or more of the CASN entry-to-practice nursing informatics competencies. This relationship is outlined in the chart on page 15.

SECTION ONE

Introduction to the Nurse Educator eHealth Resource

This section provides the user with the rationale and background context for the creation of this Resource for nursing faculty in entry-level nursing education programs.

SECTION TWO

eHealth, Informatics, and Nursing

This section provides the user with an introduction to eHealth and informatics.

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SECTION THREE

Information and Communication Technologies

This section provides the user with key eHealth knowledge and skills which should be considered for integration into entry-level nursing curricula focused on information and communication technologies as they are used in nursing and health care.

SECTION FOUR

Information and Knowledge Management

This section provides the user with key eHealth knowledge and skills which should be considered for integration into entry-level nursing curricula focused on information and knowledge management as a critical aspect of nursing and the work of nurses as knowledge professionals.

SECTION FIVE

eHealth and Socio-cultural, Regulatory, Ethical and Interpersonal Considerations

This section provides the user with key eHealth knowledge and skills which should be considered for integration into entry-level nursing curricula focused on socio-cultural, regulatory, ethical and interpersonal considerations that are relevant to nurses, nursing and the provision of nursing care within an eHealth context.

SECTION SIX

Computer Literacy

This section provides the user with an overview of the need for basic computer literacy for nursing students, as well as considerations for integration into entry-level nursing curricula.

SECTION SEVEN

eHealth and the Nursing Profession

This section provides the user with information about relevant nursing and other organizations as well as critical eHealth nursing initiatives and resources in Ontario, nationally and internationally.

SECTION EIGHT

Tools to Support Curricular Integration

This section provides educators with two assessment templates to support the identification of personal eHealth skills and to identify curriculum development opportunities for the integration of eHealth knowledge and

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skills into the curricula. Included are suggestions for curricula integration, exemplars and learning outcomes, as well as a sample template for mapping content into a curriculum. These tools are intended to provide the educator with suggestions and illustrations of integration, and can be modified and utilized in ways that best maximize outcomes related to integrating eHealth into the nursing undergraduate curriculum.

SECTION NINE

Bibliography

This section is intended to further augment the reference materials used throughout the Resource.

Nurse Educator eHealth Resource

Background and Purpose of the Nurse Educator eHealth Resource

In 2011, the RNAO received funding, through eHealth Ontario, to enhance the eHealth awareness among faculty in schools of nursing and to advance their engagement in preparing future nurses for practice in health-care settings that are increasingly using eHealth to support clinical and management decision-making. The development of this Nurse Educator eHealth Resource arose from a goal to enhance the knowledge and skill levels of nursing students through provision of a relevant eHealth-related resource for use by the faculty throughout the curriculum. Throughout this Resource the term “eHealth” refers to the use of information and communication technologies (ICT) to support the delivery and integration of clinical care within and across health-care settings.

The purpose of this Resource is to support nursing faculty integrate eHealth knowledge and skills into entry-level nursing curricula. It is also designed to increase nursing faculty’s awareness of, and knowledge about, national and provincial eHealth directions and their impact on nursing practice.

Since 2005, the RNAO has been funded by the Ontario Ministry of Health and Long-Term Care to raise the awareness of and increase knowledge about eHealth within the nursing community. RNAO’s work has been directed to supporting nurses through the creation of the RNAO’s eHealth Champions program, a set of online eHealth learning modules, online learning about Nursing and Mobile Technology and an eHealth Toolkit to support the implementation of eHealth solutions in health-care settings (see Section Three for additional information on each of these initiatives).

The RNAO has also hosted a number of educational symposia to advance the eHealth knowledge of nurse leaders from a wide range of roles and settings. In their entirety, these efforts have been complementary to the RNAO’s last decade of work in developing Best Practice Guidelines (BPGs) that have been widely deployed in clinical and education settings within

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Ontario and beyond. In recent years, the BPGs have been configured for electronic distribution and mobile access by nurses. However, to this point fewer resources have been directed to support faculty in schools of nursing with the integration of additional eHealth content and relevant skills into entry-level nursing curricula. The Nurse Educator eHealth Resource begins to address the needs of faculty and students in this area.

Target Audience:

Who will benefit from using the Nurse Educator Resource?

This Resource is intended to support nursing faculty introduce and integrate key eHealth concepts relevant to nursing practice, into the undergraduate nursing curriculum. Nursing faculty, nursing students, nurses and other members of the health-care team and ultimately the patients served will all benefit from this Resource as students taught by informed faculty will be effective adopters of eHealth innovations.

Nursing leaders and educators have recognized the need for every nurse to engage in eHealth activities; that is, the use of ICT for the collection of data, use of information and generation of knowledge to support nursing practice (Androwich, Kraft, Haas, 2008; Booth, 2006; Chinn, 2009; Nagle, 2007; Pringle & Nagle, 2009; Skiba, 2009). While there has been significant activity focused on the application of eHealth to support health care delivery across Canada, there has been limited attention given to the integration of associated informatics skills into entry-level nursing curricula.

In using this Resource, faculty will be able to support nursing students and ultimately, new graduates to:

- Meet the CASN entry-to-practice nursing informatics competencies;
- Bring eHealth knowledge and skills to ICT enabled health-care settings;
- Support patients and families in their encounters with the health-care system through the use of ICT;

Nurse Educator eHealth Resource

- Knowledgeably use ICT to contribute to increasing the visibility of contemporary nursing practice;
- Contribute to the creation of a clinical culture of evidence and knowledge-based practice;
- Contribute to patient-centered care that is timely, informed and responsive;
- Knowledgeably use ICT in the delivery of clinical care and be enabled to engage in therapeutic relationships with patients and families; and
- Improve the overall outcomes of clinical care.

From the perspective of nursing education, the entry-level curriculum that incorporates eHealth knowledge and skills will facilitate:

- Alignment of nursing education with the practice demands of current and developing e-clinical settings;
- eHealth knowledge and capability among nursing students on par with or even exceeding other disciplines;
- Skills for life-long learning among graduates;
- Student and new graduate ease of adaptation to practice settings;
- Marketability of new graduates who are prepared for practice in eHealth enabled settings; and
- Recruitment of nursing students into the profession.

While this Resource has been developed in the context of the Ontario experience, because it is closely linked to the CASN entry-to-practice nursing informatics competencies, it is expected that the content herein will be largely portable to other parts of the country, and will assist faculty in other jurisdictions. The Resource may also facilitate faculty capacity building in this area in other countries.

*“The challenge to nurse educators is to ensure that professional education remains relevant and keeps abreast of both societal and healthcare changes.”
(Hegarty et al., 2009)*

Section One

Introduction to the Nurse Educator eHealth Resource



Purpose of this Section

This section provides the user with the rationale and background context for the creation of this resource for nursing faculty in entry-level nursing education programs.

At the end of this section the user will understand:

- *The rationale for the development of this Resource;*
- *How the four domains of eHealth knowledge and skill (socio-cultural, regulatory, ethical and interpersonal) were identified for this Resource;*
- *The benefits to be realized with the integration of eHealth knowledge and skills into entry-level nursing curricula;*
- *How to use this Resource; and*
- *The limitations of this Resource.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Overarching competency: uses information and communication technologies to support information synthesis in accordance with professional and regulatory standards in the delivery of patient/client care.

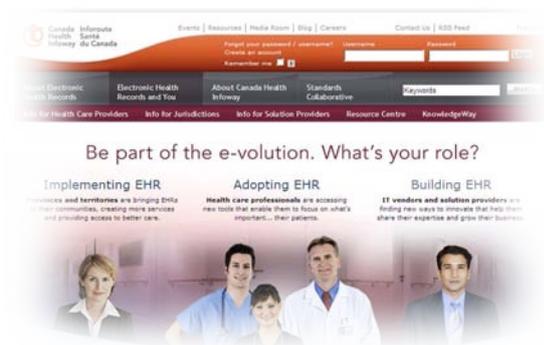
1.0 Rational for Development of the Nurse Educator eHealth Resource

Throughout the last two decades, information technology has become a significant force within society in general. Government and health-care provider organizations have begun to recognize the tremendous value and importance of advancing the use of information systems throughout the country. Without question, information technology and the management of information have become critical to the daily operations and strategic planning of health-care organizations. Issues of quality, safety and the appropriate and cost-effective use of health resources have become focal concerns for consumers, politicians and care providers alike. To this end, the advancement of information and communication technologies (ICT) to support care is seen as an essential strategy to the sustainability and modernization of Canada's health-care system (Kirby, 2002; Romanow, 2002).

“Electronic health records are one of the keys to modernizing Canada’s health system and improving access and outcomes for Canadians.”
(Romanow, 2002)

1.0.1 Federal and Provincial eHealth Initiatives

In 2001, the federal government in partnership with the provincial and territorial first ministers of health established Canada Health Infoway (*Infoway*). *Infoway* is a non-profit, strategic investor facilitating various



SECTION ONE Nurse Educator eHealth Resource

Canadian federal, provincial and territorial jurisdictions to accelerate the development of electronic health records (EHR). Essentially, an EHR is an electronic version of a patient record that is accessed by using a computer (desktop or mobile). The EHR that we view on the computer screen 'sits' on multiple databases of patient information (see Figure 1) that health providers and consumers can draw from, and contribute data to.

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Figure 1.1 Example of EHR Schematic (Source: Canada Health Infoway)

Infoway receives funding from the federal government through Health Canada, based on agreements specifying mutual obligations. From inception in 2001 to March 31, 2010, *Infoway* had received \$2.1 billion from the federal government. *Infoway*, through Board-approved investment strategies, has allocated that money to invest jointly with the provinces and territories to stimulate the development and implementation of the health information systems needed throughout every jurisdiction.

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To achieve its mandate, *Infoway* collaborates with Canada's provinces and territories, health-care providers and technology solution companies to implement private and secure health information systems. Furthermore, when possible, *Infoway* shares and replicates best practices and successful projects among regions. (For project updates see <https://www.infoway-inforoute.ca/about-infoway/infoway-projects-map>) Once implemented, these electronic health record technologies will provide health-care professionals with ready access to accurate and complete patient information to improve health care availability, quality and productivity. As well, these systems will eventually provide Canadians with access to their health information electronically to help them manage their own health.

Infoway's vision is that of a high-quality, sustainable and effective Canadian health-care system supported by a pan-Canadian health infrastructure (e.g. a Canadian-wide system of electronic health records) that provides residents of Canada and their health-care providers with timely, appropriate and secure access to the right information whenever and wherever they enter the health-care system. Respect for privacy is fundamental to this vision.

Every province and territory is building the foundational elements of an electronic health record through the following six core information systems:

- A **unique identifier** for every citizen so that the right information is associated with them in a database.
- A **unique identifier** for each provider so that information on the correct patient can link to the provider data in a secure and private way.
- A database of **medications** dispensed for each individual by pharmacies and a listing of each patient's allergies available for viewing and checking against so that harmful interactions can be avoided and providers have a comprehensive list of current medications and drug allergies.

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- A database of **laboratory results** that is available for timely viewing so that physicians have a comprehensive history of results.
- A database that holds **diagnostic images**, such as X-rays, MRIs, CT scans, etc. that are available for viewing in electronic form (i.e. digitally on a screen, no film), and can be reviewed at the time of new orders to reduce duplicate testing.
- A database of **clinical information** such as discharge summaries, immunization records and consultation reports (Canada Health Infoway, 2011a).

Infoway anticipates this ongoing momentum of EHR development and implementation will result in a sharp increase in the number and efficacy of EHR systems available to health-care professionals, including nurses.



Infoway and is focused on the EHR infrastructure to support the delivery of health care to Ontarians. While directing investments to initiatives which parallel those of *Infoway*, eHO has also developed a strategic plan which emphasizes the need to focus on activities that support the care of individuals with chronic diseases, most importantly diabetes care, and improved medication management throughout the province

Within Ontario, the agency responsible for advancing the eHealth agenda is eHealth Ontario (eHO). As an agent of the Ministry of Health and Long-Term Care (MOHLTC), this organization is

the provincial counterpart

The vision, mission and mandate of eHealth Ontario

Vision

The vision of eHealth Ontario is:
Achieving excellence in health care by harnessing the power of information.

Mission

The mission of eHealth Ontario is to:
Deliver a comprehensive, patient-focused, secure and private electronic system that will improve the way patients receive care.

Mandate

The mandate of eHealth Ontario is to:
Play leading role in harnessing IT and innovation to improve patient care, safety and access in support of the government's health strategy.

- Provide a single, harmonized and coherent eHealth Strategy for Ontario that supports the government's health agenda.
- Align all publicly-funded eHealth initiatives through a single point of accountability.
- Encompass all provincially funded health care system information initiatives that support clinicians and patient care delivery, and are actually or potentially province-wide in scope.

A Review of Common Terms...

eHealth is the use of information and communication technologies to support the delivery and integration of clinical care within, and across settings.

Information and communication technologies (ICT) are the tools and applications that support the management of clinical data, information, and knowledge (e.g. electronic health records).

Electronic Health Records (EHR) are used by clinicians and citizens to record, store and retrieve clinical data and information.

AND

For more of an academic and nursing orientation...

Informatics integrates nursing science, computer science and information science to manage and communicate data, information and knowledge to support patients, nurses and other providers in their decision-making in all roles and settings. This support is accomplished through the use of information structures, information processes, and information technology” (Staggers & Thompson, 2002, p. 260).

(eHealth Ontario, 2010)*. Collectively, these initiatives are having a significant impact on clinical care environments throughout Canada and the province of Ontario.

1.0.2 eHealth and Health-Care Professionals

In parallel with the development and implementation of ICT in clinical settings, is a need to prepare health professionals, including nurses, to be able to effectively work in increasing technological and information intensive environments. While widespread computer literacy has become a societal norm, the development of information and knowledge

* Note: These are the focal elements of the eHealth Ontario strategy at the time of this writing, but in the interest of ensuring longer term relevance of this document users are encouraged to visit their jurisdictional websites for updates to their local strategies and current initiatives (e.g. <http://www.ehealthontario.on.ca/>).

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literacy supported by ICT remains a challenge in health care. Further, studies have shown that the integration of the relevant ICT knowledge and skills into nursing curricula has been limited and that this is likely related to the limited number of nursing faculty with the requisite understanding and knowledge to do so (McNeil, Elfrink, Pierce, et al., 2005; Nagle & Clarke, 2004).

“We must teach for the future. This means teaching to find rather than to know, to question rather than answer, to achieve rather than accomplish, and inspire rather than inform.” (Brennan, TIGER, 2006, p.16)

In 2008, the College of Nurses of Ontario (CNO) released a new set of entry-to-practice competencies and described the intent as follows:

From a regulatory perspective the entry-level competencies serve the primary purpose of nursing education program approval by describing what is expected of entry-level registered nurses in order to provide safe, competent, ethical nursing care in a variety of practice settings. The competencies also serve as a guide for curriculum development and for public and employer awareness of the practice expectations of entry-level registered nurses (CNO, 2009, p. 1).

The conceptual framework organizes the competencies into five categories:

- Professional Responsibility and Accountability;

Important to Note:

The competencies aim to ensure that entry-level registered nurses are able to function in today's realities and are well equipped with the knowledge and skills to adapt to changes in health care and nursing.
(CNO, 2009, p.2)

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- Knowledge-based Practice;
- Ethical Practice;
- Service to the Public; and
- Self-regulation.

While many of the entry-to-practice competencies can be viewed and discussed in the context of eHealth or informatics applications in practice, there are a number that are explicitly referenced in the document and deemed most relevant to the intent of this Resource.

Table 1.1:
Excerpts from the CNO entry-to-practice competencies that are relevant to this Resource (CNO, 2009).

Knowledge-based Practice	Understands the significance of nursing informatics and other information and communications technologies (ICT) used in health care.
Competent Application of Knowledge	Uses existing health and nursing information systems to manage nursing and health care data during client care.
Ethical Practice	Demonstrates an understanding of ethical and legal considerations related to maintaining client confidentiality in all forms of communication
Service to the Public	Uses established communication protocols within and across health care agencies, and with other service sectors.

More specifically in the education domain, the Canadian Association of Schools of Nursing has recently released the *Entry-To-Practice Nursing Informatics Competencies For Registered Nurses* (CASN, 2012). This work was developed through a collaborative process, which commenced in 2011, with funding from Canada Health Infoway (CHI). In the development of the RNAO Nurse Educator eHealth Resource, these competencies were reviewed in order to determine how the

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competencies were specifically aligned with sections of this document. A chart outlining the alignment between the CASN competencies and the Nurse Educator eHealth Resource is presented below.

Table 1.2: Alignment between CASN entry-to-practice nursing informatics competencies for registered nurses (CASN, 2012) and Sections in the Nurse Educator eHealth Resource.

Domain	CASN entry-to-practice nursing informatics Competency	Alignment with Nurse Educator eHealth Resource
Foundational	Foundational Information and Communications Technologies (ICTs) Skills	<ul style="list-style-type: none"> • Section 2: eHealth, Informatics and Nursing • Section 6: Computer Literacy • Section 8: Tools to Support Curricular Integration
Overarching	Uses information and communication technologies to support information synthesis in accordance with professional and regulatory standards in the delivery of patient/client care.	<ul style="list-style-type: none"> • Section 1: Introduction to the Nurse Educator eHealth Resource • Section 8: Tools to Support Curricular Integration
Information and Knowledge Management	Uses relevant information and knowledge to support the delivery of evidence-informed patient/client care.	<ul style="list-style-type: none"> • Section 4: Information and Knowledge Management • Section 8: Tools to Support Curricular Integration
Professional and Regulatory Accountability	Uses ICTs in accordance with professional and regulatory standards and	<ul style="list-style-type: none"> • Section 5: eHealth and Socio-cultural, Regulatory,

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Domain	CASN entry-to-practice nursing informatics Competency	Alignment with Nurse Educator eHealth Resource
	workplace policies.	Ethical and Interpersonal Considerations <ul style="list-style-type: none">• Section 7: eHealth and the Nursing Profession• Section 8: Tools to Support Curricular Integration
Information and Communication Technologies	Uses information and communication technologies in the delivery of patient/client-care.	<ul style="list-style-type: none">• Section 3: Information and Communication Technologies• Section 8: Tools to Support Curricular Integration

1.1 Development of the Nurse Educator eHealth Resource

Efforts to identify the competencies needed by nurses to work in health-care settings utilizing eHealth have been addressed by many nurses over the last three decades and have been described as progressing through four phases:

- 1) Nurses' attitudes toward computers (1980-1990);
- 2) Basic computer skills (1985-1995);
- 3) Nurse informatician competencies (1989-2000); and
- 4) Informatics competencies for all practicing nurses and entry-level graduates (2001 – present) (Gugerty & Sensmeier, 2010).

In the development of this Resource, previous work and initiatives currently underway have been reviewed for relevance and referenced for further reading by the users of this guide.

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The necessity for all nursing faculty and graduates to have core eHealth knowledge and skills has been identified by many authors (CNA, 2001a, 2001b; Fetter, 2009; Nagle, 2007; Simpson, 2010; Staggers, Gassert, & Curran, 2001). While many of these initiatives identified competencies that range from novice nurse to expert nurse informatician, this Resource will focus primarily on the knowledge and skills deemed necessary for level-of-entry nursing practice. Some of the relevant initiatives will be further discussed in Section Three.

1.2 Identifying Key Content for the Nurse Educator eHealth Resource

Over the last several decades many authors have presented a variety of schemas depicting the core concepts and skills required by nurses from novice to expert users of information and knowledge. Some of the authors have presented these in the context of nurses in practice, administration, education and research (CNA, 1999, 2000b; Grobe, 1996), while others have described them in the realm of novice to expert informatician (Hebert, 2000; Gassert, 2008; Gugerty & Sensmeier, 2010; Staggers, Gassert, Curran, 2001). The Canadian Nurses Association (CNA) noted that evidence-based decision-making requires the inclusion of data about nursing practice in health information systems (CNA, 2006). In turn, beginning nurses must have the requisite knowledge and skills to:



- Use information and communication technologies to enter, retrieve and manipulate data;
- Interpret and organize data into information to affect nursing practice; and
- Combine information to contribute to the development of knowledge-based practice and research in nursing.

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At the level-of-entry to practice, the acquisition of this knowledge and skill set has been described as a combination of: 1) computer literacy; 2) information literacy; and 3) effective information management capability (Gugerty & Sensmeier, 2010).

This Resource was developed with the support of an Expert Panel comprised of nursing informatics experts from practice and academia, curriculum experts, nursing faculty and recent graduates representing a variety of Ontario colleges and universities. With the goal of developing a current, relevant, evidence-informed resource, the expert panel reviewed relevant literature, documents from key related initiatives including the *RNAO Curriculum Task Force Report* (2001) and the curricular recommendations that were developed at that time, along with common themes from a variety of frameworks for identifying key eHealth knowledge and skills. The Expert Panel also reviewed the competencies of the Canadian Registered Nurse Exam (CRNE) and the CNO *Entry to Practice* competencies (CNO, 2008) to further validate the congruence of the knowledge and skills identified in this Resource.

The work of the Expert Panel was further informed by participants attending the *RNAO Nurse Educator Symposium, March 2011*, and through input from a broad stakeholder review of the draft curriculum resource. The following four domains reflect the agreed upon key content areas and skills that should be incorporated into the curriculum for entry-level nursing education:

- 1) Information and Communication Technologies;
- 2) Information and Knowledge Management;
- 3) Socio-Cultural, Regulatory, Ethical, and Inter-personal Considerations; and
- 4) Computer Literacy.

The concepts and skills identified within each domain should be addressed in theory and practice where applicable in the context of existing courses and practicum.

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The following section will provide users with some historical and background information which may be used to provide context for the remaining material. Suggestions for curriculum integration of any or all content contained in this Resource are summarized in Section Seven.

