



Increasing the Utilization of Health Outcomes for Better Information and Care

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Table of Contents

EXECUTIVE SUMMARY	4
Key messages.....	4
Implementation themes:.....	4
Utilization themes:	5
Recommendations.....	5
Leadership.....	6
Project team	6
Education	6
Adaptability.....	7
Material or written resources	7
Theoretical model	7
Audit and feedback	7
MOHLTC Recommendations.....	8
INTRODUCTION.....	9
PROJECT OBJECTIVES.....	9
METHODS	10
A Model of the Innovation-Decision Process.....	10
Literature Review.....	11
Expert Consultation	11
RESULTS	12
Background Issue: Motivator for change.....	12
Implementation strategies	14
Leadership.....	14
Expertise support	15
Project team	16
<i>Inter or multi-disciplinary teams</i>	16
<i>Collaboration</i>	17
<i>Participatory input</i>	17
Education	18
<i>Dissemination</i>	18
<i>Structured or formal approach</i>	19
Adaptability.....	20
Availability of Resources.....	21
<i>Organizational support</i>	21
Theoretical model or Quality Improvement technique.....	21
Utilization Strategies.....	22
Sustained change.....	22
Leadership.....	24

Audit and feedback	24
Ongoing Education	26
Adaptability.....	28
Integration.....	28
Types of evidence	29
Evaluation Outcomes	30
Improved quality of care or documentation.....	31
Compliance (completion or participation rate).....	32
Improved patient outcomes.....	32
Care provider outcomes	32
Positive culture or attitude change.....	33
Positive organization outcomes	33
Shared learning	33
DISCUSSION	34
CONCLUSION AND RECOMMENDATIONS.....	36
Readiness for Change	36
Leadership.....	36
<i>Facilitation as a Form of Local Leadership</i>	37
Project team	38
Education	38
Creating Momentum for Change	39
Adaptability.....	39
Material or written resources	39
Theoretical model	40
Audit and feedback.....	40
REFERENCES.....	42
Appendix A: Literature review	45
Appendix B: Literature review themes	56
Appendix C: Letter of Invitation to participate.....	57
Appendix D: Letter of information and consent.....	58
Appendix E: Interview guide	61
Appendix F: Pre/Post Intervention – Design Quality Assessment Tool.....	62
Appendix G: Taxonomy of facilitation interventions/strategies and facilitator role synopsis	63

EXECUTIVE SUMMARY

This report presents evidence in published literature about successful outcomes/performance monitoring implementation strategies, as well as recommendations from healthcare managers to provide a process evaluation of the Ministry of Health and Long Term Care (MOHLTC) Health Outcomes for Better Information and Care (HOBIC) implemented between 2006 and 2010. The findings demonstrate implementation and sustainability strategies for healthcare initiatives that have been evaluated and published in academic literature, and interview feedback from healthcare managers in acute and long-term care settings in which HOBIC was implemented. The research design for this project included two key components: a literature review on successful outcomes/performance monitoring implementation strategies and interviews with HOBIC leadership in MOHLTC identified sites to discuss specific implementation and utilization strategies and recommendations for HOBIC going forward.

Rogers' *Model of the Innovation-Decision Process* (2003) was used as a theoretical model to link the implementation processes, specifically the five sequential stages of the process of innovation decision-making: knowledge, persuasion, decision, implementation, and confirmation. This theoretical model describes how, why, and at what rate new ideas and technology spread through culture, and therefore has particular relevance to HOBIC utilization and uptake. A review of published literature focused on the terms: *practice change, practice implementation, practice improvement, implementation strategy, successful implementation, nursing practice change, nursing intervention implementation and nursing implementation adoption*. This revealed an initial 2,338 abstracts which were scanned, and 29 studies that were selected (Appendix A) and analysed for key themes, strategies, and sustainability efforts that proved successful. Expert consultation was sought through semi-structured phone interviews with HOBIC leaders from 12 acute care sites and four long-term care sites. Qualitative analysis of interview content focused on motivators and strategies for implementation, utilization and sustainability practices, and recommendations for practice-change going forward.

Key messages

Key messages in relation to the implementation and utilization themes are follows:

Implementation themes:

- **Motivations for adoption** of HOBIC included *administrative initiatives* (ex. gains in funding or other resources) and *the need for an improved clinical assessment tool*.
- **Leaders** were responsible for identifying the opportunities for HOBIC within their organization, communicating with committees, management, and staff, and motivating staff enthusiasm to complete the education.
- Interview participants indicated the use of **project teams** or “working groups”, allowing for the development of “superusers” that could then disseminate conversation about HOBIC to front-line staff, as well as provide leadership in education initiatives.
- Consistent with the literature, engaging front-line **participatory input** on collaborative teams was often noted as important to engagement of staff.
- The literature shows that **education and training** are key activities to disseminate new

information, receive staff input, and gain staff support, followed by reinforcement where necessary.

- An **adaptable approach** was considered essential, as agencies adapted HOBIC within the style of roll-out, and developed agency-specific innovations related to how HOBIC would be used within the organization.
- **Available resources**, respondents felt strongly that without the support of the MOHLTC, the HOBIC initiative would not have been possible in their agencies. Financial support was indicated most often as the motivator for implementation of HOBIC.
- The most commonly applied **quality improvement technique** in the reviewed studies was the Plan, Do, Study, Act (PDSA) cycle which promotes appropriate testing, adaptation and retesting of change decisions.

Utilization themes:

- For sustained utilization of HOBIC, **leadership** provided a conduit for providing feedback to- and receiving feedback from- organizational and clinical staff, coordinating educational opportunities, and adapting HOBIC use to the priorities and current practices within the agency.
- **Audit and feedback** involved use of HOBIC reports to review compliance with use and exchange knowledge in the integration of HOBIC into clinical care and organizational management.
- Ongoing **education** of staff, as an important element of HOBIC utilization and practice change, involved diverse ways, including internal and external opportunities, as well as educational collaboration between agencies.
- Continual **adaptation** involved diverse ways in working toward sustainable practice change based on the needs of their organization, resources available, and feedback from stakeholders.
- Consistent with the literature findings, several **barriers** were noted:
 - Lack of knowledge of the utility of HOBIC measures and reports.
 - Daily work tasks that were not directly related to HOBIC.
 - Admission wait-times that were outside of the HOBIC window, transfer of patients to units that were not using the HOBIC tool, and difficulty communicating HOBIC-related questions to patients.
- Agencies also noted the lack of **sustained funding and resources** as a barrier to utilization, including loss of internal and external HOBIC Coordinators, and little perceived advantage in ongoing measurement without complete agency compliance.

Recommendations

Outcomes for this project included the importance of effective leadership before, during and after implementation, education, adaptability, the availability and use of resources, framework for change being embedded in a conceptual model, and the availability and use of audit and feedback mechanisms.

Agency recommendations arising from the study are grouped into the key themes emerging from this research, with an additional category below specifying recommendations and feedback for the MOHLTC.

Leadership

1. Demonstrate strong support and commitment for evidence-based practice and HOBIC outcomes among senior leadership within the organization.
2. Identify HOBIC leaders, including specific job functions and responsibilities related to implementation and sustainability (e.g., using report information, giving feedback to staff, reporting to committees).
3. **Anchor HOBIC in other practice initiatives such as evidence based practice, quality improvement, patient centred care, and patient safety.**
4. Provide opportunities for regular communication between staff, project team, and administration related specifically to HOBIC.
5. Identify individuals within the agency that will provide support or back-up for leadership in the case of staffing changes, or in the case of need for additional support.
6. Provide a recognition and reward system for leadership initiatives taken by staff.
7. Evaluate the feasibility of a new staff position, including skills and experience in leadership roles, with job duties including implementation, evaluation, leading quality improvement or practice development related to HOBIC outcomes, and sustainability of HOBIC.
8. Update current job descriptions and performance evaluations to clearly define staff roles and responsibilities related to use of HOBIC and evidence based practice.
9. Allocate budgetary funds for the management of sustainability of HOBIC.
10. Integrate HOBIC language into agency and unit policy manuals, mission, and value statements.

Project team

1. Consider the development of team leadership related to HOBIC utilization and sustainability, including rationale for selection of team members, representation from multiple areas within the organization, clarification of responsibilities for the team, measurable goals, and a feedback system in place to monitor practice change.
2. Provide team training in quality improvement, PDSA, and evidence-based practice. Allow development of working plans integrating training and assessment needs for the agency.

Education

1. Outline clear and measurable rationale for educational initiatives, including goals related to learning and practice change.
2. Anchor training in practice initiatives such as evidence-based practice, enabling adaptation to local priorities.
3. The change process needs to begin by identifying the priorities and needs of frontline staff and then demonstrating how HOBIC can support practice initiatives designed to address these priorities and needs.
4. Provide education that addresses the use of new technologies that may be required to complete HOBIC (e.g., first-time computer use, part-time and casual staff that are not familiar with tools). Offer education in different modes and formats
5. Identify broad educational opportunities, both formal and informal, in which to integrate HOBIC as a talking point and for practical uses.

6. Provide a feedback mechanism through which HOBIC users can evaluate educational offerings, and pre- and post- education evaluation systems.
7. Develop methods to evaluate completed education for HOBIC users, including accountability through job descriptions, compliance audits, and feedback to users.
8. Provide visible reminders and easy-access reference materials (e.g., chart-side laminated guides, hints for success).
9. Provide **'bedside'** assistance to facilitate uptake during the implementation stage, with a support person to work with client needs while the assessment tool is practiced. The support person/trained facilitator needs to model the integration of HOBIC review and feedback into clinical care planning, practice reflection, and continuous improvement.
10. Provide opportunities for group experiential learning (e.g., patient care rounds), to facilitate implementation and utilization of HOBIC within workflow.
11. Provide a forum for questions and answers; post FAQs in an area that is easy to see and easy to access for HOBIC users.
12. Identify experts that can be accessed for questions relating to HOBIC use, including different ways of reaching experts; cross-train experts.
13. Develop education that includes the use of actual patient scenarios, anticipating questions that are agency-specific.
14. Integrate HOBIC into new-hire orientation, with opportunities for additional education ongoing.

Adaptability

1. Conduct regular scheduled reviews of the utility of assessment tools. Evaluate the feasibility of *re-invention* of an improved assessment tool, with a patient-centred rationale for assessment devices.
2. Initiate a reward and recognition system for HOBIC users to suggest innovations to sustainability of HOBIC.
3. Develop an ongoing evaluation system to determine the rationale and utility of HOBIC related to agency culture and values. Communicate with staff.

Material or written resources

1. Develop a range of site-specific materials that are available and accessible. Clarify job duties related to update and placement of material or written resources.
2. Evaluate staffing models and job responsibilities, considering the possibility of staffing changes in order to support HOBIC sustainability.

Theoretical model

1. Identify strategies that would integrate HOBIC measurement into current quality initiatives, Quality Committee priorities, or accreditation strategies.
2. HOBIC indicators could be incorporated into PDSA cycles to support quality improvement
3. Integrate HOBIC data collection into evidence based practice initiatives, demonstrating the relationship between evidence based practice and outcomes measurement.

Audit and feedback

1. Schedule regular meetings to review clinical reports and discuss strategies on incorporating information into clinical practice and organizational management.

2. Conduct scheduled chart audits for compliance or patient outcomes improvement.
3. Link HOBIC outcome feedback with audit and feedback about clinical practice, nursing process, and evidence-based practice. The relationship between outcomes measurement, nursing process, and client outcome achievement needs to be continually reinforced.
4. Communicate results to staff, with a reward or recognition system in place to identify areas of practice change and use of evidence-based outcomes.
5. Conduct regularly scheduled compliance reviews with clinical and organizational users, with feedback related to practice change.
6. Combine audit feedback with educational opportunities to develop and expand capabilities of HOBIC users.
7. Provide opportunities for ongoing process review, encouraging input from clinical and organizational users; evaluate and implement recommendations for adaptation, with a recognition system in place to acknowledge staff innovations.
8. Maintain evaluation of HOBIC as a priority item for staff and committee meetings.

MOHLTC Recommendations

1. Offer leadership training and networking opportunities for staff involved in HOBIC implementation and utilization, especially related to developing confidence, communication skills, change management, and responding to negative feedback.
2. Provide on-site support staff during the implementation process, including expertise in guiding in-house 'bedside' coaches, in order to provide support for practice change during the implementation phase.
3. Allocate budgetary funds for sustainability measures related to HOBIC.
4. Offer training related to teamwork, project management, quality improvement initiatives, and evidence-based practice.
5. Facilitate participation for MOHLTC HOBIC experts on agency project teams.
6. Provide referral information for connection with other agency experts, software vendors, or IT support experts for agency project teams.
7. Encourage agencies to adapt MOHLTC education materials for site-specific needs; provide encouragement and feedback for improvements.
8. Sponsor educational forums for HOBIC users where new research, training and education, and feedback are encouraged.
9. Provide FAQ updates to managers and HOBIC users on a regular basis.
10. Provide an external resource person that is available after implementation to respond to questions and assist with trouble-shooting post-implementation.
11. Offer ongoing education encouraging use of reports in care-planning and organizational management.
12. When reviewing requests for funding for implementation of HOBIC, encourage agencies to indicate rationale related to mission and values of the organization.
13. Tie HOBIC compliance post-implementation to availability of resources, such as opportunities to conduct research or provision of education.
14. Offer email or listserv reminder updates to agency users, including an educational component, new research, recommendations from other HOBIC users, and information on how to fully utilize reports.
15. Offer post-implementation review (e.g., multi-agency project groups, phone calls). Address and/or implement recommendations of users.

INTRODUCTION

Outcomes measurement has gained importance as health care organizations focus on quality and cost, effectiveness of care and organizational performance. Practitioners in the health field are being challenged to find ways to demonstrate that the care they provide leads to improved outcomes for the recipients of that care. With the aging population and increased focus on chronic disease management, clinicians need feedback about treatment outcomes to inform any modifications that would improve the care plan. Integrating outcomes feedback into practice in ways that encourage clinicians to act upon the evidence from the feedback requires behavioral and system change.

Several initiatives have been undertaken to increase accountability for the delivery of health care services, to promote quality improvement, and to measure the impact of nurses within the health care system. Within Ontario, Health Outcomes for Better Information and Care (HOBIC), funded by the Ontario Ministry of Health and Long-Term Care (MOHLTC), has moved forward with the collection of health outcome information relevant to the practice of nursing across four health sectors: acute care, home care, long-term care, and chronic hospital care. Valid and reliable scales are used to assess patients' status on the HOBIC outcomes on admission and discharge for patients receiving acute care and on admission, quarterly, and discharge for patients receiving complex continuing care, long-term care or chronic home care. HOBIC information helps nurses identify and apply best practices, evaluate impact of their care, develop a better understanding of their patients, communicate with other care providers, and supports decisions about nursing resource use (www.health.gov.on.ca).

Experience to date shows that nursing staff learn to assess and enter the HOBIC assessments into the electronic record systems. However, only a few staff nurses retrieve the HOBIC information after the initial assessment and use it to plan care. While leaders demonstrate an understanding of how to use HOBIC reports in training workshops, only a minority of health care leaders retrieves and uses HOBIC scores to assess the quality of care on their units and determine the adequacy of their staffing plans. Thus there is a gap between current practice and ideal practice, as evidenced by more effective use of HOBIC data for care planning, quality improvement, meeting accreditation requirements, and health human resource planning. Education and change management strategies could address this gap by fostering more effective utilization of HOBIC data by frontline nurses and health care managers. Although the current education strategy is meeting the goals of implementation with regard to assessment and documentation of HOBIC outcomes, it has not resulted in practice change, or in uptake of HOBIC information for evidence-based practice and quality improvement.

PROJECT OBJECTIVES

The purpose of this project is to investigate factors that influence HOBIC adoption and utilization, and to identify strategies to improve utilization of HOBIC information for clinical care planning and health system improvement. The project involved the following components:

1. Review of the literature for studies describing attributes/strategies for successful outcome/ performance monitoring implementation strategies.

2. Consultation with HOBIC leaders for the purpose of determining strategies that have resulted in compliance with HOBIC data collection, and strategies that have resulted in utilization of HOBIC data for care planning, quality improvement, and organizational accreditation.
3. Consultation with experts in the field for the purpose of determining facilitation strategies that support outcomes-focused evidence-based practice change.
4. Determination of strategies for facilitating HOBIC adoption and utilization in Ontario healthcare organizations.

This project reviewed the evidence from published sources of outcomes measurement change strategies that have resulted in successful behavior or system change, and assessed within HOBIC sites the strategies that differentiate successful organizations from those that have not been successful in promoting measurement compliance and utilization of HOBIC data.

METHODS

A Model of the Innovation-Decision Process

Rogers' *Model of the Innovation-Decision Process* (2003) was used to guide this study as it was found to be particularly relevant, linking the stages of implementation with each other in a comprehensive and coherent manner. Rogers states that getting a new idea or innovation adopted, even if it has obvious advances, is difficult and may take a long time. Therefore, a common problem for many individuals and organizations is how to speed up the rate of diffusion, the process by which an innovation is communicated through certain channels over time among members of a social system (p.11). The model describes the five sequential stages of the process of innovation decision-making (p. 169).

- 1) *Knowledge* occurs when an individual (or other decision-making unit) is exposed to an innovation's existence and gains an understanding of how it functions.
- 2) *Persuasion* occurs when an individual (or other decision-making unit) forms a favorable or an unfavorable attitude towards the innovation.
- 3) *Decision* takes place when an individual (or other decision-making unit) engages in activities that lead to a choice to adopt or reject the innovation.
- 4) *Implementation* occurs when an individual (or other decision-making unit) puts a new idea into use.
- 5) *Confirmation* takes place when an individual seeks reinforcement of an innovation-decision already made, but he or she may reverse this previous decision if exposed to conflicting messages about the innovation.

