

Diabetes Obesity Nutrition Strategic Clinical Network (DON SCN)
Provincial Diabetes Inpatient Management Initiative

**Guide to the DON SCN Evidence-Based
Implementation of
Basal Bolus Insulin Therapy (BBIT)
and Improved Glycemic Management**

Site Information Package

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Introduction

Message from the Provincial Diabetes Inpatient Management Initiative and BBIT Implementation Core Leadership Group

The Diabetes, Obesity, and Nutrition Strategic Clinical Network (DON SCN™) is leading a provincial initiative with the goal to improve and standardize how patients with diabetes are cared for in Alberta hospitals. This work is a multifaceted quality improvement initiative, in collaboration with Pharmacy Services, Nutrition and Food Services, and operational areas in the Zones. It involves a multidisciplinary approach to diabetes management, shaped around the patient and their family.

1 in 5 adult patients admitted to hospital in Alberta has diabetes. When compared to their non-diabetic counterparts, patients with diabetes have longer hospital stays. Provincially, the average length of stay among patients with diabetes was 5 days, which is two days longer than the average length of stay among people who do not have diabetes. Literature suggests that patients with diabetes experience hyperglycemia (high blood sugar) 38 percent of the time they are in hospital. Alberta data collected from four urban hospitals between January and December 2014 is consistent with this figure.

The inpatient diabetes management initiative is a priority for the DON SCN because hyperglycemia is common in hospitals and increases the risk of complications including: post-operative infections, pneumonia, diabetic ketoacidosis (DKA), and delays in wound healing. Hyperglycemia also increases mortality, readmission, and length of stay. National guidelines recommend blood glucose targets of **5-10 mmol/L** for most patients in hospital. More information regarding the importance of managing blood glucose levels in hospital is found in the Diabetes Canada (previously Canadian Diabetes Association) Clinical Practice Guidelines (CPGs) for In-Hospital Management of Diabetes.

www.guidelines.diabetes.ca/browse/Chapter16

The provincial initiative will support improved glycemic management and diabetes care with:

- Guidelines for prescribing subcutaneous insulin (Basal Bolus Insulin Therapy)
- Safe Management of Insulin Pump Therapy in acute care
- Simplified insulin formulary and patient specific delivery of insulin- *led by provincial Pharmacy*
- Labelling carbohydrate content- to support patients to self-manage where appropriate- *led by provincial Nutrition and Food Services*
- Better coordination between meal tray delivery and availability, blood glucose testing and medication administration
- Smooth transition from and back to community care
- Self-Management- supporting patients to self-manage their diabetes where appropriate
- Peri-procedural / Peri-operative care guidelines- *led by Clinical Knowledge and Content Management in collaboration with the Surgery SCN and the DON SCN*
- Diabetic ketoacidosis (DKA) guidelines- *led by the Emergency SCN*
- Glycemic management policy with procedures for hyperglycemia and hypoglycemia management
(see [Appendix 3](#) - overview of provincial initiative)

The initial priority of the provincial initiative is the implementation of **Basal Bolus Insulin Therapy (BBIT)**, using an evidenced based implementation strategy. Building upon learnings from previous implementations, both within Alberta and across Canada, the implementation will focus on shared and unique site-specific barriers and facilitators, and use the science of knowledge translation to promote uptake and sustainability.

Thank you for your interest in the implementation of Basal Bolus Insulin Therapy (BBIT) and improved glycemic management. By adopting the BBIT protocol, you will have the opportunity to collaborate and consult with the many sites that have adopted this protocol across the province. This booklet was created to share information with you and your site about the evidenced based implementation and sustainability plan. We look forward to the opportunity to work with you to implement BBIT at your site and to hear your comments, feedback and suggestions. It promises to be an intense journey, with a rewarding experience and outcomes!

**Be a part of
the provincial
shift to BBIT**

For more information about the implementation plan, please contact the DON SCN at: diabetesobesitynutrition.scn@ahs.ca.

Please note: This document is being updated as we learn more about the implementation of this clinical practice change, including new barriers and facilitators from our early adopter sites.

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Purpose of this Initiative

The purpose of this initiative is to improve patient outcomes by improving glycemic control using basal bolus insulin therapy and recommended blood glucose targets, which are supported by guidelines published by Diabetes Canada (previously Canadian Diabetes Association). This will be achieved by implementing a provincial basal bolus insulin therapy order set and blood glucose/subcutaneous insulin administration record, as well as by improving communication and understanding of best practice using a multidisciplinary team approach which includes the patient and their family.



5-10
mmol/L

Initiative Overview

What is the Intervention?

The intervention is **Basal Bolus Insulin Therapy (BBIT)**.

BBIT is a way of ordering multiple daily injections of subcutaneous (sc) insulin that better replicates how our body naturally produces insulin. BBIT allows clinicians to customize insulin regimens based on the unique needs of each patient. BBIT involves a proactive approach to managing diabetes within the hospital and aims to anticipate and address a patient's physiologic insulin needs. It also minimizes the fluctuations in blood glucose levels, reduces episodes of hyperglycemia and hypoglycemia, and helps maintain the hospitalized patient's blood glucose within the recommended in-hospital target range of **5-10 mmol/L**. BBIT has been shown to be an effective way to manage patients' diabetes during their hospital stay, and is similar to how many patients manage their diabetes in the community.

Currently, subcutaneous "sliding scale" insulin (SSI) is commonly used in the treatment of diabetes in the inpatient setting. Unfortunately, the use of the "sliding scale" regimen treats hyperglycemia only after it has occurred. It is not individualized to the patient and can result in large blood glucose fluctuation throughout the day. These fluctuations make the patient feel unwell, and increase morbidity, mortality and length of stay. SSI does not align with clinical practice guideline recommendations.

BBIT includes 3 insulin components: basal insulin (intermediate or long acting), bolus insulin (rapid-acting or short acting mealtime), and (rapid-acting or short acting) correction insulin. It also involves optimizing insulin dosages to assist the patient in meeting their glycemic targets.

The provincial order set for adult Basal Bolus Insulin Therapy was created by a provincial multidisciplinary working group, incorporating feedback from hospitals and jurisdictions within Alberta and across Canada that have previously implemented BBIT using a pre-printed order set. The paper-based order set, along with a new blood glucose and subcutaneous insulin administration record were tested by Human Factors prior to being used at three early adopter sites starting in February 2016. The paper-based order set and blood glucose record were revised in November 2016 and again in May 2017 based on feedback from early adopter sites, and are now available provincially for order from DATA group.

