



CLINICAL + SYSTEMS
TRANSFORMATION

Our path to smarter, seamless care

Foundational Informatics: INFORMATICS COMPETENCIES

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Foundational Knowledge

FOUNDATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGIES (ICTs) SKILL

The use of ICTs has become routine in the lives of most Canadians. Thus, it is to be expected that in the workplace, clinicians will possess the foundational skills listed below. Typically, clinicians would have gained these skills through elementary and secondary level education, and through life experiences (e.g., online banking, e-mail dialogue, social media, etc.). **Although it is anticipated that clinicians will be competent in these areas, if that is not the case, health authorities should have ICTs support available to all clinicians to meet their work requirements** (insert toolkit link).

Device Use

- Demonstrates basic skills with ICTs components as related to their work requirements (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 touch-pad 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).
- 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 primary 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.).

PREAMBLE

A competency is a complex know-act based on combining and mobilizing internal resources (knowledge, skills, attitudes) and external resources to apply appropriately to specific types of situations (Tardif, 2006).

There are three clinician informatics competencies under the domains of *information and knowledge management, professional and regulatory accountability, and use of ICTs*. Each competency is accompanied by a list of indicators. Indicators are assessable and observable manifestations of the critical learnings needed to develop the competency (Tardif, 2006). An over-arching competency has been penned, which captures the essence of all three domains.

These clinician informatics competencies and indicators are intended to provide direction for curriculum development and clinician professional development. The competencies should build on, and not replace other curriculum and professional development elements. The competencies incorporate the minimum knowledge and skills clinicians require to practice in an increasingly technology-enabled environment.

COMPETENCIES AND INDICATORS

OVERARCHING COMPETENCY

Uses information and communication technologies to support information synthesis in accordance with professional and regulatory standards in the delivery of patient/client/resident care.

COMPETENCY 1: INFORMATION AND KNOWLEDGE MANAGEMENT

Uses relevant information and knowledge to support the delivery of evidence-informed patient/client/resident care.

INDICATORS

- Performs search and critical appraisal of on-line literature and resources (e.g., scholarly articles, websites, and other appropriate resources) to support clinical judgement, and evidence-informed decision making.
- Analyses, interprets, and documents pertinent clinician data and patient/client/resident data using standardized clinician and other clinical terminologies (e.g., ICNP, C-HOBIC, and SNOMED- CT, etc.) to support clinical decision making and clinician practice improvements.
- Assesses the key attributes of data and information (e.g., quality, accuracy, integrity, timeliness, appropriateness), their limitations within the context of intended use (e.g., clinical and analytic uses), and their impact on knowledge creation and use.
- Uses audience-appropriate communication and language to present information and convey concepts.

- Facilitates appropriate consumer use of health information and related technologies by assisting patient/client/residents 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.).
- Utilizes ICTs (e.g., e-mail, social media) appropriately in communication with patient/client/residents in compliance with legal, privacy and regulatory requirements.
- 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 clinician data to reflect clinical practice and to advance clinician knowledge.
- Identifies and demonstrates understanding of data interrelationships and dependencies among the various health information systems (e.g., decision support systems, electronic health records, computerized provider order entry, etc.).
- 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 care.

COMPETENCY 2: PROFESSIONAL AND REGULATORY ACCOUNTABILITY

Uses ICTs in accordance with professional and regulatory standards and workplace policies.

INDICATORS

- Demonstrates an understanding of: (i) Current legislation; (ii) Professional, ethical and legal obligations; (iii) Guidelines relating to privacy, confidentiality, and security of health information.
- Complies with legal and regulatory requirements, ethical standards, and organizational policies and procedures (e.g. protection of health information, privacy, and security).
- Demonstrates professional judgement when utilizing technologies designed to support clinical assessments, interventions, and evaluation (e.g., monitoring devices, decision support tools, etc.).
- 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 clinician practice and patient/client/resident safety during any period of system unavailability by following organizational downtime and recovery policies and procedures.
- Recognizes the importance of, and advocates for, clinicians' involvement in the design, selection, implementation, and evaluation of applications and systems in health care.

COMPETENCY 3: INFORMATION AND COMMUNICATION TECHNOLOGIES

Uses ICTs in the delivery of patient/client/resident care.

