The Health Outcomes for Better Information and Care Initiative: Implementing Nursing Sensitive Outcomes Measurement Across Sectors of the Health Care System

by

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This report has been written by me and has not received any previous academic credit at this or any other institution.

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Executive Summary

The measurement and assessment of patient health outcomes is important for ensuring that health care organizations are providing the best and most effective care. The Health Outcomes for Better Information and Care (HOBIC) initiative is looking to collect outcomes data from across various sectors which are considered sensitive to the care that nurses provide. These include measures related to functional status, symptom management, patient safety and therapeutic self-care.

As the coordinator for the Champlain LHIN, I was able to work with organizations to introduce the HOBIC initiative and in some cases lead the implementation of data collection. During visits with health care organizations, it became increasingly clear that the lack of adoption of clinical documentation systems would prevent widespread uptake of HOBIC in acute care facilities. An evaluation examining possible reasons for the poor adoption of clinical documentation systems is included. Both short and long-term strategies are proposed which would allow for increased update of HOBIC data collection in the acute care sector.

Table of Contents

Introduction

There is a well known business adage which states "you can't manage what you don't measure". This adage hold true for the delivery of health care just like any other business. With an estimated 160 billion dollars spent on the delivery of health services in 2007 (CIHI, 2007) being able to measure and manage costs, quality and accessibility to these services is very important. The evolution and proliferation of information technology into all sectors of society has only accelerated demands for more comprehensive and accurate information. Furthermore, with health care being a topic of intense political and mass media scrutiny, there is an inherent expectation that decisions about our health care spending are supported with the appropriate evidence.

Our current ability to measure and report what treatments or procedures are being done to patients is arguably well understood. For example the number of admissions, number and types of surgeries performed, and use of medications are all tracked and reported on in some manner. But what about other aspects of care? For example, are clients receiving adequate pain management? Is their ability to perform daily activities improved by this treatment? Did they experience any complications as a result of the treatment or follow-up care? While studies do exist to help better understand some of these questions, comprehensive and on-going collection of this type of data currently does not exist. In addition, our ability to measure the usefulness and quality of interventions is dependent on our ability to answer these types of questions.

This is where health outcomes measurement is working to address this gap. A health outcome can be described as "an indicator of change, at least two data collection points are necessary, one at the start of treatment and another at some later time, presumably the conclusion of treatment or some follow up point" (Brown, et. al., 2001). By measuring health outcomes we are able to answer questions beyond just head counts and better understand the role that all health professions play in the delivery of care.

This paper will examine the Health Outcomes for Better Information and Care initiative (HOBIC), my role as Coordinator in the Champlain Local Health Integration Network (LHIN) and how this placement relates to my health informatics training. It then goes on to examine the problem of consistency and overall adoption of electronic documentation systems in the delivery of nursing care services and recommends further actions which could be used by the HOBIC team to improve data collection capability.

Description of the Initiative

HOBIC is an initiative funded by the Ontario Ministry of Health and Long-Term Care (MOHLTC) and administered through the Institute for Clinical Evaluative Studies (ICES). The main goal of HOBIC is to "implement province-wide, standardized collection of patient health outcomes, staffing and quality of work life information reflecting a variety of disciplines including nursing". The origins of this initiative can be traced back to the 1999 report *Good Nursing, Good Health: An Investment for the 21st Century.* The report put forward 8 recommendations which focused on "improving patient care through nursing services; maintaining and enhancing a strong and continuing base of skilled nurses; defining the role for nurses in a restructured health system; and determining the educational qualifications nurses need in this changing environment (Good Nursing, 1999)".

Recommendation 5, in particular, outlined the need for a responsive, evidence-based, cross-sector funding methodology which would promote and reward quality patient outcomes (Good Nursing, 1999). Achieving this recommendation would require timely, accurate and valid information on the delivery of nursing services within the province. Recommendation 6 further emphasized this need by proposing that "information systems used for health care planning, delivery of services and funding provide comprehensive data on health care consumer status, nursing interventions and client outcomes" (Good Nursing, 1999).

Based on these recommendations and further consultation by experts in outcomes and funding methodologies, the nursing and health outcomes project (NHOP) was established to address this gap in nursing data. Later renamed HOBIC to better reflect an expanding project scope beyond nursing, NHOP completed two phases prior to starting the current implementation phase. Work by expert groups in phase one led to the development of a set of nursing sensitive patient outcomes which would later become the base for HOBIC data collection. Nursing sensitive outcomes are those which “are relevant, based on nurses’ scope and domain of practice, and for which there is empirical evidence linking nursing inputs and interventions to the outcomes” (Doran, 2003).