Overview of
Quality
Improvement
Initiative

The provincial order set was also populated into Sunrise Clinical Manager (SCM) in May 2016, for use by prescribers in the Calgary Zone urban, and was also revised in November 2016 and May 2017. Patient blood glucose data using the current order set shows improved glycemic control, with reduced episodes of hyperglycemia and no increase in hypoglycemia.

It’s more than just an order set! It’s more than just education!

BBIT is being implemented at early adopter sites, using an evidenced based knowledge translation strategy. The evidence for the use of BBIT is clear, as is the use of a deliberate, evidence-based approach for its implementation. Each site is unique, so the implementation plan (see [Appendix 2](#)) will focus on site readiness (see [Appendix 1](#)), known and unique site specific barriers that might get in the way of this practice change, and facilitators that will assist with the change, as well as ongoing contextual assessments. Site based champions (Physician, Nursing, Pharmacy) will lead the change, supported by local Administrators, ongoing discipline-specific education, the elimination of pre-printed sliding scale insulin orders, policy, and sharing of data to support and sustain practice change.

Early adopter sites will have the opportunity to collaborate, share learnings and insights, and problem solve together.

A Few Words about Knowledge Translation

Knowledge translation (KT) is a term describing how we put evidence that we have obtained from research into our everyday work – a simple definition is to help close gaps between what we know and what we do.



These gaps between what we know and do are called “knowledge to action” (K2A) gaps. The reason we are so focused on K2A gaps is because they can be significant sources of practice variation leading to wide discrepancies in patient outcomes, quality and safety of care, efficiency and cost. Finding K2A gaps and helping teams to overcome them is a big part of the work undertaken by the Diabetes, Obesity and Nutrition Strategic Clinical Network. When we find these gaps, it is important to dedicate time and effort to make sure evidence-based practice becomes what we do every day.

Knowledge that comes out of research is necessary for practice change but is usually insufficient on its own to get us to change what we do. To change practice, it is important to think about what things might get in the way of change.

The first step toward implementing a clinical practice improvement involves recognizing potential barriers that may get in the way of change, and make a plan together to address them, to ultimately achieve these goals. It is this deliberate, planned approach that we are using to help you and your team adopt BBIT into your daily routine.

**Supporting
Clinical
Practice
Change**

Known Facilitators and Barriers of this Practice Change

(from local Alberta experience, a national e-scan, and literature)

Facilitators / Enablers

- Site Champions (Physician, Nursing, Pharmacist, Administrative) –see page 11 for more information on suggested roles
- Ongoing multidisciplinary multi-modal Education (Profession to profession education is preferred)
 - Physician to Physician education
 - Nursing to Nursing
 - Pharmacy to Pharmacy
- Enhanced and regular communication between team members and patient
- Engage residents (medical learners) and practicum students
- Follow up with Clinicians that order sliding scale insulin (SSI), either by Pharmacy, Nursing, or Physician lead
- Linking glycemic control to order set
- Building in direction about hyperglycemia management in order sets (when notification of most responsible health practitioner for moderate hyperglycemia and severe hyperglycemia is required)
- Assessment of blood glucose and titration of subcutaneous insulin doses
- Using data to measure and support change, and share progress with the front line team
- Eliminate subcutaneous sliding scale insulin option

Barriers

- Fear of hypoglycemia
- Personal Preference of the Prescriber
- Availability and continued use of SSI order set
- BBIT orders not being given as prescribed
- Lack of communication between care team and/or patients
- Lack of ongoing education and monitoring (using data)
- Practice regression in the absence of ongoing support
- Lack of active titration of BBIT doses
- Concern around transition to hospital and back to home

Site specific facilitators and barriers

Each site has a unique culture, and will have its own barriers and facilitators for this change; thus, it is important for sites (or units) to assess and address their own perceived barriers.

What might
get in the
way?

Anticipated Outcomes of the Initiative

Successful implementation of the BBIT initiative is expected to:

- Improve blood glucose control
- Decrease incidence of hyperglycemia
- Reduce hospital length of stay
- Increase communication and collaboration among team members
- Improve patient experience

Key Elements of the Implementation Plan

The key elements of the Knowledge Translation / Implementation plan that make up the DON SCN project are:

1. **Provincial Basal Bolus Insulin Therapy (BBIT) Adult Inpatient Order set** (*AHS form #19885 or Covenant Health form # CV-0701*)
2. **Blood glucose and insulin administration record** (*AHS form #20115 or Covenant Health form # CV-0690*)
3. **Site Readiness assessment** ([Appendix 1](#))
4. **Site Champions** (Physician, Nursing, Pharmacy, Administrative)
5. **Identification of site specific Barriers and Facilitators**
6. **Education**
 - Profession to profession is preferred
 - MD to MD education
 - Nursing to Nursing
 - Pharmacy to Pharmacy
 - Resources on BBIT website
7. **Collaboration and joint problem solving** by site based multidisciplinary team
8. **Joint problem solving / shared learnings with provincial team and other early adopter sites**
 - a. Problem solving / Data sharing meetings
 - b. Participation in the process of building a more robust implementation approach by sharing feedback from your site, and piloting/implementing new tools or interventions to address barriers discovered during the implementation process at your site and others
9. **Data Collection**-Baseline data allows the site to identify the issue and establish the magnitude of the change required. Audit data helps monitor change and its effect.
10. **Data Communication**-to team members
11. **Participation in evaluation of provincial initiative**

Site Implementation Plan – Site Responsibilities and Timeline

(see [Appendix 2](#))

The initiative involves a three stage Knowledge Translation (or implementation) plan to promote the clinical practice change to Basal Bolus Insulin Therapy, and improved glycemic management. We know that even if there is evidence supporting a change and a willingness to accept a change, the process of actually establishing and sustaining the new patterns of care is very challenging. The DON SCN is using evidenced based Implementation Science / Knowledge Translation to promote and sustain behaviour change. Timelines are an estimate and will vary depending on site size and other variables.

