



Canadian Health Outcomes for Better Information and Care

C-HOBIC Phase 2

Final Report

January 2015

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Executive Summary

Canadian Health Outcomes for Better Information and Care (C-HOBIC) is leading the way with the implementation of the electronic collection of evidence-based patient-centred clinical outcomes in Canada. The project is funded by contributions from Canada Health Infoway (Infoway) and participating provincial partners and sponsored by the Canadian Nurses Association (CNA).

Phase 2 of this initiative introduces the development and implementation of a synoptic report to support patient care transitions. In Manitoba, this work is part of the rollout of Allscripts™ at St. Boniface Hospital. In Ontario, the synoptic report is available on the ClinicalConnect™ portal in the Hamilton Niagara Haldimand Brant (HNHB) and the Waterloo Wellington (WW) Local Health Integration Networks (LHIN). The synoptic reports display normalized admission and discharge scores from the C-HOBIC data set. By comparing these clinical outcomes between admission and discharge, health-care providers can plan the appropriate care and resources to manage ongoing care to optimize health care.

An evaluation focused on the implementation of the C-HOBIC data set in acute care in Manitoba and the use of the C-HOBIC Transition Synoptic/Summary Report (TSR) in designated sites in Ontario and Manitoba. In Manitoba, the collection of the C-HOBIC data set in acute care began in November 2012 within St. Boniface Hospital hence the evaluation focused on the early adopters' initial experiences with applying, documenting and using the data set as well as the C-HOBIC-TSR. In Ontario, while a number of organizations had been using C-HOBIC since 2006, the C-HOBIC TSR was made available to clinicians in January 2014 through the ClinicalConnect™ portal in the HNHB and WW LHINs. In these LHINs, the evaluation focused on the initial reflections of early adopters from a variety of care settings on the value of the C-HOBIC TSR in supporting patient transitions. This report includes a synthesis of the recommendations from the evaluation. While there is strong clinical support for the use of C-HOBIC information to support care transitions, it is clear that more effort needs to be directed to strengthening the processes of information exchange between care providers across the continuum.

To support future collection of the C-HOBIC data set in electronic health records (EHRs), the data set was mapped to SNOMED CT. Work is underway with the Canadian Institute for Health Information (CIHI) regarding the inclusion of this data set in the Discharge Abstract Database which will support sustainability of this data set.

As with any large-scale change, leadership is essential. Clinicians need to understand why data standards are being implemented and how this information can support quality patient care. Ongoing engagement of clinicians about the value of standards and how this information can support practice is required. Organizations require significant time and resources to incorporate use of data in evidence-informed practice into the organizational culture. Ongoing communication and education, as well as linking initiatives to quality and performance reporting, are essential to successful change management that can make adoption a reality.

The collection of evidence-based standardized clinical outcomes offers clinicians the opportunity to improve health outcomes for the people for whom they provide care. The sharing of this information between and among health-care sectors and health-care providers provides information to support planning appropriate care and resources to manage ongoing care to optimize health.

Background

Canadian Health Outcomes for Better Information and Care (C-HOBIC) is leading the way with the implementation of the electronic collection of evidence-based patient-centred clinical outcomes in Canada. The C-HOBIC data set comprises approximately 24 standardized data elements in four categories as shown in the table below:

C-HOBIC Concepts by Category	
Functional status and Continence (ADL and IADL)	
<ul style="list-style-type: none"> • Bathing • Personal hygiene • Walking • Toilet transfer • Toilet use • Bed mobility • Dressing • Eating • Bladder continence 	
Symptoms	
<ul style="list-style-type: none"> • Pain — Frequency • Pain — Intensity • Fatigue • Dyspnea • Nausea 	
Safety	
<ul style="list-style-type: none"> • Falls • Pressure ulcer 	
Therapeutic self-care	
<ul style="list-style-type: none"> • Knowledge of current medications • Knowledge about why you are taking current medications • Ability to take medications as prescribed • Recognition of changes in body (symptoms) related to health • Carry out treatments to manage symptoms • Ability to do everyday things like bathing, shopping • Someone to call if help is needed • Knowledge of whom to contact in case of a medical emergency 	

The C-HOBIC data set has been formally endorsed by the CNA and the Canadian Nursing Informatics Association. In addition, selected C-HOBIC data elements are being included in the National Nursing Quality Report in Canada (NNQR-C), work that is being led by the Academy of Canadian Executive Nurses and CNA. On January 11, 2012, the C-HOBIC data set was designated as a Canada Approved Standard (CAS). In Ontario, the C-HOBIC data set has received Ontario Health Informatics Standards Council approval. While endorsement is growing, significant challenges, such as the complexity of health-care environments, are inhibiting implementation of this data set in provinces and jurisdictions across Canada.

C-HOBIC Phase 2 builds on the work of C-HOBIC Phase 1, which occurred from May 2007 to June 2009. In Phase 1, the C-HOBIC data set was implemented in Ontario in acute care, long-term care, complex continuing care and home care (funded by the Ontario Ministry of Health and Long-term Care), in Manitoba, in long-term and home care, and in Saskatchewan in long-term care.

C-HOBIC Phase 2

Methodology and Deliverables

C-HOBIC Phase 2 responds to and supports Canada Health Infoway's (Infoway) Innovation and Adoption program by increasing clinicians' access to information that is of value to their practice, providing access to information across the continuum of care that will support quality patient care and ultimately increase the productivity of clinicians through the provision of evidence-based standardized clinical outcomes information at the point of care.

This phase includes the design, development and implementation of synoptic transition reports to facilitate patient transition from one sector of the health-care delivery system to another (e.g., among acute care, primary care, long-term care and home care). Based on 24 data elements in four categories of the C-HOBIC data set, a transition synoptic report provides a summary (i.e., synopsis) of the patient's outcome status on transition from one clinical care sector to another. The summary is generated using the C-HOBIC data and the principles of synoptic reporting. The C-HOBIC project is a unique use of the C-HOBIC data set in clinical care and is an innovative application and use of the principles of synoptic reporting.

Benefits of the C-HOBIC Data Set to the Health-care System

Providing measurable standardized clinical outcomes, as patients cross between sectors of the health system, contributes to the following:

- Patient safety: Information about falls and pressure ulcers can be used to support care planning across the continuum.
- Primary health-care reform: Chronic diseases can be better managed and readmissions can potentially be reduced through the provision of standardized information.
- Accountability: Data on health outcomes are essential to accountability. Clinicians need information so that they know where they are doing well in practice and where improvements are needed.
- Care planning: Planning can be informed by the sharing of standardized clinical information between providers and sectors.
- Continuity of care: Patient outcomes can be communicated at the point of discharge to other sectors to support transitions.
- Continuity of information: Standardized information can be shared between providers and sectors.
- Summary of care record: This summary of key clinical events/status can be used in communications with patients and/or informal caregivers.

- Senior care: The C-HOBIC data set addresses important outcomes for the aging Canadian population — while not intended solely for seniors, these are the indicators that are of greatest importance for the seniors population and need to be the focus for health-care interventions if seniors are to remain independent in the community.
- Data aggregation: This supports analysis of other metrics, such as emergency department readmission rates.
- Innovation: Standardized clinical outcomes can be used in an innovative way in a synoptic reporting format.

The C-HOBIC data set is accurate, reliable and available in a timely manner and can be linked with other data sets. This data set adds value at many levels of the health-care system and supports the notion of collecting information once and using it many times and for multiple purposes. The C-HOBIC concepts represent information that is important to people within the health-care system and the synopsis of this information supports care transitions.

The C-HOBIC data set is collected electronically at the point of care. As part of C-HOBIC, real-time information is available to clinicians to use in examining the impact of their practice on patient outcomes. It is different from other assessment instruments in that it provides an actual profile of the patient on several dimensions for comparison at multiple points in time as opposed to a predictive risk assessment. Another focus is on providing unit-based reports back to clinicians to use in examining the quality of care. Executives can use this information as a staff development tool or to report on quality initiatives within their organizations. At an aggregate level, the information allows for timely research through the provision of standardized information that is available electronically. For example, Wodchisⁱ linked the C-HOBIC data set with other data sets held at the Canadian Institute for Health Information (Discharge Abstract Database, DAD) and found that therapeutic self-care (TSC) scores showed a consistent and significant protective effect for readmission to acute care at 7, 30 and 90 days. A one-point improvement in TSC scores was associated with approximately a 10 per cent reduction in the likelihood of readmission. Nausea was more strongly related to early readmission (3, 7 and 30 days), while dyspnea was more strongly related to later readmission (30 and 90 days). This type of research is essential within the health-care system.

Governance

The C-HOBIC Phase 2 project is funded by contributions from Infoway and participating provincial partners. In Manitoba the partners are St. Boniface Hospital, Winnipeg Regional Health Authority and Manitoba ehealth. In Ontario the participating provincial partners are ClinicalConnect™, HInext and the Institute for Clinical Evaluative Sciences (ICES). CNA is the sponsor of this project. As part of this role, CNA managed the financial administration of the project. In addition, CNA hosts the C-HOBIC web page on its website at: http://c-hobic.cna-aiic.ca/about/default_e.aspx

The C-HOBIC team consists of the following members:

C-HOBIC Executive Project Leader: Dr. Kathryn Hannah

Canadian Nurses Association Project Lead: Margot McNamee, Diane Clements, Jane McDonald

C-HOBIC Project Director: Peggy White

Infoway Project Manager: Rose Serjak

A Steering Committee with representation from participating provincial partners, Infoway, the Canadian Institute for Health Information and the Office of Nursing Policy at Health Canada was formed to provide overall advice and direction to the C-HOBIC project team (Appendix A). The Steering Committee met three times during the course of the project: an initial face-to-face meeting and two conference calls. A provincial project manager in each participating province was responsible for leading the implementation for their province and providing ongoing problem solving and progress for the project.