In summary, this resource will describe:

- The need to integrate eHealth concepts into the entry-level curriculum within Ontario schools of nursing ;
- The need for nursing graduates to have knowledge and skills related to eHealth and informatics;
- The relevance of eHealth and informatics within nursing practice today; and
- Potential strategies and approaches to integrate eHealth concepts and knowledge into existing entry level nursing curricula.

1.3 How to use the Nurse Educator eHealth Resource

This Resource is intended to be a guide for faculty in identifying the knowledge and skills associated with the integration of eHealth in clinical practice. The core concepts and capabilities have been gleaned from the literature and the endeavors of others to synthesize the requisite eHealth knowledge for the beginning practitioner. The Resource is not intended to provide direction for the creation of a nursing informatics program or specialization, but rather to support the integration of basic eHealth concepts and skills into the entry-level curriculum. The use of additional resources is encouraged as the areas and focus of eHealth and ICT are ever evolving in the field.

The contextual background information provided in Section Two, provides faculty with a strong foundation as to the critical importance of

SECTION ONE Nurse Educator eHealth Resource

the leadership role to be played by nursing academia in preparing nurses ready for our current and future practice settings that are increasingly embracing technology. This content, along with the core content identified in sections Three, Four, Five and Six, will be useful as faculty examine how best to incorporate eHealth throughout the nursing program. Section Seven, focuses on eHealth and the nursing profession, and will be helpful for identification of key resources for faculty and students as well as opportunities for involvement in order to contribute to this area of health care.

The curriculum and educator assessment tools provided in Section Eight are designed to assist users to identify:

- a) Content which may already be incorporated into the existing curriculum but perhaps not specifically identified as eHealth or informatics;
- b) Current gaps in the relevant content areas; and
- c) Their own specific learning needs related to eHealth.

The curricular integration, exemplars and specific learning outcomes also included in Section Eight are provided as suggestions and illustrations for consideration by faculty.

The bibliography in Section Nine is provided as a supplement to those references cited throughout the document. Several nursing informatics textbooks are available, for advanced level knowledge. They are revised every four to five years to be current and may be most useful to nurse informaticians and educators, rather than the entry-level student nurse.

1.4 Limitations of the Nurse Educator eHealth Resource

This Resource is intended as a tool to support the integration of relevant eHealth content and skills into the entry-level nursing curriculum. The concept definitions are meant for the entry-level practitioner and do not subsume the competency requirements of a nurse informatician. The

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content, including suggestions for integration, exemplars and lesson plans, are not meant to be prescriptive, but rather to illustrate how eHealth knowledge and skills might be incorporated into coursework and clinical practice.

"Our students are the true luminaries for Nursing Informatics and eHealth and are taking us to new heights and depths. They are pushing the envelope in all directions and making amazing connections to further the profession."

(Page, 2011)

Application of Section One Content to the Curriculum

Introduction to the Nurse Educator eHealth Resource

This section provided the user with the rationale and background context for the creation of this Resource for nursing educators in entry-level nursing education programs. The content in this section is intended to be introductory content for the user of this Resource. Nevertheless, some of the information may be helpful to also introduce in the context of raising student awareness of entities such as eHealth Ontario and Canada Health Infoway.

Student Learning Outcomes

Upon the completion of this section, educators will be able to provide students with an introduction to eHealth and supporting organizations. With the provision of this information, students should be able to:

- Demonstrate an awareness of purpose of Canada Health Infoway;
- Demonstrate an awareness of eHealth Ontario and eHealth priorities and initiatives;
- Discuss the rationale for nurses and other health professionals to acquire eHealth knowledge and skills;
- Articulate the alignment of eHealth knowledge and skills with the College of Nurses of Ontario's practice competencies;
- Articulate the concept of electronic health records in practice settings; and
- Discuss the benefits to be derived for health care and nursing.

Key Concepts

Using the content from this section, educators may explain and discuss the following in the context of Canada's health-care system and the implications for the nursing profession:

- **eHealth**
- **Informatics**
- **Information and Communication Technology (ICT)**
- **Electronic Health Records**
- **Canada Health Infoway**
- **eHealth Ontario**

Suggestions for Course Integration

Educators may elect to use some of this background information to set the context for the introduction of eHealth into the curriculum. The introduction of the above terms might be integrated into an introductory course focused on one of the following:

- Nursing Theory
- Professional Issues
- Health Care in Canada

Learning Activities

- Encourage students to visit the websites of Canada Health Infoway and eHealth Ontario
 - Go to:
<http://www.ehealthontario.on.ca>
 - Go to:
<http://www.infoway-inforoute.ca>
- Facilitate a discussion of the benefits of eHealth and electronic health records for nurses, the health-care system and citizens.
- Facilitate a discussion of the emerging eHealth enabled health-care system and the importance of nurses acquiring an understanding of the tools that will support their clinical practice.

Tips & Tools

Ask students to visit the Canada Health Infoway and eHealth Ontario websites and identify key initiatives in progress.

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*“To date, efforts to initiate future graduates and nurses currently in practice into the world of information and communication technologies have been provided by relatively few nurse educators.”
(Nagle, 2007, p.22)*

Section Two

eHealth, Informatics and Nursing



Purpose of this Section

This section is intended to provide the user with an introduction to eHealth and informatics.

At the end of this section, the user will be able to:

- *Identify the meaning of the terms eHealth and informatics;*
- *Identify the importance of integrating eHealth knowledge and skills into nursing curricula;*
- *Identify the importance of graduate nurses being able to use data, information and knowledge to inform their practice;*
- *Describe why eHealth curriculum integration is needed now; and*
- *Identify the responsibility and accountability of nurse educators to prepare graduates for client/patient-centered professional nursing practice.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Foundational Information and Communications Technologies (ICTs) Skills

Device Use:

- Demonstrates basic skills with ICTs components (e.g. features of personal computers, hand held devices, tablets, workstations, modems, Bluetooth-enabled devices, keyboarding, use of peripheral devices including printers, USB flash drives, CD-ROMs, uploading and downloading data, Online Collaborative Learning, smart phones, mouse and touchpad interchangeably, etc.)

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- Uses intranet and extranet networks to navigate systems (e.g. access to shared file servers, virtual private networks, World Wide Web, cloud computing, browsers).

Application Use:

- Uses electronic communication (e.g. email to create, send, respond, attach and receive attachments)
- Is familiar with the use of multimedia presentations (e.g. videos, podcasts, blogs, YouTube, etc.)
- Uses word processing, spreadsheets and presentation graphics (e.g. document, spreadsheet, slideshow creation, etc.)
- Navigates preliminary operating systems (e.g. Windows to manage files, determine active printers, access installed applications, create and delete files, etc.)
- Uses technology for self-directed learning
- Is familiar with social networking applications (e.g. Twitter, Facebook, LinkedIn, etc.)

2.0 eHealth and Informatics

Nurses have been collecting and interpreting data for decades. In fact, if we hearken back to the work of Florence Nightingale, more than a century ago when she was struggling to find well-organized information:

“In attempting to arrive at the truth, I have applied everywhere for information, but in scarcely an instance have I been able to obtain hospital records fit for any purpose of comparison...”

(Nightingale, 1863)



Despite her struggle to find comparative data, she did use what she had to change the way she cared for her patients. Today the capture, recording, retrieval and use of information by clinicians are central to the delivery of Canadian health care. Historically, the tools that have been used to do this have been varied in format and form, predominantly paper-based and solely within the domain of clinicians until recent years.

2.1 What is eHealth?

The term eHealth is used to refer to “health care initiatives and practice supported by electronic or digital media” (Mastrian & McGonigle, 2009). The term is typically applied to the use of technologies that support clinical care management within and across all care settings (see Figure 1). In our communities, eHealth is visible in the use of public health surveillance tools, telehomecare remote monitoring devices, telenursing practice, and visiting nursing supported by mobile technologies such as laptops, tablets and smartphones (see sample devices on p. 28). Health-care organizations including acute care, primary care and long-term care use electronic tools to support the provision of health services and diagnostics. eHealth is everywhere!

For additional illustrations, see the Case Scenarios provided at the end of this section, as well as the exemplars in Section Seven.

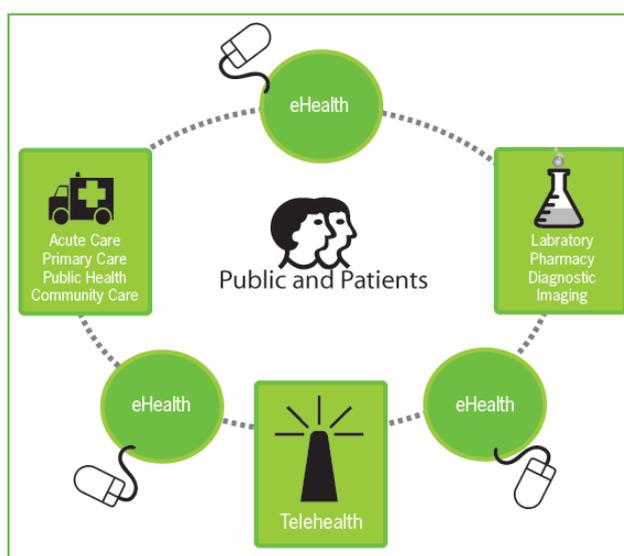


Figure 2.1. eHealth - Connecting Information, Care and People

Oh and colleagues (2005) identified more than 50 unique definitions of eHealth in the literature. But in general, the term refers to the use of technology to enable, expand, enhance or support human activities in the delivery of care.

Increasingly the term “*mHealth*” is being used to refer to the use of mobile technologies including smartphones, tablets, personal digital

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assistants (PDAs), portable computers and more recently, remote diagnostic and monitoring devices (including Global Positioning Systems – GPS and geographic information systems – GIS) (Mastrian & McGonigle, 2009).



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Smart Phones



Tablet PC's



© 2011 CBS Interactive



Personal Digital Assistants (PDA)



2.2 What is informatics?

The terms “eHealth” and “informatics” are sometimes used interchangeably when describing the requisite knowledge and skills needed by nurses and other health professionals to function in settings that are becoming increasingly reliant on the use of information and communication technologies (ICT). The term eHealth is the more common vernacular used within the public domain to describe ICT initiatives in health care. Informatics, on the other hand, is the more academic term which is typically grounded within the context of a particular profession – in this case as it relates to nursing science and practice.

The concept of informatics can be traced back to the Russian term “informatika” which was used in the context of computers in the 1960’s (Sackett & Erdley, 2002). While substantively about the management of information, it became associated with computers as the capability to manage large volumes of information through computing became more common. Gorn (1983) further described informatics as the intersection of a discipline science, information science and computer science. Since then the term has been applied to a variety of health disciplines including medicine, nursing, dentistry, public health and laboratory medicine, to mention but a few. In nursing, informatics has been a focus of study and application since the early 1960’s (Scholes, Tallberg & Pluyter-Wenting, 2001).

The concept of “Nursing informatics” (NI) has been defined in a variety of ways over the years. However, the essence of the concept has been consistent and generally reflects the integration of nursing science and elements of information management and technology. One of the earlier definitions that has been widely used is:

“Nursing Informatics is the application of computer science, information and nursing science designed to assist in the management and processing of nursing data, information and knowledge to support the practice of nursing and the delivery of health care.” (Graves & Corcoran, 1989, p. 227)

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It was Graves and Corcoran (1989) who suggested that the phenomena of study in NI are the data, information and knowledge of particular interest to nursing, and that they are substantively and structurally different from those of other disciplines. They defined these concepts on the basis of Blum's (1986) work:

- **Data** as discrete, objective entities with no interpretation;
- **Information** as data that are interpreted, organized or structured; and
- **Knowledge** as information that is synthesized with the identification and formalization of relationships.

In 2002, Stagers and Thompson further modified the Graves and Corcoran (1989) definition to the following: nursing informatics...

“...integrates nursing science, computer science and information science to manage and communicate data, information and knowledge to support patients, nurses and other providers in their decision-making in all roles and settings” and “This support is accomplished through the use of information structures, information processes and information technology” (p. 260).



The latter definition has been widely embraced by nursing organizations throughout the world.

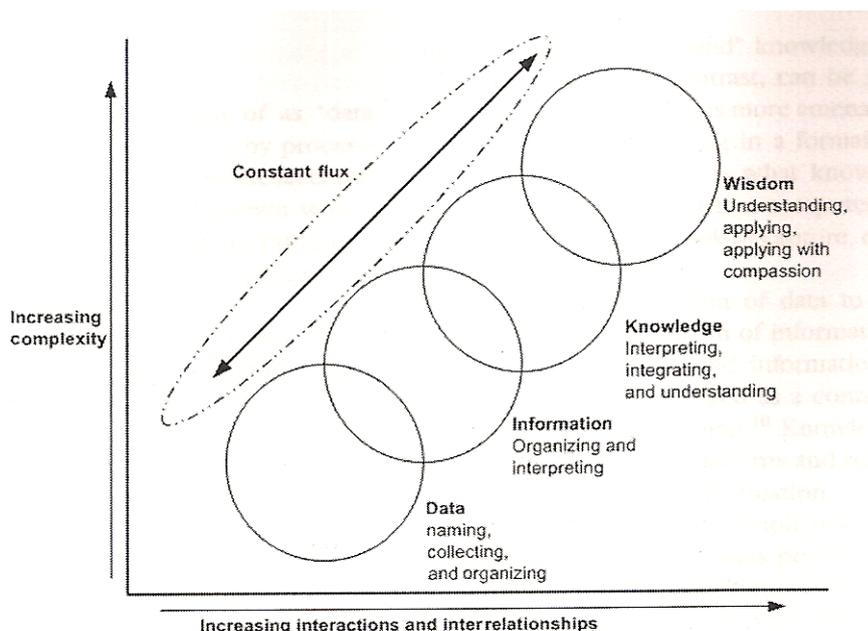


Figure 2.2 The relationship of data, information, knowledge and wisdom
 (Reprinted with permission from: Englehardt & Nelson (2002).)

Others (Englehardt & Nelson, 2002; Matney et al., 2011; & Mastrian & McGonigle, 2009; Staggers & Nelson, 2009;) have also incorporated the concept of wisdom and demonstrated it as part of the data to information to knowledge continuum (see Figure 2.2). Staggers and Nelson (2009) suggested that each level increases in complexity and requires greater human intellect due to more interaction and interrelationships between the concepts. They define wisdom as:

“...the appropriate use of knowledge to manage and solve human problems. It is knowing when and how to apply knowledge to deal with complex problems or specific human need. While knowledge focuses on what is known, wisdom focuses on the appropriate application of that knowledge” (Staggers & Nelson, 2009, p. 86).

In 2008, the American Nurses Association added the concept of wisdom to their definition of NI (ANA, 2008). Having the wisdom to appropriately use knowledge and make clinical judgments is consistent with the intent of entry-level nursing education. As an example, a nurse may have the knowledge of various options to manage pain, but it is wisdom which guides the most appropriate choice of intervention under particular circumstances. Wisdom is derived from experience and evidence, but

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might also be described as an application of nurses' "ways of knowing", empirical, ethical, aesthetic and personal as described by Carper (1978). Although beyond the scope of this Resource, revisiting Carper's ways of knowing gives a context for considering the capture, retrieval and generation of knowledge through the use of information technology (Nagle, 2009).

Over the past 50 years, informatics in nursing has continued to evolve and capture the interest of nurses across the globe. In recognition of the global focus on informatics, the International Medical Informatics Association's (IMIA) Nursing Interest group has recently developed the following definition:

“Nursing Informatics science and practice integrates nursing, its information and knowledge and their management with information and communication technologies to promote the health of people, families and communities world-wide.”
(IMIA, 2009)

While these definitions vary slightly, the common elements have been embraced globally by the nursing community. In particular, although generated more than a decade ago, the concepts highlighted in the Staggars and Thompson (2002) definition remain prevalent and relevant in the context of nursing and health care in Canada.

NURSING INFORMATICS

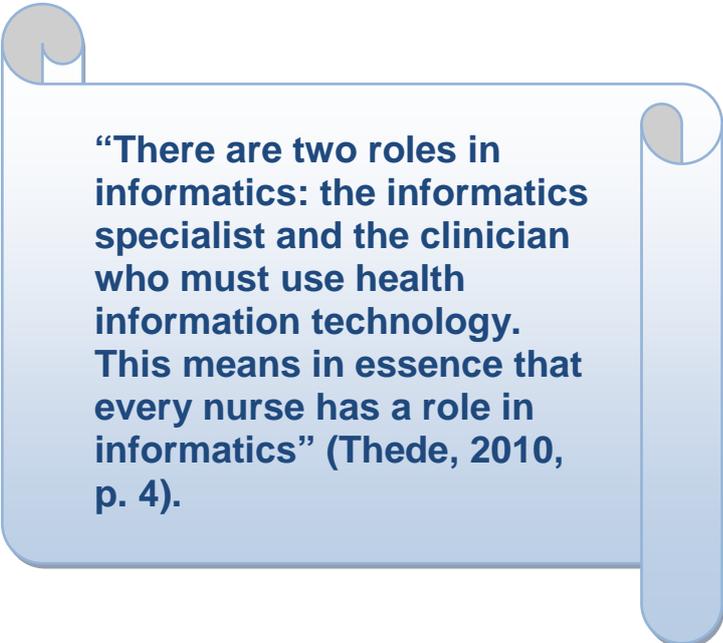
“Integrates nursing science, computer science and information science to manage and communicate data, information and knowledge to support patients, nurses and other providers in their decision-making in all roles and settings and this support is accomplished through the use of information structures, information processes and information technology”
(Staggars & Thompson, 2002, p. 260).

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It is common today to find nurses specializing in the field of informatics referred to as informaticists, informaticians and/or clinical informatics specialists, usually denoting that a nurse has advanced training and/or credentialing. Nurse informaticians can be found working within health-care organizations and educational institutions, as well as in association with ICT software and hardware developers and suppliers. The evolution of these specialists arose from the need to converge nursing expertise with the knowledge of informatics to better inform systems design, implementation, education and evaluation. At the time of this writing, there are thousands of nurses world-wide who have specialized in the field of NI, including practitioners, researchers and educators.

Notwithstanding the ongoing need for nurse experts in the field of informatics, we are now confronted with an entire health-care workforce that needs to be much more knowledgeable about the capacity and use of ICT in supporting the delivery of care. Heightened concerns for safety and quality have been directly linked to the need for timely access to information and evidence to support optimal clinical decision-making.

2.3 Why now?



“There are two roles in informatics: the informatics specialist and the clinician who must use health information technology. This means in essence that every nurse has a role in informatics” (Thede, 2010, p. 4).

Over the last decade, information technology has become a significant force within society. More recently, government and health-care providers have begun to recognize the tremendous value and importance of advancing the use of information systems throughout the country.

While information technology is widely used by nurse educators, the concepts and knowledge commonly associated with eHealth and NI are largely missing from a majority of nursing curricula.

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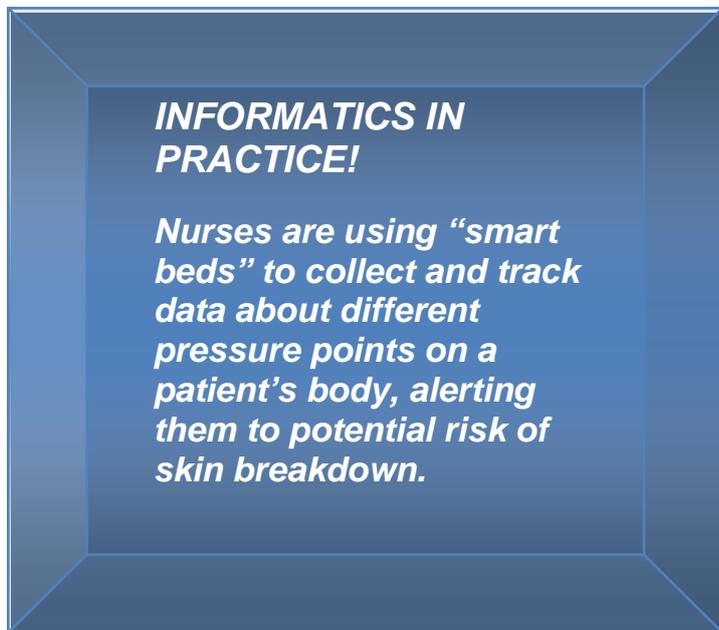
Many nurse researchers and educators have described the benefits and importance of integrating NI into core curricula (Bakken, Cook, Currie et al., 2004; Barnard, Nash, & O'Brien, 2005; Bond, 2009; Effken & Carty, 2002; Nagle, 2007). Views that informatics integration equates to a demonstration of computer literacy or the use of technology to deliver content (e.g. use of Blackboard, WebCT or PowerPoint) is a common misunderstanding that remains prevalent among nursing faculty. The concepts and capabilities identified in this Resource have limited focus on computer literacy and technology mediated teaching and learning. Rather, the important emphasis of this tool is to highlight key knowledge and skills that are essential for graduate nurses to provide evidence-informed, safe, quality care and optimize patient outcomes in today's technology-enabled clinical settings.

Recognizing the significant work effort necessary to redesign courses and accommodate additional content into basic nursing curricula, this Resource is designed to highlight core concepts and skills that might easily replace, complement or link to existing content areas. The Resource is designed to provide nurse educators with some of the fundamental knowledge elements that should be understood and considered in preparing students for clinical practice environments.



“Students are influencing and shaping new pedagogies of learning and teaching for persons and communities across the full spectrum of nursing care” (Page, 2011).