Phase 2 of the initiative looked to pilot test these measures in the real world. The goals of the pilot were to "1) evaluate the feasibility, quality, and utility of instituting outcomes data collection for nurse-sensitive outcomes in acute care, long-term care, complex continuing care and home care; 2) determine the frequency with which it is necessary to collect data on symptoms over the patient’s health care stay for the purpose of outcomes assessment; 3) assess the reliability and validity of the outcome measures; and 4) assess the learning needs and resources required in order to institute nursing-sensitive outcomes assessment within the province of Ontario" (Doran, D. et al., 2004). Ultimately the pilot project found that the collection of the proposed nursing sensitive outcomes were feasible and useful for nursing staff working in acute care (AC), complex continuing care (CCC), long-term care (LTC) and home care (HC).

The third and current phase of this initiative began in 2005 with the goal of province-wide collection of those nursing sensitive patient health outcomes. Some key facts about the implementation include:

- participation in the initiative is voluntary;
- organizations who participate must already have or are in the late stages of implementing electronic clinical documentation;
- funding for the education of staff as well as IT infrastructure required for the collection of HOBIC data at the point of care is provided to organizations who agree to participate;
- data is submitted automatically to HOBIC in real or near-real time.

Implementation team members who work with health facilities within the province are geographically located within specific health integration networks (LHIN). In 2006, the 14 LHINs were established in the province of Ontario to "plan, integrate and fund health services" (LHIN Website, 2008). In the initial stages of the implementation coordinators were hired for two LHINs: North Simcoe Muskoka and Hamilton Niagara Haldimand Brant (Illustration 1 -- LHIN 12 and 4, respectively). As the implementations progressed it

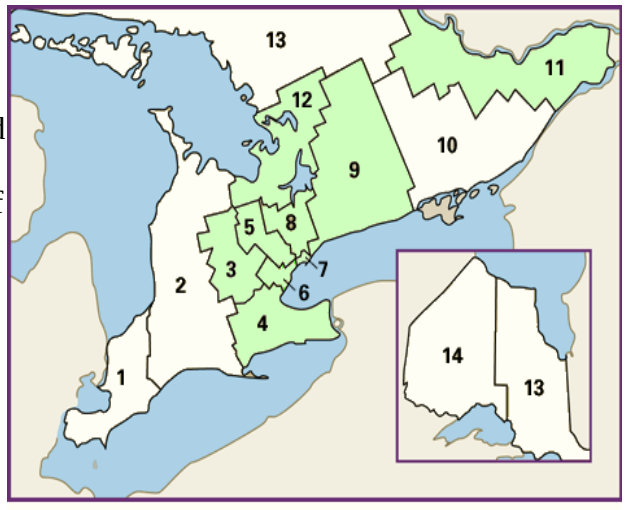

Illustration 1: HOBIC Coordinators by LHIN

was felt that a coordinator with responsibility for recruiting and working with large teaching institutions was required.

As of March 2008 there were 9 coordinators working to implement HOBIC throughout the province. 24 sites are currently live and submitting data to the HOBIC database. This includes 6 acute care, 4 complex continuing care, 13 long-term care and 1 mixed acute / complex continuing care site. An additional 8 are slated for go-live by the end of March 2008.

Currently the database physically resides at the Center for Addiction and Mental Health (CAMH) but will moved to the Institute for Clinical Evaluative Sciences (ICES) by Summer 2008. The move to ICES will allow greater access to the HOBIC data for researchers and health planners. ICES, unlike CAMH, is a prescribed entity under provincial privacy regulations and is therefore "permitted to disclose personal health information without consent for the purposes of planning and management of the health system" (IPC, 2008). At this time Cancer Care Ontario (CCO), the Canadian Institute for Health Information (CIHI) and the Pediatric Oncology Group of Ontario (POGO) are the only other prescribed entities in the province of Ontario.

Work performed

As coordinator for the Champlain LHIN (Ottawa area), my role was to coordinate the implementation of HOBIC in facilities within the LHIN. The scope for the implementation was limited to 3 sectors: acute care (AC), complex continuing care (CCC) and long-term care (LTC). Forty sites were identified as possible candidates for participation in HOBIC within the Champlain LHIN: 17 AC, 22 LTC and 1 mixed LTC/CCC site. Only LTC organizations which were already participating in the provincial MDS initiative were considered eligible for inclusion in HOBIC. These sites would already have data collection systems and processes in place which would minimize the burden of implementing HOBIC.

