Ontario Stroke Network (OSN)
Strategy for Patient Oriented Research (SPOR)
Demonstration Project:

Ensuring Quality in the Implementation of Quality Based Procedures - Stroke (EQUIP-Stroke)

Final Report

Submitted by the:
Ontario Stroke Network

The EQUIP-Stroke project aimed to evaluate the implementation of stroke Quality Based Procedures within health care settings across Ontario. And, through this evaluation, advance and inform broader QBP implementation.
Ontario Stroke Network

With its vision of Fewer Strokes, Better Outcomes, the Ontario Stroke Network (OSN) mission is to provide provincial leadership and planning for the 11 Ontario Regional Stroke Networks supporting the 14 Local Health Integration Networks through: measuring and reporting on performance; partnering to achieve best practices; leading and/or supporting provincial initiatives; and supporting innovations for stroke prevention, care, recovery and reintegration. The OSN delivers on its mission by establishing province-wide goals and initiatives to implement best practices across the stroke continuum, evaluating and reporting on the progress of the 11 Ontario Regional Stroke Networks, and translating and exchanging knowledge. Currently, the OSN is collaborating with Health Quality Ontario and the Ontario Ministry of Health and Long-Term Care to advise on best practices embedded in stroke Quality-Based Procedures (QBP), as well as their implementation, monitoring and impact on system performance.

As of April 1, 2016, the Ontario Stroke Network and the Cardiac Care Network of Ontario (CCN) have come together as a single entity to ensure a comprehensive and integrated approach to cardiac, vascular and stroke care in Ontario. The OSN and CCN are funded by the Ontario Ministry of Health and Long-Term Care.

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INTRODUCTION

This report provides to the Ministry of Health and Long-Term Care (MOHLTC), an overview of the findings relative to the Ontario Stroke Network’s (OSN) Strategy for Patient Oriented Research (SPOR) Demonstration Project: Ensuring Quality in the Implementation of Quality Based Procedures-Stroke (EQUIP-Stroke).

This significant body of research was completed over eighteen months (October, 2014 - March, 2016) through the collective effort and expertise of many organizations and individuals including; patients and families; MOHLTC; Health Quality Ontario (HQO); Ontario SPOR Support Unit; Ontario Regional Stroke Networks; Patients Canada; Institute of Clinical Evaluative Sciences; Local Health Integration Networks (LHINS); Li Ka Shing Knowledge Translation Institute, Health System Performance Research Network and Accreditation Canada.

BACKGROUND

In Ontario, stroke best practices have been a long-standing focus. Ontario’s provincial stroke system began development in the late 1990s when the Ontario Heart and Stroke Foundation funded pilot projects to establish a regionalized approach to stroke care encompassing the entire care continuum from prevention to community reintegration. In 2008, the Ontario Stroke Network was established and the system has continued to evolve associated with significant improvements in processes and outcomes. While the OSN SPOR"EQUIP-Stroke" project was designed to evaluate the impact of stroke Quality Based Procedures (QBP) in Ontario, it is important to consider the environment into which this initiative was introduced and the context of the gains already made through the ongoing evolution of Ontario’s stroke system.

SPOR

The objective of Canada’s Strategy for Patient-Oriented Research, funded by the Canadian Institutes of Health Research (CIHR), is to improve health care practices, therapies, and policies by bringing together researchers, decision makers, and patients. See SPOR Overview for more detail.

Quality Based Procedures

QBPs are one of two patient-based funding components of the MOHLTC’s Health System Funding Reform (HSFR). Procedures considered by the MOHLTC for QBPs were selected using an evidence-based framework built around four perspectives: 1) Cost Impact 2) Available Evidence 3) Feasibility/Infrastructure for Change 4) Practice Variation. Stroke was one of the first QBP medical conditions meeting all of the criteria for QBP selection. See QBP Overview and/or HSFR Overview for more detail.

For more information, please contact Linda Kelloway, Director Best Practices, Cardiac Care Network, Stroke Services at lkelloway@ccn.on.ca.
Stroke QBP Implementation
Beginning in 2012, select QBPs were implemented across the province. The QBP implementation strategy consists of two main components; 1) development of a clinical handbook led by Health Quality Ontario in consultation with a provincial expert panel; and 2) implementation of funding reform.

HQO and the MOHLTC convened a provincial Stroke Expert Panel and through their efforts, Phase One of the QBP Clinical Handbook for Stroke was released in March, 2013 and focused on; emergency departments; and, acute and rehabilitation inpatient settings. This Clinical Handbook has since undergone several revisions, the most substantial of which was in 2015 when the Handbook was updated to include recommendations for post-acute and community-based care.

PROJECT OVERVIEW

Aim
The EQUIP-Stroke project aimed to evaluate the implementation of the Phase One stroke QBP Clinical Handbook recommendations i.e.: emergency departments; acute inpatient and; inpatient rehabilitation settings, across Ontario. And, through this evaluation, advance and inform broader QBP implementation.

The results of this research serves to inform the MOHLTC, Local Health Integration Networks (LHINs), Hospitals and Ontario’s 11 Regional Stroke Networks regarding effective QBP implementation through; the experiences and voices of patients/families and health care providers; and examination of policy impacts.

Scope
The EQUIP-Stroke project included three initiatives:
1) Qualitative current state analysis of QBP implementation in Ontario hospitals
2) Examination of the impact of Accreditation Canada’s Stroke Distinction as a key support and facilitator of QBP implementation (see Stroke Distinction Overview for more detail).
3) Stroke QBP Evaluation Framework development and examination of milestones and impacts across the provincial stroke networks/system.

Objectives and Areas of Impact
EQUIP-Stroke project objectives and associated areas of impact were identified as follows:

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Examined Area of Impact</th>
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<tbody>
<tr>
<td>Examination of implementation effectiveness</td>
<td>Examination of success factors</td>
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<tr>
<td>Assessment of unintended consequences</td>
<td>Inform future implementation and evaluation of stroke QBPs²</td>
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² And other QBPs where feasible

For more information, please contact Linda Kelloway, Director Best Practices, Cardiac Care Network, Stroke Services at lkelloway@ccn.on.ca.
Areas of Impact

<table>
<thead>
<tr>
<th>Use of the Clinical Handbook</th>
<th>Role of Collaboration</th>
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<tr>
<td>Change Management and Transitions</td>
<td>Outcomes/Impacts</td>
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<tr>
<td>Lessons Learned/Best Practices</td>
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METHODS

Implementation Framework
In consideration of the complex and evolving environment into which stroke QBPs have been introduced, a multi-faceted evaluation process was needed. To achieve this, a mixed-methods research approach was adopted and a variety of partners, with diverse expertise, were engaged.

In order to support project development and adherence to project objectives, a Project Advisory Group (PAG - Membership Appendix A) was established. The PAG was comprised of stroke care and health system experts from across the province and Ontario SPOR Support Unit (OSSU) Network leads². The PAG provided oversight and guidance to the project and supported selection of evalutive and conceptual frameworks. Working with the PAG and building on the principles contained within the Evidence Integration Triangle Framework (EIT) (Glasgow et al, 2012) a conceptual framework for stroke QBP implementation was developed (Figure 1).

The EIT Framework was used to identify the hypothesized mechanisms by which QBP implementation impacted both the health care system and patient care. Given the focus of the Phase One Handbook it was hypothesized that most of the impact was at the level of hospitals. Once identified, these mechanisms helped to; recognize key components of the EQUIP-Stroke project and; design appropriate research methodology (i.e. qualitative or mixed methods).

This Stroke QBP Conceptual Framework is based on a framework designed by Erik Hellsten, Senior Specialist, Health Quality Ontario with minor modifications made by the Project Advisory Group (of which Erik Hellsten is a member).

² OSSU Networks include: Coordinating Centre at MaRS; Population Health Research Institute: Women’s Exchange; Institute for Clinical Evaluative Sciences(ICES); Ottawa Methods Centre and Provincial KTE Network; Evidence and Values; Health System Performance Research Network; Patients Canada

For more information, please contact Linda Kelloway, Director Best Practices, Cardiac Care Network, Stroke Services at lkelloway@ccn.on.ca.
Research Project Framework

Mixed methods research is well suited to addressing complex systems, and therefore in exploring project selection a framework (Figure 2) was used to identify and plan each of area of research.