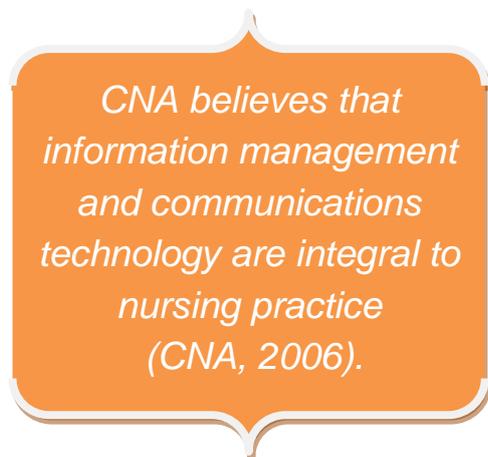
Without question, information technology and the management of information have become critical to the daily operations and strategic planning of health-care organizations.



Issues of quality and appropriate, cost-effective use of resources have become focal concerns for consumers, politicians and care providers alike. To this end, there is an immediate need for health professionals, including nurses, to be educationally

prepared to effectively use ICT and information in clinical settings, client homes and from remote locations.

Over the last two decades the Canadian Nursing Association (CNA) has released position statements on some of the key areas of focus for nurses in eHealth. Among these is an endorsement of the adoption of the *International Classification of Nursing Practice for Canada* (CNA, 2003). Related to this endorsement was the release of a publication supporting the framework of the *Health Information: Nursing Components* (HI:NC) work (CNA, 2000) (see Section Four for more details).



The CNA also released a statement regarding the evolution of nurses’ work in telehealth (CNA, 2006). In recent years, the CNA revised an earlier position

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statement to reflect the current thinking about the importance of information and knowledge management in nursing (CNA, 2006b). Each of these documents remains relevant to the work of nurses and are significant to nurses involvement with eHealth initiatives*.

In preparation for the codified capture of the elements of nursing practice in computerized systems, the International Council of Nurses has spent considerable effort developing a standardized terminology. The International Classification of Nursing Practice (ICNP) has been embraced by the profession world-wide, including Canada as the de facto standardized language for use by the profession for codified capture of nursing practice data in computerized clinical applications (CNA, 2003).

“I think it is essential to prepare us for the fast paced hi-tech ever-changing health-care system of our future practice.”
(4th year, student nurse)

Hannah (1998) articulated how the nursing profession and nursing practice will benefit from informatics. She suggested that in their role as information brokers, nurses will support patients to understand clinical information as necessary and also use informatics to support not only clinical practice, but also management, education and research. In using informatics the practice of nurses becomes visible and can be linked to clinical and financial outcomes.

Today’s eHealth agenda positions nurses well to leverage and exploit informatics, validating their practice as knowledge workers and demonstrating nurses’ unique contributions to patient/client care and the patient safety agenda across the health system.

“I believe nursing benefits from nursing informatics and will continue to do so in the future.”
(4th year, student nurse)

* Each of these position statements can be downloaded at: <http://www.cna-aiic.ca>

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In addition, eHealth mandates have driven a proliferation of new clinical tools in practice settings. Therefore, it is incumbent upon schools of nursing and nursing faculty preparing the nursing graduate of the future to assure that they are equipped to work in



ICT-enabled clinical settings. It is acknowledged that some schools of nursing have already taken this unfolding agenda into consideration in the redesign of the entry-level curriculum, but many others have not.

Section Key Messages

eHealth curricular integration is necessary now.

Nursing faculty in entry-level nursing programs have a responsibility to assure that graduates are equipped with eHealth knowledge and skills.

Application of Section Two Content to the Curriculum

eHealth, Informatics and Nursing

This section provided the user with an introduction to eHealth and informatics.

As with Section One, educators may elect to use some of this information to set the context for the introduction of eHealth concepts.

Student Learning Outcomes

Upon the completion of this section, educators will be able to provide students with an introduction to eHealth and informatics and the relevance to nursing. With the provision of this information, students should be able to:

- Explain the importance of nurses' effective use of data, information and knowledge;
- Define eHealth;
- Define the concepts of informatics and nursing informatics; and
- Provide examples of eHealth or informatics in action.

Key Concepts

From the content presented in this section, educators may explain and discuss the following terms and their implications for the practice of nursing:

- **eHealth**
- **Informatics and nursing informatics (NI)**
- **Information and communication technology (ICT)**

Suggestions for Course Integration

The introduction of eHealth and informatics definitions might be integrated into an introductory course focused on one of the following:

- Nursing Theory
- Professional Issues
- Current Issues in Clinical Practice
- Clinical Judgment

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Learning Activities

- Facilitate a discussion of examples of eHealth in action.
- Include definitions of eHealth and informatics in course exams.
- Facilitate a discussion of the role of nurses in advancing eHealth initiatives.

Tips & Tools

***In clinical practice
debriefing sessions, have students
identify their own examples of
informatics in action.***

Case Scenarios – eHealth in Action!

At the time of this writing, provider organizations are continuing to evolve in their adoption of solutions to support different departments, programs and aspects of clinical practice. It is important to remember that while the array of software and hardware tools and the degree of ICT use in health-care organizations are likely to be highly varied, the underlying principles and intent of use are largely the same.

These case studies both depict eHealth in action in two different sectors. They are included to demonstrate the extent of eHealth that students will encounter in their clinical placements. Use them to demonstrate what eHealth “looks like in action”, and have students review and discuss the cases:

- How do the cases compare with what they may have already encountered in their clinical settings?
- How do they see eHealth enhancing the quality of care for patients/clients?
- How do they see eHealth supporting nurses in giving quality care?
- What challenges, if any, do they see for nurses in these scenarios related to eHealth?

Case 1

A third-year nursing student is about to go into a rural community to conduct a day of home visits with one of the visiting nurses from St. Edwards Home Care Nursing. Before leaving for the first visit, the home care nurse reviews the client list for the day which has been sent to her mobile tablet device from the main office. Two of the clients are new, so they review the online referral and assessment information sent from the Community Care Access Centre (CCAC) in advance of each visit. The home care nurse has access to any new information about each client such as emergency room visits or specific follow-up instructions from visits to their primary care providers.

They will also be visiting three clients being monitored through a telehomecare program. Blood pressure, weight and pulse oximetry data are being sent to their primary care providers daily. This information is trended and also accessible to the home care nurse for viewing either before the visit or with the client to inform ongoing client education.

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During each client visit, the home care nurse and student conduct the relevant assessments and provide any necessary treatments. Information is securely entered (e.g. password protected and encrypted) into the mobile tablet during and after the visit. When there is internet connectivity, the information is directed transmitted back to the St. Edward's main office; otherwise it is securely stored for future transmission. Specific notes (e.g. discharge summary) and recommended follow-up activities are also sent electronically to the client's family health team practitioners. The date, time and duration of the visit, as well as all notes and findings for each visit are submitted directly to the main office, with a notification to the CCAC and others as necessary that the last visit summary has been posted. The client and family have access to the continuing care record and also receive a copy of the final discharge notes and instructions for follow-up care.

Case 2

In preparing for her surgical rotation, a second-year student has been authorized to access the hospital's clinical information system to review available information on her assigned patients. She logs into the system by using the fingerprint recognition device on one of the nursing unit central computers. The clinical information system provides access to relevant historical data and current clinical data and information.

She is able to select each of her assigned patients in turn and review the current clinical orders from all disciplines. She is also able to review each patients' progress on their relevant clinical pathways and their medication profiles, including date and time that the last dose of each was administered. She is unfamiliar with four of the medications, but is able to click on the eCPS (Compendium of Pharmaceuticals and Specialties) link and search for the information relevant to the safe administration of each. All the key information she needs about each of her assigned patients is securely sent to her mobile device.

One of her patients has a high risk of skin breakdown so she pulls up the RNAO Best Practice Guideline associated with skin care and reviews the information and practice recommendations in particular. She finds a link to an article which provides a systematic review of the wound management research and relevant interventions. With every aspect of the care she will be providing, she is able to prepare for her assignment, using all available information from a single point of access.

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“Nurses need to be able to use information and communication technology not only to support their own practice, but also to help their patients make the best use of it” (Bond & Procter, 2009, p. 55).

Section Three

Information and Communication Technologies



Purpose of this Section

This section is intended to provide the user with an overview of information and communication technologies commonly used in clinical practice settings.

At the end of this section, the user will be able to provide students with an introduction to the following:

- *Rationale for the use of information and communication technologies (ICT) in health-care settings;*
- *Types of ICT and clinical applications used in health-care settings;*
- *Clinical information systems and the different types of electronic health record solutions used in health-care settings;*
- *Telehealth and associated technologies for remote clinical care delivery; and*
- *Use of clinical decision support tools to inform clinical decision-making and care activities.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Domain	Information and Communication Technologies
Competency	Uses information and communication technologies in the delivery of patient/client care.
Indicators	<ul style="list-style-type: none">• Identifies and demonstrates appropriate use of a variety of information and communication technologies (e.g. point of care systems, EHR, EMR, capillary blood glucose, hemodynamic monitoring, telehomecare, fetal heart monitoring devices, etc.) to deliver safe nursing care to diverse populations in a variety of settings

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- Uses decision support tools (e.g. clinical alerts and reminders, critical pathways, web-based clinical practice guidelines, etc.) to assist clinical judgment and safe patient care
- Uses ICTs in a manner that supports (i.e. does not interfere with) the nurse-patient relationship
- Describes the various components of health information systems (e.g. results reporting, computerized provider order entry, clinical documentation, electronic Medication Administration Records, etc.)
- Describes the various types of electronic records used across the continuum of care (e.g. EHR, EMR, PHR, etc.) and their clinical and administrative uses
- Describes the benefits of informatics to improve health systems, and the quality of Interprofessional patient care.

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3.0 Background

At the time of this writing, nurses continue to retrieve and record clinical data and information in clinical practice using paper-based record keeping. In conjunction with these paper records a variety of online applications designed to replace paper tools have been introduced. A majority of clinical settings continue to use a combination of computerized and paper health records resulting in a highly varied distribution of electronic health record systems within and across sectors of care in Ontario and across Canada. Student nurses and clinical instructors will find variability between care settings and the availability and types of online clinical tools in use. Therefore, it is most important that students understand the basic functionality (e.g. order entry, results review, clinical documentation, e-referral, electronic medication administration record – eMAR, decision support) that is provided by electronic health information management tools rather than the unique functionality and “look and feel” of a particular vendor’s product. It is also imperative that students understand the privacy implications of ICT use and abide by the organizational and legislative requirements to maintain privacy and security of personal health information (see Section Five [5.2] for additional discussion on this issue).

3.1 Information and Communication Technologies

Information and communication technologies (ICT) most commonly refer to hardware and software associated with the support of health care business and clinical care processes. ICT are pervasive in health care settings and are typically comprised of technologies that support the collection, aggregation, distribution, communication and retrieval of clinical data and information. One of the fundamental premises of using ICT in health care is that data can be *collected once for use by many*.



SECTION THREE Nurse Educator eHealth Resource

Nurses and other health professionals have long used a variety of technologies in their practice such as monitoring devices, infusion pumps, mobile phones and pagers. With the advent of ubiquitous computing, many additional devices, including computers that are fixed workstations, point of care devices such as personal digital assistants (PDAs) (e.g. smartphones), laptop or tablet computers, wireless phones integrated with patient call bell systems, bar code readers and to a more limited extent, even the use of robotics are being introduced into clinical practice settings.

Students need to understand the basic functionality that is provided by electronic health information management tools rather than the unique functionality and “look and feel” of a particular vendor’s product.

Computer on Wheels (COW) or **Workstation on Wheels (WOW)** are terms often used to describe a computing device mounted on a mobile cart to support point of care computing and sharing among clinicians. It is common to find this type of device used by interprofessional teams during patient rounds.

Clinical Information Systems (CIS) is a term used to refer to **electronic patient records (EPRs)**, **electronic medical records (EMRs)**, or **electronic health records (EHR)**. These systems typically integrate a number of clinical applications and present these to clinicians for use through a computing device. Today, many of the clinical record management systems within health-care organizations are best described as hybrid environments as computerized clinical applications co-exist with legacy paper record

It is important to emphasize the significant risk to patient safety if nurses do not ascertain that all sources (paper and computerized) of clinical information have been considered.

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components. It is likely that these hybrid record-keeping systems will exist for many years to come. To this end, it is important to emphasize the significant risk to patient safety if nurses and other clinicians do not ascertain that all sources of clinical information have been considered.

The term EHR is most commonly used to describe a secure, life-time national or regional capture and storage of key elements of an individual's health encounters (e.g. immunizations, diagnoses and procedures, medications, referrals, diagnostic test results). These records may gather these key clinical data and information for individuals from points of clinical care delivery (e.g. diagnostic testing centers, EMRs, EPRs and **personal health records (PHRs)**). EMRs is most commonly used to describe a physician, nurse practitioner or clinic practice record to manage an individual's longitudinal care by an individual or team of health professionals. These records may receive or direct specific data or information to other points of service including EMRs, EPRs, EHR or PHRs.



EPR is the term most commonly used to describe a single organization's online management of every admission, emergency and day surgery visits. These records may also receive or direct specific data or information to EMRs, EHR, or PHRs. Individuals creating and using a PHR is just beginning to emerge as a mechanism to manage one's own health information. PHRs will likely evolve to also receive or direct specific data or information to EMRs, EHR and other points of service. The differentiating aspect of the PHR from other electronic records is that the person has access and control of the information as opposed to an organization or health-care provider.

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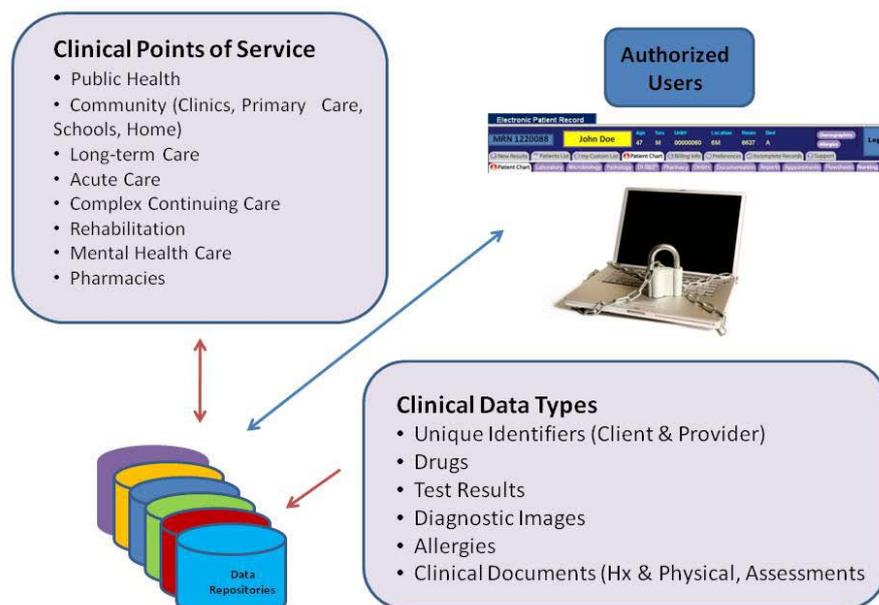


Figure 3.1 Clinical data types, sources, and users

Table 3.1. Summary of Common Terms.

Common Terminology	Acronym	Use/User
Clinical Decision Support Systems	CDSS	Linked to CIS or standalone in practice and education
Clinical Information System (commonly refers to EHR, EMRs, & EPRs)	CIS	Providers in any setting
Electronic Health Record	EHR	National, Provincial, Regional
Electronic Medical Record	EMR	Physician, Nurse Practitioner, Clinics, Community Health Centre
Electronic Patient Record	EPR	Institutional
Personal Health Record	PHR	Citizens, Providers

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Clinical Decision Support Systems (CDSS) are computerized tools “designed to support decision-making activities and improve the decision-making process and decision outcomes” (Androwich & Kraft, 2006, p. 167). In light of the sheer volume of clinical data and information available in the health-care system, these tools can be supportive of clinical care that is evidence-informed and incorporates best practices. Many CISs now have embedded CDSS functionality in the form of alerts, reminders, links to best practices and evidence, diagnostic assistance and the generation of care plans, pathways or relevant clinical protocols (e.g. standard order sets). The three primary purposes of CDSS are to:

Remember...
CDSS *SUPPORT* clinical decision-making and *DO NOT REPLACE* the judgment of clinicians.

- 1) Assist in problem-solving with semi-structured problems;
- 2) Support not replace the judgment of the clinician; and
- 3) Improve the effectiveness of the decision-making process.

It should be stressed that while CDSS support clinical decision-making, there are often additional, particularly qualitative, elements of clinical assessment.

Problems that can be solved with existing facts (highly structured) and those which are dependent on values and beliefs (unstructured) are not well suited to the use of decision support tools (Androwich & Kraft, 2006). As a result of the Institute of Medicine (2000) report on the incidence of adverse events due to human error, clinicians including nurses are increasingly expected to use evidence-based knowledge at the point of care.

Examples of CDSS Applications

- 1. Computer generated “Flags” that provide reminders or alerts (e.g. abnormal lab results or allergy alerts).**
- 2. Computer access to online literature, best practice guidelines (BPGs), e-tools for calculation, patient guidelines.**
- 3. Natural language or speech recognition applications which interpret and codify free text notes to allow electronic archiving and retrieval.**
- 4. Signal interpretations for automated ECG interpretation.**
- 5. Therapy critiquing and planning tools (e.g. care maps, guidelines, protocols, order sets).**

The prevailing focus and expectation for evidence-based or evidence-informed practice throughout health care has led to the integration of tools such as the RNAO and other BPGs into clinical environments. The Ontario-legislated *Excellent Care For All Act, 2010* further supports the notion that the care delivered in this province must be evidence-driven in order to enhance access, quality and safety. Nurses have a professional obligation to assure that their practice is based upon the best available evidence and hence are obligated to use evidence-driven decision support tools in their practice.

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Knowing Is Better

knowingisbetter.ca was launched as an important resource for Canadians looking for more information about EHR systems. While it is easy to get confused by the technical nature of EHR, this website provides information that is relevant to Canadians and presents it in a highly visual, easy to understand way.

The microsite helps demonstrate how EHR will make health care in Canada better. It also explains how the EHR system is a collaborative effort between the federal, provincial and territorial governments.

Visit www.knowingisbetter.ca for:

- An introduction animation that provides visitors with a simplistic explanation of how EHR systems will benefit the delivery of health care in Canada;
- A secondary animation in the “Knowing the Plan” section that explains how EHR systems are being built and put in place across the country;
- An interactive quiz that helps Canadians consider whether their authorized health-care providers have access to their complete health picture; and
- A series of videos that showcase real-life success stories of EHR progress that is taking place in communities and regions across Canada.

Clinical Applications that are accessible through computer technology and supporting peripheral devices (e.g. printers, barcode readers) include those previously found in paper-based records (e.g. clinical documentation, flow sheets, medication administration record, orders, diagnostic reports). In addition to these traditional components, many CISs incorporate CDSS functionality. There are many vendors of CISs from which health provider organizations may choose applications to support the various aspects of clinical information. In Canada, a majority of hospitals and long-term care homes use a limited number of vendor solutions to provide their computerization of clinical information management (e.g. Meditech™, Eclipsis™, Cerner™, McKesson™ Point-Click-Care™). In a majority academic health science centers, combinations of a variety of vendor departmental solutions (e.g.

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pharmacy, laboratory, diagnostic imaging) may be selected and then integrated into a single EPR for clinician use. See Table 3.2 for some of the most common computerized clinical applications and tools used by nurses.

Table 3.2. Examples of computerized applications/tools commonly used by nurses.

Commonly Used Nursing Clinical Applications	
Patient/Client Registration	Admission, Discharge, Transfer (ADT) functions
Computerized Provider Order Entry (CPOE)	Computerized orders for clinical care
Results Review	Online access to laboratory results, transcribed reported, consults, operative notes
Diagnostic Imaging (PACS – Picture Archiving Communication System)	Digitized clinical images
Clinical Documentation	Includes assessment tools, electronic medication administration record (eMAR), summary of care record, discharge summary, clinical consult notes
Health Records Archiving Systems	Online access to historical health records which are typically comprised of scanned chart images.
Bar-coded Medication Administration	Typically linked with CPOE and eMAR
Medication Profile or eMAR	
Workload Measurement Tools (e.g. GRASP)	
Best Practice Guidelines	

There are also many EMR solutions in use across Canada, some of which will be chosen to support the nurse practitioner-led clinics in Ontario. In the context of community and public health nursing, the acquisition and implementation of mobile computing solutions are in their infancy in this province.

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Historically, and still today, most clinical data repositories have been organizationally or provider centric with limited access by providers outside of a given site (see Figure 3.2). However, as is rapidly emerging today, access to data and information about an individual's health history from any or all of these types of records is being made possible through the use of **Portal** technology. Portals provide a “window” or viewing access to clinical data and information that resides in one or more provider clinical information systems.

These solutions are being increasingly used to provide information linkages between disparate health provider systems (see Figure 3.3).



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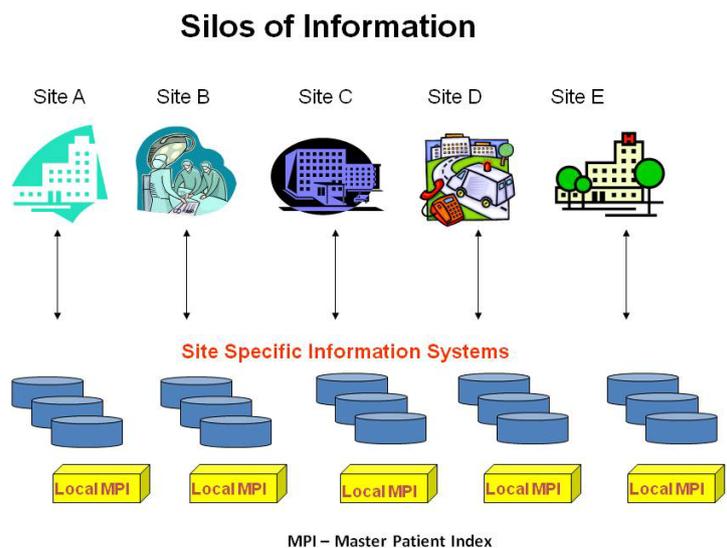


Figure 3.2 Schema of information silos.