Phase 2 Implementation

Synoptic reporting of the C-HOBIC data set supports and facilitates the use of the electronically captured standardized clinical outcomes data by providing a meaningful format for transmission of C-HOBIC information between sectors of the health-care system to support continuity of care (ISO/TR 18307:2001). Synoptic reporting of transitional information assists clinicians in communicating effectively with each other (e.g., to ensure safe hand-offs) to improve clinical practice and patient outcomes. Making this information available as patients transition from one sector to another provides clinicians with meaningful information that can support the critical decisions that are necessary for planning and delivering patient care across the health-care continuum and supporting integrated health-care delivery.

Ontario

Clinicians in Ontario have been collecting the C-HOBIC data since 2007 and currently approximately 186 organizations across the province submit these data to a database housed at the ICES. In Ontario, clinical care providers in the HNHB and WW LHINs have access to patient health information across sectors through ClinicalConnect™ using portal technology. After a meeting with the eHealth lead at ClinicalConnect™ a decision was made to make the C-HOBIC transition synoptic report (C-HOBIC TSR) available on the ClinicalConnect™ portal. Significant delays were encountered in the Ontario implementation. First, there are many key players who needed to sign on and agree to support this work:

- ClinicalConnect™ — portal host
- Medseek — portal vendor
- ICES — host of HOBIC database
- HInext — software vendor for HOBIC
- Ontario Ministry of Health and Long-Term Care — funder of HOBIC
- eHealth Ontario — lead for eHealth initiatives in Ontario

In addition, eight hospitals agreed to participate in this initiative and data-sharing agreements needed to be amended to permit sharing patients' C-HOBIC data outside the individual organizations. Finally, during the planning for development and testing of the C-HOBIC TSR, ICES needed to migrate the HOBIC database to a new server, a matter totally beyond the control of the C-HOBIC team and initiative. As a result of this unanticipated migration, there were many interface issues following the migration that needed to be addressed before development and testing of the C-HOBIC TSR could resume.

In Ontario, a decision was made to display the C-HOBIC TSR as a “snapshot” so that clinicians could quickly look at the report and see where there were issues with patient needs (see Appendix B). The C-HOBIC TSR in Ontario is based on Nightingale's Rose Diagram.ⁱⁱ C-HOBIC scores were normalized to

represent all of the concepts on admission and discharge. The statistical methodology for normalizing the scores and the software for the design that was developed for the Ontario work were provided by HInext. Throughout 2012 and early 2013 drafts of the C-HOBIC TSR were reviewed and feedback from clinicians within the region led to minor revisions being made to the report and further follow-up with clinicians. As acute care sites were informed about the C-HOBIC TSR, many sites began to revisit their data and look at the completeness of their data, recognizing that others beyond their organization would be viewing their data as part of the C-HOBIC TSR.

There are over 7,000 users of the ClinicalConnect™ portal on desktop computers and mobile devices in a variety of professional categories in the HNHB and WW LHINs, such as family health teams, nurse practitioner led clinics, community health centres and administrative staff. Communication about the C-HOBIC TSR was provided through various approaches: conference calls, meetings and presentations to user groups. The projected number of users for the C-HOBIC TSR was 500 but during the time frame from the go-live date of the C-HOBIC TSR on the ClinicalConnect™ portal to the evaluation date 579 clinicians accessed the C-HOBIC TSR. To make users of the portal aware of the C-HOBIC TSR, ClinicalConnect™ posted updates on their web page and provided information about C-HOBIC in their regular newsletters. In addition a link to a taped web conference about how to access the C-HOBIC TSR and use it in practice was provided for clinicians. In addition a document entitled *C-HOBIC TSR – Using the Synoptic Report in Practice* (Appendix C) and a case study to facilitate understanding of the value of these data across the continuum of care (Appendix D) were developed to support use of the C-HOBIC TSR. The C-HOBIC TSR went live on ClinicalConnect™ on January 21, 2014.

Manitoba

In 2012, Manitoba began implementing the clinical documentation functionality of Allscripts™ (formerly Eclipsys) Version 5.5 at St. Boniface Hospital. In C-HOBIC Phase 2, Manitoba built the standardized C-HOBIC questions into their admission and discharge assessments within the Allscripts™ clinical documentation at St. Boniface Hospital. In Manitoba the initial projection was for 1,500 health-care providers to be trained on assessing patients using C-HOBIC information; however, following the final rollout of Allscripts™ at St. Boniface, the actual number of clinicians trained was 700 users. Education focused on completing this information within assessments, understanding why there is a need to standardize clinical outcomes information and how to use this information for evidence-based practice. Manitoba made the decision to add the C-HOBIC assessments as a separate screen as part of the Allscripts™ build. The addition of a discharge assessment is new; previously nurses at St. Boniface had not routinely completed a discharge assessment using a standardized tool. The initial design had the data set as embedded elements of documentation in the relevant content areas but for reasons unknown, the C-HOBIC data set was extracted and highlighted as the elements of the “C-HOBIC initiative.” This design decision resulted in a fragmented approach to documentation and a perception of duplicate documentation since some related assessments (e.g., pain and skin breakdown and falls risk) are accessed in separate sections of the record. Consequently clinicians perceive C-HOBIC as added workload without wholly understanding the purpose of these measures relative to others. Both of these factors (an additional assessment at discharge and the separation of the C-HOBIC documentation from

the other admission documentation) may have contributed to the nurses viewing the completion of the C-HOBIC assessments as extra work.

As with the large implementation of any health information system, delays were encountered in the rollout of the clinical documentation application. The collection of the C-HOBIC data set went live on November 27, 2012. As the clinical documentation system was rolled out across the hospital, clinicians began assessing patients using the C-HOBIC data set. This rollout was completed in March 2013.

The technology and software used in the Allscripts™ system did not permit Manitoba to create a C-HOBIC TSR similar to the Ontario graphic snapshot, so they developed an alternative format of synoptic report, the C-HOBIC Transition Summary Report (see Appendix E), based on the methodology developed by HInext. (In this report, the acronym TSR will be used for both Ontario's Transition Synoptic Report and Manitoba's Transition Summary Report.) St. Boniface Hospital does not currently share electronic information with long-term care and home care services; therefore, a decision was made to generate the C-HOBIC TSR on discharge and include this report in the patients' discharge packages to provide information to support transitions of care. St. Boniface communicated with home care and long-term care services regarding the inclusion of the C-HOBIC TSR. This process was implemented on July 11, 2013.

Evaluation

The complete report of the evaluation is contained in *C-HOBIC Phase 2 Evaluation: Summary of Findings Report January 2015*; the following is merely a summary of the findings of that report.

The evaluation focused on an expanded implementation of C-HOBIC to an acute care site in Winnipeg and the use of the C-HOBIC TSR within targeted organizations in Manitoba and Ontario. *The goals of this study were to:*

1. *evaluate the experience of a C-HOBIC implementation within one acute care organization and the use and utility of a C-HOBIC TSR received by affiliated home care and long-term care settings in Manitoba; and*
2. *evaluate the use and utility of the C-HOBIC TSR received from acute care by primary care providers, nurse practitioners, emergency department nurses and community care access centre case managers within two Ontario LHINs.*

Evaluation data were gathered using a combination of methods including the following:

- *online survey targeting direct care providers and/or users of the C-HOBIC TSR*
- *focus groups*
- *interview with senior leaders*

On the basis of the questions of interest, a short survey was designed using Survey Monkey™ with input and vetting by members of the C-HOBIC leadership team and members of the Manitoba and Ontario implementation site leadership teams for review. Findings from the survey guided questions for the focus group and interviews with senior leaders.

Recommendations from the Evaluation

Manitoba

Application Design

- *Identify opportunities to eliminate redundant clinical documentation.*
- *Provide sites with guidelines regarding the integration of C-HOBIC into clinical documentation systems.*

St. Boniface's clinical documentation application design should be revisited and discussed in terms of the requirements for documentation. Streamlining required documentation and integrating C-HOBIC rather than segregating the measures would be worth considering. The C-HOBIC implementation support information should include guidelines for the most effective approach to integrating the outcomes into organization's clinical documentation systems.

Other Assessment Tools

- Identify the tools that best serve clinicians in the determination of clinical outcomes.
- Review existing standardized tools at the outset of implementation to determine whether any redundant tools are already in use.
- Revisit and clarify the purpose of C-HOBIC and differentiate it from assessment tools being used for other purposes.
- Emphasize the benefits of C-HOBIC including the TSC support care transitions.

In this review, participants highlighted the need to clarify and differentiate the purpose of C-HOBIC from that of related tools (e.g., risk assessments) to reduce the perception of duplicate documentation.

Limited Use of the C-HOBIC TSR

- Re-evaluate the use and impact of the C-HOBIC TSR at 6- to 12-month intervals particularly as it relates to activities underway to increase information use and perceived value for management and its impact on practice.
- Ensure clear and consistent processes and accountabilities for the generation, distribution and use of the C-HOBIC TSR especially in relation to patient transitions across sectors.
- Review the education component of C-HOBIC related to the use of the C-HOBIC TSR to support care transitions.

Given the limited use of the C-HOBIC TSR at the time of the evaluation and the subsequent actions of the clinical leadership team, there is merit in revisiting its use in another 12 months. St. Boniface leadership has set expectations for the C-HOBIC TSR to be generated, reviewed and distributed at the time of discharge.

Applicability of C-HOBIC

- Implementation sites should review the applicability of the entire C-HOBIC data set for different types of medical-surgical patients (e.g., cardiac, short-stay).
- C-HOBIC implementation guidelines should clearly identify the clinical populations for which C-HOBIC is intended.

