HYPOGLYCEMIA - Adult
Recognition and Treatment in Acute Care
April 29, 2013

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1.0 PRACTICE STANDARD

Purpose:

To guide nursing (RN and LPN) staff within the acute care environment in the provision of consistent best practice related to diagnosis and treatment of hypoglycemia.

Note: This CDST and protocol (refer to Appendix A) does not currently address RPN practice as awaiting practice regulation clarification and confirmation from the College of Registered Psychiatric Nurses of BC, at which time both will be amended accordingly to include RPNs.

Scope of Practice:
Registered Nurses (RN) and Licensed Practical Nurses (LPN) are required to work within their Professional scope of practice and competency level.

Registered Nurse Scope:

Whenever a physician's order is available, the RN will follow the order and is accountable for the CRNBC standards for acting with an order (CRNBC, 2012, pg 22). When a physician order is not available, RNs can administer dextrose 50% (D50W) and glucagon without an order in the emergency treatment of hypoglycemia. When acting without an order the RN is solely accountable for the decision to act as well as the activity. The RN is accountable for practicing within the CNRBC standard for Acting without an Order. (CRNBC, 2012, pg 11). As soon as possible, the client shall be transferred to a physician / nurse practitioner for assessment and orders.

LPN Scope;

LPNs can be assigned as primary nurse when the known nursing care needs of the patient/resident assigned are within LPN scope of practice and the individual competencies of the LPN. Reassignment of the patient/resident to an RN as primary nurse is required in the care of the unstable patient/resident.

LPNs are required to collaborate closely with an RN/RPN and transfer primary care responsibility to an RN as soon as possible in the event of glucagon administration or an unstable patient/resident.

LPNs require a physician or Nurse Practitioner (NP) order to administer glucagon SC/IM (refer to Interior Health Pre Printed Insulin Orders or other documented patient specific Physician/NP order).

It is not within the scope of LPNs to administer intravenous medications (e.g. prefilled 50 mL syringe of dextrose 50%; D50W).

Competency:

It is the professional responsibility of all registered health care providers who are expected to respond to hypoglycemia to maintain competency. This will include self- assessment of competency initially and as the Professional deems necessary thereafter in order to maintain competency. It is recommended that the Professional complete a self assessment at least annually.

A self assessment will include, but not necessarily be limited to, completion of an IH Personal Practice review. The IH Personal Practice Review guides the nurse to IH resources for review of their professional scope, the supporting Acute Hypoglycemia Clinical Decision Support Tool (CDST), corresponding IHA Acute Adult Hypoglycemia Protocol (# 829518), along with completion of the IHA Hypoglycemia: Prevention, Recognition and Treatment in Residential and Acute Care Self Learning Plan.

It is the responsibility of all health care providers to develop and complete a learning plan to address any personal knowledge or competency deficits that are revealed during their Personal Practice Review/Self Assessment.

2.0 DEFINITIONS AND ABBREVIATIONS

Definitions

Dextrose:
- Another name for glucose (sugar). Dextrose/glucose tablets are often used to treat mild or moderate hypoglycaemia.

Fast Acting Carbohydrate:
- A form of carbohydrate (glucose, dextrose, fructose, sucrose etc.) that results in a rapid increase in blood glucose levels (15 minutes) once ingested.

Glucose:
- A simple form of sugar that acts as fuel for the body. It is produced during digestion of carbohydrate.

Hypoglycemia:
- Low blood glucose level (less than 4 mmol/L).
- Commonly associated with the development of autonomic or neuroglycopenic symptoms (latter more common in elderly)
- Symptoms responding to the administration of carbohydrate

Hypoglycemia Severity:
- **Mild:** Blood glucose less than 4 mmol/L but above 2.8 mmol/L. Autonomic symptoms are present. Individual able to consume oral treatment.
- **Moderate:** Blood glucose less than 4 mmol/L but above 2.8 mmol/L. Autonomic and neuroglycopenic symptoms are present. Individual is able to consume oral treatment.
- **Severe**: Blood glucose typically less than 2.8 mmol/L. Individual requires assistance; unconsciousness may occur. Persons with dementia, or on psychotropic medications may show confusion, stroke-like symptoms and unawareness of symptoms when blood glucose is low. “Neuroglycopenic symptoms” may occur at blood glucose values higher than 2.8 mmol/L in the elderly.