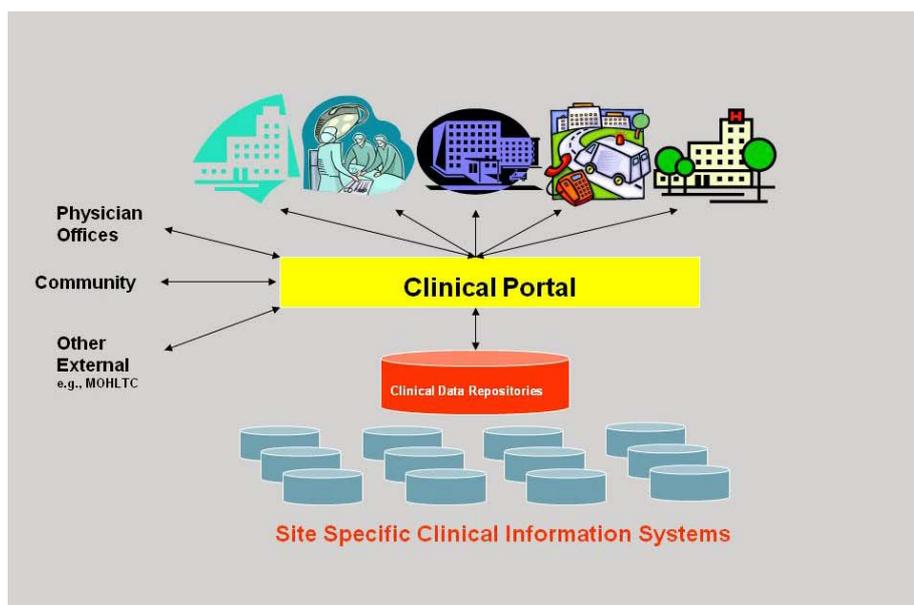


Figure 3.3 Schema of a clinical portal.

The evolution of clinical information systems and the connectivity between various points of health information management will continue to unfold for many years to come.

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Telehealth

Tele is a prefix meaning “at a distance”. **Telehealth** or **Telemedicine** is the use of ICT to provide clinical consultation and monitoring remotely to citizens in urban, rural and isolated communities, typically provided by health professionals located in larger, urban centers. In Ontario and other parts of Canada, nurses are involved in the provision of telehealth primarily through **Telenursing** practice, which is the use of “technology to deliver nursing care and conduct nursing practice” (Schlachta & Sparks, 1998, p. 558). The terms telehealth, telemedicine, and telenursing tend to be used somewhat interchangeably in the literature. In 2007, the Canadian Nurses’ Association (CNA) released a position statement on Telehealth and the role of the nurse (CNA, 2007). While nurses engaged in telenursing practice continue to assess, plan, intervene and evaluate the outcomes of nursing care, they do so using technologies such as the internet, computers, telephones, digital assessment tools and telemonitoring equipment.

At time of this writing, the Ontario Telemedicine Network (OTN) is advancing a provincial initiative focused on **Telehomecare**. This new care delivery system will provide remote monitoring and nursing support for people with chronic diseases throughout the province. Telehomecare nurses are being recruited to manage this new form of bringing telemedicine into the homes of Ontarians.

Additional information about this initiative can be found on the OTN website at: <http://www.otn.ca>

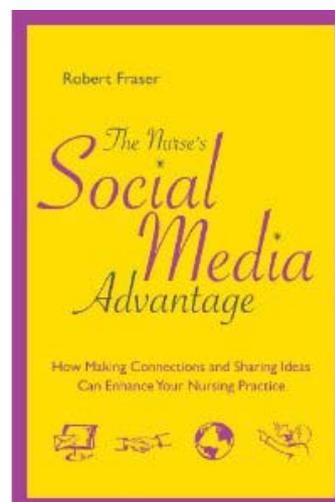
The term **mHealth** or **Mobile Health** is beginning to be applied to the use of smart phone applications that are rapidly appearing in conjunction with the wide scale use of these devices by individuals. Several researchers have begun to investigate the utility of mobile health applications that support the management of chronic diseases such as diabetes. Functionality such as dietary management tools, clinical event reminders and the trending of parameters such as blood pressure, capillary blood glucose and the documentation of hyper- and hypoglycemic events are being viewed as new ways in which to empower self-management of wellness and illness.

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Social Media and Networking

The use of internet has evolved from a vehicle of global communication and exchange of information to a network of social media and networking tools that are finding their way into health care and the education of health professionals.

Through the use of **wiki tools**, groups are able to create and edit pages of content on a wide range of topics (Skiba, 2007a). **Forums, discussion boards, blogs**, and other **online** locations allow individuals to post questions and receive community responses. While tools like **Twitter™** and **peer-to-peer** social networks are connecting and supporting students and nurses in practice



worldwide. In addition, hundreds of patients and caregivers are turning to online communities to share experiences and lend mutual support. Nurse educators are using social media tools in the delivery of content and to facilitate student learning. The use of tools such as **The Neighbourhood** (Giddens, 2011) and **Second Life** for creating simulated clinical environments (Skiba, 2007b) are further extending the notion of simulated learning scenarios. Fraser (2011) has recently published a handbook for nurses that offers a more in depth view of some of the unfolding possibilities for the use of these tools by nurses.

The RNAO regularly uses social media to convey up-to-date information and stimulate knowledge exchange, keeping an active **Twitter™**, and **Facebook™** presence. RNAO's Communities site has effectively connected nurses across Canada who are taking a lead role in working with Champions to implement the RNAO *Smoking Cessation BPG* into daily practice.

Simulation

The use of ICT to support simulation technology is common, but the integration of EHR functionality within Simulation Laboratories is less so as yet. To date, the options to incorporate EHR solutions into

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educational settings remain costly, but there are schools of nursing that have been able to utilize the training environment of an affiliate practice organization's proprietary system (e.g. University of Ontario Institute of Technology). The sooner this capability is made possible, the more integrated the use of ICT can be with the teaching and learning of other clinical skills (e.g. physical assessment and clinical documentation).

Section Key Messages

- *The health-care system is in transition with the migration to electronic health records.*
- *Information and communication technologies are in evolution and vary widely between clinical settings.*
- *The internet and social networking tools are influencing the ways that students learn.*

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Application of Section Three Content to the Curriculum

Information and Communication Technology

This section provided an overview of the key concepts and structural components of information and communication technologies (ICT) currently being used in clinical settings. The variety of terms and acronyms used to describe these tools have been defined and described.

Student Learning Outcomes

Upon the completion of this section, educators will be able to provide students with a conceptual introduction and learning activities such that they will be able to:

- Describe the rationale for the use of ICT in clinical practice settings;
- Describe how ICT support the retrieval, management and use of clinical data and information;
- Describe the multiple sources of relevant clinical information in the context of hybrid systems (combination of paper and computerized records) being used in clinical environments today;
- Explain how ICT enhances safer care delivery and quality improvements.
- Describe how ICT supports interprofessional care co-ordination and continuity across the continuum of care;
- Describe how ICT supports clinical judgment, knowledge acquisition, evidence-informed practice and client education;
- Explain the use of telehealth and associated technologies;
- Explain the possibilities associated with social media and networking tools; and
- Use electronic health record functionality in conjunction with the practice of other clinical skills in the simulation laboratory.

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Key Concepts

In this section, the following key concepts were defined and discussed:

Information and communication technologies (ICT)

Personal Digital Assistants (PDAs)

Laptop, Tablet, Computer/Workstation on Wheels

Clinical Information Systems

Clinical Decision Support Systems

Electronic Health, Medical, and Patient Records

Personal Health Records

Clinical Applications

Portal Technology

Telehealth, Telemedicine, Telenursing, Telehomecare

Mobile or mHealth

Social Media and Networking

Simulation and Electronic Health Records

Suggestions for Course Integration

These concepts should be introduced early in the curriculum to set the stage and expectations for clinical practice environments. Educators should consider introducing these concepts with course content related to professional practice issues. Further teaching concepts related to clinical information systems will fit well with the teaching of clinical documentation skills and guiding preparation for clinical practice.

The introduction of ICT terminology and concepts might be integrated into one or more courses typically or similarly focused on:

- Clinical Skill development (e.g. in the simulation lab)
- Professional Nursing
- Health Systems
- Professional Relationships
- Current issues in Nursing and Health care
- Health Assessment
- Introduction to Canadian Health care

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Learning activities

- Encourage the use of e-tools for clinical decision support (e.g, eCPS, PEPID, BPGs).
- Direct students to potential online sources of clinical information in preparation for clinical assignments.
- Introduce clinical assessment skills and documentation with the use of a generic or training version of an electronic health record management system.
- Integrate the use of an electronic health record management system with other skills development in the simulation laboratory.
- Have students write or revise a Wikipedia article as a group assignment.
- Create a Blog to support class theoretical or clinical discussions.
- Encourage students to use Twitter to crowd-source ideas for assignments or seek feedback from a diverse global audience on topical ideas for course projects.
- Have students utilize YouTube and videos from other media websites to complement other material during presentations and for assignments.

Tips & Tools
...introduce these
concepts early in the
curriculum...

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“Information literacy is being able to recognize when information is needed and having the ability to locate, evaluate and use effectively the needed information” (American Library Association, 1989, p. 1).

Section Four

Information and Knowledge Management



Purpose of this Section

This section is intended to provide the user with the key concepts of data, information, knowledge and wisdom as they relate to standards-based, evidence-informed practice.

At the end of this section, the user will be able to provide students with an introduction to the following:

- *The concepts and role of data, information, knowledge and wisdom in clinical judgment;*
- *Information literacy and information management as it relates to nursing practice;*
- *The linkage between information management and clinical judgment;*
- *The relationship between clinical judgment and the use of information and communication technologies (ICT);*
- *The rationale for nursing data standards in representing nursing practice in electronic health records (EHR) systems; and*
- *Current initiatives focused on the adoption of nursing data standards.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Domain	Information and Knowledge Management
Competency	Uses relevant information and knowledge to support the delivery of evidence-informed patient/client care.
Indicators	<ul style="list-style-type: none">• Performs search and critical appraisal of on-line literature and resources (e.g. scholarly articles, websites and other appropriate resources) to support clinical judgment, and evidence-informed

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decision making

- Analyses, interprets and documents pertinent nursing data and patient data using standardized nursing and other clinical terminologies (e.g. ICNP, C-HOBIC, and SNOMED-CT, etc.) to support clinical decision making and nursing practice improvements
- Assists patients and their families to access, review and evaluate information they retrieve using ICTs (i.e. current, credible and relevant) and with leveraging ICTs to manage their health (e.g. social media sites, smart phone applications, online support groups, etc.)
- Describes the processes of data gathering, recording and retrieval, in hybrid or homogenous health records (electronic or paper), and identifies informational risks, gaps and inconsistencies across the healthcare system
- Articulates the significance of information standards (i.e. messaging standards and standardized clinical terminologies) necessary for interoperable electronic health records across the healthcare system
- Articulates the importance of standardized nursing data to reflect nursing practice, to advance nursing knowledge and to contribute to the value and understanding of nursing
- Critically evaluates data and information from a variety of sources (including experts, clinical applications, databases, practice guidelines, relevant websites, etc.) to inform the delivery of nursing care.

4.0 Information and Knowledge Management

4.1 Data, Information and Knowledge

All computerized tools used in health-care settings are designed on the basis of clinical data and information. The use of these tools is further supported by online links to knowledge and evidence and provides the capability to generate new knowledge through the aggregation and analysis of multiple clinical events, cases, findings and outcomes.

Nurses in every area of practice must manage complex amounts of data and information. Clinical practice decisions are supported by the use of information and available knowledge. Nurses collect **data** (e.g. client vital signs, symptoms) which they then interpret, organize and turn into **information** about the status and care requirements of the client. This information, combined with other information about that client or amassed from other client experiences, is used to build new nursing **knowledge** about client assessment, status, nursing interventions and outcomes.

Data are discrete facts derived from observation, assessment, interviews, devices and analysis (e.g. vital signs, lab result, risk level). Clinical data can be entered, represented and retrieved using computer applications. **Information** is a collection of data elements that together provide more comprehensive insights to a situation than any single data element. Clinical data can be collated and represented in computer applications to inform clinical care (e.g. history of allergies, potential drug-to-drug interaction, or diaphoresis, pallor, hypotension, tachycardia = shock). **Knowledge** is aggregated data and information providing the basis of evidence when examined over time, multiple instances and in the context of specific clinical circumstances (e.g. demonstrated outcomes and efficacy of a single intervention for specific clinical problem) can be presented to clinicians via computer applications (Blum, 1986; Graves & Corcoran, 1989).

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Transformation of data to information to knowledge to wisdom.

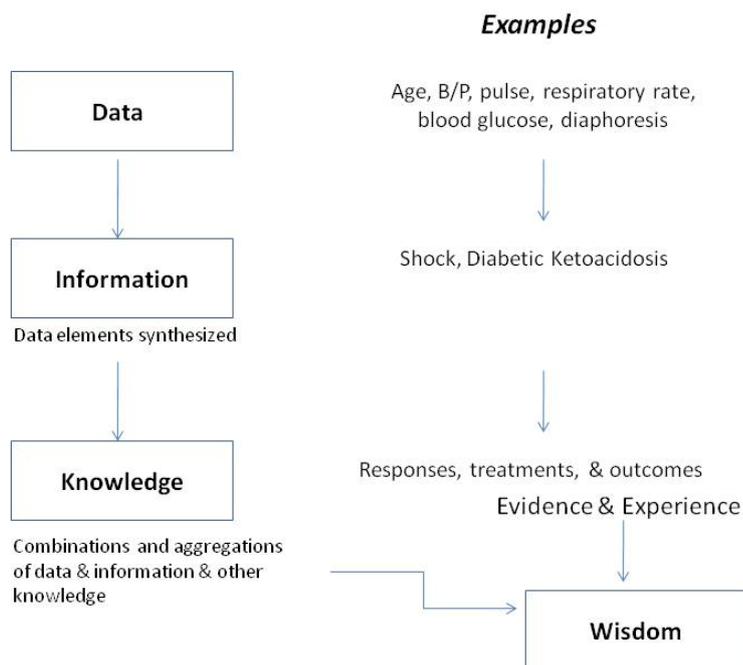


Figure 4.1.

Information literacy is the ability to know when information is needed, where to find it, evaluate it and use it effectively (American Library Association, 1989). It inherently necessitates the use of reflection, critical thinking and problem-solving skills and may or may not involve the use of computers. As a foundation for evidence-informed practice, information literacy implies that nurses are intelligent users of information from a variety of sources, including electronic media (Jacobs, Rosenfeld, & Haber, 2003). Nurses who are increasingly relying upon the availability of electronic information and knowledge sources to inform clinical decisions and to access appropriately and effectively, must also be computer literate.

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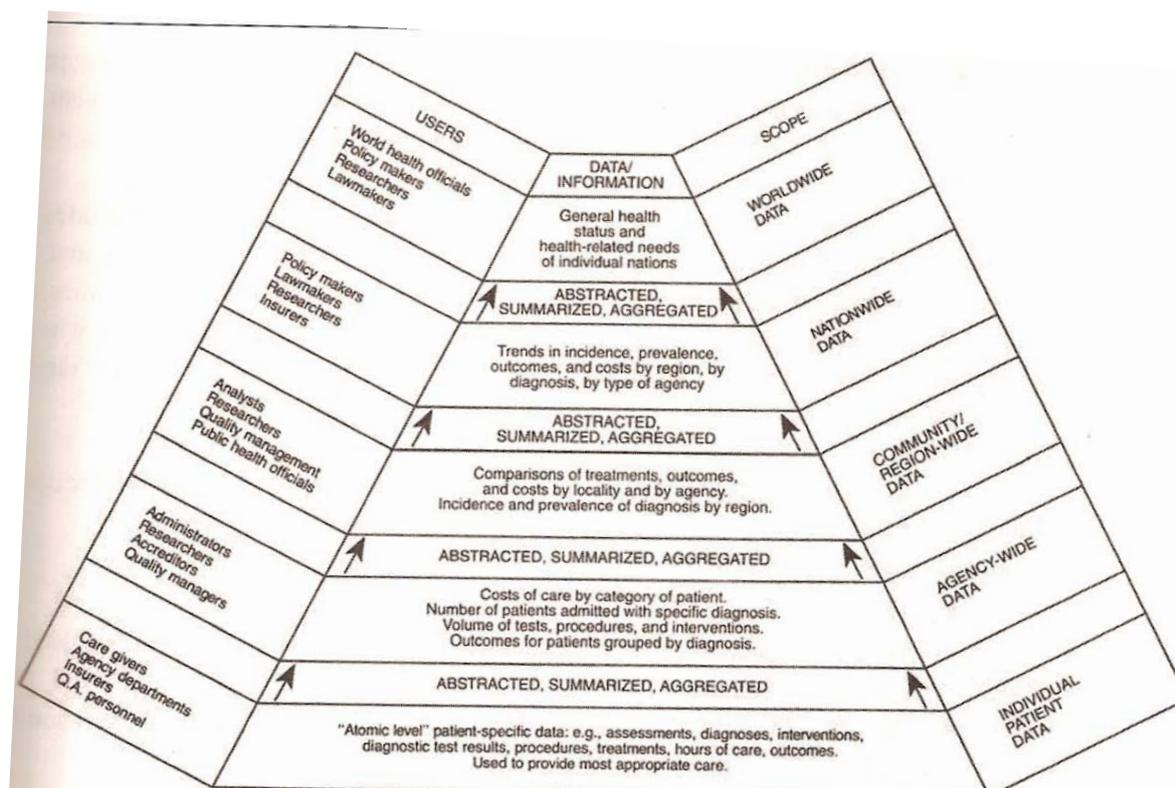


Figure 4. 2 Examples of uses of atomic-level patient data collected once, used many times.

(Reprinted with permission from Zielstorff, R. D., Hudgings, C. I., Grobe, S. J. (1993). The National Commission on Nursing Implementation Project Task Force on Nursing Information Systems: Next generation nursing information systems. American Nurses Publishing; American Nurses Foundation/American Nurses Association, Washington, D.C.)

Nurses gather clinical data, use collectives of data as information and rely on aggregated information in the form of knowledge to inform and support their clinical practice. Data may be derived from direct observation, physical assessment, physiological monitoring, measurement and testing – direct device downloads into clinical information systems (CIS) (e.g. hemodynamic monitoring, capillary blood glucose monitoring, fetal heart monitoring).

Information management has been conceptualized as a process that includes:

- 1) Collecting data;
- 2) Processing the data; and
- 3) Presenting and communicating the processed data as information or knowledge (Gugerty & Sensmeier, 2010).

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Knowledge management might then be considered as the result of the processes associated with data and information aggregation such that new understandings emerge and are made accessible to others. New knowledge is created by changing and evolving knowledge derived from the collective expertise, experience and research. Knowledge processing is the ‘activity or process of gathering or collecting, perceiving, analyzing, synthesizing, saving or storing, manipulating, conveying and transmitting knowledge’ (McGonigle and Mastrian, 2012, p. 573). Today, the ICT tools available to nurses typically include applications which provide access to knowledge management systems or knowledge repositories (e.g. e-CPS, PEPID, e-Pocrates, best practice guidelines – BPGs).

Nurses have been identified as knowledge workers and as such require information management as a core capability (Porter-O’Grady, 2003). As EHRs will be the primary vehicle by which nurses manage clinical information in the future, much of their skill in information management will be in the use of these and associated information and knowledge rich tools (e.g. links to evidence).

“I have seen improvements in my research via the internet resources and my ability to use Nursing Informatics in the hospital to obtain patient documents and to focus more on patient care” (4th year student nurse).

Information and knowledge sources may include: CIS embedded decision support tools, online journals and references, stand alone applications, hard and soft copy clinical resources, policies and procedures (may or may not be linked to CIS), and peer consultation.

Computerized decision support tools may take many forms including pop-up alerts (e.g. allergies, drug-to-drug interaction), reminders (e.g. drug administration due), clinical order sets, protocols or pathways, links to evidence and BPGs, and increasingly, online clinician collaboration with other clinicians and with patients and families.

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Evidence-informed practice has been described as the “*development of a professional practice in which the nurse does something not just because that is how it has always been done or because that is what she/he was told to do, but because she/he has made ‘a decision for actions which can be justified from a knowledge base’* (Marks-Marrah, 1993, p. 123 as cited in McSherry et al., 2002).

“As we increasingly move toward an environment of instant and infinite information, it becomes less important for students to know, memorize, or recall information, and more important for them to be able to find, sort, analyze, share, discuss, critique, and create information. They need to move from being simply knowledgeable to being knowledge-*able*.” (Wesch, 2009)

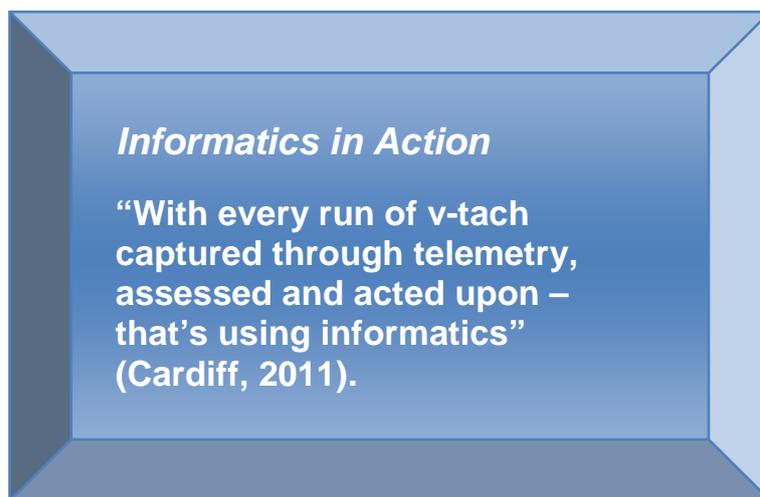
This type of practice requires that all nurses have an understanding of the importance of practice being based on appropriate evidence and supported by the ability to access and use research (McSherry et al., 2003, p.3). Access to relevant and appropriate research can be facilitated through the use of ICT and support evidence-informed practice.