Clinicians indicated that they felt the application of C-HOBIC to critical care and short-stay patients was inappropriate; indeed, C-HOBIC was not intended for use with either of these clinical populations. However, since the current approach to implementing clinical assessments tends towards the development of one assessment for all patients being admitted, consideration may need to be given for exceptions. For some medical-surgical (e.g., cardiac surgery) patients, it may well be that the information derived from pre-existing standardized assessments and clinical pathways may not be further enhanced by the use of C-HOBIC. C-HOBIC implementation information should provide sites with a clear identification of appropriate target populations for the application of C-HOBIC.

Consistent Use of C-HOBIC and the C-HOBIC TSR

- Review options to increase the completion of C-HOBIC on admission and discharge for the purpose of clinical comparability.
- Continue the conduct of C-HOBIC completion audits.
- Review timing of C-HOBIC completion for surgical patients to optimize usefulness.
- Discuss opportunities to use C-HOBIC as a basis for discussions and discharge planning with patients and families.
- Review C-HOBIC education and training to address consistency of completion and potential use.

The participants in this review identified inconsistencies in their practice as it related to C-HOBIC and the C-HOBIC TSR. It may be that demonstrating the potential value for care planning discussions will encourage greater compliance and use.

St. Boniface is conducting regular audits of the C-HOBIC completion rates on admission and discharge with the goal of improving completion rates.

The St. Boniface leadership team is being deliberative in ensuring that the C-HOBIC measures and their intended use in practice are key components of the orientation for all new hires. Furthermore, the engagement of clinical practice leaders in the use of the C-HOBIC data for utilization review and linkages with other clinical data may also provide users with a clearer demonstration of uses and benefits.

Use of C-HOBIC and the C-HOBIC TSR in Long-term Care and Home Care

- Continue to pursue the cross-sector flow of C-HOBIC information as clients move between sectors of care.
- Engage in multi-sector sectoral discussions regarding the potential value of C-HOBIC in supporting care transitions.
- Ascertain current use of C-HOBIC in long-term care and home care and introduce the C-HOBIC TSR in these sectors.

There is strong clinical support for the use of C-HOBIC information to support care transitions, but it is also clear that more effort needs to be directed to strengthening the processes of information exchange. The findings of this evaluation suggest that there is a need for more collaboration with multi-sector partners to discuss mutually acceptable processes for the exchange and use of the C-HOBIC information. Discussion with the senior leaders elicited their agreement of the need to convene a meeting with their colleagues from the other sectors to discuss the use of C-HOBIC but that current circumstances may limit progress with home care in the near term. However, the Winnipeg Regional Health Authority leadership indicated potential opportunities for strengthening the use of C-HOBIC between acute care and long-term care.

Education and Training

- *Provide opportunities to learn about the C-HOBIC initiative and its use*, separate from the training provided on the use of the clinical information system.
- *Provide follow-up education and support*, including a multi-sector workshop *on the sustainable and effective use of C-HOBIC outcomes and reports* including the C-HOBIC TSR.

Learning activities related to C-HOBIC and its use are being integrated into the new hire orientation program at St. Boniface. As is often the case with the introduction of any new clinical tool, clinicians would probably benefit from having follow-up education and support to reinforce their initial learning about C-HOBIC. Within other jurisdictions, significant value has been derived from holding clinically focused workshops to illustrate C-HOBIC's value to clinical practice, patient care, organizational initiatives and system-wide processes (e.g., quality and safety improvements, accreditation).

Ontario

Awareness of C-HOBIC and the C-HOBIC TSR to support care transitions

- ClinicalConnect™ users should be provided with information regarding the value and use of the C-HOBIC TSR when given initial access to the portal.
- Emphasize the benefits of the C-HOBIC TSR as it supports care transitions; users currently deriving benefits might be encouraged to share examples of value to other clinicians using formal education venues (e.g., LHIN-based webinars and training sessions).
- Leverage the Health Links initiatives as a means to convey the value of the C-HOBIC TSR to all sectors and clinical users.
- Consider bundling C-HOBIC data with other discharge planning and follow-up care reports.
- Within 6-12 months, re-evaluate the frequency of use and ClinicalConnect™ users' perceptions of the value of the C-HOBIC TSR in a variety of clinical care settings.

Informants in this review were strong proponents of the C-HOBIC TSR and might be further engaged to illustrate its value to other clinicians and sectors. They identified a need to broaden clinician awareness of C-HOBIC and the C-HOBIC TSR across all sectors. The emerging Health Links strategies may provide a useful vehicle for conveying the value of C-HOBIC in supporting care transitions. Users of the ClinicalConnect™ portal also indicated that there is an opportunity to integrate other relevant data/reports with the C-HOBIC TSR to reduce the time spent searching for information. As activities to increase awareness of C-HOBIC and the C-HOBIC TSR continue to unfold, there is merit in revisiting its use and users' perceptions of its value in support of care transitions.

C-HOBIC and the C-HOBIC TSR beyond Acute Care

- Continue the pursuit of cross-sector flow of C-HOBIC information as clients move between sectors of care.

- Engage in multi-sector discussions regarding the potential value of the C-HOBIC TSR in supporting care transitions.
- Continue to identify opportunities for the adoption and integration of C-HOBIC in other care settings within each LHIN.

The findings of this evaluation offered promising directions of clinician support for the use of the C-HOBIC TSR to support care transitions but highlighted the need for more efforts to raise awareness of its meaning and availability in ClinicalConnect™.

Having more acute care sites using C-HOBIC is desirable as those patients deriving benefit from the information are limited to those discharged from C-HOBIC sites. Now that the C-HOBIC TSR is available in ClinicalConnect™, further dialogue within the HNHB and WW LHINs may garner support for the implementation of C-HOBIC in additional acute care sites.

In addition, the perceived value of the C-HOBIC TSR for discharge and care planning led some participants in this evaluation to also suggest the possibility of having it integrated into their local information system (e.g., Community Care Access Centres — Client-Health and Related Information System (CHRIS)).

Education and Training

- Provide post go-live follow-up education and support, including a multi-sector workshop for the sustainable and effective use of C-HOBIC outcomes and reports including the C-HOBIC TSR.
- Revisit the potential to have undergraduate curricula incorporate the concepts of clinical data standards and application of C-HOBIC in practice.

In summary, the use of C-HOBIC data and the production of the C-HOBIC TSR were expected to improve access, quality and productivity. The availability of the C-HOBIC TSR informs clinical assessments as patients transition between sectors of care. Feedback from early adopters supports the value of the C-HOBIC TSR for planning for care after discharge from acute care.

C-HOBIC data facilitate improved assessment of symptoms through the introduction of a standardized approach to assessments that is embedded into existing admission and discharge assessment. The C-HOBIC TSR facilitates better communication of patient information during transitions and the availability of this report facilitates communication between members of a patient's inter-sectoral care team and between providers and sectors.

In this time frame it was too early to evaluate the impact of the C-HOBIC TSR on productivity in terms of enhancing the quality of the practice environment. It was expected that the use of standardized data across settings and jurisdictions may reduce overhead. Recent research in the home care sector found that clients with high therapeutic self-care ability, a C-HOBIC component, experienced fewer adverse outcomes including new hospital visits, functional decline, new falls, unintended weight loss and non-compliance/adherence with medicationⁱⁱⁱ.

For more details on the evaluation please see the ***C-HOBIC Phase 2 Evaluation Summary of Findings Report January 2015.***

Mapping to SNOMED CT

In C-HOBIC Phase 1, the C-HOBIC data set was mapped to the International Classification of Nursing Practice (ICNP®) Version 1.0. This resulted in the release in October 2008 of *Mapping Canadian Clinical Outcomes in ICNP®*.^{iv} With the release of this report, CNA and its partners were able to demonstrate the feasibility and value of mapping nursing information to a standardized clinical terminology and position clinical outcomes that reflected nursing practice for inclusion in the pan-Canadian health record. With the subsequent release of ICNP® version 2, the C-HOBIC data set was mapped to ICNP® version 2 and the *Nursing Outcomes Indicators Catalogue*^v was jointly published by CNA and the International Council of Nurses (ICN) in March 2012.

In Phase 2 of C-HOBIC, working with experts from the International Health Terminology Standards Development Organisation (IHTSDO), the C-HOBIC team undertook the development of exploratory maps between the concepts in the C-HOBIC data set, ICNP® and SNOMED CT. A major aim of this work was to investigate potential approaches to harmonization of the ICNP® catalogue and SNOMED-CT, while meeting the Canadian requirements for SNOMED CT (SCT) and ICNP® outcome concepts to be used to represent the content of the C-HOBIC data set. On June 22, 2012, 16 nursing terminology experts assembled in Montreal — four from the IHTSDO Nursing SIG, five from the International Council of Nurses ICNP® Programme and seven from Canada. A draft document had been prepared in advance by the SNOMED CT team of the National Health Service in the United Kingdom. Mapping of C-HOBIC to SCT Observables was completed at this meeting and over the following months the mapping to SCT Findings was completed and a technical report prepared and submitted to IHTSDO. In the Technical Report (December 17, 2013) that maps the ICNP Nursing Outcomes Indicators Catalogue to SNOMED CT, the terms below were found to NOT have a suitable match in SNOMED CT. The completed work has been submitted by the IHTSDO Nursing SIG to the IHTSDO for inclusion in the international release as a reference set.

- ability to walk in room
- ability to walk in corridor
- ability to dress self
- ability to dress upper body
- ability to dress lower body
- frequency of pain symptoms
- nausea level
- knowledge level: reason for medication
- ability to recognize symptoms
- ability to self-manage symptoms

- knowledge level: how to access medical emergency assistance

Subsequently, the terms listed above have been added to SNOMED CT and are included in the January 2015 release, with the following exceptions:

- "Ability to dress self" was added as a synonym to "Ability to dress."
- "Frequency of pain symptoms" was added as singular.
- "Knowledge level: how to access medical emergency assistance" was inadvertently overlooked and will be added for the July 2015 release.