Sites will be supported to follow an implementation plan with 3 stages:

Pre-implementation (3-6 months)

- Organization of Core Implementation Team
 - Identify and prepare multidisciplinary team members
- Site readiness assessment
- Train the Trainer session may be available for site champions and implementation team
- Baseline data collection
 - Identify current state and site goals
- Education
 - Discipline specific education about best practices in Diabetes Inpatient Management (including Basal Bolus Insulin Therapy)
 - Awareness building
 - Quality improvement, knowledge translation and change management
- Assessment and communication of potential site specific barriers and facilitators to provincial team for mapping and development of tools/strategies to address
- Process mapping

Getting Ready

Implementation (6 months)

- Initial uptake (6 months)
 - GO LIVE date
 - Implement BBIT order set and if possible, eliminate sliding scale insulin alternative
 - Champions use site influence to promote adoption
 - Mobilize local champions
 - Champions oversee discipline specific education
 - Educational resources available on www.bbit.ca
 - Webinars
 - Case studies
 - Communication Plan:
 - Feedback to the team monthly
 - Ongoing collection of audit data, accessing site results in Tableau
 - Feedback linking with other early adopter sites and provincial team to share insights, challenges and solutions
 - Follow up with providers
 - Qualitative feedback from users
 - Ongoing assessment of barriers, and application of new tools / resources to address same
 - Anything unanticipated? Are new tools required?

Post Implementation – Sustaining the change (6 months or more)

Sustaining the change through ongoing measurement and education

- Maintenance and Ongoing Education
 - Ongoing re-evaluation of barriers and facilitators
 - Anything new? Are new tools required?
 - Ongoing multidisciplinary education, specifically targeting identified barriers
 - Ongoing collection of audit data quarterly, accessing site results in Tableau
 - Has change been sustained? Is practice drift occurring?
 - Are provider audit/feedback tools required?
 - Communication Plan:
 - Share successes!
 - Feedback to the team quarterly
 - Feedback linking with other early adopter sites and provincial team to share insights, challenges and solutions
 - Follow up with providers
 - Qualitative feedback from users
 - Evaluation

What is
required?

Preparing the Team

The multi-disciplinary team is a key factor for the successful implementation of any change. This is especially true with BBIT, as several disciplines are responsible for supporting the patient with diabetes during their hospital stay.

Your implementation team should involve people who are responsible for the care of patients diagnosed with diabetes in your hospital. This may include: Physicians, Residents, Nurses, Educators, Pharmacists, Dietitians, Quality Improvement Specialists, Patient Safety professionals, Lab services, and others. You may also want to consider a patient representative as part of your implementation team. This group should meet on a regular basis to discuss progress, share best practice and develop new strategies to address barriers to implementation.

In addition, the participation and support of senior leaders at the site is critical. The administrative champion(s) can support and encourage the teams, facilitating the site to achieve sustained practice change. Make sure that the project has been thoroughly discussed and that everyone is aware of the efforts required to fulfill the entire process.

A first step in establishing your team is to assemble the entire team for a first meeting. We strongly suggest regular meetings to problem solve and set goals. It is important for the site team to get to know each other and share expectations, concerns and motivation for pursuing this implementation process.

Efforts will be made to support a Train the Trainer session in each zone. Each team is encouraged to send core representatives from the implementation team who will receive education, and in turn these champions will be able to provide cross-training to the remainder of the team. The representatives should consist of the Physician champion(s), Pharmacy champion(s), Nurse champion(s), Administrative champion, and other professionals as determined by the site (e.g. nurse educator(s), dietitian, quality improvement specialist).

Change Management and Knowledge Translation Resources

It is highly recommended that the site champions and other key individuals, who will be supporting this change in practice at your site, take the opportunity to access some of the existing AHS resources on change management, if they have not already done so.

See [Appendix 6](#) for recommended resources.

Site Champions

Opinion Leaders

It is strongly encouraged that the site champions meet on a regular basis during all stages of the implementation process, beginning with bi-weekly meetings during 1st quarter of implementation and monthly meetings in subsequent quarters, to discuss progress, challenges, and to problem solve.

In addition, the Nurse Champion (or site lead) will have the opportunity to collaborate with Nurse Champions (or site leads) at other early adopter sites, as well as with the provincial lead and project manager (in an online meeting format) on a bi-weekly basis to share site learnings, resources and to problem solve. Any of the site champions are welcome to join this conversation.

All site Champions will have the opportunity to collaborate with other sites, or with the provincial team, on an as needed basis.

Suggested responsibilities for each champion are as follows:

Nurse Champion(s)

Generally, this individual will be a nurse educator, with strong relationships at the site.

Responsibilities include:

- Educate Nurses (and other staff, including clinical assistants/allied health professionals)
- Educate Clinical Nurse Educators (CNEs) that can assist with the orientation and ongoing education to Nursing staff
- Lead the implementation of key components of the education which are specific to nursing
- Work with nurses in all areas to ensure the recommendations are being followed, and assist with problem solving
- Provide continuous education on BBIT recommendations and adapt educational and promotional materials provided by the BBIT project
- Liaise with other provincial sites and project leads
 - Attend bi-weekly online meetings to communicate, share progress, challenges, resources, and problem solve.
- Organize and attend bi-weekly site implementation team meetings
 - Build agenda
 - Share provincial updates
- Liaise with other Site Champions (Physician, Pharmacist, Administration), and other individuals responsible for the care of patients with diabetes (Dietitian, Nursing, Allied Health)
- Assist in organizing multidisciplinary rounds / in-services at your hospital
- Attend multidisciplinary, multisite meetings (in-person or conference call)
- Assist with or delegate data collection

Nurse Champions

- Share audit data with front line staff
- Assist with developing site specific educational resources

Physician Champion(s)

Responsibilities include:

- Educate physicians and residents at the site
- Lead the implementation of key components of the guideline which are specific to physicians
- Provide continuous education on BBIT recommendations
- Present at physician or multidisciplinary rounds
- Provide positive leadership and support to colleagues around implementation of BBIT and removal of SSI alternatives
- Liaise with site based Champions (Nursing, Pharmacist, Administration)
- Attend bi-weekly site meetings
- Work with all members of the site team to ensure the recommendations are being followed
- Liaise with other Physicians (Endocrinology, General Internal Medicine, Hospitalist, Surgeon, etc.) and other team members responsible for the care of these patients
- Liaise with Physician of the provincial leadership team
- Attend multidisciplinary, multisite meetings (in-person or conference call) as required
- Access and share audit data with colleagues

Physician Reimbursement: Physician champions may wish to explore with their Zone Medical leadership, as to whether there may be funding available to support them to participate in this quality improvement initiative, including the Train the Trainer session.