Diffusion of Innovations is a theory of how, why, and at what rate new ideas and technology spread through cultures, therefore it has particular relevance to HOBIC utilization and uptake.

Rogers (2003) describes the innovation process as it applies to implementation in organizations (p. 420-429). *Agenda-setting* occurs when an organizational problem is defined that creates a perceived need for an innovation. *Matching* is defined as the stage in the innovation process at which a problem within the organization's agenda is fit with an innovation, and this match is planned and designed. The first two constitute *initiation*, defined as all of the information gathering, conceptualizing and planning for the adoption, leading up to the decision

to adopt. *Redefining/restructuring* occurs when the innovation is re-invented so as to accommodate the organization's needs and structure more closely and when the organization's structure is modified to fit with the innovation. Both the innovation and the organization usually change in the innovation process. *Clarifying* occurs as the innovation is put into more widespread use in an organization, so that the meaning of the new idea gradually becomes clearer to the organization's members. *Routinizing* occurs when an innovation has become incorporated into the regular activities of the organization and it has lost its separate identity.

Literature Review

A review of published literature was undertaken to search for evidence about strategies for facilitating evidence-based practice change. Library electronic databases (CINAHL, Medline, EMBASE and PubMed) were searched for peer-reviewed journal articles that reported successful evidence-based implementation in health care settings. The criteria for determining success include achievement of high compliance with outcomes data collection, utilization of outcomes feedback to guide care planning, and organizational improvement. The search was focused on articles that described implementation strategies, evaluation of the implementation, and evidence of sustained change. Search terms for scanning the databases included: *practice change, practice implementation, practice improvement, implementation strategy, successful implementation, nursing practice change, nursing intervention implementation and nursing implementation adoption.*

From the 2,338 abstracts that were scanned in the initial broad search, 29 studies were selected (see Appendix A for table with pertinent study details). Of the 29 studies, over half of the implementations took place in acute care settings in variety of clinical areas (n=16), followed by long-term care/rehabilitation/geriatrics (n=6), community care (n=3), primary care (n=2), physical therapy (n=1) and mental health (n=1). The clinical areas represented included oncology, medical, mental health, geriatrics, rehabilitation, critical care, and neonatal services. About half of the studies involved multisite organizations or more than one organization (n=15) and half were conducted in a single unit or within a single organization (n=14). Text from each study was imported into NVivo 8 qualitative analysis software and coded for themes relating to study purpose, setting, evidence type, implementation strategies and evaluation findings. The node list (list of themes) emerging from the analysis and number of studies containing coded text pertinent to each theme is provided in Appendix B. In NVivo, simple coding queries to compile pertinent text across studies for each theme were conducted in order to determine strategies that were most commonly used and were most beneficial based on the evaluation findings.

Expert Consultation

Semi- structured phone interviews with HOBIC leaders were completed with the purpose of determining strategies that have resulted in compliance with HOBIC data collection, and strategies that have resulted in utilization of HOBIC data for care planning or quality improvement. Email letters were sent to sites identified by MOHLTC (n= 24) as having participated in HOBIC implementation (Appendix C), providing the purpose of the study and an attached Letter of Information and Consent to Participate (Appendix D). Identified participants were invited to reply to the email or fax back the consent form as agreeing to participate. Three

sites sent replies declining participation and five sites did not reply to initial or follow-up requests.

Study Recruitment	Acute Care	LTC	Total
# Sites identified by MOHLTC	15	9	24
# of sites consenting to participate	12	4	16

The interview tool (Appendix E) was developed by a team of experts, including HOBIC staff/executive leadership and NHSRU staff, to capture information relevant to the objectives of this study. Using a semi-structured format, interview participants were invited to add additional information relevant to the objectives of the study that may not have been present on the interview guide. Within this framework, emerging themes with early interviews were acknowledge, and questions were added for later interviews in order to capture the expanding knowledge of utilization strategies or items of importance that were not initially identified by MOHLTC and NHSRU staff. This contributes to the qualitative rigour of the interview instrument.

The interview questions were provided to the participants prior to the scheduled interview. After review of the interview guide, four sites requested an invitation be sent to another staff member; thus four interviews were conducted with two organization participants. Participant consent was reviewed before the interview, as well as consent to audiotape the interviews. Each interview was given a letter-number code in order to protect the confidentiality of the participants. Interviews were transcribed by the interviewer or a member of NHSRU staff, and all identifying information was removed from the transcript.

A layered qualitative data analysis was conducted on interview transcripts using NVivo. First, transcripts were individually analyzed for themes identified *a priori* in the literature as well as emerging themes that were not previously noted in the literature review. A second-layer analysis was then completed from the compiled transcripts and emerging themes from the literature. Second-layer analysis was discussed and confirmed with a reflective team including MOHLTC and NHSRU staff, adding to the rigor of this research.

RESULTS

Background Issue: Motivator for change

Evidence-based practice changes in health care settings are undertaken to address concerns about quality of care and patient outcomes. According to Rogers (2003), the innovation-development process often begins with recognition of a problem or need, which stimulates research and development activities designed to create an innovation to solve the problem or need (p.137). For example, Cormack et al. (2007) reported several problems that were a driving force behind change: client satisfaction data suggested that continuity and coordination were lacking in that clients felt they were repeating the same information to

different staff members; there was an increased incidence of medication errors; and results of a staff survey indicated a lack of accountability within the existing model of care. Leone et al. (2009) reported the lack of a uniform plan to assess and treat pain for their residents despite published literature that demonstrates that the implementation of scales improves detection and treatment of pain.

Rogers differentiates between three types of innovation decisions. *Optional innovation-decisions* are made by an individual independent of the decisions of the other members of the system; *collective innovation-decisions* are made by consensus among the members of a system that all units in the system must conform to once it is made; and *authority innovation-decision* are made by a relatively few individuals in a system who possess power, status or technical expertise. Rogers states that in most organizations, the latter two are more common than optional decisions. For example, Reinhardt & Keller (2009) reported the impetus for practice change originated in the organization’s Nursing Policy and Procedures Committee (NPPC) charged with review of nursing practice policies for the entire organization because inconsistent wound care practices led to poor patient outcomes despite the existence of standardized procedures and protocols. In another study, state legislation requiring its 400 nursing homes to report all medication errors on an annual basis was the motivator behind a decision to develop and test a web-based individual incident medication error reporting system (Pierson et al., 2007).

Motivators for implementation were perceived as providing a framework for the usefulness of HOBIC as an organizational tool. Implementation motivation also framed strategies for the implementation and utilization process, and how the tool was integrated into the workflow of the organization. Motivations for adoption of HOBIC included *administrative initiatives*, especially gains in funding or other resources (e.g., devices, technological infrastructure) and *the need for an improved clinical assessment tool*. HOBIC was viewed as an improvement related to quality improvements, fit for the values of the organization, and ease and convenience of usage.

“It was not patient driven at all, not from the patient needs. It was more organizational.”
(Clinical Leader, Long Term Care)

Administrative Motivators	Clinical Motivators
Funding opportunity	Improved assessment tool
Staffing model changes	Measure nursing-sensitive outcomes
Transition to electronic health record	Convenience for staff
Opportunity to participate in research	
Considered ‘good idea’ by senior management	
Gaining devices for clinical and administrative use	
Good fit for organizational values	

“We had an assessment tool that desperately needed revitalizing and re-energizing...so we rolled this out as a way of saying we’re re-doing our assessment tool and this will allow us to measure our nursing outcomes. The uptake was easy, slow, and 100% compliance.” (Clinical Leader, Acute Care)

Implementation strategies

Rogers (2003) states a *change agent* is an individual who influences clients' innovation-decision in a direction deemed desirable by a change agency. All innovations carry some degree of uncertainty for an individual who is typically unsure of the new idea. The innovation-decision process is an information-seeking and information-processing activity in which the individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation (p. 172). In doing so, knowledge must be passed from one source to another through various communication channels (Rogers, 2003). The following highlight implementation strategies described in both the studies and interviews with experts.

Leadership

In the implementation process, effective leadership was given the most emphasis across the studies. Several studies describe leadership as a project leader, champion or facilitator to act as an advocate for effective change. A champion is a charismatic individual who throws his or her weight behind an innovation, thus overcoming indifference or resistance that the new idea may provoke in an organization (Rogers, 2003). These individuals are early adopters providing the forward motion to move new practices into the wider organization, reviewing clinical reports, discussing strategies on how to incorporate new information into their practice, and evaluating results (Horn et al., 2010; Reinhardt & Keller, 2009). They ensure regular communication with the project team and institutional administrators (Horn et al., 2010) and provide continuous bedside coaching and reinforcement of expectations to staff members (Gordon et al., 2008; Nelson & Massey, 2010). Effective leadership may be through a project coordinator at the local level who maintains communication, organizes regular meetings, and provides feedback and assistance (Chin, 2010; De Groot et al., 2010; Nemeth et al., 2007; McEwen et al., 2005). Leadership support is also a responsibility of the project or implementation team (Horn et al., 2010; Kenny & Goodman, 2010; Nelson & Massey, 2010).

“I asked them to identify what sort of characteristics would make a good [leader], and it’s someone who is self-confident to speak in front of groups, someone who is willing to cop a lot of flack. Lots of people who didn’t like HOBIC and would voice it to their colleagues, you had to be that resilient practitioner who would take that, not take it personally, and approach it a slightly different way...be responsible, be innovative.” (Organizational Leader, Acute Care)

Within the motivation and implementation stages of HOBIC, leaders were responsible for identifying the opportunities for HOBIC within their organization, communicating with committees, management, and staff, and motivating staff enthusiasm to complete the education. Leadership was also seen as supporting staff when implementation was challenging, including supporting individuals who found themselves in new job roles during the implementation phase. Participants identified the importance of both internal and external leadership, with a range of reasons behind accessing both as resources.

“The executive team from HOBIC, their presence and their interest in the organization, it has an impact on the senior leadership.” (Clinical Leader, Acute Care)

The importance of leadership was a strong theme for respondents reflecting on the implementation process simply as a person that they could “vent” to when things did not go well or to gain support for managing a range of change processes.

“In the first few months, I was ready to go [laughs]. But it was the management team...that kept me motivated, listened to me and made me want to stay.” (Information Leader, Long Term Care)

Expertise support

Expertise support requires a specialized knowledge base, also involving individualized attention to relieve much of the fear during the initial learning curve, especially for those who are most anxious about the implementation (Rikli et al., 2009). The following are some examples from the literature to describe the nature of this approach.

- A team-based approach involved a content specialist (CNS in advanced diabetes management), a case manager (PCF), and the unit manager (of intensive care), who collaborated to improve patient care and institute system change (Custer, 2010).
- Skin champions receive mentoring from clinical specialists, wound care experts, and managers, and are recognized by unit staff as accessible resources (Dibsie, 2008).
- Interdisciplinary consultants regularly participated in 11 of the 13 hospital study sites, including nutrition, physical therapy, occupational therapy, social work, chaplaincy, pharmacy, and care coordination or case management (Inouye et al., 2006).
- Super users were scheduled so the department had 24-hour coverage for the first 2 weeks. This group included technology and information staff, nurses, and physicians who could answer questions. They carried pagers so they could be accessed immediately and respond to the bedside. Some staff nurse super users also provided patient care support so that the bedside nurse could focus on charting (Rikli et al., 2009).
- During the go-live the system was fully supported by on-site technical and workflow experts (Wong et al., 2009).

These examples from the literature underscore the importance of continuous on-site support during the initial implementation stages of a new innovation.

Interview participants noted the engagement of both internal and external experts during the implementation process. Internal experts were meant to bring a multi-disciplinary team approach to the implementation, provide social buy-in for the project, educate others in the organization, and offer ongoing support to the project. Internal leads included senior practice managers, researchers, information specialists, clinical educators, and front-line nursing staff that were identified as having leadership potential. External leadership was identified as an important part of the implementation process when working alongside internal leadership. External leadership was specifically identified as HOBIC Coordinators from MOHLTC or software vendors. Agencies discussed the benefits of external leadership and internal leadership, noted below.

Benefits to External Leads	Benefits to Internal Leads
Continuum of communication	Clear employment boundaries
Provide IT support	Front-line knowledge expert
Provide an external layer of review	Respect from staff/Improved buy-in
Build staff enthusiasm	Career development opportunities
Provide pressure to complete implementation	Engage staff that are not on other committees
Scheduling	
Future collaborative relationships	

“I was a fairly new face, I didn’t have any cred [credibility] at the front-line level.”
 (Organizational Leader, Acute Care)

Two participants noted that job role changes following the implementation proved difficult, due to unclear delineation of job responsibilities and supervisors. Respondents noted that opportunity for relationship building was potentially missed during the implementation phase when employment commitment was given to the Ministry rather than the organization due to the allocation of funding, with a consequent need for restoring working relationships. While there may be a variety of underlying reasons for staff conflict in any change, Cormack et al. (2007) found the most difficult challenges to overcome in the implementation were long-standing issues related to staff morale, staff resistance to change, and staff relationships.

Project team

Most studies described a project team that was interdisciplinary, comprising individuals with the appropriate content expertise. Bails et al. (2008) reported a local, interdisciplinary committee composed of physicians, nurses, pharmacists, the hospital medical director, members of the hospital’s clinical information systems team, and the quality management department. Custer (2010) described an interdisciplinary diabetes team with a registered dietitian, a staff registered nurse from the ICU, internal medicine and family practice physicians, a hospital pharmacist, and the diabetes Clinical Nurse Specialist. Alternatively, in a small-scale study, once consensus was achieved in moving forward with a new nursing care delivery model, a core group of nurses from the units who would lead this initiative was democratically selected (Cormack et al., 2007). The project leadership team or committee (described as a process workgroup by Rikli et al., 2009) may require training in quality improvement methods. It addresses current practice, recommends evidence-based changes, initiates and leads the implementation of change, oversees routine monitoring, and acts as decision-makers to recommend direction of the change process (Dibsie, 2008; Reinhardt & Keller, 2009; Rikli et al., 2009).

Inter or multi-disciplinary teams. As well as a project team that is multidisciplinary, Buffum et al. (2009) indicated that the study sites needed cooperation at the unit, department, and medical center levels across disciplines (Buffum et al., 2009). As part of the implementation process, participation of external consultants from various disciplines encompassing a broad spectrum of expertise was necessary to promote positive outcomes (Inouye et al., 2006). Wong et al. (2009) pointed out the need to consult with nursing, allied health, pharmacy, and physicians to thoroughly understand the complexities of interactions and information needs of each group.

Collaboration. Collaboration is essential to successful implementation and is often discussed in association with ongoing open communication with stakeholders, involvement from all parties to bring in different perspectives on dealing with challenges, site-to-site interaction, and conference calls and webinars with other hospital participants for ongoing discussion of issues (Ang & Chow, 2010; Bails et al., 2008; Buffum et al., 2009; Daniel et al., 2010; Kimber & Grimmer-Somers, 2009). Collaboration is also between team members and administrators in order to review clinical reports and discuss strategies to use the reports as part of daily work (Chin, 2010; Nease et al., 2008). Dibsie (2008) highlighted the importance of staff working together to provide assistance and resources to one another.

Participatory input. Several studies reported efforts that were made to ensure participatory input. Frontline staff engagement in generating ideas for improvement is based on the assumption that those on the front line are well positioned to know what improvements to care and processes are needed at the unit level (Nelson & Massey, 2010). In the study by Rikli et al. (2009), staff members with a strong sense of skepticism toward the project were recruited to enable them to play a significant part in the decision making, and the process workgroup conducted frequent verbal and written spot checks with staff to determine whether their needs were being met and whether processes needed to be adjusted. All stages of the implementation process benefit from staff involvement – when determining approaches to improvement (McLean et al., 2006; Nemeth et al., 2007); during educational sessions (Custer, 2010), throughout the process and when establishing indicators for success (Dibsie, 2008).

Interview participants indicated the use of project teams or “working groups” during the implementation phase for HOBIC, with rationale consistent to that found in the literature. The use of project teams was seen as beneficial because this allowed for the development of “superusers” that could then disseminate conversation about HOBIC to front-line staff, as well as provide leadership in education initiatives. Project teams also provided a venue for cross-training for HOBIC leaders.

“Cross-pollination of our staff... can really help. And if they all hear the same information, you can customize as needed. I think that’s an important piece and really strategic piece for our team. It was great. (Clinical Leader, Acute Care)

Teams were discussed as helpful to the implementation process because they allowed the information portion to be directed across diverse areas of the organization. One respondent noted that engaging multi-disciplinary teams meant that “it just wasn’t up to nursing to do all the education.” Others noted that teams were chosen because there was staff available, to expand inter-departmental relationships, and because leaders enjoy social networking components to agency initiatives.

Engaging front-line participatory input on collaborative teams was often noted as important to engagement of staff in the implementation process. One participant specifically noted that an individual that was skeptical of the process was engaged for the project team in an attempt to increase buy-in, however that strategy was not successful, and leadership was re-evaluated. Participatory input for the implementation of HOBIC provided respondents with diverse benefits, including increased opportunities for peer-to-peer communication, improved use of clinical terminology when discussing organizational and clinical practice changes, and better time management for organizational leaders to focus attention on other elements of the

implementation. Some leaders felt that implementation strategies would not have been successful without engaging clinical staff.

“The bottom line is that I’m not the one out there doing it right now...so I have to listen to what [front-line staff] say.” (Clinical Leader, Long-Term Care)

Education

The literature shows that education and training are key activities in the implementation of evidence-based interventions in health care settings. While education sessions are aimed at disseminating new information on medical conditions and treatment protocols relevant to the intervention (Reinhardt & Keller, 2009), they are also used as an opportunity to receive staff input on problems relating to the implementation, answer questions and gain staff support (Custer, 2010). Reinforcement is necessary in the form of additional sessions or a sustained period of repeated education to support adoption of new procedures system wide (Buffum et al., 2009; Reinhardt & Keller, 2009), follow-up regular meetings to identify challenges and solutions and discuss progress (Buffum et al., 2009) or a tabletop education stand and visible reminders in each unit (Kenny & Goodman, 2010). Kimber & Grimmer-Somers (2009) reported that health professional education was carried out in a number of forums and formats for different medical staff and other care providers, including weekly clinical multidisciplinary meetings, outpatient clinic meetings, on ward round, in orientation sessions, at hospital grand rounds and hospital conferences, and in the internal hospital newspaper and other media opportunities.