According to Tanner (2006), **clinical judgment** in nursing has become synonymous with the nursing process, and has been viewed as a problem-solving activity, beginning with assessment, proceeding to the creation of a plan, the implementation of interventions and a determination of the effectiveness of the interventions. However, Tanner argues that this approach to clinical judgment is inadequate to describe the complex process of decision-making required by today’s nurses who practice in “clinical situations that may be rapidly changing and required reasoning in transitions and continuous reappraisal and response as the situation unfolds” (p. 208). She proposes a model of clinical judgment that involves four aspects: noticing, interpreting, responding and reflecting. By using ICT, nurses are supported through each step of the

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process clinical judgment described by Tanner. For example, nurses can review and enter assessment parameters (noticing) through online documentation tools, extract evidence to inform the creation of a plan of care (interpreting) and determine appropriate interventions (responding). The evaluation of clinical outcomes (reflection) is supported through the documentation of follow-

up assessments as demonstrated by the implementation of initiatives such as the Health Outcomes for Better Information and Care (HOBIC). Furthermore, the consistent, standardized documentation of nursing activities and the



outcomes through the use of nursing data standards will further contribute to the advancement of nursing knowledge. The significance of nursing data standards will be discussed further in this section.

Increasingly evidence-based **best practice guidelines (BPGs)**, like **RNAO’s clinical nursing BPGs**, clinical protocols, clinical pathways or care maps are being automated and generated on the basis of a specific diagnosis or the outcome of a nursing care assessment. Clinical order sets are often commonly associated with specific protocols of care. In CIS these tools may be linked to clinical provider order entry (CPOE) systems, online clinical documentation and or available evidence. Hence nurses’ use of ICT is directly supports evidence-informed nursing practice.

4.2 Clinical Data Standards

The ability to aggregate computerized clinical data is wholly contingent on the use of standardized clinical terminology. Several clinical data standards have been developed for use in CIS including a number of nomenclatures which are specific to nursing practice. A majority of the

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developments in the standardization of nursing language have focused on nursing diagnosis or client phenomena, nursing interventions and clinical outcomes. To date, few health-care organizations in Canada have embraced all of these elements, but there has been endorsement of the International Classification of Nursing Practice (ICNP[®]) by the Canadian Nurses Association (CNA, 2003). In Canada, Infoway is providing the leadership for the advancement and adoption of clinical data standards into all core clinical data systems.

The International Council of Nurses (ICN) launched the development of ICNP[®] as the basis for a standardized nursing classification system that could be used to compare nursing practice on an international level. This schema is designed to capture data about nursing phenomena, interventions and outcomes. The ICNP (ICN, 2010) serves as a unifying framework into which existing nursing vocabularies and classifications can be cross-mapped to enable comparison of nursing data world-wide.

ICNP[®] is an integral part of the global information infrastructure informing health care practice and policy to improve patient care worldwide.

The strategic goals of ICNP are to:

- 1) Serve as a major force to articulate nursing's contribution to health and health care globally.**
- 2) Promote harmonization with other widely used classifications and the work of standardization groups in health and nursing.**

ICNP program benefits have been articulated as follows:

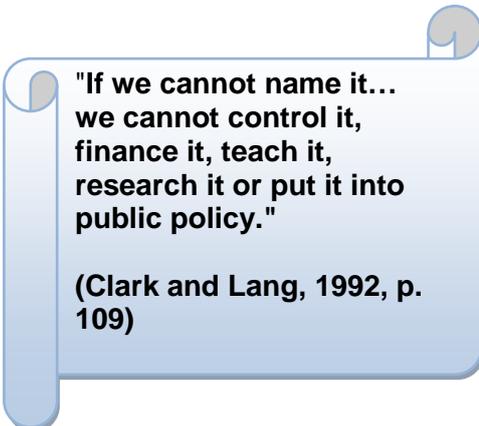
- Establishes an international standard to facilitate description and comparison of nursing practice;
- Serves as a unifying nursing language system for international nursing based on state-of-the-art terminology standards;

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- Represents nursing concepts used in local, regional, national and international practice, across specialties, languages and cultures;
- Generates information about nursing practice that will influence decision-making, education and policy in the areas of patient needs, nursing interventions, health outcomes and resource utilization;
- Facilitates the development of nursing data sets used in research to direct policy by describing and comparing nursing care of individuals, families and communities world-wide;
- Improves communication within the discipline of nursing and across other disciplines; and
- Encourages nurses to reflect on their own practice and influence improvements in quality of care (ICN, 2010).

SNOMED® (Systematized Nomenclature of Medicine) is another leading standardized language developed by the College of American Pathologists. SNOMED and ICNP have entered a collaborative relationship in order to complement each other's terminologies (ICN, 2006). SNOMED has a lengthy history, dating from the mid-1960s when it was used as a terminology system for pathology.

Since that time, it has evolved into a comprehensive computerized clinical terminology that captures diseases, clinical findings, and procedures. SNOMED Clinical Terms® (CT) provide a "consistent way of indexing; storing, retrieving and aggregating digitized clinical data across specialties, sites of care and computing platforms" (Canada Health Infoway, 2008). In 2006,



**"If we cannot name it...
we cannot control it,
finance it, teach it,
research it or put it into
public policy."**

**(Clark and Lang, 1992, p.
109)**

SNOMED CT was selected for use in Canada as the common reference terminology of the pan-Canadian interoperable Electronic Health Record which is currently in development (Canada Health Infoway, 2008). The International Health Terminology Standards Development Organization (IHTSDO) is a not-for-profit association that develops and promotes use of SNOMED CT to support safe and effective health information

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exchange. SNOMED CT is a clinical terminology and is considered to be the most comprehensive, multilingual health care terminology in the world.

For more detailed information about SNOMED CT go to: <http://www.ihtsdo.org/>

Nursing Data Standards in Canada

In an effort to identify a minimum data set for nursing in Canada, the CNA initiated a process to delineate the elements of **Health Information: Nursing Components** (HI:NC) in 1991 (CNA, 1993). HI:NC were identified as essential data elements deemed to reflect the contribution of nursing practice to patient care. These data were suggested to be part of a larger national, multidisciplinary, cross-sectional, client-focused compilation of health information such as those maintained by the Canadian Institute of Health Information (CIHI).

The following care elements were identified as core to the HI:NC data set:

- Client Status;
- Nursing Interventions;
- Client Outcomes; and
- Nursing Intensity.

The HI:NC data was specifically designated as the direction for nursing to make an important contribution to the datasets that inform policy and decision-makers about the health needs of Canadians. At the time of this writing, the capture and reporting of standardized nursing data at a national or jurisdictional level is extremely limited.

Ontario's **HOBIC** captures standardized patient outcome data related to nursing care in four sectors: acute care, long-term care, complex continuing care and home care. HOBIC's focus is on nurses' assessments of individuals':

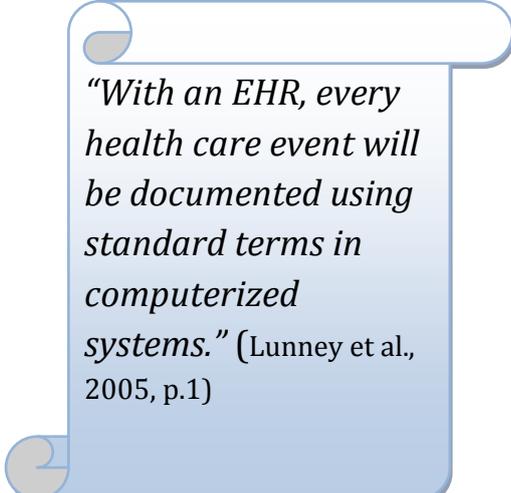
The logo for HOBIC (Health Outcome Based Information Collection) features the letters 'HOBIC' in a stylized, blue, serif font. The 'O' and 'B' are particularly large and ornate, with decorative flourishes.

- Functional status (ADL, iADL) and continence;
- Symptoms of pain, fatigue, nausea, dyspnea;

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- Fall and pressure ulcer risk assessment; and
- Therapeutic self-care (readiness for discharge).

These are standardized measures, patient-centered outcomes and provide valuable information to all clinicians regarding selected patient outcomes. The HOBIC database has two purposes: It provides “anonymized” aggregate data for researchers and decision-makers to use in examining clinical outcomes; and it gives clinicians access to individual clinical outcomes to use in planning for, and evaluating, care. Each participating site has access to its HOBIC data for conducting its own analysis.



“With an EHR, every health care event will be documented using standard terms in computerized systems.” (Lunney et al., 2005, p.1)

C-HOBIC, a project which introduced HOBIC to Canadian sites outside Ontario, has included the work of mapping the HOBIC measures to ICNP (CNA, 2008) to assure Canada’s congruence with international directions.

For more information about C-HOBIC go to:
http://www.cna-aiic.ca/c-hobic/about/default_e.aspx

Without the adoption of clinical nursing data standards, the profession will lose the opportunity to have the contribution of nurses consistently represented in clinical information systems. According to Lunney et al. (2005), the EHR affords many advantages to both clinicians and patients, including improved patient safety, access to information at the point of care and active decision support. EHRs can provide easily accessible, relevant and timely information at the point of care for all clinical team members. The discipline of nursing **will not** realize these EHR advantages without advocacy for the adoption and use of standardized nursing languages.

Section Key Messages

- *Nursing is an information intensive profession.*
- *Nurses require skills in information and knowledge management literacy to deliver optimally safe quality care.*
- *Clinical documentation standards are fundamental to the design and use of clinical information systems that will generate new nursing knowledge and evidence.*

Application of Section Four Content to the Curriculum

Information and Knowledge Management

This section provided an overview of the concepts central to information and knowledge management in nursing.

Student Learning Outcomes

Upon the completion of this section, educators will be able to provide students with a conceptual introduction and learning activities such that they will be able to:

- Define the concepts of data, information and knowledge, and their use in practice settings to support clinical judgment and evidence-informed practice;
- Explain the significance of clinical data standards in clinical information systems; and
- Discuss key initiatives in the development of nursing data standards.

Key Concepts

In this section, the following key concepts have been defined and discussed:

Data
Information
Knowledge
Clinical Data Standards
ICNP[®]
HI:NC
SNOMED
HOBIC
C-HOBIC
Information and Knowledge Management Literacy
Computerized Decision Support
Evidence-Informed Practice
Clinical Judgment

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Suggestions for Course Integration

These concepts should be introduced early in the curriculum to set the stage and expectations for clinical practice environments. Consider integration with course content related to clinical judgment and related clinical information and documentation. Concepts related to clinical data standards are closely aligned with the teaching of clinical documentation skills.

The introduction of nursing data, information, knowledge and standardized languages might be integrated into one or more courses focused on the following:

- Clinical Judgment in Nursing
- Clinical Judgment and Health Assessment
- Professional Nursing
- Organization of the Health Care System
- Nursing Ways of Knowing and Caring
- Introduction to Promoting Decision-making for Health
- Introduction to Statistics and Data Analysis

Tips & Tools

Encourage students to identify sources of online evidence.

Learning Activities

- Ask students to explore how information and knowledge management can be utilized now and into the future to assist the health care of vulnerable disadvantaged populations (e.g. homeless, mental health, low socio-economic status, immigrant).
- Ask students to generate potential recommendations on how clinical information systems can be evolved to assist in the delivery of health care to vulnerable populations (e.g. homeless, mental health, low socio-economic status, immigrant).
- Use concept definitions as examination content.
- Ask students to identify evidence sources when using ICT to make clinical decisions.

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- Use clinical and/or nursing data standards as a topic of choice for critical appraisal assignment.
- Create a journaling assignment to chronicle use of evidence in clinical practice.

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...the world has become a "global village."

McLuhan, (1968)

Section Five

Socio-Cultural, Regulatory, Ethical and Interpersonal Considerations



Purpose of this Section

This section is intended to provide the user with an overview of key discussion points related to socio-cultural, regulatory, ethical and interpersonal implications related to the use of information and communication technology (ICT) by nurses.

At the end of this section, the user will be able to provide students with an introduction to the following:

- *Potential socio-cultural implications with the use of ICT;*
- *Regulatory obligations related to the use of ICT;*
- *Potential ethical implications with the use of ICT; and*
- *Impact of ICT use on interpersonal relationships and communications with patients, other health professionals and others.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Domain	Professional and Regulatory Accountability
Competency	Uses ICTs in accordance with professional and regulatory standards and workplace policies.
Indicators	<ul style="list-style-type: none">• Complies with legal and regulatory requirements, ethical standards, and organizational policies and procedures (e.g. protection of health information, privacy and security)

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- Advocates for the use of current and innovative information and communication technologies that support the delivery of safe, quality care
- Identifies and reports system process and functional issues (e.g. error messages, misdirections, device malfunctions, etc.) according to organizational policies and procedures
- Maintains effective nursing practice and patient safety during any period of system unavailability by following organizational downtime and recovery policies and procedures
- Demonstrates that professional judgment must prevail in the presence of technologies designed to support clinical assessments, interventions and evaluation (e.g. monitoring devices, decision support tools, etc.)
- Recognizes the importance of nurses' involvement in the design, selection, implementation and evaluation of applications and systems in health care.

5.0 Socio-Cultural, regulatory, ethical and interpersonal considerations

The use of technology in health care and in particular nursing practice, impacts a number of critical areas that have been termed socio-cultural, regulatory, ethical and interpersonal.

5.1 Socio-Cultural Implications

The use of ICT in society has become so pervasive in the last two decades that a majority of citizens in this country have access to computing and mobile devices. As predicted in the 1960's by Marshall McLuhan (1968), the world has become a "global village". ICT have led to marked changes in society as a whole with changes in how people communicate, the urgency with which responses are expected and the global reach of our messages. They have changed how business processes and commerce occurs in this country and worldwide. So, too, will health care be transformed because of the integration of ICT – changing care processes, communication with patients and families and between health professionals, and with the right solutions to support evidence-informed practice, improved safety and quality outcomes.

Patients and families are also becoming knowledgeable users of the internet and other ICT bringing yet another challenge to health



professionals. Nurses in particular are frequently finding it necessary to assist individuals to sort through the vast amount of information available to them and identify credible sources. In this regard, nurses are becoming "knowledge brokers" and

need to have a comfort level with these tools themselves in order to provide appropriate guidance to patients.

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As ICT become increasingly integrated in all settings and locations of care delivery, consideration needs to be given to the social and cultural impact of these tools. Early experiences with ICT in other industries suggest that not every citizen or culture will embrace the use of technologies as a replacement for face-to-face contact. Furthermore, in culturally diverse communities the essence of some ICT may not be easily adapted to multiple languages and cultural norms.

5.2 Regulatory Implications

In Section 1.0 of this Resource, it was noted that many of the requisite entry-to-practice competencies can be viewed and discussed in the context of eHealth or informatics applications in practice. The College of Nurses of Ontario (CNO) Practice Standards and Guidelines associated with privacy, electronic documentation and telepractice can be found at: <http://www.cno.org/pubs/compendium.html>

However, nurses are not only obligated to be knowledgeable in the use of ICT in accordance with the CNO *Standards of Practice* (2008); they must abide by legislation such as the *Personal Health Information Protection Act, 2004* (PHIPA)(MOHLTC, 2004). This Ontario-based privacy legislation is designed to:

- (a) Establish rules for the collection, use and disclosure of personal health information about individuals that protect the confidentiality of that information and the privacy of individuals with respect to that information, while facilitating the effective provision of health care;
- (b) Provide individuals with a right of access to personal health information about themselves; and
- (c) Provide individuals with a right to require the correction or amendment of personal health information about themselves (MOHLTC, 2004).

The legislation addresses issues of information practices, accuracy, security, consent, and the use and disclosure of health information. Nurses need to be aware of their obligations in the context of this *Act*, particularly in their use of ICT to manage and access individuals' personal health information.

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PHIPA has developed a number of resources for health care providers that can be accessed at http://www.health.gov.on.ca/english/providers/legislation/priv_legislation/priv_legislation.html

Personal health information is defined in PHIPA as identifying information about an individual that:

- Relates to the physical or mental health of the individual;
- Relates to the provision of health care to the individual;
- Is a plan of service under the *Home Care and Community Services Act, 1994*;
- Relates to payments or eligibility for health care or eligibility for coverage for health care;
- Relates to the donation of any body part or bodily substance of the individual or that is derived from the testing or examination of any such body part or bodily substance;
- Is the individual's health number; or
- Identifies an individual's substitute decision-maker.

Personal health information also includes identifying information about an individual that is not health-related, but that is contained in a record

Important to Note:
Privacy, confidentiality and security are not equivalent terms.

that includes personal health information about the individual. Such records are referred to as "mixed records." (Information Privacy Commissioner, 2011).

It is also important for students to understand the distinctions between information **security, privacy** and **confidentiality**. **Security** refers to the mechanisms and protocols to protect health information from unauthorized access. In the realm of ICT, this encompasses the use of passwords, encryption technologies, firewalls and increasingly, the use of biometrics (e.g. fingerprint and retinal recognition). Security



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typically encompasses organizational measures to protect the confidentiality, integrity and availability of all electronic health information. These measures include protection against potential human or environmental threats or hazards, and any unauthorized disclosures by securing computers, networks and other electronic devices (Barker, 2006). Student nurses need to be aware of clinical placement and future employers' policies regarding the requirements for authorized system access (e.g. password changes) and the terms of authorized access to patient information.

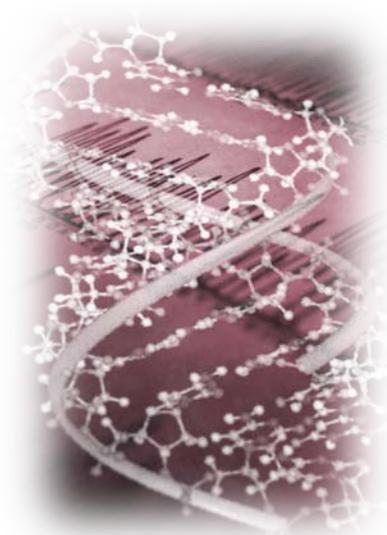
Privacy denotes the protection of personal information from unauthorized users. As per the *Code of Ethics for Registered Nurses* (2008) the principles of privacy and confidentiality prevail. When using ICT, nurses need to be sensitive to the possible indiscretion and privacy breeches associated with publically visible computer screen displays or the use of mobile phones or voice recognition devices to discuss patient issues with colleagues.

Confidentiality does not differ from the context understood in the world of paper health records. Whether using paper or computerized health records, nurses are obligated to maintain patient confidentiality in every aspect of collecting, documenting and using individual's health information.

5.3 Ethical Implications

Strict adherence to the *Code of Ethics for Registered Nurses* (2008) prevails in the face of ICT use. The code expressly refers to behaviours and activities associated with electronic communications (e.g. maintaining privacy and confidentiality as previously discussed).

In addition to the above considerations, students need to be aware of the potential ethical issues associated with the use of



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ICT. Sensitivities associated with specific types of information must be considered as these tools become more common. For example, genomics or human gene mapping will likely introduce significant ethical concerns. Should an individual's genetic map be associated with the electronic health record, who has access will be very important. Unauthorized access to an individual's genetic predisposition to certain diseases could threaten or impede the ability of individuals to receive specific health insurance coverage. Thus the protection of health information in the electronic and genetically informed world becomes even more critical to citizens.

“We must redesign professions and the way they work together. This involves stressing evidence-based practice and interdisciplinary learning, modifying the way professionals are regulated, and using the liability system to support changes and ensure accountability”.

(Brennan, P., TIGER, 2007, p. 3)

5.4 Interpersonal Impact

It is important for nurses to be aware of the potential impact of ICT on communications and the therapeutic relationship with patients and families. In addition, changes to the communication and relationships between members of the interprofessional team need to be considered. At the time of this writing there is little to no evidence to suggest how interpersonal relationships may change, although anecdotal experience suggests that the use of point-of-care devices and electronic communications do change the nature of interactions.

Increasingly, health-care provider organizations are deploying self-service solutions for activities such as self-scheduling, self-registration and triage, and pharmaceutical dispensing kiosks. As with other industries with self-service (e.g. banking ATMs), uptakes of these alternatives rather than face-to-face interaction appeal to some and not to others. The use of telehomecare monitoring equipment is also

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changing the connectedness of patients and families to health providers. Although not commonplace as yet, the future will most likely see an increase in electronic communications and exchanges of health information (e.g. emails, diagnostic results to PHRs). With this unfolding future, nurses may need to teach and support patients and families in the use of these devices and tools for wellness and illness care.

Section Key Messages

- *As eHealth becomes more pervasive, it is important to recognize that there may not always be an appropriate social or cultural fit.*
- *Nurses must be familiar with expected security practices within clinical settings in order to maintain the confidentiality of personal health information.*
- *Nurses ethical obligations must be upheld in the context of ICT use in clinical practice.*
- *ICT, particularly the internet and electronic communication tools, and home monitoring technology are influencing the ways that health professionals interact with each other and their patients.*

Application of Section Five Content to the Curriculum

Socio-Cultural, Regulatory, Ethical and Interpersonal Considerations

This section provided an overview of the key socio-cultural, regulatory, ethical and interpersonal considerations related to the use of ICT in practice settings.