Pharmacist Champion(s)

Responsibilities include:

- Educate and train Pharmacists, Pharmacy Residents and Pharmacy students
- Lead the implementation of key components of the guidelines, with a focus on those pertaining to pharmacy
- Work with other pharmacists and pharmacy students to ensure the recommendations are being followed
- Provide continuous education on BBIT recommendations
- Assist in organizing multidisciplinary rounds/in-services
- Follow up with Physician (or other prescriber) when BBIT not ordered following recommended practice
- Liaise with site based Champions (Nursing, Physician, Administration)
- Attend bi-weekly site meetings
- Liaise with Physicians, Residents, Nurses, Pharmacists and Allied Health Professionals responsible for the care of these patients
- Attend multidisciplinary, multisite meetings (in-person or conference call)
- Assist with developing site specific educational resources
- Share audit data with front line staff

Physician
and
Pharmacist
Champions

Administrative Champion

Responsibilities include:

- Provides administrative leadership support to Nursing, Physician, and Pharmacist Champions at the site
- Assists with problem solving and conflict resolution
- Communicates to other administrators (managers, directors) at the site
- Liaise with site based Champions (Nursing, Pharmacist, Physician)
 - Attend bi-weekly site meetings as required
- Access and share audit data with administration and other stakeholders

Who could help lead?

Notes & ideas:

Data

Site specific data is an important facilitator of the clinical practice change to Basal Bolus Insulin Therapy (BBIT).

The provincial team has developed an audit tool in Tableau, which can be used by site teams that have data support. This will allow site teams to monitor BBIT implementation outcomes over time, and share this information with the multidisciplinary team. The provincial team may be able to assist with data analysis.

Baseline Data: Teams are encouraged to collect retrospective, baseline data on patients with diabetes that have been admitted to their site. The provincial team can assist with sample size recommendation. Data collection to include blood glucose results for the first two weeks of identified patient stays during an individual hospital admission and the associated insulin order (or other anti-hyperglycemic medication) at the time.

Note: The DON SCN has approached Health Information Management (HIM), and they have agreed to collaborate and facilitate sites accessing medical records for data extraction in a timely fashion. The DON SCN will assist with this process.

Audit Data: As with the baseline data, sites are encouraged to collect this data manually on an on-going basis and submit this information to the provincial team for analysis and reporting. (Please see Audit Tool under Resources for information around reporting of site data.)

Note: Teams operating in sites that are currently using Sunrise Clinical Manager (i.e., Calgary zone urban sites) may not be required to complete this step manually as this data can be extracted electronically.

Resources / Support available from the DON SCN provincial team

The provincial team will provide support in the following areas:

Site Readiness Assessment tool

[\(Appendix 1\)](#)

The readiness assessment can also be done online via survey select at:

<https://redcap.albertahealthservices.ca/surveys/?s=P8XEXJEDPKL8889A> (and results shared back to site teams by the DON SCN)

Champion Education

BBIT may be implemented using a Train the Trainer approach. The provincial team, and possibly site champions from previous early adopter sites, may be able to support your site champions in a Train the Trainer session to be able to educate your larger multidisciplinary team.

The Implementation Team are invited to attend a Train the Trainer sessions prior to implementing BBIT at your site. Each team must send 4-6 (or more depending on the site size) core representatives from the Implementation Team who will receive education, and then provide cross-training to the remainder of their multidisciplinary peers. The representatives must consist of: Nurse champion, physician champion, Pharmacist champion, Administrative champion, and other professionals deemed to be supporting the change at your site (e.g. nurse educator, dietitian, quality improvement specialist, etc.). Note: it is imperative that each of these groups, especially the physician champion, is represented as it significantly affects the success of the project.

Train the Trainer Session Topics

- Overview of Basal Bolus Insulin Therapy
- What is Knowledge Translation?
- Data
 - Review of site specific baseline data and why it is needed
 - Audit data
- What will be different?
 - How to use new order set (MDs, Pharmacists)
 - Understanding new order set (Nursing)
- Barriers and Facilitators - known and site specific
- Individual Team planning - setting plans for the months to come, and anticipating barriers and exploring solutions
- Education material will be provided by the Provincial project team

Videoconference session to review case based scenarios

- For designated site champions, and other key individuals that will be supporting the change at your site
- Multidisciplinary education, as well as discipline specific education
- Topics covered are:
 - How to order basal bolus insulin therapy using provincial order set
 - Case scenarios
 - Review of special circumstances
 - Understanding the orders
 - Review of baseline measurements and current status for site / unit

- Audit data-understanding and using data to support implementation
 - Demonstration of audit tool in Tableau
- Design standard reports to use for team meetings
- Review site specific barriers and facilitators
- Problem solving and solutions for implementation plan

Project Lead

- Coordinating the multiple initiatives that are part of the multifaceted provincial initiative
- Contact for the site leadership
- Communication to the multiple stakeholders involved in the provincial initiative

Clinical Practice Lead(s)

- Organizes and leads bi-weekly/monthly meetings with sites for joint sharing and problem solving
- Is a conduit for the site teams to the provincial team
- Following up with sites regarding barriers, so the provincial team and other sites can assist with same.

Project Management

- Assistance with scope and project timelines
- Generic tools to assist with process mapping (work plan, flow map)

Access to multidisciplinary experts

- Physician
- Nursing
- Pharmacy

Data Support

Data Entry Forms

- Forms provided for manual baseline and audit data collection to guide sites in their data collection.
- Guidelines for the collection of baseline and audit data

Audit Tool

- An audit tool has been developed as a Tableau dashboard by Data Integration and Measurement (DIMR) and Clinical Quality Metrics.
- The audit tool includes a number of indicators (see below) that are being used to support some of the early adopter sites. It will be updated monthly for at least the first six months, then quarterly for at least one year. Paper based sites will be supported to collect the required information manually from the patient’s health record.
- The purpose of the audit tool is to assist in providing feedback to the site based clinical team, and support uptake and sustained implementation of BBIT at each site.

The following indicators are populated in Tableau, and available for sites in a dashboard format:



1. Percent of patient visits where basal bolus insulin therapy is the insulin treatment used
2. Proportion of patient-days with a hypoglycemic event (BG less than 4.0 mmol/L)
3. Proportion of Patient-days with a moderate or severe hyperglycemic event (BG greater than 14.0 mmol/L)
4. Point of Care Blood Glucose Testing Frequency Among Acute Care Patients
5. Acute Care Utilization Among Patients with Diabetes
6. Diabetes Medication Dispenses Prior to Admission
7. Glycated Hemoglobin (A1C) Testing Prior to Admission

For more information about the audit tool; please refer DON SCN “Understanding your audit data in Tableau” booklet.