These final three terms are anticipated to be included in the July 2015 release.

The C-HOBIC terms can be found in SNOMED CT using the browser at

<http://browser.ihtsdotools.org>

Sustainability — Submission of the C-HOBIC Data Set to the Canadian Institute for Health Information

The C-HOBIC team has had ongoing meetings with the Vice-President of Programs, the Director of Acute and Ambulatory Care Information Systems and the Director of Methodologies and Specialized Care, from the Canadian Institute for Health Information (CIHI), to discuss models for inclusion of the C-HOBIC data in the Discharge Abstract Database (DAD). The functional components of the C-HOBIC data set are based on the responses to questions that originated with interRAI.^{vi} There is support from interRAI for inclusion of the C-HOBIC data set in the DAD, as interRAI would like access to this type of data to examine health system use. Inclusion of the C-HOBIC data set will provide CIHI with standardized patient-centred outcomes data in the DAD to support reporting on health system use and performance reporting. The value lies in being able to link this data set with other data sets such as the home care data set and long-term care homes data set to understand clinical outcomes across the continuum of care.

The model proposed by CIHI would initially see the submission of the C-HOBIC data set from two pilot sites to identify the resources required at the sites for the submission. Once this work is completed, other sites that are collecting the C-HOBIC data set will be allowed to include these data with their DAD submission. Eventually, the goal is that the C-HOBIC data set would become part of the DAD core submission and available on the CIHI portal to support health system use.

Communication about C-HOBIC

An important component of this project has been communication about the value of the C-HOBIC data set and engagement with key stakeholders in both the nursing community and the larger health-care environment across Canada. One component of the communication strategy has focused on local presentations, such as a presentation to the College of Registered Nurses of Manitoba; national presentations, such as a presentation to the terminology subcommittee of the Health Information Standards Committee for Alberta (HISCA); and international presentations, such as sessions at the 11th International Congress on Nursing Informatics and the Association for Common European Nursing Diagnoses, Interventions and Outcomes — 9th Biennial European Conference and a presentation to the nursing interest group of the International Medical Informatics Association. An article was published in the spring 2012 issue of the *Nursing Leadership* journal entitled “C-HOBIC: Standardized Clinical Outcomes to Support Evidence-Informed Nursing Care.” In addition to many presentations, FAQs (Appendix F) and Key Messages (Appendix G) were circulated to stakeholders across Canada and posted on the C-HOBIC web page.

For further information on the communication strategy see Appendix H.

Key Learnings

Leadership

Leadership at all levels of the organization is required to engage staff in using health-care data, such as C-HOBIC data, to support staff in practising in an evidence-informed manner with individual patients, to examine the impact of their practice on individual patients' health outcomes and to examine how well they are doing in preparing individual patients for discharge from hospitals to other sectors of the health-care system. The volume of electronic clinical data will continue to increase as electronic health records (EHRs) are deployed and an essential leadership role is actively engaging clinicians in using data to enhance their skill in evidence-informed practice and to improve clinical outcomes.

Clinician Workflow

Clinicians in Manitoba questioned the need to complete the therapeutic self-care scale on admission. This scale asks patients about their knowledge of their medications, their knowledge of symptoms and their ability to manage self-care. These are important issues to assess on admission to ensure that patients receive the education they need during their hospital stay to prepare them for discharge and to manage once they are discharged from the hospital. Better information at the point of care should lead to better health care; however, there is a need to integrate this information into the workflow for clinicians. Assessments need to be coordinated so that there is no duplication and that clinicians understand the value of the data that they are collecting.

Change Management

As evidenced in both C-HOBIC Phase 1 and Phase 2, there is a need to cycle back to clinicians and managers to ensure that C-HOBIC data are used in evidence-informed practice and in the review of patient outcomes. While there has been an increased focus on the availability of better data to support quality health care, clinicians still do not fully realize how standardized information can support their practice within the organization, between providers and organizations, and the resulting benefits of these data for health system use. Many view the introduction of standards into documentation as just another bureaucratic change. Findings from the evaluation indicate that education about C-HOBIC and training on the use of online documentation should be addressed separately to ensure that clinicians appreciate the rationale for completing the C-HOBIC outcome measures. Initial education about C-HOBIC seems to only result in data capture. Follow-up education is essential to ensure that the resulting information is used to inform practice. Ongoing engagement of clinicians about the value of standards and how this information can support practice is required. Furthermore, organizations require significant time and resources to incorporate use of C-HOBIC data in evidence-informed practice into the organizational culture.

Communication with Health-care Providers/Organizations

In health care there are many initiatives to improve efficiency and effectiveness. Often an initiative is implemented and then another initiative is planned and readied for implementation before the first initiative is adopted and integrated into clinical practice. Furthermore, communication about initiatives within organizations is difficult and communication with outside sites about reports such as the C-HOBIC TSR is even more challenging. If an initiative is to be successfully adopted, ongoing communication and education are essential and the initiative must be clearly linked to quality improvements and performance reporting.

Innovation and Complexity within the Health-care Environment

Initiatives such as C-HOBIC need to be integrated with larger information systems, such as Allscripts™ and ClinicalConnect™. Implementing such an initiative is a complex process; timelines frequently slip, there are changes in staff along the way and unanticipated (and unforeseeable) issues arise during the course of the implementation. In this project clinicians were just beginning to collect data when the evaluation was completed. Tenacity and commitment are required over the long term to see such a project through to completion. Two-year project timelines may not be sufficient for complete integration of C-HOBIC into practice and for all of the benefits of implementation of C-HOBIC to be fully realized.

For a complete list of the lessons learned, see Appendix I.

Discussion

The C-HOBIC concepts represent information that all clinicians assess on admission in all sectors of the health-care system. Furthermore, clinicians assess these items on all encounters with the patient: Is the patient in pain? Is the patient short of breath? Is the patient able to use the bathroom on their own? Is the patient able to manage their care after discharge? C-HOBIC is introducing a standardized way to assess this information so that it is codable. These measures are based on evidence^{vii} and research has demonstrated their sensitivity to clinical practice.^{viii} The introduction of a formal discharge assessment is new for acute care but offers the opportunity to compare admission and discharge scores to examine individual patient outcomes and practice within the organization. The challenge is how to support clinicians in becoming users of the data to examine their practice. Rhoads and Ferrara argue that hospitals and health-care systems need to leverage their data to improve the way that they deliver care and that making use of data is critical for the next generation of decision support and quality management.^{ix}

The measures developed by interRAI were chosen as an approach^x to standardize some of the C-HOBIC concepts as they are valid and reliable measures that are utilized already in many sectors of the health-care system across Canada. The interRAI suite of measures became a Canada Approved Standard (CAS) in January 2014. Standardized coding such as that developed by C-HOBIC for a subset of the interRAI concepts will enable data aggregation and health system use. While many organizations are focusing on collecting information for internal use, the collection of standardized outcomes along with the development of EHRs will offer the opportunity to examine clinical outcomes across the continuum of care. With increasingly complex and chronic conditions this is essential.

Clinicians in Manitoba reported confusion regarding the “many assessments” they were required to complete. The C-HOBIC measures are an assessment of clinical status at that point in time, whereas scales such as the Braden scale are risk assessment scales. There are many tools/scales that have been implemented in practice environments and it is important that clinicians understand the purpose of these different tools and how they relate to practice. This requires time and continued communication and education.

Currently, the C-HOBIC assessments are completed on admission and discharge to an organization. Clinicians on the surgical units in Manitoba had concerns about the fact that assessment was completed post-op (i.e., on admission) and then on discharge and the implications of this on clinical outcomes. They quite correctly suggested the usefulness of gathering C-HOBIC data in pre-operative assessment clinics prior to actual hospital admission. Health care is to some extent still focused on sector-specific data and clinicians do not see the bigger picture of cross-sector information. As data standards and information become more integrated across the health-care continuum the opportunity exists to follow clinical outcomes across the continuum and also support the secondary use of data. For example, collection of standardized data about function and pain at various points in time, such as when a patient first presents to a clinician with knee pain, before surgery, after surgery, on discharge from hospital, on discharge from rehabilitation or home care, and six months or one year later, will facilitate

understanding of what type of patients benefit from knee surgeries and what interventions produce better outcomes. This type of information is required for the health-care system to function efficiently and effectively.

As EHRs are further developed, the availability of clinical documentation that is based on data standards will facilitate sharing of information across the health-care continuum. Furthermore, clinicians will require a summary of information during transitions so that they do not have to read through sizable amounts of information; the C-HOBIC TSRs developed for this initiative provide two approaches to summarizing standard information to support care across the continuum.

Many quality improvement initiatives have relied on productivity and process indicators because of their availability. C-HOBIC data offer clinicians and executives the opportunity to examine clinical outcomes and look at evidence-informed practice for the care of individual patients and for aggregated patient populations both within organizations and as patients transition to other sectors of health-care system. The C-HOBIC TSR's use of standardized clinical information facilitates a coordinated information exchange between health-care providers. There is increasing research on the importance of strengthening communication through data sharing between all health providers.^{xi} While each item provides clinical value, the whole suite of measures presents clinicians with vital information about function, continence, symptoms and readiness for discharge. There is evidence to support the value of this data set in terms of readmissions,¹ predictive ability regarding length of stay and need for alternate level of care,^{xii} the relationship between therapeutic self-care and adverse events, and health system utilization.^{xiii} With the increased focus on senior care and readmissions this information will continue to add value within a health-care system that is focused on efficiency and quality.