Education sessions involved both structured and interactive components, ... and ongoing education was provided throughout the implementation phase.

Education sessions involve both structured and interactive components and delivered at a group or individual level. In one study, health-care providers received intensive education using a standardized teaching package, and subsequent interactive classes and ongoing education was provided throughout the protocol phase based on a need assessment (Sebat et al., 2005). In another study, the same coaches worked together throughout the project in learning session agendas that were designed to permit flow between large group presentation and discussion and sharing of ideas and experience in each small group facilitated by the study team coaches (Nease et al., 2008). When hands-on training with computers was needed, demonstrations for staff (Wong et al., 2009) or individual learner packets with pictures of specific computer screens and hints for success were developed and distributed in advance (Rikli et al., 2009), which facilitate the implementation process. Education incentives included allowing staff members to teach/attend classes as extra work time or as part of their regularly scheduled hours (Rikli et al., 2009), and team members being given continuing education units for participation (Kenny & Goodman, 2010).

Dissemination. Dissemination of pertinent information was often discussed in connection to education activities. Strategies included newsletters (De Groot et al., 2010; Dibsie, 2008; Inouye et al., 2006) and simulated hands-on scenarios (Gaal et al., 2008). In one study, one-sheet Nursing Cliff Notes detailing salient features of the new protocol were placed in each nurse’s mailbox and a laminated copy distributed to nursing stations (Kenny & Goodman, 2010).

Wong et al. (2009) reported that the appearance of a 40” LCD display on the nursing unit promoted word-of-mouth communication in the days leading up to the implementation. To maintain connection throughout implementation, vehicles for dissemination included quarterly practice performance reports, access to meeting minutes, network meetings, special staff meetings, and informal opportunities to speak with committee members (Cormack et al., 2007; Nemeth et al., 2007).

Structured or formal approach. Several studies described a structured or formal approach, often in relation to the scheduling and consistent format of education sessions (Nease et al., 2008; Smyrnios et al., 2002). For example, Buffum et al. (2009) reported a 10-session course with a treatment manual that gives specific guidelines for class structure and provides directions specific to each behavioral strategy in managing auditory hallucinations in people with schizophrenia. In another study, educational strategy included 4 components: Internet-based self-directed learning module, mentorship through peer mentors at each provider organization, Internet learning and search skills workshops, and organizational support (McEwen et al., 2005). In terms of the overall implementation process, Rikli et al. (2009) emphasized the importance of a functional large process workgroup, so meetings were structured with the assigned roles of facilitator, leader, timekeeper, and recorder among members at each meeting.

Consistent with the literature, interview participants indicated that the education phase of implementation provided opportunities to exchange information and gain new knowledge on benefits of HOBIC for both administrative and clinical staff. Participants also indicated the importance of support from the HOBIC Coordinator of the Ministry. Both external educators, such as HOBIC Coordinators and software vendors, and internal educators such as managers were utilized during the implementation stage for participating organization. Diverse strategies were employed for education, both formal and informal. Most respondents indicated that multiple methods of delivering education were conducted during HOBIC implementation.

Education Strategies-Implementation	
Unit-to-unit phasing	Small group of mentors expanding to larger
Large group training with customized smaller break-away sessions	Variety of scheduling options
Individual and group sessions	Printed materials (e.g., posters, newsletters)
Ministry training resources	Internally created resources
Structured and interactive (role-playing)	Computer and paper-based

Participants commonly noted that the educational materials provided by the MOHLTC at the implementation stage of HOBIC were easy to use, understandable, and useful. Participants also indicated that the training resources were beneficial in that they increased knowledge for participants related to nursing-sensitive outcomes.

“They’re really starting to have a more critical eye on the care we’re providing and the trends over time.” (Clinical Leader, Long Term Care)
“I think because we had the information sessions they felt they were part of something new and interesting that would benefit the residents.” (Organizational Leader, Long Term Care)

Adaptability

An adaptable approach was considered essential for successful implementation. Rogers (2003) refers to *re-invention*, considering it a key principle in that success depends on how well the innovation can be changed or modified by a user in the process of its adoption and implementation. In the study reported by Inouye et al. (2006), the vast majority of sites implemented the protocols fully, although several sites adapted the individual protocols according to local circumstances. Adaptations were made across multiple domains, including enrollment criteria, screening and assessment tools, and individual intervention protocols. Local circumstances drove these adaptations, with the most common reasons being lack of adequate staffing and logistical constraints. The adaptation may involve additional education (Gordon et al., 2008; Horn et al., 2010), or it may require customization to reflect the unique involvement of care providers such as in the case of the inpatient unit whiteboard implementation (Wong et al., 2009). Nelson & Massey (2010) employed rapid-cycle tests of change, using the plan, do, study, act model, whereby outcomes are analyzed and decisions are made in the "act" phase to adapt and retest, adopt the change, or abandon the test and proceed to the next idea. Similarly, Rikli et al. (2009) reported a plan for rapid feedback, which included a designated communication board in the staff lounge for updates and changes and weekly process meetings with key players to review content, answer questions, and make decisions about changes to forms or procedures.

Respondents described ways in which HOBIC materials could be adapted to the specific needs of the agency to facilitate successful implementation. This was discussed in relation to training materials, development of screens and assessment devices, and accommodating other agency priorities. Related to training, agencies adapted education sessions to suit learners, including providing problem-resolution for staffing difficulties, allowing staff time for practicing with the new measures, and developing agency-specific tools to facilitate implementation. Highlights of adaptation practices during the implementation process included flexibility with the use of paper or electronic devices, and the cross-posting of questions from education sessions to share with others in the agency.

An important concept within adaptability indicated by participants included what Rogers' describes as *re-invention*, namely agency integration of HOBIC measures into their practice. Participants discussed updating *all* of their assessment tools in order to implement HOBIC, and furthermore describing ways in which their agency could be defined as providing patient-centred care by implementing HOBIC. Fewer agencies adapted HOBIC through re-invention, but instead adapted the implementation within the style of roll-out, and developing agency-specific innovations related to how HOBIC would be used within the organization. Adaptable solutions at integrating HOBIC measures often included multiple decision-makers, including software vendors, administrative management, clinical management, and functional abilities and needs of the agency.

Adaptability- Integration	
HOBIC as a measure of organizational values	HOBIC as a new, improved assessment tool.
Creation of a new assessment tool, with HOBIC as starting-point	Establishment of HOBIC as an add-on or intervention
Required data entry	Embedding with current assessment tool
Specific design of data entry tool (paper or computer)	

A strong theme that emerged with interview participants was the importance of integrating the *meaning* of HOBIC as purposeful in relation to organizational values. One respondent added that organizational leaders “believe in it,” as a model of care that fits their vision and values statements. Some participants indicated that incorporating organizational values into HOBIC training could result in more meaningful use for front-line staff.

“I think that the HOBIC measures sit nicely...we can plan our restorative care implementation around some of those questions that are asked on HOBIC.” (Clinical Leader, Long Term Care)

Availability of Resources

Adequacy of resources including written protocols and the necessary equipment was given priority in a number of the studies. For example Dibsie (2008) reported that handling of products required committed personnel from the purchasing department, help from the central supply manager, and carts that were dedicated for standardized supplies were accessible and kept stocked by personnel responsible for maintaining inventory. More often it was the written resources that were described, for example: daily nursing flow sheets (Gordon et al., 2008); written protocols to guide chronic disease management (Nemeth et al., 2007); written training materials with login information and passwords (Pierson et al., 2007); and individual reference packets for each staff member and reference notebooks in every nursery (Rikli et al., 2009).

Organizational support. In addition to the clinical support needed in an implementation, unit managers and organizational administrators must take a visible and active role (Bails et al., 2008; Cormack et al., 2007; Custer, 2010; McEwen et al., 2005). Support of the immediate director and participation of the nurse manager in skin rounds brought credibility, support for the staff, and commitment (Dibsie 2008). Demonstrating enthusiasm and allowing paid time for team members to work on the project facilitated the process (Kenny & Goodman, 2010; McEwen et al., 2005). Rikli et al. (2009) identified several measures: additional staffing and support which included release of super users from patient care assignments; a bonus for working extra shifts; adjusting patient care assignments to allow extra time for charting; personnel costs which included release time for attendance at classes and additional staffing; and central funding of hardware purchases and rewiring for the wireless devices.

Respondents felt strongly that without the support of the MOHLTC, the HOBIC initiative would not have been possible in their agencies. **Financial support was indicated most often as the motivator for implementation of HOBIC.** Participants indicated that financial support enabled support including adding staff for education and team-building initiatives, an increased number of devices to conduct bedside assessments, and access to internet services (e.g., wireless installation). Notably, participants that were early adopters provided a mixed evaluation of resource availability. One agency leader indicated that she felt fortunate as an early adopter to be provided with resources, support, and bi-directional influence on the ongoing development of HOBIC. Another participant indicated that as an early adopter she felt that she did not have access to the information and educational resources because they were not yet available.

Theoretical model or Quality Improvement technique

Several theoretical models or QI techniques provided a framework guiding the overall implementation process. The most commonly applied paradigm was the Plan, Do, Study, Act

(PDSA) cycle (Chin, 2010; Leone et al., 2009; Nelson & Massey 2010), also referred to as the Plan, Do, Check, Act cycle (Gordon et al., 2008) or the Think, Do, Plan, Act cycle (Kimber & Grimmer-Somers, 2009). Forming the basis for testing improvement ideas, the "plan" phase includes identifying the idea to test, predicting what will happen and why, and setting up baseline measures/data for the test of change and a plan for gathering the data (Nelson & Massey, 2010). The "do" phase involves testing the planned change or intervention. Outcomes of the rapid-cycle test of change are analyzed in the "study" phase to assess what was learned, and results are used to make decisions in the "act" phase to adapt and retest, adopt the change, or abandon the test and proceed to the next idea (Nelson & Massey, 2010). In the implementation reported by Chin (2010), the MacColl Chronic Care Model (Wagner et al., 1996) domains (patient self-management, delivery system redesign, decision support, clinical information systems, leadership and health system organization, and community outreach) became the target for the PDSA cycles. Similarly, in Nelson & Massey's (2010) study, the PDSA cycle was applied to the processes and methods associated with Transforming Care at the Bedside (TCAB) to change a long-standing practice.

Rogers' (2003) sequential stages of innovation adoption (Knowledge, Persuasion, Decision, Implementation and Confirmation) guided the facilitation of advanced practice nurse (APN) participation in the study by Buffum et al. (2009). De Groot et al. (2010) applied the five stages of the implementation model of Grol et al. (2005) (orientation; insight; acceptance; change; maintenance, three questions) to ascertain the implementation phase in the evaluation. Dibsie (2008) applied the PICO format to help process the clinical question through identification of the patient population (P), intervention (I), comparison intervention (C) or status, and outcome (O) to yield the most relevant information (Melnik & Fineout-Overholt, 2005). Nease et al. (2008) described a change management strategy structured around the principles of the Reflective-Adaptive Process (RAP), incorporating a rapid-cycle test of change and based on a practice commitment to articulating a shared mission and vision, protecting time and space for reflection and learning, managing inevitable tension and conflict associated with change, and providing supportive leadership that is involved in the change process.

Theoretical models and quality initiative techniques were not indicated in participant interviews as influencing implementation strategies. Two participants from the acute care sector expressed their hopes for increased compliance prior to preparing for future accreditation. One participant noted the Excellent Care for All Act as a quality initiative as pulling resources *away* from HOBIC strategies, but also remarked that there may be opportunities for integrating the two.

"We can't do any more than we're doing now. The big focus here is on Excellent Care for All...on performance walls and patient safety huddles. The only way I see us going forward is incorporating somehow this HOBIC into our daily performance huddles...there may be a possibility that way." (Clinical Leader, Acute Care)

Utilization Strategies

Sustained change

While *routinizing* occurs when an innovation has become incorporated into the regular activities of an organization, a closely related concept is *sustainability*, defined by Rogers (2003) as the degree to which an innovation continues to be used after initial efforts to secure adoption are completed. Considering an intervention in an organization in which a new program is

introduced and evaluated, the question is whether or not the innovation program will continue after the special funding and expertise end. The following examples from the literature review describe program sustainability following the implementation to facilitate practice change.

- To sustain improved compliance, a plan for ongoing monitoring whereby the champion will provide monthly reinforcement of the two criteria, followed by a 6-monthly audit (Ang & Chow 2010).
- The decision to continue using the innovation after completion of the project was evident, in that all six sites continued using the course materials in individual work with patients and in educating other clinical staff (Buffum et al., 2009).
- Sustainability of this initiative is supported by the development of the geriatric resource nurse role and the emphasis on this role as a support for bedside nursing. Furthermore, the core group of nurses who spearheaded this initiative remained intact as a sustainability committee to respond to any issues requiring further refinement during the implementation process (Cormack et al., 2007).
- The final conclusion reached by all clinic and district managers was that the implementation process should be continued in all 70 physical therapy clinics. High participation rates and acceptable completion rates were attained, supporting good clinician acceptance of the outcomes process (Deutscher et al., 2008).
- Pain reassessment is in hospital orientation, and on the policy and specific documentation requirements, a routine variable displayed on all unit and departmental quality dashboards. Pain reassessment parameters built into our customized vendor-provided electronic documentation record, scheduled for full implementation (Gordon et al., 2008).
- Obtaining long-term funding has been identified as essential to sustaining HELP beyond the initial period. The individual HELP sites varied in their sources of program funding. Most programs had multiple sources of funding (Inouye et al., 2006).
- A policy dictating the EBP processes was written and approved by nursing and other disciplines within the organization (Kenny & Goodman, 2010).
- At the 15-month follow-up, nearly all changes had been sustained, and additional practices had implemented tracking/care management and self-management support. Significant pre-post improvements were reported demonstrating substantial diffusion to other clinicians in the practice. The program led to measurable improvements in implementation of office procedures and systems known to improve depression care. The improvements were both sustained beyond the end of the program and substantially diffused to the other clinicians in the practice (Nease et al., 2008).
- Adoption of the template began informally as units tested and adopted the template to fit their specialty populations. The bedside report process has been adopted by all inpatient units. The electronic shift report template developed by bedside nursing staff led to sustained improvement in the change-of-shift report process both from a qualitative and quantitative perspective in a comprehensive cancer center (Nelson & Massey, 2010).
- In the light of the highly positive outcomes of the initial implementation study, a decision was made to make the new system available with the goal of moving all of the approximately 400 nursing homes in the state over to the new system as quickly as possible (Pierson et al., 2007).
- Treatment guidelines using new products incorporated into individualized patient treatment and sent to each responsible clinic when patient discharged to outpatient care (Reinhardt & Keller, 2009).

- Two years following reimplementation, the staff has gained competence in using the EMR, and the process workgroup continues to meet regularly to fine-tune and maintain the documentation system. Following a self-assessment of staff and chart reviews, some individual and group reeducation has been needed and accomplished (Rikli et al., 2009).
- The multidisciplinary care teams have embraced the electronic whiteboard, taken ownership of it, and continuously improve it to meet their needs. Several other inpatient units have requested similar tools for their units; a testament to the positive impact the whiteboard has had in meeting the needs of its users (Wong et al., 2009).

Leadership

Leadership provided a conduit for providing feedback to- and receiving feedback from- organizational and clinical staff, coordinating educational opportunities, and adapting HOBIC use to the priorities and current practices within the agency. Participant discussion of leadership roles in sustained utilization of HOBIC included the importance of internal and external leaders, which was also identified as a theme during implementation stages. Internal leaders included both identified HOBIC leaders as well as individuals in the organization that were well-respected practitioners that were successfully learning how HOBIC can influence practice and were willing to work hard to create that change.

“I think there are those people that did document very well to begin with, they had a nice process and a comfort and a confidence with it, and once they developed that electronically they were fine. But there was a transition period of you know, I may make an error and I don’t want to make an error, so this is creating a lot of anxiety. Once they’ve established, I’m not going to make an error or I’m going to fix my errors, they get that comfort level built back up and they’re going what else can we do, let’s move this along because I can see some good potential here.
(Information Leader, Acute Care)

External leadership was important to respondents as well, especially the support of Ministry Coordinators. Ministry leadership was noted to support ongoing enthusiasm of HOBIC use, provide resources and problem solving, and support solutions from software vendors related to IT difficulties. External leadership provided expertise in areas that participants were not always able to access internally.

“The external support person was very valuable...especially when we were losing, or changing, people of interest. It was very valuable to have that continuation of communication happening.”
(Information Leader, Acute Care)

Audit and feedback

Audit and feedback has been used for decades as a strategy for changing the clinical practice behaviors of health care personnel, often to increase guideline adherence across settings and conditions (Hysong et al., 2006). Flottorp et al. (2010) define audit and feedback as “any summary of clinical performance of health care over a specified period of time aimed at providing information to health professionals to allow them to assess and adjust their performance” (p. iv). This approach is described by the following examples:

- Monthly documentation compliance audits revised to include the new pain reassessment performance measure; daily audits of 100% of patient records to assess the status of the interventions (Gordon et al., 2008).
- After guideline implementation, three-monthly audits, each of 31 randomly selected patient records, were undertaken over 9 months, to establish evidence of change in practice which might be attributed to the guideline implementation initiatives (Kimber & Grimmer-Somers, 2009).
- As part of a Quality Improvement Project (QI), a total of 40 patients were chosen at random in 2 of the major skilled care and dementia units at a nursing home, 20 patients from each. A chart review was conducted to document the presence or absence of pain syndromes, pain medications used, and use of standardized tools for the evaluation of pain (Leone et al 2009).
- The study evaluated performance on 36 process and outcome indicators across eight domains relevant to primary care practice (screening and treatment of cardiovascular disease, diabetes, cancer, respiratory tract illness, adult immunizations, mental health, nutrition, and safe prescribing in the elderly patients) (Nemeth et al., 2007).