Student Learning Outcomes

Upon the completion of this section, educators will be able to provide students with a conceptual introduction and learning activities such that they will be able to:

- Explain their professional accountability to use ICT in accordance with ethical, legislated and regulatory requirements;
- Understand the potential implications of ICT on nurse-patient and interprofessional relationships;
- Understand the importance of maintaining the therapeutic relationship when using ICT during client-family interactions; and
- Understand professional boundaries when using ICT in the provision of clinical care.

Key Concepts

In this section the following issues were discussed in relation to use of ICT to support evidence-informed management and delivery of clinical care:

Socio-cultural implications

Regulatory obligations

Ethical implications

Interpersonal impact

Personal Health Information Protection Act

Privacy

Security

Confidentiality

Suggestions for Course Integration

These concepts should be introduced in concert with course discussions that focus on ethical nursing practice, including the therapeutic relationship. Consider integration of course content related to the privacy and confidentiality obligations with clinical information and documentation. Opportunities to discuss the interpersonal and inter-professional implications of electronic communication and documentation could be provided in classroom and clinical settings.

The concepts related to the regulatory requirements and ethical use of ICT might be considered for integration into courses such as the following:

- Professional Nursing
- Nursing Ways of Knowing and Caring
- Ethical Nursing Practice

The considerations related to interpersonal and socio-cultural issues might be integrated in courses such as:

- Self and Others: Helping Relationships
- Professional Relationships

Tips & Tools

Encourage students to be knowledgeable about organizational security practices related to the use of electronic health records.

Learning Activities

- Discuss the role of nurses in supporting patients and families in the use of ICT (e.g. PHRs) and access to credible information
- Ask students to explore their online presence and representation (e.g. Facebook, Twitter, LinkedIn, personal websites, comments left on blogs).
- Discuss the dynamic personal-professional life considerations in regards to professionalism, regulatory and interpersonal considerations.
- In discussions of privacy, confidentiality and security, incorporate additional considerations on the context of using electronic health record and social networking tools.

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The integration of these concepts into entry-level curricula will provide student nurses with an opportunity to understand:

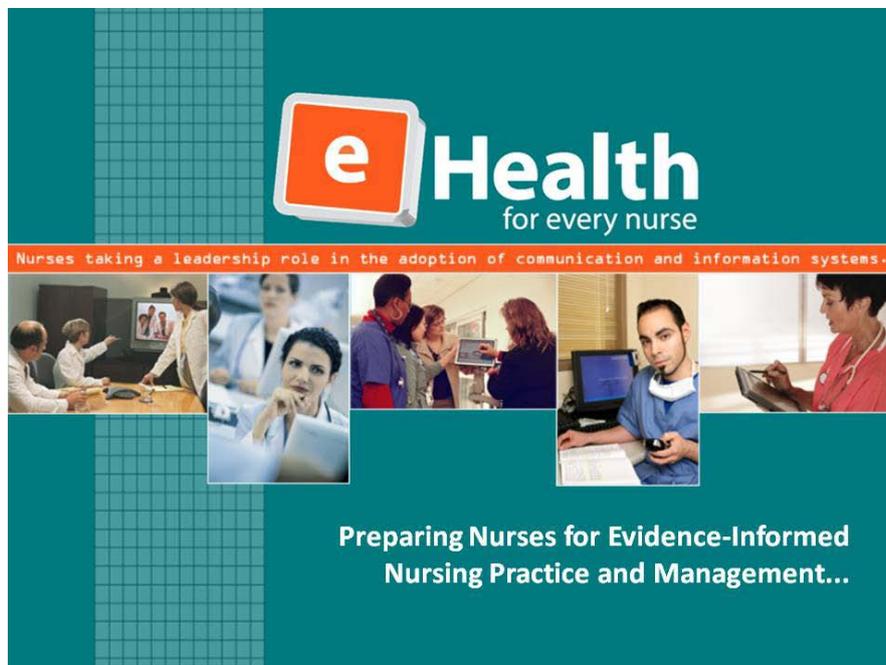
- Their accountability to use ICT in accordance with ethical, legislated and regulatory requirements;
- The potential implications of ICT on nurse-patient/client and interprofessional relationships;
- The importance of maintaining the therapeutic relationship in the context of ICT use with clients/patients; and
- The importance of maintaining professional boundaries while using ICT in the provision of clinical care.

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*“There is no aspect of our profession that will be untouched by the informatics revolution in progress.”
(Barron-McBride, TIGER, 2007, p. 6)*

Section Six Computer Literacy



The banner features a teal background with a white grid pattern on the left. The logo consists of a white square with an orange 'e' inside, followed by the word 'Health' in white and 'for every nurse' in a smaller white font below it. A thin orange horizontal bar contains the text 'Nurses taking a leadership role in the adoption of communication and information systems.' Below this bar are five small photographs: a group of people in a meeting, a woman looking at a laptop, a group of people around a tablet, a man at a computer, and a woman with a tablet. At the bottom, the text 'Preparing Nurses for Evidence-Informed Nursing Practice and Management...' is displayed in white.

eHealth
for every nurse

Nurses taking a leadership role in the adoption of communication and information systems.

Preparing Nurses for Evidence-Informed
Nursing Practice and Management...

Purpose of this Section

This section is intended to provide the user with a brief overview of computer literacy, and how it might be assessed and ensured among entry-level student nurses.

At the end of this section, the user will be able to:

- *Understand the necessity of entry-level students having basic computer literacy skills; and*
- *Recognize that computer literacy does not equate to information literacy.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Foundational Information and Communications Technologies (ICTs) Skills

Device Use:

- Demonstrates basic skills with ICTs components (e.g. features of personal computers, hand held devices, tablets, workstations, modems, Bluetooth-enabled devices, keyboarding, use of peripheral devices including printers, USB flash drives, CD-ROMs, uploading and downloading data, Online Collaborative Learning, smart phones, mouse and touchpad interchangeably, etc.)
- Uses intranet and extranet networks to navigate systems (e.g. access to shared file servers, virtual private networks, World Wide Web, cloud computing, browsers).

Application Use:

- Uses electronic communication (e.g. email to create, send, respond, attach and receive attachments)

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- Is familiar with the use of multimedia presentations (e.g. videos, podcasts, blogs, YouTube, etc.)
- Uses word processing, spreadsheets and presentation graphics (e.g. document, spreadsheet, slideshow creation, etc.)
- Navigates preliminary operating systems (e.g. Windows to manage files, determine active printers, access installed applications, create and delete files, etc.)
- Uses technology for self-directed learning
- Is familiar with social networking applications (e.g. Twitter, Facebook, LinkedIn, etc.)



6.0 Computer Literacy

Some variation still exists among schools of nursing in terms of their requirements for admission.

However, in order to be successful in today's entry-level nursing programs, students do need to be capable of

navigating computer applications and devices. Computer literacy is the set of competencies represented by being able to understand computer basics and use a variety of applications to manipulate data and create documents (Schloman, 2001).

Computer literacy is the set of competencies represented by being able to understand computer basics and use a variety of applications to manipulate data and create documents (Schloman, 2001).

The basics of computer literacy need to be evident so that students will be able to complete program requirements and adapt to computerized clinical environments. Many faculty members presume that today's generation of nursing students are very computer savvy and capable of navigating the use of computer applications and devices. While some

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students will be entering the program at an advanced level of computer use, others, in particular second level entry or mature students, may not have the same level of computing competency as their peers. Until demonstrated, basic computing literacy is an admission requirement for entry-level nursing programs, and consideration should be given to students needing assistance.

**Important to Note:
Computer literacy does not
equate to information and
knowledge management
literacy.**

While an individual may be adept in the use of computer technologies, this does not automatically make them a knowledgeable user of information. Nevertheless, having good computing skills does serve as an enabler for information management activities. In this world of rapidly evolving professional and technical knowledge, health care professionals are realizing that content mastered by graduation is soon dated. What constitutes best practice today may well be deemed substandard practice tomorrow. Continued professional competence is dependent upon knowing how to seek, evaluate and apply information and knowledge.

Assessing Computer Literacy

Students should be able to demonstrate computer literacy in the completion of course assignments by preparing and electronically submitting written work using word processing and an appropriate electronic delivery method (e.g. email, electronic drop box functionality within BlackBoard or WebCT). Faculty might consider making one or more of their course assignments require a concrete demonstration of computer literacy to assure the maintenance of these basic skills.

Entry level students should be able to demonstrate basic computer literacy in the use of:

- Word processing, spreadsheets, multimedia presentation software in course assignments and presentations;

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- Email (create, send, respond, uses attachments);
- Use of the internet (to locate, download files, articles, clinical information and evidence);
- Use of telecommunications devices (cellphones);
- Use of computing devices (laptop, notebook PC, tablet, personal digital assistant and/or smartphone);
- Use of external peripheral devices (mouse, CD/DVD, memory sticks, etc.); and
- Keyboarding skills.

Section Key Messages

Students should be able to clearly demonstrate computer literacy through their use of hardware and software devices found in the public domain.

Students requiring remedial development should be provided with guidance to seek out basic computing knowledge and skills.

Future admission requirements should consider incorporating demonstrated computer literacy skills.

Application of Section Six Content to the Curriculum

Computer Literacy

In this section, the user has been provided with an overview of the significance of computer literacy for entry-level nurses. One might assume that computer literacy is pervasive, but mature students may not have the same skill level as younger entrants. As was discussed in section Four, it is important to note that being computer-savvy does not assure good information and knowledge management capabilities.



For the near future, educators might consider the knowledge and skills related to information and communication technology use to be a requirement for admission to entry-level programs. While not necessarily a qualification for hire into nursing positions, it is a prevailing requirement that health professionals have computer proficiency in order to work in a majority of practice environments.

Student Learning Outcomes

Upon the completion of this section, educators will recognize the importance of students' ability to:

- Demonstrate an understanding of computer basics;
- Demonstrate proficiency in the use of computer technology and supporting peripheral devices (e.g. mouse, printers, bar code readers); and
- Demonstrate proficiency in the use of a variety of applications to manipulate data and create documents for course assignments and in preparation for clinical practice.

Key Concept

- ***Computer literacy***

Suggestions for Course Integration

Computer literacy is a knowledge and skill that is pervasive in supporting the delivery of nursing education in the classroom, online or in practice settings. All entry-level programs should have multiple opportunities for students to demonstrate their comfort and proficiency with computing. It is not recommended that computer literacy be a part of the curriculum; rather, that students are encouraged to seek remedial training from other educational programs (see below) as necessary. Educators may, however, encourage the use of computer applications for communication with themselves and others and in the preparation of assignments and presentations.



Learning Activities

- Use of email and online drop box for submission of assignments.
- Use of social media presentation or other office applications to support assignment preparation and delivery.
- GCFlearnfree.org online tutorials for helping students/educators understand computer and internet basics, windows, office, outlook, social media, etc. They are quite good and **most modules include lessons, interactive activities, extra tips and videos.** Check them out at:

<http://www.gcflearnfree.org/computers>

References

Schloman, B. (March, 2001). Information Resources: "Information Literacy: The Benefits of Partnership." *Online Journal of Issues in Nursing*. Available: www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/Columns/InformationResources/InformationLiteracy.aspx

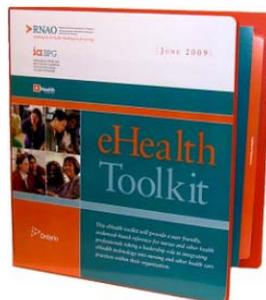
“Faculty must be skilled in various new teaching approaches, evidence-based nursing and nursing informatics as well as how to obtain and impart knowledge and processes for influencing change...” (Ehnfors & Grobe, 2004).



Section Seven

eHealth and the Nursing Profession

ONIG



 **RNAO** Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers autorisés de l'Ontario

 **eHealth**

Purpose of this Section

This section is intended to provide the user with information about nursing and other organizations, initiatives and resources related to eHealth in Ontario, as well as nationally and internationally.

At the end of this section, the user will be aware of:

- *Organizations focused on the development of eHealth knowledge among nurses in Ontario, Canada and internationally;*
- *Historical developments related to the integration of eHealth into entry-level nursing program curricula;*
- *eHealth nursing initiatives in Ontario, Canada and internationally; and*
- *eHealth nursing resources available in Ontario, Canada, and internationally.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Domain	Professional and Regulatory Accountability
Competency	Uses ICTs in accordance with professional and regulatory standards and workplace policies.
Indicators	<ul style="list-style-type: none">• Complies with legal and regulatory requirements, ethical standards, and organizational policies and procedures (e.g. protection of health information, privacy and security)• Advocates for the use of current and innovative

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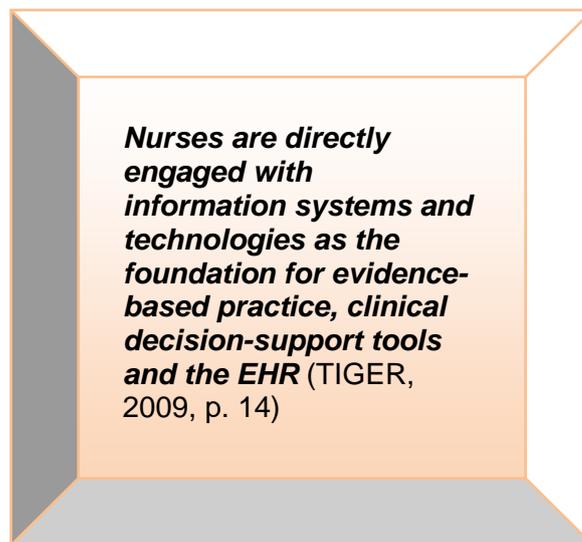
information and communication technologies that support the delivery of safe, quality care

- Identifies and reports system process and functional issues (e.g. error messages, misdirections, device malfunctions, etc.) according to organizational policies and procedures
- Maintains effective nursing practice and patient safety during any period of system unavailability by following organizational downtime and recovery policies and procedures
- Demonstrates that professional judgment must prevail in the presence of technologies designed to support clinical assessments, interventions and evaluation (e.g. monitoring devices, decision support tools, etc.)
- Recognizes the importance of nurses' involvement in the design, selection, implementation and evaluation of applications and systems in health care.

7.0 Relevant Nursing Organizations and Initiatives

The necessity of integrating informatics into basic nursing education has been identified and affirmed by numerous authors for more than 25 years. In response, there have been many efforts directed toward the integration of eHealth and informatics concepts and skills into undergraduate nursing curricula. However, the reality is that much work remains to be done as few Canadian schools of nursing have substantially addressed this need

(Nagle & Clarke, 2004). The challenge to do this work has been documented by nurse colleagues from across the globe (Androwich et al., 2008; Bond, 2009; Chang et al., 2011; Fetter, 2009; McNeil et al., 2005; Nagle & Clarke, 2004; Saranto & Tallberg, 1998; Yee, 2002). In particular, our nursing counterparts in the United States have been making significant progress over the last decade (TIGER, 2007; 2009). In Canada and Ontario, there have been some key initiatives focused on the articulation of the essential knowledge and skills that should be provided to all nurses and ideally started in the context of basic nursing education. Highlights from each of these are provided in order to further frame the evolution of this Resource to support nursing faculty in realizing the goal of eHealth curriculum integration.



7.1 Canada Health Infoway – Clinical Adoption

Since its inception, *Infoway* has recognized the importance of engaging clinicians in the work of delivering an electronic health record for all Canadians. Clinicians, including nurses, have been invited to participate in stakeholder engagement sessions, the work related to the development of standards for clinical systems, and the advancement of eHealth in the academic programs for the health professions. Specifically, *Infoway* has created opportunities for nurses to be involved

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in the leadership and development of electronic health solutions for Canada. The following describes but a few of these.

7.1.1 *Infoway* Clinician Peer Support Network

In 2007, *Infoway* established the Clinician Peer Support Network Program with the purpose to collaborate with the jurisdictions to create a strong, supported network of physician, nurses and pharmacists peer leaders across Canada to accelerate the adoption and integration of information technology into regular work processes to improve access, quality and productivity.

The pan-Canadian Clinician Peer Support Network Program provides participating jurisdictions with a defined structure, objectives and opportunities to support health providers in the engagement and use of electronic health record solutions within the practice setting.

The RNAO was the designated nursing professional channel organization to support the work of the *Infoway* peer leaders. Representing each of the 14 Local Health Integration Networks in Ontario, the nursing peer leaders were tasked to expand the access and use of the RNAO eLearning tool to a



significant number of nurses in Ontario. Through a variety of local professional networks and forums, these nurse peer leaders have advanced the eHealth awareness and knowledge of nurses provincially.

7.1.2 *Infoway* Nursing Reference Group 2010

In 2010, *Infoway* created a Nursing Reference Group with representatives from across Canada to provide strategic-level advice and input on policies, priorities and strategic plans aligned with *Infoway's* Clinical Adoption business strategy and clinical engagement, as well as to review and provide feedback on products, services and projects.

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As part of *Infoway's* clinical engagement strategy a joint initiative with the Canadian Association of Schools of Nursing (CASN) was launched in 2011. This initiative aims to support faculty and nursing students with the knowledge, tools and support they need to teach and practice in a technologically-enabled practice setting. Canada's nursing faculties and students will be involved in a three-year effort to strengthen learning on effective uses of information and communications technologies (ICT) in nursing practice.

For more information on Canada Health Infoway go to:

<http://www.infoway-inforoute.ca>

7.2 Canadian Nurses Association

7.2.1 National Nursing Informatics Project 1999

In 1998, a national working committee was constituted from a number of nursing stakeholder groups. The mandate of this group was to identify issues related to nursing informatics in Canada (Hebert, 2000). The project team released a discussion paper specifically addressing key nursing informatics education and practice issues. The project was grounded in an assumption that the evolving nature of Canadian health care necessitates the integration of nursing informatics into nursing practice, education, research and administration as quickly as possible. Moreover, because of the limited informatics expertise in nursing, educational strategies need to be addressed at both the entry- and expert-level throughout the country. This paper was widely disseminated to nursing schools and employers for feedback. The limited response to this document was most telling as few from the target audience responded with any commentary.

The overall goal of this project was to propose a strategy for addressing nursing informatics education in Canada and included the following:

- Establish a national definition of nursing informatics;
- Propose core competencies for Canadian nurses;
- Identify nursing informatics education opportunities currently available to Canadian nurses; and

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- Determine nursing informatics education priorities.

The results of this working committee was the first formal dialogue on the issue of nursing practice and education and the need to begin to develop specific knowledge and skills in the use of ICT.

7.2.2 eNursing Strategy

The Canadian Nurses Association (CNA) has taken a leadership role in the development of an eHealth strategy for nursing in Canada. CNA supports, that as knowledge workers in the technological age, nurses need to access current information about their patients and that ICT initiatives are integral to nursing practice. The purpose of the e-Nursing strategy^{*} is to guide the development of ICT initiatives to support nursing practice and improve client outcomes (CNA, 2006a). The strategy is intended to:

- Consider nurses in all domains of practice – clinical practice, education, research, administration and policy;
- Identify what nurses need, take advantage of existing quality products and programs, and reduce duplication of effort; and
- Benefit individual nurses and their clients, employers, nursing professional and regulatory organizations and the nursing profession as a whole, nationally and around the world.

Overall, the e-Nursing strategy is focused on ensuring that nurses have access to ICT technologies; that nurses are competent in their use of ICT technologies; and that nurses play an increased role in the development of ICT solutions.

^{*} Note: The e-Nursing strategy can be downloaded from: <http://www.cna-aiic.ca>

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7.2.3 NurseONE

CNA has developed a nursing portal to support the ongoing competence and professional development of nursing in Canada – NurseONE. This portal is a personalized interactive web-based resource developed to provide nurses and nursing students with a reliable one-stop information source for all their professional needs. NurseONE supports nursing practice through enhancing their evidence-based decision-making process, managing their careers and connecting with colleagues and health-care experts. NurseONE allows nurses and nursing students across Canada access to up-to-date, accurate information relevant to their practice.



To register or access NurseONE go to: <http://www.nurseone.ca>

7.2.4 Relevant Position Statements

CNA believes that information management and communications technology are integral to nursing practice.
(CNA, 2006)

Over the last two decades the CNA has released position statements* on some of the key areas of focus for nurses in eHealth. Among these is an endorsement of the adoption of the *International Classification of Nursing Practice for Canada* (CNA, 2003). Related to this endorsement was the release of a publication supporting the framework of the *Health Information: Nursing Components* (HI:NC) work (CNA, 2000) (see Section Four for more details). The CNA also released a statement regarding the evolution of nurses' work in telehealth (CNA, 2007). In recent years, the CNA revised an earlier position statement to reflect the current thinking about the importance of information and knowledge management in nursing (CNA, 2006b). Each of these documents

* Note: Each of these position statements can be downloaded at: <http://www.cna-aiic.ca>

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remains relevant to the work of nurses and are significant to nurses involvement with eHealth initiatives.

7.3 Canadian Nursing Informatics Association

The Canadian Nursing Informatics Association (CNIA) was established in 2002 and is an affiliate group of the CNA. The CNIA's mission is to provide a voice for Canadian nurses on issues of health and nursing informatics. The intent of the CNIA is to engage nurses in all sectors and in all roles related to informatics practice, administration, education or research. The CNIA membership is primarily registered nurses, but is also open to vendor and non-nurse participation. The board of directors comprises nursing informatics leaders that represent each provincial and territorial region. The CNIA has leveraged its position and formalized linkages with regional nursing informatics interest groups previously in existence and is working to support the emergence of new regional groups. The CNIA seeks to:

- To provide nursing leadership for the development of nursing/health informatics in Canada.
- To establish national networking opportunities for nurse informaticians.
- To facilitate informatics educational opportunities for all nurses in Canada.
- To engage in international nursing informatics initiatives.
- To act as a nursing advisory group in matters of nursing and health informatics.
- To expand awareness of Nursing Informatics to all nurses and the health-care community.



