Toolkit to Support the Implementation of Quality-Based Procedures

ONTARIO HOSPITAL ASSOCIATION

Forward

The Ontario Hospital Association (OHA) has been a strong supporter of the *Excellent Care for All Act* (ECFAA) and associated strategy since their introduction, because they are important to the continuous quality improvement efforts underway in Ontario's health system. In particular, we support initiatives which optimize value and quality for patients through evidence-informed care. We are seeing this through Ontario's Health System Funding Reform – a process of system-wide transformation which seeks to change how health care providers are reimbursed for their services – of which Quality Based Procedures (QBP) are an important component.

The successful implementation of QBPs is integral to this transformation, and the OHA is doing its best to support hospitals during implementation, including the development of educational resources such as this toolkit. I am pleased to present the *Toolkit to Support the Implementation of Quality Based Procedures*, which I hope will serve as a roadmap for hospitals to support them with the application of the Clinical Handbooks and the QBP implementation process.

No journey is without its challenges. However, we can learn from each other and benefit from the lessons and successes of other jurisdictions that have gone down this path. I would like to acknowledge the tremendous work of Health Quality Ontario (HQO), the Clinical Expert Panels, and the Ministry of Health and Long-Term Care (MOHLTC) for the development of the Clinical Handbooks, which were designed to guide providers through the clinical implementation and evidence driving each QBP. They are a rich and valuable resource for hospitals.

I would also like to take this opportunity to recognize Ontario's hospitals for their commitment to the successful transformation of the system. The planning, mobilization, and leadership required to bring about such a significant change cannot be underestimated.

Finally, I would like to thank all OHA members and system partners who have generously provided their insight during the development of this toolkit.

As we continue on this journey, I firmly believe that ECFAA's principles of integration and its primary focus on quality must remain a strong foundation and driving force for change – our success and the care of our patients depend on it.

Anthony Dale
Interim President and CEO
Ontario Hospital Association.

Disclaimer

This toolkit has been prepared by the Ontario Hospital Association (OHA) to be used as guidance when implementing the *Congestive Heart Failure (CHF), Chronic Obstructive Pulmonary Disease (COPD) and Stroke* Quality-Based Procedures (QBPs). Sections of the toolkit can also be used to guide the implementation of future QBPs. Through the work of the OHA's QBP Implementation Advisory Group, members of the QBP Clinical Expert Panels reviewed this toolkit including the implementation tools included herein. Any revisions and/or additions to this document will be vetted by the Clinical Expert Panels.

The materials in this toolkit are for general information purposes only and should be adapted to the circumstances of each hospital. The OHA recognizes that individual hospitals will have unique circumstances for each type of clinical procedure, as well as different clinical team composition and staffing capacity related to support functions, such as decision support, project management and information technology. As such, the OHA advises hospitals to seek their own advice and opinion when developing their organization's approach and plans for implementing QBPs.

The OHA assumes no responsibility or liability for any harm, damage or other losses, direct or indirect, resulting from any reliance on the use or the misuse of any information contained in this toolkit.

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The OHA also acknowledges the contribution of the hospitals that were interviewed in the process of developing the toolkit. These are:

- Brockville General Hospital
- Grey Bruce Health Network
- Hamilton Health Sciences
- London Health Sciences Centre
- Norfolk General Hospital
- Orillia Soldiers' Memorial Hospital
- St. Michael's Hospital

All stakeholders interviewed are listed in Appendix B.

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Objective

To provide an overview on:

- The background and expected objectives of QBPs
- Why the toolkit was developed
- The information included in the toolkit

Target Audience:

- Senior management and/or QBP project teams

Chapter 1: The Need to Understand QBPs

Background to QBPs

Ontario's Excellent Care for All Strategy has initiated a greater focus on healthcare quality and quality improvement in Ontario. This provincial strategy is based on four central principles intended to improve the quality of care across the system:

- Care is organized around the person to support their health
- Quality of care is supported by the best evidence and standards of care
- Quality and its continuous improvement are critical goals across the health care system
- Payment, policy and planning **support quality and efficient use of resources**

These principles reflect the key attributes of successful improvement in high-performing health care systems described in Dr. Ross Baker's influential book, "High Performing Healthcare Systems – Delivering Quality by Design (2008)." In his book, Dr. Baker analyzed seven health care systems – including two in Canada – that have successfully used quality improvement tools and knowledge management strategies to transform their health delivery.

The common attributes of these systems include leadership; incentives and accountability; an engaged clinical workforce; a quality culture that supports learning, strategy and policy; and strong information and data to drive improvement.

Introduced in June 2010, the *Excellent Care for All Act* (ECFAA) is a landmark piece of legislation that underpins the Excellent Care for All Strategy. The legislation helps "define quality for the health care sector, reinforces shared responsibility for quality of care, builds and supports boards' capability to oversee the delivery of high quality care, and ensures health care organizations make information on their commitment to quality publicly available".[1] Under ECFAA, quality is defined as a system that is accessible, appropriate, effective, efficient, equitable, integrated, patient-centred, population health-focused, and safe.

The creation of this legislation and strategy are meant to more closely link quality and evidence-based care, and to strengthen the relationship between the delivery of high-quality care and fiscal sustainability through Health System Funding Reform (HSFR).[2] The goal for HSFR is to promote quality and improved outcomes and create a more equitable allocation of resources. Many countries around the world, including Australia, Germany, Denmark and the United Kingdom (U.K.), have used funding as a lever for change. Over the past two decades, these models have been associated with successes in decreasing wait times/improving access to care, reducing unit costs per admission, reducing variation in both costs and clinical practice and, most importantly, improving quality.

1 Ontario Ministry of Health and Long-Term Care.

2 Ibid.

As part of this reform, funding is tied more directly to quality of care and uses evidence to determine what the best care is for patients. It aims to enhance the system by linking funding, policies and accountability, in order to provide more patient-centred care.

In Ontario, there are two key components to HSFR:

- **Health Based Allocation Method** (HBAM), which will be leveraged to provide organizational-level allocations informed by case-mix utilization and aggregate cost, volume and types of patients and providers.

- **Quality-Based Procedures** (QBPs), wherein health care providers are reimbursed according to the types and quantities of patients they treat, using evidence-informed rates that are associated with the quality of care delivered.[3]

QBPs are specific clusters of patient services that offer opportunities for health care providers to share best practices and will allow the system to provide even better quality care, while increasing system efficiencies. By promoting the adoption of clinical evidence-informed practices, clinical practice variation should be reduced across the province while improving patient outcomes to ensure that patients receive the right care, in the right place, at the right time.

These clusters, which are comprised of clinically related diagnoses or treatments, have been identified by an evidence-based framework as providing opportunities for:

- Process improvements;
- Developing innovative care delivery models;
- Clinical redesign;
- Improved patient outcomes;
- Greater standardization in care;
- Enhanced patient experience; and
- Potential cost savings.

QBPs are currently being implemented by the Ministry of Health and Long-term Care (MOHLTC) in annual phases spread over three years. The MOHLTC has begun with acute episodic and transition phases, with the vision to include community and long-term care over the coming years through the work of the Quality in Community Care Reference Table. To-date, a total of 10 groups of patient services have been launched as QBPs.

- **2012:** The first phase focused on the implementation of four QBPs: primary unilateral hip replacement; primary unilateral knee replacement; chronic kidney disease; and cataracts.

- **2013/14:** The second phase includes GI endoscopy; chemotherapy-systemic treatment; vascular (non-cardiac), including elective repair of lower extremity occlusive disease and elective aortic aneurysm repair; congestive heart failure (CHF); chronic obstructive pulmonary disease (COPD); and stroke.

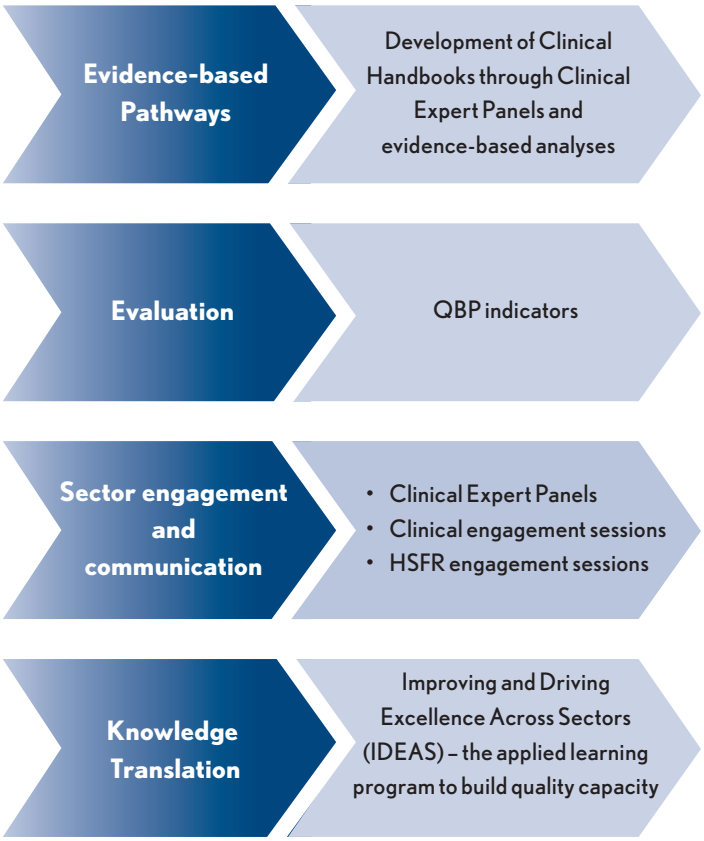
- **2014/15:** The third full stream has yet to be fully confirmed.

The multi-year QBP implementation is being supported by a number of enablers and resources, including a series of QBP Clinical Handbooks developed by Health Quality Ontario (HQO), Cancer Care Ontario (CCO), and the Cardiac Care Network (CCN) through Clinical Expert Panels. The handbooks are based on the most recent clinical evidence and research, and have been supported by specialized Expert Panels comprised of physicians and other clinicians who are recognized for their experience and knowledge in their respective clinical fields. The handbooks provide detailed information on the pathways that should be implemented to ensure the consistent application of care delivery. The Expert Panels will review and, where required, update the recommended practices, evidence and policy applications, at least every two years.

3 Ontario Ministry of Health and Long-Term Care. Available [here]

The illustration below depicts several key enablers which are driving the provincial QBP implementation strategy:

Figure 1.1: Enablers Driving QBP Implementation



Why was this toolkit developed?

1. To support implementation of the Clinical Handbooks

The Clinical Handbooks can serve as an invaluable resource for hospitals as they consider their approach to the implementation of QBPs. They provide the "evidence based rationale and clinical consensus"[4] associated with each QBP.

The purpose of this toolkit is to provide a suggested roadmap along with several tools and resources to support Ontario hospitals with QBP implementation and the application of the Clinical Handbooks. The toolkit includes and builds on the guidelines developed by the Clinical Expert Panels with regards to the QBPs, and focuses on the process – the "how to" – for adapting the guidelines to local circumstances.

Although this toolkit is focused on three of the 2013/14 QBPs, namely COPD, CHF and Stroke, it is intended to be broadly applied to the implementation of future QBPs.

2. The second wave of QBPs is more complex than the first wave of QBPs

The second stream of QBPs is considered less interventional and episodic in nature, and as a result, hospitals may require additional guidance and support with their implementation. Stroke, CHF and COPD are complex chronic diseases/conditions that require multiple types of health care services across many provider groups/organizations. These factors will have to be carefully considered as an organization develops its approach to successful implementation.

3. To share approaches and learn from their peers

A great deal of learning can be gained by sharing information between hospitals and hearing from "peer" experiences and insights. Therefore, the toolkit was developed to share peer learning and includes case studies demonstrating how different sized hospitals have approached the implementation of QBPs to date, which can offer hospitals additional guidance and support.

4 Quality-Based Procedures: Clinical Handbooks for COPD, CHF and Stroke. January 2013.

How was this toolkit developed?

Through a formal Request for Proposal, the OHA engaged KPMG LLP and PatientOrderSets.Com (POS) to develop the toolkit and associated Regional Sessions. An external QBP Implementation Advisory Group was formed (see Appendix A for membership) to provide guidance and input into the development of the toolkit and the Regional Sessions. In addition, KPMG and POS conducted a number of interviews with a range of hospital representatives to gather their perspectives on success factors and lessons learned related to previous and current QBP implementation (See Appendix B).

During these interviews, hospitals identified key success factors in the implementation of the first phase of QBPs including the need to:

- Compare current clinical practices to leading practices;
- Standardize procedures; and,
- Understand cost drivers related to each QBP.

In addition, hospitals emphasized the importance of considering the unique clinical, change and project management approaches to QBP implementation. These two approaches are illustrated in Figure 1.2 below:

To complement the interviews, a number of case studies were put together to outline these key success factors and lessons learned. These are included in Appendix C, D and Appendix E.

The OHA has committed to reviewing and sharing ongoing QBP updates with members. Please refer to the OHA HSFR website for on-going updates and information.[5]

What information will I find in the toolkit?

The toolkit:

- Provides a sequential approach to the implementation of QBPs. For example what are the suggested steps for transforming clinical practices in order to meet leading practice standards?" This includes the different roles and responsibilities required within the organization for successful implementation;
- Features a number of case studies that provide information on how a number of Ontario hospitals have approached the implementation of QBPs; and
- Includes a summary of considerations for hospital boards when faced with strategic decisions or approaches with respect to QBP implementation.

Figure 1.2: Clinical, Change and Project Management Approaches to QBP Implementation

5 OHA HSFR Education

Implementation Considerations for Hospitals

The OHA is aware that there are a broad range of health care organizations in Ontario that are at different stages of their QBP implementation efforts. To reflect the provincial variation in implementation efforts, this toolkit suggests one QBP implementation approach. The material is not meant to be prescriptive, and should only be viewed as a general guide to implementation.

As noted in the Clinical Handbooks:

"It should be recognized that the practices recommended in this clinical handbook have been defined at an aspirational provincial level to guide all hospitals across the province. This is not intended to be an operational care pathway – individual providers will have to implement these best practices based on their own local circumstances and available capacities. In many cases, the implementation of these recommendations will be challenged by local arrangements or the availability of services." [6]

Hospitals will need to make refinements and revisions to the approach based on their unique situation and available resources. For example, some organizations may choose to leverage existing committees to support implementation efforts as opposed to structuring new committees. Some organizations may be able to draw on the expertise of in-house staff in their departments such as Finance, Decision Support, Health Records, etc., while other organizations may not necessarily have these dedicated capacities.

Frequently, single individuals assume responsibility for multiple functions within hospitals, and are, as such, confronted with numerous competing priorities. Senior leadership in these hospitals should remain sensitive to this fact, and be more involved in carefully assessing the requirements associated with successfully implementing the selected QBPs. In such cases, it may be appropriate to engage additional assistance to provide the necessary support. For instance, many local health integration networks (LHINs) may have already taken steps to support QBP implementation among hospitals within their catchment area. It is important that health care providers take advantage of these resources. In situations where QBP implementation may benefit from regional coordination, LHINs may bring together the appropriate health service providers or utilize their Local Partnership Committee, which is part of the MOHLTC's HSFR Committee Structure.

Despite these differences, every hospital's approach should ensure that project objectives and timelines are clear from the outset and monitored on a regular basis throughout the course of implementation.

To provide additional insight into the different approaches and various strategies for success, three case studies are featured in Appendix C, D and Appendix E.

6 Quality-Based Procedures: Clinical Handbook for Chronic Obstructive Pulmonary Disease, page 59

Objective:

To provide:

- An overview of the structures that will support the successful implementation of QBPs
- A proposed team structure and associated roles and responsibilities for team members
- A series of tools and templates to support the organizational structure and set-up for QBP implementation

Target Audience:

- Senior management and/or QBP project teams

Chapter 2: Structuring Your Organization for Success

QBP Implementation Structures

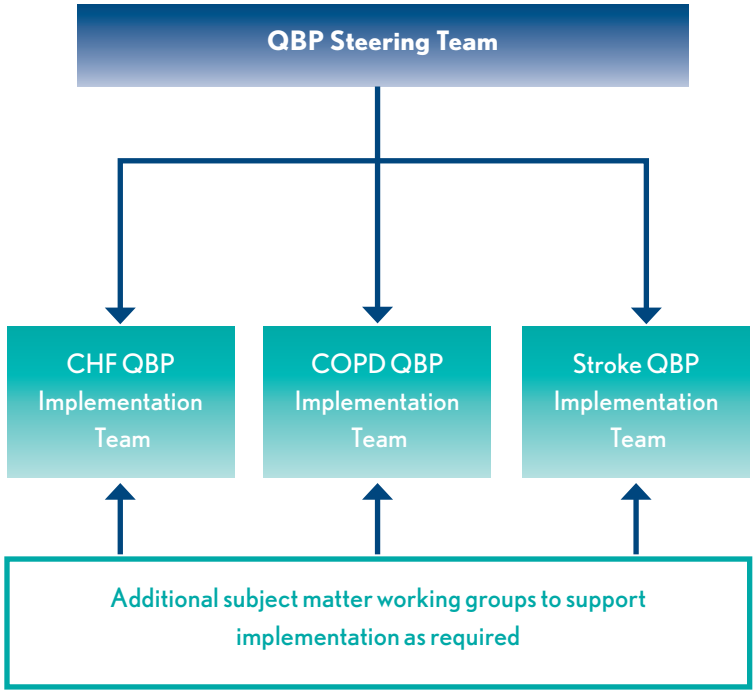
The following approach is proposed as a way to structure the organization's implementation process. Organizations may need to make modifications to this approach based on their staffing mix and resource capacity.

The organizational structure requires:

1. A steering team, and
2. QBP-specific implementation teams

These are illustrated below:

Figure 2.1: QBP Implementation Structure



- **Team leader/executive sponsor:** Senior executive accountable to the CEO with an understanding of clinical issues
- **Other team members:** representatives from clinical programs, finance, decision support, health records, quality and professional practice

- **Team leader:** experienced clinical leader (e.g., program lead)
- **Other team members:** multidisciplinary and interdepartmental (where appropriate) subject-matter experts (e.g., physicians, nurses, other clinicians, finance, decision support, IT) and allied health partners

Associated Roles, Responsibilities, Tools and Supports for the Steering Team

Roles and Responsibilities of the Steering Team:

- Govern and support the pace of all QBPs
- Provide leadership and direction to the QBP strategy and implementation teams
- Champion the organization's implementation and transformation of QBPs
- Develop a corporate approach to the implementation process, including identifying the relationship between the steering team and all related QBP-specific implementation teams
- Steward and support the QBP-specific implementation teams
- Prioritize the QBP implementation process
- Remove barriers to implementation and manage unique challenges
- Establish timelines and accountabilities for the implementation teams
- Ensure that the necessary resources are available to the implementation teams
- Monitor the performance of the implementation teams

Steering Team considerations:

"Through what lenses do we approach this change (for example, quality, funding, standardization, sustainability)?"

"What should the role of executives/senior leadership or management be in the implementation of QBPs?"

"Who, how, and when do we engage the right people and how do we manage any resistance to this engagement?"

"Is the quality and availability of the data sufficient to support the QBP implementation?"

- Facilitate the appropriate communication with all stakeholders, both internally (i.e., report to the senior leadership and board on progress) and externally (i.e., Local Health Integration Networks (LHINs), Ministry of Health and Long-Term Care (MOHLTC), unions, professional associations, and allied health partners)

Tools and Supports:

a) **Terms of reference:** Includes the mandate of the group, team roles and responsibilities, key milestones, timelines, and a communication strategy.

See Appendix F for a sample terms of reference

b) **Project charter:** Defines the mandate and function of the steering team and is an agreement between the steering team members, executive sponsor, and stakeholders. A project charter can be used as a tool to communicate the objectives and scope of the program, and to guide the team members throughout the QBP implementation process. The charter should also define the working relationship between teams.

The project charter may include the following sections:

i. **Project Purpose and Intent:**
   - Overview of the steering team's goals and objectives
   - Alignment of objectives with overall organizational direction
   - Team outcome expectations
   - Measurement of expectations

ii. **Scope:** determine what is in and out of scope for the steering team

Sample project purpose and intent:

- Our QBP steering team will provide leadership, direction and support to the QBP implementation teams in our hospital.
- The work of the steering team will ensure that the corporate direction of improving patient outcomes guides the selection, prioritization, communication, and implementation of the QBPs within the hospital.
- The steering team will provide guidance regarding the level of adherence to clinical guidelines and funding formula required in our hospital overall, and with every QBP implementation.
- Our measure of success is the level of satisfaction that the QBP implementation team has with the support we are providing in the areas of project structure, data analytics, priority setting, and roadblock removal that will speed up the successful implementation of the QBPs within our hospital.

In Scope:

Communications and engagement throughout the hospital on QBPs;

- Identifying risks and opportunities and present these to the executive teams and the hospital board;
- Prioritization of QBPs;
- Resourcing, conflict identification and resolution;
- Timelines for completion;
- Minimum project structure requirements (status reporting, project plans, implementation gates, and communication plans); and
- Recommendations with respect to QBP transfer, if appropriate.

Out of Scope:

- Decision on QBPs' transfer to other institutions; and
- Decisions on changes to programs and services at the hospital (e.g., closing an ambulatory service).

c) **Communications plan:** Defines the organization's engagement strategy and may include:

- Organization's short and long-term goals associated with QBPs;
- Expected and potential impact of HSFR and QBPs on the hospital, including risks and mitigation strategies;
- Timelines;
- Key messages;
- Stakeholders impacted by the change;
- Relative impact of QBP implementation on the stakeholder groups to determine their communication needs; and
- Frequency of interactions with stakeholders.

*See **Appendix G** for a draft communications plan template*

Associated Roles, Responsibilities, Tools and Supports for the QBP-specific Implementation Team

Roles and Responsibilities of the QBP Implementation Teams:

- Lead the implementation of QBP
- Work closely with the steering team to communicate roadblocks, needs, successes and other supports, as required
- Facilitate the planning, execution and delivery of the implementation plan including all phases of the design and execution
- Champion the QBP adoption process
- Understand any organizational-wide resource constraints and resource additional workload, as feasible
- Determine, implement and monitor the desired practice changes based on the Clinical Handbooks
- Monitor the QBP implementation plan and related outcomes

*See **Appendix H** for suggestions regarding the QBP-specific implementation team members*

Tools and Supports:

The tools and supports to assist the QBP-specific implementation teams are included throughout the toolkit. Examples of these include:

- Current state pathways and process mapping/heat map;
- Identified peer best practices; and
- Sample QBP pathways, clinical order set checklists, and protocols.

Working Relationship between Steering Team and QBP-specific Implementation Team

The QBP-specific implementation team should expect a commitment from the steering team and executive leadership to provide advocacy, support, and resources. Specifically, the steering team should facilitate the efforts of the implementation team by:

- Staggering QBP teams' work according to organizational priority and resources;
- Removing barriers to implementation and managing unique challenges;
- Facilitating communication with stakeholders; and
- Expediting the approval standards that the QBP team wishes to implement.

The following are few examples of how the steering team supported the QBP implementation team within hospitals using this structure:

i. Hip material standardization recommended by the QBP team bypassed several layers of administrative approval within a large hospital because adoption was expedited by the steering team.

ii. The steering team provided additional Lean resources to support the QBP team in analyzing the flow of a complex patient grouping. The resource facilitated the identification of several flow inefficiencies within the different hospital departments.

iii. The QBP implementation team recognized that a particular element of their practice is a unique provincial resource. The steering team advocated to the MOHLTC and LHIN about this potential resource for funding consideration and future revision of the QBP guidelines.

Patient Engagement

Organizations may wish to consider engaging patients as part of their QBP implementation process. Patient engagement could help identify process improvement opportunities and more effective ways to design process steps to support implementation and positively impact the patient experience. The importance of understanding the experience from the patient and family/caregiver's perspective should not be underestimated. Patients can provide critical insights on effective discharge planning/hand-off processes and identify opportunities for strengthening links with community providers. Hospitals may want to consider different types of patient engagement processes appropriate to their patient base, such as:

- Engaging patients as a part of rounds and asking the questions, 'How can we make things better?' and 'What has been your experience so far?' Using these questions, the hospital can develop patient stories that are used to educate staff/clinicians on why changes are required.
- Creating clinically specific patient advisory panels to engage in discussion around what can be improved and/or changed.
- Engaging through the patient advisory committee.
- Engaging patients at discharge to ask questions specifically related to discharge experience.

Challenges in engaging patients may include:

- Identifying representatives of the average patient;
- Engaging patients who are currently experiencing a procedure as they are "too close" to the experience; and
- Undue influence by a minority group of patients whose experience does not represent the norm.

Objective:

To provide:

- An overview of change management considerations
- An overview of the key success factors for implementing QBPs
- A suggested approach to guide QBP implementation

Target Audience:

- Senior management and/or QBP project teams

Chapter 3: Roadmap to Implementation

Overview of Change Management Considerations

Change management considerations are particularly significant when implementing an initiative as important as funding reform. The eight components of the United Kingdom's National Health Service (NHS) change model below (Figure 3.1) have been adapted in Ontario to contribute to large-scale improvement in care delivery and to support a shared approach to this significant reform.

Figure 3.1: NHS Change Model

Successful implementation of the QBPs can be facilitated by leveraging these components, in particular:

- Understanding the shared purpose;
- Engaging leadership for change;
- Supporting clinical engagement; and
- Establishing transparent metrics to measure success.

According to this model, hospitals should be able to meet the following change management objectives:

- Articulate a vision of the change;
- Empower administrative and clinical leaders to act as role models by engaging, mobilising and supporting them through all eight components in the model;
- Demonstrate the right behaviours; and
- Bring together the resources needed to enable change.

The process of change is not automatic or built-in. A set of specific organizational processes are required for improvement to occur. Listed below are some of the elements of the organizational infrastructure necessary for improvement:

- The reliable flow of useful information;
- Education and training for staff in improvement theory, methods and techniques;
- Understanding of time and change management necessary to change core processes;

- Alignment of strategic organizational incentives and improvement goals; and
- Leadership to guide and inspire improvement.

In Ontario, improvements are being facilitated through the Improving & Driving Excellence Across Sectors (IDEAS) Strategy. IDEAS is a provincial applied learning strategy, designed and delivered in Ontario for Ontario, to support the health care system in achieving progress on Ontario's system priorities such as QBPs and Health Links.

Key Success Factors for Organizational Implementation

In approaching the implementation of QBPs, there are a number of key success factors organizations should consider:

1. Senior Leadership Support/Sponsor
2. Clinician Engagement
3. High-quality Data

1. Senior Leadership Support/Sponsor

An engaged senior leadership team is a key success factor for effectively implementing QBPs. QBP implementation needs to be a priority for the CEO, as well as other members of the senior team, in order to achieve sustainable change. Evidence suggests that the leadership style and philosophy most likely to deliver large-scale change is one that fosters the commitment to a shared purpose through collaboration.[7] Senior leaders can support the change culture and vision required to create improvement by sharing and cascading this sense of commitment to the rest of the organization. Senior teams should provide clear and consistent messaging about the implications of QBP implementation and the need to focus on clinical aspects and improving quality of care.

Across Ontario, different leadership models have been developed to oversee QBP implementation. Potential examples for the senior lead include the CEO, CFO, CIO, or Vice President responsible for clinical programs. Given the need to emphasize the clinical and quality issues associated with the respective QBPs, it is suggested that an individual possessing an *executive role* AND *clinical knowledge* act as the Executive Sponsor to oversee QBP implementation.

On an ongoing basis, progress regarding QBP implementation should be discussed regularly at senior team meetings. Metrics for gauging success should be developed and used as a framework for assessing progress and to identify potential risks as early as possible. The Executive Sponsor should be clear about their role, responsibility and accountability for the agreed-upon organizational goals.

Implementation Considerations for Executives

"What should the role of executives/senior leadership or management be in the implementation of QBPs?"

"Who, how, and when do we engage the right people and how do we encourage buy-in for this change?"

"Are the quality and availability of the data sufficient to support the QBP implementation?"

2. Clinician Engagement

Strong clinician leadership and governance are critical for quality improvement efforts and for continuously improving the quality of patient care. A common theme in the feedback from hospitals that have implemented QBPs is the importance of effective clinician engagement. Regular and frequent communication with clinicians is vitally important throughout the implementation of QBPs. Plans for improvement must be owned and understood by the chief decision-makers with respect to patient care. This

7 National Health Service. Change Model. Available [here]

requires creating teams of physicians (and other clinicians) engaged in patient care who can design and champion improvement.[8]

From the outset, staff, physicians and other clinicians should be provided with sufficient information that will help them understand the importance of this initiative, especially its impact on patient care, and its link to key Ministry of Health and Long-Term Care (MOHLTC) directives. As stated in the Clinical Handbooks, "clinical leaders play an integral role in the [QBP implementation] process. Their knowledge of the patients and the care provided or required represents an invaluable component of assessing where improvements can and should be made."[9]

> *"Building bridges between clinicians and administrators will be the hardest part for hospitals. It must be understood that QBPs are not just clinical, but financial, and they are not just financial, but clinical!"*
>
> *Director of Quality Care, Academic Hospital*

This applies not just to staff associated with specific QBPs, but to all clinical and support staff in the organization. While it is recognized that this may be a challenge, every organization must dedicate resources to communication with staff in a way that ties in with an organization's unique culture. Organizations that have been largely successful at implementing the first wave of QBPs have dedicated a significant amount of time and resources to the education of clinical staff through workshops, educational sessions, updates at Medical Advisory Committee (MAC), and other clinical professional forums.

The need to focus on clinical engagement cannot be understated because the organizing principle of QBPs is the positive enhancement of the delivery of clinical care.

An organization may consider using QBP champions to enhance and support clinician engagement. These individuals should be well-respected and influential clinical leaders who can support the implementation process, maximize stakeholder buy-in, and help overcome barriers.

While regular reports to the Board, senior management team, MAC and other inter-professional councils will contribute to success, the most critical element is the strength of the clinical groups addressing each of the QBPs. This toolkit has addressed the structure associated with these groups in Chapter 2; however, the linchpin to success is the effectiveness of these groups. Their power and influence is remarkable if they are well-led, focused and given the permission to be open and transparent when reviewing current practice patterns and the desired future state.

The Clinical Handbooks are also key to supporting the implementation of QBPs. The QBP champions, in collaboration with the appropriate medical leaders, should engage clinicians in a critical evaluation of practice patterns, and enforce the message that increasing standardization is not meant to impinge on a clinician's autonomy to make decisions which are best suited for individual patients. Clinical pathways are meant to be guidelines, and it is understood that variations may occur given specific patient needs. Champions should focus on the extensive work that went into the handbooks which have been carefully reviewed by leading clinical experts. They should also deliver a clear message that this is not a cost-cutting initiative, but a quality initiative.

Dealing with Potential Barriers

It is important to be sensitive to the responses of those who may feel challenged by changes to their practice and provide the necessary support, while at the same time, being clear and consistent that this change is about continuous clinical improvement in alignment with the MOHLTC's direction to provide high-quality, safe and effective care to patients.

8 Sawka, C., Ross, J., Srigley, J., Irish, J. The Crucial Role of Clinician Engagement in System-Wide Quality Improvement: The Cancer Care Ontario Experience. Healthcare Quarterly, 15 (Special Issue). December 2012.

9 Quality-Based Procedures: Clinical Handbooks for COPD, CHF and Stroke. January 2013.

Nevertheless, feeling hindered by change is normal and should be expected. The graphic in Appendix I illustrates some of the reasons that may contribute to the these feelings – for example fear of the unknown or feeling a loss of control, can differ from one stakeholder to another, and should be isolated to help identify appropriate mitigation strategies.

3. High-quality Data

The establishment of QBPs provides organizations with the opportunity to bring clinicians and key support departments together with a view to improving **quality of care**, while maximizing the effective use of available resources. In order to make informed and accurate decisions, the importance of high-quality data cannot be emphasized enough. Without good data, working groups will be stymied by the inability to make the necessary progress.

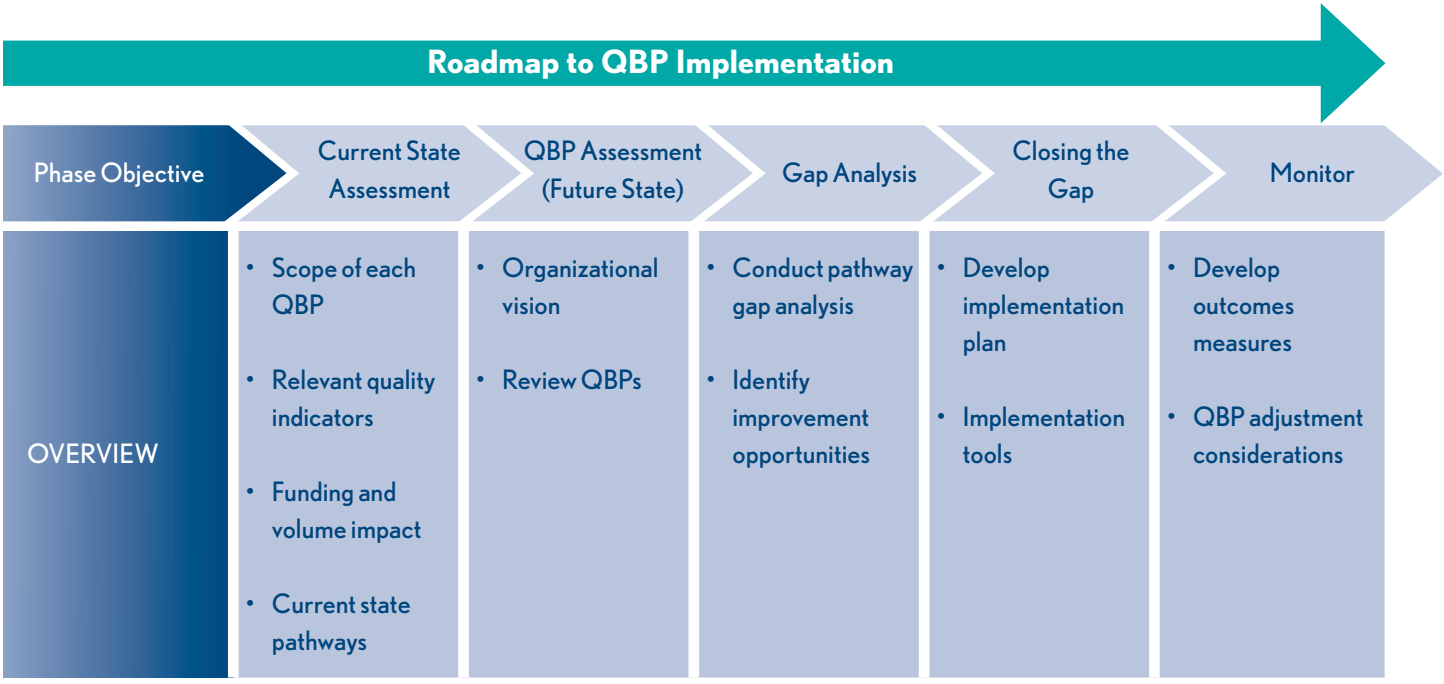
As a first step, organizations should review the quality of their clinical, financial and statistical data, and ensure that they are as robust and is as reliable as possible. In some cases, there may be multiple sources of data, which should be reconciled prior to any data review (e.g., data from the Discharge Abstract Database vs. data from the acute care census reports). Examples of the type of data to consider may include:

- Types and number of interventions
- Types of medications prescribed
- Patient co-morbidities
- Hospital mortality
- Admission rate
- Staffing models/skill mix

Suggested Roadmap to QBP Implementation

As noted in Chapters 1 and 2, the Clinical Handbooks provide the detail supporting the leading practices related to each QBP. It is important to recognize that there is no "one" way to address QBP implementation. Within this section of the Toolkit, one approach to QBP implementation is provided (see Figure 3.2). Hospitals may wish to apply the relevant parts of this approach to their organization, and customize it according to their size, capacity, and where they are in their funding reform journey.

