



National Nursing Data Standards Symposium Proceedings

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Toronto, Ontario

Editors

Lynn M. Nagle and Peggy White

CANADIAN
NURSES
ASSOCIATION



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Acknowledgements

Host Organizations

We sincerely thank our host organizations for their support in the preparation and delivery of the symposium: Canadian Nurses Association; Canadian Institute for Health Information; Canada Health Infoway; Canadian Nursing Informatics Association; and the Lawrence S. Bloomberg Faculty of Nursing, University of Toronto.



List of Acronyms

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

CHI – Canada Health Infoway

CIHI – Canadian Institute for Health Information

CNA – Canadian Nurses Association

DAD – Discharge Abstract Database

HIMSS – Health Information Management Systems Society

HOBIC – Health Outcomes for Better Information and Care

ICNP – International Classification of Nursing Practice

InterRAI – International Resident Assessment Instrument

LOINC – Logical Observational Identifiers Names and Codes

NNQR-C – National Nursing Quality Report – Canada

SNOMED-CT – Systematized Nomenclature of Medicine - Clinical Terms

1. Introduction

These proceedings reflect the discussions and output of a National Nursing Data Standards Symposium, held April 9–10, 2016, in Toronto, Ontario. (See Appendix A.) This invitational meeting included 60 nurse leaders, host organization and vendor representatives, as well as student scribes. The attendees represented most jurisdictions and health care sectors in Canada, plus selected national health care organizations. (See Appendix B.) The impetus for the symposium came from the view that it is time to formulate a national strategy to unite Canadian nursing in representing, teaching, capturing, and reporting its practice. With the advent of new electronic health record (EHR) implementations as well as the design of online clinical documentation and support for the adoption of standardized clinical data, a unified clinical data strategy will promote the study and advancement of nursing practice and health care policy that will, in turn, strengthen the quality and safety of clinical care.

Nurses, as the largest constituency of health professionals in Canada, are also the predominant users and contributors of clinical data. A unified approach to the documentation of nursing clinical practice will provide a basis for evaluating the quality and impact of nursing care; promote safe, quality patient care; and contribute to the most appropriate and cost-effective use of health resources.

Symposium Objectives

Symposium participants focused on developing the beginnings of a national strategy to promote the adoption of a core set of nursing data standards; more specifically, to identify

- short-term objectives and action plans to promote adoption in clinical (administration and practice), education, research, and policy domains;
- stakeholders' accountability and sponsorship for each objective and action.

Setting the Context

The proceedings include the following (authors in parentheses):

- background white paper delineating the rationale for a national nursing data standards strategy (Nagle and White);
- supporting perspectives from the host organizations including the Canadian Nurses Association (Sutherland Boal), the Canadian Institute for Health Information (Webster), and Canada Health Infoway (Charlebois);
- experience in the United States (Murphy);
- syntheses of each working group discussion and action items for 2016–2017;

- summary of follow-up activities;
- bibliography of relevant literature;
- appendices including the agenda for the 2-day symposium, attendee names and organizations, and a synopsis of the action plan.

2. Toward a Pan-Canadian Strategy for Nursing Data Standards

Lynn M. Nagle, PhD, RN, FAAN
Peggy White, MN, RN

Canadian nurses have an unprecedented opportunity to derive sharable, comparable nursing data to inform practice, education, research, and health policy directions

2.1 Background

Over the past 2 decades, government and provider organizations throughout the Canadian health care system have invested heavily in the acquisition and deployment of health information systems including electronic health records (EHRs). As nurses are the largest constituency of health professionals in Canada, they are also the predominant users and contributors of clinical data. To optimally leverage the investments both to date and going forward, the timing is right for Canadian nurses to develop a national strategy to utilize technology and informatics. Such a strategy will enable nurses to expand nursing knowledge; demonstrate and evaluate the quality and impact of nursing care on outcomes; promote safe quality patient care; support health system use of nursing data; and contribute to the overall national strategy for health informatics.

In 1992, nurses in Canada reached consensus on the data elements required to understand the impact of nursing practice: client status, nursing interventions, and client outcomes. In addition to these clinical data, nurses in Canada identified the need for unique nurse identifiers and nursing resource intensity information to represent nursing practice in the health care system.¹ While there has been progress in different areas in identifying, defining, and standardizing nursing data, these data are neither consistently collected nor widely integrated into EHRs. In addition, these data are not captured within administrative systems nor abstracted into key data repositories. Moreover, there is a lack of understanding among leaders within health care organizations of the value of standardized data within individual organizations and across care settings.

With the advent of new EHR implementations as well as the design of online clinical documentation and support for the adoption of standardized clinical data (CNA, CIHI, Infoway), the time is ripe to articulate a national strategy to unite Canadian nursing in representing, teaching, capturing, and reporting its practice. Further, a unified clinical data strategy will support the study and advancement of nursing practice and health care policy that will, in turn, strengthen the quality and safety of clinical care and outcomes.

1 Canadian Nurses Association, *Papers from the Nursing Minimum Data Set Conference*.

2.2 Data Standards and EHRs — The Opportunity

National and jurisdictional endorsements of data and documentation standards — such as interRAI, SNOMED-CT, and ICNP — have set the stage for the adoption of standards more broadly. In nursing, specific initiatives such as C-HOBIC² and NNQR-C³ have begun to allow the standardized collection of nursing data within specific jurisdictions and health care organizations. Efforts are currently under way to include the C-HOBIC data set in the Discharge Abstract Database (DAD) at the Canadian Institute for Health Information (CIHI), beginning with the collection using DAD Special Project Fields. However, a majority of nurse leaders have yet to appreciate the potential value of standardized terminologies, metrics, definitions, and approaches to reporting.