Audit and feedback mechanisms can be used alone or linked to other interventions; most research on the effects of audit and feedback has treated them as components of a multifaceted intervention, often combined with educational activities (Flottorp et al., 2010).

Interview respondents indicated that HOBIC reports offered opportunities for reviewing compliance with use. Many agencies saw the utility of HOBIC reports in providing feedback to support integration of the tool into daily practice and uptake. However, barriers to accessing reports were identified. Some agencies reported that front-line nursing staff was not provided with system access. Inability or lack of knowledge in how to read report output was also identified as a barrier to accessing reports. Some participants indicated that HOBIC reports were not as useful as reports from other measures (e.g., RAI), influencing their decision to integrate HOBIC reports into practice. Similarly, Deutscher et al. (2008) reported a barrier as lack of knowledge and experience in using outcomes data during the clinical reasoning process. Overall, full utilization of HOBIC reports was identified as an opportunity for exchanging knowledge between staff and influencing practice and integrating HOBIC use into clinical care and organizational management.

Having a single person as our admin person...that was a real bottle-neck, and that particular person is really swamped. I spent seven months trying to get access...and it wasn't from lack of trying, I just couldn't get any further than that single admin person." (Information Leader, Acute Care)

Agencies also relied on feedback at staff meetings, daily huddles, and other communication avenues to receive input from clinical staff on whether integration of HOBIC was proceeding as intended. Agencies indicated that the use of computer software aided in integration of HOBIC measures into daily practice of clinical staff, such as required form-fields on data entry screens. Organization's also engaged assigned staff people to conduct data entry of HOBIC assessments to integrate the tool into documenting patient care. For agencies that did not have designated staff for entry of HOBIC data, managers used verbal and written reminders, chart audit feedback, and rewards such as recognition and thank you notes to reinforce the integration of HOBIC into clinical practice.

“How do the staff know the difference they make on a daily basis if we’re not sharing the data with them?” (Clinical Leader, Acute Care)

Feedback through a system of recognition for use of HOBIC and working toward practice change was also in the form of a range of reward systems.

Recognition	
Thank you notes sent to homes	Pizza, cake, ice cream sundaes
Pens	Certificates
Names listed in company newsletter	Posted on communication board
Identified to senior management	Identified to registration agency
Spotlight nurses for Nursing Week	Identify for other organizational opportunities
Identify for nurse fellowships	Coffee cards
Cook breakfast for staff	Special education opportunities
Special team-building activities	

Ongoing Education

Ongoing education of staff was identified as an important element of HOBIC utilization and practice change. Agencies described education in diverse ways, including internal and external opportunities, as well as educational collaboration between agencies. One agency noted the importance of educating clinical staff about conducting research related to nursing-sensitive outcomes and ways in which HOBIC supported a positive work environment for clinical staff.

“We all know the contributions that we’re making but it’s not very well quantified.” (Clinical Leader, Acute Care)

Participants discussed the importance of gaining knowledge and maintaining practice in the use of HOBIC reports to facilitate practice change and give feedback to staff. Respondents discussed the use of reports to review patient changes, to develop care plans, and to provide education to patients and their families. Participants also indicated that including HOBIC education in new-hire orientation sessions was a relevant way of utilizing HOBIC and influencing practice change. In general, participants noted the importance of ongoing educational efforts in order to both maintain the enthusiasm and momentum generated by the implementation of HOBIC, as well as to continue developing the knowledge of those who were learning about HOBIC for the first time.

“I think that’s an art, when we start rolling things out around HOBIC... you go and give feedback to the nurses and say the data isn’t where we want it to be yet...it’s helping them understand we’re learning as we go and it is a learning process...the hope is for the near future it will be where we need it to be...it will evolve constantly as will our environment, our professions do.” (Clinical Leader, Acute Care)

Multi-agency educational collaboration was often mentioned as being important and relevant for expanding knowledge of HOBIC utilization. The HOBIC Symposium was

mentioned by a number of participants as providing insight and opportunities for overcoming barriers to practice change and uptake. Interviewees also discussed the usefulness of inter-agency panel discussions and committees to provide opportunities for problem-solving and knowledge exchange.

“I came away from that conference with a whole new outlook and strategies for practice, you know, a vision from where I thought we could potentially go.” (Clinical Leader, Acute Care)
“I really enjoyed the discussion [at the Symposium], the provocations. It did provoke me to think about things a little differently.” (Clinical Leader, Long Term Care)
“When everyone left that day they felt much better about the whole HOBIC, because lots of people have instituted it but never really used it.” (Organizational Leader, Long Term Care)
“I was so regenerated from that [Symposium], to see that kind of thinking going on, both Canada and the US and the work that’s coming. I’m really excited for initiatives like HOBIC and getting nurse-sensitive outcomes.” (Clinical Leader, Acute Care)

Lack of knowledge of the utility of HOBIC measures and reports was seen as a barrier to sustained utilization of the tool. Lack of knowledge also prevented agencies from developing adaptations to tool use that would facilitate practice change and uptake. Participants noted that clinical staff was not aware how HOBIC measures were related to improving patient care; this is an educational opportunity that could facilitate HOBIC becoming a part of clinical practice and evidence-based care.

“Perhaps they’re looking at it as I must do this as a documentation. I don’t think they’re seeing the value of what information they’re contributing to patient outcomes...I mean I certainly think they see how they contribute to patient outcomes in other ways but I’m not sure they completely associate that answering of those questions in that same regard.” (Information Leader, Acute Care)

Education Strategies- Utilization	
Staff-to-staff sharing/peer-sharing based on reports in daily huddles	Newsletters with FAQs about HOBIC use
Weekly communication letters	Recognition events with an education component (e.g., Nurse’s Week)
Education on specific report items	Education on using reports in meetings with patients/families
Integrate into new-hire orientation	Incorporate into use with co-op/practicum students
Post-evaluation of competency	Conduct ongoing evaluation (e.g., SWOT)

“Talk about specific patients and how this is relevant for him or her, and for the work that we’re doing with them as nurses...use some of the data related to patients in their care and look at the comparison assessment and see how they’re changing.” (Clinical Leader, Long Term Care)

Adaptability

Continually adapting and innovating within agencies was an important utilization strategy in working toward sustainability and practice change. Agencies adapted in diverse ways based on the needs of their organization, resources available, and feedback from stakeholders.

Adaptation Strategies- Utilization	
Evaluate/change peer mentors	Adapt new-hire orientation materials
Extend time frames for admission/discharge data entry	Create individual unit action plans for use and feedback
Allow patients to complete therapeutic self-care portion of assessment	Staff choice of paper or electronic measures
Staff privacy for using electronic tools	Adding new staff person
Focus on site-specific priorities for measurement	Ongoing feedback between software vendors and HOBIC users

Opportunities for adapting processes for HOBIC completion were identified by both organizational leaders and clinical staff. Innovations were communicated through channels that leadership and staff were previously aware of, although some agencies indicated that new communicative relationships (e.g., HOBIC leaders) were made available due to the implementation of the tool.

“I think I scare IT on a daily basis now, and the CEO when I talk about handhelds at the bedside. But, you know, it’s happening in the States, why can’t we do it here? I know some hospitals are doing it, so what would it take?” (Clinical Leader, Acute Care)

Participants noted that the ability to adapt the reports for agency-specific priorities was an important element in utilizing the tool. Realizing the full potential and adaptability of feedback measures from the data entry process was often discussed by participants as an opportunity for practice change and uptake. Additionally, participants discussed opportunities in adapting HOBIC measures related to quality initiatives and committee priorities as a method of improving utilization.

Integration

As previously stated, integration of HOBIC into both the values and the practical tools of participating agencies was noted to be an important utilization strategy. Some agencies indicated that although attempts were made to integrate HOBIC measures into tools, after repeated use, leadership discovered that the tools were not functioning as intended. Participants noted that, in order to evaluate integration of tools, a feedback system was important for both leadership and clinical staff.

A barrier that participants noted in integration of HOBIC and practice change involved daily work tasks that were not directly related to HOBIC. One participant indicated that clinical staff was concerned about infection control related to movement of devices from the bedside.

“I think another piece for staff is infection control...if you’re bringing devices to bedside, or taking from room to room...I’ve been asked do I need to be cleaning this device in between rooms?...Do I clean the outside of the laptop or do I clean the entire cart?”(Information Leader, Acute Care)

Other organizational barriers to integration included admission wait-times that were outside of the HOBIC window, transfer of patients to units that were not using the HOBIC tool, and difficulty communicating HOBIC-related questions to patients. Agencies also noted the lack of sustained funding and resources as a barrier to utilization, including loss of internal and external HOBIC Coordinators, and little perceived advantage in ongoing measurement without complete agency compliance.

The literature revealed common barriers to implementation as including: workflow changes and difficulty in the face of other work demands (Buffum et al., 2009; Wong et al., 2009); lack of information technology support (Wong et al., 2009); perceived redundancy (Gaal et al., 2008); identifying correct procedural codes for documentation (Buffum et al., 2009); and patients being unfamiliar with computer platforms (Deutscher et al., 2008).

Integration Strategies- Utilization	
Provide access to reports for all users	Choose one measure as an agency priority
Compliance audits	Weekly communication letters on updates to use- patient specific
Tie to performance evaluation	Integrate into organizational workplan
Agenda item for Quality Committee	Assign HOBIC entry as job function for specified individual
Identify specific residents to focus HOBIC assessments	Identify LHIN priorities relevant to HOBIC measures.
Electronic hard-stop data entry rules.	

Types of evidence

Evidence from the literature relating to implementation evaluation was mainly descriptive in nature. Many studies were described as an evaluation of a program or protocol, reporting outcomes of the intervention itself and/or of the process of implementation (i.e. implementation strategies), including barriers and challenges. According to Rogers (2003), diffusion studies ideally should rely on “moving pictures” of behavior rather than “snapshots” because of the need to trace the sequential flow of an innovation as it spreads through a social system. Diffusion research designs that consist mainly of correlational analysis of cross-sectional data gathered in one-shot surveys of respondents can be intellectually destructive of the “process” aspects of the diffusion of innovations over time (p.127). Rogers states that alternative research designs include field experiments, longitudinal panel studies, use of archival records and case studies with data at multiple points in time and from multiple respondents.

Several studies used qualitative methods as part of the implementation and evaluation processes, aiming to better understand staff perceptions of interventions necessary for quality improvement, nature of implementation strategies, effect of the intervention and if it is being sustained (Cormack et al., 2007; Gaal et al., 2008; McLean et al., 2006; Nease et al., 2008; Nemeth et al., 2007). Rogers describes *process* versus *variance research* in diffusion studies (p.

196). Process research is a type of data gathering and analysis, that seeks to determine the sequence of events over time (Mohr, 1982), usually with qualitative methods to gain insight into human behavior. Variance research consists of determining co-variances among a set of variables but not their time order, usually using quantitative methods assigning numerical values to behaviors. Rogers claims that variance research cannot probe how each of events influences the next event in the innovation decision process. Rogers claims the lack of process research in the innovation-decision process is the reason why we lack understanding of the degree to which stages exist. Many of the studies could be broadly described as non-experimental descriptive, using descriptive statistics on survey and/or chart audit data (further details about methods of each study is provided in the table in Appendix A). There were only two studies that were described as control studies (Katz et al., 2004; Sebat et al., 2005) and one literature review study (Chin, 2010). While there was an evaluation component in all of the studies, 13 gave specific emphasis to the use of pre- and post-implementation evaluation measures, with baseline and follow-up measures at various points to examine effect of the evidence-based implementation.¹

Evaluation Outcomes

Rogers (2003) observes that past diffusion research has been lacking in terms of studying consequences; “change agencies, which often sponsor diffusion research, overemphasize adoption per se, tacitly assuming that the consequences of the innovation-decisions will be positive” (p. 440). The final phase in the innovation-development process includes the *consequences* of an innovation, defined as the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation (Rogers, 2003, p. 157).

When asked what evidence would show that HOBIC implementation led to practice change, some respondents indicated that a change would be seen in patient outcomes, the primary intention of the HOBIC tool. However, most respondents indicated other qualitative measures, such as nurse satisfaction with the tool in providing clinical care, the ease of use and ability to improve flow and efficiency for front-line staff, and the potential redirection of staff resources and evaluation of staffing models. Some respondents also indicated more broad measures of success, like the ability to expand HOBIC usage to other areas of health services, and one participant noted that she would like to see HOBIC support pathways to a comprehensive electronic health record for all Ontarians.

Many participants indicated positive secondary organizational outcomes for the implementation of HOBIC, benefits that they considered opportunities for supporting ongoing utilization of the tool.

¹ Based on the *Pre/Post Intervention – Design Quality Assessment Tool* (Appendix F) (Schalk et al., 2010) to determine quality of evidence, it was found that only one study could be considered “moderate” (Sebat et al., 2005) and one study could be considered “strong” (Katz et al., 2004). These two studies were the only ones that used a control group in the research design. While many of the studies used mixed methods (ex. survey, chart audit, focus groups), they were of descriptive design and did not match the criteria specified in the tool. However, as Rogers (2003) suggests, regular and consistent data collection throughout and following the implementation process is necessary to demonstrate effectiveness of the intervention and sustained practice change. According to the Canada Health Infoway’s (2006) *Benefits Evaluation Framework*, indicators should be selected according to their level of importance, relevance, feasibility, reliability, and validity.

Organizational Outcomes	
Improved career satisfaction for users	Expanded knowledge for field of nursing
Career development opportunities	Improved inter-departmental relationships
Improved clinical decision-making	Improved inter-agency relationships
Increased knowledge of nursing-sensitive outcomes	Increased awareness of quality indicators
Increase in educational opportunities	Research opportunities
Staffing model evaluation	

The unexpected outcome of development of career opportunities for clinical and administrative leadership was notable for many participants. Some participants also discussed how technology can continue to improve efficiency and staffing in healthcare into the future as assessment tools are effectively used to measure nursing-sensitive outcomes.

“My ideal role, even though I’m only one person and it’s one role within an IT world, is to see that role expand so that nurses have interest, see value and want, have vision to where they want to see technology fit into practice.” (Information Leader, Acute Care)

“We seconded a nurse from our palliative care unit, and she was super fantastic. In fact she has since left her position as a nurse on our palliative care unit and is working as an application specialist.” (Clinical Leader, Long Term Care)

The ability for staff to develop and take on expanded job tasks facilitated developing of leadership skills and identifying ways to improve the work environment for clinical staff.

“An emerg nurse came to me because she loves informatics and she’s keen to do that...we don’t know what to do with them, and they don’t position [informatics] well and won’t get out of the box from old traditional nursing practice crap, to put it politely.” (Information Leader, Acute Care)

In the literature review, only studies reporting successful implementation outcomes were selected. Although several barriers to implementation were reported, evaluation findings were positive in relation to quality of care, care provider outcomes (ex. increased knowledge, satisfaction, or confidence), compliance or participation, culture or attitude change, organization outcomes and shared learning, as shown in the following examples.

Improved quality of care or documentation

- Success in improving awareness on pain assessment reflected in an increase from 29% to 75% for accuracy in the assessment and documentation of pain (Ang & Chow, 2010).
- Management plans were increasingly aligned with best practice, evidenced by percentage of patients referred to other health practitioners for further care, and percentage of patients who were provided with information by hospital staff (Kimber & Grimmer-Somers, 2009).
- Nursing staff found that relevant disease-specific templates or flow sheets within the EMR system helped to more effectively focus and plan a patient care visit. Nursing staff in many practices took more responsibility for ensuring the health maintenance, and screening

procedures needed by the patients were up-to-date. The EMR system also featured flags, reminders, and internal messaging that was increasingly used. (Nemeth et al., 2007).

- Approximately 71% of the participants believed that the whiteboard improves and standardizes communication within the care team. Further, approximately 62% of the participants agreed that the whiteboard saves them time when searching for information on a patient and their care plan (Wong et al., 2009).

Compliance (completion or participation rate)

- During the first 12 months of the implementation process, the participation rate increased from 50.1% to 79.8%. Our goal was a 90% participation rate. The rate of participation by the end of the study among all 11 participating clinics ranged from 52.7% to 100%, with 5 clinics reaching or exceeding the 90% goal (Deutscher et al., 2008).
- Audit data revealed improvement to 72% from 24% (target compliance rate was > 90%). We have sustained full compliance (that is, > 90% target) with a cumulative rate of 94.9% appropriately documented pain reassessments (Gordon et al., 2008).
- Significant improvement in compliance with the performance indicators over the audit periods. Change was immediately observable in all indicators after implementation of the guideline education strategies, and improvements continued over subsequent audits (Kimber & Grimmer-Somers, 2009).

Improved patient outcomes

- Data suggest a decline in the number of in-house pressure ulcers (PrUs) on participating units during the intervention period. The average number of in-house-acquired PrUs per facility decreased between pre-implementation post-implementation by 62% from 12.1 to 4.6 (Horn et al., 2010).
- ...a continued trend of improved patient satisfaction with how well pain is controlled (Gordon et al., 2008)
- Good outcomes (i.e., discharged to home or to a rehabilitation center) were more likely in the protocol group than in the control group ($p = 0.02$). Hospital mortality rate 40.7% in control group and 28.2% in protocol group ($p = 0.035$) (Sebat et al., 2005).
- The mean Acute Physiology and Chronic Health Evaluation (APACHE) II score increased from 22.2 to 24.4 in year 1 ($p = .006$) and to 26.2 in year 2 ($p = .608$), hospital length of stay decreased from 37.5 to 31.6 days ($p = .058$), ICU length of stay decreased from 30.5 to 25.9 days ($p = .133$). When year 0 was compared with year 2, mean days on mechanical ventilation decreased from 23.9 days to 17.5 days ($p = .004$), mean hospital length of stay decreased from 37.5 to 24.7 days, mean ICU length of stay decreased from 30.5 to 20.3 days (Smyrnios et al., 2002).