Figure 3.2: Roadmap to QBP Implementation



Current State Assessment

To conduct its current state assessment, hospitals may need to examine the following:

1. Scope of each QBP
2. Current state pathways
3. Relevant quality indicators
4. Funding and volume impact of QBPs

1. Scope of each QBP

During the development of the Clinical Handbooks, each Clinical Expert Panel was tasked with defining the inclusion and exclusion criteria for the cohort of patients associated with the QBP based on routinely reported administrative databases.

The Clinical Handbooks for CHF, COPD and Stroke all contain recommended cohort definitions and patient grouping approach, including specific inclusion/exclusion criteria for QBP funding purposes. For example, the CHF QBP defined the patient cohort using the following ICD-10-CA diagnosis codes, diagnosis types, and ICD-10 CCI (Canadian Classification of Health Interventions) exclusion criteria:[10]

- **Age:** Age greater than or equal to 20 years at time of admission.
- **Diagnosis codes:** The ICD-10-CA most responsible diagnosis codes are listed below. I50.x Heart failure, left ventricular dysfunction, etc.
  - I40.x, I41.x Myocarditis
  - I25.5 Ischemic cardiomyopathy
  - I42.x, I43.x Cardiomyopathies
  - I11.x plus I50.x (secondary Dx) Hypertensive heart disease plus heart failure, left ventricular dysfunction
  - I13.x plus I50.x (secondary Dx) Hypertensive heart disease and renal disease plus heart failure, left ventricular dysfunction)
- **Intervention – CHF:** Patients in the pathway are not assigned to an intervention-based HBAM Inpatient Grouper (HIG) cell, given the current methodology. (i.e., Major Clinical Category [MCC] partition variable is not "I")

As a first step, organizations should review the process for defining the patients in the QBP as outlined by the Clinical Handbooks in order to help define the relevant patient cohorts in the episodes of care pathway.

To assist, HQO has also identified a number of implementation priorities for organizations to consider during the first year of QBP implementation. Equipped with their analysis of their patient cohorts relative to those defined in the Clinical Handbooks, the implementation priorities can greatly assist organizations with their focused implementation efforts. These Year 1 implementation priorities can be found in Appendix L.

2. Current state pathways

Another step in completing the current state analysis is the development of a current state pathway or, in other words, an understanding of how patients in the relevant patient cohorts/HIG groups currently receive care in the hospital. Pathways provide an identified continuum of care for a specific population or condition which outlines expected evidence-based outcomes that are likely to be achieved due to the care provided.

Organizations will also need to understand the current state of their pathways including an analysis based on the pathway structure which combines both the administrative (e.g., flow of information, coding) and clinical aspects (e.g., episode of care) of the current state.

The performance information that can be relevant to collect at this stage includes: (a) practice statistics heat map, and (b) episode of care pathway.

10 Quality-Based Procedures: Clinical Handbook for Congestive Heart Failure, page 28.

How to develop a current state pathway

The approach typically used to develop a current state pathway is to identify the existing, typical episode of care and document:

1. The workflow process from when a patient presents at the emergency room to their discharge;
2. How care is provided and why specific steps are performed;
3. How decisions about care are being made;
4. The guidelines that inform decisions about care;
5. The resources (technologies, pharmaceuticals) that are available and being used; and
6. The existing metrics for performance analysis.

It is important to have a thorough understanding of the range and degree of care variability that are present for each of the QBP-related diagnoses.

a) Practice Statistics Heat Map

The heat map can be used as a prioritization tool for an HIG or a particular performance dimension (e.g., length of stay or LOS, can be more important than rate of admission).

The practice performance information can be structured as in Table 3.1. It includes quality performance data and a further breakdown of the QBP HIG. The table highlights the ideal performance relative to a provider's current performance. The ideal is based upon best known performance as outlined in the QBP Clinical Handbooks. Where the current practice corresponds to the ideal, the cell can be highlighted in green; where there is a small gap between current and ideal, the cell can be highlighted in yellow; performance with larger/more significant gaps can be highlighted in red.

Table 3.1: Sample Current State Assessment Heat Map for COPD

QBP			COPD	
Description			**139a - Chronic Bronchitis**	**39b - Chronic Obstructive Pulmonary Disease**
Quality	LOS	Current		
		Ideal		
	Hospital Mortality	Current		
		Ideal		
	Readmission	Current		
		Ideal		
	Admission Rate	Current		
		Ideal		
Funding Impact	Number of Cases			
	Cost per Case	Current		
		Funded		
	Funding Gap			

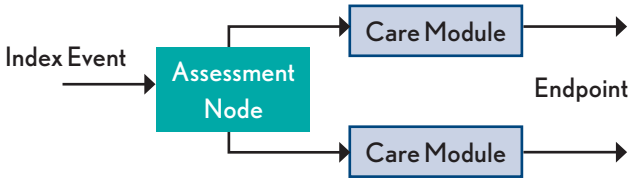
b) Episode of Care Current Pathway

Red areas in the current performance heat map can be further analyzed by a more in-depth analysis of the current state pathway. In developing current state pathways, organizations may wish to consider using the definitions which are included in the Clinical Handbooks to define the patient process flow.

Figure 3.3 provides an illustrative example of the episode of care model.

The episode of care pathway model presents the critical decision points and phases of treatment within the episode of care, referred to in the Clinical Handbooks as the clinical assessment nodes and care modules.

Figure 3.3: Episode of Care Pathway Model



Care Pathway:	A schematic representation of an episode of care, including care modules and assessment nodes.
Assessment Node:	A decision point within a care pathway that provides specific criteria to establish the state of a patient and guides stratification down a particular branch of the pathway.
Care Module:	A health service event following an assessment node that is comprised of recommended quality-based practices associated with a particular phase and severity of treatment.

Consider identifying the best performing peer hospitals and define the relative differences in practice, and the factors that may contribute to the gap. Peers can be defined as similarly sized hospitals with a similar practice within the province or LHIN. MOHLTC resources can be used to identify best performing peers.

3. Relevant Quality Indicators

In introducing the QBPs, the ministry has a strong interest in monitoring and evaluating the impact (both intended and unintended) and to provide benchmark information for clinicians and administrators that will enable mutual learning and promote on-going quality improvement. The ministry recognized that reporting on a few system-level indicators alone would not be sufficient to meet the aim of informing and enabling quality improvement initiatives. For that reason, measures meaningful to hospitals and clinicians that are interpretable and have demonstrable value in improving the quality of care provided to patients, were also included.

To guide the selection and development of relevant indicators for each QBP, the ministry, in consultation with experts in evaluation and performance measurement, developed an integrated scorecard based on the policy objectives of the QBPs and a set of guiding principles. This resulted in the creation of a scorecard with the following five quality domains:

- Effectiveness (including safety)
- Appropriateness
- Integration
- Efficiency
- Access

For each of these five domains, a set of evaluation questions was identified and subsequently translated into provincial-level indicators.

The MOHLTC and experts recognized that to be meaningful for clinicians and administrators, it was important to tie indicators to clinical guidelines and care standards. Hence, the advisory groups that developed the best practices were also asked to translate the provincial-level indicators into QBP-specific indicators. Some of these measures are included in Appendix M in draft form. In addition, and for illustration purposes, the table in Appendix N is an example of how key provincial measures were translated into Stroke QBP-specific indicators.

In partnership with its agencies, clinicians and researchers, the MOHLTC is calculating the recommended indicators at the QBP level for which data is readily available. Once calculated and validated by the respective advisory groups and other stakeholders, the results will be shared with hospitals to provide benchmark information. The results will also be summarized at the LHIN and provincial level as baseline information to support the evaluation of QBPs and provide background information to clinicians, administrators and policy decision-makers.

It is prudent for hospitals to review the quality indicators identified in the handbooks as well as the related quality measures that are already accessible within their organizations. Examples of these quality measures may include:

- Risk-adjusted 30-day mortality rate
- Rate of unplanned readmissions within 30 days
- Proportion of patients referred to a heart failure clinic
- Rate of complications
- Discharge destination following acute admission
- Risk-adjusted 90-day readmissions rates
- Time to treatment

Developing an understanding of a QBP's quality indicators and the organization's performance against these indicators is critical to ensuring that there is a common understanding of the quality levers that can impact overall performance and cost. In addition, organizations should consider establishing a target for each quality metric based on best practices and/or provincial/LHIN targets. An example of sample quality measures is highlighted below.

Table 3.2: Sample Quality Measures

	QBP level indicator	Actual Performance	Target Performance
Congestive Heart Failure	Length of stay	12 Days	8 Days
	30-day Readmission Rate	5%	1%

The measures included in Table 3.2 are for sample purposes only and intended as examples of how organizations can identify their current performance against a target. The targets included in the table do not reflect any pre-established provincial or LHIN targets.

4. Funding and Volume Impact of QBPs

Each organization will be required to understand the funding and volume impact of QBPs on the hospital.

The MOHLTC provides an interim funding level for each QBP as the product of a Cost per Weighted Case (CPWC) price and the projected volume, which represents the province-wide funding level for each case. Each organization will therefore have to assess its actual costs relative to the CPWC price being funded. The funding surplus or deficit per case implications can be further analyzed by calculating the volume of cases that the hospital performs annually. Multiplying the annual volume and the funding surplus or deficit per case will provide an indication of the total financial impact on the organization.

If there is an estimated shortfall between the actual cost and funding allotted, it is suggested that the organization examine the drivers of this gap (refer to St. Michael's Hospital case study in Appendix C, to review their response to a potential gap).

In cases of an expected shortfall, organizations can consider the following questions as part of their gap analysis:

- Have we standardized our processes? Are costs impacted by variations in clinical and procedural processes?
- What are the costs of materials? Can we look to group purchasing to drive any discounts?
- Are we coding our data correctly to accurately reflect costs? How do we address any data quality issues?
- Are there too many steps/roadblocks in our processes? Can we apply LEAN methodology to remove "waste" from our processes?
- Is a potential divestment of service required?

The assessment of the potential funding impact may influence the organization's decision regarding that service. The case studies included in Appendix C, D and Appendix E provide an overview of how different sized hospitals approached a forecasted funding shortfall.

QBP Assessment (Future State)

Having conducted the current state assessment, hospitals will now be in the position to determine what the future will look like once the QBPs have been implemented. The objective is to build a common understanding of the organization's vision for the future, following implementation of QBPs. As part of the QBP future state assessment, hospitals should consider:

1. Developing the organization's future vision for QBPs
2. Reviewing the Clinical Handbooks and QBP pathways

1. Develop the organization's future vision for QBPs

This is the opportunity for the organization to set QBP goals within the context of internal and external realities. To assist, the following questions can be considered:

- For each QBP (e.g., CHF, COPD and Stroke), what are the expected operational and clinical changes to the organization (e.g., in relation to stroke, hospitals may need to reduce practice variations, such as improving transfer processes to integrated stroke centers)?
- What are the overall implications for the hospital in achieving the quality targets of each QBP (e.g., what will we do with the resources that are freed up as a result of a significant reduction in LOS)?
- How will the implementation of QBPs increase collaboration and engagement throughout the hospital and with our wider stakeholders (e.g., multidisciplinary teams or community-based providers)?
- What external changes are expected (e.g., centres of excellence, community-based specialty clinics, designating special care programs, evolving changes in care pathways, demographic changes)?
- What are the requirements of QBP transfers with hospital boards, senior management and LHIN?

2. Review QBP Clinical Handbooks

The Clinical Handbooks have been created to serve as a compendium of the evidence-based rationale and clinical consensus driving the implementation approach for each QBP.[11] The handbooks have been prepared for informational purposes only and do not mandate health care providers to provide services in accordance with the recommendations included therein. The recommendations included in the handbooks are not intended to take the place of the professional skill and judgment of health care providers. Using an episode of care model, the handbooks illustrate the pathway of each patient case included in the defined cohort, from initial presentation through segmentation into one of the defined patient groups.

"While the episode of care model bears some resemblance to a clinical pathway, it is not intended to be used as one for implementation in a particular care setting. Rather, the model presents the critical decision points and phases of treatment within the episode of care."[12]

It is essential that organizations review the Clinical Handbooks and the episodes of care in detail. Recognizing that the QBPs are the ideal future state to strive for and that the handbooks were developed by province-wide recognized expert panels, there may be variation at the organizational provider level that needs to be recognized (e.g., unique complex cases not clearly covered, resources not available).

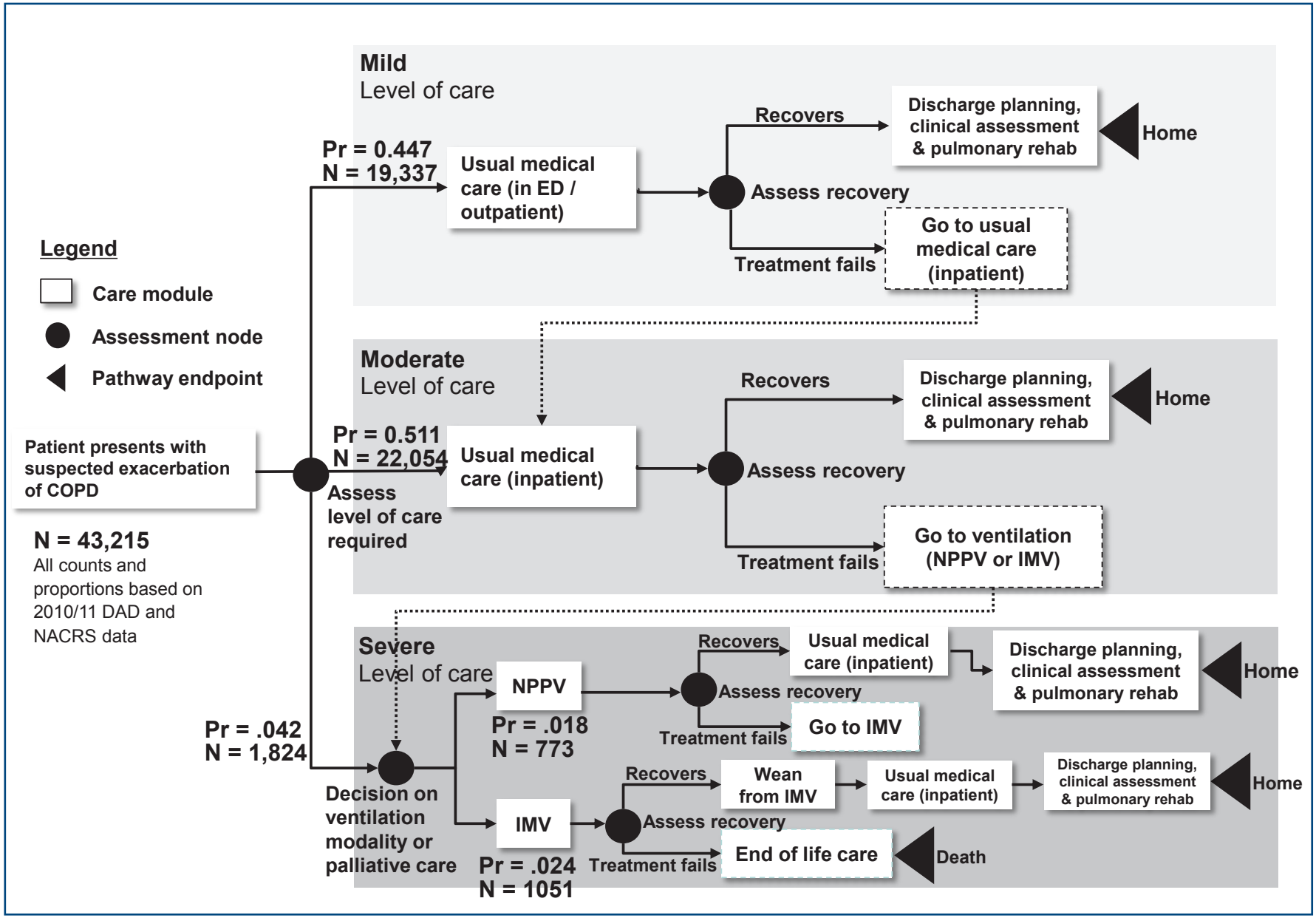
Example of Future State Pathway

The following episode of care pathways (figures 3.4-6) for COPD, CHF and Stroke have been taken from the Clinical Handbooks.

11 Quality-Based Procedures: Clinical Handbooks for COPD, CHF and Stroke. January 2013.

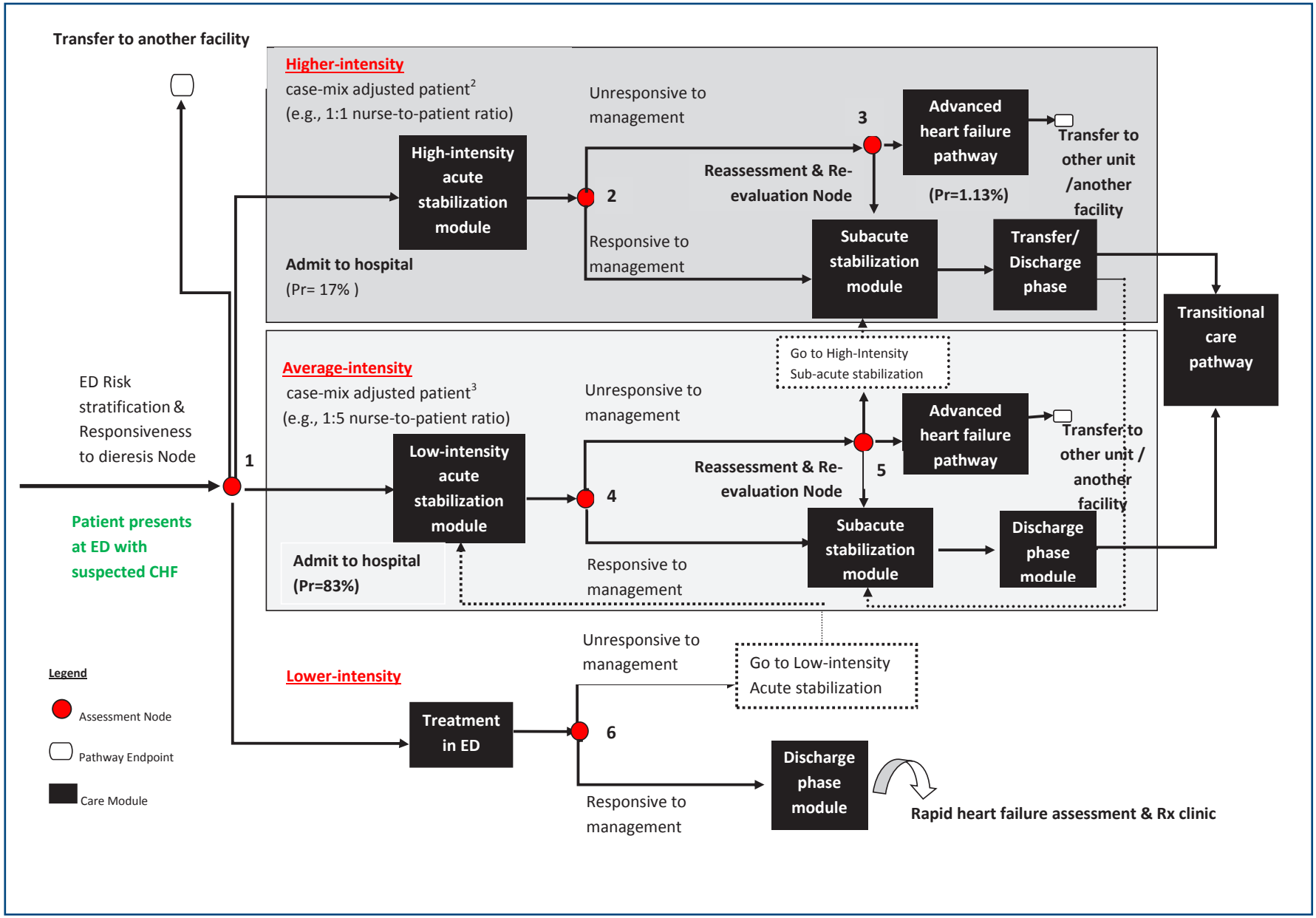
12 Ibid.

Figure 3.4 – COPD QBP Episode of Care Pathway[13]



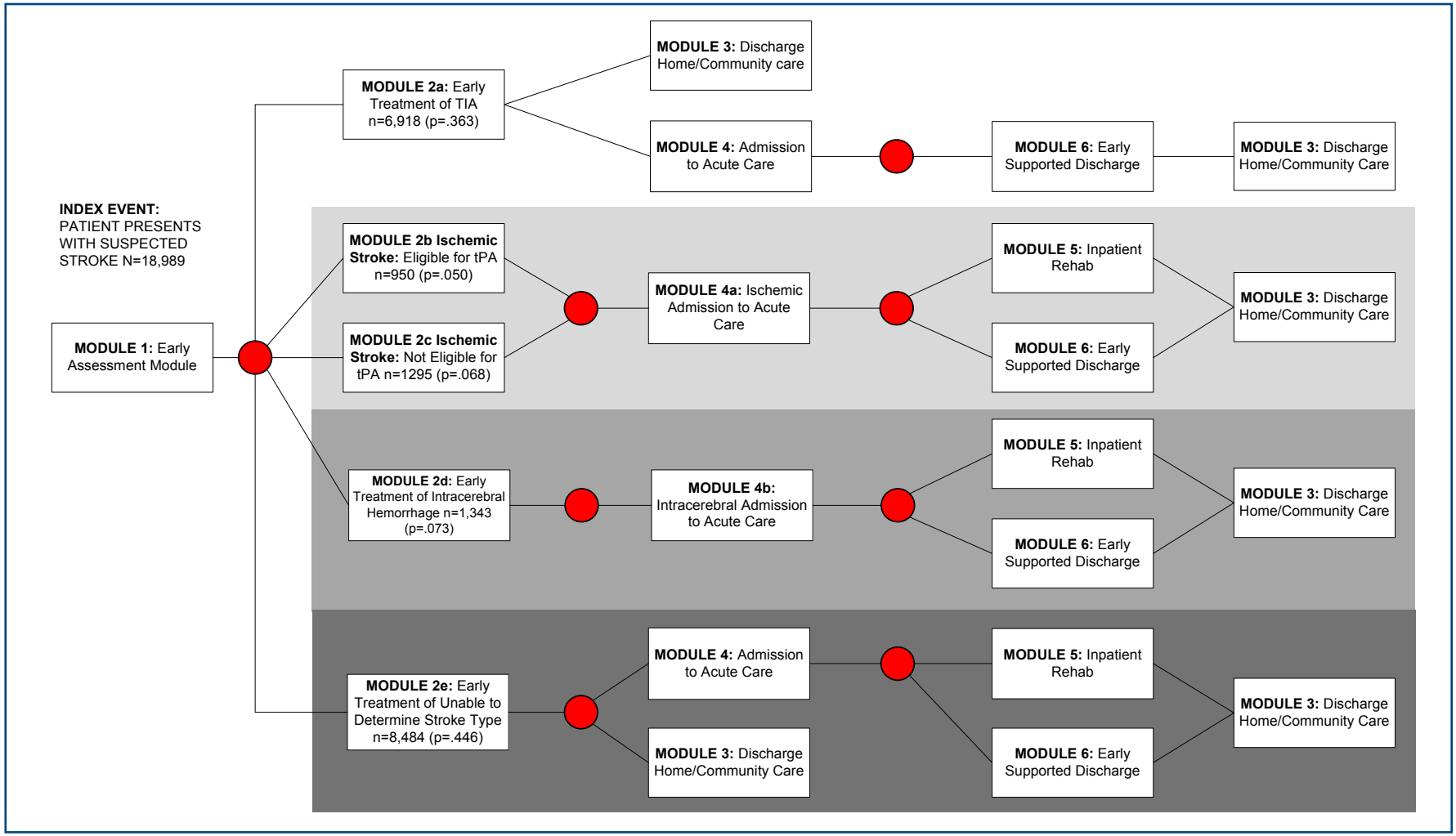
13 Quality-Based Procedures: Clinical Handbooks for Chronic Obstructive Pulmonary Disease. January 2013.

Figure 3.5: CHF QBP Episode of Care Pathway[14]



14 Quality-Based Procedures: Clinical Handbooks for Congestive Heart Failure. January 2013.

Figure 3.6: Stroke QBP Episode of Care Pathway[15]



15 Quality-Based Procedures: Clinical Handbooks for Stroke. January 2013.

Gap Analysis

A gap analysis is performed by the organization after extensive data gathering to assess current state against future state and identify a road map for closing the gaps. To conduct the gap analysis, hospitals may need to complete the following:

1. Conduct pathway gap analysis;
2. Identify improvement opportunities; and
3. Consolidate QBP opportunities.

1. Pathway gap analysis

Analysis of the gaps in practice between the current pathway and the QBP episodes of care/desired future state can provide insight into potential improvement opportunities.

A comparison between an organization's current clinical process for each QBP and the clinical pathway outlined in the handbook may reveal a number of gaps that will need to be addressed. For example, the COPD episode of care includes positive pressure ventilation, where appropriate, for treating severe COPD, before more invasive forms of ventilation. Organizations will have to review their current state pathways to identify whether this is part of their clinical processes.

2. Identify improvement opportunities

There are two principal areas that need to be analyzed in order to identify improvement opportunities for each QBP:

a) Process Flow Efficiency

Process flow assessments can highlight potential opportunities for improving or standardizing patient and information flow. Process flow assessment is relevant to a patients' *episode of care* (e.g., a stroke patient flows through hospital departments from emergency to discharge); and *information flow* (coding information relevant to the patient's condition and treatment).

b) Practice Variation

Patients with the similar diagnoses should be treated according to evidence-based protocols. Variation in patient care may produce differences in patient outcomes and in levels of adherence to best practices (e.g., dose and dosing schedule for patients with a similar condition).

3. Consolidating QBP opportunities

Clinical variation and pathway opportunities highlighted through the analysis above should be consolidated with opportunities identified through other analysis (e.g., process improvement exercises such as value stream mapping or Kaizen; or quality improvement exercises such as hypothesis generation and testing). Prioritization of these opportunities and implementation timelines will guide the next phase of work.

Closing the Gap

Closing the gap is the action organizations are required in order to implement the future state. When closing the gap, hospitals may need to complete the following:

1. Develop an Implementation Plan; and
2. Identify Implementation Tools.

1. Develop an Implementation Plan

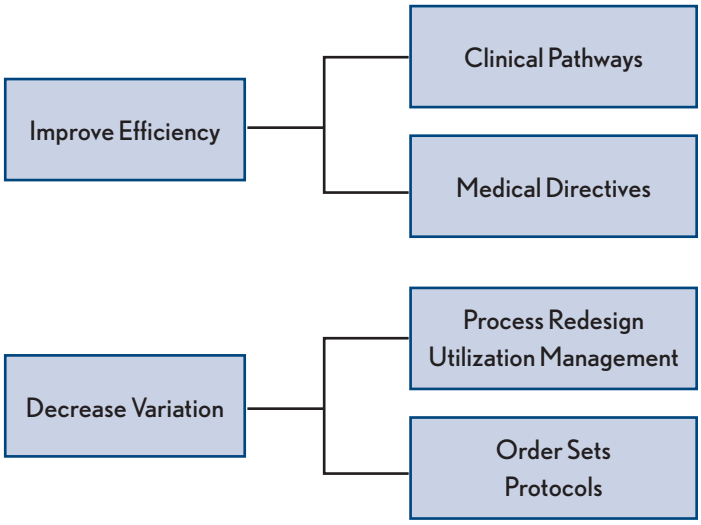
The plan is a tool that can be used for communicating the overall approach to implementation. The plan can be preliminary and can be adjusted as additional information becomes known. The plan is a tool that can be used for communicating the overall approach to implementation. Clarity on timelines provides the structure necessary for successfully implementing multiple QBPs simultaneously and the sequencing for QBP implementation can depend on the relative importance to the organization (i.e., case volume or quality gap), resource availability, and data availability.

A sample QBP Implementation Plan is provided in Appendix J. The main components of the plan are the list of activities, sponsor for each activity, and duration of each activity. In creating this implementation plan, hospitals may wish to consider the implementation priorities created by HQO in Appendix L.

2. Implementation Tools to improve flow and minimize practice variation

There are many tools available to hospitals which can assist them in streamlining the delivery of care for each of the respective QBPs. They include clinical pathways, protocols, order sets, medical directives, utilization management tools, and process improvement approaches, to name a few. The QBP checklists included in Appendix O are also an important resource for supporting effective implementation (see discussion below). A number of tools are provided in the appendices to assist with implementation. The use, adaptation, and maintenance of these tools will be at the organization's discretion.

Figure 3.7: Implementation Tools to Improve Efficiency and Minimize Variation



Reduction of clinical practice variation as well as patient and information flow efficiency can be improved in a number of ways, including the standardization of pathways, protocols, order sets, and the utilization of medical directives. Together, these tools translate guidelines and standards into clinical language that can be acted upon. They bring best practices to the point of care and can empower clinicians to expedite care in critical situations, leading to better patient outcomes and increased operational efficiency. Both the reduction of clinical practice variation and patient flow efficiency have the added benefits of supporting organization-wide quality improvement goals, (e.g., reducing LOS, decreased mortality rates).

Many hospitals in Ontario focus significant attention on the area of utilization management. Tools such as Medworxx and InterQual, for example, allow organizations to review the utilization of their most valuable resource – an inpatient bed – by monitoring LOS and reasons contributing to prolonged stays in those beds. This analysis can be done either retrospectively or concurrently, but is instrumental for understanding reasons that contribute to an increased LOS, and therefore, increased costs. Utilization management tools also support the prompt identification of patients who are designated alternate level of care (ALC) while still in an acute bed, and allow for proactive planning to get the patient into the right facility offering the most appropriate level of care. These tools can support effective QBP implementation by allowing hospitals to understand reasons that contribute to delays in discharge.

The use of process improvement tools can also facilitate effective QBP implementation and support closing identified gaps. The adoption of LEAN principles and tools such as Value Stream mapping, 5S thinking, Kaizen events and root cause analysis can provide hospitals with valuable information with respect to flow in respective clinical units and departments, and identify factors that contribute to bottlenecks and/or delays in the patient process. By streamlining the flow with respect to each of the QBPs, one could expect to see improvements in patient care and reduction of variability.

Table 3.3: Defining Order Sets, Protocols and Medical Directives

What are Order Sets?	Order sets are medical checklists used by clinicians to provide high-quality, safe health care. They: • Include comprehensive best-practice interventions for a particular population condition. • Reflect the latest and most reliable evidence-based practices. • Present specific recommended interventions (e.g., specific dosing, frequencies). • Are formatted to present information clearly in an organized and standardized structure - clear and accurate order lines reduce the likelihood of errors and improve patient safety. • Must remain current to support clinical advances and clinical judgment.
What are Protocols?	Clinical protocols are a type of order set that: • Contains only default orders. • May not need to be signed by the practitioner. • May or may not be placed on the paper chart depending on local workflow considerations. Clinical protocols are made up the following modules: • Patient Population: outlines the patient population for which the clinical protocol is intended. It will provide specific criteria for inclusion and exclusion of patients into the clinical protocol orders. • Implementation Considerations: contains specific conditions and considerations that must be met before proceeding with the clinical protocol. • Clinical Protocol Orders: contains the orders implemented as part of the patient's plan of care. • Termination of Clinical Protocol: outlines the criteria for the clinical protocol to be discontinued.
What are Medical Directives	Medical directives can be used to improve efficiency of patient flow. A medical directive is a written order by a physician(s) to other health care providers that pertains to any patient who meets the criteria set out in the medical directive (CPSO Delegation of Controlled Acts, policy #5-12). The purpose of medical directives is to eliminate and/or reduce any delay in the management of patient care and to ensure standardization of therapy. Note that responsibility for a delegated controlled act always remains with the delegating physician(s).

QBP checklists

To support organizations in understanding and implementing the QBP episode of care pathways, the QBP checklists included in Appendix O provide a comprehensive list of the expert panel recommendations outlined in each Clinical Handbook. The checklists take the handbook material and present them in a standardized format to facilitate the gap analysis process.

A checklist has been created for each phase of the episode of care and is organized in accordance with the modules and assessment nodes outlined in the handbooks.

In addition to reducing/mitigating process inefficiency and practice variation, there are several other standards and tools that can be help to improve quality and safety. The tools are available in Appendices P-AF.

Objective:

To provide:

- Examples of process and outcome measures that can be tracked to ensure implementation success
- An approach to monitoring QBP adjustments

Target Audience:

- Senior management, Steering Teams and/or QBP project teams

Chapter 4: Monitor and Adjust

As part of the implementation process, the organization will have to identify and communicate performance metrics to monitor progress. Ideally, the measures should be a balance of both process and outcome, where possible. In addition to any relevant pre-existing measures, organizations are also encouraged to monitor progress by using the metrics that are being recommended by the respective QBP clinical advisory groups described in Chapter 3 (see Appendix M for draft recommended indicators).

An organization may wish to identify a series of metrics over the course of two or three years to monitor improvement. Table 4.1 is an example of the types of metrics organizations can consider. Organizations may choose to use their own pre-existing metrics, those included in the Clinical Handbooks, and metrics currently under development. Hospitals should also draw upon a number of available national and provincial resources such as Health Quality Ontario and the Canadian Institute for Health Information, which can provide support in developing an approach to the collection of data for QBP implementation process.

Resource models, templates used, and frequency and type of communication may need to be adjusted over time. Organizations will also need to ensure that unintended consequences from the QBP implementation are identified and managed (e.g., increase in readmission rate, increased inappropriate referrals to CCACs).

Table 4.1: Monitoring Progress for QBP implementation

Timeframe	Metrics
By end of Year 1	• Reduction in unplanned readmissions within 30 days rate by x% • Reduction in acute LOS by x% • Diuretic management (frequency) • Pre-discharge functionality (walkability test)
By end of Year 2	• Reduction in unplanned readmissions within 30 days rate by x% • Reduction in LOS by x% • 30 day stroke/TIA risk adjusted mortality rate • % reduction in time from referral to home care visits • % patients admitted to LTC within 1 year of stroke/TIA inpatient hospitalization
By end of Year 3	• Reduction in unplanned readmission rate within 30 days by an additional x% • Reduction of inpatient mortality rate by x% • Reduction in LOS by x%

Monitoring QBP adjustments

Additional changes to QBPs will likely be necessary overtime. There are three broad conditions that will drive adjustments:

1. Advancements in clinical guidelines: revised best practice guidelines.
2. Continuous quality improvement: opportunities for greater flow efficiency, recommendations from quality improvement team, revision of QBP targets etc.
3. HQO Clinical Handbook and evidence review: HQO is planning a review of the handbooks every two years. Therefore, the gap analysis and implementation plan may have to be reviewed in order to align with any changes made to the handbooks.