While significant EHR investments have been made in every Canadian jurisdiction, there has been little effort to unify approaches to online clinical documentation. Regardless of system vendor, the opportunity to adopt standardized models, tools, and measures is being lost with every health care organization adopting its own design. Ironically, the potential to design standardized data repositories and reporting tools is one of the greatest advantages of using EHRs, yet this has not been addressed in nursing or in other health professions.

With the greater focus on primary care and management of chronic illness, there is an increased need to collect standardized information to support the continuity and coordination of care and examination of outcomes as people transition across health care sectors.

2.3 Domains of Opportunity

There are 4 primary domains of opportunity when working toward national data collection and reporting standards for nursing: (1) clinical (practice and administration); (2) education; (3) research; and (4) health policy.

Clinical

Numerous efforts have been made to bring evidence to nurses in practice settings and to support nurses to actually use the information they are gathering when making clinical decisions. The use of best practice guidelines/pathways, electronic order sets, smartphone apps (e.g., drug manuals, calculators), point-of-care documentation tools (e.g., bar-code readers), plus access to Internet resources, can facilitate and support evidence informed

2 Hannah et al., “Standardizing nursing information in Canada.”

3 VanDeVelde-Coke et al., “Update on the NNQR(C) Pilot Project.”

practice. Health care delivery organizations need to consistently enable and support evidence-informed practice and administration within and across the health care system. Moreover, with the adoption of standardized data and documentation methods, large volumes of comparable clinical data will become available for analysis and study, thereby facilitating the generation of new knowledge and evidence.

Canada's nursing regulatory bodies expect nurses to abide by an acceptable standard of care and practice, including documentation standards. But, to a large extent, documentation standards are silent on the issue of standardized nursing terminology. Nurses need to be held to account for taking appropriate clinical action based upon data gathered through the processes of care. Documentation standards should encompass the use of standardized nursing data and evidence-based tools to guide assessment, interventions, clinical decision-making, and outcomes evaluation.

In May 2014, Canada Health Infoway (Infoway), in partnership with the Canadian Nurses Association (CNA), released the findings of the *National Survey of Canadian Nurses: Use of Digital Health Technologies in Practice*.⁴ The study was designed to explore Canadian nurses' access to and use of digital health in nursing practice. The findings indicated that nurses are ready, willing, and able to take a leadership role in advancing digital health and 83 per cent are comfortable using digital tools. While nurses recognize that digital health tools present a range of benefits for both themselves and their patients, a number of factors constrain the full realization of digital health tools in nursing practice. These factors include a lack of nurses' input into the introduction of digital health systems and tools, lack of access to information, and lack of satisfaction with digital tools and systems in current use to support their practice. Hence, there is an opportunity to engage nurses more actively in the design of standards-based, electronic documentation tools in the future.

Education

New nursing graduates and the existing nursing workforce need to be informatics savvy. There is a need to further develop nursing expertise in informatics, particularly related to standardized terminologies.

In 2012, the Canadian Association of Schools of Nursing (CASN) published entry-to-practice informatics competencies for registered nurses.⁵ To date, efforts have been directed at engaging nursing faculty to advance their understanding and approaches to integrating these competencies into undergraduate nursing curricula. However, it is still early days and only modest progress has been made to date. Although the existing

4 Harris/Decima, *National Survey of Canadian Nurses*.

5 Canadian Association of Schools of Nursing, *Nursing Informatics*.

nursing workforce has generally been exposed to the use of information and communication technologies in practice settings, the use of EHRs by itself does not equate informatics competency, particularly as it relates to the use of standardized nursing data and documentation and the use of evidence to be derived from the same.

Research

The Canadian informatics research community remains limited to a few individuals. There are even fewer individuals when it comes to research related to the adoption and use of standardized terminologies. However, there is a growing body of research using standardized nursing-sensitive outcomes. One study examined the C-HOBIC admission data set as a predictor of alternate level of care (ALC) and length of stay (LOS) and found that higher fatigue and dyspnea scores at the time when patients were admitted were significantly related to longer lengths of stay. Furthermore, patients with high scores for fatigue and a history of falls and, to a lesser extent, a high activities-of-daily-living (ADL) composite score on admission were more likely to be discharged to complex continuing care, long-term care homes, or rehabilitation facilities.⁶ Research linking the C-HOBIC data set to the other data sets held at the Canadian Institute for Health Information (Discharge Abstract Database or DAD) found the following: therapeutic self-care scores on discharge showed a consistent and significant protective effect for readmission to acute care at 7, 30, and 90 days; nausea was more strongly related to early readmissions (3, 7, and 30 days); and dyspnea was more strongly related to readmission at later stages (30 and 90 days).⁷ A home care study highlighted the importance of assessing therapeutic self-care in relation to protecting against hospital readmissions and other adverse events.⁸

Nonetheless, additional research is essential for a further understanding of the potential impact and benefit of data standards for practice, specifically, clinical outcomes (patient, quality, safety); nurse impact on patient outcomes; and health services administration as it relates to resource management and service delivery. As shown in Figure 1, all levels of the health care system can benefit from additional research focused on the convergence of standardized, abstracted, and aggregated clinical data that can be studied relative to other individual, local, regional, and national data sets.