For more information about Tableau; please see AHS Tableau webpage.

Data Analysis and Data Communication Strategy

- Paper based data forms will need to be entered into Excel format, so they can be sent for input into Tableau and analysis by DIMR.
- Analysis and summary of data and outcomes will be provided to the site team (for those sites who will be receiving data support through the DON SCN).

Order Set (AHS form #19885 or Covenant Health form # CV-0701)

- The provincial order set was created by a provincial working group, using insights from other hospitals / jurisdictions across the province and country, with direction built in for holding of insulin and appropriate treatment of hypoglycemia and hyperglycemia. It is designed to support non diabetes experts in ordering BBIT.
- It was revised iteratively after testing by Human Factors and early adopter sites. It is now available for provincial ordering through the DATA group.

Blood Glucose and Subcutaneous Insulin Administration Record (AHS form #20115 or Covenant Health form # CV-0690)

- To support association of patient blood glucose results to subcutaneous insulin orders
- Blood glucose record was tested at early adopter sites and revised in November 2016. It is now available for provincial ordering through the DATA group.

Education Materials for Patients and Staff

- Access to www.BBIT.ca website, which contains the following resources:
 - Key Message for Diabetes Inpatient management Seminar
 - Overview of Basal Bolus Insulin Therapy Seminar
 - How to Order BBIT Seminar
 - Paper based order set
 - Sunrise Clinical Manager order set
 - Pocket card for Nurses and Prescribers
 - Educational resource document for prescribers - “How To BBIT” (including special circumstances)
 - BBIT self-study module for Nurses
 - In hospital diabetes management summary
 - Health care provider pamphlet - summarizing BBIT and improved glycemic management in hospital
 - Patient education handout

- Posters that can be individualized to suit site-specific needs
- Resource binder for site

Knowledge Translation Support

- The provincial team is being guided by a Knowledge Translation / Implementation Scientist. Knowledge Translation resources will be included in the resource binder (above).

Collaboration with Provincial Pharmacy

- The provincial order set was developed using the current revised AHS simplified formulary for insulin (September 2015). The provincial Diabetes Inpatient Management Initiative also supported Pharmacy's initiative to move towards patient specific dispensing of insulin. More info available on www.bbit.ca

Nutrition and Food Services Support

- Supporting nutritional aspects of diabetes management in the hospital
- Assisting patients in nutritional **self-management** and carbohydrate content resources where appropriate.

Note: It is not the expectation that nursing will assist with the process of carbohydrate counting or adjust the dose of insulin in response to the carbohydrate count.

Innovative Collaboratives

The Innovation Collaborative approach (modelled after *Institute for Healthcare Improvement's* Breakthrough Series) brings together health care staff from different sites to share ideas and successes that will bring about clinical change, while focusing on measurement of progress. The Innovation Collaborative approach, which combines Learning Workshops with unique reporting tools, has demonstrated success in supporting the implementation of clinical initiatives across the province. Innovation Collaboratives provide a structure and process for engaging local teams in making changes designed to enhance the system of care using evidence and measurement. This approach provides provincial groups, such as the Strategic Clinical Networks, a structure to introduce new practices across the province that is respectful of individual site characteristics, and leads to sustainable change that is owned by the frontline staff and site.

These are opportunities to collaborate with other site teams in the province, to share learnings and insights, as well as support joint problem solving.

The intent is to build a community of practice with early adopter sites.

- Topics likely to be covered are:
 - Review of data and current status for each team
 - Site specific barriers and facilitators
 - Problem solving and solutions

Moving Forward – what will we accomplish together?

- Share best practices across the province
- Involve our patients and their families and caregivers in their diabetes care
- Strengthen communication amongst members of the multidisciplinary clinical team and with patients and families
- Develop collaboration within and amongst the hospitals in Alberta
- Implement initiatives which will lead to improved outcomes in patients with diabetes in hospital which will be sustainable beyond the life of the project
- Communicate our progress to stakeholders and other hospitals
- Increase our understanding of barriers and facilitators to the implementation of Basal Bolus Insulin Therapy and to evaluate our knowledge translation activities, so that they may be applied to other initiatives in other hospitals

Synergies

Evaluation of Provincial BBIT implementation

The implementation of Basal Bolus Insulin Therapy at early adopter sites across the province will be evaluated using the Health Quality Council of Alberta (HQCA) 6 dimensions of quality: Appropriateness, Acceptability, Effectiveness, Safety, Efficiency, and Accessibility. (<http://hqca.ca/about/how-we-work/the-alberta-quality-matrix-for-health-1/>) The evaluation will be used to inform the scale and spread of Basal Bolus Insulin Therapy, and other Diabetes Inpatient Management quality improvement initiatives, to other hospitals throughout Alberta.

Evaluation will focus on 3 areas:

1. Process Outcomes
 - Uptake of BBIT order set usage
 - Monitoring each sites implementation strategies
2. Clinical/Patients Outcomes
3. Patient and Provider Satisfaction

See [Appendix 4](#) for more details.

Budget

The DON SCN has received a modest budget to support sites in the implementation and sustainability of this clinical practice change. Budget is primarily to support data collection and change management at the site level, as well as collaboration with the provincial team and other early adopter sites. The modest budget is currently allotted until October 31, 2018.

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Appendix 1: Site Readiness Assessment

BBIT Readiness Assessment Tool

Site: _____ Role: _____

Proposed Change: To enhance and improve inpatient diabetes management, beginning with the implementation of basal bolus insulin therapy (BBIT). BBIT will support more consistent clinician practice. It involves the optimization of insulin delivery, and titration of insulin to meet glycemic targets of **5-10 mmol/L** for patients with diabetes in acute care (aligned with the Diabetes Canada [formerly Canadian Diabetes Association] Clinical Practice Guidelines). This change should be supported by an evidenced based implementation strategy including: identification of site specific barriers and facilitators, collection of data (before and after implementation), and multidisciplinary site champions supporting multidisciplinary ongoing education.