Implementation of HOBIC typically follows a standard series of steps. These include:

- Introductory meetings with senior nursing leaders in the various health care facilities within the LHIN. These meetings allow us to gauge interest and capability to participate.
- If a facility agrees to participate, coordinate the completion of both IT and education funding proposals.
- Perform "train-the-trainer" sessions with on-site resource person(s). Ultimately this person will be responsible for all on-site training.
- Support training as required.
- Help coordinate other activities (such as interface activation) as required.
- Ensure all project documentation is submitted to ICES in a timely fashion.
- Follow-up evaluation and support.

During the placement period, I was able to meet with senior nurse managers from 31 of the 40 sites. Five sites, all acute care, were not able to participate due to lack of capability to collect data electronically. A further 7 were put on hold either due to lack of available solution from their system vendor or due to resource constraints within the organization. Twelve sites were deciding on next steps. By the end of my placement period, a total of 7 organizations had agreed to participate with 1 site live and one in the midst of implementation.

In addition to my core coordinator duties I took on some responsibility for planning and implementing several electronic tools to help support communication between team members. Up until this time each coordinator was responsible for providing his/her own email - which in addition to the phone, was the primary means of communication. Otherwise, there were no other collaborative tools or shared infrastructure in place. This meant that even simple tasks such as booking time to use the teleconference line or updating status documents was complicated by the lack of tools which allowed for shared viewing and editing. Project materials such as forms, templates and instruction manuals were provided on a CD without the supporting supporting tacit knowledge of how, when and why they should be used. These materials were also frequently updated, which meant having to distribute and manage versions of many of these documents.

In order to facilitate communication between the team members, I implemented the freely available google apps product (www.google.com/a). By using different tools in this product suite we were able to:

- have a common @hobic-outcomes.ca email address.
- book teleconference lines through a shared calendar.
- use online spreadsheets for regular status updates and reporting
- create a shared, password protected intranet site for posting of all project documentation including orientation materials, forms, presentations and procedure manuals.

Relationship to health informatics learnings

My work with the HOBIC initiative allowed me to utilize skills and knowledge I had acquired through most of the health informatics courses. Below I have outlined instances where my health informatics education was used in the course of my work.

Project Management for Health Information Projects

- In my opinion, the knowledge and skills I acquired from the project management course have been the most vital for success on this placement.
- Each site implementation represents a "mini project". With 40 mini projects on the go, being able to draw upon project management tools and techniques allowed me to get started quickly.
- I worked with my colleagues to setup a project flow process which all new coordinators are now using to guide them through the various phases of the implementation.

Statistics and Research Methods

- Client sites frequently have questions about what is possible with the data we are collecting. My statistics and research methods training allowed me to address those questions.
- Additionally I have worked with other HOBIC team members to identify potential methodology errors in how we are presenting and interpreting the data we collect.

Networks and the Web for Health Informatics

- An understanding of how networks function is valuable in this position because client sites are being funded to implementing wireless networks.

- On a number of occasions client sites have had concerns about the security of wireless networks and learning from this course allowed me to effectively address their concerns.
- Being able to provide information on security and encryption methods used for transmitting data was also helpful for some of my client sites.
- Knowledge acquired on topics such as domain names, DNS, etc. were essential for setting up the google apps solution used by the coordinators.

Health Information Flow and Use

- A key theme of this course was on the importance of collecting and evaluating patient health outcomes. This knowledge was useful for my interview for the position as well as being able to explain the importance of health outcomes to our potential client sites.

Health Information Systems and Issues

- Interfaces and HL7 are being used to submit data between the client system and the HOBIC database. Understanding how these work allowed be to better understand how data is submitted to the HOBIC data repository.

Knowledge Management for Health Informatics

- Because we are a virtual team spread across the province, experience with tools to manage knowledge (especially tacit knowledge) has helped immensely.
- Understand the concepts related to clinical decision support are important for truly appreciating the impact that HOBIC can have on the delivery of health care.

Overall, my nursing background and experience coupled with the knowledge I gained through the various health informatics courses have helped me immensely during this placement. Throughout the placement I was able to meet the needs of my clients and convey knowledge I had learned through various courses. In addition I was able to support and aid my fellow coordinators by adding insights and providing tools we had learned to use in our courses.

Adoption of electronic clinical documentation and the impact on health outcomes measurement.