Policy

As shown in Figure 1, the availability of aggregated, standardized data and information will also significantly inform health policy directions related to the distribution and use of nursing resources by type, within specific sectors, and for specific populations. These

6 Jeffs et al., “Linking HOBIC measures with length of stay and alternate levels of care.”

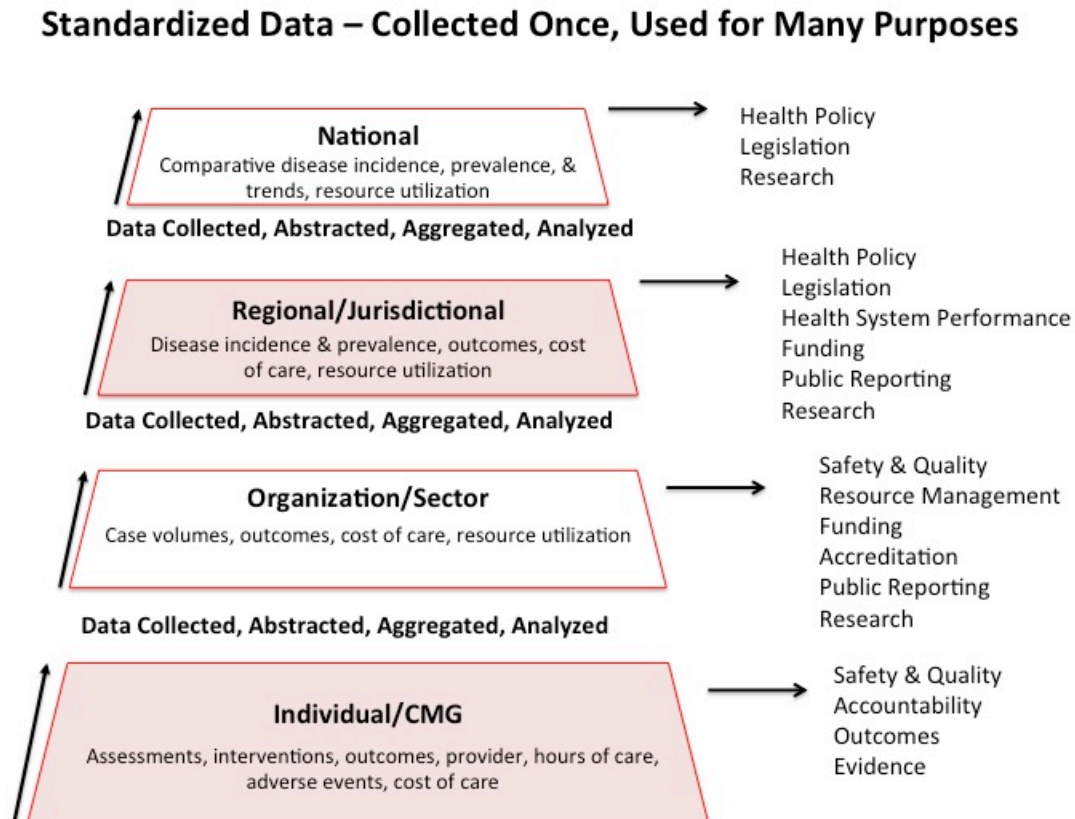
7 Wodchis et al., “Increasing patient self care.”

8 Sun and Doran, “Understanding the relationship between therapeutic self-care and adverse events.”

data will significantly broaden the understanding of provider organizations and of regional, jurisdictional, and national policy-makers about health system performance.

The availability of comparative data and information for benchmarking, public reporting, and transparency is of increasing importance in terms of perceived value for investment in health services. Accountability for clinical and financial outcomes will be better understood relative to health human resource use in all sectors. As the largest contingent of health care providers, nurses' contributions to these outcomes warrant much greater clarification; this will be realized only with the adoption of national nursing data standards and reporting in practice settings nationwide.

Figure 1. Potential for Data Aggregation from One to Many



3. Host Organization Perspectives

3.1 Canadian Nurses Association (CNA)

Anne Sutherland Boal, Chief Executive Officer

1. *Why is this discussion important at this time?*

The purpose of CNA, the national professional organization for nursing in Canada, is twofold; first, to advance the profession of nursing; second, to support the contributions nurses make in sustaining Canada's publicly funded not-for-profit health care system. At the national level, CNA advocates for sound public policy to support system innovation to meet the changing and increasingly complex health care needs of Canadians. Policy requests to government decision-makers must come with evidence to support positions on optimal health system and provider requirements. At the provider level, nursing is the largest health care professional group delivering care to Canadians. Though there are excellent data collection initiatives (e.g. C-HOBIC and NNQR) in selected facilities and institutions across the country there is no national recognized system for the collection and reporting of data regarding the specific contributions that nurses make to the delivery of care. Ongoing collection of data; year-over-year trends; patient outcomes on multiples aspects of care, across the continuum from acute to community to home is required to inform long-term planning of the health care system. It is also needed to inform policy and practice as it applies to nursing health human resource planning. Without an agreed-upon national approach, the proliferation of variable and different initiatives will hamper the optimal dissemination of best practices and models of care across the country.

2. *What is the value of this conversation?*

The value of the conversation is to bring together researchers, educators, clinicians, employers and national organizations to work toward a common language and understanding of optimal data standards; terms used and their meaning as well as how standardized data and information are collected, reported, and used across the system and across the country.