For more information go to: <http://www.cnia.ca>

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7.3.1 CNIA School of Nursing Study

Educating tomorrow's nurses – where's nursing informatics?

In 2002, the CNIA secured Health Canada funding to conduct a study of schools of nursing across Canada. The study objectives were focused on assessing the state of informatics integration within nursing curricula. The overall goal of the national study was to promote the development of nursing informatics (NI) competencies required now and in the future for clinical nursing practice and education. The national study aimed to describe the current situation of undergraduate NI education in Canada. Specifically, it sought to assess and describe:

- The NI education opportunities currently available to undergraduate students in schools of nursing across the country;
- The level of preparedness and expertise of nursing faculty to provide necessary education opportunities in NI for undergraduate nursing students;
- The ICT infrastructure and support for providing the education opportunities; and
- Opportunities and needs, including policy, for enhancing nursing curricula, faculty preparedness and ICT infrastructure and support in Canadian schools of nursing.

“There is a danger of practice outpacing academia as ICT and Clinical Information Systems (CIS) become commonplace in health-care settings” (CNIA, 2002).

The national study used survey questionnaire methods and referent group discussions. The findings from the survey questionnaires, referent group discussions and other feedback corroborated those of several recent Canadian and American studies examining similar issues.

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School ICT Access

- Universal access to the internet, e-mail, library, software programs and computers ~100% for faculty; less to students (~20% less).
- Universal access to research data-bases is available to faculty in ~75% of the schools; less so for students.
- Appropriate ICT in the classrooms is inadequate.

Clinical ICT Access

- Faculty has more access to clinical institution ICT than students. A desirable level of access is available in less than 1/3 of schools.
- There is greatest access to the library (68% faculty; 43% students) and least to clinical information systems (22% faculty; 14% students).
- There is little connectivity between educational and clinical services settings except for e-mail.
- Students' greatest access to clinical applications is in acute care settings and least in home care. Their access is increased if working as RN or with an RN.
- Faculty note: access to clinical ICT systems is important, but the systems have been underdeveloped and their access guarded.

Educational Applications of ICT

- WEB-CT or other distance ICT applications are used in approximately 75% of the schools.
- There is variability in use of educational ICT, primarily due to limited school resources.

Education Opportunities – ICT and Nursing

- More educational opportunities are available to faculty than to students, except computer labs that are more available to students.
- Basic computer education is more available than use of computers in nursing.
- Less than 1/3 of schools offer NI credit courses.

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Other reported findings focused on issues of human resources, organizational culture and expectations of ICT integration, curriculum characteristics and objectives, and faculty attitudes, knowledge and competencies. Overall, the findings from the survey questionnaires, referent group discussions and other feedback corroborated those of several recent Canadian and American studies examining similar issues.

Of particular relevance to the use of this resource are the following conclusions:

1. The link between NI and evidence-based practice needs to be made and valued.
2. There is a need to have concurrent education and capacity building of educators, clinicians and students.
3. There is a danger of practice outpacing academia as ICT and CIS become commonplace in health-care settings.
4. There is a need to identify where nursing informatics is in the curriculum, identify core objective, competencies and outcomes.
5. There is a lack of supportive infrastructure (human, material and financial) in both educational and clinical settings – for faculty, staff and students.
6. Partnerships are needed within and across settings and with the private sector.

Additional details of this study have been reported elsewhere (CNIA, 2003; Nagle & Clarke, 2004).

7.4 Registered Nurses' Association of Ontario

The Registered Nurses' Association of Ontario (RNAO) has been actively supporting the development of NI by their ongoing recognition and support for the Ontario Nursing Informatics Group (ONIG). In recent years, the RNAO has actively sought provincial funding to further advance the involvement and knowledge of nurses in the area of eHealth. The development of this resource is the most recent manifestation of that support. Other eHealth-related initiatives and resources are described in the remainder of this section.

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7.4.1 Ontario Nursing Informatics Group

Established more than 30 years ago, ONIG achieved RNAO status as an affiliate group in 1991. ONIG's purpose is to provide a forum for nursing professionals to communicate and disseminate current developments in health-care information systems.



ONIG Vision

Nursing Informatics is a recognized specialty within the discipline of nursing in the Province of Ontario. ONIG promotes the awareness and value of nursing's contribution to quality health care through health data, information and knowledge management enabled by the use of technology.

Through a variety of activities, ONIG has been purposeful in advancing the knowledge and work of nurses in Ontario in the area of health informatics. Education and visible leadership have been at the forefront of those activities.

For more information about ONIG go to:

<http://www.onig.on.ca>

7.4.2 RNAO Curriculum Task Force (2001)

In the spring of 2000, the RNAO requested that ONIG establish a task force to address the need for informatics content in basic nursing curricula. The mandate for the working group was specifically derived from recommendations in *Ensuring the Care Will Be There: Report on Nursing Recruitment and Retention in Ontario*, a report submitted to the Ontario Ministry of Health and Long-Term Care (RNAO, April, 2000). Prepared by the RNAO in collaboration with Registered Practical Nurses Association of Ontario (RPNAO), recruitment and retention recommendations were based upon consultations with nurse stakeholders throughout the province of Ontario. The four key findings that influence recruitment and retention of nursing in Ontario are: 1) the

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policy context, 2) the work environment, 3) the labour market, and 4) the educational environment.

Recommendation Six of the report addressed the educational environment and formed the context for the work of the ONIG curriculum task force. “Delivering increasingly complex care requires more sophisticated knowledge and skills, and the educational environment should respond to these challenges. We need to address long-standing issues related to entry-level and ongoing nursing education that are essential to attract and retain nurses within the system” (RNAO, 2000, p.7). The report specifically recommended the promotion of lifelong learning and improved access to educational programs as an important aspect of successful nursing recruitment and retention in Ontario. Furthermore, nursing education needs to keep pace with practice settings and continuously integrate changes in society and practice settings, shifting health care needs and the evolution of new knowledge. In sum, the incorporation of new content into basic nursing curricula will be essential to meet population needs including: 1) healthy aging, 2) cultural diversity and its impact on health provision, 3) primary health care, **and 4) *information technology and information management.***

The ONIG report specifically addressed the content required to support information technology and information management. The report of this task force provided direction for the content and skills focus within basic nursing education. Recommendations for specific “informatics” competencies were organized to address the following: 1) Basic concepts of informatics, 2) Social, ethical, human issues, 3) Information systems, 4) Communication tools, 5) Research tools, and 6) Decision support systems. In addition, the task force examined the existing and potential challenges that needed to be addressed in order to advance this work. Recommendations for next steps were provided to the RNAO executive for their consideration.

7.4.3 RNAO eHealth Champions

In 2006, the RNAO launched an initiative to create a network of nurse champions to advance eHealth knowledge within the Ontario nursing community. These nurses have participated in workshops focused on

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Level 1 and Level 2 eHealth knowledge development. Led by nurse informaticians from throughout the province, these workshops have hosted in person sessions and webinars featuring speakers discussing a range of eHealth-related topics. To date, more than 1000 Ontario nurses have participated in the Level 1 workshops and many have also completed the Level 2 eHealth champions workshop.

7.4.4 RNAO eHealth Education Program eLearning Modules

With the guidance of an eHealth Advisory Committee, the RNAO secured funding for the development on an online eHealth learning program. This modular learning tool is designed to provide eHealth basics to nurses.



“The eHealth course was helpful to understand why NI is being integrated into the curriculum” (4th year student nurse).

To date, more than 12,000 nurses have completed the eHealth program and received a certificate of completion in return for same. Since the initial launch, the modules have been updated and expanded. This learning tool is free to all nurses and has been used by some nurse educators as a source of eHealth foundation knowledge for their students.

Overarching Goal of the RNAO eHealth Course

To provide a foundational program for nurses related to eHealth to support the nursing role and quality client care.

Description

The course is a self-directed presentation that allows you to work at your own pace. Throughout the course there are (optional) self-evaluation components that will allow for personal reflection and the identification of strengths and weaknesses.

Also, upon completion of the self-evaluation, you will be presented with a certificate of completion that can be used as evidence in your College of Nurses of Ontario reflective practice requirements.



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The eHealth learning modules include content in the following key areas:

- Nursing, quality health care and eHealth;
- Computers and information processing;
- Electronic health record, information and communication;
- Ontario eHealth initiatives;
- Professional issues for nurses;
- eHealth and the nursing role;
- Consumer eHealth;
- Nurses, nursing students and social media in health care;
- Professional development, knowledge management, and eHealth;
and
- Nursing and health care strengthened through eHealth.

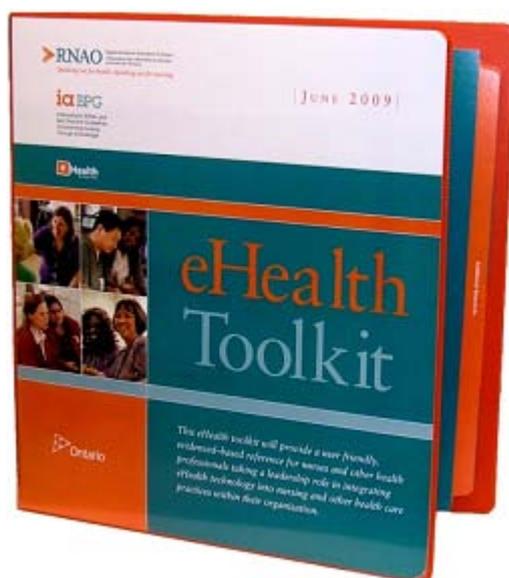
It is suggested that faculty use this rich source of additional content as a complement to this resource. This resource is not intended to replicate the content available to the users of these eHealth Learning modules. Moreover, ***faculty may find that completion of these modules will serve to enrich their own knowledge of eHealth*** and provide a solid foundation for effective integration of eHealth knowledge and skills into course content and assignments.

To access the eHealth Learning modules go to: <http://elearning.rnao.ca/>

7.4.5 RNAO Nursing eHealth Toolkit

In response to the wide-scale organizational change associated with the implementation of clinical information systems, RNAO led the development of an Nurse eHealth Toolkit to guide nurses leading and/or involved with the deployment of ICT in health-care organizations. The Nurse eHealth Toolkit provides a user-friendly, evidenced-based reference for nurses and other health professionals taking a leadership role in integrating eHealth technology into nursing and other health-care practices within their organization.

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The Toolkit contains eight chapters related to planning and implementing eHealth innovation. Included throughout the Toolkit are case studies, exemplars, pictures, diagrams, quotes and other resources designed to assist nurses and others with effective eHealth adoption strategies. The Toolkit is based on a vision of clinical excellence through eHealth and the importance of people and change management in successful eHealth innovation.

- Chapter 1: Introduction to the eHealth Toolkit
- Chapter 2: Nursing and eHealth
- Chapter 3: People and the Organization
- Chapter 4: Organizational Building Blocks for eHealth: Project Management
- Chapter 5: Organizational Building Blocks for eHealth: Change Management
- Chapter 6: The Innovation (eHealth)
- Chapter 7: The People, the Organization and the Innovation
- Chapter 8: Evaluation Strategies

This resource may also provide some useful insights, particularly related to change management, for faculty attempting the introduction of eHealth related changes to the entry-level curriculum.

To access the eHealth Toolkit go to: www.ehealthtoolkit.rnao.ca

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7.4.6 RNAO Nursing and Mobile Technology Online Learning Modules

Another free eHealth online learning tool has been developed by the RNAO with a focus on nurses' use of mobile technologies.

This course has been designed to:

- Provide an engaging, practical, "hands-on" curriculum for nurses to develop confidence in the use of mobile technology;
- Demonstrate the value and effectiveness of integrating mobile technology into nurses' daily routine, in various practice settings; and
- Demonstrate ways to use mobile technology to facilitate patient / client-centered learning.

The screenshot shows the RNAO eLearning website for the 'Nursing & Mobile Technology: eHealth at the Point of Care' course. The header includes the RNAO logo and the course title. A navigation bar contains links for Home, Module 1, Module 2, and Module 3. The main content area features the heading 'This course is comprised of three modules:' and three module cards. Each card includes a title, a brief description, and a 'Start Now!' button.

Module	Title	Description
Module 1	Nursing & Mobile Technology Basics	This module describes why mobile technology is important for nurses. It also covers the basic functionality of the Blackberry, iPhone, Tablet PC and Windows Mobile Classic (formerly called the Pocket PC).
Module 2	Integrating Mobile Technology in Nursing	This module reviews strategies to incorporate mobile technology in various health care sectors.
Module 3	Mobile Technology & Client Education	This module highlights innovative ways that nurses can use mobile technology to enhance client education.

To access these RNAO programs go to: <http://elearning.rnao.ca/>

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7.4.7 Personal Digital Assistants and RNAO Best Practice Guidelines

The Personal Digital Assistant (PDA) Initiative was an innovative project promoting the use of mobile technology at the point-of-care.

This initiative was funded by the Ontario Ministry of Health and Long-Term Care (MOHLTC) and designed to optimize front-line nurses' ability to access and integrate current evidence into their practice and build upon the government's commitment to improve the quality and safety of client/patient care.

Through the project, RNAO developed its entire clinical and Healthy Work Environment (HWE) Best Practice Guidelines (BPGs) into condensed versions suitable for use with PDAs. The project involved more than 1500 nurses in various health-care facilities province-wide and had the following objectives:

- Support the implementation of evidence-based practice;
- Improve nurses' use of research in practice;
- Improve patient outcomes; and
- Enhance nurses' quality of work-life.

To access the condensed PDA versions go to: <http://pda.rnao.ca/>

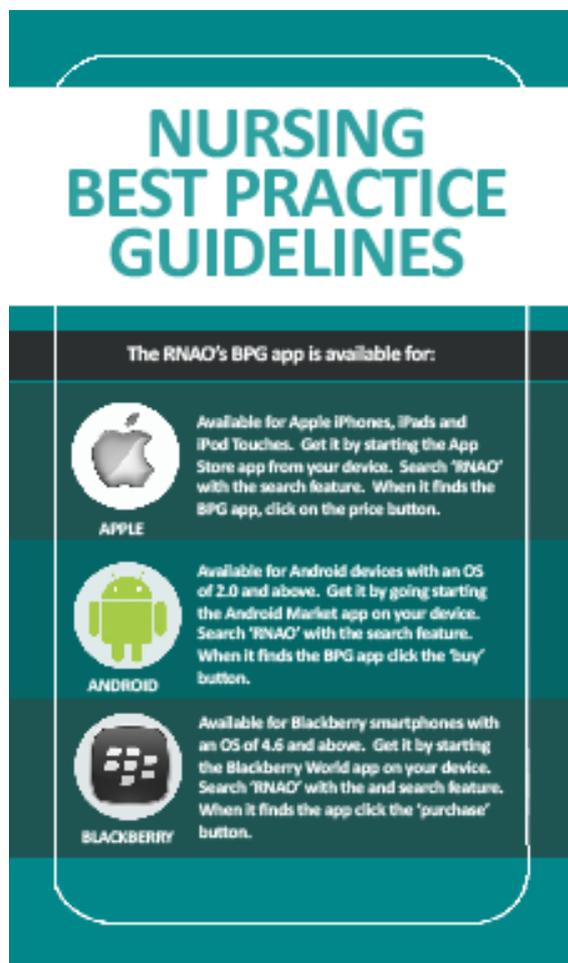
The project, advanced nurses' use of eHealth at the point of care, as well as demonstrated the powerful impact of having best evidence in the form of BPGs and other sources of information at point of care. An evaluation of this initiative is now available to the public. To get a copy please visit the MOHLTC Nursing Secretariat's website at:



http://www.health.gov.on.ca/english/providers/program/nursing_sec/nursing_sec_mn.html



7.4.8 RNAO BPG APP



Following the first year of the PDA initiative, RNAO reformatted the condensed information related to the clinical and HWE BPGs based on input from the PDA project participants provided through a formal focus group evaluation. Currently, the BPGs now available for PDA use include a search function, as well as a more intuitive approach to categorizing the data for point of care use, focusing on practice recommendations, BPG implementation tools, and relevant evidence-based teaching resources. The HWE BPGs have a comparable user-friendly format.

RNAO has since developed a BPG APP that includes all clinical and HWE BPGs and is available for APPLE, Android and Blackberry devices.

To date, over 15,000 BPG users, including nursing students, have purchased the APP from all around the world.

All RNAO BPGs are now developed with a condensed version that is incorporated into the PDA versions and the BPG APP as an update.

7.5 Other Relevant Initiatives

7.5.1 Technology Informatics Guiding Educational Reform

Overall, there have been a number of efforts directed to the engagement of nurses in the eHealth agenda. The nursing profession is a key

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stakeholder in eHealth initiatives and nurses must be knowledgeable about the unfolding initiatives that will impact their work in every clinical setting. In the United States, significant resources have been directed to support the development of nurses' eHealth knowledge and the integration of relevant content into entry-level nursing programs. Specifically, the Technology Informatics Guiding Educational Reform (TIGER) initiative is being advanced largely through voluntary efforts of nurses from throughout the U.S. The work of TIGER has focused on raising awareness with nursing stakeholders in three areas:

1. Develop a U.S. nursing workforce capable of using electronic health records to improve the delivery of health care.

2. Engage more nurses in the development of a national health care information technology (NHIT) infrastructure.

3. Accelerate adoption of smart, standards-based, interoperable technology that will make health care delivery safer, more efficient, timely, accessible and patient-centered (TIGER, 2009). Faculty may find the documentation related to TIGER useful (TIGER 2007; 2009); additional details of this initiative are provided in Section Eleven of this Resource.

7.5.2 Health IT Workforce Curriculum Components

In April 2010, the U.S. Office of the National Coordinator for Health Information Technology (ONC) extended grants to five post-secondary institutions of higher education (Columbia University, Duke University, Johns Hopkins University, Oregon Health & Science University, University of Alabama at Birmingham) with the goal of developing curriculum and instructional materials to enhance health IT workforce training programs primarily at the community college level. The Curriculum Development Centers Program arose from these investments, providing funding to support health information technology curriculum development. The content developed through this program was launched and made widely available in July 2011. This material is extremely extensive, including seminar presentations, references, instructor transcripts, notes and manuals, audio files, self-assessments and quizzes. While very focused on the American health system and providing much more depth and breadth than would be needed by entry-

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level nurses, it does provide another source of useful materials. The site is accessible to educators and materials can be downloaded at no cost. The materials are still under evaluation with a particular focus on usability.

To access these materials go to: <http://onc-ntdc.info/home>

Section Key Messages

Canadian and Ontario nurses have been involved in eHealth-related initiatives for several years.

Much foundational development work has been completed to support nurses in the integration of eHealth.

There are several key resources available to nurses in practice and education to advance their knowledge and skills in eHealth.

RNAO is an excellent source of eHealth-related resources, all of which are freely accessible online.

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Application of Section Seven Content to the Curriculum

eHealth and the Nursing Profession

This section has provided an overview of a number of relevant nursing organizations and eHealth developments in support of nurses. Much of this material is intended to provide the educator with some background context of the work already done to advance and support the eHealth awareness and education of nurses.

Student Learning Outcomes

Upon the completion of this section, educators will be able to provide students with an introduction to key resources such that they will be able to:

- Demonstrate knowledge of the CNA position statement on information and knowledge management for nurses;
- Demonstrate awareness of the CNA eNursing Strategy;
- Demonstrate use of NurseONE in support of course assignments and preparation for clinical practice; and
- Complete the RNAO eHealth e-learning modules

Key Concepts

From this section, educators may want to explain and discuss the eHealth resources available for use by all nurses:

- **CNA e-Nursing Strategy**
- **CNA position statements related to eHealth**
- **NurseONE**
- **RNAO eHealth resources**

Suggestions for Course Integration

An introduction to the relevant nursing organizations and eHealth initiatives might best fit with a course focused on professional issues in nursing. For example:

- History of Nursing Ideas
- Current Issues in Clinical Practice
- Health Informatics

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- Professional Issues

Learning Activities

- Encourage students to register for the use of NurseONE to support the completion of assignments and clinical preparation.
- Make the completion of the online RNAO eHealth program a course requirement.
- Make the completion of the online RNAO Nursing and Mobile Technology program a course requirement.
Go to: http://www.rnao.org/eHealth_Course
- Encourage access to available resources for the completion of course assignments (e.g. NurseONE).
Go to: <http://www.nurseone.ca>
- Include exam questions regarding the CNA position statement on Information and Knowledge Management.
Access at: <http://www.cna-aiic.ca/CNA/documents/pdf/publications/PS87-Nursing-info-knowledge-e.pdf>

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“We must teach for the future. This means teaching to find rather than to know, to question rather than answer, to achieve rather than accomplish, and inspire rather than inform.”

(Brennan, 2006, p. 17)

Section Eight

Tools to Support Curricular Integration



Purpose of this Section

This section is intended to support the user to gain awareness of key assessment processes, tools and other resources that will assist in integrating eHealth into the nursing undergraduate curriculum.

At the end of this section, the user will be able to:

- *Develop a personal learning plan for the advancement of their eHealth knowledge and skills;*
- *Ascertain the extent to which eHealth knowledge and skills are currently integrated into the curriculum;*
- *Describe key eHealth resources to support personal development and guide curriculum revision; and*
- *Identify how a curricular mapping template may assist in integrating eHealth into the nursing curriculum.*

This section is aligned with the following entry-to-practice nursing informatics competency for registered nurses (CASN, 2012):

Overarching competency: uses information and communication technologies to support information synthesis in accordance with professional and regulatory standards in the delivery of patient/client care.