The documentation of nursing care serves a primary purpose as the main "source of reference and communication between nurses and other health care providers" (Martin, et al., 1998). Nurses spend an estimated 15-20% of their time on documentation (Moody & Snyder, 1995) yet use of this information beyond its primary purpose remains relatively low. HOBIC, and initiatives like it, represent a secondary use for nursing care documentation but are hindered by low adoption of systems which are able to appropriately capture and code this information. For example, in the Champlain LHIN only one, of a total of 17 acute care sites, claimed it had an electronic documentation system in place. Furthermore, in long-term care only one third of the facilities in the LHIN are able to capture some form of nursing documentation electronically through their participation in the provincial MDS roll-out. With such low adoption, especially in in the acute care sector, it is apparent that many health facilities [in the Champlain LHIN] have yet to see a compelling reason to justify the investment.

So what potential factor can influence the decision to move ahead with a software implementation such as clinical documentation? Organizational size, culture and capability will no doubt affect not only the decision to move ahead but also the process used to decide which projects take priority. Larger health care organizations are likely to have a more rigid formalized processes for ranking all potential project proposals. Tools such as the project portfolio matrix below, can then be used to quickly visualize the likely success and benefits of all the projects under consideration.

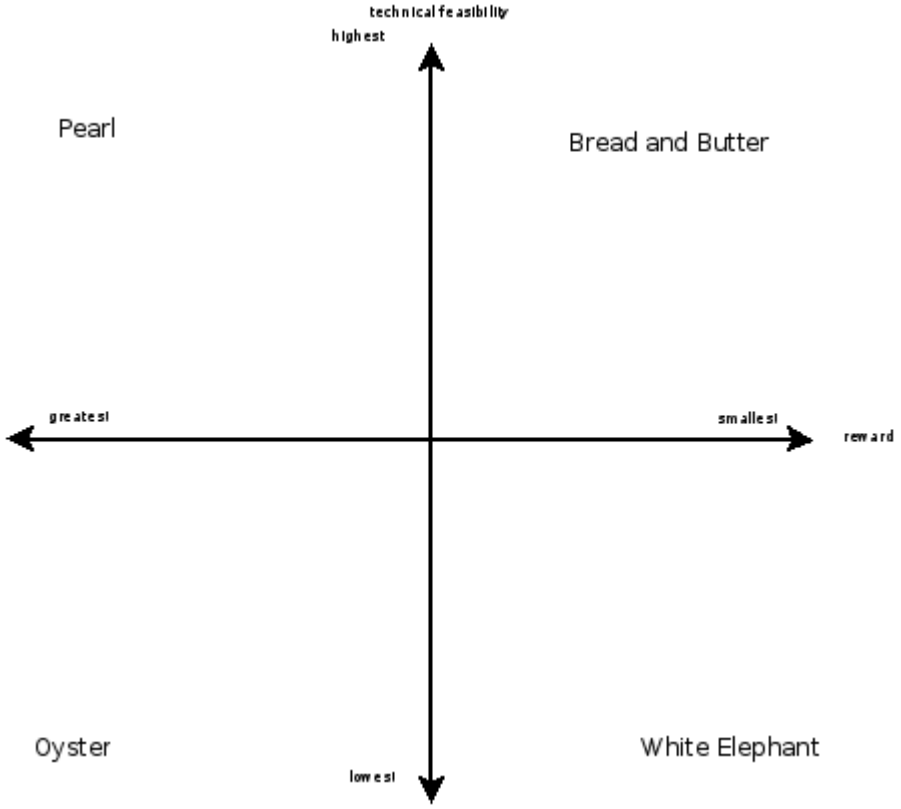

Illustration 3: Project Portfolio Matrix

In the case of clinical documentation systems, the feasibility and rewards associated with implementation would likely be seen as lower than other informatics projects such as CPOE or PACS. In organizations where there is infrastructure for clinical decision support the perceived benefit of implementation would no doubt be viewed as greater than those without any capability to analyze and act on the information they collect. Most community facilities I interviewed as part of the HOBIC introduction did not have decision support capability.

On the other hand, organizations such as the LHINs and the provincial Ministry of Health would likely rank these projects very differently based on their needs. Systems such as CPOE and PACS, while useful for streamlining the delivery of services within a health care organization, add little to the availability of data for planning and decision making. The data collected from a CPOE system can and likely is already being extract from various systems already in place (such as Lab, DI, and Pharmacy). In the case of PACS – the digitization of patient x-rays is not necessarily useful for health system planning. In LTC homes we the desire fore better client outcome information is reflected in the support for the implementation of the MDS in that setting.