INDICATORS

- Identifies and demonstrates appropriate use of a variety of ICTs (e.g., point of care systems, EHR, EMR, capillary blood glucose, hemodynamic monitoring, telehomecare, fetal heart monitoring devices, etc.) to deliver safe clinician care to diverse populations in a variety of settings.
- Demonstrates efficient and responsible use of clinical decision support tools (e.g. clinical alerts and reminders, critical pathways, web- based clinical practice guidelines, etc.) to assist clinical judgment and safe patient/client/resident care.
- Documents patient/client/resident care activities in a timely, retrievable, usable manner for access by other care providers, and in the interest of patient/client/resident care outcomes and safety.
- Uses ICTs in a manner that supports (i.e. does not interfere with) the clinician-patient/client/resident 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.
- Understands key information technology concepts, principles and components (e.g., networks, storage devices, operating systems, information retrieval, data warehousing, application, firewalls, etc.) and their interrelationships.

LIST OF ACRONYMS

C-HOBIC – Canadian Health Outcomes for Better Information and Care

EHR – Electronic Health Record

EMR – Electronic Medical Record

ICNP – International Classifications of Nursing Practice

ICTs – Information and Communication Technologies

PHR – Personal Health Record

SNOMED-CT – Systematized Nomenclature of Medicine – Clinical Terms

GLOSSARY OF TERMS

TERM	DEFINITION
Canadian Health Outcomes for Better Information and Care (C-HOBIC)	An initiative to introduce systematic, structured language to admission and discharge assessments of patient/client/residents receiving acute care, complex continuing care, long-term care, or home care. This language can be abstracted into provincial databases or EHRs.
Clinical Informatics	A science and practice [which] integrates a profession, its information and knowledge, with information and communication technologies to promote the health of people, families and communities worldwide.
Competency	A complex know-act based on combining and mobilizing internal resources (knowledge, skills, attitudes) and external resources to apply appropriately to specific types of situations.
Decision Support Tools	Tools used for enhancing health-related decisions and actions with pertinent, organized clinical knowledge and patient/client/resident information to improve health and healthcare delivery.
Electronic Health Record (EHR)	A record specific to a clinician's (e.g. physician) practice or organization. It is the record that clinicians maintain on their own patient/client/residents, and which detail demographics, medical and drug history, and diagnostic information such as laboratory results and findings from diagnostic imaging. It is often integrated with other software that manages activities such as billing and scheduling.
Health Information Systems (HIS)	A combination of vital and health statistical data from multiple sources, used to derive information and make decisions about the health needs, health resources, costs, use, and outcome of healthcare.
Indicators	Assessable and observable manifestations of the critical learnings needed to develop the competency.
Information and Communication Technologies	Encompasses all those digital and analogue technologies that facilitate the capturing, processing, storage, and exchange of information via electronic communication.
International Classifications of Nursing Practice (ICNP®)	The ICNP® is a unified nursing language system. It is a compositional terminology for nursing practice that facilitates the development of, and cross-mapping among, local terms and existing terminologies.
Messaging Standards	Standards for the exchange, integration, sharing, and retrieval of electronic health information in a consistent manner to support clinical practice and the management, delivery, and evaluation of health services.

Personal Health Record (PHR)	A complete or partial health record under the custodianship of a person(s) (e.g. a patient/client/resident or family member) that holds all or a portion of the relevant health information about that person over their lifetime
Standardized Nomenclature of Medicine – Clinical Terms (SNOMED-CT)	A systematically organized computer processable collection of clinical terms providing codes, terms, synonyms and definitions covering diseases, findings, procedures, microorganisms, substances, etc. It allows a consistent way to index, store, retrieve, and aggregate clinical data across specialties and sites of care.
Standardized Clinical Terminology	Terminology required directly or indirectly to describe health conditions (e.g. symptoms, complaints, illness, diseases, disorders, etc.), and healthcare activities. Used in medical records, clinical communication, and medical science.
Standardized Nursing Terminology	A classification system which allows for the standardized collection of essential nursing data. The collected data are meant to provide an accurate description of the nursing process used when providing nursing care. This allows for the analysis and comparison of nursing data across populations, settings, geographic areas, and time.
Interoperable Electronic Health Records	This system will allow authorized health care professionals to view and, in some cases, to update a patient/client/resident’s essential health information. Interoperable refers to a system that has the ability to work with other systems or products. If they weren’t part of an interoperable electronic health record (iEHR), the registries, diagnostic imaging, drug information, and laboratory information systems would be unable to send or receive information from health care professionals.

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