![Figure 2 – Stroke QBP Research Project Framework](image)

Projects

An introduction to each project and a brief description of research methods follows and is organized by project i.e.:

**Project 1:** *Qualitative Current State Analysis and Patient and Family Consultation*; Li Ka Shing Knowledge Translation Institute

**Project 2:** *Stroke Distinction Program Assessment*; Toronto Rehabilitation Institute-University Health Network and Health System Performance Research Network

**Project 3:** *QBP Impact Analysis using Administrative Data*; Institute for Clinical Evaluative Sciences

Individual project reports are available on request (see contact information below), and provide a full description of each research project. We encourage review of each report for more in-depth knowledge of the methods and results outlined herein.

Throughout the duration of these projects, the OSN collaborated with the MOHLTC Health Quality Branch and HQO to inform development of QBP pricing (including the MOHLTC Quality Overlay initiative). The focus on QBP pricing resulted in a jurisdictional scan of stroke best practice pricing (Appendix B) as well as discussion of recommended approaches to pricing, quality overlay and performance management. At this time HSRF and QBP pricing is under review by the MOHLTC and next steps are to be determined.
Project 1: Qualitative Current State Analysis and Patient and Family Consultation; Li Ka Shing Knowledge Translation Institute

Introduction
The purpose of the QBP evaluations by the Li Ka Shing Knowledge Translation Institute was to gain insight into QBP implementation from numerous perspectives ranging from patients and their families through to regional system planners. This study was approved by St. Michael’s Hospital.

Methods Overview; Patient/Family Consultation
Interview questions were developed by the PAG and reviewed by Patients Canada and stroke survivors. The interview guide was further refined based on the four principles of the British Columbia Patient-Centered Care Framework. Inclusion criteria included; person with stroke onset that occurred since QBPs were released (i.e. after March 2012); their care was received in an Ontario hospital; and the patient was over 18 years of age. Additional considerations included at least one of the following; the stroke survivor’s experience reflected Emergency Department, inpatient acute and rehabilitation; age; gender; regional location; and employment status to ensure a balanced and representative sample.

Consultation interviews were conducted with stroke survivors and their families from September 2015 to March 2016. One-on-one interviews were conducted by telephone with either a stroke survivor and/or their family member and were approximately sixty minutes in length. All interviews were audio recorded and transcribed verbatim and analyzed using a framework approach. Theoretical Domains Framework and Consolidated Framework for Implementation Research (Cane, O’Conner, & Michie, 2012; Damschroder et.al, 2009). (Ritchie & Spencer, 1993). Seventeen individuals; eleven stroke survivors and six family members participated in the interviews.

Methods Overview; Stroke System Stakeholder Current State Evaluation
A current state evaluation of stroke QBP implementation in Ontario was conducted using a multi-stage sequential mixed-methods approach. The survey was distributed to a wide range of key stakeholders (i.e., LHIN members, Ontario Regional Stroke Network (RSN) members, hospital senior leaders and administration, decision support, and front-line clinicians) with a target of one hundred and fifty (150) responses.

<table>
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<tr>
<th>Phase One: Online Survey</th>
<th>Phase Two: Interviews and Focus Groups</th>
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<td>Survey questions were informed by the Theoretical Domains Framework (TDF) (Cane, O’Connor, &amp; Michie, 2012) and the Effective Practice and Organization of Care (EPOC) taxonomy (CADTH, 2011). The survey was administered from May 12, 2015 to July 31, 2015.</td>
<td>A standard semi-structured interview and focus group guide was developed using information obtained from the survey, as well as behavior change frameworks (i.e. TDF and the Consolidated Framework for Implementation Research (CFIR) (Cane et al., 2012; Damschroder et al., 2009). Interview questions aimed at eliciting data on behaviors, perceptions, and implementation context for stroke QBPs. The guide was adapted for five broad stakeholder groups (i.e., LHIN, decision support, clinical team, CEO/CFO, administrative staff (i.e., administrative director, vice-president, chief of staff). Interviews/focus groups were conducted from September 2015 to February 2016. Results were analyzed using the same method as the patient/family data.</td>
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Project 2: Stroke Distinction Program Assessment; Toronto Rehabilitation Institute-University Health Network and Health System Performance Research Network

Introduction

In partnership with the Canadian Stroke Network, Accreditation Canada developed and implemented the Stroke Distinction Program that allows organizations to apply for a rigorous assessment of their stroke care based on Canadian Stroke Best-Practice Recommendations. Stroke Distinction recognizes organizations that demonstrate clinical excellence and a commitment to leadership in stroke care. Many Ontario organizations have participated in Stroke Distinction (SD) prior to/during the period in which stroke QBPs were being implemented. The rationale for this component of the EQUIP-Stroke Project was to better understand the impact prepared for SD may have on improved stroke care in parallel with QBP, and to understand the opportunity for organizations to leverage SD accreditation as a means to improve stroke care. This was examined in two phases; 1) examining the experience of organizations undergoing the SD process and; 2) the costs and benefits of participation in the Stroke Distinction program.

Brief Methods

Phase One: Organizational Experience

This component adopted a qualitative descriptive approach (Sandelowski, 2000; 2010). All Ontario-based inpatient acute and rehabilitation stroke sites that have participated and/or preparing to participate in the Stroke Distinction program were approached (n=8). Clinical (front line), administrative/senior management, as well as decision support staff who participated in the SD program were recruited to participate in the focus groups. Research ethics approval was obtained from the Toronto Rehabilitation Institute-University Health Network as well as all of the participating SD sites. Two focus groups lasting approximately 60 minutes were conducted at each site; one with the administrator and clinical leadership team and the other with front line clinical team members.

Phase Two: Economic Analysis

This component consisted of interviews to identify expected/unexpected costs and perceived benefits to achieving and maintaining the SD program. The activities associated with accreditation were monetized by adopting an activity-based costing approach used in economic evaluation of Australian acute care accreditation (Mumford et al., 2013; 2015). Three SD sites were selected for interviews to reflect different accreditation history and type: Kingston General Hospital (Acute 2012 and 2014), Trillium Health Partners (Acute/Rehab integrated 2015), and Hamilton Health Sciences Centre (Rehab 2012; Acute/Rehab Integrated 2014). A senior leader responsible for SD at each site was asked to participate in an interview to determine implementation and resources required to achieve SD. Interviews were conducted by two investigators and were approximately 60 minutes in duration.
Project 3: QBP Impact Analysis using Administrative Data;
Institute for Clinical Evaluative Sciences

Introduction
The Institute for Clinical Evaluative Sciences (ICES) examined Stroke QBP quality indicators over time to assess trends including differences before and after QBP implementation.

With the evolution of the Ontario Stroke System (OSS), numerous policies and procedures have been implemented in the province to promote best practice implementation. The Ontario Stroke Network staff and stakeholders identified the following key policies as important milestones (Appendix C) for examination of impact:

1. Feb 2004 – Emergency medicine (EMS) medical redirect protocol
2. April 2006 – Establishment of regional stroke care infrastructure and funding
3. June 2011 – Provincial and regional performance report cards released by the OSN

Brief Methods
To examine and analyse the quality of stroke care since 1999/2000 two main data sources were used; Canadian Institute for Health Information (CIHI) databases (Discharge Abstract Database [DAD] and the National Rehabilitation Reporting System [NRS] for 2000 to 2015); and the Ontario Stroke Registry’s Ontario Acute Stroke Audits (OSA), 2004/05, 2008/09, 2010/11, and 2012/13. Acute stroke hospital admissions were identified using International Classification of Diseases and Related Health Problems 10th Canadian version codes.

Two statistical approaches, interrupted time series and pre-post analysis using chi-squared tests, were applied to examine the impact of four key policy interventions (above) on selected indicators. Interrupted time series compares the slope of change in an indicator before and after a policy or intervention is implemented. In this study, slopes were based on data collected monthly. Indicators not routinely collected in administrative databases (i.e. OSA data) required use of the Rao-Scott $X^2$ test for before and after QBP implementation.

To analyse and evaluate the impact of the release of QBP clinical handbooks on quality indicators, indicators were calculated and performance compared pre handbook release to post handbook release using administrative data housed at ICES. Specifically, CIHI-DAD, CIHI-NACRS and CIHI-NRS (2010/11 – 2014/15). The Registered Persons Database (RPBD) was used to capture 30-day mortality.
CONSOLIDATED FINDINGS

In line with the mixed-methods approach, findings from all research activities have been combined and are presented together in this section. Findings are presented according to the constructs presented in the conceptual framework beginning with patient/family outcomes and experiences.