3. *What would you like to see as outcomes and follow-up?*

It would be useful to have:

- an executive secretariat established to lead this initiative on behalf of the nursing profession;
- a communications document defining the various standardized terminologies, e.g., ICNP, C-HOBIC, NNQR, etc.;
- a scan to confirm the degree to which the data elements/information are already in place/reported and utilized across the country;

- a process to engage and update nurse leaders across the country specifically targeting those who are employers (perhaps through the Academy of Canadian Executive Nurses or the Canadian College of Health Leaders) ;
- a consensus process to determine the elements to be used nationally;
- strategic engagement and ongoing partnership with CIHI and Infoway to advance this work.

3.2 Canadian Institute for Health Information (CIHI)

Greg Webster, Director, Acute and Ambulatory Care Information Services

1. *Why is this discussion important at this time?*

- CIHI's mandate is better data, better decisions, healthier Canadians. Developing and promoting the use of common data standards are fundamental and essential aspects of CIHI's work. The importance of data standards is reflected in CIHI's new strategic plan (available at <https://www.cihi.ca/en/about-cihi/corporate-strategies/strategic-plan>).
- CIHI has 3 goals:
 1. be a trusted source of standards and quality data;
 2. expand analytical tools to support measurement of health systems;
 3. provide actionable analysis and accelerate its adoption across health systems and populations.
- It is a priority to maximize patient experiences and optimize outcomes while maintaining or decreasing costs. These goals can be achieved and measured only if we have and use common data standards.

2. *What is the value of this conversation?*

- One of CIHI's objectives is to make it easier to collect and access the data and information needed to support health system goals. One way to support this is to embed clinician-friendly data standards where data is collected for clinical care purposes and to make a subset of relevant data available in a timely manner for clinical program management, innovation, and health system management.
- CIHI sees value in connecting nursing and other clinical activities to patient experiences, outcomes, and system costs. We all need to view health information with the patient in the centre. There is high value in nursing data and linking outcomes in a way that does not increase the data collection burden. We need to keep a focus on collecting data once and making it available to many users in a privacy-appropriate manner.
- Many system leaders are now discussing the value-based paradigm — how do we maximize the patient experience while optimizing health outcomes and maintaining costs so more patients can be cared for. At the heart of this is health

- 2015 Nursing Knowledge: Big Data Science Conference
(<http://www.nursing.umn.edu/centers/center-nursing-informatics/events/2015-nursing-knowledge-big-data-science-conference>)
- 2016 Nursing Knowledge: Big Data Science Conference
(<http://www.nursing.umn.edu/centers/center-nursing-informatics/events/2016-nursing-knowledge-big-data-science-conference>)

The conferences have engaged participants in developing and implementing a national plan of action to ensure that nursing data are captured in electronic health records and other information systems and to ensure the data are available in sharable, comparable formats for clinicians, nursing administrators, researchers, policy-makers, and others who may be interested in gaining useful insights from it. The ultimate aim is to be able to use nursing data to improve health outcomes. The 2013 conference was attended by 35 participants; that number grew to over 200 participants in 2016. All of their work is chronicled through reports and conference proceedings available on their website. In addition, the group uses extensive outreach and has completed many presentations and publications to ensure that their work is widely disseminated and their recommendations are adopted by all, not just by those who attend the conferences.

Objectives for the initiative have been identified in 4 categories:

Education

- develop a standard curriculum for nursing informatics faculty and students;
- influence certification, credentialing, and accreditation in nursing informatics programs.

Practice

- transform nursing documentation;
- develop strategies to measure value of nursing.

Policy and incentives

- advance the National Database for Nursing Quality Indicators pressure ulcer eMeasure work;
- coordinate efforts to engage nurses in health IT policy;
- build an infrastructure for the collection and dissemination of standardized workforce data.

Research

- develop and disseminate LOINC/SNOMED CT framework for integration into EHRs;
- promote harmonization and standardization of nursing data and model;
- promote nursing and the science of big data.

The work has been executed by project teams formed during each of the conferences. Each project team creates an annual action plan and reports its accomplishments at the next year's conference. At that time, new project teams are created or existing teams are adjusted, based on the status of the work and the state of the industry. The current work involves 12 project teams, renamed as Big Data Expert Groups in 2015:

- Education
- Clinical data sets and analytics
- Engaging all nurses in health IT policy and equipping them
- Standard data organizations and core documentation
- Nursing value
- Encoding nursing assessments using LOINC and SNOMED CT
- Context of care
- Transforming documentation and context of care
- Connecting emerging and expert nurse informatics leaders
- mHealth data
- Supporting inclusion of social and behavioural determinants of health in electronic health records
- Nursing practice informatics issues related to care coordination

4.4 U.S. Initiative Organized Through HIMSS

A second initiative to help ensure the standardization and integration of the data that nurses gather in EHRs and other health IT was organized through the Healthcare Information and Management Systems Society (HIMSS) CNO-CNIO Vendor Roundtable. This group was formed in 2014 to optimize health engagement and care outcomes through IT by leveraging the thought leadership of nurse executive leaders of health IT suppliers. This pioneer partnership led by HIMSS and including the nursing health IT suppliers depends largely on the ability to move beyond the cultural norms of each supplier's organization to innovate in order to advance outcomes for nursing and clinical practice.