Assessing the success of QBP implementation

The successful implementation of QBPs will require significant change in any organization. However, these changes have the potential to significantly improve the quality of health care for Ontarians. This is what the ECFAA and strategy are all about.

The success of the implementation process will depend on the ability of a hospital to sustain and maintain the changes required in clinical practices and processes, and to realize the improvements that have been targeted. Making quality improvement in patient care the main focus, and communicating this goal effectively during QBP implementation, will yield demonstrable results and benefits.

Organizations should consider reviewing and measuring adherence to new standards, and attempt to understand the factors that contribute to the standards being met. Implementation teams should also maintain a high-quality educational plan beyond the point of implementation to ensure that any new personnel are aware of the organization's commitment to QBPs and are trained and practicing up to the established QBP standards.

Objective:

- To provide considerations for directors related to QBPs and their impact

Target Audience:

- Hospital board directors

Chapter 5: Considerations for Boards

QBPs are an integral part of Health Services Funding Reform (HSFR) and play a key role in transforming Ontario's health care system into one that is more person-centered, evidence-based and focused on quality and value. The environment in which hospitals operate is changing and directors will be required to make decisions related to funding reform. Proactive consideration of this change will help hospitals to be nimble and responsive in their approach to any QBP-specific decisions. It is suggested that hospital board chairs develop an understanding of the potential strategic and operational impacts of HSFR and QBPs on their organization.

Suggestions specifically for board chairs:

- Board chairs may wish to include funding reform as a standing item on board agendas. QBPs could also be discussed at the appropriate board committee (e.g., quality committee, finance committee).
- Board chairs can consider a specific and focused discussion with their board on the relationship between QBPs, the government's strategic goals for the health system, and the goals of the organization (www.ontario.ca/healthfunding).

The following items are included as further considerations for board chairs and directors with regards to QBP implementation. These are included as suggestions to recognize that different hospital boards will have varying knowledge of HSFR and QBPs.

1. **Do we understand QBPs and its link to HSFR, as well as how reform supports the government's vision as described in Ontario's Action Plan for Health Care?**

Boards can ask: "*Do we understand how QBPs support HSFR and what the potential effects may be?*" To ensure that boards can answer this question, education (as part of regular board education processes) should be provided on QBPs and on the principles of the *Excellent Care for All Act* (ECFAA), and reinforce quality and quality improvement as the primary driver behind improved patient care and system sustainability.

Directors should be encouraged to engage in ongoing discussions on the impact of funding reform on quality, cost and value. Directors should familiarize themselves with the core benefits of HSFR for the long-term viability of the system: to use funding as a way to drive better value for money by spreading best practice, improving quality, and lowering costs within the system.

Armed with this knowledge, hospital boards may wish to revisit their strategic directions and planning documents in light of funding reform. Questions to consider are:

- Are our strategic objectives still relevant given the current environment? Do we need to course correct?
- What will be the effect of QBPs on our services and programs?
- What is the current state of our quality improvement processes and what impact will QBPs have on our approach?
- Should we be using QBPs to focus our efforts towards continuous quality improvement? What do we need to do to achieve this?

- How can the Quality Committee, established under ECFAA, support the QBP journey and ensure that "best practices information supported by available scientific evidence is translated into materials that are distributed to employees and persons providing services within the health care organization, and to subsequently monitor the use of these materials by these people."[16]

2. Have we engaged with our LHIN and other hospital boards to understand their approach to QBPs and any implications for our organization?

Board chairs may wish to use existing governance forums or seek LHIN support to facilitate new forums to explore how QBPs are being implemented. There will be a need to understand, as a regional health system, the challenges and opportunities associated with QBPs. The Ministry of Health and Long-term Care (MOHTLC) is publishing stories from hospitals and other health service providers on its website.

3. Have we engaged our communities in discussions regarding the impact of QBPs on care and services offered?

Hospital boards are accountable to their local communities and should ensure that the public has a high-level understanding of funding reform. Boards should provide public messaging developed in collaboration with the MOHLTC and their local LHIN as to how potential changes may impact patients. Boards can use existing communication channels or consider developing specific opportunities for community education. In the event there is a change in service, proactive community engagement will likely enhance "buy-in" for this change.

4. What information do we require from our management about the hospital's approach to implementing QBPs?

Directors should require management, who will lead the implementation of QBPs, to provide an organization-wide overview of the approach to implementation.

Questions to probe include:

- How are we identifying, understanding, and managing our costs?
- How wide is the "gap" between what we are presently doing and what is expected through implementation of the QBPs? Can the gap be closed? Do we want to close the gap? What is the impact on services if we close the gap or if we choose not to?
- What is management's approach to closing this gap?
- What resources and supports are currently available for implementation?
- How is the organization approaching the implementation? What are the reporting relationships between the Steering Teams and the Board/Board Quality Committees?
- What is our approach to changing the culture of our hospital to one of continuous quality improvement?
- What are the risks if we are unable to meet certain aspects of the clinical guidelines?
- Are there mitigation strategies?
- What are the Key Performance Indicators that will inform us about our performance?

Additionally, it is likely that hospital boards will be presented with decisions for approval by their management teams on QBPs. For example, whether to "stay in the business" of a specific QBP or how to approach a potential deficit situation if the actual cost of a procedure is significantly more than the funding allowance.

Boards and senior management may decide to proactively plan for these types of scenarios and to spend time on generative discussions about the impact QBPs will have on the services they deliver. These discussions can be supported by a decision-making framework (with specified criteria) or a set of questions that can be used to manage difficult decisions when they arise.

16 *Excellent Care for All Act*, 2010. Available [here]

Appendices

Number	Title	Purpose
A	QBP Implementation Advisory Group Membership	Reference
B	Stakeholder Interview List	Reference
C	Case Study: St Michael's Hospital	Case Study
D	Case Study: Orillia Soldier's Memorial Hospital	Case Study
E	Case Study: Grey Bruce Regional Health Network	Case Study
F	Terms of Reference Template	Change Management Tool
G	Communication Plan	Project Management Tool
H	Implementation Team Structure	Project Management Tool
I	Resistance to Change	Change Management Tool
J	QBP Implementation Plan Template	Project Management Tool
K	Draft QBP Implementation Checklist	Project Management Tool
L	HQO Year 1 Implementation Priorities	Reference
M	Draft QBP Indicators	Reference
N	Draft Stroke QBP Indicators from Provincial Indicators	Reference
O	Sample Order Set CHECKLISTS: • *Stroke Presentation to ER* • *Stroke Admission* • *Stroke Discharge* • *COPD Presentation to ER* • *COPD Admission* • *COPD Discharge* • *CHF Presentation to ER* • *CHF Admission* • *CHF Discharge*	Clinical Tools
P	MRSA and VRE Screening and Management Clinical Protocol	Clinical Tool
Q	New Diarrhea, Suspected Clostridium difficile infection (CDI), Possible Melena Stools Clinical Protocol	Clinical Tool
R	Potassium Oral Dosing Clinical Protocol	Clinical Tool
S	Indwelling Urinary Catheter (Short Term) Clinical Protocol	Clinical Tool
T	Hypoglycemia Management Clinical Protocol	Clinical Tool
U	ICU Electrolyte Replacement Clinical Protocol	Clinical Tool
V	Nicotine Replacement Therapy In-patient Clinical Protocol	Clinical Tool
W	Guidelines & Standards: GOLD staging criteria for COPD	Clinical Tool
X	Guidelines & Standards: GOLD decision guidelines for hospital admission	Clinical Tool
Y	Guidelines & Standards: NICE decision guidelines for hospital admission	Clinical Tool
Z	Guidelines & Standards: Decision on ventilation or palliative car	Clinical Tool

Number	Title	Purpose
AA	Guidelines & Standards: Canadian Thoracic Society antibiotic treatment recommendations	Clinical Tool
AB	TALLman letter guidelines	Clinical Tool
AC	ISMP dangerous abbreviations	Clinical Tool
AD	ISMP common confused drugs	Clinical Tool
AE	Stroke Network: • AlphaFIM® Instrument for Stroke • Canadian Stroke Best Practices Table 3.3A Screening and Assessment Tools for Acute Stroke • Canadian Best Practice Recommendations Taking Action Towards Optimal Stroke Care for Stroke Care (Update 2013)	Clinical Tool

Appendix A: QBP Implementation Advisory Group Membership

Membership

The OHA QBP Implementation Advisory Group is composed of partners with key expertise in the QBP content and hospital implementation requirements.

- Cancer Care Ontario
- Cardiac Care Network
- CHF Expert Panel Co-Chairs
- COPD Expert Panel Co-Chairs
- Council of Academic Hospitals of Ontario
- Health Quality Ontario
- Local Health Integration Network/LHIN local partnership clinical co-chairs
- Ministry of Health and Long-Term Care
- OHA Medium Sized Hospital Council
- OHA Provincial Physician Leadership Council
- OHA Small, Rural and Northern Hospital Council
- Ontario Stroke Network
- Ontario Medical Association
- Registered Nurses Association of Ontario
- Stroke Expert Panel Co-Chairs

Appendix B: Stakeholder Interview List

The following interviews were completed to inform the development of the toolkit. The OHA would like to thank each individual and organization for their time and for sharing their perspectives with us.

- Mount Sinai: Decision Support Term
- St Michael's: Director, Decision Support
- Brockville General Hospital: CEO
- Orillia Soldier's Memorial Hospital: CEO & CFO, Program Director
- Mark Rochon: Advisor
- Janet Davidson: Advisor
- Hamilton Health Sciences Centre: Executive Vice President Inter-Professional Practice & Chief Medical Executive
- Norfolk General Hospital: CEO
- London Health Sciences Centre: Director Quality Care
- Board Chair: North East LHIN
- Ontario Stroke Network: Best Practice Leader

Appendix C: St. Michael's Hospital Case Study

St. Michael's Hospital: Quality-Based Procedures Implementation

Health System Funding Reform (HSFR) created a burning platform for the organization which started early conversations about the reality of the new funding methodologies and their impacts on the core business. However, organizational leadership has capitalized on the opportunity to align this transformation with existing quality work and the renewal of St. Michael's Hospital's (SMH) vision for quality.

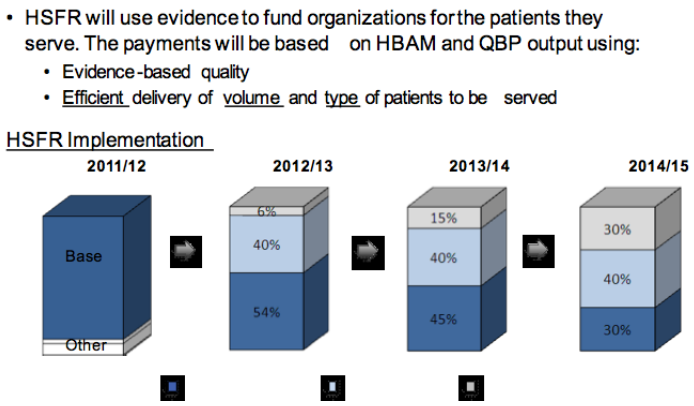
SMH has been on a process improvement journey for a number of years, with success in patient flow and organizational efficiencies. The change management lessons (namely engaging stakeholders early and often in large-scale change) were utilized in the QBP implementation planning and execution.

SMH Leadership Approach

Specific QBP work is organized by a QBP Steering Committee which is chaired by the Chief Information Officer (CIO) and reports to the hospital's Utilization Committee and senior management. The QBP plan utilized an approach that has been successful in other corporate initiatives in the past: it used small, multi-disciplinary, expert teams that provide clinicians' a voice.

In addition to creating a clear structure focusing on the change and dedicating resources to coordinate HSFR work, the hospital executives used various means of communication on a regular basis to discuss the importance of HSFR and highlight the work underway throughout the organization. **Figure 1** highlights the message widely communicated across SMH's staff and management meetings. The message is focused on how **quality** and efficient care delivery will determine organizational funding going forward.

Figure 1: SMH's June 2013 Management Forum & Staff Town Hall



Specifically, the relevance of QBP, and HSFR overall, to organizational activity and quality visioning has been conveyed by organizational executives through the adoption of a value equation:

Value = Quality/Cost

Through this expression, hospital leadership allowed programs to challenge themselves on both dimensions demonstrating that value increases as quality increases and/or as costs decrease.

The hospital executive team was very visible in initiating, structuring, communicating, and staffing the roll-out of HSFR for QBPs and HBAM.

Implementation Approach

The approach to implementing QBPs is essentially identical from one QBP to the other. The following five steps were followed for each of the QBPs implemented:

1. A small, interdisciplinary, expert implementation team is established that includes clinicians, program and medical directors with support from Decision Support, Health Records and Finance.

2. Initial data analysis was performed to identify any performance gaps against peers. The analysis applies several filters that include any special hospital information such as case costing, case mix, demographic, or unique clinical practices.

3. The implementation team reviews the data findings and develops a hypothesis for any performance gaps.

4. Each identified hypothesis is further investigated with accompanying analysis to prove or disprove the reason for the gap.

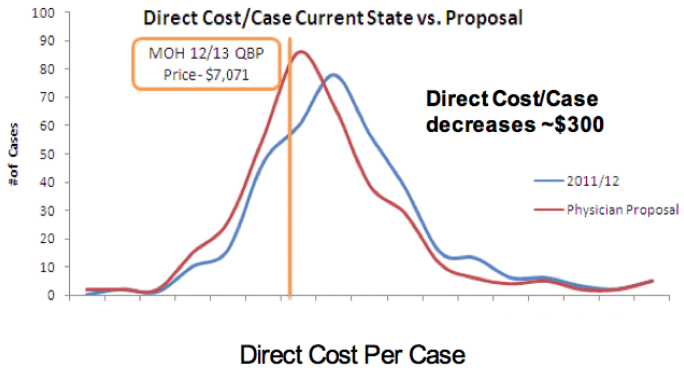
5. One or more of the following four strategies is used to close the findings from the hypothesis analysis:

    a. **quality/process improvement**,
    b. **data quality**,
    c. **standardization**, and/or
    d. **advocacy** (to the MOHLTC in order to highlight unintended negative quality consequences or inappropriate application of the QBP funding formula)

The following is a sample of SMH's approach as it applies to Hip Replacement, CHF and Endoscopy QBPs:

Hip: The team observed that implant type and cost varied greatly. Based on findings from data analysis, clinicians led a proposal to standardize materials used for a group of patients. Recognizing that total cost will still vary, the team developed a target (as shown in **Figure 2**) based on the distribution of cost rather than focusing on a single value. This strategy leveraged the available data and modeled the clinical realities. **Standardization and data quality** analysis facilitated the recognition and closure of the cost gap related to hip implants.

Figure 2: Hip Implant Material Standardization Expected Impact



CHF: The team recognized length of stay (LOS) as a critical measure of quality and a cost driver for chronic heart failure (CHF) and, therefore, hypothesized about opportunities to improve the LOS performance. Some items considered were the use of Order Sets, IV Lasix (Clinical indicator for discharge readiness), and daily weights monitoring. The analysis for the patient orders sets included a review of patients' electronic health records stratified to order sets' use. Initial findings demonstrated that the LOS is lower by more than 10% with the use of order sets. The team further reviewed and discussed the data in detail to understand the reason for the correlation rather than assuming direct causation. This approach is intended to lead to the discovery of potential practice changes that the clinical and administrative stakeholders are more likely to align with. **Analyzing standardization** and **quality improvement** through the use of order sets facilitated the recognition of CHF quality improvement potential.

Endoscopy: The Endoscopy QBP initiation was challenging for several reasons, including:

- A heightened perception that the QBP plan is focused on cost reduction
- Lack of clarity on the QBP's scope for either Endoscopy or Colonoscopy

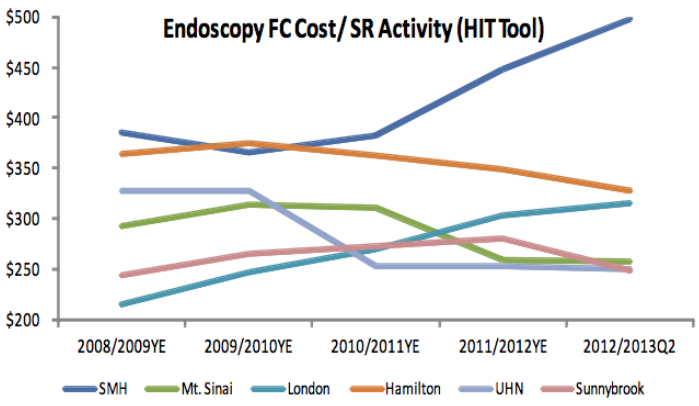
- The program had not been evaluated in the past as other programs had been (e.g., Pay for Performance, Wait Time Reduction, or any programs that have a direct rate and volume management model). Therefore, there was limited understanding about the procedure's performance.

Due to these reasons, the initial Endoscopy review meeting focused on the allocation and costing methodology rather than the intended focus, which was the quality performance of the program.

Cancer Care Ontario (CCO) engaged the hospital by providing them with data validation and proposing funding methodology. This information provided the team with appropriate leads to further explore improvement opportunities within clinical documentation.

The team reviewed 14,000 patient charts to determine opportunities for improvement. Through the review conducted by the Program, Health Records, and Decision Support departments, a substantial number of charts were discovered to be inappropriately coded due to some clinical information gaps in the information continuum, and the limited scope of available endoscopy codes versus the sophisticated clinical practice realities at SMH. These factors contributed to the results in **Figure 3**.

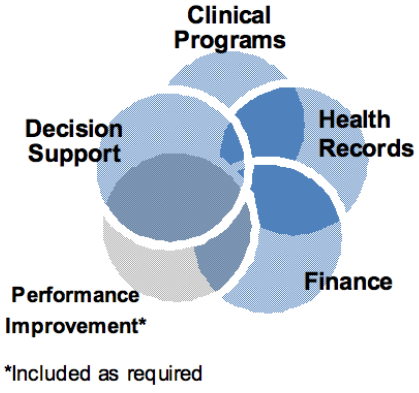
Figure 3: Endoscopy variation among peer providers



As a result, the charting and coding processes have been redesigned for these procedures. In the process, the administrative members of the QBP team gained an appreciation for the complexity of clinical practice at the hospital, and the clinical practice gained valuable insight into the importance of collaboration with the Health Records team and Decision Support as a way to close performance gaps. This process has also provided CCO with evidence and information related to SMH's complex program, which can help to inform funding methodologies. **Data quality**, as demonstrated through the chart revision exercise, and internal/external **advocacy** for the unique clinical program at SMH, facilitated the improvement underway in Endoscopy.

Summary

The approach and implementation of QBP work has resulted in many tangible benefits to the organization – including gains in value with respect to the quality equation. There have also been many intangible benefits observed at SMH that are directly related to the QBP review approach. The QBP structure and the burning platform related to HSFR have been successful in removing previous barriers related to: Health Records not understanding practice; practice not understanding Health Records; Decision Support being somewhat disconnected from others, etc.



The approach used at the hospital has been fact-based and supported by diverse functions: Clinical Program, Decision Support, Health Records, Performance Improvement and Finance. The approach has led to increased collaboration among these different organizational functions. The collaboration has also led to a strengthened relationship and greater trust among the different departments and will improve the momentum for future QBP reviews.

The output of the QBP teams has varied and is reflective of the current state of each one. Some have provided very tactical and data-focused recommendations and actions, while others have had larger/broader issues to investigate further (e.g., CHF).There is also an increased awareness on how to leverage existing data, and the requirement to improve data quality to manage the output of further QBP work. At the time of writing, the Performance Improvement function at SMH was being engaged in some QBPs to provide process improvement support.

Lessons Learned

The hospital journey through QBPs (HSFR) offered many important lessons with respect to implementing a change that spans several functions and programs across the hospital. The following is a summary of the learnings from SMH's experience:

- The focus on **quality** rather than just the funding formula, has been instrumental for facilitating discussions. The use of a fact-based performance analysis approach to brainstorm potential opportunities for improvement has yielded practical improvement solutions. The use of objective measures and the inclusion of the various stakeholders to develop solutions facilitated the implementation of what can be considered a difficult change.

- Having a Steering Team in place for the initiative can be considered a critical success factor supporting the transformation. The Steering Team at SMH has been supporting the transformation by:
  - Capitalizing on the burning platform created by HSFR
  - Dedicating resources to facilitate the change
  - Facilitating on-going communication on the importance of the initiative and recognition of the progress and achievements made to date
  - Expediting the approval process of the QBP expert panel recommendations (e.g., Hip implant material standardization approval of changes was relatively efficient through the Steering Team)
  - Providing standard approval process requirements (i.e., what is the change, what are the cost and resources required to implement?, What is the benefit expected? and Are the program stakeholders aligned with the change?)

- Recognizing that success comes from helping clinicians see where there is opportunity to do things differently, document differently, and partake in a process that traditionally has been seen as an administrative function. Team flexibility with the approach in order to achieve the goal is a critical element that allows for the inclusion of diverse programs and practice variations from other organizations. For example, leveraging additional resources for support (e.g., CCO for Endoscopy).

Despite it being early in the process, SMH's executives, management, clinicians and staff feel that implementing HSFR has been a positive journey that improved alignment between management and staff, and clinicians and administrators. The journey is works to support the organization's mission to improve the **quality of care** provided to patients.

***Acknowledgements**

The case has been written based on interviews with SMH's Staff: Tomi Nieminen, Director of Decision Support, and Danielle Jane, Project Manager – Business Intelligence. Case review and guidance has been provided by Anne Trafford, SMH's Vice President, Information Management and Performance & CIO. All figures included in the case have been adapted from SMH's presentations. The interviews were conducted during the month of June 2013.

Appendix D: Orillia Soldier's Memorial Hospital Case Study

Orillia Soldier's Memorial Hospital: Quality-Based Procedures Implementation

Orillia Soldier's Memorial Hospital (OSMH) is a community hospital providing both community and designated regional specialized programs, and services to residents of North Simcoe Muskoka and surrounding areas.

The hospital has implemented the first stream of QBPs (e.g., hips) and is currently designing the approach to the implementation of the second stream of QBPs (e.g., Congestive Heart Failure).

Approach to the first stream of QBPs

In approaching the first wave, there were overarching themes to OSMH's approach as described in the table below:

Theme	Description
Identification of clear measureable objectives	The establishment of measureable performance targets through the QBPs for pricing helped to set expectations and mobilize clinical staff and physicians towards clearly defined objectives.
Framing the change as a "quality" and "efficiency" initiative	OSMH recognized that the implementation of QBPs was both a quality and efficiency initiative. They took a proactive approach to communicate that quality and efficiency are interlinked. They also needed to identify cost savings and the implementation of QBPs presented an excellent opportunity to assist with this goal. The focus on quality and efficiency has been a two-year strategic journey for OSMH. QBPs have successfully aligned with this multi-year performance improvement journey.
Executive Oversight/ Leadership	The Executive Team was actively involved in the QBP implementation process and specific teams were required to report on progress on the overall surgical strategy (which included the QBP implementation processes) at weekly meetings.
On-going staff engagement	Engagement occurred through multiple avenues. Executive team members met with clinical program directors and specialists who were involved in the pathway. There were presentations to the physician leadership committee, the Medical Advisory Committee, full medical staff association, the Joint Conference Committee, Board Chair and the Board of Directors.
Identifying standardization opportunities	OSMH considered QBPs as an opportunity to integrate standardization into the hospital's processes and procedures. For example, requiring surgeons to standardize materials and supplies.
Early Current State Assessment	OSMH recognized the value of undertaking an upfront, current state assessment in order to analyze the various components of the QBPs such as length of stay (LOS), dosage etc. It also allowed for the review of data which was used to communicate the rationale for necessary changes with clinicians and physicians.

Overall, OSMH believes that the implementation strategies have put the hospital on a path to sustainability and that there has been significant initial success in bringing the costs in line with the funding provided.

Cataracts

The Program Director and Medical Director for surgery met with the ophthalmologists to review the new funding model and current state and to obtain their buy-in for change. The approach led to standardization of equipment – OSMH moved from 'preference cards' to 'procedure cards' and each surgeon now has the same pick list. Additionally, there was a movement to minimize supplies/drugs used. For example, a drug was being supplied in 500 ml bags, but only 10 ml vials were required. OSMH reduced costs by approximately $100/case and projects further cost reductions once a contract for lenses is completed and signed.

Hips

The Program Director and Medical Director for surgery met with the orthopedic surgeons to review the new funding model and current state, including prolonged length of stay. The approach led to standardization of equipment. For example, by creating 'procedure cards' (costs between surgeons for the same surgery varied by hundreds of dollars). Additionally, OSMH changed the OR schedule to have orthopedic surgery earlier in the week, which resulted in LOS reduction from 5.8 days to 3.0 days.

CHF

OSMH is currently developing the approach to implementing the CHF QBP. From the outset, it was understood that CHF will be more complex than hips, cataracts, etc. and that the opportunities for standardization of care processes will likely, comparatively, be fewer.

The Program Director and Medical Director for Medicine are developing the planning approach for CHF. A draft Project Plan has been developed based on the Clinical Handbook which defines what is in and out of scope and identifies areas that will be impacted by the episode of care. This Project Plan will be shared and approved and a Project Plan will be developed to support the Charter. It is anticipated that the Utilization Committee will play a key role.

Concurrently, there has been engagement and communication on the CHF QBP. The hospital has decision-making care teams who have been introduced to the QBP concept. A lesson learned from the first stream of QBPs is the need to ensure on-going engagement and focus – "*the organization must continue to educate and engage.*" Additionally, OSMH plans to engage the CCAC (through the CCAC in-house Case Managers) to determine their role in the CHF QBP.

There are still a number of outstanding decisions with regards to CHF and the implementation of the CHF QBP which will further guide the development of the Project Plan. Once developed, the challenge will be to maintain focus on the Project Plan as staff do not have dedicated time set aside for the implementation of QBPs.

Lessons Learned

The hospital journey through HSFR has offered many important lessons for implementing a change that spans several functions and programs across the hospital. The following is a summary of the learning from the OSMH experience:

- **Laying the foundation**: A success factor for OSMH was that the organization was already leading the implementation of a performance improvement/LEAN culture which provided the foundation for the implementation of QBPs. Having been on this performance improvement journey for a number of years helped to provide fertile ground for QBP implementation.

- **Engagement**: Engaging all players at the beginning of process and providing as much detail as possible was important to the success of QBP implementation. Going forward, senior leadership will visit and engage with all departments to share information on QBPs and the related processes that will follow.

- **Physician-to-Physician Engagement**: When engaging physicians, identify physicians to lead the engagement processes. There was more positive engagement with physician-to-physician conversations.

- **Planning and monitoring**: Develop an overall target and timeline with regular performance reporting.

- **Changing approach to review of surgery**: OSMH has modified their approach to recruiting surgeons by informing potential candidates at the interview stage about performance expectations. For example, expected LOS and approach to surgery procedures. OSMH proactively addressed utilization issues; for example, late starts, overtime costs and OR utilization. Though not directly linked to QBPs, this approach helped manage costs at year-end which were lower than expected.

- **Consider inter-dependencies**: When reviewing the options related to a QBP – for example, whether to continue offering this procedure at the hospital – it is important to realize that it is not only a cost vs. price choice. Decisions related to QBPs are inter-dependent. For example, removing one procedure may have repercussions. If you lose a surgical program, for example, you may also lose anaesthetists who want that type of surgical experience. The needs of the community, distance to other providers of the service, frequency of encounters and inter-dependencies will be key drivers when choosing whether to "stay in the business of a QBP."

Appendix E: Grey Bruce Regional Health Network Case Study

Grey Bruce Regional Health Network: Quality-Based Procedures Implementation

The Grey Bruce Health Network (GBHN) is a network of five corporations: Grey Bruce Health Services (six hospitals), Hanover and District Hospital (one hospital), South Bruce Grey Health Centre (four hospitals), Grey Bruce Health Unit and the South West Community Care Access Centre (CCAC), which provides home healthcare to the region. These corporations began working together to implement seven deliverables as a network.

One of these deliverables was to develop a common process for assessing the quality of services provided by the hospital corporations. The initial process determined by the network for internal coordination of care, was the development and use of clinical pathways. The network proposed to develop regional clinical pathways and guidelines for care that would span all 11 hospitals. It was intended that these pathways would improve communication within and across the hospitals; improve efficiencies, both clinical and financial; and improve access to best practices within the network resulting in quality outcomes. As a result of this deliverable, the evidence-based care (EBC) program was created to develop, implement and evaluate evidence-based clinical pathways, physician order sets and other evidence-based tools.

While the work in GBHN has focused on the implementation of clinical pathways, the use of order sets has been instrumental in facilitating increased standardization across the region. The order set project improved utilization, resulting in cost reduction, and provided the opportunity to better allocate resources as well as improve the quality of care and patient safety. The physician group regards order sets as the guide toward best practice and most commonly applied practice; but the order set itself must be individualized for each patient.

For more information please see: www.gbhn.ca

Lessons Learned

The hospital journey through the establishment of evidence-based care offers many important lessons for implementing a change that spans several functions and programs across the hospital. The following is a summary of the learning from GBHN's experience:

1. **Engagement:**

   The amount of broad discussion, debate and interdisciplinary approval regarding content was considerable. Initially, the project had been led by a non-clinician. As the organization went through the process of implementing the first clinical pathway, they recognized that there was limited clinical engagement. The decision was made to appoint clinical champions for order sets. Strategic placement of order set champions was the single biggest and most successful approach to increasing understanding and usage. Nurse clinician involvement was paramount in communicating and understanding the needs of the various departments, as well as front-line staff to identify workflow.

2. **Distance**

   As with many other hospitals, there are significant challenges in providing flexibility of content to allow for vastness of geography and how that relates to timely best practice. (Grey and Bruce counties cover 3,400 square miles and the network serves a population of approximately 150,000 people). For example, the time to percutaneous coronary intervention for ST-elevated myocardial infarction (STEMI) from "door to balloon," is extremely difficult to achieve due to distance in travel. As part of the EBC program, a modification attempt was achieved through pharmaco-invasive intervention awaiting transfer, or "treat and transfer" with the supporting cardiac centres. This involved modifying the guidelines to better suit the entire range of circumstances.

3. Recognizing the relationship between pathways and order sets

At GBRN, clinical pathways are viewed as a corporate resource. The order sets provide the structure for physicians to reduce variation with respect to medical orders. The pathways are much more inclusive and address the appropriate roles and responsibilities for all care providers.

4. Communication and Education

Establishing an effective communication and education strategy for ongoing implementation and change is critical. Pathway and order set implementation cannot be viewed as a change project. It needs to be embedded into the culture of the hospital, and actively supported by clinical and administrative leaders. New staff and physicians will require a comprehensive orientation program to facilitate the seamless integration of evidence-based care.

Appendix F: Terms of Reference Template

Steering Team: Terms of Reference

Purpose

The Steering Team will provide the support and act as the steward of the implementations of QBPs across the organization

Mandate

- Oversee the implementation of all QBPs
- Govern, pace, and support all QBPs implementation by providing
  - Project management support
  - Activity prioritization
  - Removing obstacles as they arise for the QBP teams
  - Membership

- Provide leadership and direction to the QBP strategy and implementation teams
- Represents multi-disciplinary nature of all QBPs
- Includes executive level and program level staff
- Number of members should be between 6-10

Term

- Until the full implementation of all QBPs across the hospital ("full implemented" to be defined by Executive Team)

Meetings

- To be determined by Project Sponsor

Coordination and Administration

- The Project Sponsor will identify administrative support and coordination of the Steering Team

Appendix G: Communication Plan

The Communication Plan template below can be tailored and completed as a tool to help an organization manage and execute the necessary communications related to QBP Implementation.

Engagement Activity/ Tactics	Timing	Target Audience	Message Objectives	Sender	Response	Status	Action
e.g. CEO/ CFO to present HSFR to all program teams							

Appendix H: QBP Implementation Team Structure

The following table provides an example of the breath and depth of recommended stakeholders to fill the identified roles (Lead, Team Member of Subject Matter Expert – SME) on the implementation team. The table can be used in QBP implementation charting to determine the appropriate representation and potential role in the team.

Departments	Stakeholders	Recommended Role
Emergency	Medical Program Director	Lead or Team Member
Inpatient	Nurse educator	Lead or Team Member
	Nurse manager	Lead or Team Member
Community Care	Chief nursing Officer/executive	Lead or Team Member
	Physicians	Team Member or SME
Finance	Staff nurses	Team Member or SME
	Allied health	Team Member or SME
IT	Pharmacist	Team Member or SME
	IT, decision support, CPOE	Team Member or SME
Coding	Medical Program Director	Team Member or SME
	Laboratory specialist	Team Member or SME
Diagnostics Pharmacy	Health Records Coders	Team Member or SME
	Primary care representative	Team Member or SME
Lab	CCAC representative	Team Member or SME
	Maintenance	Team Member or SME
	Patient care/flow coordinator	Team Member or SME
Decision Support **Quality/Flow Improvement**	Specialized community support services	Team Member or SME

Appendix I: Example Reasons of Resistance to Change

Appendix J: Implementation Plan Template

The Implementation Plan template below can be tailored by an organization to use as a tool to manage and execute the necessary tasks related to QBP Implementation.

Phase: Establish QBP Implementation Teams	Tasks	Responsibility	Completed By	Status
1. Assign Project Lead	1.1 Determine Project Lead 1.2 Review current capacity	Steering Team sponsor		
2.	2.1			
3.	3.1			
4.	4.1			

Appendix K: QBP Implementation Checklist

This checklist has been developed to support QBP implementation. It includes a list of questions for each hospital to consider as they initiate the implementation in their organization. The objective of the checklist is to provide organizations with some immediate action items that they can consider executing as part of its QBP implementation process.

What is included in the checklist:

- Questions and action items based on the toolkit and its suggested approach.

- A column to identify responsibility/accountability.

Chapter 1: The Need to Understand QBPs

For all questions where you select "No" please review the suggested Action Item.

Question	Yes	No	Action Item	Responsibility
Does your organization's senior team understand the intentions that are driving Health System Funding Reform, and specifically, Quality-Based Procedures?			Organize an education session with senior team to present background on QBPs and to provide an overview of the intended outcomes. Develop regular communication processes. *The toolkit provides a high-level background on QBPs and a communication plan.*	
Across your organization, do staff (and specifically clinical staff) understand the intentions that are driving Health System Funding Reform, and specifically, Quality-Based Procedures?			Organize education sessions (such as lunch and learns/post information on intranet) so that staff can garner an understanding of the background behind QBPs and the intended outcomes. *The toolkit provides a high-level overview and the case studies provide examples of how peers have approached communications.*	
Has your organization identified the opportunities to align the implementation of QBPs with their existing organizational quality improvement efforts (e.g quality improvement plans, HealthLinks)			Review existing quality initiatives and identify opportunities for greater alignment, including, where applicable, key performance measures.	
Do the Program Leads for CHF, COPD and Stroke have an intimate understanding of the Clinical Handbooks for these QBPs?			Direct Program leads for QBPs to review the Clinical Handbooks in detail.	