Conclusion

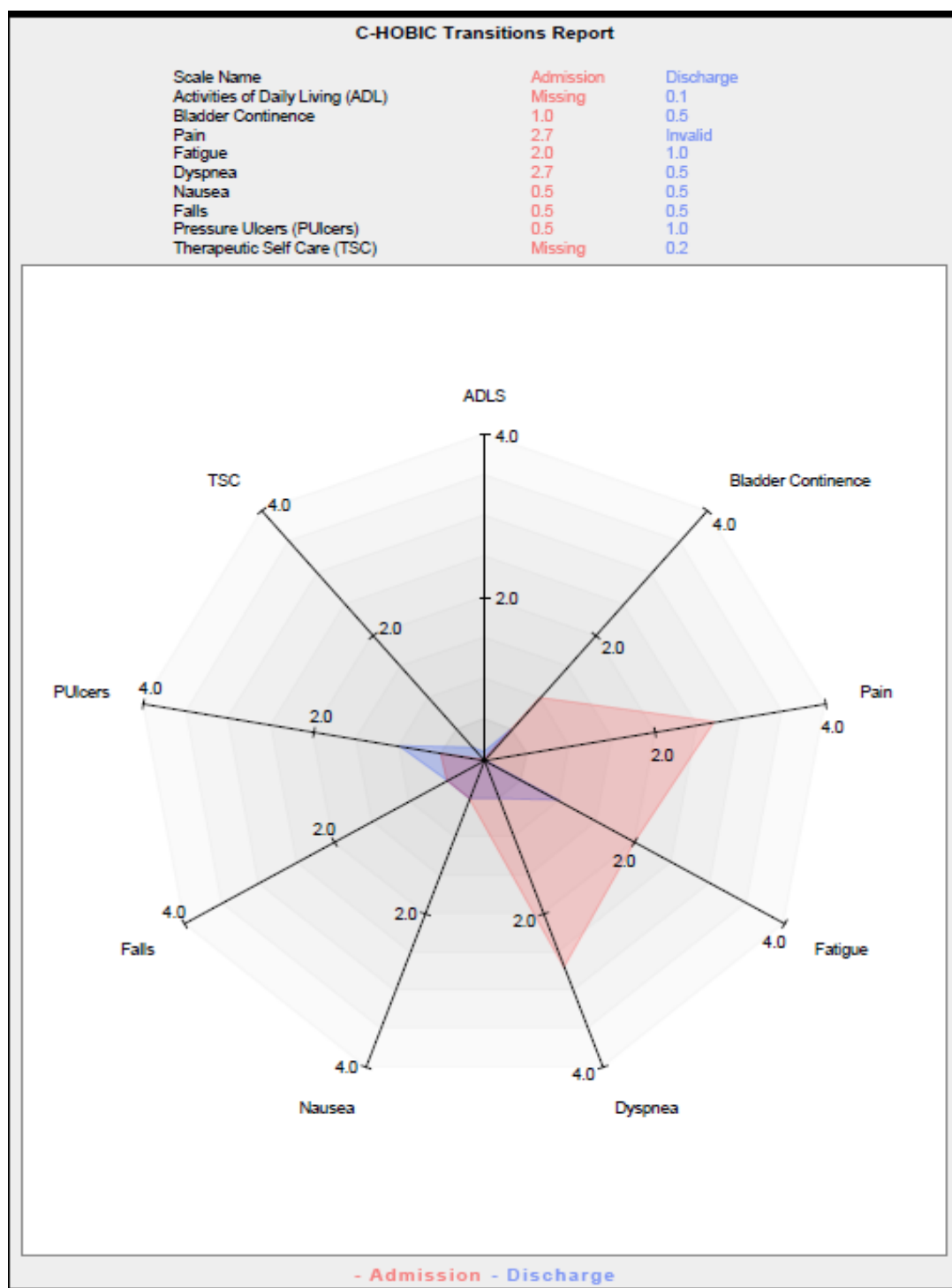
The collection of evidence-based standardized clinical outcomes offers clinicians the opportunity to improve health outcomes for the people for whom they provide care. The sharing of this information in a standardized synoptic format between and among health-care sectors and health-care providers enhances communication and provides information that enables care to be planned and resources to be used in such a way as to optimize health. Access to the C-HOBIC information and the C-HOBIC TSR supports the coordination of care as the patient transitions from one organization or level of care to another, improving the effectiveness of care. This type of information is especially important for an aging population and patients with chronic diseases.

If the benefit of EHRs is to be fully realized, they need to provide patient-centred information that is of value to clinicians and that supports care across the continuum. The C-HOBIC data set provides high-quality data that are useful, can be integrated across the care continuum and are relevant to decision-making within the health-care environment.

Appendix A: C-HOBIC Steering Committee

Name		Job Title/Organization
Lori	Lamont	Vice-President and Chief Nursing Officer, Winnipeg Regional Health Authority
Heather	Tabin	Project Director, Manitoba eHealth
Dale	Anderson	Senior Consultant, Stakeholder Engagement, Hamilton Niagara Haldimand Brant LHIN
Kirsten	Krull	Vice-President, Professional Affairs, and Chief Nursing Executive, Hamilton Health Sciences
Anne	Sutherland Boal	Chief Executive Officer, Canadian Nurses Association
Sue	Van DeVelde-Coke	President, Academy of Canadian Executive Nurses
Maureen	Charlebois	Chief Nursing Executive and Group Director, Clinical Adoption, Canada Health Infoway
Sandra Laurianne Barbara	McDonald-Rencz Jodouin Foster	Executive Director, Office of Nursing Policy, Health Canada, Senior Nursing Advisor, Office of Nursing Policy, Strategic Policy Branch, Health Canada Nurse manager, Nursing Policy Unit, Health Canada
Douglas	Yeo	Director, Methodologies and Specialized Care, Canadian Institute for Health and Information
Peter	Catford	President, HInext Inc.

Appendix B: Ontario Transition Synoptic Report



Appendix C: C-HOBIC TSR — Using the Synoptic Report in Practice



C-HOBIC Integration into ClinicalConnect™

1. What is C-HOBIC?

C-HOBIC ([Canadian Health Outcomes for Better Information and Care](#)) is a project that introduces a standardized approach to patient assessments. Sponsored and managed by the Canadian Nurses Association and funded with contributions from Canada Health Infoway and participating provincial partners, C-HOBIC adopted the methodology developed by [Health Outcomes for Better Information and Care](#) (HOBIC) in Ontario, which was funded by the Ministry of Health and Long-term Care (MOHLTC). The C-HOBIC data set was designated as a [Canada Approved Standard](#) in January 2012 through the pan-Canadian standards process and was also approved by the [Ontario Health Informatics Standards Council](#) in April 2012.

2. What clinical outcomes are collected as part of C-HOBIC?

The following clinical outcomes are collected in a standardized format on admission and discharge from participating hospitals:

- Functional status and continence
- Symptom management (pain, nausea, fatigue, dyspnea)
- Number of falls
- Pressure ulcers
- Therapeutic self-care (readiness for discharge, i.e., medication knowledge, ability to manage symptoms and carry out treatments and knowledge of who to contact in an emergency).

3. What is the purpose of the C-HOBIC Transitions Synoptic Report?

The C-HOBIC Transitions Synoptic Report (C-HOBIC TSR) is a summary report of the normalized admission and discharge scores displayed graphically (see attachment A). This report is being made available to view and download through the ClinicalConnect™ secure web portal. Patients who receive care in a participating acute care hospital will have a C-HOBIC TSR available to health- care providers (HCP) at other health service provider organizations (HSP) within the Hamilton Niagara Haldimand Brant (HNHB) and Waterloo Wellington LHINs to support patient care planning and management as they transition to another care setting.

4. What sites in Ontario are participating in this initiative?

Currently the following sites participate in HOBIC and therefore have data to populate the C-HOBIC TSR:

- Hamilton Health Sciences: General Site and Juravinski Site
- St. Mary's General Hospital
- Haldimand War Memorial Hospital
- Niagara Health System: Niagara-On-The-Lake Site and Douglas Memorial Site
- Norfolk General Hospital
- Joseph Brant Hospital
- Brant Community Healthcare System
- Brantford General Site
- Grand River Hospital: Kitchener-Waterloo Site and Freeport Site

5. What are some sites not participating?

At this time this project is focused on acute care sites that are participating in the HOBIC program.

6. How is C-HOBIC Transition Synoptic Report accessed through ClinicalConnect™?

HCPs who are authorized to access patient information in ClinicalConnect™ can locate the C-HOBIC TSR in the Transcription module. Personal identifiers are not on the C-HOBIC TSR. The Event Date associated with the C-HOBIC TSR is the encounter discharge date. Only the most current C-HOBIC TSR will display in ClinicalConnect™. Confirm that the C-HOBIC displayed is concurrent with the most recent hospital encounter.

The screenshot shows the ClinicalConnect interface. On the left is a 'Main Menu' with various modules. The central area displays patient information for 'CLINICAL CONNECT' and a list of transcription reports. The 'C-HOBIC Transition Report' is highlighted in green.

Event Date	Transcribed Date	Name	Department	Dictated By	Status	Facility
26/08/2010	26/08/2010 14:56	Consultation	HEALTH RECORDS/TRANSCRIPTION	General, Libby	Signed	General
26/08/2010	26/08/2010 14:54	Consultation	HEALTH RECORDS/TRANSCRIPTION	Adam, Christina Marie	Signed	General
26/08/2010	26/08/2010 14:54	Discharge Summary	HEALTH RECORDS/TRANSCRIPTION	Amundson, Heather Jean	Signed	General
25/08/2010	25/08/2010 15:34	Echo Report	MEDICAL DIAGNOSTIC UNIT	Europe, Dornalee	Signed	General

7. How will the C-HOBIC Transition Synoptic Report assist me in my practice?

By comparing the clinical outcomes between admission and discharge, the HCP can plan the appropriate care and resources to manage ongoing patient care to optimize health. Access to this information supports the coordination and effectiveness of care between HCPs and HSP as the patient transitions from one organization or level of care to another: family health teams, community health centres, community care access centres, hospitals and nurse practitioner led clinics will find that this coordinated approach facilitates excellent care for all but is especially important in chronic care management for those high-needs patients identified in the MOHLTC Health Links initiatives. The following evidence illustrates how the C-HOBIC TSR when applied to practice has the potential to help reduce readmission and optimize health.