One recommendation of the HIMSS CNO-CNIO Vendor Roundtable was to form a subgroup, the Big Data Principles Workgroup, to help with the nursing big data work in the U.S. from the health IT vendor point of view. The workgroup's mandate was to develop a paper to identify big data principles, barriers, and challenges; develop a framework for universal requirements; identify differences in the context of nursing outcomes; address the impact of health IT system versions/configurations; analyze the variation in quality measures; and discuss implementation challenges. The resulting paper and Top 10 Recommendations, published in 2015, also provide the foundation for future discussions with the broader nursing community including nurse executives in hospitals,

health care systems, and other key stakeholder groups to explore and advance shared objectives.

On the HIMSS website (www.himss.org/big10), there are 3 versions of the work available:

- Guiding Principles for Big Data in Nursing: Using Big Data to Improve the Quality of Care and Outcomes (full white paper)
- Guiding Principles for Big Data in Nursing: Using Big Data to Improve the Quality of Care and Outcomes (Executive Summary)
- Guiding Principles for Big Data in Nursing (Top 10 Recommendations)

Here are the 10 guiding principles that were identified, organized in 3 categories:

Promote Standards and Interoperability

The ability of nurses to make optimal clinical decisions depends on having access to accurate, real-time information regardless of care setting. Data must also be structured in standard ways to enable sharable, comparable information.

1. Nurses should promote the use of standardized and accepted terminologies that address the documentation needs of the entire care team regardless of care setting. All care delivery settings should create a plan for implementing an ANA-recognized nursing terminology that is mapped to national standards i.e., SNOMED CT or LOINC.
2. Nurses should recommend consistent use of research-based assessment scales and instruments that are standardized through an international consensus body. The lack of standardization makes comparison of data challenging and adds to the burden of cost for copyright permissions and/or licensing of such instruments.
3. The ANA-recognized nursing terminologies should be consistently updated and made available to international standards organizations for translation and complete, comprehensive mapping.
4. The use of free text documentation should be minimized. When “within defined limits” is used, discrete data elements should be stored within the EHR to enable decision support, research, analytics, and knowledge generation.

Advance Quality eMeasures

Measurement of quality data, including clinical quality measures and nursing-sensitive performance indicators, is a complex process. The data needed to populate these measures come from multiple sources, some of which are not available in the EHR today. Therefore, alignment on what data are to be collected, how they are collected, and the terminologies needed to support them is critical to be able to share data across settings and organizations.

5. Efforts to develop and design quality eMeasures must ensure the data to be collected and measured are aligned with the clinician's workflow, not as additional documentation.
6. To advance nursing-sensitive quality eMeasures, paper measure sets must be evaluated for appropriateness, and expectations set for which data should be collected, how the data are collected, and the required terminologies to be used.
7. Initiatives and programs that define and promote new, quality eMeasures and their requirements should allow time for testing and piloting with defined time frames that consider all stakeholders.
8. Clinical quality eMeasures must support evidence-based, cost-effective care that follows clinical practice guidelines and minimizes the negative impact on clinicians' workflow.

Leverage Nursing Informatics Experts

Nursing Informatics (NI) is a specialty that integrates nursing science with multiple information management and analytical sciences to identify, define, manage, and communicate data, information, knowledge, and wisdom in nursing practice.⁹ (ANA, 2015). NI supports nurses, consumers, patients, the interprofessional health care team, and other stakeholders in their decision-making in all roles and settings to achieve desired outcomes. The application of nursing informatics knowledge is essential to capture health and care data in a structured manner to accomplish the vision of accurate, reliable, clinically meaningful measurement across systems and settings of care.

9. Health care organizations should utilize nurse informaticists who will provide valuable insight into concept representation, design, implementation, and optimization of health IT to support evidence-based practice, research, and education.
10. To achieve the desired outcomes, nurse informaticists should have formal informatics training education and certification

4.5 Summary

It is exciting that nursing in Canada is embarking on an initiative to determine how nursing data is collected and used in their health care organizations; to create an action plan, as necessary, to ensure that the nursing data is "sharable and comparable" as collected, stored, and used in their EHRs and other health IT systems. It is my hope that the lessons and examples from the U.S., described above, are helpful in this journey to better health and health care in Canada.

9 American Nurses Association, *2015 Nursing Informatics: Scope and Standards of Practice*, 2nd ed. (Silver Spring, MD: ANA).

5. Working Group Discussion Synthesis

Over the course of the 2-day symposium, the majority of time was set aside for working group discussion of key questions. Five groups were formed, based on the invitees' areas of expertise that included clinical practice, clinical administration, education, research, and policy. Group discussions were guided by key questions and a facilitator and a student scribe supported each group. The following is a synthesis of the discussions including common themes and recommended action plans for moving the national nursing data standards agenda forward.

5.1 What Is the Value of Standardized Nursing Data?

All groups engaged in vigorous discussion about why standardized nursing data were important to, and needed by, the nursing profession. The working groups concluded that the adoption of data standards for nursing would serve to do the following:

- create visibility for nursing;
- bring credibility to the nursing profession;
- inform care planning and evaluation;
- inform opportunities for quality improvement;
- support the delivery of safer care;
- leverage decision-making;
- advance consistency in and alignment between nursing education and practice;
- accelerate research capabilities, particularly practice-based research;
- inform health human resource planning;
- strengthen local, jurisdictional, and national decision-making.