Patients and Families Speak
This research revealed the following key messages from 17 patients and families relative to their stroke care:

- **What is most important?**
  
  “Being treated like ‘humans’
  - Stroke Survivor
  
  (i.e., as individuals and not just as stroke victims)

  - Timely communication. Tools suggested for improving communication included:
    - A weekly progress report
    - A Frequently Asked Questions (FAQs) resource

  - Availability of a navigator resource role to assist with transitions
  - Receiving support from both family and staff

- **How might patient care be improved?**
  - Provide more opportunities for patients and families to be involved
  - Ensure resources necessary for patient care are available (including weekend therapy)

  - Provide information that is easy to understand and straightforward

- **How might patients be involved in advancing care?**
  - Give patients/families opportunities to be involved in research initiatives
  - System planners (e.g., MOHLTC, OSN) should attend stroke support groups to dialogue with stroke survivors to share their experiences

“**I think the staff at [hospital], they didn’t have the time obviously, to educate me more or discuss what possible goals he should be looking at while he was there. I think that was ignored.”**

– Family member
Health System Stakeholders Impacts and Observations
Far exceeding the goal of one hundred and fifty (150); six hundred and sixty-seven (667) surveys were submitted of which, one hundred and seventy-eight (178) were excluded as incomplete or duplicate, resulting in;

Four hundred and eighty-nine (489) surveys comprised of
59.5% hospital clinical staff, 18% hospital senior leadership team, 10%
Regional Stroke Network teams, 8% decision support members, 5% LHINS

Additionally, stakeholder interviews were conducted with 44 participants including six LHIN representatives, ten senior leadership team members, two decision support team members, sixteen clinical team members and nine RSN members. The purpose of the interviews were to validate survey results and provide greater detail on findings.

Survey results revealed that 85% of respondents were aware of the handbook, 58% had read the handbook. QBPs were generally viewed as positive, and to have contributed to better patient care. The predominant themes were that this was accomplished by MOHLTC plans to add accountability to best-practice standards (including a link to funding) and establishing processes for implementation. It is important to note, perceptions regarding the success of QBP implementation, the level of handbook implementation, and the priority given to QBPs differed by role with senior leadership consistently providing more positive ratings than clinical staff.

Overall Impact of QBP
Perceived positive impacts of stroke QBPs include:
- Strengthened interdisciplinary relationships
- Fostered innovations in care
- Generally, positive impact to quality of care
- Building better data management and feedback systems

Improvements relating to QBP implementation include:
- Reduced time to tissue plasminogen activator (tPA) administration in the ED
- Reduced number of alternate level of care (ALC) days
- Increased number of centres with achievement of SD
- Increased volume of patients treated in acute care settings
- Increased rehabilitation hours and weekend rehabilitation availability
- Improved AlphaFIM® score documentation
- Lowered rehabilitation length-of-stay

Also, researchers found there appears to be a relation to critical mass with regard to overall organizational capacity to implement QBP in that, large QBP hospitals (i.e. >165 stroke admissions) indicated a higher degree of implementation.

“There know, thinking back, one of the things that actually kind of lit this fuse was the stroke report cards... there was a lot of reds, and I think that maybe, when we showed that to our CEO...

I think that was essentially one of the motivators for us to put some kind of, make it a LHIN level priority for us to mobilize some resources and tackle this as a clinical population.”

– LHIN Staff Member

For more information, please contact Linda Kelloway, Director Best Practices, Cardiac Care Network, Stroke Services at lkelloway@ccn.on.ca.
QBP Clinical Handbook; Feedback and Observations
The Stroke QBP Clinical Handbook was used most frequently by RSN staff and senior leadership and least often by clinical staff. QBP handbook familiarity was highest when staff were directly involved in QBP implementation. Suggestions for improving the Clinical Handbook include:

- Condense the Handbook
  - Consolidate common areas together (e.g. evidence)
- Tailor the Handbook to audiences (e.g. clinical staff, senior leadership)
- Facilitate implementation of the Handbook with tools/resources
  - Order sets, protocols, pathways
  - Two page summary of recommendations
  - Process improvement approaches
  - Management tools
  - Providing guidance on how to disseminate the Handbook
    - List of key strategies
    - Samples of dissemination plan

QBP Implementation Preparation
Many of the preparatory activities noted by survey respondents were similar to those used to prepare for stroke distinction described below and included:

- Conducting readiness assessments to:
  - Assess current state of stroke care
  - Assess the quality indicators identified in the clinical handbook
  - Conduct a gap analysis
- Development of implementation plan(s) to:
  - Utilize the quality indicators to gauge performance
  - Monitor and measure both the progress and outcomes of stroke QBP implementation
- Use of:
  - Standardized order sets
  - Program-based score cards
- Use of resources such as the Ontario Stroke Network Report Card, Ontario Stroke Evaluation Report, and the QBP Baseline Report.
- Establishing early, engagement between hospitals and LHINs.
- Establishing adequate decision support teams capable of responding to the ever-increasing demands for data.

Opportunities to improve implementation efforts include:

- LHIN-led regional initiatives (including cross-LHIN partnerships)
- Regional cross-disciplinary stroke forums
- Cross-sector (e.g. acute and rehabilitation) working groups
Stroke Distinction Impact
An examination of the experience of eight organizations that had completed SD was undertaken in parallel with QBPs and revealed that undergoing the SD accreditation process was viewed by as an enabler for QBP implementation by:

- Providing a rigorous structure and process to establish stroke best practice as an organizational priority
- Establishing a process to identify gaps and opportunities for improvement
- Increasing awareness of best practice targets;
- Creating engagement opportunities to bring care providers and decision support staff together to improve stroke care
- Providing a mechanism to catalyze improvements in staff engagement and staff morale.

Participants also identified barriers to undergoing SD including: increased workload; competing priorities; variation in standards and indicators between QBP and Accreditation Canada.

Three sites were strategically selected to reflect SD history and three different SD streams (i.e. acute only, rehabilitation only and, integrated acute and rehabilitation) to inform the costs and benefits of participation in the SD program. The costs and benefits assessment of participation in the SD program revealed the majority of organizational and process changes were made within the existing staff member’s roles, without additional monetary compensation. Accreditation Canada program fees were the primary expenditure for SD. It was observed that in this regard there is little obvious opportunity cost associated with SD.

The researchers noted; that while clinician time spent in meetings to prepare for SD could be viewed as time away from direct patient care, the process improvements associated with SD suggest a positive net benefit in terms of higher achievement of clinical care processes.

Impact of Stroke System Policy Changes on Patient Outcomes
Examination of the impact of key policies on the processes and outcomes of care showed the following statistically significant results:

1. Feb 2004 – Emergency medicine (EMS) medical redirect protocol
   - Increased admission to stroke centres
2. April 2006 – Establishment of regional stroke care infrastructure and funding
   - Decreased 30-day mortality
   - Increased admission to stroke centres
   - Decreased proportion of patients with mild disability being admitted to inpatient rehab
3. June 2011 – Provincial and regional performance report cards released by the OSN
   - Decreased proportion of mild stroke patient receiving inpatient rehabilitation

   - Increase in patients achieving target inpatient rehabilitation Length of Stay (LOS)

Stroke QBP implementation was associated with a statistically significant improvement in the proportion of patients meeting the QBP target LOS for inpatient rehabilitation (Figure 3). These LOS targets were introduced for the first time in the Phase One QBP Clinical Handbook for stroke and the dramatic change suggests that rehabilitation hospitals have taken steps to achieve these targets.

Figure 3. The Proportion of patients achieving target Rehabilitation Patient Group LOS
Project Objectives; Findings
Findings specific to project objectives include:

<table>
<thead>
<tr>
<th>QBP Implementation Objectives</th>
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<tbody>
<tr>
<td>Effectiveness</td>
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<tr>
<td>Full effectiveness will be revealed over time particularly because the QBP policy has not been fully implemented. Results of this evaluation suggests; stroke QBP implementation is an important factor in driving positive health system change. Lessons learned can inform ongoing health system funding reform policy.</td>
</tr>
<tr>
<td>The presence of supportive networks such as LHINs, OSN, and Regional Stroke Networks (RSNs)</td>
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<tr>
<td>Involving stakeholders throughout the implementation process</td>
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<tr>
<td>Standardized practices</td>
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“I envision after the end of this, if you do this for sustainability for the next five, or ten years it becomes inherent practice. We no longer call it a stroke QBP handbook. It’s just best practice.”

- Senior leadership member
The mixed methods approach applied during this project, allowed for a rich understanding of the impact of stroke QBP to date. This approach has also provided insight into methods of evaluation that could be adopted on an ongoing basis. The project team **recommends a mixed-methods approach** based on the Evidence Integration Triangle ([Appendix D](#)) and Stroke QBP Implementation Conceptual Framework illustrated in Figure 1. This framework could be utilized for future evaluations and as a mechanism to engage all stakeholders, including patients and their families.