Insulin Secretagogues:	• Oral medication that simulates the pancreatic beta cells to produce insulin. This medication can be associated with hypoglycaemia.
RN Initiated Activity:	• Actions taken by an RN without an order from a Physician or Nurse Practitioner. The RN is solely accountable and responsible for the decision to act and for the act itself. The RN is accountable for practicing within the CNRBC standard for Acting without an Order. (CRNBC, 2012, pg 11).
Sucrose:	• A common type of sugar derived from sugar cane or sugar beets.

Abbreviations

CDST	• Clinical Decision Support Tool
FP	• Family Practitioner
IM	• Intramuscular
LPN	• Licensed Practical Nurse
MRP	• Most Responsible Physician
NP	• Nurse Practitioner
PRN	• As needed
RN	• Registered Nurse
RPN	• Registered Psychiatric Nurse
SC	• Subcutaneous
VAD	• Vascular Access Device; Commonly referred to as an VAD

3.0 EQUIPMENT and RECOMMENDED SUPPLIES

• Blood Glucose Meter:	AccuChek Inform II Meter
• Oral fast acting carbohydrate:	2 juice boxes; 6 packages sugar; 1 package glucose / dextrose tablets; 4 packages honey
• Carbohydrates:	6 packages of crackers or 1 slice of bread
• Protein:	4 packages of peanut butter, 240 mL milk or 1.5oz hard cheese
• Prefilled 50 mL syringe of dextrose 50% (D50W)	
• 2 of 10 mL sodium chloride 0.9% prefilled syringes	
• Glucagon 1 mg kit	

4.0 PROCEDURE	RATIONALE
4.1. Assess blood glucose level of all patients demonstrating autonomic or neuroglypenic symptoms by testing with blood glucose meter.	Demonstration of autonomic or neuroglypenic symptoms requires nursing assessment. Refer to IHA Hypoglycemia: Prevention, Recognition and Treatment in Residential and Acute Care Self Learning Plan, Section: Signs and Symptoms.
4.2. If blood glucose is equal to or greater than 4 mmo/L**:** • DO NOT proceed to follow this CDST • Notify physician • Assess for other underlying factors or causes for symptoms	Blood glucose value equal to or greater than 4mmol/L is not hypoglycemia.
If blood glucose is less than 4 mmo/L: • Initiate the IHA Hypoglycemia Protocol – Adult: Recognition and Treatment in Acute Care (See Form 829518, Sample in Appendix A)	Blood glucose value less than 4 mmol/L indicates hypoglycemia.
When following the hypoglycemia protocol, each professional is responsible for working within their practice scope and individual competence. Refer to Scope of Practice section above.	

Disclaimer: The procedure steps may not depict actual sequence of events. Resident specifics must be considered in applying Interior Health Clinical Practice Decision Support Tools.

5.0 DOCUMENTATION

- Document all blood glucose results, medication administration, nursing assessment, interventions and follow-up as per regular nursing documentation procedures and practice requirements, including:
  - Recording of patient blood glucose readings and insulin administration on IHA Insulin Subcutaneous Administration and Blood Glucose Record forms (IH sites where used), or in patient chart as appropriate.
  - Document all medications administered on MAR
  - Document all assessments, interventions and follow up within nursing notes on patient chart.
    - When an RN administers medications without an order, the RN medication documentation shall include the words “RN initiated activity”
- An addressographed copy of the protocol must be placed on the patient’s chart as a permanent part of the medical record:
  - At the time the physician/NP signs an IHA Pre-Printed Insulin Order, in accordance with IH Pharmacy Guiding Principles for Pre Printed Orders,,and
  - Whenever the protocol is enacted without a physician/NP order