Care provider outcomes

- As nursing and medical staff knowledge of standardized insulin orders improved, resistance to managing glucose control with standardized orders decreased. Important implications for nursing included staff empowerment, improved interdisciplinary collaboration, and enhanced levels of physician-nurse knowledge (Custer, 2010).
- Staff members became more confident with identification and assessment of skin breakdown and wounds; they sought support and validation of their interventions and expressed pride in the improvements noted within their patient population (Dibsie, 2008).
- In conversations with the nurse leader, staff also reported satisfaction associated with

leaving on time and with the increased usefulness and quality of the information received in reports (Nelson & Massey, 2010).

- Nursing staff assumed new roles to enhance communication between patients and providers (Nemeth et al., 2007).
- Ultimately, outcomes of the quality improvement and clinical microsystems process used to re-implement the NICU's EMR system included increased staff involvement in process improvement activities, (2) a decrease in turnover, (3) staff satisfaction improvement with change management, and (4) the use of this process for other projects (Rikli et al., 2009).

Positive culture or attitude change

- The changes in the climate and practice related to skin care and prevention of breakdown are the direct result of nursing taking ownership of their practice with the support of nursing leaders at all levels (Dibsie, 2008).
- Culture of value for EBP from the level of the clinical staff nurse to the nursing executive level (Kenny & Goodman, 2010).
- As refinements were made and tested to improve the template and process, the levels of staff comfort and buy-in increased. The staff-driven process using TCAB methods contributed to an increased sense of ownership and awareness of staff about their ability to effect a positive change in the work and practice environment (Nelson & Massey, 2010).
- Program created a paradigm shift in the minds of healthcare team regarding what is most important in weaning patients from MV. No longer focus on "best" mode of weaning; focus turned to the identification of problem patients, the management of barriers to weaning, and the elimination of impediments to timely extubation and discharge (Smyrniotis et al., 2002).

Positive organization outcomes

- The advantages of HELP reported by at least half the sites included providing an educational resource at 100% of sites; providing nursing education and improving retention at 100%; providing cost-effective care at 76.9% (Inouye et al., 2006)
- The incremental cost per quitter associated with the study intervention compared favorably with that computed in a formal cost-effectiveness analysis, which demonstrated that implementation of the AHRQ Guideline was highly cost-effective relative to other preventive care interventions (Katz et al., 2004).
- To champion the development and implementation of EBP processes, the Department of Nursing allocated \$1,000,000 for additional CNSs on the inpatient units. The CNSs support nursing staff in the implementation of current EBP processes and periodic evaluation of such processes for continued sustainment. Measures of EBP are included in education and training (Kenny & Goodman, 2010).
- End-of-shift overtime costs were calculated after implementation and indicated that end-of-shift overtime costs were reduced to \$6,602.85, a net savings of \$73,726.35 per year for the pilot unit (Nelson & Massey 2010).

Shared learning

- Of note is that the nurse leaders found the conference calls most helpful when sites with obstacles learned how other sites successfully overcame challenges and implemented the course (Buffum et al 2009).
- Positive comments and good results from successful pilot projects communicated to the

rest of the medical personnel through staff meetings and reports disseminated by the organization's quality improvement committee. As information spread to other providers and distant sites and interest generated (Reinhardt & Keller, 2009).

DISCUSSION

Rogers (2003) examines why certain innovations spread more quickly than others, highlighting five qualities that determine success of an innovation. *Relative advantage* is the degree to which an innovation is perceived as better than the idea it supersedes by a particular group of users, measured in terms that matter to those users. *Compatibility with existing values and practices* is the degree to which an innovation is perceived as being consistent with the values, past experiences, and needs of potential adopters. *Simplicity and ease of use* is the degree to which an innovation is perceived as difficult to understand and use. *Trialability* is the degree to which an innovation can be experimented with on a limited basis; an innovation that is trialable represents less uncertainty to the individual who is considering it. *Observable results* lower uncertainty and increase the likelihood of adoption of an innovation. These qualities are consistent with those reported in the literature and by the interview participants.

It is important to determine what types of implementation and evaluation strategies are the most likely to lead to positive outcomes. In the PARIHS (Promoting Action on Research Implementation in Health Services) model, Kitson et al. (2008) suggest that three elements are vital to successful implementation: evidence, context, and facilitation. *Evidence* is characterized by research evidence, clinical experience, patient experience, and local data/information; *context* by culture, leadership, and evaluation; and *facilitation* by purpose, role, and skills and attributes. Each of the elements is on a continuum of low to high. Kitson et al. (2008) further suggest that if each sub-element is judged to be toward the high end, implementation is more likely to be successful. Evidence needs to be robust; match professional consensus and patient needs; and where relevant, include local data. There will be greater receptiveness to change if the context has sympathetic cultures, strong leadership, and appropriate evaluative systems, and if the implementation is supported by appropriate facilitation.

The following discussion is organized according to the evaluation objectives described in the introductory section of this report, with recommendations based on qualities identified by Rogers' (2003), elements identified in the PARIHS model, and suggestions based on practices and lessons learned from healthcare experts.

Investigate factors that contribute to variation in HOBIC adoption and utilization.

This process successfully reports factors that contribute to variation in HOBIC adoption and utilization according to site users identified by the MOHLTC. Reports from participants indicate that 1) implementation was considered successful by most agencies, facilitated by internal and external support and a range of resources, but that 2) utilization strategies related to sustainability were multi-layered, with organizations experiencing a range of results. Some concerns that contributed to variation in HOBIC utilization were context-specific (e.g., choice of software vendor), while others were more general (e.g., effective use of HOBIC reports). Variation in use was also attributed to agency issues that are not specific to HOBIC, such as simultaneous adoption of other new projects, difficulty accessing physical work-space due to construction, and evaluation of all current assessment tools.

The unique responses of participants in discussing factors contributing to variation in HOBIC utilization were grouped into three sub-categories, namely 1) integration, 2) education, and 3) adaptation. These three categories fit under an over-arching theme of the necessity of competent leadership. The importance of leadership to communicate the relevance of HOBIC to organizational and clinical staff, follow-up on implementation and utilization strategies, identify ongoing opportunities for education, and support adaptation and innovative practice was a cornerstone of successful strategies in HOBIC adoption and utilization.

Identify strategies to improve utilization of HOBIC for clinical care planning and health system improvement.

Numerous suggestions were offered by participants, some which could be directed to agency strategies and others directed as feedback to the MOHLTC. Strategies for improved utilization were identified by discussing processes that went well, especially during the implementation process, and areas where the organization perceived barriers to utilizing HOBIC assessment and data. Participants also identified ways in which their agency adapted the HOBIC tool for site-specific needs, in order to address their own evaluation of HOBIC strengths and opportunities.

“Once you approach these people you don’t actually have to work very hard to get them to help because it’s almost as if by acknowledging them as being valuable they will say oh, okay then, I’ll do that.” (Clinical Leader, Long Term Care)

Review the literature for studies describing strategies for successful outcome/ performance monitoring implementation strategies.

Inouye et al. (2006) emphasized several important strategies which included gaining internal support to initiate organizational change required for implementation. Sites spent seven months on average before enrolling any patients to start up their programs, including time to gain administrative and financial support, advance interdisciplinary collaboration, and foster buy-in by physicians and non-physician clinicians across floors. Demonstrating the cost-effectiveness of the program to hospital administration may assist in overcoming the initial financial barriers. Similarly, Kimber & Grimmer-Somers (2009) advises obtaining local consensus from health providers of importance, developing targeted education programs, obtaining overt support from nursing and medical leaders, providing evidence of their support by directives and their presence at meetings and education sessions, and group brainstorming sessions to obtain stakeholder buy-in, present ongoing record audit findings regularly.

Ensuring and sustaining effective leadership was of paramount importance to successful adoption (Inouye et al., 2006). Direct and extensive leadership involvement must be provided in the form of continuous bedside coaching, combined with clear accountability and alignment with goals (Gordon et al., 2008). Leadership must also consist of support for the program at high levels throughout the organization. Gordon et al. (2008) states that multilevel support and attention must be maintained for the practice change over six to nine months to sustain the improvement.

Characteristics of the innovation itself must be attractive, such as being advantageous; compatible with values, beliefs, needs, and former practices; flexible to implement; relatively easy to do in the clinical setting; and observable as a consequence of implementing (Buffum et al., 2009). Demonstration of positive outcomes, particularly those which are compelling at the local institution, is imperative for successful establishment of the program (Inouye et al., 2006). De Groot et al. (2010) emphasize that test outcomes should be reliable, valid and responsive to

clinical change that occurs over time, and manuals and test forms should be presented in an easy format, accessible, and user-friendly.

For use of clinical reports, successful strategies were to assign responsibility to individual team members to review and share specific report information during interdisciplinary care team meetings, and also to phase in the use of clinical reports and limit the number of reports reviewed each week (Horn et al., 2010). Strategies to sustain improvements include daily administrative and monthly staff documentation audits with prompt and direct feedback to both clinical nurse managers and staff (Gordon et al., 2008).

For continued utilization, Kenny & Goodman (2010) described the use of Clinical Nurse Specialists to support nursing staff in the implementation of change and periodic evaluation for continued sustainment. In their study, the CNS job descriptions list explicit job performance criteria for the use of evidence to guide practice, and measures are included in education and training. Initial competency incorporates educating new staff on evidence-based practice processes and annual competency verification involves demonstration of competency.

CONCLUSION AND RECOMMENDATIONS

This project investigated factors that influence HOBIC adoption and utilization and identified strategies to improve utilization of HOBIC information for clinical care planning and health system improvement. While the success of an implementation is facilitated by internal and external support and a range of resources, sustained utilization requires ongoing competent leadership for the integration, education and adaptation of HOBIC across individual organizations, thereby addressing unique evaluations of strengths and opportunities. HOBIC leaders need ongoing support to be able to facilitate the necessary adaptations in response to current feedback and upcoming issues, while keeping aligned with organizational values and priorities. Ultimately, collection of nursing-related outcomes and increased utilization of HOBIC information will provide more effective decision support in health care planning and research.

The interview and literature findings were applied in formulation of the following recommendations.

Readiness for Change

1. Determine an organization's readiness for HOBIC implementation. Implementation and sustainability worked best in organizations that had strong leadership support, and integrated HOBIC assessment into nurses' clinical workflow, clinical documentation, and care planning.
2. Re-consider implementation when HOBIC is clearly an activity outside normal clinical documentation and care planning.
3. Conduct a needs/barriers assessment and tailor implementation strategies to address local barriers to change.

Leadership

1. Demonstrate strong support and commitment for evidence-based practice and HOBIC outcomes among senior leadership within the organization.
2. Identify HOBIC leaders, including specific job functions and responsibilities related to implementation and sustainability (e.g., using report information, giving feedback to staff, reporting to committees).

3. **Anchor HOBIC in other practice initiatives such as evidence based practice, quality improvement, patient centred care, and patient safety.**
4. Provide opportunities for regular communication between staff, project team, and administration related specifically to HOBIC.
5. Identify individuals within the agency that will provide support or back-up for leadership in the case of staffing changes, or in the case of need for additional support.
6. Provide a recognition and reward system for leadership initiatives taken by staff.
7. Evaluate the feasibility of a new staff position, including skills and experience in leadership roles, with job duties including implementation, evaluation, leading quality improvement or practice development related to HOBIC outcomes, and sustainability of HOBIC.
8. Update current job descriptions and performance evaluations to clearly define staff roles and responsibilities related to use of HOBIC.
9. Allocate budgetary funds for the management of sustainability of HOBIC.
10. Integrate HOBIC language into agency and unit policy manuals, mission, and value statements.

Facilitation as a Form of Local Leadership

Facilitation is a technique whereby facilitators provide support to help individuals and groups realize what they need to change and how to make changes to incorporate evidence into practice (Kitson et al., 1998). Facilitators support individuals and groups through the change process (Dogherty, Harrison, & Graham, 2010; Thompson et al., 2006).

Dogherty, Harrison, and Graham (2010) reported the following common roles for facilitators of evidence-based practice:

- Increasing awareness of a need for change;
- Leadership and project management;
- Relationship building and communication;
- Working with practitioners to adapt facilitation interventions and practice guidelines to the local context;
- Ongoing monitoring and evaluation

See Appendix G for a full Taxonomy of facilitation interventions/ strategies and facilitator role synopsis

Feedback to MOHLTC

Offer leadership training and networking opportunities for staff involved in HOBIC implementation and utilization, especially related to developing confidence, communication skills, change management, and responding to negative feedback.

Provide on-site support staff during the implementation process, including expertise in supporting in-house 'bedside' coaches, in order to provide support for practice change during the implementation phase.

Allocate budgetary funds for sustainability measures related to HOBIC.

Project team

1. Consider the development of team leadership related to HOBIC utilization and sustainability, including rationale for selection of team members, representation from multiple areas within the organization, clarification of responsibilities for the team, measurable goals, and a feedback system in place to monitor practice change.
2. Provide team training in quality improvement, PDSA, and evidence-based practice. Allow development of working plans integrating training and assessment needs for the agency.

<h3>Feedback to MOHLTC</h3> <ul style="list-style-type: none"> • Offer training related to teamwork, project management, quality improvement initiatives, and evidence-based practice. • Facilitate participation for MOHLTC HOBIC experts on agency project teams. • Provide referral information for connection with other agency experts, software vendors, or IT support experts for agency project teams.
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Education

1. Outline clear and measurable rationale for educational initiatives, including goals related to learning and practice change.
2. Create momentum for change by situating HOBIC in valued organizational initiatives such as evidence-based practice, thus enabling adaptation to local priorities.
3. The change process needs to begin by identifying the priorities and needs of frontline staff and then demonstrating how HOBIC can support practice initiatives designed to address these priorities and needs.
4. Provide education that addresses the use of new technologies that may be required to complete HOBIC (e.g., first-time computer use, part-time and casual staff that are not familiar with tools).
5. Offer education in different modes and formats.
6. Identify broad educational opportunities, both formal and informal, in which to integrate HOBIC as a talking point and for practical uses.
7. Provide a feedback mechanism through which HOBIC users can evaluate educational offerings, and pre- and post- education evaluation systems.
8. Develop methods to evaluate completed education for HOBIC users, including accountability through job descriptions, compliance audits, and feedback to users.
9. Provide visible reminders and easy-access reference materials (e.g., chart-side laminated guides, hints for success).
10. Provide bedside assistance to facilitate uptake during the implementation stage, with a support person to work with client needs while the assessment tool is practiced. The support person/trained facilitator needs to model the integration of HOBIC review and feedback into clinical care planning, practice reflection, and continuous improvement.
11. Provide opportunities for group experiential learning (e.g., patient care rounds), to facilitate implementation and utilization of HOBIC within workflow.
12. Provide a forum for questions and answers; post FAQs in an area that is easy to see and easy to access for HOBIC users.

13. Identify experts that can be accessed for questions relating to HOBIC use, including different ways of reaching experts; cross-train experts.
14. Develop education that includes the use of actual patient scenarios, anticipating questions that are agency-specific.
15. Integrate HOBIC into new-hire orientation, with opportunities for additional education ongoing.

Feedback for MOHLTC

- Encourage agencies to adapt MOHLTC education materials for site-specific needs; provide encouragement and feedback for improvements.
- Sponsor educational forums for HOBIC users where new research, training and education, and feedback are encouraged.
- Provide FAQ updates to managers and HOBIC users on a regular basis.
- Provide an external resource person that is available after implementation to respond to questions and assist with trouble-shooting post-implementation.
- Offer ongoing education encouraging use of reports in care-planning and organizational management.

Creating Momentum for Change

Adaptability

1. Conduct regular scheduled reviews of the utility of assessment tools. Evaluate the feasibility of *re-invention* of an improved assessment tool, with a patient-centred rationale for assessment devices.
2. Initiate a reward and recognition system for HOBIC users to suggest innovations to sustainability of HOBIC.
3. Develop an ongoing evaluation system to determine the rationale and utility of HOBIC related to agency culture and values. Communicate with staff.

Feedback for MOHLTC

- When reviewing requests for funding for implementation of HOBIC, encourage agencies to indicate rationale related to mission and values of the organization.

Material or written resources

1. Develop a range of site-specific materials that are available and accessible. Clarify job duties related to update and placement of material or written resources.
2. Evaluate staffing models and job responsibilities, considering the possibility of staffing changes in order to support HOBIC sustainability.

Feedback to MOHLTC

- Tie HOBIC compliance post-implementation to availability of resources, such as opportunities to conduct research or provision of education.

Theoretical model

1. Identify strategies that would integrate HOBIC measurement into current quality initiatives, Quality Committee priorities, or accreditation strategies.
2. HOBIC indicators could be incorporated into PDSA cycles to support quality improvement
3. Integrate HOBIC data collection into evidence based practice initiatives, demonstrating the relationship between evidence based practice and outcomes measurement

Audit and feedback

1. Schedule regular meetings to review clinical reports and discuss strategies on incorporating information into clinical practice and organizational management.
2. Conduct scheduled chart audits for compliance or patient outcomes improvement.
3. Link HOBIC outcome feedback with audit and feedback about clinical practice, nursing process, and evidence-based practice. The relationship between outcomes measurement, nursing process, and client outcome achievement needs to be continually reinforced.
4. Communicate results to staff, with a reward or recognition system in place to identify areas of practice change and use of evidence-based outcomes.
5. Conduct regularly scheduled compliance reviews with clinical and organizational users, with feedback related to practice change.
6. Combine audit feedback with educational opportunities to develop and expand capabilities of HOBIC users.
7. Provide opportunities for ongoing process review, encouraging input from clinical and organizational users; evaluate and implement recommendations for adaptation, with a recognition system in place to acknowledge staff innovations.
8. Maintain evaluation of HOBIC as a priority item for staff and committee meetings.
9. Design HOBIC reports so that they are consistent with agency quality monitoring reports. For example control charts enable organizations to track change over time and identify when there has been a significant change for the better or worse.