8.0 Assessment Tools

These tools are designed to support:

- An assessment of your existing curriculum in order to determine whether there is already content addressing the eHealth knowledge and skills discussed in this resource; and
- An educator self-assessment of your specific learning needs in each of the content areas.

These tools might be most useful if distributed to educators for assessment of individual courses.

Please note these assessment tools have no demonstrated psychometric properties and are only intended to facilitate the evaluation of one's knowledge of eHealth and current curriculum course offerings.

In support of content integration or self-study, educators may also wish to take advantage of eHealth learning resources as summarized in this section 8.4 and discussed in detail in Section Seven.

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8.1 Curriculum Assessment

Evaluate your curriculum for the integration of knowledge and skills related to the use of information and communication technologies (ICT) in nursing education and practice.

Assess your current/planned curriculum within the following domains:

Basic ICT Literacy

Indicate which of the following applications and tools students are currently using to support their learning:
(classroom, assignments or clinical practice)

	YES	PLANNED
Word processing (e.g. MS Word)	<input type="checkbox"/>	<input type="checkbox"/>
Spreadsheets (e.g. Excel)	<input type="checkbox"/>	<input type="checkbox"/>
Database Management (e.g. MS Access)	<input type="checkbox"/>	<input type="checkbox"/>
Presentation Software (e.g. PowerPoint)	<input type="checkbox"/>	<input type="checkbox"/>
Communication Tools (e.g. email, text messaging)	<input type="checkbox"/>	<input type="checkbox"/>
Learning Management Tools (e.g. Blackboard, WebCT)	<input type="checkbox"/>	<input type="checkbox"/>
World Wide Web – Internet	<input type="checkbox"/>	<input type="checkbox"/>
Social Networking Tools (e.g. wikis, blogs, podcasts)	<input type="checkbox"/>	<input type="checkbox"/>
Telecommunications Devices (e.g. PDAs, smartphones)	<input type="checkbox"/>	<input type="checkbox"/>
Use of External Peripheral Devices (e.g. printers, faxes, barcode readers)	<input type="checkbox"/>	<input type="checkbox"/>
Online courses	<input type="checkbox"/>	<input type="checkbox"/>
e-References for PDA (e.g. BPGs, eCPS, eProCates, PEPID)	<input type="checkbox"/>	<input type="checkbox"/>
e-Textbooks	<input type="checkbox"/>	<input type="checkbox"/>
e-Learning modules (e.g. RNAO eHealth)	<input type="checkbox"/>	<input type="checkbox"/>
Simulation Lab use of Electronic Health Record	<input type="checkbox"/>	<input type="checkbox"/>

Notes/Action Plan:

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Assess your current/planned curriculum within the following domains:

Basic eHealth Concepts and Skills

	YES	Course Name(s) (e.g. NUR371)	PLANNED	Course Name(s)
Provides opportunities to understand the elements of data, information and knowledge and the ICT applications that support their use in practice settings.	<input type="checkbox"/>		<input type="checkbox"/>	
Provides opportunities to develop proficiency in the use of ICT for assessment, planning, documentation and evaluation in practice settings.	<input type="checkbox"/>		<input type="checkbox"/>	
Provides knowledge as to the significance of clinical data standards in the use of ICT in health care. (e.g. ICNP, HOBIC, SNOMED-CT)	<input type="checkbox"/>		<input type="checkbox"/>	
Provides experience in the use of ICT to access and exchange information and knowledge within practice settings. (e.g. electronic health records)	<input type="checkbox"/>		<input type="checkbox"/>	
Defines/discusses concepts of eHealth and informatics as they relate to nursing practice.	<input type="checkbox"/>		<input type="checkbox"/>	

Information and Communication Technologies

	YES	Course Name(s) (e.g. NUR371)	PLANNED	Course Name(s)
Discusses/demonstrates the use of ICT to enhance safer care delivery.	<input type="checkbox"/>		<input type="checkbox"/>	
Discusses/demonstrates the use of ICT to enhance quality improvement in practice settings.				

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	YES	Course Name(s) (e.g. NUR371)	PLANNED	Course Name(s)
Communication	<input type="checkbox"/>		<input type="checkbox"/>	
Care co-ordination	<input type="checkbox"/>		<input type="checkbox"/>	
Nurse-client relationship	<input type="checkbox"/>		<input type="checkbox"/>	
Discusses/demonstrates how ICT can be used to foster/support:				
Clinical judgment	<input type="checkbox"/>		<input type="checkbox"/>	
Knowledge acquisition	<input type="checkbox"/>		<input type="checkbox"/>	
Evidence-informed practice	<input type="checkbox"/>		<input type="checkbox"/>	
Client education	<input type="checkbox"/>		<input type="checkbox"/>	
Discusses/demonstrates how ICT can be used to identify and respond to client outcomes:				
Results reviews	<input type="checkbox"/>		<input type="checkbox"/>	
Report generation	<input type="checkbox"/>		<input type="checkbox"/>	
Inform and evaluate	<input type="checkbox"/>		<input type="checkbox"/>	
Communicate	<input type="checkbox"/>		<input type="checkbox"/>	
Care co-ordination	<input type="checkbox"/>		<input type="checkbox"/>	
Discusses ICT use in different practice settings (e.g. acute, home, public, primary, school)	<input type="checkbox"/>		<input type="checkbox"/>	

Information and Knowledge Management

	YES	Course Name(s) (e.g. NUR371)	PLANNED	Course Name(s)
Discusses the use of decision support tools in practice settings.	<input type="checkbox"/>		<input type="checkbox"/>	
Demonstrates the use of ICT to support clinical decision-making.	<input type="checkbox"/>		<input type="checkbox"/>	
Defines and discusses consumer health informatics.	<input type="checkbox"/>		<input type="checkbox"/>	
Discusses approaches to identify credible sources of information online.	<input type="checkbox"/>		<input type="checkbox"/>	
Demonstrates applications of	<input type="checkbox"/>		<input type="checkbox"/>	

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	YES	Course Name(s) (e.g. NUR371)	PLANNED	Course Name(s)
social networking tools to teaching and student learning.				
Integrates ICT with clinical simulation applications for teaching and learning.	<input type="checkbox"/>		<input type="checkbox"/>	

Socio-Cultural, Regulatory, Ethical and Interpersonal Implications of ICT in Clinical Practice

	YES	Course Name(s) (e.g. NUR371)	PLANNED	Course Name(s)
Provides knowledge about the implications of ICT:				
Socio-cultural	<input type="checkbox"/>		<input type="checkbox"/>	
Regulatory	<input type="checkbox"/>		<input type="checkbox"/>	
Ethical	<input type="checkbox"/>		<input type="checkbox"/>	
Interpersonal	<input type="checkbox"/>		<input type="checkbox"/>	
Provides knowledge of the CNO <i>Standards of Practice</i> related to the use of ICT.	<input type="checkbox"/>		<input type="checkbox"/>	
Provides knowledge of Ontario privacy legislation related to the protection of personal health information as it relates to the use of ICT.	<input type="checkbox"/>		<input type="checkbox"/>	
Discusses the implications of ICT use on nurse-client and Interprofessional relationships.	<input type="checkbox"/>		<input type="checkbox"/>	

Recommendations – Action Plan for Integration

8.2 Educator Self-Assessment

Evaluate your own knowledge and skills related to eHealth and informatics related to the use of information and communications technology (ICT) in nursing education and practice.

Basic ICT Literacy

Rate your proficiency in the use of:	Beginner					Advanced
	1	2	3	4	5	
Word Processing	<input type="checkbox"/>					
Spreadsheets	<input type="checkbox"/>					
Database Management	<input type="checkbox"/>					
Presentation Software	<input type="checkbox"/>					
Communication Tools (e.g. email, text messaging)	<input type="checkbox"/>					
Learning Management Tools (e.g. Blackboard, WebCT)	<input type="checkbox"/>					
World Wide Web	<input type="checkbox"/>					
Social Networking Tools (e.g. wikis, blogs, podcasts)	<input type="checkbox"/>					
Telecommunications Devices (e.g. PDAs, smartphones)	<input type="checkbox"/>					
Use of External Peripheral Devices (e.g. printers, faxes, barcode readers)	<input type="checkbox"/>					

Score:

- 1-20 Novice**
- 21-40 Intermediate**
- 41-50 Advanced User**

Novice – Little to no experience in the use of these applications and/or technologies; prioritize needs and develop learning plan.

Intermediate – Moderate level of proficiency; identify specific areas for further development.

Advanced User – Very proficient in the use of the specific applications or technologies

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Assess your knowledge and skills within the following domains:

Basic eHealth Concepts and Skills					
	None				A Lot
	1	2	3	4	5
Have an understanding of the elements of data, information and knowledge, and the ICT applications that support their use in practice settings	<input type="checkbox"/>				
Am proficient in the use of ICT for assessment, planning, documentation and evaluation in practice settings.	<input type="checkbox"/>				
Have an understanding of the significance of clinical data standards in the use of ICT in health care. (e.g. ICNP, HOBIC, SNOMED-CT)	<input type="checkbox"/>				
Have experience in the use of ICT to access and exchange information and knowledge within practice settings. (e.g. electronic health records)	<input type="checkbox"/>				
Have already integrated eHealth concepts into my existing courses.	<input type="checkbox"/>				

Information and Communication Technologies					
	None				A Lot
	1	2	3	4	5
Understand the use of ICT to enhance safer care delivery.	<input type="checkbox"/>				
Understand the use of ICT to enhance quality improvement in practice settings.					
Communication	<input type="checkbox"/>				
Care co-ordination	<input type="checkbox"/>				
Nurse-client relationship	<input type="checkbox"/>				
Understand how ICT can be used to foster/support:					
Results reviews	<input type="checkbox"/>				
Report generation	<input type="checkbox"/>				
Inform and evaluate	<input type="checkbox"/>				
Communicate	<input type="checkbox"/>				

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Information and Communication Technologies					
	None				A Lot
	1	2	3	4	5
Care co-ordination	<input type="checkbox"/>				
Understand ICT use in different practice settings (e.g. acute, home, public, primary, school)	<input type="checkbox"/>				

Information and Knowledge Management					
	None				A Lot
	1	2	3	4	5
Understand the use of decision support tools in practice settings.	<input type="checkbox"/>				
Understand the use of ICT to support clinical decision-making.	<input type="checkbox"/>				
Understand consumer health informatics.	<input type="checkbox"/>				
Recognize credible sources of information online.	<input type="checkbox"/>				

Socio-Cultural, Regulatory, Ethical and Interpersonal Implications of ICT in practice settings					
	None				A Lot
	1	2	3	4	5
Have knowledge of the implications of ICT:					
Socio-Cultural	<input type="checkbox"/>				
Regulatory	<input type="checkbox"/>				
Ethical	<input type="checkbox"/>				
Interpersonal	<input type="checkbox"/>				
Have knowledge of the CNO <i>Standards of Practice</i> related to the use of ICT.	<input type="checkbox"/>				
Have knowledge of Ontario privacy legislation related to the protection of personal health information as it relates to the use of ICT.	<input type="checkbox"/>				
Recognize the implications of ICT use on nurse-client and Interprofessional relationships.	<input type="checkbox"/>				

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Scoring

1. Basic eHealth Concepts and Skills	/25
2. Information and Communication Technologies	/70
3. Information and Knowledge Management	/20
4. Socio-Cultural, Regulatory, Ethical and Interpersonal Implications of ICT in practice Settings	/35
TOTAL	/150

0-50 – Need a lot of knowledge development. Recommend self-study, beginning with RNAO eHealth online modules. Develop personal learning plan focused on key knowledge domains.

51-100 – Need some knowledge development. Recommend self-study focused on knowledge gaps.

101-150 – Good knowledge base; maintain and advance knowledge. When able, provide support to other educators.

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8.3 Sample Mapping of eHealth Concepts and Skills into the Curriculum

This template can be used to review courses to determine curricular content using the content in the Nurse Educator Resource as a framework, and key nursing content themes in undergraduate curricula. It is meant as a guide, and can be altered to incorporate the actual course titles from your curriculum.

Course Number	NURXXX		NURXXX		NURXXX		NURXXX		NURXXX	
Course Title (Examples)	Intro to Professional Nursing		Clinical Judgment & Health Assessment		Nursing Care of Adults		Management & Leadership		Clinical Practicum Community Nursing	
Concepts/Skills	Current	Future	Current	Future	Current	Future	Current	Future	Current	Future
Information and Communication Technologies (ICTs)										
• EHR, EMR, PHR										
• COW, WOW										
• Laptops, Tablets, Smartphones										
Clinical Information Systems										
• Order Entry										
• Clinical Documentation										
• eMAR										
Clinical Decision Support Systems (CDSS)										
Telehealth, Telenursing										
Social Networking Tools										
Electronic Health Record use in the Simulation Lab										
Information and Knowledge Management										
Data, information, knowledge										
Information and knowledge literacy										
Clinical data standards										
• ICNP										

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Course Number	NURXXX		NURXXX		NURXXX		NURXXX		NURXXX	
Course Title (Examples)	Intro to Professional Nursing		Clinical Judgment & Health Assessment		Nursing Care of Adults		Management & Leadership		Clinical Practicum Community Nursing	
Concepts/Skills	Current	Future	Current	Future	Current	Future	Current	Future	Current	Future
• HI:NC										
• HOBIC, C-HOBIC										
Socio-Cultural, Regulatory, Interpersonal Considerations										
• Privacy										
• Security										
• Confidentiality										
Standards of Practice re: ICTs										
<i>Personal Health Information Protection Act</i>										

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RESOURCE	Available at:
Ontario Ministry of Health <ul style="list-style-type: none"> • Nursing Secretariat – PDA Study • HOBIC 	http://www.health.gov.on.ca/english/providers/program/nursing_sec/nursing_sec_mn.html http://community.hobic-outcomes.ca
eHealth Ontario	http://www.ehealthontario.on.ca
TIGER Initiative – USA (Technology Initiative Guiding Educational Reform)	http://www.tigersummit.com/
Health IT Workforce Curriculum Components eHealth education resource materials developed through the Office of National Coordinator for Health Information Technology (ONC) USA	http://onc-ntdc.info/home

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8.5 Case Studies

These exemplars are intended to provide the educator with examples of teachable moments and opportunities for integration of eHealth concepts into clinical practice.

Case One

This case study can be used in conjunction with Section Two (eHealth, Informatics and Nursing) and pertains to the competency in *Foundational Information and Communications Technologies (ICTs) Skills*.

A second-year nursing student is assigned to an orthopedic unit and enters a patient's room to conduct her initial assessment. The 70-year-old patient, Jim Greaves, had a total hip replacement two days ago. When she arrives at the bedside, the student uses her iPhone to enter a query regarding post-operative ambulation of patients with hip surgery. The Mr. Greaves seems agitated and asks: "Why don't you nurses and doctors pay attention to me and put those machines away?!"

At lunch time, the student posts a query to her nurse friends on Facebook™ about Mr. Greaves' care plan. In doing so, she reveals a significant amount of the patient's personal information and also makes a disparaging comment about his "ridiculous annoyance" with her use of the iPhone.

Learning Queries:

- Ask the students to discuss how and when they would use this device in this scenario.
- Ask the students to discuss how they might respond to the patient.
- Reflect upon what you (as instructor) think of the student's use of this device at the bedside.
- What discussion might you have with your students about the patient interaction?; The use of social media for this purpose? (e.g. ethical, professional responsibility,

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accountability and the development of the therapeutic relationship).

- Ask the students to identify any legal concerns to be addressed in this scenario.

Case Two

This case study can be used in conjunction with Section Two (eHealth, Informatics and Nursing) and pertains to the competency in *Foundational Information and Communications Technologies (ICTs) Skills*.

Kelly is a third-year nursing student beginning his rotation within a mental health outpatient clinic. In reviewing the electronic health record of his first assigned patient, Jean Krechinski, a 38-year-old woman with bipolar disorder, he notes that the patient has been in day treatment on and off for the past 10 years. She is significantly overweight, has Type II Diabetes and is scheduled for an umbilical hernia repair in the local community hospital the following week.

When Kelly meets the patient for the first time, she appears agitated and expresses concern that “Since those computers came into the clinic everyone knows my business”. She doesn’t want everyone to know that she has a mental illness because they already make fun of her because of her weight.

Learning Queries:

- Discuss the implications of the *Professional Health Information Protection Act (PHIPA)* as it pertains to this situation.
- Ask students identify and discuss key issues of privacy, confidentiality and the security of electronic health records.
- Ask students to discuss the potential actions for Kelly to take in this situation.
- In small groups, ask students to role play this situation to develop responses to the patient’s statement about computers. Have students identify therapeutic and non-therapeutic responses, and have them share with the class.

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Case Three

This case study can be used in conjunction with Section Three (Information and Communication Technologies), Section Four (Information and Knowledge Management) and Section Five (eHealth and Socio-cultural, Regulatory, Ethical and Interpersonal Considerations) and pertains to the competencies in *Information and Knowledge Management* (Uses relevant information and knowledge to support the delivery of evidence-informed patient/client care) and *Professional and Regulatory Accountability* (Uses ICTs in accordance with professional and regulatory standards and workplace policies).

While working in the Bestway Children's Hospital, Justin, a second-year student nurse is oriented to the components of the paper and electronic clinical record keeping system. However, because he prefers working with the computer system, he focuses on retrieving relevant information and documents related to the care of his assigned patients online. In doing so, he accesses clinical applications including electronic orders, the eMAR, diagnostic results and the currently available online clinical documentation.

Learning Queries:

- Ask students to review all potential sources of clinical data, information and knowledge in preparing for their clinical assignments.
- Ask students to articulate the safety, security and privacy implications of working in a hybrid (paper and electronic) environment.
- Ask students to identify other potential sources of evidence to inform Justin's care.

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Case Four

This case study can be used in conjunction with Section Four (Information and Knowledge Management) and pertains to the competency in *Information and Knowledge Management* (Uses relevant information and knowledge to support the delivery of evidence-informed patient/client care).

You notice that a number of students in your third year nursing theory course are using Wikipedia to reference salient points in their respective assignments and for clinical preparation. Upon questioning the students about their use of Wikipedia, they state, “It’s the easiest way to find information on various topics”. Recognizing a potential learning opportunity, you explore the potential functionality of Wikipedia and various online informational sites in nursing education and practice.

Learning Queries:

- Ask students to describe their process of critiquing health information found on the internet.
- Ask students to identify the potential benefits/drawbacks to using Wikipedia in their clinical preparation and for evidence in academic work.
- Ask students to describe how they might differentiate between evidenced-based material and information of potentially lesser quality.
- Discuss credible reference sites (e.g. NurseONE, CINAHL, Cochrane Database)

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Case Five

This case study can be used in conjunction with Section Four (Information and Knowledge Management) and Section Five (eHealth and Socio-cultural, Regulatory, Ethical and Interpersonal Considerations) and pertains to the competency in *Information and Knowledge Management* (Uses relevant information and knowledge to support the delivery of evidence-informed patient/client care) and *Information and Communication Technologies* (Uses information and communication technologies in the delivery of patient/client care).

A student nurse participates in a home visit one afternoon to a 68-year-old man with COPD and Type II diabetes. She makes the following observations upon meeting the client:

- He is short of breath and can only give one or two word responses to her questions.
- He apologizes for not getting out of his chair to greet them, but he “doesn’t have the energy in these old bones”.
- His lunch is on a TV table beside him, however, it is mostly untouched. He states that he doesn’t do anything but sit in a chair so he doesn’t “have the any appetite.”

In consultation with her nurse preceptor, she completes the online HOBIC admission assessment for the client. She compares her assessment to the acute care HOBIC discharge assessment and notes that the client’s ability to complete his activities of daily living has been deteriorating since discharge from hospital last week. His wife verifies that he has become increasingly short of breath and unable to undertake activities of daily living without significant assistance, is more fatigued, is unsteady on his feet and has not regained his appetite. The student nurse also observes that the wife seems listless and that she has dark circles under her eyes.

Learning Queries

- What nursing interventions should the visiting nurse and student consider in view of the HOBIC outcomes?
- What might some of the nursing considerations and next steps in providing care for this client be?

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- What discussion might you have with the student about the importance of clinical data standards in the generation of new knowledge?
- What are the types and sources of information, and knowledge that are important for the student to consider beyond clinical data?
- What other sources of evidence might be referenced to inform his care?
- What other data might the nurse need to inform her understanding of him so that her care can be patient-centered? What else does she need to find out? (e.g. What is important to him? How is his wife managing? What supports might they need in the home? How has their quality of life been affected? Client and family as a source of evidence).

Case Six

This case study can be used in conjunction with Section Four (Information and Knowledge Management) and pertains to the competency in *Information and Knowledge Management* (Uses relevant information and knowledge to support the delivery of evidence-informed patient/client care) and *Information and Communication Technologies* (Uses information and communication technologies in the delivery of patient/client care).

Abigail is a first-year student nurse in her first clinical rotation in a long-term care home. Her assigned resident is Mr. Wong, an 82-year-old with Alzheimer's disease. He requires substantial assistance in performing activities of daily living including bathing, feeding and ambulation. During her morning care, Abigail notes a reddened area on his coccyx and right hip. This finding was not reported in any of the documentation she reviewed about his physical status and she has no recollection of seeing any documentation about his potential risk of skin breakdown. She reports this finding to her instructor and wonders what the best intervention might be at this time.

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Learning Queries

- What discussion might you have about online sources of evidence she should use to determine the most appropriate plan of action?
- Ask how and where she might find information about past incidents of skin breakdown.
- Ask her to identify what should be included in her online documentation and where in the clinical information system this finding should be noted.
- Given that the health record system in the long-term care facility is still a hybrid of paper and computerized information, what might she do to assure that other health professionals and nurses are aware of his risk for skin breakdown.

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