See [Appendix E](#) for detailed recommendations on areas of focus for QBP evaluation frameworks.

## DISCUSSION

QBP implementation is occurring at multiple levels:

1. Frontline clinicians are making individual-level behavioural changes to align their practice with QBP recommendations;
2. Senior leaders are making organizational and inter-organizational changes; and,
3. LHIN and regional stroke networks are changing their practices to better support individual clinicians and organizations to implement stroke QBP

Overall feedback from stakeholders indicates the QBP Clinical Handbook was an effective tool in supporting the adoption of best practices. Predominant themes indicated the Handbook has positively impacted the MOHLTC policy goal of adding accountability to best-practice standards and improved patient care. In addition there were unanticipated benefits including; strengthened interdisciplinary relationships; fostering of innovations; and development of data management and feedback systems – accomplished without finalization of QBP best practice pricing.

The evaluation of the use of the Clinical Handbook revealed many strengths including;

- serves as a resource to guide development of order sets and protocols;
- enables standardized approaches to stroke care provincially across LHINS;
- provides rationale and metrics for re-alignment of stroke care practices;
- supports increased accountability for achieving best practices; and
- is helping drive improvements in process and outcomes of care

Respondents also identified a number of areas for improvement including; condensing and tailoring the handbook to the appropriate audience (e.g. front line clinician versus decision support); supporting the handbook with tools/resources (e.g. “FAQ’s, order sets, protocols, process improvement approaches); and, a standardized dissemination plan available on recognized websites such as MOH and OSN.
The apparent connection of a higher degree of implementation in relation to critical mass (>165 stroke admissions) further strengthens rationale for LHINS/regions to consider consolidation of stroke services so as to support efforts and build expertise in stroke QBP best practices.

The seventeen patients and families interviewed expressed similar feedback and care needs (e.g., for increased information, and to be treated with dignity and respect), however, there were many differences between individual experiences. These individual stories, however, can be used to highlight important aspects and reveal gaps in stroke care which can be improved upon.

The quantitative analysis of the impact of Policy Changes on Patient Outcomes revealed steady impact of multiple stepwise policies and trends to improvement over time. The QBP Handbook was layered on existing policies and therefore, would not be expected to have an observed immediate impact. However, the release of the Handbook was associated with a significant improvement in rehabilitation Length of Stay targets which was a new “policy” within the Handbook. This suggests that creating provincial best practice standards and targets can generate improvements. It is expected that future analyses will reveal ongoing impact of the QBP Handbook and policies.

Undergoing SD was viewed by organizations as an enabler for QBP implementation and provided a formalized structure and standards to improve stroke care. Results suggest that SD is an effective mechanism for targeting quality improvement activities relating to stroke best practices and QBP implementation and also improves the efficiency of process improvements with little opportunity cost. SD may provide a cost effective mechanism to support implementation of QBP policy goals.

The EIT (Glasgow et al, 2012) and the stroke QBP conceptual implementation framework used for this project aligns well with patient-oriented research, and with QBP implementation strategies. This is because the approach emphasizes team-based research, integration of evidence based practice, stakeholder engagement, and researcher-practitioner-community partnerships. Addressing such challenges through a partnership approach and measuring progress to inform/adapt implementation activities ensures long-term sustainability. However, these research approaches should be applied well in advance of the intervention. The ability to draw clear conclusions about the impact of the QBP policy is significantly restricted by the retrospective nature of the project.

Overall results suggest the Stroke Clinical Handbook was successful in driving QBP implementation and that SD is an enabler. It is anticipated the speed and level of implementation for stroke and other QBP initiatives will be enhanced by addressing the areas for improvement including establishing more intentional and standardized implementation strategies. The work of HQO on QBP adoption including the development of the QBP connect portal is an excellent initiative that should prove to impact the funding reform policy goals.
RECOMMENDATIONS

Drawing on the collective knowledge gathered during this project, recommendations have been developed:

1. Continue to establish provincial best practice standards and performance expectations using the Clinical Handbook or a similar method and address areas for improvement (below).

2. Improve the Clinical Handbook by:
   - Condensing the Handbook
   - Consolidate common areas together (e.g. evidence)
   - Tailoring the Handbook to audiences (e.g. clinical staff, senior leadership)
   - Supporting the Handbook with tools/resources
     - Order sets, protocols, pathways
     - Two page summary of recommendations
     - Process improvement approaches
     - Management tools
   - Providing guidance on how to disseminate the Handbook
   - Listing key strategies
   - Providing samples of dissemination plans

3. Patient and family recommendations:
   - Provide more opportunities for patients and families to be involved in care
   - Ensure resources necessary for patient care are available including weekend therapy
   - Provide information that is easy to understand and straightforward
   - Give patients/families opportunities to be involved in research initiatives
   - System planners (e.g., MOH, OSN) should attend stroke support groups to dialogue with stroke survivors to share their experiences

4. Patients and families should be involved in policy development as well as implementation and evaluation in the principle of “nothing about me, without me”.

5. The MOHLTC and LHINs should consider making funding available to support the achievement of SD as an effective mechanism to advance and accelerate QBP implementation.

6. The EIT and stroke QBP conceptual implementation framework used in this report is recommended as a foundation to inform future evaluations. This framework could be used as a template for evaluation of any QBP or similar policy initiative.

7. Evaluation of policy interventions should be planned and budgeted for well in advance of implementation.

8. Based on the evaluation findings and informed by the science of KT the Li Ka Shing Knowledge Institute research team identified four recommendations that can help organizations increase the effectiveness of QBP implementation strategies, address barriers and facilitators, save resources, and provide more resource-efficient solutions for the long-term outcomes (Appendix F).
CONCLUSIONS

The EQUIP Stroke Project provided an opportunity to evaluate and inform the strengths of QBP implementation and identify improvement strategies. While this Project was designed to evaluate the impact of stroke QBPs in Ontario, it is important to consider the environment into which this initiative was introduced. Literature on complexity in health care system change suggests multiple levers are needed to drive system change (Plsek and Greenhalgh BMJ, 2001).

With the evolution of Ontario’s stroke system, provincial stroke indicators and outcomes have steadily improved since 1999. Ontario’s stroke QBP initiative has been introduced into a system already moving toward better care and outcomes for patients. Therefore, rapid and immediate changes in outcomes would not be expected after QBP release; rather QBPs are expected to further drive improvements already taking place across the province.

As this project was developed post release of the QBP Clinical Handbook and after commencement of implementation activities across Ontario, much of this research took a retrospective approach. A complex retrospective evaluation in an evolving environment revealed many challenges. To ensure successful health system policy implementation, proactive evaluation planning that engages health system stakeholders, patients and families, and experts in implementation science/policy researchers is recommended.

Within this context, of note, is that a new best practice and target (rehabilitation Length of Stay) introduced through the Stroke QBP Handbook had a statistically significant impact. In addition positive outcomes were reported despite implementation challenges and in the absence of finalized best practice funding. This suggests that while there are areas for improvement, and with greater involvement of patients and families, the approach to funding of quality and best practices and the use of a clinical handbook to establish provincial standards is reasonable policy initiative.
## Appendix A: Project Advisory Group (PAG) Membership

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
<th>ORGANIZATION</th>
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<tbody>
<tr>
<td>Bayley, Dr. Mark</td>
<td>Medical Director/Co-Chair</td>
<td>Toronto Rehab Institute/UHN</td>
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<tr>
<td>Brouillard, Daniel</td>
<td>Stroke Survivor</td>
<td>SEO Stroke Network</td>
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<tr>
<td>Custers, Thomas</td>
<td>Lead, Strategy and Policy</td>
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<tr>
<td>Dykes, Linda</td>
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<td>Hall, Ruth</td>
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<td>Kastner, Monika</td>
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<td>Martin, Cally</td>
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<td>Meyer, Matthew</td>
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<td>Moore, Patrick</td>
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<td>O’Callaghan, Chris</td>
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Appendix B: Stroke Quality Funding Jurisdictional Summary

Best Practice Payment Systems

1. A **Qualitative and Quantitative Evaluation** of the Introduction of Best Practice Tariffs (BPT): An evaluation report commissioned by the Department of Health. October 2012 (UK)

**Problem:**
In most activity-based financing systems, tariff prices are based on national average costs. A widespread concern is that this may create incentives for some providers to reduce quality, in order to reduce their costs below the national average level.