Feedback for MOHLTC

- Offer email or listserv reminder updates to agency users, including an educational component, new research, recommendations from other HOBIC users, and information on how to fully utilize reports.
- Offer post-implementation review (e.g., multi-agency project groups, phone calls). Address and/or implement recommendations of users.

In conclusion, the measurement of outcomes has gained in importance as health care organizations focus on the areas of cost and quality, effectiveness of care, and organizational performance. HOBIC provides organizations with valuable data relevant to the contribution of nursing to patient care and such data are foundational to organizational quality improvement initiatives. More importantly, outcome measurement such as HOBIC is an essential component of evidence based practice because it provides information about the effectiveness of health care interventions, and enables adjustment to the plan of care to meet patient needs. Implementation

of standardized outcome measurement requires multi-faceted strategies to prepare for, implement, and sustain change. At a minimum there must be strong leadership support for HOBIC outcomes measurement. Staff members need to see the value of HOBIC by linking outcomes measurement to existing unit and organizational priorities or by articulating new organizational priorities. Multi-faceted educational strategies are needed, as is integration of HOBIC data collection into care planning to support clinical decision making, and feedback is required to sustain the change.

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Appendix A: Literature review

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
<p>Ang & Chow (2010): To implement pain assessment, using JBI audit criteria, along with routine screening of blood pressure, and pulse and respiratory rates on admission, and whenever pain is present.</p>	<p>Pre- and post-implementation audit Sample – 24 patients and nurses. Implemented in 3 phases over a 6-month period. Audits utilised 3 out of 10 criteria recommended by The National Health Service Quality Improvement. Took place in 24-bed oncology ward in a large acute care setting</p>	<p>Leadership, Education, Adaptability, Collaboration, Project Team, Audit & Feedback</p>	<p>Modest to significant improvement in the three criteria: 1) improvement of 33% through using pain assessment tool; 2) 75% increase in number nurses who received education on pain assessment; 3) 46% increased accuracy in pain assessment and documentation. Plans for ongoing monitoring whereby champion will provide monthly reinforcement, followed by 6-monthly audit.</p>
<p>Bails et al. (2008): Describe interdisciplinary process to develop online medication reconciliation (MR) program (comparing a patient's medication orders to all of the medications that a patient has been taking).</p>	<p>In a large hospital setting, hospital wide auditing, followed by mandatory functionality. In implementing computerized system, plan was to create a tool that could be incorporated into everyday work flow; create a reliable medication list that could incorporate inpatient and outpatient medication ordering activity; have measurable compliance rates so that ongoing feedback could occur; be shared as an interdisciplinary activity; have mandatory settings if necessary to assure full compliance</p>	<p>Leadership, Education, Collaboration, Interdisciplinary, Organizational support, Project team, Participatory input Audit & Feedback</p>	<p>Pilot in summer 2006– inconsistent compliance, averaging 20% of patients Nov 2006 – compliance remained low (10%-65%) due to work flow reasons Since mandatory discharge reconciliation, compliance has been stable at 95% across the hospital.</p>
<p>Buffum et al. (2009): To educate APNs on how to implement the 10-session course "Behavioral Management of Persistent Auditory Hallucinations", determine the facilitators and barriers to implementation, and evaluate course helpfulness from APN and patient perspectives.</p>	<p>Both inpatient and outpatient settings at six sites. Sample: 6 APNs and 32 patients <i>29-item Program Evaluation form, Pre- & post-course patient data for Characteristics of Auditory Hallucinations Questionnaire; Unpleasant Voices Scale; Symptom Management Course Questionnaire</i></p>	<p>Leadership, Education, Adaptability, Collaboration, Dissemination, Interdisciplinary, Structured or formal approach, Theoretical or QI model</p>	<p>All APNs reported course helpfulness, improved communication with patients about voices, and improved harm assessment. Means and ranges from program evaluation forms (1 [not very helpful] to 6 [extremely helpful]). Of the patients, 96% found the course helpful: 67% no longer heard voices to harm self or others, and 60% had improved auditory hallucination intensity scores.</p>
<p>Chin (2010): To describe Health Disparities</p>	<p>HDCs, a quality improvement (QI) collaborative incorporating</p>	<p>Leadership, Education, Collaboration,</p>	<p>HDCs improve clinical processes of care over short-term period (1-2 years), and clinical processes and outcomes over</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
<p>Collaboratives (HDCs) and review the evidence for impact on quality of care, the financial ramifications for society and individual community health centers (HCs), and factors important for organizational change at the HCs.</p>	<p>rapid QI, a chronic care model, and learning sessions, implemented in over 900 community health centers to reduce racial and socioeconomic disparities in health care.</p> <p>Summary findings from systematic review of literature for articles on the HDC since 1998. 23 articles met the inclusion criteria.</p>	<p>Expertise support, Organizational support, Project team, Structured or formal approach, Theoretical or QI model, Audit & Feedback</p>	<p>longer period (2 to 4 years). Most participants perceive that the HDCs are successful and worth the effort. Societally cost-effective but consistent revenue streams do not exist. Barriers include lack of resources, time, and staff burnout. Relatively low-cost ways to increase staff morale and prevent burnout include personal recognition, skills development opportunities, and fair distribution of work.</p>
<p>Cormack et al. (2007): To describe a participative management approach used to develop and implement a nursing care delivery model for geriatric rehabilitation.</p>	<p>Geriatric assessment & rehabilitative services in multi-site tertiary care center</p> <p>Qualitative- Key informant interviews with a purposeful sample of 11 staff members, representing RNs (n = 5), RPNs (n = 2), allied health (n = 3), and physicians (n = 1).</p>	<p>Leadership, Education, Adaptability, Collaboration, Dissemination, Organizational support, Participatory input, Project team, Structured formal approach, Theoretical or QI model</p>	<p>Overall, staff reactions to the new care delivery model were favorable. The participative approach used to select and implement the new model led to a sense of shared decision making and empowerment and established consensus across the majority of staff.</p> <p>Sustainability of this initiative supported by the development of the geriatric resource nurse role and the emphasis on this role as a support for bedside nursing.</p>
<p>Custer (2010): to determine if the use of standardized insulin orders versus the use of nonstandardized insulin orders improved glucose results in a hospital's critical care unit.</p>	<p>Quality improvement project to compare effectiveness of standardized hospital insulin orders with non-standardized insulin orders. ICU in an acute care hospital</p> <p>Comparative study</p> <p>331 individual glucose results from 16 patients reviewed</p>	<p>Leadership, Education, Adaptability, Collaboration, Dissemination, Expertise support, Interdisciplinary, Organizational support, Participatory input, Project team, Audit & Feedback</p>	<p>Mean glucose of 175 mg/dL and median glucose of 149 mg/dL when standardized insulin orders used versus mean glucose of 206 mg/dL and median glucose of 190 mg/dL when standardized orders not used.</p> <p>System change to improve glucose control resulted in improved nurse empowerment, improved provider knowledge of glucose control methods, and improved patient glucose control.</p> <p>Standardized insulin orders were implemented and physician education sustained.</p>
<p>Daniel et al. (2010): To identify and develop a set of standardized, inpatient measures that would eventually be used to evaluate health care practices for prevention and management of venous thromboembolism.</p>	<p>Community teaching hospital (two-hospital system) in pilot project along with 54 other hospitals to develop quality measures for VTE prevention & management.</p> <p>8 quality measures- 4 monitored initially</p> <p>Data collected included discharges from Oct 2006 – Mar 2007. During pilot, significant improvements in VTE prevention & management. Summer 2007, developed organization-wide initiative</p>	<p>Leadership, Education, Adaptability, Collaboration, Interdisciplinary, Organizational support, Audit & Feedback, Project team, Participatory input, Expertise support, Structured or formal approach</p>	<p>Standardized order sets, audit and feedback of results, and electronic reminders helped improve VTE prophylaxis.</p> <p>2008 - Joint Commission recommended VTE measures become a core measure set. Following successful implementation of multiple quality improvement innovations from the pilot project participation, expanded efforts in 2009 to improve performance on eight VTE quality measures.</p> <p>For 2009, quality goals included 4 of 8 VTE quality measures and commitment to continued monitoring of the remaining four. For the quality measures that carried</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
	to improve VTE prevention and treatment. Abstraction of VTE data – random, relevant hospital-wide sample		over from 2008, the individual targets were raised from 75% to 95%.
De Groot et al. (2010): Evaluate implementation of standardized physical and functional tests to monitor patients with a spinal cord injury (SCI) in eight rehabilitation centers	Multi-site prospective effect and process evaluation Questionnaires at start (n=115) and end (n=82) of 1-year implementation period. Questionnaire administered to managers (n=8), coordinators (n=8), and 32 persons with SCI in four centers. Outcome of effect evaluation was phase of implementation of standardized testing in each center, based on model of Grol et al. (2005)- five phases of the implementation process (orientation, insight, acceptance, change, maintenance).	Leadership, Education, Dissemination, Interdisciplinary, Organizational support, Project team, Structured or formal approach, Theoretical or QI model	After 1 year of implementation, half of the centers shifted to higher implementation phases. None of the centers was classified in the highest phase. Enablers were the positive attitude of the team members regarding standardized testing and an encouraging local coordinator. Most important barrier was lack of time to implement the standardized testing. There is a large support for implementing standardized tests to monitor patients with SCI. During the 1-year, a positive shift was visible in the extent of implementation.
Deutscher et al. (2008): Describe implementation of an electronic patient-centered functional outcomes data collection system and integration of these data into an existing HER, and assess effect of routine electronic outcomes data collection in a public health care service in relation to patient and clinic burden.	Data examined from 21,523 adult patients. Process and patient characteristics were entered into the HER. Outcomes data collected using computerized adaptive testing technology in 11 outpatient clinics were integrated into the HER. The effect of data collection was assessed by measuring participation rate, completion rate, and data entry time. Qualitative assessment of barriers and facilitators of the implementation process by unstructured interviews.	Leadership, Education, Organizational support, Project team, Structured or formal approach, Participatory input, Audit & Feedback	Descriptive statistics- After 1 year, average participation rate per clinic was 79.8%; average completion rate per clinic was 45.1%; and average data entry time per patient (minutes: seconds) was 3:37. Maximum estimate of average time per patient was 9.6% of overall episode time. Routine collection of outcome data is realistic in a large physical therapy service and can be integrated with EHR data to produce a valuable clinical practice improvement platform for service evaluation and outcomes research. Intend to add data on patient medical background for analyzing relationships between independent variables and functional outcomes.
Dibsie (2008): To implement an evidence-based practice change associated with skin breakdown or pressure ulcers, including quarterly prevalence data collection, as a mechanism for improving skin care.	A multisite academic medical center, attempting to change practice following 2 significant episodes of reportable skin breakdown. A standard form provided triggers to ensure comprehensive documentation of the wound assessments each week, and standardization of the inclusion of photographs into the medical record. Each quarter, for 4 quarters, prevalence data shared with individual managers, staff, and senior leadership.	Leadership, Education, Adaptability, Collaboration, Dissemination, Expertise support, Interdisciplinary, Material or written resources, Organizational support, Participatory input, Project team, Theoretical or QI model, Audit & Feedback	Steady decreases in rate of hospital-acquired stage 2 or greater pressure ulcers. As an organization, an overall rate of just more than 3%. For surgical ICU, rate also decreasing - 7% below the target established as an organization goal and consistent with benchmarks. Since the establishment of weekly rounds and implementation of skin care protocol, medical center has not had any hospital acquired stages 3 or 4 pressure ulcers. Organization commitment remains solid, as indicated by a strategic goal, tied to financial rewards for maintaining prevalence of stage 2 or greater pressure ulcers at, or below, the current level.

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
<p>Gaal et al. (2008): Describe implementation process of a four-part, multidisciplinary, discharge planning instrument that assists staff in early identification of infant readiness for transfer or discharge home.</p>	<p>NICU of large hospital. The 12-week pilot concluded with 3 separate evaluations. 357 random audits were done over an 11-day period nearing the end of the project by members of the committee. Nominal data collected for each question compiled using frequency tables and expressed as a percentage of the total. Informal focus groups during the final 2 weeks of the pilot project. Staff survey randomly distributed at the end of the 12-week period</p>	<p>Leadership, Dissemination, Material or written resources, Audit & Feedback, Interdisciplinary, Participatory input, Project team</p>	<p>Focus group feedback mixed - the most improvement involved families. Parents found train useful, helpful, and less distressed at transfer or discharge. Some physicians had misgivings where family confronted physician about decisions regarding transfer because did not “match the train.” Staff survey results substantiated findings- modest improvement with team collaboration. Random audits- just fewer than 65% of staff and families had checked trains and more than 80% of trains accurately reflected infants’ readiness for transfer that day. Staff not updating the train at the time of the audit included mostly negative feedback regarding the required time necessary to document daily on the train.</p>
<p>Gordon et al. (2008): To implement a large-scale plan-do-check-act (PDCA) cycle to improve the documentation of pain reassessments, including development of an evidence-based administrative policy, repetitive education efforts with bedside coaching, changes in daily bedside documentation flow sheets, and audit and feedback.</p>	<p>In tertiary-care medical centre, evaluation of current practice to examine baseline performance. Medical record audits on 85 open charts (5 records per unit on 17 units). Only 24% (94/389) of timed reassessments were made within one hour after any intervention. A repeat open record review and ongoing monthly audit data – 72% from 24%, failed to achieve > 90% Monthly audit and feedback process too slow to provide timely feedback.</p>	<p>Leadership, Education, Adaptability, Expertise support, Material or written resources, Dissemination, Project team, Theoretical or QI model, Participatory input, Audit & Feedback</p>	<p>Daily audits of 100% of patient records initiated. Daily meetings between the directors and clinical nurse managers held to assess the status of the interventions. We have sustained full compliance (that is, > 90% target) with a cumulative rate of 94.9% appropriately documented pain reassessments. Strategies to sustain improvements include daily administrative and monthly staff documentation audits with prompt feedback to clinical nurse managers and staff. Nurses are instructed on the importance of pain reassessments and on the policy and specific documentation requirements. Reassessment of pain is a routine variable displayed on unit and departmental quality dashboards.</p>
<p>Horn et al. (2010): To design and facilitate implementation of practice-based evidence changes associated with decreases in pressure ulcer (PrU) development in long-term-care (LTC) facilities and promote these practices as part of routine</p>	<p>Pre/post observational study. Frail elderly adults in 11 LTC facilities. Project facilitators assisted frontline multidisciplinary teams develop standardized documentation and weekly reports to identify high-risk residents and integrate clinical reports into daily practice and clinical decision making. The program was called “Real-Time Optimal Care Plans for Nursing Home QI” (Real-Time).</p>	<p>Leadership, Adaptability, Collaboration, Interdisciplinary, Material or written resources, Organizational support, Participatory input, Project team, Structured or formal approach, Audit & Feedback</p>	<p>Seven LTC facilities experienced 33% reduction in high-risk PrU QM in 18 months and reduction in newly occurring PrUs. Five of these LTC facilities that fully implemented Real-Time experienced a combined 48.1% reduction in high-risk PrU QM. Ten facilities reduced by an average of 2 to 5 their number of documentation forms; Weekly documentation completeness reached a consistent level of 90% to 95%, and 8 facilities integrated the use of 2 to 4 weekly project reports in routine clinical decision making.</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
care.	Main outcome measure – prevalence of PrUs using quality measures (QMs), number of in-house–acquired PrUs, and number and completeness of documentation forms.		
Inouye et al. (2006): To describe the Hospital Elder Life Program (HELP), an innovative model of care designed to prevent delirium and functional decline in hospitalized older persons, across dissemination sites, to detail adaptations, and to summarize advantages across sites.	Cross-sectional survey. Setting: HELP sites in acute care hospitals. Of these 17 sites, survey completed by 13 (76.5%) sites that enrolled 11,344 patients. Measurements: Seventy-five closed- and open-ended questions describing details of the HELP site, procedures, staffing, outcomes tracked, and advantages.	Leadership, Education, Adaptability, Dissemination, Expertise support, Interdisciplinary, Audit & Feedback	Descriptive statistics. Variations existed in staffing patterns, outcome tracking, and recommended HELP procedures. Adaptations made across multiple domains, including enrollment criteria at 15.4% of sites, screening and assessment tools at 61.5%, and individual intervention protocols at 15.4% to 30.8%. Local circumstances drove adaptations, ex. lack of staffing and logistical constraints. All sites conducted regular HELP meetings; other quality assurance procedures conducted at 46.2% to 92.3% of sites. Advantages of HELP - providing an educational resource at 100% of sites, improving hospital outcomes (delirium and functional decline) at 100%, providing nursing education and improving retention at 100%, enhancing patient and family satisfaction with care at 92.3%, raising visibility for geriatrics at 92.3%, and improving quality of care at 84.6%.
Katz et al. (2004): To evaluate a guideline-based intervention in which intake clinicians (nurses or medical assistants who document the reasons for the office visit and check patients' vital signs) assessed smoking status in all patients and provided brief cessation counseling for smokers.	Pre/post evaluation RCT of effectiveness of guideline implementation at 8 primary care clinics among 2163 adult patients. After collecting baseline data, implemented intervention over 2-month period. The intervention included a tutorial for intake clinicians, group and individual performance feedback for intake clinicians, use of a modified vital signs stamp, an offer of free nicotine replacement therapy, and proactive telephone counseling. Staff at control sites received only general information about the AHRQ Guideline. Self reported abstinence from smoking determined by telephone interviews at 2- and 6-month follow-up.	Leadership, Education, Organizational support, Theoretical or QI model, Audit & Feedback	Hierarchical logistic regression models to estimate the odds ratios (ORs) for treatment assignment after adjustment for patient characteristics. Statistical tests 2-sided. No statistically significant differences in smoking cessation rates between participants at test and control sites during the baseline period. During intervention period, those at test sites more likely than those at control sites to report being abstinent at the 2-month (16.4% versus 5.8%; adjusted OR =3.3, 95% confidence interval [CI] =1.9 to 5.6; $P<.001$) and 6-month (15.4% versus 9.8%; adjusted OR =1.7, 95% CI =1.2 to 2.6; $P= .009$) follow-up assessments and to report continuous abstinence, that is, abstinence at both 2 and 6 months (10.9% versus 3.8%; adjusted OR=3.4, 95% CI=1.8 to 6.3; $P<.001$). <i>Conclusion:</i> Implementation of a guideline based smoking cessation intervention by intake clinicians in primary care is associated with higher abstinence among smokers.
Kenny & Goodman (2010): To conceptualize the evidence base for management of enteral tube	Medical centre consisting of 16 inpatient units Pretest-posttest measures. Protocol data collection occurred both before and after implementation of the	Leadership, Education, Dissemination, Expertise support, Interdisciplinary,	Descriptive statistics and data were analyzed using independent samples t tests. Staff knowledge of enteral feedings & methods to unclog feeding tubes differed significantly before and after ($p < .05$). Staff knowledge of danger of using