Notes:

Chapter 2: Structuring your Organization for Success

For all questions where you select "No" please review the suggested Action Item.

Question	Yes	No	Action Item	Responsibility
Does your organization have a lead or a team who is managing the implementation process for all QBPs?			Develop a Steering Team to govern, remove road blocks and monitor the implementation of QBPs.	
Is it clear at your organization who is the lead/ executive sponsor for the implementation of QBPs? Does this person have both an executive and clinical background?			Assign an executive sponsor who has an senior role and clinical knowledge to oversee QBP implementation.	
Has the organization considered setting up a team to support the implementation of specific QBPs?			Develop a multi-disciplinary QBP-specific Implementation Team.	

Notes:

Chapter 3: Roadmap to Implementation

For all questions where you select "No" please review the suggested Action Item.

Question	Yes	No	Action Item	Responsibility
Do staff across the organization understand the intention and impact of QBPs?			Develop a communication plan. *Template provided in toolkit*	
Do clinicians at your organization feel engaged in the QBP process? Are they on-board with the approach the organization has taken?			Develop a communication plan specifically for clinicians. Consider the following approaches: • Identify QBP champions • Have a clinical sponsor for the QBPs • Engage clinicians in a critical evaluation of practice patterns and use the foundational principle of "quality" to underpin all discussions and engagements	
Have specific resources been identified to support education of clinical staff through workshops, education sessions, updates at MAC and other clinical professional forums?			Review the resources required and capacity of current staff leading QBP implementation.	
What data will support QBP-related decisions?			Review the quality of clinical, financial and statistical data and, where necessary, take steps to ensure that data is as robust and reliable as possible.	
Has your organization developed a QBP implementation approach or work plan?			Review the Roadmap suggested on page 14 in the toolkit.	
Does your organization have a plan to close the funding gap?			A number of questions are included in the toolkit which can be reviewed to identify the potential funding shortfall. For example: • Have we standardized our processes? Are costs impacted by variations in clinical and procedural processes? • What are the costs of materials? Can we look to group purchasing to drive any discounts? • Are we coding our data correctly to accurately reflect costs? How do we address any data quality issues?	

Question	Yes	No	Action Item	Responsibility
			A number of case studies are included in the toolkit which provides an overview of how some hospitals have approached identifying the drivers of the gap.	
Has your organization conducted a detailed current state assessment for each specific QBP?			Develop a current state assessment. Ask the QBP leads to review and develop the current state pathways. An approach is provided in the toolkit.	
Is it clear to your organization what the QBP pathways (based on the Clinical Handbooks) for each of the QBPs will look like once they have been implemented?			Review the QBP pathway as defined in each Clinical Handbook.	
Is there any gap between the QBP pathway and your current state pathway?			Develop an implementation plan to close the gap: 1. Conduct a pathway gap analysis 2. Identify improvement opportunities 3. Consolidate QBP opportunities 4. Review implementation tools such as order set checklists, standards to support QBP implementation*	

Note: the Toolkit includes a number of supporting documents, such as order set checklists, protocols and associated documents and standards and guidelines. These are not recommended documents, but are included as guidance to be used by hospitals.

Notes:

* For more detailed information about stroke best practices, please visit http://www.strokebestpractices.ca/

Chapter 4: Monitor and Adjust

For all questions where you select "No" please review the suggested Action Item.

Question	Yes	No	Action Item	Responsibility
Has your organization considered how you will measure progress in QBP implementation?			Review the Clinical Handbooks as well as the suggested draft QBP indicators in Appendix M for suggested measures and review internal data to determine if there are other measures of improvement.	
Are you clear on the approach you will take to reflect any adjustments to the QBPs over time?			Develop an approach to monitoring QBP adjustments – information is provided in the toolkit in Chapter 4.	

Notes:

Chapter 5: Considerations for Boards

For all questions where you select "No" please review the suggested Action Item.

Question	Yes	No	Action Item	Responsibility
Does your Board Chair understand and provide education to the Board Directors on QBPs?			Organize a meeting with the Board Chair to brief him/her on the potential strategic implications of QBPs. A list of questions for Board Chairs to consider is provided in Chapter 5.	
Does the Board Quality Committee (established under ECFAA) understand their role in translating and monitoring the application of the evidence-based practices throughout the organization?				

Notes:

Appendix L: HQO Year 1 Implementation Priorities

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
Chronic Obstructive Pulmonary Disease (Source: COPD Chairs)		
Non-Invasive Positive Pressure Ventilation	• If possible, seek patient preferences for ventilation therapy before proceeding to ventilation interventions • If ventilation is not desired, proceed to palliative care management of the patient • Non-invasive positive pressure ventilation (NPPV) should be considered as part of first-line treatment for patients with acute respiratory failure and pH < 7.35 • NPPV should be trialed before proceeding to invasive ventilation (IV) for all patients with indications for ventilation, including severe patients (pH < 7.20), unless contraindications are present (including respiratory or cardiac arrest, loss of consciousness, craniofacial trauma, hemodynamic instability, impaired mental status) • Where patients have expressed preferences against intubation, NPPV can still be considered but ensure that therapy does not progress to invasive ventilation in the case of failure to respond to NPPV *(Found in Clinical Assessment Node 2)* • Ensure continuous monitoring of patients receiving NPPV • Specialized respiratory teams and/or units are likely to be more effective in delivering NPPV *(Found in Care Module 3)* • Use NPPV to help wean patients from invasive ventilation when they fail spontaneous breathing tests *(Found in Care Module 4)*	
Early Ambulation	***Promote Early Ambulation Therapy*** • If patient is admitted, use early ambulation therapy. *(Found in Care Module 2: Usual Care)*	
Oral Antibiotics	***Preference for use of oral antibiotics*** • Oral antibiotics are preferred • Intravenous antibiotics should be considered a 2nd line therapy used only when oral antibiotics are contraindicated (e.g. GI issues) *(Found in Care Module 2: Usual Medical Care)*	
Oral Steroids	***Oral Steroids are preferred over intravenous steroids in patients with a functioning gastrointestinal tract who can tolerate oral medications*** *(Found in Care Module 2)*	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
Smoking Cessation	***Smoking Cessation Counseling while in Hospital*** • COPD patients who smoke should receive smoking cessation counseling while in hospital, with the goal of referral to longer-term, intensive smoking cessation counseling (including appropriate pharmacotherapy) in the outpatient setting. May include providing information to patients with contact information / instructions for resources or other guidance *(Found in Care Module 6)*	
Peak Flows	***Clinical Diagnosis of COPD*** • Spirometry is required to make clinical diagnosis: postbronchodilator FEV1/FVC <0.70 confirms COPD. • Spirometry need not be performed during the initial phase of an exacerbation when the patient is unstable, but should be performed once the patient has stabilized. • Spirometry should only be performed if the patient has no recent, reliable, objective documentation of COPD by spirometry. *(Found in Definition)* • Spirometry need not be performed during the initial assessment of an exacerbation, but should be performed once the patient has stabilized, if patient has no prior objective documentation of COPD through spirometry *(Found in Care Module 1)* ***Clinical assessment of stabilized patient*** • Where a patient has no prior objective documentation of spirometry assessment, spirometry should be performed on the stabilized patient before discharge (as time and patient's condition allows) or arranged for following discharge. *(Care Module 5)*	
Discharge Planning	• Ensure patients have a follow-up appointment with a primary care provider (PCP), respirologist or internist within 1-2 weeks of discharge. • If the patient does not have a regular PCP, have them connected with one before discharge. If there is no PCP available in the community, the patient may need support from hospitalists, specialists or the CCAC. • Ensure the patient's primary care provider (PCP) and CCAC receives a discharge summary from the hospital, including full clinical assessment of the patient, within 48 hours of discharge.	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
Pulmonary Rehabilitation	***Referral to Pulmonary Rehabilitation*** *(Care Module 2: Usual Medical Care)* • Begin discharge planning, including referral to pulmonary rehabilitation ***Discharge planning*** • COPD patients with functional disabilities (e.g. shortness of breath when walking) should begin therapy in an evidence-based pulmonary rehabilitation program within 1 month following hospital discharge for an acute exacerbation of COPD *(Care Module 6)*	
Congestive Heart Failure (Source: CHF Chairs)		
Emergency Department Risk Stratification	***All recommended initial investigations that support appropriate ED Risk Stratification should be performed.*** • Initial investigations should include the following: – serum creatinine and electrolyte levels – troponin measurements – complete blood count – electrocardiogram – chest x-ray and an echocardiogram if no recent – echocardiogram is available (class I, level C) *(Found in Clinical Assessment Node: ED Risk Stratification)*	
Daily Weights	***Daily weights should be taken to manage and monitor pulmonary congestion and fluid overload during the acute stabilization phase.*** *(Found in Care module: Acute Stabilization Phase)*	
Discharge Follow-up Visits	***At discharge, patients should be provided with their general practitioner of specialist appointment details, which should be scheduled to occur within 2 weeks post-discharge*** *(Found in Care Module: Discharge Phase)* • Physician appointments – General practitioner/family physician identified, and follow-up visit scheduled within 2 weeks of discharge – Ambulatory care specialty follow-up (cardiology or internal medicine)	
Discharge Documentation	***Discharge notes should be sent within 48 to 72 hours of hospital discharge*** *(Found in Care Module: Discharge Phase)* • Timely documentation – Discharge notes dictated and sent to primary care (and relevant other) provider(s) within 1 week (ideally within 48 to 72 hours of hospital discharge)	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
Stroke (Source: Stroke Chairs and select members of panel)		
Stroke types should be specified for all admissions	• A large proportion of strokes are not specified as hemorrhagic, or ischemic *(Found in Stroke Cohort Definition Chapter)*	
Imaging	• All patients should undergo brain imaging (MRI or CT) immediately and vascular imaging of the brain and neck arteries as soon as possible • All patients should undergo vascular imaging of the brain and neck arteries as soon as possible • ll patients presenting within 48 hours of symptom onset or with persistent or fluctuating motor or speech symptoms should undergo immediate vascular imaging of the neck arteries (carotid ultrasound, CTA, or MRA) for patients eligible for revascularization (unless the patient is clearly not a candidate for revascularization) *(Found in Module 1: Early Assessment)*	
Other Early Assessment Tests	• ECG should be completed to detect atrial fibrillation and other acute Arrhythmias *(Found in Module 1: Early Assessment)* All patients should have the following blood work: • CBC • Electrolytes • Creatinine • Urea • Glucose • INR • Partial thromboplastin time • TSH • Creatine kinase • Troponin test • HbA1c • If hypercoagulability or vasculitis is suspected refer to a Stroke Prevention Clinic or neurologist *(Found in Module 1: Early Assessment)*	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
Dysphagia Screening	• All patients with stroke should be placed NPO and have their swallowing ability screened using a simple, valid, reliable, bedside testing protocol as part of their initial assessment and before initiating oral medication, fluid, or foods *(Found in Module 1: Early Assessment; Module 2B: Early Treatment of Ischemic Stroke in Patients Eligible for Tissue Plasminogen Activator; Module 2D: Early Treatment of Intracerebral Hemorrhages; Module 4A: Acute Inpatient Admission of Ischemic Stroke Patients)* • Stroke patients should be placed NPO and have their swallowing ability screened using a simple, valid, reliable, bedside testing protocol as part of their initial assessment and before initiating oral medications, fluids, or food. • Patients who are not alert within the first 24 hours should be monitored closely. Dysphagia screening should be performed when clinically appropriate. • Patients with stroke presenting with features indicating dysphagia or pulmonary aspiration should receive a full clinical assessment of their swallowing ability by an S–LP or appropriately trained specialists who would advise on swallowing ability and required consistency of diet and fluids. *(Found in Module 4a: Acute Inpatient Admission of Ischemic Stroke Patients)*	
TIA/Stroke prevention Clinic	• The majority of TIA patients do not require admission to hospital and should be referred to an urgent TIA/Stroke Prevention Clinic or comparable ambulatory care setting for rapid diagnostic and medical evaluation (ideally within 48 hours of symptom onset) and to initiate secondary stroke prevention therapies. *(Found in Module 2A: Early Treatment of Transient Ischemic Attack)*	
Timely Thrombolysis	• All patients with disabling acute ischemic stroke who can be treated within 4.5 hours of symptom onset should be evaluated without delay to determine their eligibility for treatment with intravenous tPA (alteplase) in accordance with criteria adapted from NINDS tPA Stroke Study and ECASS III • Every effort should be made to deliver treatment as soon as safely possible as the evidence suggests outcomes are optimized by delivery as close to onset of cerebral ischemia as possible. • Telestroke networks should be implemented wherever acute care facilities do not have on-site stroke care expertise to provide 24/7 acute stroke assessment and treatment with tPA in accordance with current treatment guidelines or standardized protocols should be established to ensure a coordinated and efficient approach to telestroke service delivery in the hyperacute phase of stroke to facilitate delivery of tPA in referring sites • All eligible patients should receive intravenous tPA (alteplase) as soon as possible after hospital arrival with a target door-to-needle time of < 60 minutes	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
	• Ischemic stroke patients receiving tPA should have very high blood pressure (> 185/110 mm Hg) treated to reduce the risk of secondary intracranial hemorrhage • Patients with stroke whose first random glucose value > 10 mmol/L should have fasting glucose and an HbA1c test ordered. If levels are elevated, antihyperglycemic agents should be considered • Administration of intravenous tPA (alteplase) should follow the American Stroke Association guidelines: total dose 0.9 mg/kg up to a maximum of 90 mg with 10% (0.09 mg/kg) given as intravenous bolus over 1 minute and the remaining 90% (0.81 mg/kg) given as an intravenous infusion over 60 minutes • For patients with stroke treated with tPA, 160 mg ASA dose should be delayed until after the 24 hour post thrombolysis brain imaging (CT/MRI) has excluded intracranial hemorrhage • All patients treated with tPA should receive brain imaging (CT/MRI imaging) 24 hours after the administration of tPA to exclude intracranial hemorrhage and to evaluate stroke evolution *(Found in Module 2B: Early Treatment of Ischemic Stroke in Patients Eligible for Tissue Plasminogen Activator)*	
Stroke Units	• Patients should be admitted to a specialized, geographically defined hospital unit dedicated to the management of stroke patients. • The core stroke unit team should consist of health care professionals with stroke expertise in medicine, nursing, occupational therapy, physiotherapy, speech–language pathology, social work, and clinical nutrition (a dietitian). • To have the necessary stroke expertise, the health care professionals spend the vast majority of their time treating stroke patients and regularly complete education about stroke care *(Found in Module 4a: Acute Inpatient Admission of Ischemic Stroke Patients)*	
AlphaFIM	AlphaFIM® should be completed on day 3 *(Found in Module 4a: Acute Inpatient Admission of Ischemic Stroke Patients)*	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
Vascular Cognitive Impairment	• All stroke patients with vascular risk factors and clinically evident stroke should be considered at high risk of vascular cognitive impairment • All high-risk patients27 should be screened for cognitive impairment using a validated screening tool • Screening to investigate a person's cognitive status should address arousal, alertness, attention, orientation, memory, language, agnosia, visuospatial/ perceptual function, praxis, and executive functions such as insight, judgment, social cognition, problem- solving, abstract reasoning, initiation, planning, and organization • The Montreal Cognitive Assessment is considered more sensitive to cognitive impairment than the Mini-Mental Status Exam in patients with vascular cognitive impairment. • Its use is recommended when vascular cognitive impairment is suspected • Patients with identified cognitive impairments should receive additional cognitive or neuropsychological assessments to guide management *(Found in Module 4a: Acute Inpatient Admission of Ischemic Stroke Patients)*	
Inpatient Rehabilitation	• All patients who require rehabilitation should be referred to a specialist rehabilitation team in a geographically defined unit as soon as possible after admission • Procedures should enable admission 7 days/week • All patients admitted to hospital with acute stroke should have an initial assessment by rehabilitation professionals as soon as possible, preferably within 24-48 hours of admission • The interprofessional rehabilitation team should assess patients within 24–48 hours of admission and develop a comprehensive individualized rehabilitation plan that reflects the severity of the stroke and the needs and goals of the stroke patient • The interprofessional rehabilitation team should consist of a physician, nurse, physical therapist, OT, S–LP, psychologist, SW, recreation therapist, pharmacist, patient, and family and/or caregivers • Recommended staffing ratios for inpatient rehabilitation are: • PT/OT: 1 each per 6 inpatient beds • S–LP: 1:15 *Found Module 5: Admission to Inpatient Rehabilitation)* • Rehabilitation should begin as early as possible once medical stability is reached *(Found Module 5: Admission to Inpatient Rehabilitation)*	

Episode of Care Best Practice Recommendation	Recommendations from Episode of Care Handbook	Notes
	• Patients with moderate or severe stroke who are rehabilitation ready and have rehabilitation goals should be given an opportunity to participate in inpatient stroke rehabilitation *(Found Module 5: Admission to Inpatient Rehabilitation)* • Patients with stroke as well as their families and caregivers should be prepared for transitions between care environments by being given education, training, emotional support, and information related to community services specific to the transition they are undergoing *(Found Module 5: Admission to Inpatient Rehabilitation)* • LOS in rehabilitation is determined by the benchmarks proposed by the OSN stroke reference group for each Rehabilitation Practice Group (RPG) and recommended as : • 1100 = LOS 48.9 days • 1110 = LOS 41.8 days • 1120 = LOS 35.8 days* (note this is has been revised from the handbooks) • 1130 = LOS 25.2 days • 1140 = LOS 14.7 days • 1150 = LOS 7.7 days • 1160 = LOS 0 days *(Found Module 5: Admission to Inpatient Rehabilitation)*	

Appendix M: Draft QBP Indicators

List of indicators*

QBP	Indicator
Stroke	The risk-adjusted 30-day mortality rate among stroke patients
	The risk-adjusted 90-day readmission rate among stroke patients
	The risk-adjusted 90-day readmission (revisits) rate to ED among stroke patients
	Length of Stay (acute LOS and alternative level of care LOS)
	The discharge destination of stroke patients following acute admission
	Proportion of ischemic patients arriving in ED within 3.5 hours who are eligible for TPA that received stroke thrombolysis
	Rate of unplanned readmissions within 30 days
	Time between discharge from an acute facility and admission to a rehab facility (7 days)
	Distribution of severity among inpatient rehabilitation patients
	% of patients receiving CT/MRI within 24 hrs
	Time from referral to home -care visit
	Post-discharge follow-up visit primary care

QBP	Indicator
COPD	Acute length of stay
	In-hospital mortality rate
	Rate of unplanned readmissions within 30 days
	COPD admission rate
	Use of non-invasive ventilation for COPD patients (TBD)
	Post-discharge follow-up visit for hospitalized COPD patients
	Post-discharge follow-up visit primary care
	Time from referral to home -care visit

* Indicators in grey will be calculated for all QBPs (where relevant) as they relate to other ministry priorities and/or are important to evaluate the impact of QBP implementation despite the fact that they may not have also been recommended by the Clinical Expert Advisory Groups

List of indicators (Cont'd)

QBP	Indicator
CHF	The proportion of new ODB-eligible patients discharged with ACE inhibitors or ARBS (filled prescriptions within 7 days of discharge)
	The proportion of new ODB-eligible patients discharged with B-blockers (filled prescriptions within 7 days of discharge)
	The proportion of ODB-eligible patients who refill, ACE inhibitors, ARBS, B -blockers at 6 and 12 months following hospital discharge
	The proportion of ODB-eligible patients who received CCAC/homecare assessment within 2, 14, and 30 days
	Among patients who received CCAC/homecare assessment within 30 days, the proportion of patients who receive their assessment within 3 and 14 days
	The mortality and rehospitalisation rates of ODB -eligible patients at 7 days, 6 months and 12 months following discharge from hospital
	The physician follow-up rates (GP and cardiology) of ODB-eligible patients at 7, 14, 30 days following discharge
	The length of stay of CHF patients from admittance to ER until discharge from hospital

QBP	Indicator
CKD	Vascular Access Rate: Incidence
	Vascular Access Rate: Prevalence
	Six-month independent dialysis rate for incident patients
	Home dialysis rate: Prevalence
	Attrition from home dialysis
Endoscopy	Positive FOBT and family history colonoscopy wait time
	Colonoscopy perforation rate
Systemic	Wait Times for Systemic Treatment
	Wait Time between Diagnosis and Adjuvant Chemotherapy
	Treating Lung Cancer According to Guidelines
	Treating Stage III Colon Cancer According to Guidelines
	Unplanned hospital visits after Adjuvant Chemotherapy / Unplanned revisits to hospital after adjuvant chemotherapy

Appendix N: Draft Stroke QBP Indicators from Provincial Indicators

Domain (QBP Goal)	What is being measured?	Key provincial indicators	QBP level indicators recommended by Clinical Advisory Expert Panels *
Effectiveness	What are the results of care received by patients ? Do results vary across providers? Can any variance be explained by population characteristics? Is care provided without causing harm?	• Proportion of QBPs that improved outcomes • Proportion of QBPs that reduced variation in outcome (risk -adjusted differences in outcome across hospitals) • Proportion of (relevant) QBPs that reduced rates of adverse events and infections	• Risk-adjusted 30-day mortality rate
Appropriateness	Is patient care being provided according to scientific knowledge and in a way that avoids overuse, underuse or misuse?	• Proportion of QBPs that reduced variation in utilization (age -gender adjusted) • Proportion of (relevant) QBPs that saw a substitution from inpatient to outpatient/day surgery • Proportion of (relevant) QBPs that saw a substitution to less invasive procedures • Increased rate of patients being involved in treatment decision • Proportion of (relevant) QBPs that saw an increase in discharge dispositions into the community • Proportion of QBPs that showed a reduction in LOS	• Utilization • Discharge destination following acute admission • Percentage of patients receiving CT/MRI within 24 hrs. • Distribution of severity among inpatient rehabilitation patients • Acute LOS and ALC • Time from referral to home-care visit
Integration	Are all parts of the health system organized, connected and working with one another to provide high quality care?	• 30-day readmission rate • Improved access to appropriate care providers for diagnosis/ treatment/ follow -up care • Coordination of care (TBD) • Involvement of family (TBD)	• 30-day readmission rate • Risk-adjusted 90-day readmissions • 90-day readmission (revisits) rate of ED • Time between discharge from an acute facility and admission to a rehab facility (7 days) • Proportion of eligible ischemic patients arriving in ED within 3.5 hours receiving thrombolysis • Post-discharge follow-up visit primary care
Efficiency	Does the system make best use of available resources to yield maximum benefit ensuring that the system is sustainable for the long term?	• Proportion of QBPs with actual costs ≤ QBP price	• QBPs with actual costs ≤ QBP price
Access	Are those in need of care able to access services when needed?	• Wait times for QBPs / for specific populations for QBP • Wait times for other procedures • Distance patients have to travel to receive the appropriate care related to the QBP • Proportion of providers with a significant change in resource intensity weights (RIW)	-

* Indicators in *italics* will be calculated for all QBPs (where relevant) as they relate to other ministry priorities and/or are important to evaluate the impact of QBP implementation despite the fact that they may not have also been recommended by the Clinical Expert Advisory Groups

Appendix O: Sample Order Set CHECKLISTS – Stroke Presentation to ER

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Stroke QBP ER Presentation Checklist	ACTION

Module 1: Early Assessment

- ☐ Rapid initial evaluation for airway, breathing, circulation
- ☐ Neurological examination to determine focal neurological deficits and assess stroke severity (Evidence Level B) on a standardized stroke scale (either the NIHSS or CNS for stroke)
- ☐ Brain imaging (MRI or CT) immediately and vascular imaging of the brain and neck arteries as soon as possible
  - ☐ Vascular imaging of the brain and neck arteries as soon as possible

Patients presenting within 48 hours of symptom onset or persistent/fluctuating motor or speech symptoms:

- ☐ Immediate vascular imaging of the neck arteries (carotid ultrasound, CTA, or MRA) for patients eligible for revascularization (unless the patient is clearly not a candidate for revascularization)
- ☐ ECG should be completed to detect atrial fibrillation and other acute arrhythmias

Blood Work:

☐ CBC	☐ Urea	☐ Creatine kinase
☐ Electrolytes	☐ Glucose	☐ Troponin test
☐ Creatinine	☐ TSH	☐ HbA1c
☐ INR	☐ Partial thromboplastin time	

- ☐ If hypercoagulability or vasculitis is suspected refer to a Stroke Prevention Clinic or Neurologist

Diet

- ☐ NPO
- ☐ Swallowing ability screened using a simple, valid, reliable, bedside testing protocol as part of their initial assessment and before initiating oral medication, fluid, or foods

Discharge Planning

Non-admitted patients:

- ☐ Refer to a designated Stroke Prevention Clinic or stroke specialist for further timely investigations and management

Module 2a: Early Treatment of Transient Ischemic Attack

The majority of TIA patients do not require admission to hospital and should be referred to an urgent TIA/Stroke Prevention Clinic or comparable ambulatory care setting for rapid diagnostic and medical evaluation (ideally within 48 hours of symptom onset
TIA patients who present within 48 hours of symptom onset with fluctuating or crescendo motor or speech symptoms may be considered for admission to hospital

Patients presenting within 48 hours of symptom onset or persistent/fluctuating motor or speech symptoms:

- ☐ Immediate vascular imaging of the neck arteries (carotid ultrasound, CTA, or MRA) for patients eligible for revascularization (unless the patient is clearly not a candidate for revascularization

Patients with TIA or nondisabling stroke with ipsilateral 50%–99% internal carotid artery stenosis (measured by 2 concordant noninvasive vascular imaging modalities such as Doppler ultrasound, CTA, or MRA):

- ☐ Referral to, and evaluated by a stroke expert
- ☐ Selected patients should be offered carotid endarterectomy with the goal of operating within 14 days of the incident event once the patient is clinically stable

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Stroke QBP ER Presentation Checklist	ACTION

Patients with TIA or nondisabling ischemic stroke who are not on an antiplatelet agent at time of presentation:

☐ Start on antiplatelet therapy immediately with one of the following
(after brain imaging has excluded intracranial hemorrhage):
- ☐ ECASA 160 mg loading dose, followed by ECASA 81 - 325 mg daily dose
  Most patients should be on a maintenance dose of 81mg/day
- ☐ clopidogrel 300 mg loading dose, followed clopidogrel 75 mg daily
  OR
- ☐ extended-release dipyridamole 200 mg / ASA 25 mg BID (could load with ECASA 160–325 mg first)

Patients with TIA and atrial fibrillation, after brain imaging excluded intracranial hemorrhage or large infarct:

☐ Immediately begin oral anticoagulation with:
- ☐ dabigatran, rivaroxaban, apixaban (pending approval for use in Canada)

OR
- ☐ warfarin

All patients with ischemic stroke or TIA:

☐ antiplatelet therapy for secondary prevention of recurrent stroke unless there is an indication for anticoagulation
☐ Prescribe treatment to lower blood pressure to stay consistently < 140/90 mm Hg
☐ Blood glucose measurement should be repeated if the first random glucose value is >10 mmol/L
- ☐ Fasting glucose and HbA1c
- ☐ If elevated (fasting glucose greater than 7 mmol/L; HbA1c greater than 7%), consider using antihyperglycemic agents
- ☐ Hypoglycemia should be corrected immediately

Patients with TIA or non-disabling stroke who smoke:

☐ Offer assistance with the initiation of a smoking attempt – either directly or through referral to appropriate resources
☐ Combination of pharmalogical therapy and behavioural therapy should be considered

For patients with suspected hypercoagulability or with no evident cause of stroke:

The following investigations may be required

☐ Antiphospholipid antibody	☐ Protein C	☐ Prothrombin gene mutation
☐ Lupus anticoagulant	☐ Antithrombin III	☐ Factor V Leiden mutation
☐ Protein S		

For patients with suspected vasculitis

The following investigations may be required:

☐ Erythrocyte sedimentation rate	☐ Antinuclear antibody
☐ C-reactive protein	☐ Syphilis screen

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Stroke QBP ER Presentation Checklist	ACTION

Module 2B: Early Treatment of Ischemic Strokes in patients eligible for TPA

Expert Panel did not include intra-arterial (IA) stroke treatment (IA stroke thrombolysis or IA clot retrieval) in this QBP as the evidence is still evolving. IA thrombolysis is excluded as it is an intervention-based HIG.

All patients with disabling acute ischemic stroke who can be treated within 4.5 hours of symptom onset:

☐ evaluate without delay to determine their eligibility for treatment with intravenous tPA (alteplase) in accordance with criteria adapted from NINDS tPA Stroke Study and ECASS III

Every effort should be made to deliver treatment as soon as safely possible as the evidence suggests outcomes are optimized by delivery as close to onset of cerebral ischemia as possible

☐ Implement Telestroke networks wherever acute care facilities do not have on-site stroke care expertise to provide 24/7 acute stroke assessment and treatment with tPA in accordance with current treatment guidelines

OR

☐ Establish standardized protocols to ensure a coordinated and efficient approach to telestroke service delivery in the hyperacute phase of stroke to facilitate delivery of tPA in referring sites

☐ Administer intravenous tPA as soon as possible after hospital arrival with a target door-to-needle time of < 60 minutes

☐ Treat very high blood pressure (> 185/110 mm Hg) to reduce the risk of secondary intracranial hemorrhage

☐ Blood glucose measurement should be repeated if the first random glucose value is >10 mmol/L

- ☐ Fasting glucose and HbA1c
- ☐ If elevated (fasting glucose > 7 mmol/L; HbA1c > 7%), consider using antihyperglycemic agents

☐ Follow the American Stroke Association guidelines for tPA (Ateplase):

- Total dose 0.9 mg/kg up to a maximum of 90 mg
- with 10% (0.09 mg/kg) given as intravenous bolus over 1 minute
- and the remaining 90% (0.81 mg/kg) given as an intravenous infusion over 60 minutes

☐ ASA ≥160 mg dose should be delayed until after the 24 hour post-thrombolysis brain imaging (CT/MRI) has excluded intracranial hemorrhage

☐ Brain imaging (CT/MRI imaging) 24 hours after the administration of tPA to exclude intracranial hemorrhage and to evaluate stroke evolution

☐ NPO

☐ Swallowing ability screened
using a simple, valid, reliable, bedside testing protocol as part of their initial assessment
and before initiating oral medication, fluid, or foods

- ☐ Patients who are not alert within the first 24 hours should be monitored closely and dysphagia screening performed when clinically appropriate

☐ If not done as part of initial assessment extracranial vascular imaging (carotid ultrasound, CTA, or MRA) should be done as soon as possible to better understand the etiology of the stroke and guide secondary stroke prevention management

☐ Aggressively managed all risks factors for cerebrovascular disease through pharmacological and nonpharmacological means to achieve optimal control

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Stroke QBP ER Presentation Checklist	ACTION

Module 2c: Early Treatment of Ischmic Strokes in Patients Not eligible for tPA

☐ The best practices for these patients are identical to those of Module 2B except for the administration of tPA

Module 2d: Early Treatment of Intracerebral Hemorrhages

☐ Treat as a medical emergency
☐ Patients should be evaluated immediately by physicians with expertise in stroke management
☐ CT or MRI immediately to confirm diagnosis, location and extent of hemorrhage if not already completed in ED
☐ Evaluation of patients with acute ICH should include questions about:
anticoagulant therapy, measurement of platelet count, PTT, and INR
☐ Consider patient for CTA or other imaging modality to exclude an underlying lesion such as an aneurysm, arteriovenous malformation, or tumour

Patients with acute ICH and established coagulopathy or a history of anticoagulant use:

- ☐ Reverse the coagulopathy (prothrombin complex concentrate / factor IX, Vitamin K, or fresh-frozen plasma)

☐ The majority of patients with acute supratentorial ICH do not require neurosurgical evacuation; however, select patients with supratentorial ICH and posterior fossa ICH patients may require neurosurgical consultation
☐ Patients presenting with systolic blood pressure > 180 mm Hg should undergo acute lowering of blood pressure

Medically stable patients with acute ICH:

- ☐ Admit to a stroke unit or neuro/intensive care unit and undergo interprofessional stroke team assessment to determine their rehabilitation and other care needs

☐ NPO
☐ Swallowing ability screened
using a simple, valid, reliable, bedside testing protocol as part of their initial assessment
and before initiating oral medication, fluid, or foods

- ☐ Patients who are not alert within the first 24 hours should be monitored closely and dysphagia screening performed when clinically appropriate

☐ Blood glucose measurement should be repeated if the first random glucose value is >10 mmol/L

- ☐ Fasting glucose and HbA1c
- ☐ If elevated (fasting glucose > 7 mmol/L; HbA1c > 7%), consider using antihyperglycemic agents

Module 2e: Unable to Determine, not eligible for tPA

Believed that most of these individuals have stroke-like symptoms usually due to ischemic stroke that is not evident on the initial computed tomography (CT) scan in the ED

☐ The best practices for these patients are identical to module 2B except for the administration of tPA

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

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Appendix O: Sample Order Set CHECKLISTS – **Stroke Admission**

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Stroke QBP Admission Checklist	ACTION

Care Module 4A: Acute Inpatient Admission of Ischemic Stroke Patient

☐ Admit to a specialized, geographically defined hospital unit dedicated to the management of stroke patients
- The core stroke unit team should consist of health care professionals with stroke expertise in medicine, nursing, occupational therapy, physiotherapy, speech–language pathology, social work, and clinical nutrition (a dietitian)
- To have the necessary stroke expertise, the health care professionals spend the vast majority of their time treating stroke patients and regularly complete education about stroke care

☐ Place patient NPO **AND** have their swallowing ability screened using a simple, valid, reliable, bedside testing protocol as part of their initial assessment and before initiating oral medications, fluids, or food

☐ Patients who are not alert within the first 24 hours should be monitored closely

☐ Screen for dysphagia, when clinically appropriate

Patients with stroke presenting with features indicating dysphagia or pulmonary aspiration:

☐ Receive a full clinical assessment of their swallowing ability by a S–LP or appropriately trained specialists who would advise on swallowing ability and required consistency of diet and fluids

All stroke patients admitted to hospital with acute stroke:

☐ Mobilize early and as frequently as possible **AND** preferably within 24 hours of stroke symptom onset, unless contraindicated
- Therapy to promote recovery of motor impairments should commence within 48 hours of stroke according to best practices

☐ Interprofessional team assessment of stroke patients within 48 hours of admission to hospital

☐ Formulate a management plan

Clinicians should use standardized, valid assessment tools to evaluate patients' stroke-related impairments and functional status

☐ AlphaFIM® should be completed on day 3

☐ LOS of 5 days for ischemic stroke patients (recommended)

☐ Manage all risks factors for cerebrovascular disease aggressively through pharmacological and nonpharmacological means

☐ Statin drug should be prescribed to most ischemic stroke patients
- to achieve LDL cholesterol < 2.0 mmol/L or a 50% reduction in LDL cholesterol from baseline

Stroke patients with diabetes:

☐ Diabetes assessed and optimally managed:

☐ HbA1c should be measured as part of a comprehensive stroke assessment
- Although glycemic targets must be individualized, most patients with type 1 or type 2 diabetes should be treated to achieve HbA1c ≤ 7.0%
- To achieve HbA1c ≤ 7.0%, patients should aim for fasting plasma glucose or preprandial plasma glucose of 4.0–7.0 mmol/L
- If 2-hour postprandial HbA1c of 5.0–10.0 mmol/L cannot be achieved, further postprandial blood glucose lowering, to 5.0–8.0 mmol/L, can be considered

☐ Low dose ASA therapy (81–325 mg/day) recommended, unless contraindicated

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Stroke QBP Admission Checklist	ACTION

Care Module 4A: Acute Inpatient Admission of Ischemic Stroke Patient Continued…

☐ Assess for risk of developing venous thromboembolism

Patients at high risk include those who:

- ☐ are unable to move one or both lower limbs
- ☐ are unable to mobilize independently
- ☐ have a previous history of venous thromboembolism
- ☐ are dehydrated
- ☐ have comorbidities e.g., malignant disease

☐ Encourage early mobilization and adequate hydration to help prevent venous thromboembolism

Stroke patients at high risk of venous thromboembolism:

- ☐ Start on venous thromboembolism prophylaxis immediately:
  - ☐ low molecular weight heparin should be considered for patients with acute ischemic stroke
  - ☐ unfractionated heparin should be considered for patients with renal failure
  - The use of antiembolic (compression) stockings for post stroke venous thrombo-embolism prophylaxis alone is not recommended

☐ Evaluated temperature as part of routine vital signs every 4 hours for first 48 hours

If temperature > 37.5°C:

- ☐ increase frequency of monitoring
- ☐ initiate temperature-reducing measures
- ☐ investigate potential infection, and
- ☐ initiate antipyretic and antimicrobial therapy as required

☐ Screened for urinary incontinence and retention, fecal incontinence, and constipation

- a portable ultrasound is the preferred non-invasive painless method for assessing postvoid residual urine volume
- indwelling catheters should be avoided due to the risk of urinary tract infection
- If used, indwelling catheters should be assessed daily and removed as soon as possible
- a bladder-training program should be implemented in patients who are incontinent of urine, and should include timed and prompted toileting on a consistent schedule
- a bowel management program should be implemented with persistent constipation or bowel incontinence

☐ Screen nutrition and hydration status of stroke patients within the first 48 hours of admission using a valid screening tool.