5.2 Clinical Practice

Facilitator: Peggy White

Scribe: Gillian Strudwick

Participants:

Michelle Allard
Carole Canon
Rosa Hart
Karen Quigley-Hobbs
Cindy Hollister
Jacquelyn MacDonald
Emily O'Sullivan
Sonia Pagliaroli
Josette Roussel
Allison Taylor

- In thinking about big data and the possibilities for aggregation across the country, there is a need to be precise about the adoption of standardized data sets and to be sure that key nursing activities are captured. With standardized data, machine learning or data analytics can be used to try and understand the relationships among concepts in nursing. Data mining is much easier with standardized data than with free text. Most people are using standardized data as well as artificial intelligence (e.g., IBM’s Watson) to understand relationships between things; natural language processing is also being used to understand concepts.
- With standardized nursing data being collected in practice, the cost of research will be reduced. Funding would not need to include the costs of data collection and there can be more focus on the analytics. In other words, one needs to adopt the principle of capture data once and then use for multiple purposes, in this case, research.
- Standardization of nursing data (e.g., the adoption of ICNP as a classification system) could be quite beneficial for how nurses across the country think about nursing.

5.6 Education

Facilitator: Margaret Kennedy

Scribe: Sally Remus

Participants:

Cynthia Baker
 Sandra Bassendowski
 Glynda Doyle
 Jodi Found
 Noreen Frisch
 Karen Furlong
 Sylvie Jetté

Discussion

- It was acknowledged that Canadian nursing education programs teach their respective curricula within different models, often using different perspectives on “nursing data” and the issues around representing and managing nursing data in clinical practice. Consistency in nursing data standards would facilitate a consistent point of reference and support consistent education targets, evaluation, and performance achievement in clinical practicums. It is important to note that unanimous agreement was achieved on this topic and educators endorsed the inclusion of nursing data standards as critical for consistency while not obstructing methods and models of educational design and delivery.

- Among the advantages of using consistent nursing data standards, the following were identified as priorities for nursing education:
 - consistent approach to use of clinical terminology across the entire curricula;
 - mitigation of the need for every nursing program to “reinvent the wheel” in designing approaches to clinical documentation.
- If a national toolkit were available, each school could further individualize the curriculum according to its respective needs.
- Nursing data standards would facilitate synthesis of information and evaluation, emphasizing the value of nursing and its respective contributions across the health care continuum.

5.7 Reasons to Adopt Data Standards

The **top reasons** for adopting data standards were identified by the working groups and included the following. Data standards would

1. define the role of nurses in relation to health outcomes and assist the profession in demonstrating its impact within an interprofessional practice team;
2. make it possible for clinical data to follow patients across the continuum of care, thereby facilitating continuity of care and patient safety;
3. enable national, peer-group comparability, providing both macro and micro insights to guide decision-making;
4. allow nurses to engage in shared problem-solving, which is critical for all domains — research, practice, policy, and education;
5. improve population health by enabling individuals to use data to understand and manage illness and improve their health;
6. fulfill the nursing profession’s obligation to improve the health care system;
7. enable the gathering of system-level metrics around care transitions in order to understand the role nurses play across the system and associated funding;
8. demonstrate the meaning of putting the patient first — focusing on patient and family; and
9. support informed and consistently educated nurses in regards to nursing data, data quality, and data utilization.

All groups identified the need for provincial health ministry mandates to ensure that patient information, consistent with national standards, is being collected across the health care system. Without such mandates, there will be no buy-in or incentive to act accordingly. Furthermore, the adoption and use of data standards will mean that organizations will have to deliberately shift from a focus just on the acquisition of information technology to a full integration of information technology and information use in practice environments.

While many challenges associated with development of National Nursing Data Standards were identified, financial and human resource implications were common themes in all groups. However, it was recognized that the timing is right; there is a need to think of the future and to build now. Organizations are in the process of changing their legacy systems and this is an ideal time to incorporate nursing data standards into assessments. Executives are ready to have these conversations because they understand the challenges of a lack of comparable and sharable data and the increased focus on patient transitions within and between organizations; they recognize the need for data standards. The risk of not adopting national nursing data standards is the potential loss of professional nursing due to a lack of evidence of what professional nurses contribute to patient care and the outcomes of that care. Additionally, there is a risk of further fragmentation of data and care.

5.8 Existing Initiatives to Be Leveraged to Advance the Adoption of Standardized Nursing Data

- C-HOBIC (The logic behind this recommendation is to start with something that already exists, that illustrates successful practice integration, and offers tremendous potential for the future. C-HOBIC is a Canada Approved Standard and has been implemented in organizations in Ontario and Manitoba with interest from acute care organizations across Canada. Furthermore, there is research reflecting the value of nurses' collecting and using this information to inform practice. In particular, the group supported the value of assessing therapeutic self-care in terms of assessing patients' knowledge about their medications and how to manage their care post-discharge from acute care/home care. The assessment of therapeutic self-care questions has demonstrated a predictive relationship to hospital readmission.)
- InterRAI tools and the CIHI Primary Health Care EMR Content Standards: for data elements that reflect nursing care
- National Nursing Quality Reports (NNQR): for structure, process, and outcome indicators
- Entry-to-practice Nursing Informatics competencies
- Work in the U.S. by Westra et al. (2015) (where relevant) to avoid reinventing the wheel

Organizations are struggling with how to access real-time data. Developing good metrics is challenging but important. The U.S. experience highlights the need for some top-down leadership to identify and drive core metrics. The metrics should be of value to clinicians but also reflect what is most important to patients. All groups recognized that

standardized data need to begin at the clinical level and then they can be translated into use for administration, research, and policy. Data must be useful at the clinical level for individual and group care planning, and then at the system level for resource utilization and systems-level functioning.