**Objective of BPTs:**
The objective of these BPTs was to create incentives to deliver best clinical practice through adequate reimbursement of high quality care. By linking financial rewards to service delivery, the intention was to promote care that is clinically and cost effective and do so in a way that universalized best practice.

**Stroke BPT:**
The BPT for stroke is intended to encourage rapid assessment and appropriate treatment by a multi-disciplinary clinical team. Best practice care involves fully assessing, managing and responding to the complex needs of stroke patients including planning and delivering rehabilitation from the moment they enter hospital. **The BPT consists of a base payment and two additional payments if patients receive:**

   I. Urgent brain imaging
   II. Care delivered within an acute Stroke unit

In addition to these BPT elements there is the **continuation of the 2008/09 targeted adjustment for patients who are thrombolysed using alteplase**. Although these elements are priced and payable separately, they are nonetheless interlinked. The best environment would be an acute stroke unit with access to brain imaging, expert interpretation and the opinion of consultants 24 hours a day.

**Evaluation:**
Quantitative analysis suggested little impact of the stroke BPT on the available national indicators of quality of care and patient outcomes in the first year. There were similar improving trends in quality and outcomes over time prior to the introduction of BPTs, and there was no evidence that participating Trusts made additional improvements in quality and outcomes.

**NB:** The Stroke BPT was introduced against a backdrop of increasing quality in the process of care and rapidly decreasing 30 day death rates.
2. The Performance-Based Premium Payment Program – Western Australia (BP premium/payment)

Objectives:\n- Driver for supporting safe, high quality care.
- Improve sustainability of clinical practice improvements to ensure that every patient, every time, is provided with best evidence-based care.
- The Premium Payment Program has been designed to:
  - recognize and reward services which provide a very high level of best evidence-based care;
  - reimburse service providers for any additional costs associated with best evidence-based care;
  - and, reimburse service providers for the additional tasks required to participate in the scheme, including the collection and submission of data.

The Performance Based Program:
Piloted in 2012-2013 with five payments and continued in 2013-2014 with three payments. It is anticipated that these payments will be continued in 2014-2015 with no changes:
- Fragility Hip Fracture Treatment
- Stroke Model of Care
- Acute Myocardial Infarction
The program is open to ABF-funded hospitals. Participation is not mandatory; sites and services will be eligible for payment only if the required data is submitted.

Stroke Model Premium Payment:
The aim of this payment is to ensure appropriate admission to a designated stroke unit for patients suffering a stroke. A $200 payment will be awarded for each patient
  - admitted to a designated stroke unit
  - and where the stroke unit achieves a minimum of 65% of stroke patients treated within a designated stroke unit at any time during their admission, in a quarter

No evaluation of the effectiveness of the program was found.

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3 Principles:
- the patient, their family and their carers are the central focus of the health system
- funding is transparently linked to the efficient delivery of health services and their outcomes
- evidence is available to enable performance to be managed
- clinical leadership and partnership is essential at all program levels
- risks are identified, controlled and managed in a consistent manner
- funding distribution is equitable, and recognizes the needs of special populations
Financial Incentive/Payment for Reporting

1. CMS Hospital Inpatient Quality Reporting (IQR) Program (financial incentive for reporting)

**Stroke quality measures** are reported to the Centers for Medicare & Medicaid Services (CMS) as part of the Hospital Inpatient Quality Reporting (Hospital IQR). This program was originally mandated by Section 501(b) of the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003. This section of the MMA authorized CMS to pay hospitals that successfully report designated quality measures a higher annual update to their payment rates. Hospitals that do not successfully report receive a reduction of 2.0%.

**Stroke-Related Measures**

CMS requires reporting on designated quality measures in order to receive a higher annual update to Medicare MS-DRG rates\(^26\) (*CMS regulations for Fiscal Year 2017, †CMS regulations for Fiscal Year 2015*)

To avoid a 2% penalty in Medicare reimbursement, hospitals must report all Hospital IQR measures\(^26\)

**NB: No stroke specific performance target or thresholds and no evaluation of program effectiveness was found**

2. Advancing Quality

The basic idea of the Advancing quality programme is that if every hospital achieves the appropriate measures it will help to: save lives, reduce the number of people being re-admitted into hospital; reduce complications and decrease the length of time patients have to spend in hospital. From this simple foundation Advancing Quality can then enable hospitals to reduce costs and the money saved can be used to improve care and facilities. It is a publically facing program.

**Measures**

1. **You should be admitted to a stroke unit within 4 hours of arriving at hospital** (a stroke unit will be staffed with a multi-disciplinary team with specialist knowledge)

2. **Your ability to swallow should be tested.**
3. A scan of your brain should be done within 24 hours.

4. Blood thinning medication within 24 hours of hospital admission

5. You should be weighed during your hospital stay

6. Assessment of movement within 72 hours of admission (PT)

7. Assessment of ability to carry out day to day tasks within 72 hours of admission (OT)

NB: No performance target or thresholds and no detailed evaluation of program effectiveness were found. From website within Northwest NHS: program associated with: 890 Fewer deaths during the first 18 months; 22,802 Bed days saved; £4.4m Saved due to bed days saved

**SUMMARY:**

Payment schemes revealed consistent use of stroke units as a measure of quality/best practice. Brain imaging and thrombolysis was included in 3/4 programs. Where available none of the programs have been shown an impact of the payment programs on outcomes. A common theme is that the desired benefits of payment reforms will take time and considerable effort to materialize.

It is important to note that the lack of a solid evidence has not prevented policy makers across peer jurisdictions from embracing incentives as a lever for change. It is important, therefore, to build knowledge of how and why schemes are implemented in practice, in order to inform future policy in this area. In particular, studies which go beyond a ‘black box’ approaches and a control/ resistance framework are urgently required.

> “Financing shortcuts cannot circumvent the hard work and commitment needed for quality improvement, and may corrode the indispensable tools of progress: conscientious data collection, honest self-reflection, altruism, and creativity”

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APPENDIX A

OTHER PAYMENT SYSTEMS - PRIVATE, BUNDLED PAYMENT &/OR DOES NOT SEEM TO INCLUDE STROKE

1. Hospital Value-Based Purchasing

Background
Congress authorized inpatient Hospital Value-Based Purchasing (HVBP) in Section 3001(a) of the Affordable Care Act. The program uses the hospital quality data reporting infrastructure developed for the Hospital Inpatient Quality Reporting (IQR) Program, which was authorized by Section 501(b) of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003.

Hospital VBP is part CMS’ long-standing effort to link Medicare’s payment system to improve healthcare quality, including the quality of care provided in the inpatient hospital setting. The program will implement value-based purchasing to the payment system that accounts for the largest share of Medicare spending, affecting payment for inpatient stays in over 3,500 hospitals across the country.

Purpose
The HVBP program is designed to promote better clinical outcomes for hospital patients, as well as improve their experience of care during hospital stays. Hospital VBP seeks to encourage hospitals to improve the quality and safety of care during acute-care inpatient stays by:

- eliminating or reducing the occurrence of adverse events
- adopting evidence-based care standards and protocols that result in the best outcomes
- re-engineering hospital processes that improve patients’ experience of care

2. PROMETHEUS PAYMENT AN EVIDENCE-INFORMED MODEL FOR PAYMENT REFORM

Problem
Most experts agree that a fundamental problem of the nation’s health system is that both the current fee-for-service and the per-patient (capitation)-style models of reimbursing providers encourage volume-driven health care rather than value-driven health care. Providers are rewarded for “doing things” (often too many or not enough), rather than delivering quality services that are proven to keep people healthy, reduce errors and help avoid unnecessary care.

Objective
PROMETHEUS Payment steps beyond “pay for performance” models of change to test paying for individual, patient-centered treatment plans that fairly reward providers for coordinating and providing high-quality and efficient care. Centers on packaging payment around a comprehensive episode of medical care that covers all patient services related to a single illness or condition.

The costs of treatments are calculated into what is called an “Evidence-informed Case Rate” (ECR®), which creates a patient-specific budget for the entire care episode. ECRs include all the covered services related to the care of a single condition – bundled across all the providers who would treat a given patient for the given condition (such as a hospital, a physician, laboratory, pharmacy, rehabilitation facility, etc.). The ECR is adjusted to take into account the severity and complexity of the individual patient’s condition.

The PROMETHEUS Payment comprehensive quality scorecard contains a variety of metrics that track and evaluate care across the entire scope of treatment. These include scores for a range of items – each
provider’s performance in meeting the clinical practice guidelines which define the ECR, positive patient outcomes, the avoidance of preventable complications and the patient’s satisfaction with care received. When ECRs are paid, a portion of the budget is withheld and then paid out depending on the scores that the providers and their clinical collaborators earn.