Research by Dr. Walter Wodchis linked the HOBIC data to data sets held at the Canadian Institute for Health Information (Discharge Abstract Database, DAD) and found that therapeutic

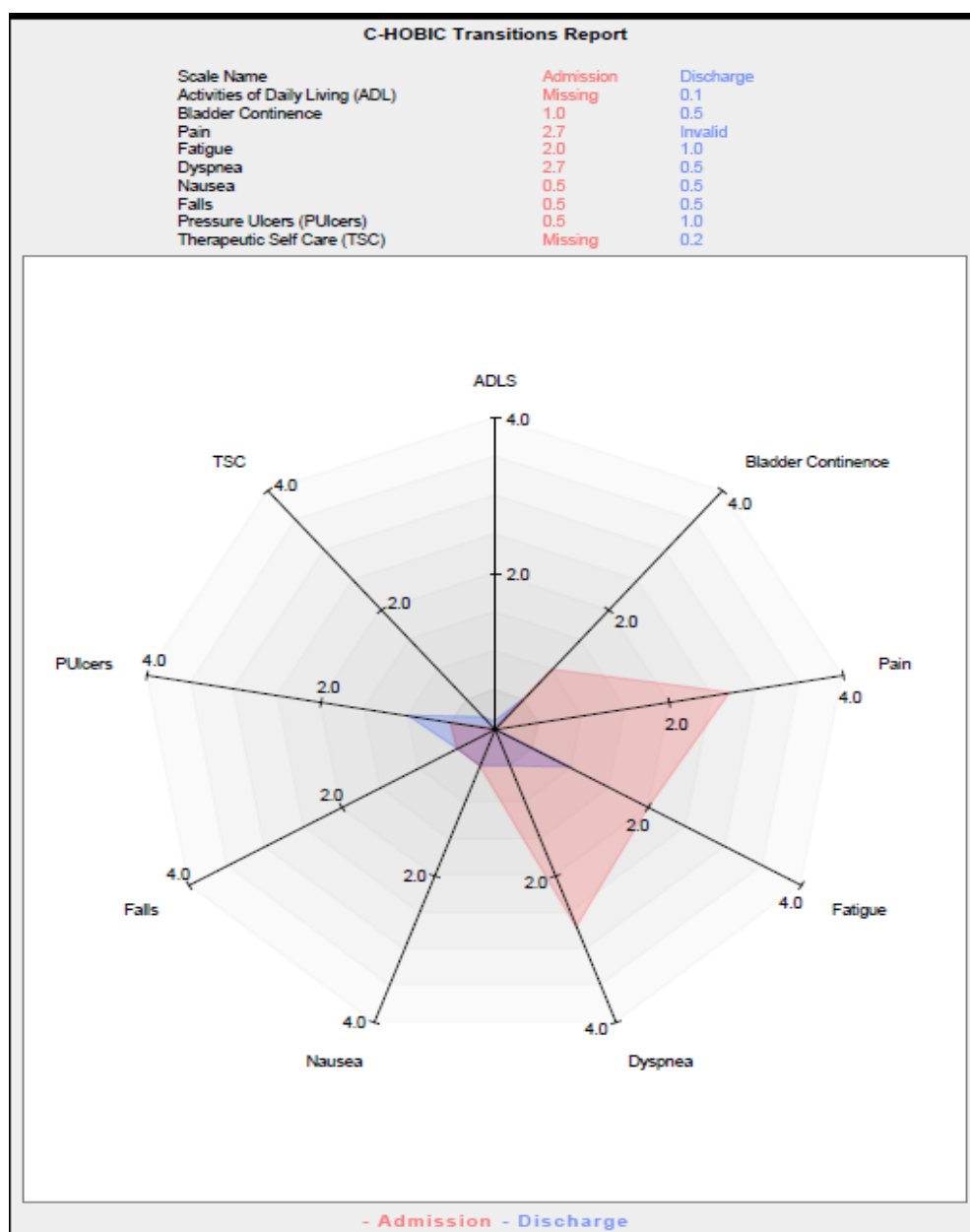
self-care (TSC) scores showed a consistent and significant protective effect for readmission to acute care at 7, 30 and 90 days. A one-point improvement in TSC scores was associated with approximately a 10 per cent reduction in the likelihood of readmission. Nausea was more strongly related to early readmissions (3, 7, and 30 days), while dyspnea was more strongly related to readmission at later stages (30 and 90 days).

8. Using the C-HOBIC Transition Synoptic Report in your practice

The C-HOBIC TSR is a summary report of the normalized admission and discharge scores that are displayed graphically. By examining the changes in scores from admission to discharge you will be able to focus care planning on areas of the person's need for interventions after discharge from hospital.

For example, in the C-HOBIC TSR below the following changes have occurred:

- **ADLs:** The admission score is missing – it may be that the patient was unable to ambulate on admission due to shortness of breath and pain. On discharge the normalized score is 0.1. The patient is able to manage ambulation on discharge without any issues.
- **Bladder continence:** On admission the score is 1.0, which represents some issues with bladder continence. On discharge the score is 0.5* (see note below) — the patient is continent on discharge.
- **Pain:** The pain score was 2.7 on admission and noted as “missing” on discharge. This means the discharge assessment was incomplete. While the discharge score is missing the fact that this patient had pain on admission should result in this issue being discussed with the patient in terms of care planning.
- **Fatigue:** On admission the normalized score was 2.0 and on discharge it is 1.0. The fatigue level has improved but there is still some fatigue present and it would be beneficial to discuss this with the patient in terms of their ability to manage their care.
- **Dyspnea:** The dyspnea score was 2.5 on admission and 0.5 on discharge. The shortness of breath that the patient was admitted with has been addressed; however, it is important to continue to monitor this symptom.
- **Nausea:** The score was 0.5 on admission and on 0.5 discharge. This is not an issue for this patient.
- **Falls:** The score was 0.5 on admission and 0.5 on discharge. This patient has no history of falls in the last 90 days.
- **Pressure ulcers:** The normalized score was 0.5 on admission and 1.0 on discharge. This score reflects that the patient has developed some skin issues during their hospital stay and this will need to be addressed in a care plan.
- **Therapeutic self-care:** The score was missing on admission and coded as 0.2 on discharge. This score reflects that the patient is now able to manage their therapeutic self-care.



Please note the following:

- If a scale has a value of 0 it will be displayed as a 0.5. This is so that the scales do not disappear in the middle of the C-HOBIC TSR.
- If all the subscales are missing no report will be generated.
- If either the admission or discharge assessment has a missing scale the missing subscale will be displayed as a 0. This scale will be labelled as “missing” in the C-HOBIC TSR legend.

If you have any questions/comments about the C-HOBIC Transition Synoptic Report please contact Peggy White, Project Director, at: pwhite@hobic-outcomes.ca

Appendix D: Case Study

Case Scenario — Patient with Congestive Heart Failure

Mrs. S is a 78-year-old female who has had frequent admissions to her local acute care hospital over the past five years due to her congestive heart failure (CHF). Each time she has been discharged home with home care but discharged after one visit as her symptoms have improved and she is able to manage her own care. Usually within four to six weeks she again experiences shortness of breath and ends up back in the emergency department.

Mrs. S lives alone in a one-bedroom condo. On admission to acute care this time the nurse assesses Mrs. Smith and asks her specific questions about her functional status, dyspnea, fatigue and knowledge of medications and ability to manage her care after discharge

Mrs. S reports that she has shortness of breath and is unable to do any activities and that she is so tired that she is unable to start day-to-day activities. She is able to get to the bathroom but too tired and short of breath to cook and manage her bathing. She has swelling in her feet and ankles and she can't wear her shoes. She does not have any nausea or pain, she has no history of falls and her skin is clear. Mrs. S is prescribed blood work, chest X-ray and intravenous diuretics in addition to her digoxin. A referral is made to physiotherapy for assessment regarding exercise and lifestyle changes required related to her CHF. Also an occupational therapy referral is made regarding energy management.

Mrs. S is in the hospital for four days and she now only has dyspnea when she walks a long distance. She reports that she has no fatigue and is able to bathe herself without becoming short of breath. The occupational therapist reports that Mrs. S is able to prepare a meal and able to eat without shortness of breath. The physical therapist reports that she is able to walk in the corridor without shortness of breath. A referral is made to pharmacy for a pharmacist to meet with her to go through her medications prior to discharge and make sure that she understands why she is taking the medications. Mrs. S meets with the dietician who provides her with information regarding restricting her sodium and fluid intake in her home.

Forty-eight hours before her discharge Mrs. S is again asked specific questions about her functional status, dyspnea and fatigue levels. She reports that she is able to bathe and dress herself but has some shortness of breath when performing moderate activities such as taking a long walk or doing stairs but has no fatigue at this time. While this is an improvement from her admission the registered nurse (RN) tells Mrs. S that they know that people who have dyspnea and difficulty managing their self-care often end up back in the hospital and that they are going to put a plan of care in place to work with her to support her in managing her care and remaining in the community. Mrs. S reports that she is sick of being in and out of the hospital and will do whatever is needed so that she can remain in her home so she can have her grandchildren for visits and she also mentions that she has lots of friends in her building.