Stroke patients with nutritional concerns, hydration deficits, dysphagia, or other comorbidities:

- ☐ Refer to a dietitian
- Referral to a dietitian should be made within 7 days of admission for recommendations and consideration of enteral nutrition support for those patients who are unable to meet nutritional and fluid requirements.

☐ Complete oral/dental assessment including screening for signs of dental disease, level of oral care, and appliances

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Stroke QBP Admission Checklist	ACTION

Care Module 4A: Acute Inpatient Admission of Ischemic Stroke Patient Continued…

☐ Initiate an appropriate oral care protocol for every patient including those who use dentures.
- The oral care protocol should be consistent with the Canadian Dental Association recommendations and should include:
  - frequency of oral care (≥ twice/day)
  - initiate temperature-reducing measures
  - investigate potential infection, and
  - initiate antipyretic and antimicrobial therapy as required

☐ Screen at admission for risk of falls by an experienced clinician
- A falls risk assessment should include comprehensive interprofessional assessment of medical functional history and examination of mobility, vision, perception, cognition, and cardiovascular status.

☐ Based on assessment, implement an individualized fall-prevention strategy

All stroke patients with vascular risk factors and clinically evident stroke should be considered at high risk of vascular cognitive impairment

☐ Screen all high risk patients for cognitive impairment using a validated screening tool
- Screening to investigate a person's cognitive status should address arousal, alertness, attention, orientation, memory, language, agnosia, visuospatial/perceptual function, praxis, and executive functions such as insight, judgment, social cognition, problem- solving, abstract reasoning, initiation, planning, and organization
- The Montreal Cognitive Assessment is considered more sensitive to cognitive impairment than the Mini-Mental Status Exam in patients with vascular cognitive impairment. Its use is recommended when vascular cognitive impairment is suspected

☐ Patients with identified cognitive impairments should receive additional cognitive or neuropsychological assessments to guide management

☐ Screen for depression using a validated tool, especially if there is evidence of depression or mood change noted
☐ All patients with stroke should be screened to determine if they have a history of or risk factors for depression
☐ Patients identified at risk for depression during screening should be referred to a healthcare professional with expertise in diagnosis and management of depression in stroke patients

☐ Prepare patients, families, and caregivers for transitions between care environments through education and training, emotional support, and information related to community services specific to the transition they are undergoing.

☐ Patient and family education should occur at all stages of stroke care

☐ Patients who smoke should be strongly advised to quit immediately and be provided with pharmacological and nonpharmacological means to do so

☐ Discharge planning should be initiated as soon as possible after the patient is admitted to hospital
- Risk factor management should be included in any discharge planning
- Information about discharge issues and possible needs of patients following discharge should be provided to patients and their families and caregivers as soon as possible after admission
- Discharge planning activities should include patients and their family in team meetings and cover discharge and transition care plans, a predischarge needs assessment, caregiver training, postdischarge follow-up plan, and a review of patient and family psychosocial needs

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Stroke QBP Admission Checklist	ACTION

Module 4B Acute Inpatient Admission of Intracerebral Hemorrhage Patients

The care of these patients is identical to that for ischemic stroke patients as outlined in Module 4A except for the following:

- ☐ The recommended length of stay is 7 days
- ☐ There is insufficient evidence on the safety and efficacy of anticoagulant deep vein thrombosis prophylaxis after ICH
- ☐ Antithrombotics and anticoagulants should be avoided for at least 48 hours after onset

Module 5: Admission to Inpatient Rehabilitation

Patients who qualify for inpatient rehabilitation are those with an early AlphaFIM® score of 40–80
Age, availability of a caregiver, severity of cognitive/perceptual needs, severe aphasia/dysphagia, and profound inattention/neglect are other considerations

- ☐ Refer to a specialist rehabilitation team in a geographically defined unit as soon as possible after admission
- ☐ Procedures should enable admission 7 days/week
- ☐ All patients admitted to hospital with acute stroke should have an initial assessment by rehabilitation professionals as soon as possible, preferably within 24-48 hours of admission
  - ☐ The inter-professional rehabilitation team should assess patients within 24 - 48 hours of admission and develop a comprehensive individualized rehabilitation plan that reflects severity of the stroke and the patients needs and goals
  - The inter-professional rehabilitation team should consist of a physician, nurse, physical therapist, OT, S–LP, psychologist, SW, recreation therapist, pharmacist, patient, and family and/or caregivers
  - Recommended staffing ratios for inpatient rehabilitation are:
    - ☐ PT/OT: 1 each per 6 inpatient beds
    - ☐ S–LP: 1:15
- ☐ Clinicians should use standardized valid assessment tools to evaluate the patient's stroke-related impairments
  - ☐ The FIM tool should be used as a standard assessment tool
- ☐ All patients with stroke should begin rehabilitation therapy within an active and complex stimulating environment
  - Rehabilitation should begin as early as possible once medical stability is reached
- ☐ Patients with moderate or severe stroke who are rehabilitation ready and have rehabilitation goals should be given an opportunity to participate in inpatient stroke rehabilitation
- ☐ Stroke patients should receive, through an individualized treatment plan, at least 3 hours of direct task-specific therapy per day by the interprofessional stroke team for at least 5 days per week
  - ☐ Stroke patients should receive the above therapy for at least 6 days a week

Providing a higher intensity of rehabilitation should lead to decreases in patient length of stay

- ☐ Stroke unit teams should conduct at least one formal interprofessional meeting per week at which they
  - identify patient problems
  - set rehabilitation goals
  - monitor patient progress
  - plan post discharge support
- ☐ Patients who fail a swallowing screen or present with features indicating dysphagia or aspiration should receive a full clinical assessment of their swallowing ability by an S–LP

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Stroke QBP Admission Checklist	ACTION

Module 5: Admission to Inpatient Rehabilitation Continued…

- ☐ Therapy to promote motor and physical recovery should be provided according to best practice recommendations
  - ☐ SCORE recommendations for upper and lower limb post-stroke management
- ☐ Patients with stroke as well as their families and caregivers should be prepared for transitions between care environments by being given education, training, emotional support, and information related to community services specific to the transition they are undergoing
- ☐ Patients with stroke and their families should be educated at all stages of stroke care
- ☐ All patients with stroke should be screened using a validated tool to determine if they have a history of or risk factors for depression.
  - ☐ Screening should take place during early rehabilitation and prior to discharge to the community and whenever clinical presentations occur
  - ☐ Patients identified as being at risk of depression during screening should be referred to a health care professional with expertise in diagnosis and management of depression in stroke
- ☐ All patients with stroke should be screened at admission for risk of falls by an experienced clinician
  - ☐ This screening should include comprehensive inter-professional assessment of medical functional history and examination of mobility, vision, perception, cognition, and cardiovascular status
  - ☐ Based on assessment, an individualized fall-prevention strategy should be implemented
- ☐ All stroke patients with vascular risk factors should be considered at high risk of vascular cognitive impairment and should be screened for cognitive impairment using the Montreal Cognitive Assessment.

The Montreal Cognitive Assessment is considered more sensitive to cognitive impairment than the Mini-Mental Status Exam in patients with vascular cognitive impairment.

  - ☐ Patients with identified cognitive impairments should receive additional cognitive or neuropsychological assessments to guide management
- ☐ Discharge planning should be initiated as soon as possible after the patient is admitted to hospital

LOS in rehabilitation is determined by the benchmarks proposed by the OSN stroke reference group for each Rehabilitation Practice Group (RPG) and recommended as:

1100 = LOS 48.9 days
1110 = LOS 41.8 days
1120 = LOS 25.8 days
1130 = LOS 25.2 days
1140 = LOS 14.7 days
1150 = LOS 7.7 days
1160 = LOS 0 days

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Appendix O: Sample Order Set CHECKLISTS – **Stroke Discharge**

PatientOrderSets.com

Stroke QBP Discharge Planning Checklist	ACTION

Care Module 3: Discharged Home / Community Care

☐ Refer to an urgent TIA/Stroke Prevention Clinic or comparable ambulatory care setting

- For rapid diagnostic and medical evaluation, ideally within 48 hours, to initiate secondary stroke prevention therapies
- Access to community-based services is an integral part of providing high quality care for TIA patients in Ontario

TIA patients who present within 48 hours from symptom onset with
fluctuating or crescendo motor or speech symptoms may be considered for admission to hospital

Care Module 6: Early Supported Discharge for Rehabilitation

☐ Refer to outpatient/community rehabilitation interprofessional team

- Early supported discharge and outpatient/community rehabilitation are essential components of best practice stroke care to achieve optimal outcomes and efficiencies
- interprofessional teams provide rehabilitation and educational interventions in the community in the first few days and weeks after discharge from either inpatient acute care or rehabilitation care

Care Module 7: Outpatient/Community Rehabilitation

☐ Refer to interprofessional team

- provides rehabilitation and educational interventions in the first 8 - 12 weeks after discharge from either inpatient acute care or rehabilitation care
- interprofessional teams have been shown to reduce length of stay and essential support to consistent achievement of inpatient care targets

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Appendix O: Sample Order Set CHECKLISTS – COPD Presentation to ER

PatientOrderSets.com

Chronic Obstructive Pulmonary Disease (COPD) QBP Presentation to ED Checklist	ACTION

Care Module 1: Patient Presents with suspected COPD

- ☐ Check vital signs, including:
  - ☐ Assess for hypoventiliation
  - ☐ Check level of consciousness / cognition
  - ☐ Pulse oximetry – check blood saturation level
  - ☐ Assess whether patient has purulent sputum
- ☐ Physical examination
- ☐ Check patient history
- ☐ Document and reconcile medications currently used by patient
- ☐ Chest X-ray:
  - ☐ Posteroanterior and lateral
  - ☐ Portable x-ray for patients that are too unwell to leave emergency department
  - ☐ Expiratory view when concerned with pneumothorax
- ☐ Baseline blood work
  - ☐ Complete blood count
  - ☐ Electrolytes
  - ☐ Creatinine
  - ☐ Blood urea nitrogen (if available)
- ☐ Electrocardiogram
  - check for arrhythmias, myocardial ischemia, right ventricular strain etc.

If low oxygen saturation on oximetry and/or acute respiratory failure suspected:

- ☐ Check arterial blood gases where appropriate

If suspected pneumonia or sepsis:

- ☐ Draw blood cultures

- ☐ Cardiac markers, if appropriate
  - suspected cardiac disorders
- ☐ Identify patient wishes with respect to goals of care and/or limitations of treatment – i.e. code status
- ☐ Spirometry
  - need not be performed during the initial assessment of an exacerbation
  - should be performed once the patient has stabilized, if patient has no prior objective documentation of COPD through spirometry
- ☐ Other diagnostic interventions as appropriate to identify / rule out other suspected diagnoses or co-morbidities
  - it is expected that additional diagnostic interventions may be required and based on clinical assessment
  - may depend more on individual hospitals' standard ED processes rather than COPD - specific guidelines

Clinical Assessment Node 1: Assess level of care required

- ☐ The decision to admit relies largely on clinical judgment and availability of local resources
  - use the NICE and/or GOLD criteria as a guide
- ☐ Trial immediate resuscitation on initial presentation at the ED, with re-evaluation for admission following this

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Appendix O: Sample Order Set CHECKLISTS – COPD Admission

PatientOrderSets.com

Chronic Obstructive Pulmonary Disease (COPD) QBP Admission Checklist	ACTION

Care Module 2: Usual Medical Care

☐ Short-acting bronchodilators are effective for treating an exacerbation:
- ☐ Beta-2 agonists are recommended
- ☐ Ensure continuous supervision of the patient during delivery
- ☐ Metered dose inhalers with spacers are the preferred delivery vehicle
- ☐ Nebulizers should be considered second line treatment due to infection risk

If patient is already on long-acting anticholinergics:
- ☐ Continue to administer in combination with Beta-2 agonists

There is little evidence to support the benefits of adding short-acting anticholinergics to long-acting anticholinergics

☐ Corticosteroids are effective except for only very mild exacerbations, or if contraindicated

Specific cautions and/or contraindications include:
- Frequency of use (dependence or chronic use)
- Chronic obstructive pulmonary disease
- Diabetes
- Osteoporosis
- Avascular necrosis

- ☐ Prednisone 30 – 50 mg / day or Equivalent 10 – 14 day course of therapy
  - ☐ IV methylprednisolone 40 mg if oral route unavailable
- ☐ Manage corticosteroid-induced side effects

☐ Antibiotics should be used for indications of infection (e.g. purulent or high volume sputum)
- Oral antibiotics are preferred
- Intravenous antibiotics should be considered a 2nd line therapy used only when oral antibiotics are contraindicated (e.g. GI issues)

Refer to Canadian Thoracic Society antibiotic treatment recommendations
Refer to institution-specific antimicrobial stewardship policies

☐ Theophylline not recommended - only if patient is already receiving theophylline; if so, check levels
☐ Deliver oxygen to maintain target oxygen saturation of 90%
☐ Initiate bronchopulmonary (lung) hygiene physical therapy to clear mucus and secretion from the airway
☐ Use early ambulation therapy
☐ Begin discharge planning, including referral to pulmonary rehabilitation

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Chronic Obstructive Pulmonary Disease (COPD)
QBP Admission Checklist

ACTION

Clinical Assessment Node 2: Decision on Ventilation or palliative care

- ☐ Seek patient preferences for ventilation therapy before proceeding to ventilation interventions
- ☐ If ventilation is not desired, proceed to palliative care management of the patient
- ☐ Noninvasive positive pressure ventilation (NPPV) should be considered as part of first line treatment for patients with acute respiratory failure and pH < 7.35
- ☐ NPPV should be trialed before proceeding to invasive ventilation (IV) for all patients with indications for ventilation, including severe patients (pH < 7.20), unless contraindications are present (including respiratory or cardiac arrest, loss of consciousness, craniofacial trauma, hemodynamic instability, impaired mental status)

Where patients have expressed preferences against intubation:

- ☐ NPPV can be considered but ensure that therapy does not progress to IV in the case of failure to respond to NPPV

Care Module 3: Non-invasive ventilation

- ☐ Ensure continuous cardiopulmonary monitoring of patients receiving NPPV
- ☐ Specialized respiratory teams and/or units are likely to be more effective in delivering NPPV

Care Module 4: Invasive Ventilation/weaning from invasive ventilation

- ☐ Use NPPV to help wean patients from IV when they fail spontaneous breathing tests
- ☐ There may be a volume-outcome relationship at the hospital level associated with effectiveness of IV

Care Module 5: Clinical Assessment of Stabilized Patient

- ☐ Spirometry should be performed on the stabilized patient before discharge arranged for following discharge
- ☐ In addition to classification of airflow limitation, assess for symptom severity and other risk factors (e.g. comorbidities), considering tools such as the MRC dyspnea scale, CAT / BODE / LACE indices

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Appendix O: Sample Order Set CHECKLISTS – COPD Discharge

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Chronic Obstructive Pulmonary Disease (COPD) QBP Discharge Planning Checklist	ACTION

Care Module 6: Discharge Planning

- ☐ Full clinical assessment on suspected COPD patient once their condition stabilizes, before they are discharged
- ☐ Individualized discharge plan provided to the patient
- ☐ (Re-)establish patient on their long-term COPD maintenance bronchodilator therapy before discharge, including continuing or resuming use of handheld inhalers
- ☐ Review and reconcile patient's full range of medications before discharge
  - Ensure that patient understands their medication therapy, including when to stop corticosteroids if prescribed
- ☐ Assess the patient's inhaler technique before discharge
- ☐ Consider developing an action plan with the patient, including:
  - Identified patient responsibilities for their ongoing care
  - Instructions for seeking help for future acute exacerbations

Patients that do not have up-to-date influenza (annual) or pneumococcal vaccinations, unless there are contraindications:

- ☐ Vaccinate before discharge

OR

- ☐ Refer for vaccination following discharge

All patients that qualify for home oxygen:

- ☐ Discharge on home oxygen

COPD patients with functional disabilities (e.g. shortness of breath when walking):

- ☐ Begin therapy in an evidence-based pulmonary rehabilitation program within 1 month following hospital discharge

COPD patients who smoke:

- ☐ Refer to intensive smoking cessation counseling (including appropriate pharmacotherapy) in the outpatient setting
  - May include providing information to patient with contact information / instructions for resources or other guidance
- ☐ Ensure that patient is supported by CCAC with appropriate home care services in the community after discharge
- ☐ Where appropriate, arrange for an assessment of the patient's home or living situation by an occupational therapist following discharge
- ☐ Ensure patient has a follow-up appointment with a primary care provider (PCP), respirologist or internist within 1 - 2 weeks of discharge
  - If the patient does not have a regular PCP, have them connected with one in the community before discharge
  - If there is no PCP available, the patient may need support from hospitalists, specialists or the CCAC
- ☐ Ensure the patient's primary care provider (PCP) and CCAC receives a discharge summary from the hospital
  - including full clinical assessment of the patient, within 48 hours of discharge

In some cases:

- ☐ Direct communication between hospital staff and the PCP and/or CCAC case manager may be necessary

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Appendix O: Sample Order Set CHECKLISTS – CHF Presentation to ER

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CHF QBP Presentation to ED Checklist	ACTION

Clinical Assessment Node: ED risk stratification and responsiveness to diuresis

- ☐ Initial investigations:
  - ☐ serum creatinine and electrolyte levels
  - ☐ troponin measurements
  - ☐ complete blood count
  - ☐ electrocardiogram
  - ☐ chest x-ray and an echocardiogram if no recent echocardiogram is available (class I, level C)
  - ☐ heart rate, blood pressure and oxygen saturation
    - should be measured frequently until the patient is stabilized
- ☐ Classification of CHF patients into one of following groups
  - ☐ **Low-intensity:** These patients can be treated in the ED or in outpatient settings and discharged home without requiring an inpatient admission
  - ☐ **Average-intensity:** These patients require admission to inpatient care with normal nurse-to-patient staffing
  - ☐ **High-intensity:** These patients require ventilation (either non-invasive or invasive ventilation) and/or admission to an intensive care unit with higher nurse-to-patient staffing
- ☐ Identify high risk markers:
  - ☐ respiratory distress
  - ☐ hypoxemia
  - ☐ severity of pulmonary edema
  - ☐ poorly responsive to ED Lasix
  - ☐ hemodynamic compromise
  - ☐ significant arrhythmias
  - ☐ positive troponin
  - ☐ concomitant acute life-threatening directives
- ☐ Determine heart failure risk score
  - e.g. EHMRG risk score assists with clinical decision-making and predicting the 7-day mortality risk of CHF patients

Low-risk patients can be considered for discharge home if:

- They have responded to initial treatment in the ED
- No other considerations exist
  (e.g. advanced-directives, severe dementia, estimated impact of admission on life-expectancy, bed-availability, etc.)

High-risk patients can be considered for admission to a higher-intensity unit:

- Decision to admit is based on clinical judgement and availability of hospital resources

A full review of the evidence is required to determine the essential markers and defined thresholds for the 3 CHF patient groups (high-intensity, average-intensity, and low-intensity).

- ☐ Determine Clinical Pathway for admitted patients based on severity:
  - ☐ High-intensity case-mix-adjusted patient
    - implies that a patient is high-risk enough to necessitate a 1:1 nurse-to-patient ratio
  - ☐ Average-intensity case-mix-adjusted patient
    - implies that a patient is of sufficient low risk to be managed with the usual hospital-ward 1:5 nurse-to-patient ratio

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Appendix O: Sample Order Set CHECKLISTS – CHF Admission

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CHF QBP Admission Checklist	ACTION

Care Module: Acute Stabilization Phase

Acute Stabilization of High-Intensity Patient

- ☐ Mechanical ventilation (Pr = 9.5%)
- ☐ BIPAP (Pr = 25.95%)
- ☐ IV inotropes and/or IV vasodilators (Pr = 17.2%)
- ☐ Diuretic monitoring and management, acute phase
- ☐ Identifying and treating precipitating factors
  - ☐ Echocardiography
  - ☐ Cardiac catheterization
  - ☐ Non-invasive cardiac imaging
- ☐ Evidence-based pharmacotherapy management, acute phase
- ☐ Telemetry
- ☐ Advanced care discussions and directives (Pr = 13.96%)
- ☐ Non-invasive imaging for those who are not ideal candidates for cardiac catheterization
- ☐ Oxygen
- ☐ IV Lasix
- ☐ Ultrafiltration (consider if necessary)
- ☐ Intensive PA monitoring
- ☐ Other (IABP, assistive devices)

Acute Stabilization of Low-Intensity Patient

- ☐ BIPAP (Pr = 4.47%), (consider if appropriate)
- ☐ Telemetry (consider if appropriate and available)
- ☐ Diuretic monitoring and management, acute phase
- ☐ Identifying and treating precipitating factors
  - ☐ Echocardiography (Pr = 50.1%)
  - ☐ Cardiac catheterization (Pr = 3.76%)
  - ☐ Noninvasive cardiac imaging
- ☐ Evidence-based pharmacotherapy management, acute phase
- ☐ Advanced care discussions and directives (Pr =13.8%)
- ☐ DNR (Pr =15.8%)
- ☐ PO Lasix
- ☐ Oxygen (consider if appropriate)
- ☐ IV Lasix (consider if appropriate)
- ☐ Non-invasive imaging for those who are not ideal candidates for cardiac catheterization

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CHF QBP Admission Checklist	ACTION

Care Module: Acute Stabilization Phase Continued…

Diuretic monitoring and management - Acute Phase

- ☐ Recording of:
  - ☐ Daily weights
  - ☐ 6-hour input/output
  - ☐ Salt restriction (2 g/day) (low level of evidence)
  - ☐ Possible fluid restriction (2 L/day)
  - ☐ Electrolytes
  - ☐ Renal function
  - • The frequency of electrolyte and renal function monitoring depends on the dose and administration of Lasix (i.e., higher doses necessitate closer monitoring)
  - • Frequency of laboratory and x-ray follow-up should remain discretionary
- ☐ Chest x-ray
  - • The frequency of chest x-rays depends on the baseline extent of pulmonary edema, a patient's clinical status, and his/her responsiveness to diuretics
- ☐ Diuretic management approaches should take an "early and frequently" approach
  - ☐ Those at higher intensity should receive an intravenous Lasix bolus every 6 to 12 hours or a continuous IV infusion
  - ☐ Those at lower intensity should also begin with IV Lasix daily or BID

Identifying and Treating Precipitating Factors

- ☐ Identify precipitating factors, such as medication and dietary noncompliance

  Two particular prognostic indicators that have been shown to correlate with poorer 30-day outcomes of death or recurrent hospitalization:
  - ☐ presence of myocardial ischemia and/or
  - ☐ worsening of valvular heart disease
    - • either of which would be severe enough to possibly warrant surgical or interventional procedures
- ☐ Evaluation for precipitating factors must also include the application of a risk-stratification process, to help clinicians decide whether the patient should or should not undergo cardiac catheterization.
- ☐ Each patient should be screened for severe valvular heart disease or mechanical heart complications that may have served as a precipitating cause
- ☐ Most patients should be considered for 2D echocardiography for assessment of left ventricular systolic and diastolic function and underlying valvular disease

Should severe valvular heart disease be found:

- ☐ The patient should be considered for cardiac catheterization.
  - • many exceptions may occur, and each patient must be evaluated on a case-by-case basis
- ☐ Document that the patient has been considered for cardiac catheterization or noninvasive cardiac imaging for evaluation of coronary ischemia or valvular abnormality
- ☐ Document that the patient was deemed either an appropriate or an inappropriate candidate, along with the reason
  - • An implementation process will ensure that all providers think about precipitating factors and address the 2 that are most prognostically important

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CHF QBP Admission Checklist	ACTION

Care Module: Acute Stabilization Phase Continued…

Evidence-Based Pharmacotherapy Management, Acute Phase

Patients on ACE inhibitors/ARBs and β-blockers:prior to hospital arrival:

☐ Should continue them during hospitalization

For patients who have been introduced recently to β-blockers and have acute decompensated heart failure associated with the increase:

☐ Consideration should be given to cutting the dose in half if they are in severe pulmonary edema

☐ Discontinuing ACE inhibitors/ARBs and β-blockers discouraged unless the patient is hemodynamically unstable.

For patients not already receiving these evidence-based medications (ACE inhibitors/ARBs and β-blockers):

☐ ACE inhibitors/ARBs should be initiated early if the patient is hemodynamically stable

☐ β-blockers should begin only once patient has been diuresed and is stable from a pulmonary congestion standpoint.

  ☐ For both medications, doses should be started low and titrated slowly

The use of other evidence-based pharmacotherapy (e.g., aldosterone receptor antagonists) should be left to the discretion of the health care provider

Telemetry

☐ Continuous ECG monitoring among patients with acute CHF

Hospitals using telemetry should develop policies identifying patients' eligibility and timing for reassessment

Clinical Assessment Node: Reassessment and Re-evaluation

Reassessment and Re-evaluation: High-Intensity Case-Mix-Adjusted Patient

☐ Re-evaluate underlying and precipitating cause
  ☐ Echocardiography
  ☐ Cardiac catheterization
  ☐ Noninvasive cardiac imaging

☐ Screen for complications (e.g., arrhythmia, urosepsis, chronic obstructive pulmonary disease, renal failure, pneumonia)

☐ Continue management and monitoring as per care pathway

☐ Discuss advanced directives

☐ Withdrawal from therapy

Reassessment and Re-evaluation: Low- Intensity Case-Mix-Adjusted Patient

☐ Re-evaluate underlying and precipitating cause
  ☐ Echocardiography
  ☐ Cardiac catheterization
  ☐ Noninvasive cardiac imaging

☐ Screen for complications (e.g., arrhythmia, urosepsis, chronic obstructive pulmonary disease, renal failure, pneumonia)

☐ Continue management and monitoring as per care pathway

☐ Discuss advanced directives

☐ Withdrawal from therapy

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

Contact Telephone #: _____

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CHF QBP Admission Checklist	ACTION

Care Module: Sub-acute Stabilization Phase

Diuretic Monitoring and Management (Sub-acute Phase)

Diuretic monitoring and management in the sub-acute phase is similar to that of the acute phase

- ☐ Weight and input/output recorded daily
- ☐ Electrolytes and renal function can be monitored daily, every second day, or every third day depending on:
  - the patient's clinical status
  - dose of Lasix
  - responsiveness to therapy
  - prior electrolyte or renal laboratory abnormalities

Early Mobilization

Mobilization depends upon responsiveness to diuresis, and activities such as walking should not be encouraged for patients with severe residual pulmonary congestion or refractory heart failure

- ☐ Early mobilization (new approach to in-hospital heart failure management)
- ☐ The mobilization/activity care map should follow early-mobilization maps for other care pathways (e.g., COPD).
- ☐ Scale activities from sitting up in bed to sitting in a chair with bathroom privileges, to walking
- ☐ Patients should be encouraged to mobilize (with walking) at least once every 6 hours during daytime waking hours

Evidence-Based Pharmacotherapy Management (Sub-acute Phase)

- ☐ Treat with β-blockers (assuming there is no absolute contraindication), and ACE inhibitors/ARBs
- ☐ Nitrates ± vasodilators should be used in patients intolerant of or with contraindications to ACE inhibitors/ARBs
- ☐ Initiate therapy at low doses and titrate slowly

The use of aldosterone receptor antagonists should be left to the discretion of the treating health care providers

Other Heart Failure Management Considerations

- ☐ Continuous positive airway pressure (CPAP) for patients with confirmed sleep apnea and as recommended by a sleep specialist
- ☐ Nitrates can be considered for preload reduction
- ☐ Digoxin can be considered for residual heart failure if symptoms persist despite otherwise optimal therapy
- ☐ Implantable cardioverter defibrillator (ICD)
- ☐ Cardiac resynchronization therapy (CRT)

Patients can be considered for an implantable cardioverter defibrillator (ICD) or cardiac resynchronization therapy (CRT) at the discretion of the treating physician
The decision to insert ICD/CRT devices should occur following optimization of heart failure therapy and reassessment of ejection fraction, unless the patient who requires the ICD presents with ventricular arrhythmia

Practitioner: _____ _____ _____ _____
ID PRINTED NAME YYYY-MM-DD HH:MM SIGNATURE

Contact Telephone #: _____

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CHF QBP Admission Checklist	ACTION

Care Module: Advanced Heart Failure

After reassessment and re-evaluation, a small number of patients (approximately 1.3%) may follow an advanced heart failure pathway

- ☐ Ultrafiltration or dialysis
- ☐ Cardiac resynchronization therapy
- ☐ PCI or CABG
- ☐ Valve repair/replacement
- ☐ Transplantation assessment
- ☐ LVAD
- ☐ Transplantation

Practitioner: _____ _____ _____ _____
ID PRINTED NAME YYYY-MM-DD HH:MM SIGNATURE

Contact Telephone #: _____

Appendix O: Sample Order Set CHECKLISTS – CHF Discharge

PatientOrderSets.com

CHF QBP Discharge Checklist	ACTION

Discharge Planning Module

- ☐ Diuretic monitoring and management
- ☐ Evidence-based pharmacotherapy
- ☐ Other relevant medical therapies
- ☐ Counselling
- ☐ Predischarge functional capacity and mobility assessment
  (e.g., 6MWT, low-level (modified) protocol on a treadmill, cyclometer exercise test)

If patient unable to pass mobilization test:

- ☐ Remain in hospital or discharge under close supervision

- ☐ Predischarge cognitive and social support assessment

***Cognitive assessment should be done by trained staff

- ☐ Physician appointments
  - ☐ General practitioner/family physician identified, and follow-up visit scheduled within 2 weeks of discharge
  - ☐ Transitional care (for patients without a primary care physician)
  - ☐ Ambulatory care specialty follow-up (cardiology or internal medicine) within 2 weeks of discharge

***The Expert Panel recommends that CHF patients discharged from hospital be referred to a specialized community-based heart failure clinic within 2 weeks of discharge

- ☐ Timely documentation
  - ☐ Discharge notes dictated and sent to primary care (and relevant other) provider(s) within 1 week (ideally within 48 to 72 hours of hospital discharge)

Diuretic Monitoring and Management

- ☐ Standing Lasix order
- ☐ Referral to Heart Failure Clinic
- ☐ Daily inputs and outputs
- ☐ Record daily weight

Evidence Based Pharmacotherapy

- ☐ ACE inhibitors/ARBS and β-Blockers unless contraindicated

If cannot tolerate ACE inhibitors/ARBS or contraindicated:

- ☐ Hydralyzine and nitrates as an alternative (if cannot tolerate ACE inhibitors/ARBS or contraindicated)
- ☐ Discretionary use of aldosterone receptor antagonists (use recommended by ESC 2012 guidelines)

Other Relevant Medical Therapies

- ☐ CPAP for patients with confirmed sleep apnea (requires sleep specialist recommendation)
- ☐ Statins and antiplatelets for patients with ischemic heart disease
- ☐ Anticoagulation for patients with atrial fibrillation.

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CHF QBP Discharge Checklist	ACTION

Counselling

***Counselling strategy will likely require multiple in-hospital allied health professionals (e.g., pharmacists, social worker, nursing), and would incur costs.