The Essential Elements of Prometheus Payment

1. Evidence-informed Case Rate (ECR)
   - Budget for the treatment of an illness or condition that includes all covered services related to the care for that condition, as determined by tested, medically accepted, clinical practice guidelines.
   - Payment for all providers across all settings who would treat the patient for that condition (such as a hospital, a physician, laboratory, pharmacy and a rehabilitation facility).
   - Is adjusted to take into account the severity and complexity of the patient’s condition.

2. Provider quality scorecard
   - A portion of the ECR payments is withheld and paid depending on the scores that providers and their clinical collaborators earn on individual quality scorecards.
   - Includes a comprehensive mix of quality care metrics e.g. performance in meeting clinical guidelines, positive patient outcomes, avoidance of complications and patient satisfaction.
   - Incentivizes clinical collaboration by making 30 percent of the score dependent on what others treating that patient for that condition have done.

3. Potentially avoidable complications (PAC) pool
   - Potentially preventable deficiencies that occur in inpatient or outpatient care which cause harm yet could have been prevented through proactive care.
   - Represent up to 40 cents of every dollar spent on chronic conditions, and up to 30 cents of every dollar spent on hospitalizations.
   - A PAC allowance is calculated based on the ECR – it is paid out either to offset the costs when complications do occur or as bonuses to providers for avoiding them.

Evaluation (non-stroke bundles studied)

We evaluated the initial “road test” of PROMETHEUS Payment, one of several bundled payment pilot projects. The project has:

- **Faced substantial implementation challenges**, and none of the three pilot sites had executed contracts or made bundled payments as of May 2011.
- Taken longer to set up than expected, **because of complexity of the payment model** and other complexities of healthcare.
- Participants continue to see promise and value in the bundled payment model, but the pilot results suggest that the desired benefits this and other payment reforms may take time and considerable effort to materialize.
Appendix C: Milestones and Impacts

OSN and Evaluating the Quality of Stroke Care

- Coordinated Stroke Strategy 98/99 launched by HSFO
- MOHLTC releases "Towards and Integrated Stroke Strategy for Ontario" & incremental funding of $30M – includes $$ for evaluation & research
- 6 RSC, 5 SPC's designated
- 1st CSS Best Practice Guidelines released
- 1st EMS redirect protocol released
- MOHLTC defines - 11 Stroke Regions
- 11 RSC, 19 DSC, 24 SPC, 4 Telestroke sites 2005
- Regional Stroke funds moved to stroke centre (hospital) base
- HSF(Ontario) provides OSS provincial coordination
- OSN SEQC identifies 20 Core LHIN Report Card indicators
- OSN completes Regional & District Reviews & establishes HSAA & HAPS for stroke centres & SPC's
- OSN collaborates with Accreditation Canada to develop a stroke distinction award
- CSN and CIHI develop project 340 - core set of stroke measures in DAD & NACRS
- 11 Telestroke sites
- MOH commissions HQO to develop QBP – OSN co-chairs Expert Panel
- OSN establishes Targets for 16/17
- 2nd OSN Stroke Report Cards include Interpretation for recommended activities
- ECASS3 trial results (2008) expand IPA treatment window from 3.5 to 4.5hrs. EMS protocol revised & implemented Sept 2011
- 20 Telestroke sites
- OSN selected as SPOR demonstration project to evaluate stroke QBP - implementation
- OSN LHIN Economic Assessments released
- OSN holds forum bringing together Regional Stroke Networks, LHIN and MOH
- Three more sites achieve AC Stroke Distinction
- OSN funding ends for OSR
- 23 Telestroke sites
- OSN revises SU definition (16 SU's in 13/14) from 34
- OSN expands HMP & advances VHAST for Primary Care
- Rehab Intensity to be captured in NRS
- LHIN progress reports released
- EVT trials successful – OSN establishes planning/implementation committee
- CIHI 640 – 3 more stroke elements in DAD & NACRS – includes Telestroke
- 25 Telestroke sites
Acronyms

- CIHI – Canadian Institute for Health Information
- CSN – Canadian Stroke Network
- CSSBPR – Canadian Stroke Strategy Best Practice Recommendations
- DAD – Discharge Abstract Database (Inpatients)
- DSC – District Stroke Centres
- ECASS3 – European Cooperative Acute Stroke Study III
- EMS – Emergency Medical Services (Ambulance)
- EVT – Endovascular Thrombectomy
- FRONTIER - Field Randomization of NA-1 Treatment In Early Responders
- HAPS – Hospital Accountability Planning Submissions
- HQO – Health Quality Ontario
- HSAA – Hospital Service Accountability Agreements
- HSF – Heart and Stroke Foundation
- HMP – Hypertension Management Program
- LHINs – Local Health Integration Networks
- MoHLTC - Ministry of Health and Long-Term Care
- NACRS – National Ambulatory Care Reporting System (Emergency Department)
- NRS – National Rehabilitation Reporting System
- OSN – Ontario Stroke Network
- OSS – Ontario Stroke System
- QBP – Quality Based Procedures
- RSC – Regional Stroke Centres
- RCSN – Registry of the Canadian Stroke Network
- SEQC - Stroke Evaluation Quality Committee
- SPC – Secondary Prevention Clinics
- SPOR – Strategy for Patient Oriented Research
- SU – Stroke Unit
- VHAST – Vascular Health and Support Tool
Appendix D: Evidence Integration Triangle Framework

Among the multitude of frameworks available for use in implementation science research, the Evidence Integration Triangle (EIT) was selected to guide development of research plans and activities described in this report. The EIT framework describes critical elements required to optimize integration of evidence into practice and evaluate the success of implementation through actionable outcome measures. According to the EIT framework, interactions among three critical elements – evidence-based interventions, key stakeholders, and practical progress measures, provide a rational approach to implementing practices that have the potential to improve patient outcomes.

The EIT framework aligns well with patient-oriented research, and with QBPs implementation strategies, because of its emphasis on team-based science, stakeholder engagement, and researcher-practitioner-community partnerships. It also situates integration of scientific evidence into practice as an incentive for achieving positive health impacts by incorporating progress measurement into the implementation model. Instituting measurement of indicators and outcomes early in the process of implementation, influences stakeholders to carefully consider the core policy/intervention elements most relevant for change and multiple contextual variables that may facilitate or impede change. Addressing such challenges through a partnership approach and measuring progress to inform/adapt implementation activities ensures long-term sustainability. The EQUIP-Stroke project aimed to work closely with provincial stakeholders to evaluate the impact of QBPs to date, but also to initiate a process by which groups could reflect on performance and prepare for ongoing improvement. The EIT framework, as developed by Glasgow et al., is presented in Figure A.

Figure A. The Evidence Integration Triangle
## Appendix E: Recommended Areas of Focus – Evaluation

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<tr>
<th>Focus</th>
<th>Rationale and Considerations</th>
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| 1. Patient and family experience | - With the focus of Ontario’s MOHLTC on Patient’s First, ongoing evaluation must consider patient and family experience and outcomes.  
- Patient and family interviews and focus groups offer an excellent opportunity to understand the experiences of patients and their families as they proceed through the system.  
- Experience-based co-design has been identified by Health Quality Ontario as the preferred method for engaging patients in their families.  
- In addition to routinely collected process indicators, patient reported outcome measures should be collected to truly understand the impact of system change on patient care.  
- Opportunities for data collection include points of transition (e.g. discharge from hospital), but should also be performed at routine intervals.  
- The QBP Clinical Handbook for stroke recommends that routine follow-up phone calls be performed as part of best-practice care, which would offer the perfect opportunity to collect both experience information and outcome measures.  
- Outcomes that should be considered would include the Stroke Standard Set recommended by the International Consortium for Health Outcome Measurement (iCHOM), or the EQ-5D. |
| a) Patient and family interviews/focus groups built around experience-based co-design methods | |
| b) Routine collection of patient experience and outcomes | |
| • Follow-up phone calls | |
| 2. Stakeholder knowledge and experience | - Surveys should be routinely distributed to gain a breadth of information on participants’ perception of the QBP implementation, followed by interviews and focus groups to gain depth by exploring and understanding certain phenomenon that emerge from survey findings.  
Survey questions should be tailored to the knowledge user (i.e., health care provider survey questions and organizational or process level questions). Core components of the survey should include questions such as:  
  o Stakeholder’s knowledge of the QBP  
  o Stakeholder’s knowledge of the QBP costing model/formula  
  o Stakeholder’s knowledge of the clinical handbook  
    i. How was it disseminated  
    ii. How was it used  
  o What implementation strategies have been used to support QBP implementation  
  o What resources/tools have been used/developed to support QBP implementation  
  o What structures/mechanism are in place to monitor and measure outcomes and performance  
    iii. How was this information used  
  o What stage of QBP implementation is the organization presently at (i.e., identify activities that are taking place)  
  o Perceived level of success with QBP implementation  
  o Perceived level of satisfaction with QBP implementation  
  o Is implementing the QBP considered a priority in their organization  
  o What are the facilitators and barriers to QBP implementation  
  o How is the organization sustaining QBP implementation efforts  
    iv. What measures are in place to sustain implementation efforts |
### Recommended Areas of Focus for QBP Evaluation Frameworks