On discharge she is referred to her local Health Links and assigned a RN care coordinator. At Mrs. S's first meeting with the care coordinator, the care coordinator logs into the ClinicalConnect™ portal to access Mrs. S's discharge notes. She notes from the C-HOBIC TSR that on admission Mrs. S had a score of 4 for fatigue, dyspnea and therapeutic self-care and recognizes the need for a plan of care to address

these issues to prevent readmissions and support Mrs. S in the community. Mrs. S and her daughter work with the care coordinator to develop a care plan that focuses on the following:

- Medications:
 - Mrs. S is made aware of the need to take oral medications as prescribed. She is instructed to familiarize herself with her medications and follow the doctor's instructions. The nurse reinforces the point that heart failure medications are used to reduce symptoms and that one of the most common reasons for rehospitalization for heart failure is not taking medications properly.
 - Mrs. S is instructed to carry a medication list and know the names and doses of the drugs she is taking and why she is taking them.
 - She is reminded that she needs to take her medicine at the same time every day. She is reminded to keep her medications in the original container and use a weekly pill box to ensure that she doesn't miss a dose. She is also reminded of the need to make sure that she calls in refills before she runs out of pills.
- Monitoring weight:
 - Mrs. S is provided with a weight chart and instructed on how to complete the chart. She is instructed to weigh herself each morning before breakfast and after urinating. She should have on the same amount of clothing, and use the same scale in the same spot daily. She is instructed to record her weight on the chart and to call the care coordinator if she experiences a two- or three-pound weight gain over a two-day period or five pounds in one week.
 - She is made aware that an increase in weight can be an early indication of worsening of congestive heart failure. If caught early, an additional diuretic (fluid pill) can be prescribed and possibly avoid the need for rehospitalization.
- Monitoring salt and fluid intake
 - Salt: Mrs. S is to familiarize herself with the amount of salt in her diet: she is allowed two grams of sodium each day.
 - Instructions:
 - Salt causes the body to hold onto water, causing an increase in body weight, swelling and shortness of breath. She is told that if she eats too much salt or drinks too much fluid her body's water content may increase and make her heart work harder.
 - She should consider taking the salt shaker off the table.
 - She is reminded to read all labels on foods and to avoid processed foods and meats and canned soups and vegetables as they contain a lot of salt.
 - Fluid: Mrs. S is told that she will need to monitor the amount of fluid she drinks daily.
 - She should plan out her fluid intake to include the amount of water needed to take her medications, as well as a drink with meals. The care coordinator shows her what a litre of fluid looks like and tells her that she is probably drinking more than a litre of fluid a day.
 - She is told that she shouldn't forget to include the fluids in the foods she is eating, particularly soups and broths. She can use hard candies or ice chips in

moderation for dry mouth throughout the day.

- Activity and exercise
 - Mrs. S is made aware that even modest increases in activity can help to reduce fatigue and shortness of breath and can improve well-being.
 - Mrs. S is provided with the names and contact information for exercise programs for seniors that are in her community.

Visit with family health team

Mrs. S's general practitioner logs into ClinicalConnect™ to access Mrs. S's X-ray, laboratory work, care plan and discharge transcription records. He notices that her blood work was within normal limits on discharge and that her chest X-ray is clear. He notes that on the C-HOBIC TSR she still had a dyspnea score of 1 and also a therapeutic self-care score of 2 on discharge. He inquires about her dyspnea and fatigue levels now and asks her how she is managing her care in her home. Mrs. S reports that she is not fatigued but experiences some shortness of breath with moderate activity but that she is able to manage her cooking and cleaning and that her daughter takes her shopping every weekend. He discusses with her the medications she is taking and asks her if she is taking them as prescribed. Mrs. S reports that she is. Mrs. S meets with the dietician to review her understanding of her diet restrictions and the pharmacist to review and discuss her medications. The nurse meets with Mrs. S to review her weight chart and answer any questions that Mrs. S has. Mrs. S is told to call the care coordinator if she has any questions and makes a follow-up appointment for a family health team visit in three months.

Follow-up

One year later Mrs. S is still in her own home and has had no further readmissions to hospital. She visits her care coordinator monthly and her family health team every three months. She is closely monitoring her diet and takes her medications as prescribed. Mrs. S is weighing herself daily and attends a community exercise program two times a week.

Appendix E: Manitoba Transition Summary Report



CHOBIC Transition Summary

CHOBIC, test2

58y

05-Feb-1955

Female

MRN: 01501036

SBGH-A7SO-A7027-02

Attending MD: Galimova, Lena

Visit: 8001918 DSC

PHIN: 252452345

Reg: 545234524

Language - Rajasthani

Interpreter - No

This report provides a summary (i.e. a synoptic report) of the patient's C-HOBIC scores on admission and discharge.
The scores have been normalized to provide a quick visual snapshot.

C-HOBIC Scale Name	Admission	Discharge
ADL Activities of Daily Living - Higher score reflects greater need for assistance. <i>Summary ability to bath, transfer to toilet, ambulate and feed.</i> 0 - independent 1 - set up help/supervision 2 - limited assistance 3 - extensive assistance 4 - total dependence	1.24	Incomplete
Bladder Continence - Higher score reflects increasing incontinence 0 - Continent 1 - Control with catheter 2 - Infrequently incontinent 3 - Frequently incontinent 4 - Incontinent	3.00	1.00
Pain - Higher score reflects greater intensity of pain 0 - No Pain 1 - Mild 2 - Moderate 3 - Severe 4 - Worst Possible	Incomplete	1.33
Fatigue - Higher score reflects greater fatigue when performing normal daily activities 0 - None 1 - Minimal, diminished energy but completes normal day-to-day activities 2 - Moderate, due to diminished energy unable to finish normal day-to-day activities 3 - Severe, due to diminished energy- unable to start normal day-to-day activities 4 - Unable to commence any normal day-to-day activities due to diminished energy	4.00	3.00
Dyspnea - Higher score reflects increasingly greater levels of dyspnea 0 - Absence of dyspnea 1 - Absence at rest but present when performed moderate activities 2 - Absent at rest but present when performed normal day-to-day activities 3 - Present at rest	1.33	2.67
Nausea - Higher score reflects increasingly greater levels of nausea 0 - No nausea 1 - Mild nausea: occasionally experienced but does not interfere with eating and/or activities 2 - Moderate nausea: interferes somewhat with eating and/or activities most days 3 - Severe nausea: interferes daily with eating and/or activities 4 - Incapacitating: remains in bed part of each day due to nausea and interferes with eating	Incomplete	2.00
Falls 0 - No falls in the last 90 days 1 - No fall in last 30 days but fell 31-90 days ago 2 - One fall in last 30 days 3 - Two or more falls in last 30 days	1.33	0.00
Pressure Ulcers 0 - No pressure ulcer 1 - Any area of persistent skin redness 2 - Partial loss of skin layers 3 - Deep craters in skin 4 - Breaks in skin exposing muscle or bone 5 - Unstaged	2.00	2.00
Therapeutic Self-Care - Higher score reflects the greater need for assistance. <i>Summary of a person's knowledge and ability to take their medications, manage their symptoms and perform everyday activities and ability to contact someone if there is an emergency.</i> 0 - Assistance not required 1 - Minimal Assistance Required 2 - Heavy Assistance required	Incomplete	Incomplete

Confidential Patient Information

Report Requested By: Fradkov, Marianna (Analyst)

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Appendix F: C-HOBIC FAQs



FAQs

1. What is C-HOBIC?

C-HOBIC (Canadian Health Outcomes for Better Information and Care) is a project that introduces a systematic, structured language to patient assessment and documentation, in acute care, complex continuing care, long-term care and home care. Sponsored and managed by the Canadian Nurses Association, and funded with contributions from Canada Health Infoway and other provincial partners, C-HOBIC uses the same methodology developed in Ontario through its HOBIC program.

These clinical outcomes have a concept definition, a valid and reliable measure, and empirical evidence linking them to nursing inputs or interventions. Each concept is mapped to ICNP®, the clinical reference terminology for nursing developed by the International Council of Nurses, which provides a standardized clinical term and an associated coding.

Phase 1 of C-HOBIC (May 2007 to June 2009) was implemented in Ontario (acute care, long-term care, complex continuing care and home care), Manitoba (long-term and home care) and Saskatchewan (long-term care). In this phase, nurses were taught about collecting standardized clinical outcomes and how to use this information to plan for and evaluate care.

Phase 2 of C-HOBIC (currently underway) is due to be completed in March 2014. In Manitoba, the second phase of C-HOBIC will build standardized measures into admission and discharge assessment screens (with the Allscripts system) at the St. Boniface Hospital. Using C-HOBIC's clinical information, St. Boniface will make available a synoptic report to support patient transitions from acute care to other health-system sectors. In Ontario, this same type of synoptic report will be available on the ClinicalConnect portal to assist patient transitions within a Local Health Integration Network (LHIN).

2. What are the objectives of C-HOBIC?

C-HOBIC's aims are to

- standardize the C-HOBIC language concepts in accordance with ICNP® and the Systematized Nomenclature of Medicine — Clinical Terms® (SNOMED CT®);
- capture patient outcome data related to nursing care across four sectors of the health system: acute care, complex continuing care, long-term care and home care;
- share the captured data as patients transition across the various sectors of the health system;
- store the captured and standardized data in relevant, secure jurisdictional data repositories (or databases) in preparation for entry into provincial electronic health records (EHRs); and
- facilitate the use of the data for aggregation and analysis at provincial and national levels to inform studies and comparisons related to health-system use and performance indicators.

3. What are the benefits of collecting this information?

There are many benefits to collecting this standardized suite of clinical data:

- It gives nurses access to real-time information about the effect of nursing care on patients.
- It provides health-care executives with real-time reports they can link with staffing, financial and other data (such as length of stay and readmissions), which helps them understand how well their unit/organization is doing to improve clinical outcomes and prepare patients for discharge.
- It offers researchers standardized aggregate data to support examinations into how well the system is working to meet people's health-care needs.

4. How does C-HOBIC contribute to the priorities for health-care renewal in Canada?

The collection of standardized clinical information across the continuum of care will support patient safety, increase the use of information technology and provide clinical information to support professional accountability.