An additional factor to consider is the amount of investment already placed into nursing care documentation. Understanding how much is currently spent on the collection nursing information would be useful for understanding the cost of any missed opportunity. In my research, no such estimates were found to exist. In order to estimate this cost I decided to create a crude model which would provide a high/low range of overall money spent in terms of nursing time on documentation. Limiting the analysis to RNs working in direct patient care and using 2006 statistics from CIHI I created a model which provides a rough estimate of the total cost of current nursing care documentation (Appendix A). Using high/low estimates of average hourly wage ($24.5 and $37) and high/low estimates of percent time documenting (15 and 20 %) the projected total cost of nursing care documentation in Canada ranged from 1.1 to 2.1 billion dollars per year (approximately $4284 to $8626 / nurse / year). Using the same methodology, estimates for the Champlain LHIN the cost of documentation ranged from 38 to 77 million dollars per year (or $4482 to $9025 / nurse / year).

Conclusions

Based on the results of this simple model above it is apparent that a significant investment is already being made in the collection of data which is not being fully exploited. While further review and refinement of the model would be necessary to increase the accuracy and detail of this information, it is certainly something that should be considered when setting priorities for future data collection initiatives. In long-term care this has likely already be realized to some extent and is apparent in the provincial roll out of the MDS assessments in many LTC facilities.

The collection of data related to nursing and other direct patient care outcomes will likely need to be mandated and funded at the provincial or LHIN level in order to see widespread standardized adoption. This is the case with LTC facilities and without a mandate for implementation in acute care, I believe it would be unlikely that many organizations would implement a clinical documentation system in the near term. The value add for these facilities just is not present, especially when you consider other potential competing priorities.

Recommendations

In order to achieve a comprehensive collection of the HOBIC measures across the acute care sector, the HOBIC team will need to formulate strategies which address both short and long-term approaches to electronic clinical documentation. In the short term, the development of simple customized data collection tool may provide the only means of data collection. Along with the HOBIC measures, this tool could be made to look like the paper based admission and discharge forms currently being used at the facility. Once the assessment was completed, the users would be able to print out the assessment for inclusion in the chart while the HOBIC measures are submitted to the data repository,

Over the long-term, the HOBIC leadership and coordinators should work to influence the push towards full electronic documentation in all acute care facilities. As mentioned above, this would likely need to be mandated by the Ministry of Health or the individual LHINs. Use of a software as a service (SaaS) model, where all software maintenance hosting is done either by a vendor or a facility may be a cost effective means of achieving this goal. Our experience with this approach in LTC sites who implemented a specific SaaS vendor solution were very positive. A similar approach in acute care facilities may ease the fears about ongoing costs and maintenance.

Appendix A

Crude estimates of the cost of nursing documentation, by Canada and Champlain LHIN (2006).

Range	Employment Status	Number of Nurses	Hours worked	% Working in Direct Care	Average hourly rate	% of time documenting	Total Cost
Low	Full Time	141047	1800	86.5	24.5	15	$807,067,407.83
High	Full Time	141047	1800	86.5	37	20	$1,625,115,324.60
Low	Part-Time	82120	900	86.5	24.5	15	$234,944,293.50
High	Part-Time	82120	900	86.5	37	20	$473,085,108.00
Low	Casual	27366	360	86.5	24.5	15	$31,317,513.57
High	Casual	27366	360	86.5	37	20	$63,061,115.76

Total Cost High	$2,161,261,548.36	**Total Cost per Nurse (High)**	$8,626.65
Total Cost Low	$1,073,329,214.90	**Total Cost per Nurse (Low)**	$4,284.18

Range	Employment Status	Number of Nurses in Ontario X % of population living in Champlain LHIN(9.5%)	Hours worked	% Working in Direct Care	Average hourly rate	% of time documenting	Total Cost
Low	Full Time	5268.89	1800	86.5	24.5	15	$30,148,456.86
High	Full Time	5268.89	1800	86.5	37	20	$60,707,096.80
Low	Part-Time	2585.71	900	86.5	24.5	15	$7,397,683.99
High	Part-Time	2585.71	900	86.5	37	20	$14,896,016.74
Low	Casual	701.2	360	86.5	24.5	15	$802,444.05
High	Casual	701.2	360	86.5	37	20	$1,615,805.71

Total Cost High	$77,218,919.25	**Total Cost per Nurse (High)**	$9,025.34
Total Cost Low	$38,348,584.90	**Total Cost per Nurse (Low)**	$4,482.18

Source:

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