Responses:

Y=yes N=no DK=don't know NA= not applicable

Rating scale: 1-5 (unless indicated otherwise)

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Question /Statement	Response
INDIVIDUAL/TEAM CHARACTERISTICS	
1. I/we believe we can successfully implement this change	Y,N,DK, NA
2. This change will benefit me	Y,N,DK, NA
3. Most of my respected peers embrace the proposed organizational change	Y,N,DK, NA
4. I/we believe the proposed change will have a favorable effect on patient care	Y,N,DK, NA
5. Our site has the capability to implement the change	Y,N,DK, NA
6. I/we can implement this change into my/our current practice	Y,N,DK, NA
7. Implementing a basal bolus insulin protocol as part of a new inpatient glycemic control strategy is the right choice for our site	Y,N,DK, NA
8. The majority of our respective peers are dedicated to making this change work	Y,N,DK, NA
9. When I/we think about this change, I/we realize it is appropriate for our site.	Y,N,DK, NA
10. In my/our opinion, how strong is the evidence for this practice change? 1 – Poor 2 – Fair 3 – Good 4 – Very good 5 – Excellent	1 2 3 4 5
11. Our team will share responsibility for the success of this project	1 2 3 4 5
12. Our team has clearly defined roles and responsibilities	1 2 3 4 5
13. The team has release time or can accomplish intervention tasks within their regular work load	1 2 3 4 5

Question /Statement	Response
14. Our team has staff support and other resources in place for the project	1 2 3 4 5
15. People keep each other informed about work-related issues in the team	1 2 3 4 5
16. The people in our team are approachable	1 2 3 4 5
17. Team members are supportive of other team members	1 2 3 4 5
18. This team is open and responsive to change	1 2 3 4 5
19. The team critically appraises its activities to achieve the best possible outcome	1 2 3 4 5
SENIOR LEADERSHIP/CHAMPIONS	
20. There are champions identified at our site, representing nursing, pharmacy, physician and administration groups	Y/N/DK/NA
21. The champions for this project are passionate about the change	1 2 3 4 5
22. The champions for this project will accept responsibility for the success of this project	1 2 3 4 5
23. The champions for this project have the authority to carry out the implementation	1 2 3 4 5
24. The champions for this project are considered local opinion leaders	1 2 3 4 5
25. The champions for this project work well with our team and providers	1 2 3 4 5
26. Senior leadership reward clinical innovation and creativity to improve patient care	1 2 3 4 5
27. Senior leadership solicit opinions of clinical staff regarding decisions about patient care	1 2 3 4 5
28. Senior leadership seek ways to improve patient education and increase patient participation in treatment	1 2 3 4 5
29. Senior leadership encourages us to support the change	Y/N/DK/NA
30. Staff in our site hold each other accountable for achieving results	1 2 3 4 5
31. Staff in our site have a sense of personal responsibility for improving patient care and outcomes	1 2 3 4 5
32. Staff in our site cooperate to maintain and improve effectiveness of patient care	1 2 3 4 5
33. Staff in our site are willing to innovate and/or experiment to improve clinical procedures	1 2 3 4 5
34. Staff in our site are receptive to change in clinical processes	1 2 3 4 5
35. Senior leadership clearly define areas of responsibility and authority for clinical managers and staff	1 2 3 4 5
36. Senior leadership provide staff with feedback on performance measures and guidelines	1 2 3 4 5
37. Senior leadership establish clear goals for patient care processes and outcomes	1 2 3 4 5
38. Opinion leaders at our site work cooperatively with senior leadership/clinical management to make appropriate changes	1 2 3 4 5
RESOURCES	
39. We have the necessary training support to undertake the change	1 2 3 4 5
40. We have the necessary staffing support to undertake the change	1 2 3 4 5
41. We have the necessary time to undertake the change	1 2 3 4 5

Question /Statement	Response
42. Is the project appropriate and feasible for our unit/team?	Y/N/DK/NA
PATIENTS AND PATIENT NEEDS	
43. The proposed change is supported by our clinical experience with patients	1 2 3 4 5
44. The proposed change aligns with the opinions of clinical experts in our setting	1 2 3 4 5
45. The proposed change takes into consideration the needs and preferences of patients	1 2 3 4 5
46. The proposed change appears to have more advantages than disadvantages for patients	1 2 3 4 5
THE PROPOSED CHANGE	
47. The implementation plan for this intervention identifies specific roles and responsibilities	1 2 3 4 5
48. The team's objectives are clear	1 2 3 4 5
49. The objectives are useful / appropriate.	1 2 3 4 5
50. Other team members agree with these objectives.	1 2 3 4 5
51. These objectives are realistic and can be attained	1 2 3 4 5
52. Our team members are committed to these objectives.	1 2 3 4 5
COMMUNICATION	
53. Regular feedback to clinical management on progress of project activities and resource needs is important for the success of the project?	1 2 3 4 5
54. Regular feedback to clinicians and front line staff on the effects of practice changes on patient care/outcomes is important for the overall success of the project?	1 2 3 4 5

The readiness assessment can also be done on line via survey select at:
<https://redcap.albertahealthservices.ca/surveys/?s=P8XEXJEDPKL8889A> (and results shared back to site teams by the DON SCN)

Appendix 2: Site Implementation Plan

Pre-Implementation

- Identify Problem
 - Identify in-patients with diabetes
 - Record glycemic management. Monitor capillary blood glucose four times daily (ac meals and qhs), and record values; for all above patients on set acute care unit(s)
 - Chart audit for above patients to include:
 - blood glucose values (as above)
 - review of patient orders
 - How are the patients being treated – ie. diet alone, oral agents, insulin
 - If insulin ordered– what is being used – Sliding scale insulin, basal insulin, bolus insulin, correction insulin, other
 - Record PHN (so above data can be linked to length of stay)
- Identify best practices
 - For patients requiring sc insulin; Basal + Bolus (prandial) + Correction (BBIT)
 - Glycemic target-5-10mmol (as recommended by the Diabetes Canada [formerly Canadian Diabetes Association] Clinical Practice Guidelines for Inpatient Management of diabetes)
- Define existing practice patterns and outcome, and current variation from best practices
 - Explore potential Barriers / Facilitators
 - Map processes. Prepare for potential change in workflow-define current workflow
 - Define outcomes of interest-what needs to be measured? Is there site-specific outcome data, in addition to above recommended data?
 - Identify quality and performance gaps. How will they be measured?
- Site Readiness
 - Who could best support the site as a Nursing Champion, Physician Champion, Pharmacy Champion, Administrative Lead (These individuals need to be agreeable, motivated and able to participate; ideally should be opinion leaders) who are they? Are they ready?)
 - Promote QI training amongst the team members