5. Are there other benefits to collecting the C-HOBIC data set?

The C-HOBIC team has been in discussions with the Canadian Institute for Health Information (CIHI) about ways to include C-HOBIC data in the Discharge Abstract Database (DAD). Including the C-HOBIC data set in DAD will provide standardized patient-centred outcomes data to support aggregation and analysis of clinical outcomes, health-system use and performance reporting.

With C-HOBIC data sets at CIHI, we could also link it with other data sets, such as those in home care and long-term care homes, and understand clinical outcomes across the continuum of care.

6. Is C-HOBIC different from the Canadian National Nursing Quality Report (NNQR-C) or the Nursing Quality Indicators for Reporting and Evaluation (NQuIRE®)?

C-HOBIC is working in collaboration with NNQR-C and NQuIRE® (a Registered Nurses' Association of Ontario initiative). Together, these programs are best seen as complementary: C-HOBIC focuses on patient assessment and outcome data; NNQR-C on data to report nursing and organizational performance; and NQuIRE® on nursing interventions and best practices.

All three initiatives recognize the use of evidence-based, meaningful quality indicators as an essential component of accountability for a sustainable health-care system.

For more information, visit the C-HOBIC webpage at http://www2.cna-aiic.ca/c-hobic/about/default_e.aspx

Appendix G: C-HOBIC Key Messages



Key Messages

- C-HOBIC introduces a systematic, structured language to patient assessment and documentation, in acute care, complex continuing care, long-term care and home care.
- The C-HOBIC data set consists of the following categories of evidence-based clinical outcomes:
 - Functional status and continence
 - Symptoms (pain, nausea, fatigue, dyspnea)
 - Safety outcomes (falls, pressure ulcers)
 - Therapeutic self-care (readiness for discharge)
- The C-HOBIC data set was designated as a Canadian Approved Standard (CAS) on January 11, 2012.
- Collecting standardized clinical outcomes data for patients as they move across the health-care system will allow for comparative analysis within organizations and industry benchmarking. In addition, it will provide the information necessary to evaluate operational decisions and resource allocation and support continuity across the continuum of care.
- It is important for the nursing profession to collect standardized information if nurses are to demonstrate their contribution to patient outcomes, identify areas for quality improvement, show how clinical practice leads to improved outcomes and provide information to support clinical accountability.
- The C-HOBIC team is in discussions with the Canadian Institute for Health Information regarding the inclusion of the C-HOBIC data set in the Discharge Abstract Database (DAD). For this inclusion to occur, nursing leaders across Canada need to advocate at the local, provincial and national levels. Including the C-HOBIC data set in DAD will provide standardized patient-centred outcomes data to support aggregation and analysis of clinical outcomes, health-system use and performance reporting.

For more information visit the C-HOBIC webpage at http://www2.cna-aiic.ca/c-hobic/about/default_e.aspx

Appendix H: C-HOBIC Communications

February 13, 2012	Presentation to Hamilton Niagara Haldimand Brant LHIN vice-presidents
Spring 2012	Article in <i>Nursing Leadership</i> entitled “ C-HOBIC: Standardized Clinical Outcomes to Support Evidence-Informed Nursing Care ” by Dr. Kathryn Hannah and Peggy White
April 5, 2012	Joint press release from the Canadian Nurses Association and Canada Health Infoway: New Advances in Patient Safety through Nursing Assessments in Electronic Health Records
June 22, 2012	C-HOBIC/SNOMED-CT mapping session attended by 16 international nursing terminology experts: four from the IHTSDO nursing SIG, five from the International Council of Nurses ICNP® program and seven from Canada
June 23, 2012	C-HOBIC Phase 2 project highlighted as a leader in the area of standards for nursing at the Canadian Nursing Informatics Association meeting in Montreal
June 24, 2012	Presentation entitled C-HOBIC — Standardized Information to Support Clinical Practice and Quality Patient Care across Canada at the 11 th International Congress on Nursing Informatics
August 27, 2012	Presentation on C-HOBIC to Standards Collaborative Working Group 2
Fall 2012	Article in <i>Nursing Leadership</i> : “ Measuring Outcomes of Nursing Care, Improving the Health of Canadians: NNQR(C), C-HOBIC and NQuiRE ”
November 2012	Presentation at the 2012 Infoway Fall Partnership Conference and InfoFair — C-HOBIC — Demonstrating the Value of Standardization for Nurses in Canada
January 2013	C-HOBIC web page updated http://c-hobic.cna-aiic.ca/toolkit/default_e.aspx
February 5, 2013	Presentation about the C-HOBIC data set at the 2nd Annual Nurse Executive Leadership Academy sponsored by the Registered Nurses’ Association of Ontario
Feb 15, 2013	Presentation to the College of Registered Nurses of Manitoba: Nursing Informatics: Leading the Way
March 13, 2013	Circulation of C-HOBIC key messages and FAQs to nursing leaders and nurse informaticians across Canada
March 23, 2013	Presentation by Dr. Margie Kennedy to the Association for Common European Nursing Diagnoses, Interventions and Outcomes (ACENDIO) at the 9th Biennial European Conference in Dublin entitled Validating the C-HOBIC Mapping to SNOMED CT
May 13, 2013	Presentation at CNIA Conference 2013: May 12th – 15th, 2013, at the Palais de Congrès, Montréal, Québec entitled C-HOBIC – Standardizing Clinical Outcomes in Canada
May 2013	C-HOBIC FAQs and key messages circulated to the Canadian Nursing Informatics Association, Ontario Nursing Informatics Group and nursing leaders across Canada

July 19, 2013	Presentation to Alberta Health Services nursing leadership team
July 31, 2013	InspireNet presentation on C-HOBIC . Session taped for future viewing by InspireNet users
September 4, 2013	WebEx presentation to the nursing interest group of the International Medical Informatics Association on C-HOBIC
September 24, 2013	Presentation to the Waterloo Wellington resource user group for ClinicalConnect™ on the C-HOBIC Transition Synoptic Report and how this can be used in practice
November 15, 2013	Presentation to chief nursing executives in British Columbia on C-HOBIC
November 26, 2013	Presentation to Academy of Canadian Executive Nurses regarding C-HOBIC and the value of this information for nurse leaders in Canada
December 5, 2013	Presentation to the Health Information Standards Committee for Alberta (HISCA) terminology subcommittee
December 12, 2013	Presentation to community care access centre directors in the Hamilton Niagara Haldimand Brant and Waterloo Wellington LHINs on the C-HOBIC Transition Synoptic Report
December 17, 2013	Presentation on C-HOBIC to the Providence Health Care in Vancouver professional practice team
February 22, 2014	Presentation at the National Institute on Nursing Informatics
February 27, 2014	Presentation to the clinical adoption — joint clinician reference group meeting (Infoway nursing reference and pharmacy reference groups)
March 12, 2014	Presentation at the annual general meeting of the Ontario Nursing Informatics Group
April 23, 2014	Presentation to the Brant Six Nations Health Links team
May 1, 2014	Presentation to the Waterloo Wellington integration team
June 3, 2014	Presentation at the ehealth 2014 conference — Advancing the Uptake and Perceived Value of Standardized Clinical Data
March 2015	Paper accepted for presentation at the Annual Nursing Leadership Network of Ontario conference
June 2015	Paper accepted for presentation at the ehealth 2015 conference

Appendix I: C-HOBIC Lessons Learned Log

DATE	ISSUE/CHALLENGE	COMMENTS
February 2012	Delays in signing agreements impact project work.	Some senior members moved to other organizations and we had to connect with the new team to make them aware of this initiative and provide the support they needed to become engaged and committed to this project.
June 2012	Lack of a provincial EHR adds challenges in terms of time and costs.	In Ontario we have to connect/communicate/work with the Ministry of Health and Long-term Care, eHealth Ontario, the Institute for Clinical Evaluative Sciences (which manages the HOBIC program), HInext (the HOBIC vendor for software and reporting), ClinicalConnect™ (the portal in the Hamilton Niagara Haldimand Brant LHIN) and MedSeek (the interface software for the ClinicalConnect™ portal).
December 2012	Dealing with many players adds time and costs.	While it is important that there is input from all stakeholders, this can delay progress.
December 2012	The C-HOBIC TSR was developed for an electronic environment. Manitoba does not have an EHR yet and therefore the C-HOBIC TSR will have to be printed on the unit and will be included in the discharge package.	Units do not have colour printers so there is a need to redesign the C-HOBIC TSR for Manitoba.
June 2013	Within the Allscripts™ system they are not able to create the graph that was developed in Ontario.	Manitoba created a different C-HOBIC TSR.
November 2013	Data-sharing agreements are needed.	The timeline for completing data-sharing agreements is challenging. In Ontario the privacy officer at the Institute for Clinical Evaluative Sciences requested copies of the original Privacy Impact Assessments between the sites and ClinicalConnect™. Many of these were signed in 2008 and the organizations have had changes in leadership since then; some sites were unable to

		find the original signed copies. This resulted in delays.
December 2013	Organizations do not always act on lessons learned.	In Ontario sites learned that for clinicians the C-HOBIC measures should be embedded into existing assessments; they should not be on a separate screen. This was communicated to Manitoba; however, they ended up building the C-HOBIC measures as a separate screen. The transfer of learnings is not always applied.
December 2013	For projects with a 2-year time frame it is important to scope out the project.	Projects that involve input and approval from many players across different settings/sectors take a significant amount of time to move from planning to implementation.
December 2013	Communication is required across sites/sectors and diverse clinician groups.	It is important to establish that there is a communication mechanism to support communication with large numbers of clinicians who work in different settings/sectors before beginning a project.
December 2014	Multi-site/multi-province projects involve many key players and organizations.	Budget should provide for and support champions in each organization who have dedicated time to advance the initiative within their organization and stakeholder group.

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