- ☐ Lifestyle (e.g., smoking)
- ☐ Daily weight
- ☐ Self monitoring
- ☐ Diet (e.g, salt restriction, fluid intake)
- ☐ Physical activity
- ☐ Advanced care directives
- ☐ Medication Management

***Medication reconciliation at discharge should involve the community pharmacist

- ☐ Patient/Family/Caregiver Education:
  - ☐ Symptoms and signs of worsening heart failure
  - ☐ Assess health literacy:

***Adapt education programs based on health literacy/learning disabilities/language

- ☐ Involved multidisciplinary team for transitional care:
  (including family physicians, family health teams, nurses, community pharmacists, OT, SW and dietitians)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

Contact Telephone #: _____

Appendix P: MRSA and VRE Screening and Management Clinical Protocol

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

MRSA and VRE Screening and Management Clinical Protocol	ACTION

Methicillin-resistant Staphylococcus aureus (MRSA) and Vancomycin Resistant Enterococci (VRE)

Patient Population

☒ All admitted patients are to be evaluated to establish if MRSA and VRE specimen screening is required

☒ Eligible for MRSA and VRE specimen screening are patients at increased risk for MRSA/VRE and who have been:

- Who have been diagnosed with a skin or soft tissue infection
- Previously colonized or infected with MRSA or VRE
- Who have been in a health care facility or retirement home within the past 12 months
- Admitted to, or have spent more than 12 continuous hours as a client/patient/resident in any health care facility within the past 12 months
- Who received healthcare outside of Canada in the last 12 months
- With severe underlying illness and a lengthy hospital stay
- Transferred between health care facilities
- Exposed to a unit/area of a health care facility with an MRSA or VRE outbreak
- Identified as at high risk by Infection Prevention and Control Professional(s), Health Department
- Receiving health care services at home
- Living in a communal setting e.g. shelter, halfway house, correctional facility, military facility
- Receiving treatment with an indwelling medical device (e.g. catheter, IV lines)
- Receiving care in an ICU, Transplant unit, Burn unit, Hemodialysis unit
- With a history of injection drug use
- Who are a household contact of person(s) with MRSA
- Who are immunocompromised (e.g. Oncology patient, HIV infection)
- Who belong to a sports team/club
- Who have been recently exposed to antibiotics (e.g. second or third generation cephalosporins)

During outbreaks situations, additional MRSA/VRE specimen screening will be as per recommendations by the Infection Control Practitioner

Implementation Considerations

- MRSA includes: Vancomycin-intermediate Staphylococcus aureus (VISA) or Vancomycin-resistant Staphylococcus aureus (VRSA) strains of MRSA
- If positive MRSA results, routine decolonization therapy is not recommended. Following consultation with Infectious Diseases, the MD may consider decolonization prior to select elective surgeries, or during an MRSA outbreak, or for patients with recurrent MRSA infections (see Methicillin-Resistant Staphylococcus aureus (MRSA) Decolonization Order Set)

Clinical Protocol Orders

utilize hospital protocols for infection prevention and control practices

☒ Assess all patients for risk factors and check patient's electronic record for attributes of a MRSA or VRE 'Precaution Flag'

☒ If an 'MRSA/VRE 'Precaution Flag' or a Risk Factor is identified, or a patient has been become a 'Contact' of an MRSA or VRE Positive roommate, then proceed with the following orders and notify MD

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

09-12 V7

Signature required only if any changes/additions made to clinical protocol

Page 1 of 3

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PATIENT INFORMATION

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MRSA and VRE Screening and Management Clinical Protocol

ACTION

Clinical Protocol Orders Continued…

Precautions

☒ Contact Precautions until admission MRSA/VRE cultures are negative (and any Additional Precautions if ordered)
OR
☒ If known to be colonized or infected with MRSA or VRE or patient is a direct transfer from a facility outside of Canada, initiate Contact Precautions and admit to a single room. If no single room available, cohort with patient with same strain of MRSA (community or hospital acquired)
☒ If history of MRSA/VRE or if patient is a direct transfer from a facility outside of Canada, termination of Contact precautions, single room placement or cohorting and any additional precautions can ONLY occur when authorized by an Infection Control Practitioner
☒ Personal toileting facilities and dedicated supplies/equipment
☒ Follow electronic and chart 'Precaution Flag' processes as per hospital protocol

Consults

☒ Infection Control Practitioner:
- ☒ On admission if patient is known to be colonized or infected with MRSA or VRE
- ☒ On admission if patient is a direct transfer from a facility outside of Canada

OR
- ☒ If positive MRSA/VRE result(s)

Activity

☒ While awaiting admission MRSA/VRE culture results or if results are MRSA/VRE positive:
- ☒ Patient should remain within own room
- ☒ If transport within facility is required, inform receiving department and patient transfer personnel of MRSA status

Lab Investigations

MRSA Investigations

☒ Obtain and send the following specimens on admission, and prior to discharge or transfer:
- ☒ Anterior nares swab for MRSA (1 swab stick)
- ☒ Perianal/perineal or groin swab for MRSA (perianal preferred)
- ☒ Swab all incisions/skin lesions/ulcers/wound/ostomy for MRSA (use separate swabs)
- ☒ Exit site swab of all indwelling devices for MRSA
- ☒ If MRSA contact, do follow-up screening specimens with at least two specimens taken on different days, with one taken a minimum of seven days following the last exposure to MRSA
- ☒ If any 1 swab is positive, then repeat all swabs
- ☒ Notify MD of positive results

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

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PATIENT INFORMATION

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MRSA and VRE Screening and Management Clinical Protocol

ACTION

Clinical Protocol Orders Continued…

Lab Investigations Continued…

VRE Investigations

☒ Obtain and send the following specimens on admission, and prior to discharge or transfer
- ☒ Rectal swab for VRE (stool preferred). If the patient has a colostomy, take the specimen from the colostomy output
- ☒ If VRE contact, do follow-up screening specimens with two specimens taken on different days, with one taken a minimum of seven days following the last exposure to VRE
- ☒ If swab is positive, then repeat
- ☒ Notify MD of positive results

Education

☒ Ensure patient/family teaching about MRSA/VRE is completed

Discharge/Transfer

☒ Notify the receiving facility and of Positive MRSA/VRE status/history of patient
☒ Notify the Family MD of Positive MRSA/VRE status/history of patient

Termination of Clinical Protocol

☒ At discharge

Submitted by: ID | PRINTED NAME | YYYY-MM-DD HH:MM ☐ Read Back (Only for Changes)

Practitioner: ID | PRINTED NAME | YYYY-MM-DD HH:MM | SIGNATURE

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Appendix Q: New Diarrhea, Suspected Clostridium difficile infection (CDI), Possible Melena Stools Clinical Protocol

PatientOrderSets.com

PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

New Diarrhea, Suspected Clostridium difficile Infection (CDI), Possible Melena Stools Clinical Protocol	ACTION

Patient Population

Inclusion Criteria

- New onset of diarrhea
- Has received treatment for Clostridium difficile Infection (CDI) and there is a recurrence of diarrhea
- Suspected melena

Exclusion criteria

- Asymptomatic patient
- Bright red blood in stool
- New onset abdominal pain
- Hemodynamically unstable

Implementation Considerations

Clostridium difficile (C. difficile) is a gram positive bacteria known to cause health-care associated diarrhea. The patient will present with a new onset of diarrhea (e.g. 3 loose/watery bowel movements in a 24 hour period) that is unusual or different from usual pattern and there is no other recognized etiology for diarrhea e.g. laxative use, inflammatory bowel disease or other etiology.

Clinical Protocol Orders

☒ If CDI is diagnosed, ensure communication 'alert' system is in place (electronic and/or paper chart)

Precautions for New Diarrhea and Suspected CDI

☒ In addition to Routine Practices, initiate Contact Precautions at onset of diarrhea (do not wait to initiate precautions prior to confirmation of lab results)
☒ Single room with dedicated toileting facilities if positive for C. difficile (private bathroom or individual commode chair)
☒ If a single room is not available, consult with Infection Prevention and Control Professional to determine patient placement
☒ If CDI is suspected, do not take rectal temperatures (to prevent transmission of C. difficile)
☒ Follow other hospital infection control and environmental management practices (e.g. dedicated supplies/equipment)
☒ Discontinue Contact Precautions only after consultation with Infection Prevention and Control Professional
☒ If there is a strong suspicion of recurrence of CDI after treatment, then re-initiate Contact Precautions

Consults

☒ If stool is positive for C. difficile: Infection Prevention and Control Professional or alternate Infection Control contact

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

New Diarrhea, Suspected Clostridium difficile Infection (CDI), Possible Melena Stools Clinical Protocol	ACTION

Lab Investigations

Suspected CDAD

☒ If a new onset of diarrhea is noted, then send stool for C. difficile cytotoxin assay and notify MD

☒ If first specimen was indeterminate or negative and if patient remains symptomatic or there is a high suspicion of CDI, then repeat Stool for C. difficile cytotoxin assay x 1 and notify MD

☒ Stool C + S

If Positive CDI: ☒ Do not retest if stool is positive for C. difficile

Post CDI Treatment - If patient previously received treatment for CDI

☒ Only retest stool for C.difficile cytotoxin assay if a relapsing episode of diarrhea occurs and CDI is suspected

New and Possible Melena Stools

☒ If new black bowel movement occurs (different from regular bowel movement), send stool for Occult Blood **And** notify MD

Transfers/Discharge

☒ If transferred to another unit or discharged to another facility, ensure communication of CDI status to receiving department and responsible MD

Termination of Clinical Protocol

☒ On discharge

Submitted by: _____ ID _____ PRINTED NAME _____ YYYY-MM-DD HH:MM ☐ Read Back

Practitioner: _____ ID _____ PRINTED NAME _____ YYYY-MM-DD HH:MM _____ SIGNATURE

02-13 V9

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Appendix R: Protocol: Potassium oral dosing

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

Potassium Oral Dosing Clinical Protocol

ACTION

Patient Population

- Patient requiring oral potassium replacement

Clinical Protocol Orders

☒ Creatinine, if not already done
☒ If serum Creatinine greater than 110 µmol/L, check with MD prior to initiating protocol
☒ Goal: To maintain serum Potassium at 4.0 – 5.4 mmol/L
☒ If this clinical protocol is ordered, administer potassium chloride tablet(s) or liquid according to the following:

Potassium Level (mmol/L)	Potassium Chloride Dosage	Repeat Potassium Level	Action
Less than 2.9	Notify MD immediately	As per MD order	Notify MD
3 – 3.4	40 mmol PO/NG	24 hours	
3.5 – 3.9	20 mmol PO/NG	24 hours	
4 – 5.4	None	daily for 2 days, then as per MD	
Greater than 5.5	Hold all potassium	As per MD order	Notify MD

Termination of Clinical Protocol

☒ If Creatinine increases 1.5 times baseline or urine production is less than 0.5 mL/kg/h for 6 hours, hold this clinical protocol and notify MD
☒ On discharge or by MD order

Submitted by: ID | PRINTED NAME | YYYY-MM-DD HH:MM ☐ Read Back (Only for Changes)

Practitioner: ID | PRINTED NAME | YYYY-MM-DD HH:MM | SIGNATURE

07-13 V7

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Appendix S: Indwelling Urinary Catheter (Short Term) Clinical Protocol

PatientOrderSets.com

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

PATIENT INFORMATION

Indwelling Urinary Catheter (Short Term) Clinical Protocol	ACTION

Patient Population

Inclusion Criteria

- Patient with an approved indication and requires an indwelling urinary catheter, or has one in situ

Approved indications for insertion of an indwelling urinary catheter for short term use are 1 or more of the following:

- Close/hourly monitoring of urinary output is required e.g. critically ill patients
- Comfort care during terminal illness
- Continuous bladder irrigation (CBI)
- Obstruction of the urinary tract distal to the bladder e.g. prostate enlargement, significant uterine prolapse
- Perioperative use for selected surgical procedures e.g. planned urologic/prostatic surgery
- Protection of an open wound in the sacral/perineal area from urinary incontinence

Exclusion Criteria

- Urinary retention with contraindications to intermittent catheterization
- Known challenges to insertion of a urinary catheter and/or previously requiring catheterization by an Urologist
- Long term use of an indwelling catheter (more than 30 days) is required

Implementation Considerations

- Indwelling urinary catheters cause hospital acquired urinary tract infection associated with morbidity and mortality

Clinical Protocol Orders

Refer to the hospital Policies/Procedures for insertion and maintenance of an indwelling catheter

☒ If this clinical protocol is ordered for reasons other than approved indications, check MD documentation for reason. If no documentation, consult with MD prior to initiation (incontinence, immobility, convenience are not approved indications)

☒ Assess and document need for continued use of an indwelling urinary catheter against the inclusion and exclusion criteria daily (this includes on admission or transfer) and notify MD daily

☒ Request MD evaluation q3days for alternative management

☒ If there is no approved indication for short term use, notify MD for orders to remove indwelling urinary catheter

☒ If the patient is unable to void 6 hours after the indwelling urinary catheter has been removed, initiate the Intermittent Bladder Catheterization Clinical Protocol

Suspected Urinary Tract Infection

☒ If signs and symptoms of a new urinary tract infection occur e.g. T greater than/equal to 38°C, suprapubic pain, flank pain, delirium not usual for patient, notify MD

And ☒ Change urinary catheter

Then ☒ Urine R + M and Urine C + S

Education

☒ Provide information about indwelling urinary catheter use to the patient or substitute decision maker

Termination of Clinical Protocol

☒ This clinical protocol is discontinued after removal of the indwelling urinary catheter and the patient is voiding **OR** the Intermittent Bladder Catheterization Clinical Protocol is initiated

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

07-13 V6

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Appendix T: Hypoglycemia Management Clinical Protocol

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

Hypoglycemia Management Clinical Protocol	ACTION

Patient Population

- Patient with Diabetes with a Blood Glucose level less than 4 mmol/L [Venous or Capillary Blood Glucose (CBG)]

Clinical Protocol Orders

☒ Initiate the orders below immediately
☒ Notify MD of hypoglycemia episode and request evaluation of patient, glycemic management and IV fluid/nutrition
☒ Hold oral antihyperglycemic agents and/or insulin until condition is stabilized and MD has evaluated

Conscious Patient, Able to Follow Treatment Directions, Exhibits No Swallowing Disorder

Mild to Moderate Hypoglycemia (Blood Glucose 2.8 – 3.9 mmol/L)

☒ carbohydrate 15 – 16 g PO (glucose tabs or sucrose tabs or solution) preferred. Patients taking an alpha-glucosidase inhibitor (acarbose) must use glucose
OR ☒ 175 mL (3/4 cup, 6 ounces) of juice or regular pop (not sugar free or diet pop)
OR ☒ For patient taking an alpha-glucosidase inhibitor (acarbose), 15 mL (1 tablespoon) honey or 1 cup (250 mL, 8 ounces) milk
☒ Repeat CBG in 15 minutes
Then
☒ If CBG level still less than 4 mmol/L, repeat above orders, to a maximum of two times, until result is greater than 4 mmol/L. Notify MD
☒ If CBG remains less than 4 mmol/L after third dose, notify MD and implement orders in 'Patient is NOT able to take oral liquids or solids' (next page)
☒ When CBG is greater than/equal to 4 mmol/L, ensure patient follows treatment with scheduled meal or snack consisting of a serving of carbohydrate and protein e.g. ½ cheese sandwich **OR** 6 crackers and 1 package of cheese

Severe Hypoglycemia (Blood Glucose less than 2.8 mmol/L)

☒ carbohydrate 20 – 21 g PO (glucose tabs or sucrose tabs or solution) preferred. Patients taking an alpha-glucosidase inhibitor (acarbose) must use glucose
OR ☒ 240 mL (1 cup, 8 oz) of juice or regular pop (not sugar free or diet pop)
OR ☒ For patient taking an alpha-glucosidase inhibitor (acarbose), 20 mL (4 teaspoons) honey or 1½ cups (375 mL, 12 ounces) milk
☒ Repeat CBG in 15 minutes
Then If CBG level less than 4 mmol/L, carbohydrate 15 – 16 g PO [glucose tabs or sucrose tabs or solution preferred, for alternate options, refer to 'Mild to Moderate Hypoglycemia (Blood Glucose 2.8 - 3.9 mmol/L)' above]
And repeat CBG in 15 minutes. Notify MD
☒ If CBG level is still less than 4 mmol/L, repeat carbohydrate 15 – 16 g PO **And** repeat CBG in 15 minutes
☒ If CBG remains less than 4 mmol/L after 3 doses of carbohydrate, notify MD and implement orders in 'Patient is NOT able to take oral liquids or solids' (next page)
☒ When CBG is greater than/equal to 4 mmol/L, ensure patient follows treatment with scheduled meal or snack consisting of a serving of carbohydrate and protein e.g. ½ cheese sandwich **OR** 6 crackers and 1 package of cheese

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

Hypoglycemia Management Clinical Protocol

ACTION

Clinical Protocol Orders Continued…

Patient is NOT Able to Take Oral Liquids or Solids

Mild to Moderate Hypoglycemia (Blood Glucose 2.8 – 3.9 mmol/L)

☒ Initiate IV
☒ Dextrose 50% 25 mL IV push over 1-3 minutes
☒ If unable to establish IV, administer glucagon 1 mg Subcutaneous
☒ Notify MD
☒ Repeat CBG in 15 minutes
☒ If CBG remains less than 4 mmol/L, repeat:
  ☒ Dextrose 50% 25 mL IV push over 1-3 minutes
  OR
  ☒ glucagon 1 mg Subcutaneous
☒ Repeat CBG in 15 minutes
Then ☒ If CBG remains less than 4 mmol/L, notify MD STAT and request further treatment orders
  OR
  ☒ If patient is not able to eat, request further orders from MD
☒ When CBG is greater than/equal to 4 mmol/L, and patient is alert, patient must follow treatment with a scheduled meal or a snack consisting of a serving of carbohydrate and protein e.g. ½ cheese sandwich **OR** 6 crackers and 1 package of cheese

Severe Hypoglycemia (Blood Glucose less than 2.8 mmol/L)

☒ If IV in situ: Dextrose 50% 50 mL IV push over 1-3 minutes
☒ If no IV in situ, administer glucagon 1 mg Subcutaneous
☒ Notify MD
☒ Repeat CBG in 15 minutes
☒ If CBG remains less than 4 mmol/L, repeat:
  ☒ Dextrose 50% 50 mL IV push over 1-3 minutes
  OR
  ☒ glucagon 1 mg Subcutaneous
☒ Repeat CBG in 15 minutes
Then ☒ If CBG remains less than 4 mmol/L, notify MD STAT and request further treatment orders
  OR
  ☒ If patient is not able to eat, request further orders from MD
☒ When CBG is greater than/equal to 4 mmol/L, and patient is alert, patient must follow treatment with a scheduled meal or a snack consisting of a serving of carbohydrate and protein e.g. ½ cheese sandwich **OR** 6 crackers and 1package of cheese

Termination of Clinical Protocol

☒ On discharge

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

07-13 V6

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Appendix U: ICU Electrolyte Replacement Clinical Protocol

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

ICU Electrolyte Replacement Clinical Protocol

ACTION

Patient Population

- Patient requiring electrolyte replacement in the ICU/Critical Care Unit

Exclusion

- Diabetic ketoacidosis diagnosed within the last 24 hours

Implementation Considerations

- Where different administration routes are available, the critical care nurse may make the decision for the route as per this Clinical Protocol
- Correction of low magnesium will support correction of low calcium and potassium
- All patients will be on telemetry and intake and output monitoring as per standard care in the ICU/critical care setting

Clinical Protocol Orders

☒ If any of the following occur, notify MD and discuss prior to initiating these clinical protocol orders

- Serum Creatinine increases 1.5 times baseline
- Urine production is less than 0.5 mL/kg/h for 6 hours
- Serum Creatinine greater than 110 µmoL/L and/or Creatinine Clearance less than 50 mL/minute (whichever is lower)

Lab Investigations

☒ Review results daily with MD for additional lab requirements
☒ If any level remains low, despite protocol driven interventions, notify MD
☒ If ventricular ectopy or atrial arrhythmias, draw serum K and Mg and notify MD to rule out pacemaker interference and pulmonary artery catheter position as possible cause for arrhythmias

Calcium Replacement

Ionized Calcium Level (mmol/L)	Calcium Gluconate 10% IV Infusion	Repeat Ionized Calcium Level
Less than 0.85	2 g over 2 hours Notify MD	2 hours after infusion completed Notify MD of result
0.85 – 0.99	2 g over 2 hours	2 hours after infusion completed Notify MD of result
1 – 1.10	1 g over 2 hours	24 hours
Greater than/equal to 1.11	None	Daily for 2 days, then as per MD orders

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

04-13V8

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

ICU Electrolyte Replacement Clinical Protocol

ACTION

Clinical Protocol Orders Continued…

Magnesium Replacement

Magnesium Level (mmol/L)	Magnesium Glucoheptonate 100 mg/mL (PO or Enterally)	Magnesium Sulphate (IV Peripheral or Central)	Repeat Magnesium Level
Less than 0.30	Follow IV peripheral or central order	4 g over 4 hours Notify MD	12 hours
0.3 – 0.49	Follow IV peripheral or central order	3 g over 3 hours	12 hours
0.5 – 0.69	30 mL q8h **OR**	2 g over 2 hours	24 hours
0.7 – 0.79	30 mL q12h	Follow PO order	24 hours
Greater than/equal to 0.80	None	None	daily for 2 days, then as per MD orders

Phosphate Replacement

Phosphate Level (mmol/L)	Phosphate Effervescent Tab (PO or Enterally)	Sodium Phosphate (IV Peripheral or Central)	Repeat Phosphate Level
Less than 0.50	Follow IV peripheral or central order	30 mmol over 4 hours Notify MD	12 hours
0.5 – 0.64	1,000 mg q8h for 3 doses **OR**	15 mmol over 2 hours	24 hours
0.65 – 0.79	500 mg q8h for 3 doses	Follow PO order	24 hours
Greater than/equal to 0.80	None	None	daily for 2 days, then as per MD orders

Submitted by: _____ ID _____ PRINTED NAME _____ YYYY-MM-DD HH:MM ☐ Read Back (Only for Changes)

Practitioner: _____ ID _____ PRINTED NAME _____ YYYY-MM-DD HH:MM _____ SIGNATURE

04-13V8

Signature required only if any changes/additions made to clinical protocol

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

ICU Electrolyte Replacement Clinical Protocol

ACTION

Clinical Protocol Orders Continued…

Potassium Replacement

☒ If potassium level greater than/equal to 5.5 mmol/L, hold all potassium (including all KCl in maintenance IV). Notify MD

Potassium Level (mmol/L)	Potassium Chloride Liquid (PO or Enterally)	IV		Repeat Potassium Level
		Peripheral Line	Central Line	
		IV Potassium Chloride Supplementation (max rate 20 mmol in 1 hour)	IV Potassium Chloride Supplementation (max rate 40 mmol in 1 hour)	
Less than 2.5	Notify MD and start IV replacement	Notify MD and start 20 mmol in 100 mL Sterile Water IV infusion over 1 hour for 3 doses (Total dose = 60 mmol over 3 hours)	Notify MD and start 20 mmol in 100 mL Sterile Water IV infusion over 30 minutes for 3 doses (Total dose = 60 mmol over 90 minutes)	2 hours after infusions are complete
2.5 – 2.9	Notify MD and start IV replacement	20 mmol in 100 mL Sterile Water IV infusion over 1 hour for 3 doses (Total dose = 60 mmol over 3 hours)	20 mmol in 100 mL Sterile Water IV infusion over 30 minutes for 3 doses (Total dose = 60 mmol over 90 minutes)	If IV: 2 hours after infusions are complete
3 – 3.4	40 mmol	20 mmol in 100 mL Sterile Water IV Infusion over 1 hour for 2 doses (Total dose = 40 mmol over 2 hours)	20 mmol in 100 mL Sterile Water IV infusion over 30 minutes for 2 doses (Total dose = 40 mmol over 1 hour)	If IV given: 2 hours after infusions are complete **OR** If PO given: 24 hours
3.5 – 3.9	20 mmol	20 mmol in 100 mL Sterile Water IV infusion over 1 hour for 1 dose	20 mmol in 100 mL Sterile Water IV infusion over 30 minutes for 1 dose	If IV given: 2 hours after infusion is complete **OR** If PO given: 24 hours
4 – 5.4	None	None	None	Daily for 2 days, then as per MD

Termination of Clinical Protocol

☒ If Creatinine increases 1.5 times baseline or urine production is less than 0.5 mL/kg/h for 6 hours, hold this Clinical Protocol and notify MD

☒ When patient is transferred out from ICU/Critical Care Unit, discontinue this Clinical Protocol

Submitted by: _____ ID _____ PRINTED NAME _____ YYYY-MM-DD HH:MM ☐ Read Back (Only for Changes)

Practitioner: _____ ID _____ PRINTED NAME _____ YYYY-MM-DD HH:MM _____ SIGNATURE

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Signature required only if any changes/additions made to clinical protocol

Appendix V: Nicotine Replacement Therapy In-patient Clinical Protocol

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PATIENT INFORMATION

Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

Nicotine Replacement Therapy In-patient Clinical Protocol	ACTION

Patient Population

- Patients who would like to receive nicotine replacement therapy while in hospital

Implementation Considerations

- Patient agrees to initiate nicotine replacement therapy
- Withdrawal from smoking symptoms include craving to smoke, irritability, frustration, anger, anxiety, difficulty concentrating or restlessness not accounted for by other physical or mental health condition

Clinical Protocol Orders

Nicotine Patch

☒ Prior to applying a new nicotine patch, remove previous nicotine patch

☒ If patient smokes greater than/equal to 10 cigarettes in 24 hours, nicotine patch 21 mg topically daily for 6 weeks
Then nicotine patch 14 mg topically daily for 2 weeks
Then nicotine patch 7 mg topically daily for 2 weeks

☒ If patient smokes less than 10 cigarettes in 24 hours, **OR** has cardiovascular disease **OR** weighs less than 45 kg, nicotine patch 14 mg topically daily for 6 weeks
Then nicotine patch 7 mg topically daily for 2 weeks

Management of Nicotine Replacement Therapy Side Effects and Withdrawal

☒ If sleep disturbance is experienced, may remove patch prior to bedtime

☒ If patient complains of withdrawal symptoms or continues to smoke, request MD to reassess for alternative or combination therapy and refer MD to Smoking Cessation Pharmacologic Aids In-patient Order Set

Patient Education

☒ Provide patient with smoking cessation educational materials

Termination of Clinical Protocol

☒ On discharge or by MD order

Submitted by: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) ☐ Read Back (Only for Changes)

Practitioner: _____ (ID) _____ (PRINTED NAME) _____ (YYYY-MM-DD HH:MM) _____ (SIGNATURE)

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Signature required only if any changes/additions made to clinical protocol

Page 1 of 1

Appendix W: Guidelines & Standards: GOLD staging criteria for COPD

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GOLD Staging Criteria for COPD

Stage	Severity	FEV1/FVC	FEV1	Symptoms
I	Mild	Less than 0.70	Greater than or equal to 80 percent predicted	Symptoms may or may not be present. Possible Symptoms include chronic cough and sputum production.
II	Moderate	Less than 0.70	Equal to 50% or between 50% and 80% predicted	Shortness of breath on exertion. Cough and sputum production are sometimes present.
III	Severe	Less than 0.70	Equal to 30% or between 30% and 50% predicted	Greater shortness of breath, reduced exercise capacity, fatigue, and repeated exacerbations.
IV	Very Severe	Less than 0.70	Less than 30% predicted or less then 50% predicted plus chronic respiratory failure	Respiratory failure, which may also lead to cor pulmonate.

Abbreviations: COPD, chronic obstructive pulmonary disease; FEV, forced expiratory voume in 1 second; FVC, forced vital capacity

Appendix X: Guidelines & Standards: GOLD decision guidelines for hospital admission

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GOLD Decision Guidelines for Hospital Admissions

Potential indications for hospital admission

Local resources need to be considered

- Marked increase in intensity of symptoms, such as sudden development of resting dyspnea
- Severe underlying COPD
- Onset of new physical signs (e.g., cyanosis, peripheral edema)
- Failure of an exacerbation to respond to initial medical management
- Presence of serious comorbidities (e.g., heart failure or newly occurring arrhythmias)
- Frequent exacerbations
- Older age
- Insufficient home support

Appendix Y: Guidelines & Standards: NICE decision guidelines for hospital admission

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NICE Decision Guidelines for Hospital Admission

Factors to Consider When Deciding Where to Manage Exacerbations (Take patient preference into account)		
	Treat at home?	**Treat in hospital?**
Able to cope at home	☐ Yes	☐ No
Breathlessness	☐ Mild	☐ Severe
General Condition	☐ Good	☐ Poor/ deteriorating
Level of activity	☐ No	☐ Yes
Cyanosis	☐ Normal	☐ Impaired
Worsening peripheral oedema	☐ No	☐ Yes
Level of consciousness	☐ Normal	☐ Impaired
Already receiving LTOT	☐ No	☐ Yes
Social circumstances	☐ Good	☐ Living alone/ not coping
Acute confusion	☐ No	☐ Yes
Rapid rate of onset	☐ No	☐ Yes
Significant comorbidity (particularly cardiac disease and insulin dependent diabetes) SaO_2 less than 90%	☐ No	☐ Yes
Change on chest X-ray	☐ No	☐ Present
Arterial pH level	☐ Greater than or equal to 7.35	☐ Less than 7.35

Appendix Z: Guidelines & Standards: Decision on ventilation or palliative car

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Severe AECOPD Episode of Care Ventilation Decision Support

Determine Patient Preferences QBP

- If possible, determine patient preferences for ventilation therapy before proceeding to ventilation interventions
- If the patient's preferences are not currently documented, education and non-judgemental information regarding treatment options and impact on quality of life should be offered. See 'Considerations for Initiation of Palliative Care Management' below
- If the patient does not want to receive noninvasive or invasive ventilation, palliative care management should be initiated

Considerations for Ventilation QBP

- Noninvasive positive pressure ventilation (NPPV) should be considered as part of first line treatment for patients with acute respiratory failure and pH < 7.35
- NPPV should be trialed before proceeding to invasive ventilation (IV) for all patients with indications for ventilation, including severe patients (pH < 7.20), unless contraindications are present (including respiratory or cardiac arrest, loss of consciousness, craniofacial trauma, hemodynamic instability, impaired mental status)
- Where patients have expressed preferences against intubation, NPPV can still be considered but ensure that therapy does not progress to IV in the case of failure to respond to NPPV
- Initiation of invasive ventilation should be a secondary approach when Noninvasive Positive Pressure Ventilation (NPPV) is contraindicated or was trialed and failed, even in severe acidosis (pH < 7.20)

NPPV QBP	Invasive Ventilation QBP
Indications • Acute respiratory failure • Respiratory acidosis (pH < 7.35 and/or $PaCO_2$ 6.0 kPa, 45 mmHg) • Severe dyspnea with clinical signs suggestive of respiratory muscle fatigue, increased work of breathing, or both, such as use of respiratory accessory muscles, paradoxical motion of the abdomen, or retraction of the intercostal spaces **Contraindications** • Respiratory arrest • Cardiac arrest • Loss of consciousness • Craniofacial trauma • Hemodynamic instability • Impaired mental status **Implementation** • May be appropriate for home mechanical ventilation	**Indications** • NPPV not tolerated or failure • Contraindications for NPPV • Respiratory or cardiac arrest • Decreased level of consciousness, psychomotor agitation which is inadequately controlled by sedation • Massive aspiration • Persistent inability to remove respiratory secretions • Heart rate < 50 beats/minute with loss of alertness • Severe hemodynamic instability without response to fluids and vasoactive drugs • Severe ventricular arrhythmias • Life-threatening hypoxemia in patients unable to tolerate NPPV **Contraindications** • Patient expressed preference against invasive ventilation **Implementation** • Use NPPV to wean patients from invasive ventilation when they fail spontaneous breathing test(s)

Noninvasive Ventilation QBP

- Ensure continuous monitoring of patient receiving NPPV
- Specialized respiratory teams and/or units are likely to be more effective in delivering NPPV
  - While some hospitals provide noninvasive ventilation in a dedicated respiratory or general medical ward, others only provide it in Intensive Care Units—as well as access to pulmonary rehabilitation, which is not available in many communities

Invasive Ventilation / Weaning from Invasive Ventilation QBP

- Use NPPV to help wean patients from IV when they fail spontaneous breathing tests. There may be a volume-outcome relationship at the hospital level associated with effectiveness of invasive ventilation

Reference: Health Quality Ontario, & Ministry of Health and Long-Term Care. (2013). Quality-Based Procedures: *Clinical Handbook for Chronic Obstructive Pulmonary Disease.* 1-60.

07-2013

Appendix AA: Guidelines & Standards: Canadian Thoracic Society antibiotic treatment recommendations

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1

Canadian Thoracic Society Antibiotic Treatment Recommendations

Group	Probable Pathogens	First Choice	Alternatives for Treatment failure
I, Simple Smokers FEV1 > 50% ≤ 3 exacerbations per year	H. influenzae M. catarrhalis S. pneumoniae	Amoxicillin, 2nd or 3rd generation cephalosporin, doxycycline, extended spectrum macrolide, trimethoprimsulfamethoxazole (in alphabetical order).	Fluoroquinolone β-lact/ β-lactamase inhibitor.
II, Complicated, as per I, plus at least one of the following should be present: FEV1<50% predicted; ≥4 exacerbations/ year; ischemic heart disease; use home oxygen or chronic oral steroids; antibiotic use in the past 3 months.	As in group I, plus: Klebsiella spp. and other Gram-negative bacteria Increased probability of β-lactam resistance.	Fluoroquinolone β-lact/ β-lactamase inhibitor (in order of preference).	May require parenteral therapy. Consider referral to a specialist or hospital.
III, Chronic Suppurative II, plus: Constant purulent sputum; some have bronchiectasis; FEV1 usually <35% predicted; chronic oral steroid use; multiple risk factors	As in group II, plus: P. Aeruginosa and multi-resistant Enterobacteriaceae .	Ambulatory - tailor treatment to airway pathogen; P. Aeruginosa is common (ciprofloxacin) Hospitalized - parenteral therapy usually required.	

Source: Canadian Thoracic Society Action Plan 2012

MM-YYYY

Appendix AB: TALLman letter guidelines

ISMP Institute for Safe Medication Practices

FDA and ISMP Lists of *Look-Alike Drug Names with Recommended Tall Man Letters*

The look-alike drug names in the Tables that follow have been modified using tall man (mixed case) letters to help draw attention to the dissimilarities in their names. Several studies have shown that highlighting sections of drug names using tall man letters can help distinguish similar drug names,[1] making them less prone to mix-ups.[2-3] ISMP, FDA, The Joint Commission, and other safety-conscious organizations have promoted the use of tall man letters as one means of reducing confusion between similar drug names.

Table 1 provides an alphabetized list of FDA-approved established drug names with recommended tall man letters, which were first identified during the FDA Name Differentiation Project (www.fda.gov/Drugs/DrugSafety/MedicationErrors/ucm164587.htm).

Table 2 provides an alphabetized list of additional drug names with recommendations from ISMP regarding the use and placement of tall man letters. This is not an official list approved by FDA. It is intended for voluntary use by healthcare practitioners and drug information vendors. Any product label changes by manufacturers require FDA approval.

One of the difficulties with the use of tall man letters includes inconsistent application in health settings and lack of standardization regarding which letters to present in uppercase. A new study by Gerrett[4] describes several ways to determine which of the dissimilar letters in each drug name should be highlighted. To promote standardization, ISMP followed one of these tested methodologies whenever possible. Called the CD3 rule, the methodology suggests working from the left of the word first by capitalizing all the characters to the right once two or more dissimilar letters are encountered, and then, working from the right of the word back, returning two or more letters common to both words to lowercase letters. When the rule cannot be applied because there are no common letters on the right side of the word, the methodology suggests capitalizing the central part of the word only. ISMP suggests that the tall man lettering scheme provided in Tables 1 and 2 be followed when presenting these drug names to healthcare providers to promote consistency. At this time, scientific studies do not support the use of tall man letters when presenting drug names to patients.

References: 1) Filik R, Purdy K, Gale A, Gerrett D. Drug name confusion: evaluating the effectiveness of capital ("Tall Man") letters using eye movement data. *Social Science & Medicine* 2004;59(12):2597-2601. **2)** Filik R, Purdy K, Gale A, Gerrett D. Labeling of medicines and patient safety: evaluating methods of reducing drug name confusion. *Human Factors* 2006;48(1):39-47. **3)** Grasha A. Cognitive systems perspective on human performance in the pharmacy: implications for accuracy, effectiveness, and job satisfaction. Alexandria (VA): NACDS; 2000 Report No. 062100. **4)** Gerrett D, Gale AG, Darker IT, Filik R, Purdy KJ. Tall man lettering. Final report of the use of tall man lettering to minimize selection errors of medicine names in computer prescribing and dispensing systems. Loughborough University Enterprises Ltd.; 2009 (www.connectingforhealth.nhs.uk/systemsandservices/eprescribing/refdocs/tallman.pdf).