Current health and population data sources exist. Examples include the following:

- InterRAI (<http://interrai.org>)
- OECD population health data (<http://www.oecd.org/els/health-systems/health-data.htm>)
- ER/home care/surgical wait times (<https://www.cihi.ca/en/health-system-performance/access-and-wait-times>)
- health care quality indicators (<http://www.oecd.org/els/health-systems/health-care-quality-indicators.htm>; <https://www.cihi.ca/en/health-system-performance/performance-reporting/indicators>)
- wait lists for long-term care, home care (e.g., <http://oaccac.com/Quality-And-Transparency/Provincial-Wait-Times/long-term-care-wait-times>)
- primary care provider availability (https://www.cihi.ca/en/cmwf/media_release_commonwealth_2015)
- health equity data (e.g., <http://torontohealthequity.ca>)
- provincial quality indicators (e.g., <http://www.mccormickcaregroup.ca/mccormick-home/resident-care/cihi-quality-indicators/>)
- Accreditation Canada Required Organizational Practices (ROPs) (<https://accreditation.ca/rop-handbooks>)

All these data sources have the potential to be linked and to contribute to policy at local, provincial, national, or international levels. The Strategy for Patient-Oriented Research (SPOR) initiatives in each province support the creation and expansion of data warehouses and linkages among individual data sets. An opportunity exists because the provinces are seeking questions to be answered using their databases. There is a need for nursing data as there are significant policy implications in terms of health human resources, new models of care enabled by technology and information, and evidence-informed practice.

6. Summary of Follow-up Activities

Clinical

- Develop a “How to Use Outcomes Data to Inform Clinical Practice: A Guideline for Nurses at the Point of Care”;
- Create a demonstration of alignment between nursing documentation and clinical outcomes across the continuum of care;
- Identify opportunities for standards integration, such as C-HOBIC, within existing and pending clinical documentation implementations.

Administration

- Develop a “How to Use Outcomes Data to Inform Clinical Practice and Administrative Decision-Making: A Guideline for Nurse Leaders”;
- Identify core messaging on the value of nursing data standards.
- Develop a nurse executive informatics-competency framework that facilitates dialogue and informed decision-making with senior executives, stakeholders, and vendors by 2017.

Policy

- Develop a targeted policy advocacy strategy to advance evidence-based nursing practice and quality care across the health system through standardized nursing data;
- Advance a national resolution for the adoption of nursing data standards through CNA.

Research

- Establish a research consortium for national nursing data standards;
- Identify priority areas for research to advance the adoption of data standards;
- Secure funding for initial research initiatives by 2017.

Education

- Develop a “How to Incorporate Nursing Data Standards into Clinical Practice Education: A Guideline for Nurse Educators” that includes teaching scenarios for nurse educators by 2017;
- Continue with Infoway-CASN sponsored Digital Health Faculty Peer Network efforts.

Provide nurses in all domains with guidance such as that found in the *Pan-Canadian Nursing EHR Business and Functional Elements Supporting Clinical Practice* (Canada Health Infoway Nursing Reference Group, 2012) so that they will be able to effectively contribute to the procurement, design, implementation, and evaluation of clinical information systems.

Overall recommendation

Secure support from key stakeholder groups and establish a national taskforce that includes relevant stakeholders from every jurisdiction. Charge a national coalition with the mandate to develop and evaluate a framework for nursing data standards by spring 2018.

Key stakeholders to participate in advancing this work

- Canadian Nurses Association
- Canadian Institute for Health Information
- Canada Health Infoway

Other key organizations/people with which to partner

- Accreditation Canada
- Canadian Nursing Informatics Association
- Canadian Association of Schools of Nursing
- Academy of Canadian Executive Nurses (ACEN)
- Provincial nursing regulators and professional associations
- Provincial initiatives to standardize how quality is measured (e.g., Quality Based Procedures in Ontario)
- Information Technology Association of Canada (ITAC)
- Work currently under way at the federal/provincial level, including the Council of Federations and the Provincial Nursing Advisor Task Force, should be leveraged
- Deputy ministers: with current fiscal pressures, there is a need to move from fee-for-service to outcomes-based funding