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
<p>feedings in adult patients, develop an Evidence-based practice (EBP) protocol based on review of the literature, implement the new protocol, and evaluate its impact.</p>	<p>protocol. Data collection tools based on the literature review and included three domains: (a) documentation of patient procedures, (b) nursing knowledge of each of the specific procedures, and (c) environment of care.</p> <p>20 patients and charts evaluated before EBP protocol implementation significantly higher than after implementation (n=5).</p>	<p>Material or written resources, Organizational support, Project team, Structured or formal approach, Theoretical or QI model</p>	<p>blue dye in feeding solution significant ($p < .001$). Improvement in administration of medications separately rather than mixed together and in head of bed elevation of patients with feeding tubes. 10% improvement in documentation of patient family education and 15% improvement in recording fluid flush during medication administration. Environment of care data showed 100% of patients with head of bed elevated and with functioning suction available, an improvement.</p>
<p>Kimber & Grimmer-Somers (2009): To describe the implementation of multifaceted strategies to improve health-promoting behaviors and the uptake of osteoporosis guidelines, reflecting organizational and individual commitment to embedding recommendations into routine practice.</p>	<p>Large tertiary hospital. Five audit datasets were compared: 62 patient records in two baseline audits, and three post-implementation audits of 31 patient records, collected over the following 3-month periods. All audits used the same criteria to assess compliance with clinical guidelines, and outcomes of implementation strategies.</p>	<p>Leadership, Education, Adaptability, Collaboration, Dissemination, Interdisciplinary, Organizational support, Participatory input, Project team, Theoretical or QI model, Audit & Feedback</p>	<p>Consistent improvement in compliance with osteoporosis guidelines. Comparing baseline and immediate post-implementation data, a significant improvement ($P < 0.05$) in percentage of patients with likely fragility fractures who were identified with osteoporotic fracture. Percentage of patients who had a likely fragility fracture, with whom staff communicated about their problems, increased consistently over post-implementation audit periods. For patients with established osteoporosis who presented with fragility fractures, sustained improvement over the audit periods in the percentage provided with guideline-based care.</p>
<p>Leone et al. (2009): To analyze the baseline pain level in institutionalized elderly, and then implement a standard pain scale for its assessment and evaluation, while simultaneously identifying challenges in adopting this standardized method.</p>	<p>40 patients were chosen at random in 2 dementia units at a nursing home, 20 patients from each. A chart review was conducted to document the presence or absence of pain syndromes, pain medications used, and use of standardized tools for the evaluation of pain. Nursing staff adopted the chosen pain tools and gave positive feedback after the trial period, indicating that they were helpful tools to identify pain and treat it promptly.</p>	<p>Leadership, Education, Adaptability, Collaboration, Material or written resources, Organizational support, Participatory input, Structured or formal approach, Theoretical or QI model, Audit & Feedback</p>	<p>The first evaluation showed that pain was poorly assessed and treated without adopting a specific standardized tool and appropriate policy. New PDSA cycles for quality improvement will be scheduled, and all the residents will participate in the program. Preliminary data from new PDSA cycles suggests that pain prevalence has substantially decreased after the intervention.</p>
<p>McEwen et al. (2005): To determine effectiveness of Rehabilitation Education Program for</p>	<p>2 regional stroke programs, involving several agencies and hospitals. Participants completed learning tests and practice surveys before and after the program and at 6-month</p>	<p>Leadership, Education, Interdisciplinary, Organizational support, Participatory input, Structured</p>	<p>At T1, participants scored mean of 9.17 on the learning test. A 2-tailed paired t test shows a statistically significant improvement at T2 (mean, 10.19; $p < .001$). Mean scores at T2 increased on 10 of 12 questions. 56 participants completed learning test at T3. Mean overall learning</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
<p>Stroke (REPS), an interdisciplinary continuing education program for stroke rehabilitation practitioners, on learning and practice outcomes.</p>	<p>follow-up. There were 108 participants at T1, including 21 mentors and 87 learners. Of those, 78 (72%) completed the program by T2. Nine participants (8%) submitted the results after the deadline, 7 (6%) experienced technical difficulties, and 14 (13%) did not complete the post-program tests for unknown reasons. The follow-up tests, T3, were completed by 56 (52%) participants. The distribution of the 4 professions did not change from T1 to T2.</p>	<p>or formal approach</p>	<p>test score 9.94, significantly better ($p < 0.01$) than the T1 mean and unchanged from the T2 mean, suggesting participants' learning from REPS was retained 6 months after introduction to the program. Statistically significant increase ($p < .001$) in the practice survey scores at both T2 and T3 Analysis of participants' individual responses from T1 to T3 suggested progress toward sustained practice change. At T1, comments indicated awareness of situation and willingness to change, but no specific actions described. At T2, participants more likely to indicate concrete action plans, and by T3 participants' comments frequently indicated that previously stated plans were being implemented.</p>
<p>McLean et al. (2006): To assess outcomes before and after implementing the Model for Accelerating Improvement in restarting a mechanical ventilation weaning protocol in adult ICU patients.</p>	<p>ICU in a teaching hospital Prospective comparative design, before & after implementation with 129 patients & 112 multidisciplinary team members. Chart abstraction- rate of unsuccessful extubations, rate of ventilator associated pneumonia, and duration of mechanical ventilation; practice outcomes were staff's understanding of the mechanical ventilation weaning protocol, perceptions of practice safety climate, adherence to weaning protocol. Focus group session, 2 surveys- <i>Protocol Directed Weaning survey; Safety climate Survey</i></p>	<p>Education, Participatory input, Theoretical or QI model, Project team, Collaboration, Interdisciplinary, Audit & Feedback</p>	<p>Descriptive statistics After the intervention, the rate of unsuccessful extubations decreased and staff understanding of and adherence to the weaning protocol increased significantly. Rate of ventilator associated pneumonia, duration of mechanical ventilation, and staff's perception of the practice safety climate did not change significantly.</p>
<p>Nease et al. (2008): Describe the use of a modified improvement collaborative to improve primary care of depression that emphasized change management strategies for small primary care practices.</p>	<p>16 practices completed 9-month program. Two practice champions (PCs) from each attended 3 two-day learning sessions. 9-item Patient Health Questionnaire (PHQ-9) for screening, diagnosis, surveillance, tracking and care management, and self-management support. Pre- and post-intervention depression care survey data gathered from clinicians. Assessment of Clinician Depression Management in Primary Care (ACDM)</p>	<p>Leadership, Education, Collaboration, Structured or formal approach, Project team, Participatory input, Theoretical or QI model, Audit & Feedback</p>	<p>Response rate for ACDM 89% at baseline and 60% for follow-up survey. 36 surveys available for matched pre- and post project analysis. All individual subscales except those measuring "use of consultants" and "self-management support" showed significant improvements from baseline. Overall, ACDM scores showed significant improvement during the project, moving from an average of 2.63 to 3.12, based on weighted analysis. On the basis of PC reports at 9 months, 16 practices had implemented the PHQ-9 for depression case finding and 13 for monitoring severity; 5 practices had implemented tracking and care</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
	<p>survey at baseline and after final learning session (22-item measure to measure aspects of Chronic Care Model applied to depression in primary care. ACDM descriptive statistics for the pre- and post-intervention surveys, and mixed-effects repeated measures models, adjusting for clustering effect at practice level.</p> <p>Qualitative data- interviews at baseline and during each of three action phase calls and field notes from learning session discussions. Follow-up interviews with PCs 6 months after end of program to determine how well sustained.</p>		<p>management and 1, self-management support. At the 15-month follow-up, nearly all changes had been sustained, and additional practices had implemented tracking/care management and self-management support. Significant pre-post improvements were reported on several subscales of the clinician survey, demonstrating substantial diffusion from the PC to other clinicians in the practice. The program led to measurable improvements in implementation of office procedures and systems known to improve depression care. The improvements were both sustained beyond the end of the program and substantially diffused to the other clinicians in the practice.</p>
<p>Nelson & Massey (2010): Describe a staff-driven, quality improvement project aimed at improving the process, timeliness, and consistency of information communicated in change-of-shift report on a gastrointestinal surgical oncology unit in a comprehensive cancer center.</p>	<p>Baseline data on the start and end times of change-of-shift reports (2 per day) on the unit for a 7-day period in July 2004. Change-of-shift reports exceeded the 30-minute parameter by an average of 36 minutes - overtime costs calculated.</p> <p>5-item survey, rated on a Likert scale, to RNs on the unit to gauge their satisfaction with the current process and the quality of information in and usefulness of shift reports. Surveys returned indicated that RNs perceived the current process, efficiency, flow, and usefulness of information to be lacking some or most of the time.</p>	<p>Leadership, Adaptability, Organizational support, Collaboration, Participatory input, Theoretical or QI model, Project team</p>	<p>After 7 testing cycles & implementation of the new template and process, survey of RNs regarding satisfaction with the report process using the same survey prior to the change. Results from the final survey indicated perceived usefulness and efficiency of the report process, and quality and flow of information, increased. Staff reported satisfaction associated with leaving on time and with the increased usefulness and quality of information in reports.</p> <p>Time spent in change of-shift report decreased by 38 minutes from the initial data collection period. Report duration maintained 6 months after.</p> <p>End-of-shift overtime cost reduced to \$6,602.85, a net savings of \$73,726.35 per year.</p> <p>Adoption of the template began as units tested and adopted the template to fit their specialty populations. Hospital's leadership formally endorsed use of the electronic template on all inpatient units.</p>
<p>Nemeth et al. (2007): Describe implementation strategies in primary care practices using electronic medical records in a national QI demonstration project, Accelerating Translation of</p>	<p>The PPRNet A-TRIP study evaluated performance on 36 process and outcome indicators across 8 domains relevant to primary care practice (screening and treatment of cardiovascular disease, diabetes, cancer, respiratory tract illness, adult immunizations, mental health, nutrition, and safe prescribing in the elderly patients).</p>	<p>Leadership, Dissemination, Interdisciplinary, Material or written resources, Participatory input, Audit & Feedback, Theoretical or QI model, Project team</p>	<p>Prioritizing performance throughout the practice staff was found to be fundamental to the process of improvement. Practice redesign efforts were the most commonly used improvement strategies. Specific strategies included reviewing office processes to streamline and reduce redundancy or inefficiency; establishing written protocols to guide chronic disease management, and forming care management teams of providers and nurses to help manage patients in the practice with a chronic illness.</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
<p>Research into Practice (A-TRIP), to improve performance on multiple quality indicators. The PPRNet is a primary care practice-based research network whose members use a common EMR</p>	<p>Qualitative methods to develop a compendium of improvement strategies and a quantitative survey conducted to assess practice adoption of these strategies.</p> <p>99 practices participated in the A-TRIP project for at least 1 year, and 65 practices participated in at least 1 site visit by the investigators.</p> <p>147 participants completed A-TRIP process evaluation survey.</p>		<p>Increased adoption of point-of-care laboratory tests enabled prompt patient discussion and decision-making at time of visit. Nursing staff assumed new roles to enhance communication between patients and providers. Nursing staff found that relevant disease-specific templates or flow sheets within EMR system helped them focus and plan a patient care visit. A patient education tool (provided by the A-TRIP study) used commonly by practices, but otherwise patient activation strategies were the least commonly adopted improvement strategies.</p>
<p>Pierson et al. (2007): To evaluate the initial implementation of a large-scale web-based medication error reporting system, a part of a quality initiative on medication error in long-term care.</p>	<p>Evaluation study design Participants: 25 nursing homes Intervention: Detailed information about all medication errors occurring in a facility during a 1 year period entered into a web-based reporting system. An evaluation survey was conducted to assess usability and potential for the system to prevent errors.</p> <p>Main outcome measures: Number and specific characteristics of medication errors reported. Survey to evaluate ease of use of the system and whether the participants thought it would help improve medication safety.</p>	<p>Leadership, Education, Collaboration, Material or written resources, Audit & Feedback</p>	<p>23 (92%) sites entered 631 error reports for 2731 discrete error instances when weighted by the number of times the errors were repeated. 51 (8%) errors classified as having a serious patient impact requiring monitoring/intervention or worse. The most common errors were dose omission (203, 32%), overdose (91, 14%), underdose (43, 7%), wrong patient (38, 6%), wrong product (38, 6%), and wrong strength (38, 6%). Errors most commonly occurred during medication administration (296, 47%) and were attributed to basic human error (402, 48%). Seven drugs were implicated in a third (175, 28%) of all errors. 20 sites (86% of respondents) completed the evaluation survey - participants found system easy to use and felt it would increase accuracy of reporting and improve patient safety.</p>
<p>Reinhardt & Keller (2009): To describe the successful system-wide change to evidence-based wound care practices in a large health services organization using a multinational workforce.</p>	<p>Two inpatient hospital facilities inconsistent wound care practices that led to poor patient outcomes. Pilot projects using new wound care products and updated protocols were implemented at selected sites across the system. Clinical participants included nurses, surgeons and internists. Clinicians field-tested new products and tracked their results, comparing treatments to usual methods.</p> <p>Anecdotal evidence -</p>	<p>Leadership, Education, Adaptability, Dissemination, Interdisciplinary, Material or written resources, Collaboration, Organizational support, Project team, Participatory input, Audit & Feedback</p>	<p>Treatment guidelines using new products incorporated into individualized patient treatment and sent to each responsible clinic when patient discharged to outpatient care.</p> <p>At the end of trial period, anecdotal information regarding results of new practices began to be reported by WCTF members, e.g. cancelled amputation led to increased physician interest in new wound care products and practices. Although complete summative evaluation of the pilots unavailable at the time, the momentum to change practice that had been established.</p> <p>WCTF succeeded in raising awareness of the need for change and obtaining support for the change from management and</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
	Evaluations from the nurses involved indicated that nursing care providers were impressed with the trial products and dressing protocols.		clinicians.
<p>Rikli et al. (2009): To describe the process used to reimplement an integrated electronic documentation system using a clinical microsystems approach and quality improvement methods.</p>	<p>The neonatal services department with 67-bed intensive care unit and 28-bed intermediate nursery.</p> <p>Subjective, qualitative measures and processes. Verbal and written spot checks with staff to determine whether needs being met and whether processes needed to be adjusted. Tool at each computer to document issues and suggestions to consider. Informal verbal evaluation during shared governance council meeting.</p>	<p>Leadership, Education, Adaptability, Collaboration, Expertise support, Dissemination, Interdisciplinary, Material or written resources, Organizational support, Participatory input, Project team, Structured or formal approach, Theoretical or QI model</p>	<p>Staff was overwhelmingly positive about the reimplementation experience.</p> <p>Ultimately, outcomes of the quality improvement and clinical microsystems process used to reimplement the NICU's EMR system included (1) increased staff involvement in process improvement activities, (2) a decrease in turnover, (3) staff satisfaction improvement with change management, and (4) the use of this process for other projects.</p>
<p>Sebat et al. (2005): To determine the effect of a community hospital-wide program enabling nurses and pre-hospital personnel to mobilize institutional resources for the treatment of patients with non-traumatic shock.</p>	<p>Historically controlled single-center study in 180-bed community hospital January 1998 to May 31, 2000, patients in shock received standard therapy (control group). June 2000 - intensive education of all health-care providers (i.e., prehospital personnel, nurses, and physicians) July 1 2000 - June 30 2001, patients in shock (protocol group) managed with hospital-wide shock program (early recognition and initiation of therapy by non-physicians). Frontline personnel mobilized shock team which used goal-directed resuscitation protocols, early intensivist involvement, and rapid transfer to ICU for shock protocols. Both groups - time zero earliest point when screening criteria met. Intervals from time zero to shock alert activation, intensivist arrival, ICU admission, administration of 2 L fluid, vasopressor therapy, antibiotic</p>	<p>Leadership, Education, Interdisciplinary, Material or written resources, Organizational support, Project team</p>	<p>86 and 103 patients, respectively, enrolled in control and protocol groups, similar baseline characteristics. Protocol group had significant reductions in the median times to interventions, as follows: intensivist arrival, 2:00 h to 50 min ($p < 0.002$); ICU/operating room admission, 2 h 47 min to 1 h 30 min ($p < 0.002$); 2 L fluid infused, 3 h 52 min to 1 h 45 min ($p < 0.0001$); and PA artery catheter placement, 3 h 50 min to 2 h 10 min ($p < 0.02$). Good outcomes (i.e., discharged to home or to a rehabilitation center) more likely in the protocol group than in the control group ($p < 0.02$). Hospital mortality rate 40.7% in control group and 28.2% in protocol group ($p < 0.035$).</p> <p><i>Conclusion:</i> Empowerment of non-physician providers to mobilize hospital resources for the care of patients with shock is effective. The program incorporating the education of providers, the activation of a coordinated team response, and early goal-directed therapy expedited appropriate treatment associated with improved outcomes. Shock Program accepted by medical staff and hospital administration as the standard of care at institution. Remains operational after 4 years, implemented at another community hospital.</p>