Table 1. FDA-Approved List of Generic Drug Names with Tall Man Letters

Drug Name with Tall Man Letters	Confused with
acetaZOLAMIDE	acetoHEXAMIDE
acetoHEXAMIDE	acetaZOLAMIDE
buPROPion	busPIRone
busPIRone	buPROPion
chlorproMAZINE	chlorproPAMIDE
chlorproPAMIDE	chlorproMAZINE
clomiPHENE	clomiPRAMINE
clomiPRAMINE	clomiPHENE
cycloSERINE	cycloSPORINE
cycloSPORINE	cycloSERINE
DAUNOrubicin	DOXOrubicin
dimenhyDRINATE	diphenhydrAMINE
diphenhydrAMINE	dimenhyDRINATE
DOBUTamine	DOPamine
DOPamine	DOBUTamine

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FDA and ISMP Lists of *Look-Alike Drug Names with Recommended Tall Man Letters (continued)*

Table 1. FDA-Approved List of Generic Drug Names with Tall Man Letters (continued)

Drug Name with Tall Man Letters	Confused with
DOXOrubicin	**DAUNO**rubicin
glipi**ZIDE**	gly**BURIDE**
gly**BURIDE**	glipi**ZIDE**
hydr**ALAZINE**	hydr**OXY**zine
hydr**OXY**zine	hydr**ALAZINE**
medroxy**PROGESTER**one	methyl**PREDNIS**olone - methyl**TESTOSTER**one
methyl**PREDNIS**olone	medroxy**PROGESTER**one - methyl**TESTOSTER**one
methyl**TESTOSTER**one	medroxy**PROGESTER**one - methyl**PREDNIS**olone
ni**CAR**dipine	**NIFE**dipine
NIFEdipine	ni**CAR**dipine
predniso**LONE**	predni**SONE**
predni**SONE**	predniso**LONE**
sulf**ADIAZINE**	sulfi**SOXAZOLE**
sulfi**SOXAZOLE**	sulf**ADIAZINE**
TOLAZamide	**TOLBUT**amide
TOLBUTamide	**TOLAZ**amide
vin**BLAS**tine	vin**CRIS**tine
vin**CRIS**tine	vin**BLAS**tine

Table 2. ISMP List of Additional Drug Names with Tall Man Letters

Drug Name with Tall Man Letters	Confused with
ALPRAZolam	**LOR**azepam
a**MIL**oride	am**LODIP**ine
am**LODIP**ine	a**MIL**oride
ARIPiprazole	**RABE**prazole
AVINza*	**INV**anz*
aza**CITID**ine	aza**THIO**prine
aza**THIO**prine	aza**CITID**ine
car**BAM**azepine	**OX**carbazepine
CARBOplatin	**CIS**platin
ce**FAZ**olin	cefo**TE**tan – cef**OX**itin – cef**TAZ**idime – cef**TRIAX**one
cefo**TE**tan	ce**FAZ**olin – cef**OX**itin – cef**TAZ**idime – cef**TRIAX**one
cef**OX**itin	ce**FAZ**olin – cefo**TE**tan – cef**TAZ**idime – cef**TRIAX**one
cef**TAZ**idime	ce**FAZ**olin – cefo**TE**tan – cef**OX**itin – cef**TRIAX**one
cef**TRIAX**one	ce**FAZ**olin - cefo**TE**tan – cef**OX**itin – cef**TAZ**idime
Cele**BREX***	Cele**XA***
Cele**XA***	Cele**BREX***
chlordiaze**POXIDE**	chlorpro**MAZINE**
chlorpro**MAZINE**	chlordiaze**POXIDE**
CISplatin	**CARBO**platin
clonaze**PAM**	clo**NID**ine – clo**ZAP**ine – **LOR**azepam

** Brand names always start with an uppercase letter. Some brand names incorporate tall man letters in initial characters and may not be readily recognized as brand names. An asterisk follows all brand names in Table 2.*

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FDA and ISMP Lists of *Look-Alike Drug Names with Recommended Tall Man Letters (continued)*

Table 2. ISMP List of Additional Drug Names with Tall Man Letters (continued)

Drug Name with Tall Man Letters	Confused with
cloNIDine	clonazePAM – cloZAPine - KlonoPIN*
cloZAPine	clonazePAM - cloNIDine
DACTINomycin	DAPTOmycin
DAPTOmycin	DACTINomycin
DOCEtaxel	PACLitaxel
DOXOrubicin	IDArubicin
DULoxetine	FLUoxetine – PARoxetine
ePHEDrine	EPINEPHrine
EPINEPHrine	ePHEDrine
fentaNYL	SUFentanil
flavoxATE	fluvoxaMINE
FLUoxetine	DULoxetine – PARoxetine
fluPHENAZine	fluvoxaMINE
fluvoxaMINE	fluPHENAZine - flavoxATE
guaiFENesin	guanFACINE
guanFACINE	guaiFENesin
HumaLOG*	HumuLIN*
HumuLIN*	HumaLOG*
HYDROcodone	oxyCODONE
HYDROmorphone	morphine
IDArubicin	DOXOrubicin
inFLIXimab	riTUXimab
INVanz*	AVINza*
ISOtretinoin	tretinoin
KlonoPIN*	cloNIDine
LaMICtal*	LamISIL*
LamISIL*	LaMICtal*
lamiVUDine	lamoTRIgine
lamoTRIgine	lamiVUDine
levETIRAcetam	levOCARNitine
levOCARNitine	levETIRAcetam
LORazepam	ALPRAZolam – clonazePAM
metFORMIN	metroNIDAZOLE
metroNIDAZOLE	metFORMIN
mitoMYcin	mitoXANtrone
mitoXANtrone	mitoMYcin
NexAVAR*	NexIUM*
NexIUM*	NexAVAR*
niCARdipine	niMODipine – NIFEdipine
NIFEdipine	niMODipine – niCARdipine
niMODipine	NIFEdipine – niCARdipine
NovoLIN*	NovoLOG*

** Brand names always start with an uppercase letter. Some brand names incorporate tall man letters in initial characters and may not be readily recognized as brand names. An asterisk follows all brand names in Table 2.*

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FDA and ISMP Lists of *Look-Alike Drug Names with Recommended Tall Man Letters (continued)*

Table 2. ISMP List of Additional Drug Names with Tall Man Letters (continued)

Drug Name with Tall Man Letters	Confused with
Novo**LOG***	Novo**LIN***
OLANZapine	**QUE**tiapine
OXcarbazepine	car**BAM**azepine
oxy**CODONE**	**HYDRO**codone – Oxy**CONTIN***
Oxy**CONTIN***	oxy**CODONE**
PACLitaxel	**DOCE**taxel
PARoxetine	**FLU**oxetine – **DUL**oxetine
PEMEtrexed	**PRALA**trexate
PENTobarbital	**PHEN**obarbital
PHENobarbital	**PENT**obarbital
PRALAtrexate	**PEME**trexed
Pri**LOSEC***	**PRO**zac*
PROzac*	Pri**LOSEC***
QUEtiapine	**OLANZ**apine
qui**NID**ine	qui**NINE**
qui**NINE**	qui**NID**ine
RABEprazole	**ARIP**iprazole
Risper**DAL***	r**OPINIR**ole
risperi**DONE**	r**OPINIR**ole
ri**TUX**imab	in**FLIX**imab
romi**DEP**sin	romi**PLOS**tim
romi**PLOS**tim	romi**DEP**sin
r**OPINIR**ole	Risper**DAL***– risperi**DONE**
Sand**IMMUNE***	Sando**STATIN***
Sando**STATIN***	Sand**IMMUNE***
SEROquel*	**SINE**quan*
SINEquan*	**SERO**quel*
sita**GLIP**tin	**SUMA**triptan
Solu-**CORTEF***	Solu-**MEDROL***
Solu-**MEDROL***	Solu-**CORTEF***
SORAfenib	**SUNI**tinib
SUFentanil	fenta**NYL**
sulf**ADIAZINE**	sulfa**SALA**zine
sulfa**SALA**zine	sulf**ADIAZINE**
SUMAtriptan	sita**GLIP**tin – **ZOLM**itriptan
SUNItinib	**SORA**fenib
TEGretol*	**TREN**tal*
tia**GAB**ine	ti**ZAN**idine
ti**ZAN**idine	tia**GAB**ine
tra**MAD**ol	tra**ZOD**one
tra**ZOD**one	tra**MAD**ol

** Brand names always start with an uppercase letter. Some brand names incorporate tall man letters in initial characters and may not be readily recognized as brand names. An asterisk follows all brand names in Table 2.*

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FDA and ISMP Lists of *Look-Alike Drug Names with Recommended Tall Man Letters (continued)*

Table 2. ISMP List of Additional Drug Names with Tall Man Letters (continued)

Drug Name with Tall Man Letters	Confused with
TRENtal*	TEGretol*
valACYclovir	valGANciclovir
valGANciclovir	valACYclovir
ZOLMitriptan	SUMAtriptan
ZyPREXA*	ZyrTEC*
ZyrTEC*	ZyPREXA*

** Brand names always start with an uppercase letter. Some brand names incorporate tall man letters in initial characters and may not be readily recognized as brand names. An asterisk follows all brand names in Table 2.*

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Appendix AC: ISMP dangerous abbreviations

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ISMP's List of *Error-Prone Abbreviations, Symbols,* and *Dose Designations*

The abbreviations, symbols, and dose designations found in this table have been reported to ISMP through the ISMP National Medication Errors Reporting Program (ISMP MERP) as being frequently misinterpreted and involved in harmful medication errors. They should **NEVER** be used when communicating medical information. This includes internal communications, telephone/verbal prescriptions, computer-generated labels, labels for drug storage bins, medication administration records, as well as pharmacy and prescriber computer order entry screens.

Abbreviations	Intended Meaning	Misinterpretation	Correction
µg	Microgram	Mistaken as "mg"	Use "mcg"
AD, AS, AU	Right ear, left ear, each ear	Mistaken as OD, OS, OU (right eye, left eye, each eye)	Use "right ear," "left ear," or "each ear"
OD, OS, OU	Right eye, left eye, each eye	Mistaken as AD, AS, AU (right ear, left ear, each ear)	Use "right eye," "left eye," or "each eye"
BT	Bedtime	Mistaken as "BID" (twice daily)	Use "bedtime"
cc	Cubic centimeters	Mistaken as "u" (units)	Use "mL"
D/C	Discharge or discontinue	Premature discontinuation of medications if D/C (intended to mean "discharge") has been misinterpreted as "discontinued" when followed by a list of discharge medications	Use "discharge" and "discontinue"
IJ	Injection	Mistaken as "IV" or "intrajugular"	Use "injection"
IN	Intranasal	Mistaken as "IM" or "IV"	Use "intranasal" or "NAS"
HS **hs**	Half-strength At bedtime, hours of sleep	Mistaken as bedtime Mistaken as half-strength	Use "half-strength" or "bedtime"
IU**	International unit	Mistaken as IV (intravenous) or 10 (ten)	Use "units"
o.d. or OD	Once daily	Mistaken as "right eye" (OD-oculus dexter), leading to oral liquid medications administered in the eye	Use "daily"
OJ	Orange juice	Mistaken as OD or OS (right or left eye); drugs meant to be diluted in orange juice may be given in the eye	Use "orange juice"
Per os	By mouth, orally	The "os" can be mistaken as "left eye" (OS-oculus sinister)	Use "PO," "by mouth," or "orally"
q.d. or QD**	Every day	Mistaken as q.i.d., especially if the period after the "q" or the tail of the "q" is misunderstood as an "i"	Use "daily"
qhs	Nightly at bedtime	Mistaken as "qhr" or every hour	Use "nightly"
qn	Nightly or at bedtime	Mistaken as "qh" (every hour)	Use "nightly" or "at bedtime"
q.o.d. or QOD**	Every other day	Mistaken as "q.d." (daily) or "q.i.d. (four times daily) if the "o" is poorly written	Use "every other day"
q1d	Daily	Mistaken as q.i.d. (four times daily)	Use "daily"
q6PM, etc.	Every evening at 6 PM	Mistaken as every 6 hours	Use "daily at 6 PM" or "6 PM daily"
SC, SQ, sub q	Subcutaneous	SC mistaken as SL (sublingual); SQ mistaken as "5 every;" the "q" in "sub q" has been mistaken as "every" (e.g., a heparin dose ordered "sub q 2 hours before surgery" misunderstood as every 2 hours before surgery)	Use "subcut" or "subcutaneously"
ss	Sliding scale (insulin) or ½ (apothecary)	Mistaken as "55"	Spell out "sliding scale;" use "one-half" or "½"
SSRI **SSI**	Sliding scale regular insulin Sliding scale insulin	Mistaken as selective-serotonin reuptake inhibitor Mistaken as Strong Solution of Iodine (Lugol's)	Spell out "sliding scale (insulin)"
i/d	One daily	Mistaken as "tid"	Use "1 daily"
TIW or tiw	3 times a week	Mistaken as "3 times a day" or "twice in a week"	Use "3 times weekly"
U or u**	Unit	Mistaken as the number 0 or 4, causing a 10-fold overdose or greater (e.g., 4U seen as "40" or 4u seen as "44"); mistaken as "cc" so dose given in volume instead of units (e.g., 4u seen as 4cc)	Use "unit"
UD	As directed ("ut dictum")	Mistaken as unit dose (e.g., diltiazem 125 mg IV infusion "UD" misinterpreted as meaning to give the entire infusion as a unit [bolus] dose)	Use "as directed"
Dose Designations and Other Information	**Intended Meaning**	**Misinterpretation**	**Correction**
Trailing zero after decimal point (e.g., 1.0 mg)**	1 mg	Mistaken as 10 mg if the decimal point is not seen	Do not use trailing zeros for doses expressed in whole numbers
"Naked" decimal point (e.g., .5 mg)**	0.5 mg	Mistaken as 5 mg if the decimal point is not seen	Use zero before a decimal point when the dose is less than a whole unit
Abbreviations such as mg. or mL. with a period following the abbreviation	mg mL	The period is unnecessary and could be mistaken as the number 1 if written poorly	Use mg, mL, etc. without a terminal period

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ISMP's List of *Error-Prone Abbreviations, Symbols,* and *Dose Designations* (continued)

Dose Designations and Other Information	Intended Meaning	Misinterpretation	Correction
Drug name and dose run together (especially problematic for drug names that end in "l" such as Inderal40 mg; Tegretol300 mg)	Inderal 40 mg Tegretol 300 mg	Mistaken as Inderal 140 mg Mistaken as Tegretol 1300 mg	Place adequate space between the drug name, dose, and unit of measure
Numerical dose and unit of measure run together (e.g., 10mg, 100mL)	10 mg 100 mL	The "m" is sometimes mistaken as a zero or two zeros, risking a 10- to 100-fold overdose	Place adequate space between the dose and unit of measure
Large doses without properly placed commas (e.g., 100000 units; 1000000 units)	100,000 units 1,000,000 units	100000 has been mistaken as 10,000 or 1,000,000; 1000000 has been mistaken as 100,000	Use commas for dosing units at or above 1,000, or use words such as 100 "thousand" or 1 "million" to improve readability
Drug Name Abbreviations	**Intended Meaning**	**Misinterpretation**	**Correction**
To avoid confusion, do not abbreviate drug names when communicating medical information. Examples of drug name abbreviations involved in medication errors include:			
APAP	acetaminophen	Not recognized as acetaminophen	Use complete drug name
ARA A	vidarabine	Mistaken as cytarabine (ARA C)	Use complete drug name
AZT	zidovudine (Retrovir)	Mistaken as azathioprine or aztreonam	Use complete drug name
CPZ	Compazine (prochlorperazine)	Mistaken as chlorpromazine	Use complete drug name
DPT	Demerol-Phenergan-Thorazine	Mistaken as diphtheria-pertussis-tetanus (vaccine)	Use complete drug name
DTO	Diluted tincture of opium, or deodorized tincture of opium (Paregoric)	Mistaken as tincture of opium	Use complete drug name
HCl	hydrochloric acid or hydrochloride	Mistaken as potassium chloride (The "H" is misinterpreted as "K")	Use complete drug name unless expressed as a salt of a drug
HCT	hydrocortisone	Mistaken as hydrochlorothiazide	Use complete drug name
HCTZ	hydrochlorothiazide	Mistaken as hydrocortisone (seen as HCT250 mg)	Use complete drug name
MgSO4**	magnesium sulfate	Mistaken as morphine sulfate	Use complete drug name
MS, MSO4**	morphine sulfate	Mistaken as magnesium sulfate	Use complete drug name
MTX	methotrexate	Mistaken as mitoxantrone	Use complete drug name
PCA	procainamide	Mistaken as patient controlled analgesia	Use complete drug name
PTU	propylthiouracil	Mistaken as mercaptopurine	Use complete drug name
T3	Tylenol with codeine No. 3	Mistaken as liothyronine	Use complete drug name
TAC	triamcinolone	Mistaken as tetracaine, Adrenalin, cocaine	Use complete drug name
TNK	TNKase	Mistaken as "TPA"	Use complete drug name
ZnSO4	zinc sulfate	Mistaken as morphine sulfate	Use complete drug name
Stemmed Drug Names	**Intended Meaning**	**Misinterpretation**	**Correction**
"Nitro" drip	nitroglycerin infusion	Mistaken as sodium nitroprusside infusion	Use complete drug name
"Norflox"	norfloxacin	Mistaken as Norflex	Use complete drug name
"IV Vanc"	intravenous vancomycin	Mistaken as Invanz	Use complete drug name
Symbols	**Intended Meaning**	**Misinterpretation**	**Correction**
ʒ ♏	Dram Minim	Symbol for dram mistaken as "3" Symbol for minim mistaken as "mL"	Use the metric system
x3d	For three days	Mistaken as "3 doses"	Use "for three days"
> and <	Greater than and less than	Mistaken as opposite of intended; mistakenly use incorrect symbol; "< 10" mistaken as "40"	Use "greater than" or "less than"
/ (slash mark)	Separates two doses or indicates "per"	Mistaken as the number 1 (e.g., "25 units/10 units" misread as "25 units and 110" units)	Use "per" rather than a slash mark to separate doses
@	At	Mistaken as "2"	Use "at"
&	And	Mistaken as "2"	Use "and"
+	Plus or and	Mistaken as "4"	Use "and"
°	Hour	Mistaken as a zero (e.g., q2° seen as q 20)	Use "hr," "h," or "hour"
Φ or ⌀	zero, null sign	Mistaken as numerals 4, 6, 8, and 9	Use 0 or zero, or describe intent using whole words

**These abbreviations are included on The Joint Commission's "minimum list" of dangerous abbreviations, acronyms, and symbols that must be included on an organization's "Do Not Use" list, effective January 1, 2004. Visit www.jointcommission.org for more information about this Joint Commission requirement.

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ISMP Dangerous Abbreviations, Symbols and Dose Designations

The abbreviations, symbols, and dose designations found in this table are frequently misinterpreted, resulting in harmful medication errors. They should **NEVER** be used when communicating medication information.

Abbreviation	Intended Meaning	Potential Problem	Correction
U	Unit	Mistaken for "0" (zero), "4" (four), or cc.	Use "**unit**".
IU, IV	international unit, invasive ventilation	Mistaken for "IV" (intravenous) or "10" (ten).	Use "**unit**".
Abbreviations for drug names		Misinterpreted because of similar abbreviations for multiple drugs; e.g., MS, MSO4 (morphine sulphate), MgSO4 (magnesium sulphate) may be confused with each other.	Do not abbreviate drug names.
QD QOD	Every day Every other day	QD and QOD have been mistaken with each other, or as 'qid'. The Q has also been misinterpreted as "2" (two).	Use "**daily**" and "every other day".
OD	Every day	Mistaken for "right eye" (OD = oculus dexter).	Use "**daily**".
OS, OD, OU	Left eye, right eye, both eyes	May be confused with one another.	Use "**left eye**", "**right eye**" or"**both eyes".**
D/C	Discharge	Interpreted as "discontinue whatever medications follow" (typically discharge medications).	Use "**discharge**".
cc	cubic centimetre	Mistaken for "u" (units).	Use "**mL**" or "millilitre".
µg	microgram	Mistaken for "mg" (milligram) resulting in one thousand-fold overdose.	Use "**mcg**".
Symbol	**Intended Meaning**	**Potential Problem**	**Correction**
@	at	Mistaken for "2" (two) or "5" (five).	Use "**at**".
> <	Greater than Less than	Mistaken for "7"(seven) or the letter "L". Confused with each other.	Use "**greater than**"/"**more than**" or "**less than**"/"**lower than".**
Dose Designation	**Intended Meaning**	**Potential Problem**	**Correction**
Trailing zero	X.0 mg	Decimal point is overlooked resulting in 10-fold dose error.	Never use a zero after a decimal point. Use "**X mg".**
Lack leading zero	. X mg	Decimal point is overlooked resulting in 10-fold dose error.	Always use a zero before a decimal point. Use "**0.X mg**".

Adapted from ISMP's List of *Error-Prone Abbreviations, Symbols,* and *Dose Designations 2006*

Appendix AD: ISMP common confused drugs

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ISMP's List of *Confused* Drug Names

This list of confused drug names, which includes look-alike and sound-alike name pairs, consists of those name pairs that have been published in the *ISMP Medication Safety Alert!*® and the *ISMP Medication Safety Alert!*® Community/Ambulatory Care Edition. Events involving these medications were reported to ISMP through the ISMP National Medication Errors Reporting Program (ISMP MERP).

We hope you will use this list to determine which medications require special safeguards to reduce the risk of errors. This may include strategies such as: using both the brand and generic names; including the purpose of the medication on prescriptions; configuring computer selection screens to prevent look-alike names from appearing consecutively; and changing the appearance of look-alike product names.

Updated through June 2011

Drug Name	Confused Drug Name
Abelcet	amphotericin B
Accupril	Aciphex
acetaZOLAMIDE	acetoHEXAMIDE
acetic acid for irrigation	glacial acetic acid
acetoHEXAMIDE	acetaZOLAMIDE
Aciphex	Accupril
Aciphex	Aricept
Activase	Cathflo Activase
Activase	TNKase
Actonel	Actos
Actos	Actonel
Adacel (Tdap)	Daptacel (DTaP)
Adderall	Inderal
Adderall	Adderall XR
Adderall XR	Adderall
Advair	Advicor
Advicor	Advair
Advicor	Altocor
Afrin (oxymetazoline)	Afrin (saline)
Afrin (saline)	Afrin (oxymetazoline)
Aggrastat	argatroban
Aldara	Alora
Alkeran	Leukeran
Alkeran	Myleran
Allegra	Viagra
Alora	Aldara
ALPRAZolam	LORazepam
Altocor	Advicor
amantadine	amiodarone
Amaryl	Reminyl
Ambisome	amphotericin B
Amicar	Omacor
Amikin	Kineret
aMILoride	amLODIPine
amiodarone	amantadine

Drug Name	Confused Drug Name
amLODIPine	aMILoride
amphotericin B	Abelcet
amphotericin B	Ambisome
Anacin	Anacin-3
Anacin-3	Anacin
antacid	Atacand
Antivert	Axert
Anzemet	Avandamet
Apresoline	Priscoline
argatroban	Aggrastat
argatroban	Orgaran
Aricept	Aciphex
Aricept	Azilect
ARIPiprazole	proton pump inhibitors
ARIPiprazole	RABEprazole
Asacol	Os-Cal
Atacand	antacid
Atrovent	Natru-Vent
Avandamet	Anzemet
Avandia	Prandin
Avandia	Coumadin
AVINza	INVanz
AVINza	Evista
Axert	Antivert
azaCITIDine	azaTHIOprine
azaTHIOprine	azaCITIDine
Azilect	Aricept
B & O (belladonna and opium)	Beano
BabyBIG	HBIG (hepatitis B immune globulin)
Bayhep-B	Bayrab
Bayhep-B	Bayrho-D
Bayrab	Bayhep-B
Bayrab	Bayrho-D
Bayrho-D	Bayhep-B
Bayrho-D	Bayrab

** Brand names always start with an uppercase letter. Some brand names incorporate tall man letters in initial characters and may not be readily recognized as brand names. Brand name products appear in black; generic/other products appear in red.*

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
Beano	B & O (belladonna and opium)
Benadryl	benazepril
benazepril	Benadryl
Benicar	Mevacor
Betadine (with providone-iodine)	Betadine (without providone-iodine)
Betadine (without providone-iodine)	Betadine (with providone-iodine)
Bextra	Zetia
Bicillin C-R	Bicillin L-A
Bicillin L-A	Bicillin C-R
Bicitra	Polycitra
Bidex	Videx
Brethine	Methergine
Brevibloc	Brevital
Brevital	Brevibloc
buPROPion	busPIRone
busPIRone	buPROPion
Capadex [non-US product]	Kapidex
Capex	Kapidex
Carac	Kuric
captopril	carvedilol
carBAMazepine	OXcarbazepine
CARBOplatin	CISplatin
Cardura	Coumadin
carvedilol	captopril
Casodex	Kapidex
Cathflo Activase	Activase
Cedax	Cidex
ceFAZolin	cefTRIAXone
cefTRIAXone	ceFAZolin
CeleBREX	CeleXA
CeleBREX	Cerebyx
CeleXA	ZyPREXA
CeleXA	CeleBREX
CeleXA	Cerebyx
Cerebyx	CeleBREX
Cerebyx	CeleXA
cetirizine	sertraline
chlordiazePOXIDE	chlorproMAZINE
chlorproMAZINE	chlordiazePOXIDE
chlorproMAZINE	chlorproPAMIDE
chlorproPAMIDE	chlorproMAZINE
Cidex	Cedax
CISplatin	CARBOplatin
Claritin (loratadine)	Claritin Eye (ketotifen fumarate)
Claritin-D	Claritin-D 24
Claritin-D 24	Claritin-D

Drug Name	Confused Drug Name
Claritin Eye (ketotifen fumarate)	Claritin (loratadine)
Clindesse	Clindets
Clindets	Clindesse
clomiPHENE	clomiPRAMINE
clomiPRAMINE	clomiPHENE
clonazePAM	cloNIDine
clonazePAM	LORazepam
cloNIDine	clonazePAM
cloNIDine	KlonoPIN
Clozaril	Colazal
coagulation factor IX (recombinant)	factor IX complex, vapor heated
codeine	Lodine
Colace	Cozaar
Colazal	Clozaril
colchicine	Cortrosyn
Comvax	Recombivax HB
Cortrosyn	colchicine
Coumadin	Avandia
Coumadin	Cardura
Cozaar	Colace
Cozaar	Zocor
cycloSERINE	cycloSPORINE
cycloSPORINE	cycloSERINE
Cymbalta	Symbyax
DACTINomycin	DAPTOmycin
Daptacel (DTaP)	Adacel (Tdap)
DAPTOmycin	DACTINomycin
Darvocet	Percocet
Darvon	Diovan
DAUNOrubicin	DAUNOrubicin citrate liposomal
DAUNOrubicin	DOXOrubicin
DAUNOrubicin	IDArubicin
DAUNOrubicin citrate liposomal	DAUNOrubicin
Denavir	indinavir
Depakote	Depakote ER
Depakote ER	Depakote
Depo-Medrol	Solu-MEDROL
Depo-Provera	Depo-subQ provera 104
Depo-subQ provera 104	Depo-Provera
desipramine	disopyramide
dexmethylphenidate	methadone
Diabenese	Diamox
Diabeta	Zebeta
Diamox	Diabenese
Diflucan	Diprivan
Dilacor XR	Pilocar

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
Dilaudid	Dilaudid-5
Dilaudid-5	Dilaudid
dimenhy**DRINATE**	diphenhydr**AMINE**
diphenhydr**AMINE**	dimenhy**DRINATE**
Dioval	Diovan
Diovan	Dioval
Diovan	Zyban
Diovan	Darvon
Diprivan	Diflucan
Diprivan	Ditropan
disopyramide	desipramine
Ditropan	Diprivan
DOBUTamine	**DOP**amine
DOPamine	**DOBUT**amine
Doribax	Zovirax
Doxil	Paxil
DOXOrubicin	**DAUNO**rubicin
DOXOrubicin	**DOXO**rubicin liposomal
DOXOrubicin	**IDA**rubicin
DOXOrubicin liposomal	**DOXO**rubicin
Dulcolax (bisacodyl)	Dulcolax (docusate sodium)
Dulcolax (docusate sodium)	Dulcolax (bisacodyl)
DULoxetine	**FLU**oxetine
Durasal	Durezol
Durezol	Durasal
Duricef	Ultracet
Dynacin	Dynacirc
Dynacirc	Dynacin
edetate calcium disodium	edetate disodium
edetate disodium	edetate calcium disodium
Effexor	Effexor XR
Effexor XR	Effexor
Enbrel	Levbid
Engerix-B adult	Engerix-B pediatric/adolescent
Engerix-B pediatric/adolescent	Engerix-B adult
Enjuvia	Januvia
e**PHED**rine	**EPINEPH**rine
EPINEPHrine	e**PHED**rine
Estratest	Estratest HS
Estratest HS	Estratest
ethambutol	Ethmozine
Ethmozine	ethambutol
Evista	**AVIN**za
factor IX complex, vapor heated	coagulation factor IX (recombinant)
Fanapt	Xanax
Femara	Femhrt

Drug Name	Confused Drug Name
Femhrt	Femara
fenta**NYL**	**SUF**entanil
Fioricet	Fiorinal
Fiorinal	Fioricet
flavox**ATE**	fluvoxa**MINE**
Flonase	Flovent
Flovent	Flonase
flumazenil	influenza virus vaccine
FLUoxetine	**PAR**oxetine
FLUoxetine	**DUL**oxetine
FLUoxetine	Loxitane
fluvoxa**MINE**	flavox**ATE**
Folex	Foltx
folic acid	folinic acid (leucovorin calcium)
folinic acid (leucovorin calcium)	folic acid
Foltx	Folex
fomepizole	omeprazole
Foradil	Fortical
Foradil	Toradol
Fortical	Foradil
gentamicin	gentian violet
gentian violet	gentamicin
glacial acetic acid	acetic acid for irrigation
glipi**ZIDE**	gly**BURIDE**
gly**BURIDE**	glipi**ZIDE**
Granulex	Regranex
guai**FEN**esin	guan**FACINE**
guan**FACINE**	guai**FEN**esin
HBIG (hepatitis B immune globulin)	BabyBIG
Healon	Hyalgan
heparin	Hespan
Hespan	heparin
HMG-CoA reductase inhibitors ("statins")	nystatin
Huma**LOG**	Humu**LIN**
Huma**LOG**	Novo**LOG**
Huma**LOG** Mix 75/25	Humu**LIN** 70/30
Humapen Memoir (for use with Huma**LOG**)	Humira Pen
Humira Pen	Humapen Memoir (for use with Huma**LOG**)
Humu**LIN**	Novo**LIN**
Humu**LIN**	Huma**LOG**
Humu**LIN** 70/30	Huma**LOG** Mix 75/25
Hyalgan	Healon
hydr**ALAZINE**	hydr**OXY**zine
HYDROcodone	oxy**CODONE**
Hydrogesic	hydr**OXY**zine
HYDROmorphone	morphine

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
hydrOXYzine	Hydrogesic
hydrOXYzine	hydrALAZINE
IDArubicin	DAUNOrubicin
IDArubicin	DOXOrubicin
Inderal	Adderall
indinavir	Denavir
inFLIXimab	riTUXimab
influenza virus vaccine	flumazenil
influenza virus vaccine	tuberculin purified protein derivative (PPD)
Inspra	Spiriva
INVanz	AVINza
iodine	Lodine
Isordil	Plendil
ISOtretinoin	tretinoin
Jantoven	Janumet
Jantoven	Januvia
Janumet	Jantoven
Janumet	Januvia
Janumet	Sinemet
Januvia	Enjuvia
Januvia	Jantoven
Januvia	Janumet
K-Phos Neutral	Neutra-Phos-K
Kaopectate (bismuth subsalcylate)	Kaopectate (docusate calcium)
Kaopectate (docusate calcium)	Kaopectate (bismuth subsalcylate)
Kadian	Kapidex
Kaletra	Keppra
Kapidex	Capadex [non-US product]
Kapidex	Capex
Kapidex	Casodex
Kapidex	Kadian
Keflex	Keppra
Keppra	Kaletra
Keppra	Keflex
Ketalar	ketorolac
ketorolac	Ketalar
ketorolac	methadone
Kineret	Amikin
KlonoPIN	cloNIDine
Kuric	Carac
Kwell	Qwell
LaMICtal	LamISIL
LamISIL	LaMICtal
lamiVUDine	lamoTRIgine
lamoTRIgine	lamiVUDine
lamoTRIgine	levothyroxine

Drug Name	Confused Drug Name
Lanoxin	levothyroxine
Lanoxin	naloxone
lanthanum carbonate	lithium carbonate
Lantus	Lente
Lariam	Levaquin
Lasix	Luvox
Lente	Lantus
leucovorin calcium	Leukeran
Leukeran	Alkeran
Leukeran	Myleran
Leukeran	leucovorin calcium
Levaquin	Lariam
Levbid	Enbrel
Levemir	Lovenox
levETIRAcetam	levOCARNitine
levETIRAcetam	levofloxacin
levOCARNitine	levETIRAcetam
levofloxacin	levETIRAcetam
levothyroxine	lamoTRIgine
levothyroxine	Lanoxin
Lexapro	Loxitane
Lexiva	Pexeva
Lipitor	Loniten
Lipitor	ZyrTEC
lithium carbonate	lanthanum carbonate
Lodine	codeine
Lodine	iodine
Loniten	Lipitor
Lopressor	Lyrica
LORazepam	ALPRAZolam
LORazepam	clonazePAM
LORazepam	Lovaza
Lotronex	Protonix
Lovaza	LORazepam
Lovenox	Levemir
Loxitane	Lexapro
Loxitane	FLUoxetine
Loxitane	Soriatane
Lunesta	Neulasta
Lupron Depot-3 Month	Lupron Depot-Ped
Lupron Depot-Ped	Lupron Depot-3 Month
Luvox	Lasix
Lyrica	Lopressor
Maalox	Maalox Total Stomach Relief
Maalox Total Stomach Relief	Maalox
Matulane	Materna

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
Materna	Matulane
Maxzide	Microzide
Menactra	Menomune
Menomune	Menactra
Mephyton	methadone
Metadate	methadone
Metadate CD	Metadate ER
Metadate ER	Metadate CD
Metadate ER	methadone
metFORMIN	metroNIDAZOLE
methadone	dexmethylphenidate
methadone	ketorolac
methadone	Mephyton
methadone	Metadate
methadone	Metadate ER
methadone	methylphenidate
Methergine	Brethine
methimazole	metolazone
methylphenidate	methadone
metolazone	methimazole
metoprolol succinate	metoprolol tartrate
metoprolol tartrate	metoprolol succinate
metroNIDAZOLE	metFORMIN
Mevacor	Benicar
Micronase	Microzide
Microzide	Maxzide
Microzide	Micronase
midodrine	Midrin
Midrin	midodrine
mifepristone	misoprostol
Miralax	Mirapex
Mirapex	Miralax
misoprostol	mifepristone
morphine	HYDROmorphone
morphine - non-concentrated oral liquid	morphine - oral liquid concentrate
morphine - oral liquid concentrate	morphine - non-concentrated oral liquid
Motrin	Neurontin
MS Contin	OxyCONTIN
Mucinex	Mucomyst
Mucinex D	Mucinex DM
Mucinex DM	Mucinex D
Mucomyst	Mucinex
Myleran	Alkeran
Myleran	Leukeran
naloxone	Lanoxin
Narcan	Norcuron