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| **b) Interviews and focus groups** | Interviews and focus groups should be conducted with key stakeholders who have demonstrated a high degree of knowledge and awareness of QBP implementation through their survey responses (e.g., those that know a lot about “on the ground” status). This should include good representation at all levels (i.e., decision makers and knowledge users). Questions should be generated based on findings from the survey and informed by theories and frameworks such as the Consolidated Framework for Implementation Research (CFIR) and the Theoretical Domains Framework (TDF). The use of a tool such as [http://www.cfirwiki.net/guide/app/index.html](http://www.cfirwiki.net/guide/app/index.html) which can inform the development of questions at an organizational level. Core components of the interview guide should include questions such as:  
  - What their role/tasks were with respect to QBP implementation (probe for specific examples)  
  - What their perceptions are of the clinical handbook (i.e., barriers and facilitator to the utility of the handbook; and suggestions for improvements)  
  - What their thoughts are on their organization’s capability and capacity for QBP implementation (i.e., implementation climate)  
  - What resources were used/developed to support QBP implementation (i.e., how were they used/developed, how did they impact the implementation)  
  - What are the barriers and facilitators affecting QBP implementation  
  - How is the organization sustaining the QBP (i.e., what sustainability resources/tools have been used)  
  - What factors contributed to the sustainability of the implementation  
    - What are the barriers and facilitators to sustaining the QBP  
  - What were some of the outcomes and impacts of implementing the QBP  
  - What were some of the lessons learned and recommendations |
| **3. System-level indicators** | Stakeholders continually noted that existing indicator documents were helpful when planning for QBP implementation and monitoring success. They also allowed for regular comparison between regions and for performance benchmarking. Ongoing evaluation should include continuation of these reports including:  
  - The OSN Stroke Report Card  
  - The QBP baseline indicator report  
  - The Ontario Stroke Evaluation Technical Report |
### Appendix F: Recommendations for QBP Implementation Strategies

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<th>Recommendation</th>
<th>Rationale and Considerations</th>
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| **1) Assess barriers and facilitators to clinician, organization, and system changes** | • Behaviour change is a complex process, further complicated when multiple people, organizations, and systems need to change. In order to effectively support behaviour change, it is imperative to understand why people are/are not changing.  
• Conducting a barriers and facilitators assessment is one way to accomplish this task and can then serve as the basis for selecting strategies to support behaviour change.  
• A barriers and facilitators assessment should go beyond the obvious, surface level barriers to address the root causes of change or inaction. For example, commonly cited barriers include: not having enough time and the change is not a priority. By going deeper, we want to understand why this change is not considered a priority? What are the other priorities? When people talk about the changes not being a priority, is it really a motivation issue? Why they are not motivated to change?  
• A key opportunity would be to capture the barriers and facilitators to change at all levels (individual, organizational, and system). This information could be used to select appropriate implementation and dissemination strategies.  
• The current evaluation could serve as the basis of a provincial barriers and facilitator assessment as participants from across Ontario provided key examples of barriers and facilitators encountered when implementing QBPs.  
• Barriers and facilitators can be mapped to a behaviour change framework, specifically the Theoretical Domains Framework (TDF) (Cane, O’Conner, & Michie, 2012). |
| **2) Use theory and evidence to drive implementation and dissemination strategy selection** | • Once barriers and facilitators to behaviour change are well understood, they can be linked to behaviour change theory to understand the mechanism of change that is likely to result in practice changes at all levels.  
• Behaviour change theories are used to predict and understand causal mechanisms; they explain how a person will change (Michie, Atkins & West 2014).  
• Once the barriers and facilitators are linked to behaviour change theory, appropriate dissemination and implementation strategies can be selected that are based in high-quality evidence and address the underlying mechanisms of change.  
• This process allows local tailoring of dissemination and implementation strategies, it can also be used to get buy in at the local level. In addition, use of theory to drive the selection of dissemination and implementation strategies would facilitate future evaluations (Nilsen, 2015).  
• The COM-B (Capability, Opportunity, Motivation – Behaviour) is a behaviour change theory that has been commonly used in guideline implementation, since it focuses on planned behaviour change and has been mapped to the TDF using an expert panel (Michie et al., 2011).  
• Many interventions focus on capability (e.g., whether people have the knowledge and skills to do something), when motivation is really one of the primary barriers to change. For example, “reminders” are an effective |
### Increasing the Effectiveness of QBP Implementation Strategies

<table>
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<tr>
<th>Recommendation</th>
<th>Rationale and Considerations</th>
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<td><strong>implementation strategy, but are only likely to work if memory is one of the key barriers or facilitators to change, if clinicians are worried about the consequences of changing, they are unlikely to change as a result of a reminder.</strong></td>
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<td><strong>3) Maximize economies of scale in tool development, develop centralized tools that can be adapted regionally/share regionally developed tools and allow for adaptation</strong></td>
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| • Evaluation findings have revealed that many RSNs and healthcare organizations are working on very similar tasks, essentially duplicating work. For example, almost all of the regional work plans described an activity that involved developing a protocol or model.  
• If every region is spending time and resources on developing these protocols and models separately, there are many staff hours that are being allocated to this activity.  
• An alternative approach may be to develop more centralized tools that can be shared with and adapted by the regions. Tools already developed by the regions could be shared centrally with all regions and RSN teams could be encouraged to adapt existing tools, rather than creating new ones, when possible.  
• Using an integrated KT approach (Graham et al., 2014), the OSN/RSNs could select a standardized, but tailored approach to supporting stroke QBP implementation.  
• Tools could be developed based on the identified barriers and facilitators, so that RSNs and hospitals could identify and prioritize their own barriers and facilitators and select implementation strategies to specifically address challenges and opportunities in their local context. Implementation and dissemination resources could then be shared, to reduce duplication. |
| **4) Plan for sustainability** |
| • Sustainability, or the continued implementation and maintenance of outcomes is imperative to have a lasting impact (Scheirer et al., 2011).  
• Since planning for sustainability is related to actual sustainability [Rhoades], there is an opportunity to explicitly focus on sustainability while adopting a consistent process model.  
• Developing a sustainability plan includes: defining what will be sustained; how much will be sustained; who is responsible for sustaining it; and defining when sustainability starts and ends. There are also tools available, like the National Health Service’s sustainability model that could support local sustainability efforts (Sustainability Model and Guide. (2006-2013)). |
Appendix G: Glossary

Accreditation Canada
An independent, not-for-profit organization that has been improving health quality through accreditation since 1958. Accreditation Canada has accredited more than 1,000 organizations representing over 7,000 sites and services across Canada including hospitals, walk-in clinics and labs, emergency medical services, long-term care homes, home care services, mental health services, and community health programs, among others. Accreditation Canada accredits provincial health authorities and health systems.

Canadian Institute of Health Research
The Canadian Institutes of Health Research (CIHR) is Canada’s federal funding agency for health research. Composed of 13 Institutes, they collaborate with partners and researchers to support the discoveries and innovations that improve health and strengthen the health care system.

Cardiac Care Network
The Cardiac Care Network of Ontario (CCN) is a system support to the Ministry of Health and Long-Term Care (MOHLTC), Local Health Integration Networks (LHIHs), hospitals, and care providers dedicated to improving quality, efficiency, access and equity in the delivery of the continuum of cardiovascular services in Ontario. In addition to helping plan, coordinate, implement and evaluate cardiovascular care in Ontario, CCN is responsible for developing, maintaining and reporting on the provincial cardiac and vascular registries. In the role of monitoring and enhancing quality of cardiac and vascular services in Ontario, CCN develops strategies, based on best practices, to better manage cardiovascular disease across the continuum of care, including strategies to prevent acute hospital readmissions, decrease demand on emergency departments and decrease the need for initial and repeat procedures. The Cardiac Care Network of Ontario is funded by the Ontario Ministry of Health and Long-Term Care.