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Appendix A

Symposium Agenda

National Nursing Data Standards Symposium		
Lawrence S. Bloomberg, Faculty of Nursing, 155 College Street, Toronto, Ontario Room #106		
Saturday April 9, 2016		
08:30 - 09:00	Breakfast and Networking	
09:00 - 09:10	Welcome	Dr. Linda Johnston, Dean, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto
09:10 - 09:30	Introduction and vision for symposium	Dr. Lynn Nagle, Assistant Professor, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto
09:30 - 10:30	Setting the Context: Overview of U.S. Work on an Action Plan for Sharable and Comparable Nursing Data	Judy Murphy Chief Nursing Officer IBM Global Healthcare, Washington D.C.
10:30 - 10:45	Break	
10:45 - 11:30	Panel: Setting the Stage and Realizing the Opportunities from the Collection and Use Standardized Nursing Data in Canada	<ul style="list-style-type: none"> • Anne Sutherland Boal, Chief Executive Officer, Canadian Nurses Association • Brent Diverty, Vice President, Programs Division, Canadian Institute for Health Information • Maureen Charlebois, Clinical Adoption, Chief Nursing Executive and Group Director, Canada Health Infoway
11:30 - 12:00	Synthesis and Discussion regarding Key Messages to Inform Development of an Action Plan	Dr. Kathryn Hannah, Nursing Informatics Advisor, Canadian Nurses Association
12:00 - 12:45	Lunch and Networking	
12:45 - 14:15	Working Groups - Brainstorming <i>Identifying immediate opportunities</i>	All <i>Practice, education, research, policy</i>
14:15 - 14:30	Break	
14:30 - 15:30	Reporting Back - Facilitated Discussion	Dr. Lynn Nagle
15:30 - 16:15	Large Group Discussion	All
16:30 - 18:00	Wine & Cheese	Bocca on Baldwin, 28 Baldwin Street
Sunday April 10, 2016		
08:30 - 09:00	Breakfast and Networking	
09:00 - 09:30	Synthesis from Day 1 and directions for today	Dr. Lynn Nagle
0930 - 11:00	Working Groups <i>Creating action plans</i>	All <i>Practice, education, research, policy</i>
11:00 - 12:00	Reporting back - Facilitated Discussion & Next Steps	
12:00 - 1:00	Lunch	

Appendix B

Symposium Participants

<p>Michelle Allard Academic Primary Care Nurse Family Medical Centre Manitoba</p>	<p>Carole Caron Clinical Nurse Specialist Hamilton Health Sciences Ontario</p>
<p>Susan Anderson Managing Director Orion Health Ontario</p>	<p>Peter Catford CEO Hinext Inc Ontario</p>
<p>Irene Andress Chief Nursing Executive Michael Garron Hospital (formerly TEGH) Ontario</p>	<p>Maureen Charlebois Chief Nursing Executive and Group Director, Clinical Adoption Canada Health Infoway Ontario</p>
<p>Cynthia Baker Executive Director Canadian Association of Schools of Nursing Ontario</p>	<p>Leanne Currie Associate Professor University of British Columbia British Columbia</p>
<p>Sandra Bassendowski Professor University of Saskatchewan Saskatchewan</p>	<p>Maryanne D'Arpino Patient Safety Improvement Lead Canadian Patient Safety Institute (CPSI) Ontario</p>
<p>Maximillian Besworth Western University Ontario</p>	<p>Lorie Donelle Associate Professor Western University Ontario</p>
<p>Lori Block Master of Science, student University of British Columbia British Columbia</p>	<p>Marion Dowling Director of Nursing Health PEI, Queen Elizabeth Hospital Prince Edward Island</p>
<p>Richard Booth Assistant Professor Western University Ontario</p>	<p>Glynda Doyle Faculty British Columbia Institute of Technology British Columbia</p>
<p>Elizabeth Borycki Associate Professor University of Victoria British Columbia</p>	

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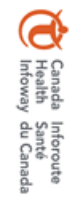

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Appendix C

Synopsis of Action Plan

 Canadian - National Nursing Data Standards <i>Collected Once – Multiple Uses - Informing Healthcare Improvements</i> 					
<p>An Invitational Symposium was held on April 9 & 10, 2016 with 65 thought leaders from across Canada with the goal of developing an Action Plan for moving forward on the collection and use of standardized nursing data in Canada https://www.cna-aicc.ca/en/on-the-issues/best-nursing/nursing-informatics</p>					
Clinical	Administration	Education	Research	Health Policy	
<ul style="list-style-type: none"> ✓ Develop a “how to use outcomes data to inform clinical practice: A guideline for nurses at the point of care” ✓ Create a demonstration of alignment between nursing documentation and clinical outcomes across the continuum of care ✓ Identify opportunities for standards integration such as C-HOBIC, within existing and pending clinical documentation implementations 	<ul style="list-style-type: none"> ✓ Develop a “how to use outcomes data to inform clinical practice and administrative decision-making: A guideline for nurse leaders” ✓ Identify core messaging on the value of nursing data standards ✓ Develop a nurse executive informatics competency framework that facilitates dialogue and informed decision making with senior executives, stakeholders and vendors by 2017 	<ul style="list-style-type: none"> ✓ Develop a “how to incorporate nursing data standards into clinical practice education: A guideline for nurse educators” that includes teaching scenarios for nurse educators by 2017 ✓ Continue with Infoway-CASN sponsored Digital Health Faculty Peer Network efforts 	<ul style="list-style-type: none"> ✓ Establish a research consortium for national nursing data standards ✓ Identify priority areas for research to advance the adoption of data standards ✓ Secure funding for initial research initiatives by 2017 	<ul style="list-style-type: none"> ✓ Develop a targeted policy advocacy strategy to advance evidence-based nursing practice and quality care across the health system through standardized nursing data ✓ Advance a national resolution for the adoption of nursing data standards through CNA 	
Enablers		Outcome			
<p>Nursing leadership</p> <p>Researchers use standardized nursing data to advance practice</p> <p>Electronic Health Records</p>		<p>Demonstration of the impact of nursing care on outcomes</p> <p>BScN & RPN/LPN programs include clinical documentation based on nursing data standards</p> <p>Perceived value by the inter-professional team</p>		<p>Consumer focused</p> <p>Real time outcome reports available at point of care</p> <p>National nursing practice reports</p>	
<p>The adoption of a core set of standardized nursing data to inform Nursing Clinical Practice, Administration, Nursing Education, Research and Health Policy</p>					
					
					

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