Implementation

Identify and implement intervention

- Implement BBIT order set (paper based or electronic)
 - Identify patients who are appropriate for BBIT protocol
 - New or pre-existing diabetes, Type 1, Type 2, Gestational Diabetes
 - Inadequately controlled blood glucose in hospital (ie. Not meeting glycemic targets)
 - Order basal, bolus, correction insulin as per clinical guidance and protocol
 - Measure capillary blood glucose four times daily (before meals and at bedtime), record in Inpatient diabetes Logbook / Blood Glucose and subcutaneous insulin administration Record.
 - Remove sliding scale insulin options and dissuade its use
 - Review blood glucose daily and titrate BBIT doses daily to achieve targets
- Remove Sliding Scale Insulin (SSI) options or pre-printed order set(s)
- Multidisciplinary Continuing Education
 - Support site Champions to attend provincial Train the Trainer sessions
 - Utilize provincial resources created to support education at the sites

- Facilitate on-site education to front line multidisciplinary teams
- (Informative, clear, effective, targeted, intermittent but ongoing, site specific, role-specific, high visual appeal)
- Focused around key messages
- General diabetes education
 - Glycemic control guideline – both hyper and hypoglycemia are harmful in hospital
- Mobilize local champions and opinion leaders
- Communication Plan (provincial and local)
- Ongoing collection and communication of implementation data – communication around “How are we doing”, “What’s working and what’s not”
 - Bidirectional communication to and from the SCN/facilitators

Post-Implementation / Evaluation

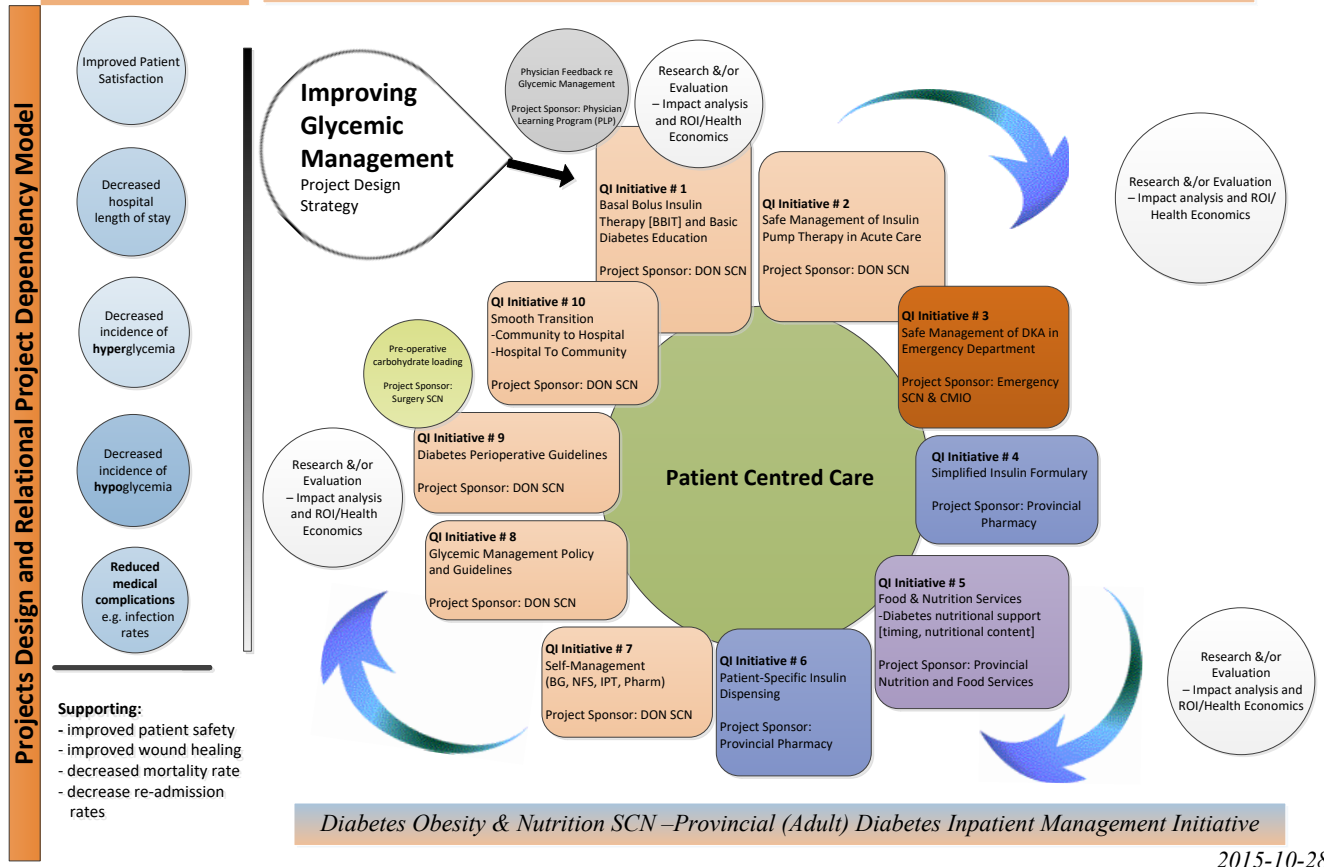
- Outcomes-(document that best practices improve outcomes)-These are proposed measures.
 - Uptake of BBIT
 - Decreased Hyperglycemia
 - Hypoglycemia—ensure no increase of hypoglycemia
 - Length of Stay
 - User Acceptance
 - Patient Experience
- Sustain the change through ongoing measurement and ongoing multidisciplinary education

Appendix 3: Overview of Provincial Initiative

Proposed Outcomes to Improving Glycemic IP Management

Provincial In-Patient Diabetes Management Initiative

Standardize Diabetes IP Care to meet National Guidelines



2015-10-28

Appendix 4: Evaluation Framework

This is a summary of Evaluation Framework of the Provincial Initiative. Full details are available upon request.

The purpose of the BBIT Project mixed method evaluation is to determine the outcomes and value of the overall provincial BBIT Project in order to inform further provincial implementation of BBIT and improved glycemic management.