Drug Name	Confused Drug Name
Natru-Vent	Atrovent
Navane	Norvasc
Neo-Synephrine (oxymetazoline)	Neo-Synephrine (phenylephrine)
Neo-Synephrine (phenylephrine)	Neo-Synephrine (oxymetazoline)
Neulasta	Lunesta
Neulasta	Neumega
Neumega	Neupogen
Neumega	Neulasta
Neupogen	Neumega
Neurontin	Motrin
Neurontin	Noroxin
Neutra-Phos-K	K-Phos Neutral
NexAVAR	NexIUM
NexIUM	NexAVAR
niCARdipine	NIFEdipine
NIFEdipine	niCARdipine
NIFEdipine	niMODipine
niMODipine	NIFEdipine
Norcuron	Narcan
Normodyne	Norpramin
Noroxin	Neurontin
Norpramin	Normodyne
Norvasc	Navane
NovoLIN	HumuLIN
NovoLIN	NovoLOG
NovoLIN 70/30	NovoLOG Mix 70/30
NovoLOG	HumaLOG
NovoLOG	NovoLIN
NovoLOG FLEXPEN	NovoLOG Mix 70/30 FLEXPEN
NovoLOG Mix 70/30 FLEXPEN	NovoLOG FLEXPEN
NovoLOG Mix 70/30	NovoLIN 70/30
nystatin	HMG-CoA reductase inhibitors ("statins")
Occlusal-HP	Ocuflox
Ocuflox	Occlusal-HP
OLANZapine	QUEtiapine
Omacor	Amicar
omeprazole	fomepizole
opium tincture	paregoric (camphorated tincture of opium)
Oracea	Orencia
Orencia	Oracea
Orgaran	argatroban
Ortho Tri-Cyclen	Ortho Tri-Cyclen LO
Ortho Tri-Cyclen LO	Ortho Tri-Cyclen
Os-Cal	Asacol
OXcarbazepine	carBAMazepine
oxyCODONE	HYDROcodone

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
oxyCODONE	OxyCONTIN
OxyCONTIN	MS Contin
OxyCONTIN	oxyCODONE
PACLitaxel	PACLitaxel protein-bound particles
PACLitaxel protein-bound particles	PACLitaxel
Pamelor	Panlor DC
Pamelor	Tambocor
Panlor DC	Pamelor
paregoric (camphorated tincture of opium)	opium tincture
PARoxetine	FLUoxetine
PARoxetine	piroxicam
Patanol	Platinol
Pavulon	Peptavlon
Paxil	Doxil
Paxil	Taxol
Paxil	Plavix
PEMEtrexed	PRALAtrexate
Peptavlon	Pavulon
Percocet	Darvocet
Percocet	Procet
Pexeva	Lexiva
PENTobarbital	PHENobarbital
PHENobarbital	PENTobarbital
Pilocar	Dilacor XR
piroxicam	PARoxetine
Platinol	Patanol
Plavix	Paxil
Plendil	Isordil
pneumococcal 7-valent vaccine	pneumococcal polyvalent vaccine
pneumococcal polyvalent vaccine	pneumococcal 7-valent vaccine
Polycitra	Bicitra
PRALAtrexate	PEMEtrexed
Prandin	Avandia
Precare	Precose
Precose	Precare
prednisoLONE	predniSONE
predniSONE	prednisoLONE
PriLOSEC	Pristiq
PriLOSEC	PROzac
Priscoline	Apresoline
Pristiq	PriLOSEC
probenecid	Procanbid
Procan SR	Procanbid
Procanbid	probenecid
Procanbid	Procan SR
Procardia XL	Protain XL

Drug Name	Confused Drug Name
Procet	Percocet
Prograf	PROzac
propylthiouracil	Purinethol
Proscar	Provera
Protain XL	Procardia XL
protamine	Protonix
proton pump inhibitors	ARIPiprazole
Protonix	Lotronex
Protonix	protamine
Provera	Proscar
Provera	PROzac
PROzac	Prograf
PROzac	PriLOSEC
PROzac	Provera
Purinethol	propylthiouracil
QUEtiapine	OLANZapine
quiNIDine	quiNINE
quiNINE	quiNIDine
Qwell	Kwell
RABEprazole	ARIPiprazole
Razadyne	Rozerem
Recombivax HB	Comvax
Regranex	Granulex
Reminyl	Robinul
Reminyl	Amaryl
Renagel	Renvela
Renvela	Renagel
Reprexain	ZyPREXA
Restoril	RisperDAL
Retrovir	ritonavir
Rifadin	Rifater
Rifamate	rifampin
rifampin	Rifamate
rifampin	rifaximin
Rifater	Rifadin
rifaximin	rifampin
RisperDAL	Restoril
risperiDONE	rOPINIRole
Ritalin	ritodrine
Ritalin LA	Ritalin SR
Ritalin SR	Ritalin LA
ritodrine	Ritalin
ritonavir	Retrovir
riTUXimab	inFLIXimab
Robinul	Reminyl
rOPINIRole	risperiDONE

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
Roxanol	Roxicodone Intensol
Roxanol	Roxicet
Roxicet	Roxanol
Roxicodone Intensol	Roxanol
Rozerem	Razadyne
Salagen	selegiline
SandIMMUNE	SandoSTATIN
SandoSTATIN	SandIMMUNE
saquinavir	SINEquan
saquinavir (free base)	saquinavir mesylate
saquinavir mesylate	saquinavir (free base)
Sarafem	Serophene
selegiline	Salagen
Serophene	Sarafem
SEROquel	SEROquel XR
SEROquel	Serzone
SEROquel	SINEquan
SEROquel XR	SEROquel
sertraline	cetirizine
sertraline	Soriatane
Serzone	SEROquel
Sinemet	Janumet
SINEquan	saquinavir
SINEquan	SEROquel
SINEquan	Singulair
SINEquan	Zonegran
Singulair	SINEquan
sitaGLIPtin	SUMAtriptan
Solu-CORTEF	Solu-MEDROL
Solu-MEDROL	Depo-Medrol
Solu-MEDROL	Solu-CORTEF
Sonata	Soriatane
Soriatane	Loxitane
Soriatane	sertraline
Soriatane	Sonata
sotalol	Sudafed
Spiriva	Inspra
Sudafed	sotalol
Sudafed	Sudafed PE
Sudafed PE	Sudafed
SUFentanil	fentaNYL
sulfADIAZINE	sulfaSALAzine
sulfADIAZINE	sulfiSOXAZOLE
sulfaSALAzine	sulfADIAZINE
sulfiSOXAZOLE	sulfADIAZINE
SUMAtriptan	sitaGLIPtin

Drug Name	Confused Drug Name
SUMAtriptan	ZOLMitriptan
Symbyax	Cymbalta
Tambocor	Pamelor
Taxol	Taxotere
Taxol	Paxil
Taxotere	Taxol
TEGretol	TEGretol XR
TEGretol	Tequin
TEGretol	TRENtal
TEGretol XR	TEGretol
Tequin	TEGretol
Tequin	Ticlid
Testoderm TTS	Testoderm
Testoderm TTS	Testoderm with Adhesive
Testoderm with Adhesive	Testoderm
Testoderm with Adhesive	Testoderm TTS
Testoderm	Testoderm TTS
Testoderm	Testoderm with Adhesive
tetanus diptheria toxoid (Td)	tuberculin purified protein derivative (PPD)
Thalomid	Thiamine
Thiamine	Thalomid
tiaGABine	tiZANidine
Tiazac	Ziac
Ticlid	Tequin
tiZANidine	tiaGABine
TNKase	Activase
TNKase	t-PA
Tobradex	Tobrex
Tobrex	Tobradex
TOLAZamide	TOLBUTamide
TOLBUTamide	TOLAZamide
Topamax	Toprol-XL
Toprol-XL	Topamax
Toradol	Foradil
t-PA	TNKase
Tracleer	Tricor
traMADol	traZODone
traZODone	traMADol
TRENtal	TEGretol
tretinoin	ISOtretinoin
Tricor	Tracleer
tromethamine	Trophamine
Trophamine	tromethamine
tuberculin purified protein derivative (PPD)	influenza virus vaccine
tuberculin purified protein derivative (PPD)	tetanus diptheria toxoid (Td)
Tylenol	Tylenol PM

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ISMP's List of *Confused* Drug Names

Drug Name	Confused Drug Name
Tylenol PM	Tylenol
Ultracet	Duricef
val**ACY**clovir	val**GAN**ciclovir
Valcyte	Valtrex
val**GAN**ciclovir	val**ACY**clovir
Valtrex	Valcyte
Varivax	VZIG (varicella-zoster immune globulin)
Vesanoid	Vesicare
Vesicare	Vesanoid
Vexol	Vosol
Viagra	Allegra
Videx	Bidex
vin**BLAS**tine	vin**CRIS**tine
vin**CRIS**tine	vin**BLAS**tine
Viokase	Viokase 8
Viokase 8	Viokase
Vioxx	Zyvox
Viracept	Viramune
Viramune	Viracept
Vosol	Vexol
VZIG (varicella-zoster immune globulin)	Varivax
Wellbutrin SR	Wellbutrin XL
Wellbutrin XL	Wellbutrin SR
Xanax	Fanapt
Xanax	Zantac
Xeloda	Xenical
Xenical	Xeloda
Yasmin	Yaz
Yaz	Yasmin
Zantac	Xanax
Zantac	Zyr**TEC**
Zavesca (escitalopram) [non-US product]	Zavesca (miglustat)
Zavesca (miglustat)	Zavesca (escitalopram) [non-US product]
Zebeta	Diabeta

Drug Name	Confused Drug Name
Zebeta	Zetia
Zegerid	Zestril
Zelapar (Zydis formulation)	Zy**PREXA** Zydis
Zestril	Zegerid
Zestril	Zetia
Zestril	Zy**PREXA**
Zetia	Bextra
Zetia	Zebeta
Zetia	Zestril
Ziac	Tiazac
Zocor	Cozaar
Zocor	Zyr**TEC**
ZOLMitriptan	**SUMA**triptan
Zonegran	**SINE**quan
Zostrix	Zovirax
Zovirax	Doribax
Zovirax	Zyvox
Zovirax	Zostrix
Zyban	Diovan
Zy**PREXA**	Cele**XA**
Zy**PREXA**	Reprexain
Zy**PREXA**	Zestril
Zy**PREXA**	Zyr**TEC**
Zy**PREXA** Zydis	Zelapar (Zydis formulation)
Zyr**TEC**	Lipitor
Zyr**TEC**	Zantac
Zyr**TEC**	Zocor
Zyr**TEC**	Zy**PREXA**
Zyr**TEC**	Zyr**TEC**-D
Zyr**TEC** (cetirizine)	Zyr**TEC** Itchy Eye Drops (ketotifen fumarate)
Zyr**TEC**-D	Zyr**TEC**
Zyr**TEC** Itchy Eye Drops (ketotifen fumarate)	Zyr**TEC** (cetirizine)
Zyvox	Vioxx
Zyvox	Zovirax

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Appendix AE: Stroke Network – AlphaFIM® Instrument for Stroke

ontario stroke network
Advancing the Ontario Stroke System

AlphaFIM® Instrument for Stroke

Regional Stroke Network Logo

What is it?

AlphaFIM® Instrument

- Standardized method of assessing patient **disability/functional status** in the acute care setting
- Consists of six items that can be reliably collected in acute care
- Facilitates the transfer of patients from acute care to rehabilitation by using common language

AlphaFIM® Components

6 Items are rated:

MOTOR

1. Toilet Transfer
2. Bowel Management

If patient walks <150 feet:	If patient walks ≥150 feet:
3. Eating	3. Walking
4. Grooming	4. Bed Transfer

COGNITION

5. Expression
6. Memory

Rating Method:

7 – Complete independence (timely, safely)	**No Helper**
6 – Modified independence (device)	
Modified Dependence	
5 – Supervision	
4 – Minimal Assist (Subject ≥ 75%)	
3 – Moderate Assist (Subject = 50 - 74%)	**Helper**
Complete Dependence	
2 – Maximal Assist (Subject = 25 - 49%)	
1 – Total Assist (Subject <25%)	

Triage Guidelines*

AlphaFIM® Rating		Recommended Referral
Mild	> 80	Community-based rehabilitation
Moderate	40 to 80	Inpatient rehabilitation
Severe	< 40	Restorative care with regular assessment for rehab potential

*AlphaFIM® rating is only **one** component for consideration in discharge planning.

Further AlphaFIM® info:

For further information on the AlphaFIM® Instrument please contact:
Name, Title,
_____ Stroke Network,
email, phone

Who Completes it?

Acute Care Allied Health and Nursing Assessors must be credentialed; but all team members may be consulted for information gathering.

When: Day 3 post admission

Benefits

- Utilize a common language for functional status and rehabilitation needs
- Provide objective data regarding disability and stroke severity
- Facilitate transfer of information to inpatient stroke rehabilitation
- Help make decisions regarding discharge from acute care
  - amount of help needed
  - best destination

What it Provides:

- Standardized Measure of Stroke Severity and Function
- Motor and Cognitive rating
- Projected FIM® ratings*
- Help Needed (in hours per day)

*Functional Independence Measure (FIM®) is an 18 item functional status measure used in inpatient rehabilitation.
AlphaFIM® and FIM® are trademarks of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

December 2012

Appendix AE: Stroke Network – Canadian Stroke Best Practices

Table 3.3A Screening and Assessment Tools for Acute Stroke

Canadian Stroke Best Practices Table 3.3A Screening and Assessment Tools for Acute Stroke

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
Neurological Status/Stroke Severity					
Canadian Neurological Scale (CNS)(1)	Items assess mentation (level of consciousness, orientation and speech) and motor function (face, arm and leg). Motor function evaluations are separated into sections A1 (and A2. A1 is administered if the patient is able to understand and follow instructions (5 items). A2 is administered in the presence of comprehension deficits (3 items)(1, 2)	5-10 minutes(1, 2)	**Interobserver reliability***: k ranged from 0.535(facial weakness) to 1.000 and there was no significant difference in agreement between physician and nurse raters(1); agreement between assessments by 2 nurses, r=0.924 – at the item level κ ranged from 0.535 (level of consciousness) to 1.00 (motor response- face)(2) **Internal consistency:** $\alpha \geq 0.89$ (neurologist, neurology student and nurse raters)(1); $\alpha = 0.792$(2) **Concurrent validity:** CNS scale scores correlated with the Mathew scale, Orgogozo scale, Scandinavian Stroke Scale, and the National Institutes of Health Stroke Scale – correlations ranged from –0.85 to 0.92(3); and with MCA Neurological Score scores (r=0.977), NIHSS scores r=-0.948 and Guy's Prognostic Scores (0.397)(4) **Construct validity (known groups):** CNS scores were significantly different (p<0.001) for patients grouped as "alive at home", "alive in care" and "dead" at 3 months(4) **Predictive validity**: Significant associations have been reported between the results of acute assessment using the CNS and length of hospital stay(5), mortality(2, 5, 6), functional outcome or independence at 3 months post stroke(4, 7) and at 6 months post stroke(2, 8).	Motor items are rated in terms of severity. Ratings are weighted and summed to provide a total score out of 11.5.(2) Higher scores represent decreasing levels of stroke severity or improved neurological status.	Yes
National Institutes of Health Stroke Scale (NIHSS)(9)	15 items: impairment in LOC, ability to respond to questions/ obey simple commands, papillary response, gaze deviation, hemianopsia, facial	Approximately 6-7 minutes(9)	**Test-retest:** ranging from 0.66 (emergency department nurse clinician) to 0.77 (neurologist)(9); ICC = 0.93 (3 month test interval-assessment of videotaped patient)(10) **Interobserver reliability****: For total overall scores, mean kappa values have ranged from 0.61 – 0.96(9, 11, 12) while reported ICC values range from 0.95-0.96(10, 13, 14). Single item reliability has varied substantially; the	Total scale score = 0-42. Higher scores reflect greater severity. Stroke severity may be stratified as follows: >25 = very severe, 15 – 24 = severe, 5 –	Yes(11, 23, 24)

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
	palsy, resistance to gravity (weaker limb), plantar reflexes, limb ataxia, sensory loss, visual neglect, dysarthria and aphasia. Each item is graded on an ordinal scale from 0-3 or 0-4 where 0=no impairment.		limb ataxia item has most often demonstrated poor interobserver reliability(11, 13, 15, 16). **Internal consistency**: Person separation reliability = 0.32 for total sample, 0.73 (left hemisphere stroke), 0.62 (right hemisphere stroke)(16); α = 0.85 and ω = 0.96(14) **Concurrent validity:** NIHSS scores associated with Mathew scale, Orgogozo scale, Scandinavian Stroke Scale, CNS (r ranging from –0.85 to 0.92)(3) (De Haan et al. 1993); also with MCA Neurological Score scores (r=-0.95), CNS scores (r=-0.948) and Guy's Prognostic Scores (r=-0.38)(4) **Construct validity**: NIHSS scores associated with stroke volume on CT(9, 17) as well as with assessments of function(3) and HRQOL(18) **Construct validity (known groups):** NIHSS scores were significantly different (p<0.001) for patients grouped as "alive at home", "alive in care" and "dead" at 3 months(4); baseline NIHSS scores correlated strongly with TOAST classification(19) **Predictive validity**: NIHSS scores have been demonstrated to be predictive of function/impairment status(9, 19-21) and of discharge destination or place or residence(9, 22)	14 = mild to moderately severe and 1 – 5 = mild	
Pediatric National Institutes of Health Stroke Scale (PedNIHSS)(25)	This is a variation of the adult form NIHSS designed for use in individuals aged 2 – 18. All items from the original version have been retained; however, age appropriate adaptations have been applied to language items, pictures and commands.	Not reported.	**Interobserver reliability:*** ** For *prospective administration*, reported ICC = 0.99 (95% CI 0.97, 0.99) between study neurologists. Item level agreement ranged from K_w = 0.40 (sensory) to 1.00 (LOC-commands)(25); When used for *retrospective derivation* of PedNIHSS scores, ICC=0.95 and item level agreement ranged from K_w = 0.47 (visual) to 0.93 (motor left and right arm items). (26) **Internal consistency reliability**: α=0.99(25)	All scoring strategies were retained from the adult version(25)	Yes. The scale authors provide a guide for administration in children aged 2-18.

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
Glasgow Coma Scale (GCS)(27, 28)	15 items in 3 categories: motor response (6 items), verbal response (5 items), and eye opening (4 items). Points are awarded for the best response in each category. Categories are summed to provide a total score.	Approximately 1 minute.	**Interobserver reliability**: Scale authors reported low rates of disagreement, but noted variations in motor responses based on stimulus used(28). Reported agreements ranged 0.48 (verbal) to 0.72 (eye opening)(29) and from 0.39 – 0.79.(30) Percentage agreements have been reported as 90% overall, and as ranging from 83.8% (eye opening, right) to 98.7% (best motor response – left).(31) In addition, similar rates of between observer agreement have been reported in groups of experienced nurses (98.6% - 100%), newly graduated nurses (94.3%-96.2%) and student nurses (77.3% - 100%).(32) **Construct validity**: In review of GCS, evidence supports association between extent of brain damage and depth of coma as assessed on GCS. GCS scores significantly associated with length of coma ($p<0.0001$). (33) **Predictive validity**: GCS score is a significant predictor of death following stroke (34, 35) or traumatic brain injury (modified by age and mechanism of injury) (36), though eye-opening may be less strongly associated than either the motor or verbal score components(37). GCS scores are also predictive of survival (AUC=0.89), though eye-opening may not add to predictive accuracy(38). GCS scores have been demonstrated to be predictive of Glasgow Outcome scores at 6 months to 1 year post injury (33, 39-42), Disability Rating Scale scores at discharge(43) and at 6 months(44), FIM scores at discharge(43, 45) and employment status at one-year(46).	GCS scores range from 3 – 15, where 3 represents total unresponsiveness and 15 represents alert and fully responsive. Scores may be divided into categories by severity: 13-15 = mild; 9-12=moderate and ≤8 represents severe injury.(47)	Yes.
Grading of Subarachnoid Hemorrhage					
Hunt and Hess Scale (HH)(48, 49)	Based on clinical signs on 3 axes: 1) intensity of meningeal inflammatory	Not reported.	**Interobserver reliability:** Reports have varied substantially ranging from k=0.41(51), k=0.42(50) to k=1.0(52) for total scale scores. **Predictive validity**: Studies have demonstrated significant associations between HH Grades and clinical	Grades correspond to neurological deficit originally ranged from 1 (none) through 5	Not reported.

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
	reaction, 2) severity of neurodeficit and 3) level of arousal. Subjective assignment of grade.(50)		outcomes, GOS scores, mortality and LOS(50, 53). However, it should be noted that there has been little difference demonstrated in clinical outcomes for individuals with grades <3 and only Grade 3 may be significantly different than Grade 0, in terms of risk for poor outcome.(50, 53) Studies that have dichotomized Grades (0-3 vs 4,5) have demonstrated clearer association with clinical outcome(53)	(deep coma or moribund). A Grade of '0' was added later to represent "unruptured"; however, there is no method to distinguish between severities of unruptured aneurysms.(52, 53)	
Fisher Scale (FS)(54)	4-level grade based on the pattern of blood viewed on CT. The FS is not regarded as a primary grading system for SAH.(50, 53)	Not reported.	**Interobserver reliability:** k=0.90(50) **Predictive validity**: Grades of 3 and 4 have been reported to be significantly associated with increased likelihood of poor outcome(52); addition of the FS to the HH appears to result in improved prediction of outcome overall(50, 53)	Grades range from 1 (no blood) through 4 (diffuse or no subarachnoid blood, but with intracerebral or intraventricular clots).(50, 53)	Not reported.
World Federation of Neurological Surgeons Scale (WFNS)(55)	5-level grade system based on compression of GCS scores into 5 grades with the addition of a focal motor deficit axis that is graded separately.(50, 53)	Not reported.	**Interobserver reliability:** k=0.27; however, in the same study the inter-rater agreement for GCS scores was 0.46 (51) **Predictive validity**: Some studies have demonstrate an association between grade and risk for poor outcome such that higher grade is associated with increased likelihood of poor clinical outcome; however, there has also been difficulty reported in distinguishing differences in outcome among individuals assigned adjacent grades(50, 53)	Grade 1 = GCS 15 (motor deficit absent), Grade 2 = GCS 14-13 (motor deficit absent), Grade 3 = GCS 14-13 (motor deficit present), Grade 4 = GCS 12-7 (motor deficit absent or present), Grade 5 = GCS 6-3 (motor deficit absent or present).(53)	Not reported.
Assessment of Function					
Modified Rankin Scale	A global outcomes rating scale in which	15 minutes (via	**Interobserver reliability:** In a systematic review, there was substantial variability demonstrated with reported	mRS scores range from 0-5 such that	No. However,

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
(mRS)(56)	individuals are assigned a subjective grade or rank ranging from 0-5 based on level of independence with reference to pre-stroke activities rather than observation of task-based performance. Modifications to the original scale have included expansion of the scale to include a "0" rank(57) and several changes to item wording (e.g. replacing disability with handicap).(58)	structured interview)(59, 60)	weighted kappa agreements ranging from 0.25 to 0.95. The authors note, however, that reliability was often low, particularly in studies with larger sample sizes(61); Overall reported agreement was ICC=0.675, between the experienced and inexperienced raters K_w=0.686, agreement between experienced and inexperienced raters using a decision making tool K_w=0.568, and agreement between inexperienced raters without a tool and inexperienced raters with a decision tool was K_w=0.736(62) **Test-retest reliability**: K_w=0.95(63); k_w=0.94 for rater 1 and k_w=0.99 for rater 2 with a mean re-test interval of 7 days(59); κ=0.72 (based on re-assessment of videotapes, 3 month interval)(64) **Concurrent validity :** MRS scores correlated with the Barthel Index (3, 65-67), Functional Independence Measure(67), the Frenchay Activities Index(68) and the physical function scale of the SF-36.(66) **Convergent/discriminant validity:** In a comparison between mRS scores and scores obtained via the Sickness Impact Profile, there were stronger associations reported between SIP subscale assessments of functional ability (IADL), mobility and living arrangements and mRS scores than there were between mRS scores and SIP subscales of cognitive alertness or social interaction.(3) **Predictive validity** : pre-stroke mRS scores were an important predictor of post-stroke outcome assessed on both the Barthel Index and mRS.(66)	'0' is indicative of no symptoms, while a rank of 5 is indicative of the most severe disability (described as bedridden, incontinent, requiring constant nursing care).(57)	training and/or the use of structured interview tools has been associated with improved reliability.(59, 69, 70)
Functional Independ-ence Measure (FIM) (71)	18 items to evaluate 6 areas of function (self-care, sphincter control, mobility, locomotion,	Approx. 30 minutes to administer and score; however, it is	**Interobserver reliability**: In a review and meta-analysis (n=11 studies), interobserver reliability ranged from 0.89 to 1.0. When converted to a common metric and pooled, median agreement was reported to be 0.95(73)	Items are scored on a 7-pt. Likert scale according to the amount of assistance required	Yes.

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
	communication and social cognition). These may be placed into 2 domains; 1) motor (13 items: motor-FIM) and cognitive (5 items: cognitive-FIM).	recommended that ratings be derived by multidisciplinary team consensus following a period of observation. (72)	**Test-retest reliability**: In a review and meta-analysis (n=11 studies), median test-retest reliability was reported to be 0.95(73) **Internal consistency reliability:** Reported values for a range from 0.88(74) to 0.95(75, 76); reported item-to-total correlations range from 0.53 to 0.87(76). **Construct validity**: The 2-factor structure (motor + cognitive) of the FIM has been confirmed on factor analysis(77, 78), although a possible 3-factor model has also been reported (self-care, cognition, elimination)(79) **Concurrent validity**: Strong associations have been demonstrated between motor-FIM scores and scores from the Barthel Index(67, 74), the mRS(67), the Disability Rating Scale (DRS)(80), the Action Research Arm Test (81), The Fugl-Meyer Assessment(81), the Wolf Motor Function Test (time and functional assessment scores)(81) as well as between the cognitive-FIM and the DRS(80) **Construct validity (known groups):** FIM scores discriminated between groups right vs left-sided involvement in individuals with stroke at admission ($p<0.005$) and discharge ($p< 0.05$)(75); at admission and discharge, FIM scores were significantly different for individuals with and without neglect ($p<0.001$ and $p<0.02$, respectively) and with or without aphasia ($p<0.01$; $p<0.09$)(82). **Predictive validity:** admission (rehab) FIM has been reported to be associated with discharge FIM scores (total FIM, motor-FIM, cognitive-FIM)(83), length of inpatient rehabilitation stay(83, 84), functional gain(82), discharge assessments of balance and mobility(84), discharge walking speed(85) as well as discharge destination(75, 86). FIM scores have been reported to predict burden of care in terms of minutes of help/day required(87); motor-FIM scores have been associated with amount of direct assistance required, cognitive-FIM scores with direct supervision required(88); FIM scores at	in the performance of each one (1=total assistance, 7 = total independence). Item scores are summed to provide a total out of 126. Motor and cognitive subscale scores may be calculated separately an may yield more useful information specific to each domain(77)	

Assessment Tool	Number and description of Items	Time to Administer	Reliability/validity	Interpretation of Scores	Training Required
			one month post stroke have been reported to be associated with depression at 3 months post stroke(89).		
Alpha-FIM(90)	A shortened version of the Functional Independence Measure. 6 items: 4 motor (eating, grooming, bowel management and toilet transfers) and 2 cognition items (expression and memory). If the individual with stroke is able to ambulate ≥150 feet then walking and bed-to-chair transfers may be substituted for eating and grooming items in the evaluation(91)	Approx. 5 minutes(92)	**Interobserver reliability:** ICC=0.92(92) **Internal consistency reliability:** α=0.87, item-to-total correlations ranged from 0.27 (toilet transfer) to 0.75 (memory)(90); α=0.90(92) **Construct validity:** A single factor/component has been identified on factor analyses, accounting for the majority of the variance in functional status(90, 92) **Concurrent validity:** Alpha-FIM scores were significantly associated with total-FIM scores (r=0.75), and there was no significant difference reported between projected and actual FIM scores(90); correlated with Barthel Index scores (r=0.68)(92) **Predictive validity:** Alpha-FIM scores obtained in acute care were predictive of FIM scores on admission to and discharge from rehabilitation(90, 91), length of stay(90, 91), FIM gain(91) and discharge to the community(90).	Items on the Alpha-FIM are scored as per the original FIM scale. Scale scores range from 6 – 42. Alpha-FIM scores may be transformed to projected FIM scores using a [proprietary] algorithm ranging from 18-100.(90)	Yes.

*****A number of studies have examined the reliability of retrospective calculation of CNS scores based on documentation provided in medical records. In general, these studies have demonstrated consistently high (excellent) levels of interobserver(93-95) and internal consistency(93) reliability. **As for the CNS, investigators have studies the use of the NIHSS for performing retrospective, chart-based evaluations.(94, 96, 97) In general, the reported reliability of these assessments is lower than that associated with the CNS and should be based upon neurologist reports where possible (94, 98). ***The PedNIHSS appears to maintain a high level of reliability when used for retrospective derivation of an NIHSS score. In addition, there was no significant difference demonstrated between scores derived prospectively vs. retrospectively (p=0.49)(26)

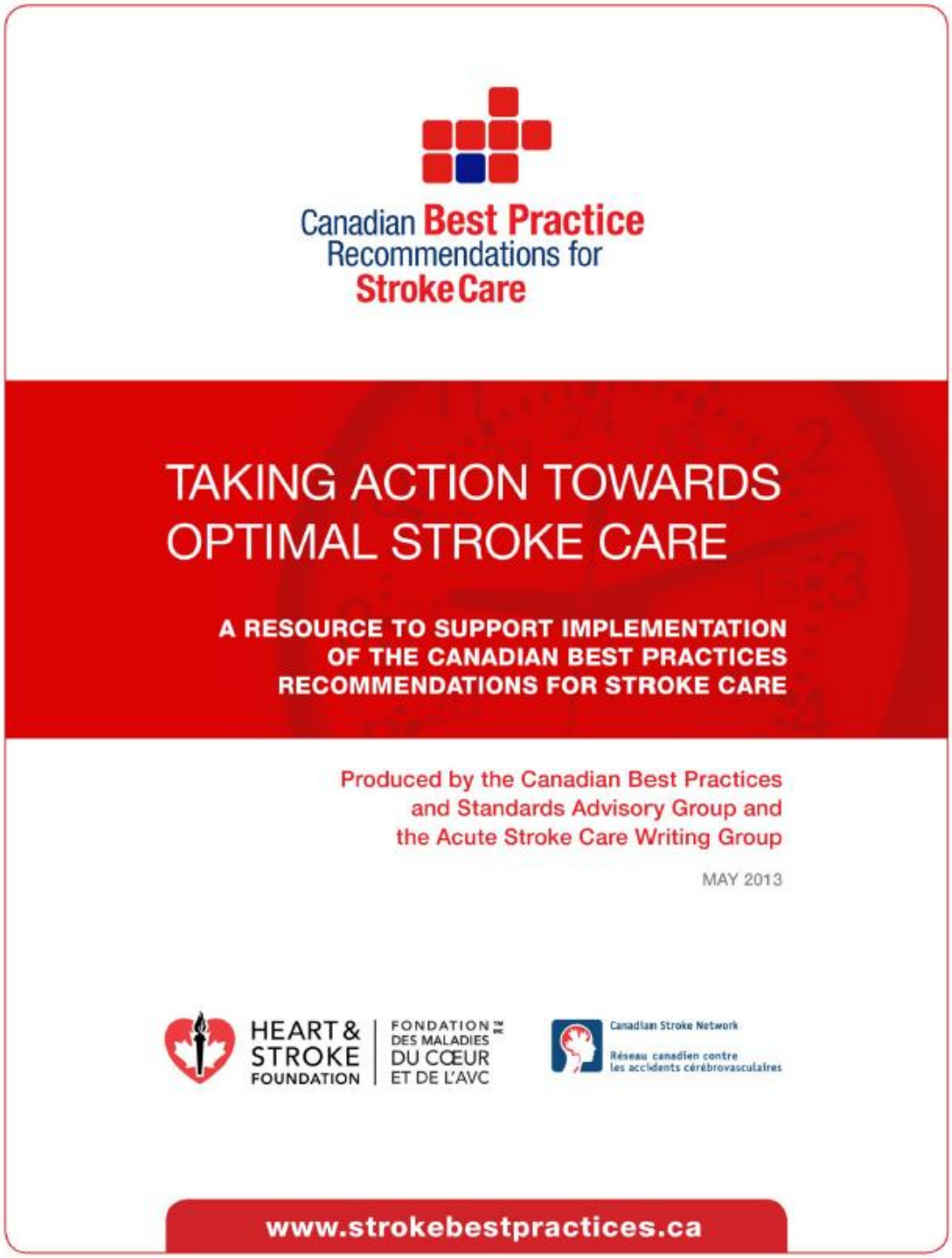
Useful Links:

1. Additional information regarding the CNS, NIHSS, mRS, and FIM is available at www.ebrsr.com and at www.strokengine.ca
2. There is a site for international users of the NIHSS scale – it may be found here: http://www.nihstrokescale.org/ It provides links to the scale in English, as well as lots of good training information – but it also provides links to the scale in quite a number of other languages as well.

3. Here is a link to the NIHSS booklet in PDF form: http://www.mdcalc.com/clinical_images/NIH_Stroke_Scale_Booklet.pdf
4. And to an online calculator: http://www.mdcalc.com/nih-stroke-scale-score-nihss/
5. Here is a link to the Hunt and Hess Scale itself: http://www.neurosurgic.com/index.php?option=com_content&view=article&id=439&Itemid=607 or http://radiopaedia.org/articles/hunt-and-hess-grading-system (this page also supplies links to the Fisher scale and to the WFNS scale)
6. Here is a link to the Fisher Scale: http://www.neurosurgic.com/index.php?option=com_content&view=article&id=438&Itemid=606
7. Here is a more descriptive presentation of the WFNS: http://www.strokecenter.org/wp-content/uploads/2011/08/WWF_scale.pdf
8. The Rankin scale has its own website: http://www.rankinscale.org/
9. The FIM is also reviewed at: http://www.rehabmeasures.org/lists/rehabmeasures/dispform.aspx?id=889
10. The official site for the Alpha-FIM: http://www.udsmr.org/WebModules/Alpha/Alp_About.aspx

Appendix AE: Stroke Network – Canadian Best Practice Recommendations Taking Action Towards Optimal Stroke Care for Stroke Care (Update 2013)

Canadian Best Practice Recommendations for Stroke Care (Update 2013) *Taking Action Towards Optimal Stroke Care*



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TAKING ACTION TOWARDS OPTIMAL STROKE CARE

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* Content and resources to support each step in the implementation process will be released through the Canadian Stroke Best Practices Website by May 31st, 2013

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