Health Quality Ontario
Health Quality Ontario (HQO) was established as an arms-length MOHLTC department to evaluate the effectiveness of new health care technologies and services, to report to the public on the quality of the health care system, to support quality improvement activities, and to make evidence-based recommendations on health care funding. Through initiatives like “Quality Matters” and “Better has no Limit”, HQO’s mission is to promote a patient-centred, evidence-based healthcare system that strives for continual improvement. As such, HQO has played an important role in identifying potential QBPs, assessing provincial opportunities for improvement and working with experts and stakeholders to develop recommendations. This has primarily been achieved through their role in developing the QBP clinical handbooks. Each Clinical Handbook contains a description of the patient population with a set of recommendations on how to provide the best care possible for patients.

Health System Reform Overview
Ontario’s healthcare system is undergoing significant structural changes that are designed to establish a more patient-centred and equitable healthcare system; one that will be sustainable for future generations. The following represent significant milestones in this change:

2010 - Excellent Care for All Act (ECFAA)
In June 2010, ECFAA became law in Ontario and outlined the government’s intention to place patients first by strengthening the healthcare sector’s organizational focus and accountability. ECFAA was built around the following principles: 1) Care is organized around the person to support their health 2) Quality and its
For more information, please contact Linda Kelloway, Director Best Practices, Cardiac Care Network, Stroke Services at lkelloway@ccn.on.ca.
epidemiologists, as well as specialists in knowledge translation and information security, privacy and information technology. The diversity within these teams and their expertise at using ICES’ outstanding array of linked datasets is the foundation of the innovative approach to research at ICES.

Li Ka Shing Knowledge Translation Institute
The Li Ka Shing Knowledge Institute conducts clinical trials, and specializes in research on health services and policy, population health, global health and knowledge translation research at St. Michael's Hospital. Their focus is on conducting research and disseminating knowledge that is relevant for the health care system and important to patients.

Ontario SPOR Support Unit
The Ontario SPOR SUPPORT Unit (OSSU) is a collaboration across 12 leading health Research Centres, supported by a Coordinating Centre which facilitates, connects and integrates activities across the network. Jointly funded by the Government of Ontario and the Canadian Institutes of Health Research, the initiative engages researchers, patients, clinicians, policy makers, industry representatives and other health system professionals to implement Canada’s Strategy for Patient-Oriented Research within Ontario.

With world leading expertise in data access, methodological and research services, knowledge translation, clinical trials and capacity building, OSSU provides infrastructure, expertise and support to those engaged in patient-oriented research. It also promotes knowledge transfer and exchange of the latest research evidence, to inform and implement more effective health policy and clinical practices.

Ontario Stroke System Overview
In Ontario, stroke best practices have been a long-standing focus. Development of Ontario’s provincial stroke system began in the late 1990s when the Ontario Heart and Stroke Foundation (HSFO) funded pilot projects to establish a regionalized approach to stroke care encompassing the entire care continuum from prevention to community reintegration. In 2000, Ontario’s provincial government funded the Ontario Stroke Strategy (OSS) to implement work done in the Heart and Stroke Foundation pilot projects. Eleven (11) stroke regions, each with a regional stroke centre responsible for local implementation of stroke care best practices across the care continuum were designated. This was to be achieved through specific funding for change agents including a regional program director, coordinators for education, rehabilitation, community and long-term care as well as secondary stroke prevention clinics and district stroke centres. Part of the OSS funding was specifically assigned to evaluating the ability of the strategy to deliver stroke best practices. The evaluation funding allowed for monitoring and reporting on the implementation of stroke care best practices with a focus on acute stroke care indicators.

Patient Engagement Framework
The British Columbia Patient-Centered Care Framework (British Columbia Ministry of Health, 2015) was selected as the key framework to inform the patient engagement strategy. This patient-centered care framework was developed by the British Columbia Ministry of Health and states that “patient-centered care puts the patients at the forefront of their health and care, ensures that they retain control over their own choices, helps them make informed decisions and supports a partnership between individuals, families, and health care service providers”. Core principles of this framework are presented in Figure B.
QBP Overview
Quality-Based Procedures (QBP) are one of two patient-based funding components of the MOHLTC’s Health System Funding Reform (HSFR). Procedures considered for QBPs were selected using an evidence-based framework built around four (4) perspectives: 1) Cost Impact 2) Available Evidence 3) Feasibility/Infrastructure for Change 4) Practice Variation. Beginning in 2012, selected QBPs were implemented across the province. The QBP implementation strategy consists of two components; 1), development of a clinical handbook led by Health Quality Ontario (HQO) in consultation with a provincial expert panel; 2) implementation of funding reform. Using Ontario Cost Distribution Methodology (OCDM) average costs of care, a one-time “carve-out” of funding is performed from each hospital’s global budget for each QBP. Using HBAM methodology and Ontario Case Costing Initiative (OCCI) data, a QBP cost per weighted case is calculated for each QBP (and appropriate sub-groups) and hospitals are remunerated on a price per-volume basis going forward. In fiscal year 2013/14, stroke QBP funding was implemented across the province using separate costs per weighted case for ischemic/unspecified stroke, hemorrhagic stroke, and TIA.

SPOR Overview
The objective of Canada’s Strategy for Patient-Oriented Research (SPOR), funded by the Canadian Institutes of Health Research (CIHR), is to improve health care practices, therapies, and policies by bringing together researchers, decision makers, and patients. Stakeholders engaged in patient-oriented research are assisted by SUPPORT (Support for People and Patient-Oriented Research and Trials) Units – locally accessible multidisciplinary research centres that provide resources, expertise, policy knowledge, and patient perspectives. The research on Quality-Based Procedures (QBPs) presented in this report was identified as a demonstration project under the Ontario SPOR SUPPORT Unit (OSSU). The expertise of

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Four Core Principles to Patient-Centered Care
(British Columbia Ministry of Health, 2015)

Dignity and Respect
- Active listening to patients and families and to honouring their values, beliefs, cultural norms, choices and decisions

Information Sharing
- Participative communication of timely, accurate, and complete information with patients and families on what decisions are to be made, and validating with patients and families what they heard and understood

Participation
- Patients and families are encouraged and supported in participating in care and informed decision making at the level at which they feel comfortable and of their own choice

Collaboration
- Patients and families are provided meaningful opportunities to engage with care providers and leaders in the continuum of quality improvement, policy, and program development, implementation and evaluation

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OSSU members was leveraged throughout the research process to ensure that the resulting knowledge will support QBP implementation in the future.

Engaging patients in all processes of the research continuum – priority setting, conducting research, and applying the knowledge, ensures that investments in health research are applicable to patient care. The multidisciplinary approach of patient-oriented research allows for collaboration with relevant stakeholders (e.g. patient advocates, academic health centers, regional health authorities, etc.) and ensures research is integrated into patient care. Each stage in the research process is an opportunity for significant collaboration with knowledge users, including the development or refinement of the research questions, selection of the methodology, data collection and tools development, selection of outcome measures, interpretation of the findings, crafting of the message and dissemination of the results (Canadian Institutes of Health Research [CIHR], 2015).

Engagement of patients and family in health care can lead to improved patient experiences and satisfaction as well as lowered costs (The Change Foundation, 2016). A patient engagement process was used in the evaluation design for this project, informed by the project working group and SPOR, Health Quality Ontario (HQO), and The Change Foundation’s recommendations for patient engagement (Canadian Institutes of Health Research [CIHR], 2014; Health Quality Ontario [HQO], 2016; The Change Foundation, 2016). This process engages patients and family members in all aspects of the research to ensure that matters most important to patients/family are heard and that decisions made with respect to health care are reflective of patient needs and priorities.

**Stroke Distinction Overview**

In partnership with the Canadian Stroke Network, Accreditation Canada developed and implemented the [Stroke Distinction Program](#) to allow organizations to apply for a rigorous assessment of stroke care based on the [Canadian Stroke Best-Practice Recommendations](#). This program assesses organizations on the ability to excel in meeting a standardized set of core indicators and includes an on-site visit by stroke experts. Many organizations across Ontario have participated in Stroke Distinction (SD) prior to and during the period in which stroke QBPs were being implemented across the province.
References


7. Lindsay, MP,Gubitz,G.,Hill,MD., Phillips,S. & Smith,EE. *Canadian Stroke Best Practice Recommendations.* On behalf of the Canadian Stroke Best Practices Advisory Committee and Writing Groups. 2014;Ottawa,Ontario Canada: Heart and Stroke Foundation, Canada