Specific evaluation objectives are:

- a. To determine if a deliberate implementation process will result in measurable and sustained improvements in the outcome(s) of interest.
- b. To appraise the impact and utility of the KT toolkit
- c. To assess the management of the overall project
- d. To generate learnings from site implementation teams
- e. To capture project lessons learned

1. Evaluation of OUTCOMES

Primary project outcome:

- BBIT ordering: Uptake of BBIT ordering by physician groups, hospital units or acute care sites which are participating in KT toolkit implementation

Secondary project outcome measures captured in the Six Dimensions of quality impact:

- Acute Length of Stay (LoS): LoS for diabetic patients with BBIT orders compared to SSI and other insulin regimes
- Hyperglycemia or Hypoglycemia: Episodes of Hyperglycemia (>10mmol/L) or Hypoglycemia (<4mmol/L) for diabetic patients following KT implementation
- Patient Reported Outcomes: Patient reported satisfaction on units participating in BBIT (HCHAPS)
- Provider Reported Outcomes: provider reported satisfaction with BBIT implementation (interviews and surveys)

Anticipated system, clinical, and patient and provider outcomes for the BBIT Project in relation to the six dimensions of Quality (HQCA, 2007):

Project Outcomes	Quality Dimensions	Expected Outcomes (following implementation of KT toolkit)	Baseline Measures (before implementation of KT toolkit)	Target Measures (after implementation of KT toolkit)	Source
BBIT order sets prescribed	Effectiveness	Increase of prescribed BBIT order set	% of BBIT order sets (15%)	% of BBIT order sets (>30%)	Pharmacy database Manual data pull; Electronic medical record

Project Outcomes	Quality Dimensions	Expected Outcomes	Baseline Measures	Target Measures	Source
Provider Perceptions of the prescribed BBIT order set	Acceptability	Maintenance and sustainment of prescribed BBIT order set	Not applicable	Perceptions of the ease of use, safety, and other barriers and facilitators to using the BBIT order set taken at 3 and 6 months post implementation	Focus groups and provider survey
Length of Stay	Accessibility Effectiveness	Reduction of LoS	Median LoS = 5 days	Reduce LoS by 10% (median LoS = 4.5 days)	Chart pull; DAD (DIMR)
Glucose level	Appropriateness Efficiency Effectiveness Safety	Reduction of hyperglycemic events and maintenance or reduction of hypoglycemic events	% of days with a hyperglycemic event (35-40%) % of days with a hypoglycemic event (3-5%)	Approximately 40% reduction of hyperglycemic events; Maintain or reduce hypoglycemic events	BG testing: SCM (Calgary Zone, urban); Manual pull
Patient reported satisfaction and experience in-hospital	Acceptability Appropriateness Effectiveness Safety	Improvement in patient reported satisfaction and patient reported experience	70% patient reported satisfaction and patient experience	10% improvement in patient satisfaction and patient experience	Manual collection From surveys (HCAHPS)

2. Evaluation of KT Toolkit (the elements required to successfully implement and sustain the clinical practice change to BBIT)

Interviews from site champions and other staff involved in the process will address 1) if the KT toolkit was used 2) if the KT toolkit was helpful 3) how the KT toolkit used 4) the perception of the practical elements of the toolkit and 5) weaknesses and strengths of KT toolkit bundle and 6) areas of improvement for the KT toolkit and its implementation.

3. Project Management Evaluation:

Gathering information from interviews with BBIT site coordinators and other staff involved in the process at each site, as well as with the BBIT provincial project manager, will address if the

provincial project team: 1) effectively communicated with the sites and used feedback from site coordinators and teams to inform successful implementation of the BBIT order set 2) facilitated adequate and appropriate data collection and successfully communicated the patient data to the team so as to inform and sustain BBIT uptake 3) has met the needs of the project sponsors to ensure clinical practice guidance change and 4) had effective membership and leadership.

4. Site Implementation Team Learnings

Evaluating the process of BBIT implementation at various sites can be accomplished by: 1) interviewing providers during implementation 2) auditing implementation activities (checklist) 3) monitoring the number of various order sets of DM patients used monthly and 4) identifying which strategies for implementation are most effective across sites. This will help to inform how providers are implementing BBIT and what the barriers and facilitators are to implementation.

5. Project Lessons Learned

The objectives of BBIT project evaluation is to examine 1) compliance with BBIT implementation, 2) patient health outcomes (e.g., quality of life; satisfaction; experience), 3) system outcomes (e.g., average LOS), and 4) factors impacting success of implementation (e.g., provider feedback, barriers/ facilitators to implementation and KT tools). This evaluation will inform the provincial team on lessons learned and recommendations for future provincial projects.

Appendix 5: Provincial Core leadership team

Dr. Julie McKeen	Physician Lead, Provincial Diabetes Inpatient Management Initiative Clinical Assistant Professor, Department of Medicine, University of Calgary; Medical Director, Diabetes Hypertension Cholesterol Centre, Alberta Health Services, Calgary
Glenda Moore	Project Lead, Provincial Diabetes Inpatient Management Initiative, Manager, Diabetes, Obesity & Nutrition Strategic Clinical Network, Alberta Health Services
Leta Philp	Clinical Practice Lead-South, Provincial Diabetes Inpatient Management Initiative,
Leian Petersen	Clinical Practice Lead-North, Provincial Diabetes Inpatient Management Initiative,
Dr. Karmon Helmle	Clinical Assistant Professor, Division of Endocrinology and Metabolism, University of Calgary
Rhonda Roedler	Clinical Practice Leader, Pharmacy, South Health Campus, Alberta Health Services, Calgary
Ed Rogers	Senior Analyst, DIMR
Chandell Popik	Project Manager
Gabrielle Zimmerman	Knowledge Translation / Implementation Scientist
Naomi Popeski	DON SCN Assistant Scientific Director
Christine Goertzen	Administrative Assistant

Project Sponsors

Petra O'Connell	Senior Provincial Director, DON SCN (2016-2021)
Dr. Peter Sargious	Senior Medical Director, DON SCN (2016-2023)
Dr. Alun Edwards	Senior Medical Director, DON SCN (2013-2016)

Contact:

Diabetes, Obesity & Nutrition SCN diabetesobesitynutrition.scn@ahs.ca

Appendix 6: Change Management and Knowledge Translation Resources

2 recommended Change Management courses available through AHS are:

PROSCI: Prosci Change Management Orientation for Employees - Understanding and Taking Control of Change

- Course can be accessed on AHS MyLearning Link
- For inquiries regarding course content, please contact 1-877-315-0556.

AHS Improvement Way (AIW): Fundamentals of Improvement, Change, and Problem Solving

- For more information about the certificate go to the Quality and Patient Safety Integrated Curriculum on Insite or Email: Quality & Patient Safety Education

To learn more about Knowledge Translation; we recommended taking advantage of the information on the Alberta Strategy for Patient Orientated Research related to Knowledge Translation.

<https://absporu.ca/learning-health-system/>