Study Purpose	Setting/Methods/ Type of Evidence	Implementation Strategy Themes	Evaluation Findings
	<p>administration, central venous catheterization, tracheal intubation, and pulmonary artery catheterization recorded. Data on mortality, hospital and ICU LOS, and discharge location.</p>		
<p>Smyrniotis et al. (2002): To examine the effects of mechanical ventilation weaning management protocol that was implemented as a hospital-wide, quality improvement program on clinical and economic outcomes.</p>	<p>Prospective, before-and-after intervention study. Data from a pre-implementation year are compared with those of the first 2 yrs after protocol implementation.</p> <p>Patients and Setting: Patients older than 18 yrs in diagnosis-related group 475 and group 483, who were admitted to the adult medical, surgical, and cardiac intensive care units (ICU) in a university hospital.</p> <p>Interventions: After the baseline year, a weaning management program implemented throughout institution. Primary endpoints were mortality, days on mechanical ventilation, ICU and hospital LOS, hospital costs, and percentage of patients requiring tracheostomy.</p>	<p>Leadership, Education, Adaptability, Collaboration, Expertise support, Project team, Interdisciplinary, Structured or formal approach, Audit & Feedback</p>	<p>Main Results: Number of patients increased from 220 in baseline year (year 0) to 247 in first year (year 1), then to 267 in second year (year 2). The mean Acute Physiology and Chronic Health Evaluation (APACHE) II score increased from 22.2 to 24.4 in year 1 (p = .006) and to 26.2 in year 2 (p = .608), hospital LOS decreased from 37.5 to 31.6 days (p = .058), ICU LOS decreased from 30.5 to 25.9 days (p = .133), and total cost per case decreased from \$92,933 to \$78,624 (p = .061). When year 0 compared with year 2, mean days on mechanical ventilation decreased from 23.9 days to 17.5 days (p = .004), mean hospital LOS decreased from 37.5 to 24.7 days, mean ICU LOS decreased from 30.5 to 20.3 days, total cost per case decreased from \$92,933 to \$63,687, and percentage of patients requiring tracheotomy decreased from 61% to 41% (all p = .039), a total cost savings of \$3,440,787 and a decrease in mortality between all 3 yrs from 32% to 28% (p = .062).</p>
<p>Wong et al. (2009): To describe the development, implementation, and user evaluation of an electronic whiteboard, in an inpatient unit of an acute care hospital.</p>	<p>The development, implementation, and evaluation of the inpatient whiteboard included scope discussions, workflow analyses, communication and training, and issues and enhancement reporting, all managed through a central project team. Evaluation of the whiteboard was two-fold: a survey given to allied health, nursing and physician disciplines (n = 120), and an audit performed on whiteboard usage.</p>	<p>Leadership, Education, Adaptability, Dissemination, Expertise support, Interdisciplinary, Participatory input, Project team, Structured or formal approach, Audit & Feedback</p>	<p>The whiteboard displays relevant, real-time patient information, in a single, highly visible, user-friendly display. With a quick glance at the whiteboard, one can get an accurate snapshot view of the current patient activity in the unit. Approximately 71% of survey participants believed that the whiteboard improves and standardizes communication within the care team. Approximately 62% of the participants agreed that the whiteboard saves them time when searching for information on a patient and their care plan. In addition, the whiteboard has had an impact on the work practices of many GIM care providers, and it along with its users has acted together as agents for positive change. Whiteboard utilization has significantly increased since its implementation.</p>

Appendix B: Literature review themes

Implementation strategies (key themes)	Studies (N=29)
Leadership	27
Education	25
Project team	23
Audit and feedback	21
Inter or multi-disciplinary approach	19
Participatory input	19
Collaboration	18
Adaptability	16
Organizational support	17
Structured or formal approach	15
Theoretical model or QI technique application	15
Dissemination	14
Material or written resources	11
Expertise support	10
Setting	
Acute care	16
Long-term care	6
Community care	3
Other	4
Type of evidence	
Process evaluation	17
Non experimental descriptive	13
Pre post evaluation	13
Qualitative (transcripts, field notes)	5
Control study	2
Literature review	1
Evaluation findings (key themes)	
Sustained change	29
Improved care delivery or documentation	23
Positive care provider outcomes	17
Positive patient outcomes	15
Increased compliance or participation	10
Positive culture or attitude change	10
Positive organization outcomes	8
Shared learning	7

Appendix C: Letter of Invitation to participate

Dear _____

You have been identified as a key contact for your organization's HOBIC initiatives. I am writing to ask **if you would be willing to participate in a one-hour telephone conversation about your HOBIC experience** to be scheduled at a time that is convenient to you **between now and November 12th, 2010.**

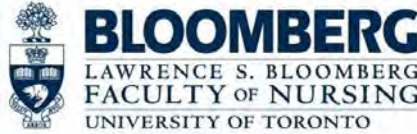
I would be pleased to work with your assistant to schedule a convenient time for you and if that would be helpful please copy your assistant on your reply to this email and I will follow-up. If you would like to name an alternate individual for the HOBIC interview please let me know and I will be in touch with them.

The information you provide is being collected as part of a study led by Dr. Diane Doran called "Increasing the Utilization of Health Outcomes for Better Information and Care." When our telephone discussion is scheduled I will forward the list of questions to you as well as a consent letter .

Thank you very much for considering my request for a telephone interview with you to share your HOBIC experience. Your contribution is pivotal to our study and is greatly appreciated.

Sincerely,

Appendix D: Letter of information and consent



Letter of Information and Consent, Site Representatives

Study Title: Increasing the Utilization of Health Outcomes for Better Information and Care

Principal Investigator: Dr. Diane Doran, Professor, Lawrence S. Bloomberg Faculty of Nursing (LSBFON), University of Toronto

Co-Investigators: Dorothy Pringle, LSBFON, University of Toronto; Peggy White, HOBIC consultant with ICES ; Barbara Mildon, LSBFON, University of Toronto

Research Officer: Autumn Marie Chilcote, LSBFON, Nursing Health Services Research Unit

Sponsor: This study is funded by the Institute of Clinical and Evaluative Sciences (ICES).

INTRODUCTION

You are invited to participate in this research study because you are a HOBIC site representative at a health care organization that collects data on Health Outcomes for Better information and Care (HOBIC). We would appreciate your assistance in this research study in the development of strategies for facilitating HOBIC adoption and utilization in Ontario health care organizations. Approximately 15-20 HOBIC site representatives as well as ‘practice change experts’ will participate in this study. Before agreeing to participate, it is important that you read and understand the following information. Please ask for clarification about anything you do not understand. Make sure all your questions have been answered to your satisfaction before signing this document. Participation is voluntary.

Purpose:

HOBIC information is used by nurses to monitor the impact of care and ensure, for example, that patients are prepared for discharge across four health sectors: acute care, home care, long-term care, and chronic hospital care. The experience to date demonstrates that there is a gap between current practices and ideal practice. For example, in the majority of organizations, few staff nurses retrieve the HOBIC information after the initial assessment and use it to plan care. Current strategies of implementing HOBIC data collection have not resulted in practice change, or in the uptake of HOBIC information for evidence-based practice and quality improvement. This is significant, as having access to timely feedback about patient outcomes is important for effective chronic disease management and for improving health care delivery. Thus the purpose of this project is to investigate factors that contribute to variation in HOBIC adoption and

utilization, and to identify strategies to improve utilization of HOBIC information for clinical care planning and health system improvement.

Procedures:

As a volunteer HOBIC site representative, your participation will include taking part in an interview either by phone or at a location agreed on by you and the research team. The interview is anticipated to take a maximum of one hour of your time. You will be asked to about your experience with barriers and facilitators to HOBIC adoption and utilization. The interviews will be audio-recorded, and then transcribed and analyzed by the research team.

CONDITIONS FOR PARTICIPATION:

Your participation in this study is voluntary. You may refuse to participate, withdraw at any time, and decline to answer any question during the interview without any consequences.

RISKS/BENEFITS

There are no known serious risks to participating in this study. If you feel uncomfortable or unable to continue at any point during the interview, you may choose not to answer any questions or to withdraw from the study at any time. You may choose to have the audio-recorder turned off at any point during the interview. If you choose to withdraw from the study, you may choose whether or not the information that you have already provided remains in the study.

There are several potential benefits to participating in this study. By participating you will contribute to valuable research. This information may assist other organizations that are implementing the HOBIC program. This study will provide helpful information to address the gap in effective utilization of HOBIC data in health care organizations. In addition, you may document your participation as a component of your quality assurance commitment to your professional college (e.g. the College of Nurses of Ontario, etc.)

ACCESS TO INFORMATION, CONFIDENTIALITY AND PUBLICATION OF RESULTS

All information that is provided will be treated in a confidential manner by the research team. To ensure confidentiality: 1) No names will appear on any data collection tools; participants' names will be stored in a locked filing cabinet, separate from study data, and will be accessible only to the research team. 2) Data will be kept in a locked filing cabinet, which will be accessible only by the research team at the University of Toronto, and stored in a secure archived location managed by the LSBFON for a period of 7 years following the end of the study. At that time, paper files will be shredded according to the secure process managed by the Faculty, all electronic data files will be deleted from the computer with a secure-erase utility that will immediately overwrite the deleted data several times to prevent recovery; 3) data will be analysed and presented as group data, and will not identify a person or organization.

Results of this study and any recommended strategies will be provided to the HOBIC office at ICES, and published in professional journals or conferences. Participants can obtain a summary of results at the end of the study by contacting Dr. Diane Doran, the Principal Investigator.

QUESTIONS:

If you have any questions or comments, please do not hesitate to contact the Research Manager or Principal Investigator listed below. If you have any questions about your rights as a research participant you can contact the University of Toronto, Office of Research Ethics at ethics.review@utoronto.ca or 416-946-3273. You may keep this copy of the information and consent letter for your own reference.

Research Manager

Barbara Mildon, RN, MN, PhD (c)
E-mail barb.mildon@utoronto.ca
Lawrence Bloomberg Faculty of Nursing, UofT
155 College St., Toronto, ON M5T 1P8

Principal Investigator

Diane Doran, RN, PhD
Phone: 416-978-2866
Email: diane.doran@utoronto.ca
Lawrence Bloomberg Faculty of Nursing, UofT
155 College St., Toronto, ON M5T 1P8

I have read and understood the above information. The study has been explained to me and I have had the opportunity to have my questions answered. I understand that my participation in this study will require me to take part in an interview that may be audio-taped. I have received a signed copy of this information and consent form for my reference. I understand that my participation is voluntary and that I may withdraw at any time without consequences. If I have any questions about my rights as a participant I know that I can contact the Office of Research Ethics, the Principal Investigator listed above. I voluntarily consent to participate in this study.

Participant's Name (Print)	Participant's Signature	Date
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Do you consent to having the interview audio-recorded? Yes No

PLEASE fax or email consent to:

Autumn Chilcote: autumn.chilcote@utoronto.ca
FAX 416-946-7142 or Fax 1-888-386-3033

Note that receipt of email consent will be considered an electronic signature.

Appendix E: Interview guide

Interview Guide: HOBIC Site Representative

1. How long ago did your organization become a “HOBIC Site”?
2. Can you tell me about the change process at your organization? [e.g....]
 - a. What strategies did you implement at your site prior to moving to standard documentation of HOBIC information (e.g., electronic or paper, raising awareness, were the HOBIC questions “new” for your staff?)
 - b. Were there any groups within staff that had difficulty with the move to document HOBIC in a standardized manner?
 - c. Were strategies attempted to motivate or support the change? What was effective? Not effective?
3. What resources did your site use from the HOBIC office? [e.g...]
 - a. Were the workshops offered by the HOBIC program in preparing staff/managers useful?
 - b. CDs and e-learning resources?
 - c. Professional resources through the HOBIC program?
4. How are staff using the HOBIC admission assessment for planning care?
 - a. Are there motivations or incentives in place for staff to complete the assessments? If yes, what are they and how are they working?
5. How helpful are the HOBIC reports for you? For others in your organization?
 - a. What do you like/what challenges?
 - b. How could the reports be more useful for your purposes?
6. What part does HOBIC information play in Quality Improvement initiatives at your agency?
7. How do you see HOBIC information being informative for accreditation purposes?

Emerging...

- Reasons for implementation?
 - Organizational or clinical?
 - Waning enthusiasm over time? (continued use- administrative or clinical functions?)
- Training of new staff?

Career development?

Appendix F: Pre/Post Intervention – Design Quality Assessment Tool

Reviewer:	Date:		
Work Environment Systematic Review (2010) Pre/Post Intervention – Design Quality Assessment Tool			
Study:			
First Author:			
Publication Information: Date:			
Journal:			
A. Sampling:	Yes	No	N/A
1. Was probability sampling used?	1	0	
2. Was sample size justified to obtain an appropriate power?	1	0	
3. Sample drawn from more than one site?	1	0	
4. Response rate > 60%?	1	0	
Subtotal (out of 4)			
B. Design:			
a) One pre-test or baseline and several post-test measures	2	0	
b) Simple before-and-after study	1	0	
Subtotal (out of 2)			
C. Control of Confounders			
Does the study employ a comparison strategy? An attempt to create or assess equivalence of groups at baseline by:			
a) Matching group participants	2	0	
b) Statistical control	1	0	
c) none	0	0	
Subtotal (out of 2)			
D. Measurement			
Measurement:			
1. Were dependent variables measured reliably (with reliability indices previously or for this study)?	1	0	
2. Were dependent variables measured validly (with validity assessments previously or for this study)?	1	0	
Subtotal (out of 2)			
E. Statistical Analysis			
1. Was (were) the statistical test(s) used appropriate for the main outcome and at least 80% of the others?	1	0	
2. Were p values and confidence intervals reported properly?	1	0	
3. If multiple outcomes were studied, were correlations analysed?	1	0	
4. Were missing data managed appropriately?	1	0	
Subtotal (out of 4)			
F. Drop-Outs			
Is attrition rate <30%?	1	0	
Subtotal (out of 1)			
Total: Total number of points (out of 15 total points)			
Overall Validity Rating:			
$\frac{\text{Total number of points obtained}}{\text{Total number of points}} =$			
Key: <0.50=WEAK; 0.51-0.74=MODERATE; >0.75=STRONG Total: WEAK MODERATE STRONG			
Schalk, M. J., Bijl, M., Halfens, R., Hollands, L., & Cummings, G. (2010). Interventions aimed at improving the nursing work environment: A systematic review. <i>Implementation Science</i> , 5:34			

Appendix G: Taxonomy of facilitation interventions/strategies and facilitator role synopsis

1) Planning for change

Increasing awareness

- 1.1 Highlighting a need for practice change
- 1.2 Selecting an area for change relevant to staff/recognized as a priority
- 1.3 Stimulating critical inquiry and assisting groups to develop/refine specific clinical practice questions
- 1.4 Assisting with/performing a formal/informal practice audit
- 1.5 Interpreting baseline data and providing feedback/insight into performance gaps
- 1.6 Emphasizing enhanced patient outcomes as opposed to poor practice as reason for change

Developing a plan

- 1.7 Assisting with development of an action plan
- 1.8 Helping identify and determine solutions to address potential barriers to EBP
- 1.9 Goal-setting and consensus-building (shared-decision making)

2) Leading and managing change

Knowledge and data management

- 2.1 Knowledge translation/dissemination (assisting with conducting literature searches, appraising and summarizing the evidence)
- 2.2 Helping to interpret the research and apply it in practice
- 2.3 Providing resources/tools for change

Project management

- 2.4 Identifying a leader
- 2.5 Establishing and allocating roles/delegating responsibilities
- 2.6 Advocating for resources and change

Recognizing the importance of context

- 2.7 Creating an open, supportive, and trusting environment conducive to change
- 2.8 Helping to build in the structures/processes to support staff and help them overcome obstacles
- 2.9 Creating local ownership of change
- 2.10 Assisting with adapting evidence to the local context
- 2.11 Boundary-spanning (addressing organizational systems/culture), managing the different requirements of each discipline/role
- 2.12 Tailoring/adapting facilitation services to the local setting

Fostering team-building/group dynamics

- 2.13 Relationship-building
- 2.14 Encouraging effective teamwork
- 2.15 Enabling individual and group development
- 2.16 Encouraging/ensuring adequate participation
- 2.17 Increasing awareness of and helping overcome resistance to change
- 2.18 Consensus-building (shared decision-making)
- 2.19 Empowering group members

Administrative and project-specific support

- 2.20 Organizing/scheduling meetings
- 2.21 Leading/participating in meetings
- 2.22 Gathering information and assembling reports
- 2.23 General planning
- 2.24 Providing skills training
- 2.25 Practical assistance

3) Monitoring progress and ongoing implementation

Problem-solving

- 3.1 Problem-solving and addressing specific issues
- 3.2 Making changes to the developed plan as necessary
- 3.3 Networking

Providing support

- 3.4 Mentoring and role-modeling EBP
- 3.5 Maintaining momentum and enthusiasm
- 3.6 Acknowledging ideas and efforts
- 3.7 Providing ongoing support/reassurance and constructive feedback
- 3.8 Providing advice

Effective communication

- 3.9 Providing regular communication (e-mails, phone calls)
- 3.10 Keeping group members informed

4) Evaluating change

Assessment

- 4.1 Performing/assisting with evaluation
 - 4.2 Linking evidence implementation to patient outcomes and improved care processes
 - 4.3 Acknowledging success, recognizing and celebrating achievements
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