6.0 SPECIAL CONSIDERATIONS

N/A

7.0 REFERENCES

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APPENDIX A: Hypoglycemia Protocol – Adult: Recognition and Treatment in Acute Care

Available for printing via Royal Printers: Form 829518

Interior Health

HYPOGLYCEMIA PROTOCOL – ADULT: RECOGNITION AND TREATMENT IN ACUTE CARE

STEP 1: Recognize Hypoglycemia

Symptomatic: Symptoms (diaphoresis, tremor, hunger, tachycardia, impaired consciousness, aggression) and blood glucose less than 4 mmol/L.

Asymptomatic: No symptoms and blood glucose less than 4 mmol/L.

STEP 2: Treat

1. Conscious – Able to swallow

Treat with fast acting carbohydrate **ONLY**, as per step (i) until blood glucose is above 4mmol/L. **DO NOT FEED PATIENT** as this may delay rise in blood glucose.

Treat Orally

i) **Give 20 grams fast acting carbohydrate by mouth. Choose ONE of the following:**
- 200 mL juice (or thickened juice for dysphagic), *OR*
- 5 x 4 grams glucose tablets, *OR*
- 4 packets (4 tsp) sugar dissolved in 60 mL water, *OR*
- 20 mL (4 tsp) honey (for dysphagic)

Patients on alpha-glucosidase inhibitor (acarbose) preferred treatment: honey or glucose tablets

ii) **Check blood glucose in 15 minutes:**
- If less than 4 mmol/L, repeat above
- If after 3 treatments (45 minutes) symptoms remain and/or blood sugar is below 4 mmol/L, proceed to 2A or 2B

2. Impaired Consciousness – Not able to Swallow

(2A) No Vascular Access Device (VAD): Treat S/C or IM

LPN requires an order to administer glucagon IM or SC. LPN must collaborate with RN/RPN and transfer care to RN/NP as soon as possible.

i) **Administer glucagon 1 mg SC/IM first**

ii) **Notify physician STAT**

iii) **Check blood glucose in 15 minutes.**
- If less than 4 mmol/L, repeat step (i) above
- If after 2 treatments (30 minutes) still less than 4 mmol/L, proceed to 2b
- If blood glucose remains less than 4 mmol/L **and patient becomes able to consume orally,** follow treatment procedure 1 (see left)

(2B) VAD Immediately Available: Treat IV: use largest vein

LPN do not administer IV medications and must transfer care to RN/NP

i) **Administer dextrose 50% injectable 10 grams (20 mL) IV over 2 to 3 minutes**

ii) **Notify physician STAT**

iii) **If no immediate response, administer dextrose 50% injectable 15 grams (30 mL) over 2 to 3 minutes**

iv) **Check blood glucose in 15 minutes**
- If less than 4 mmol/L, repeat above
- If after 2 treatments (30 minutes) less than 4 mmol/L, continue to repeat until physician gives new orders

STEP 3: Follow Up

When blood glucose is 4 mmol/L or greater

Patient able to eat	Patient unable to eat
Feed patient protein/carbohydrate snack if more than 1 hour until next meal. **Examples:** • 240 mL milk with 6 soda crackers **OR** • 1 slice bread with 1 tablespoon (15 mL) peanut butter **OR** • 6 soda crackers with 1 ounce (30 grams) cheese	Maintain IV (VAD) with **D10W** at 50 mL/hr and notify physician for ongoing orders

Evaluate patient for cause: e.g. Missed meal, exercise, change in medication (e.g. ↑ in insulin dose, ↓ in steroids, etc)

Physician notification is *required* to assess and change insulin/diabetes medication orders
- Before next insulin dose for severe hypoglycemia requiring rescue with glucagon or IV dextrose
- Within 24 hours (e.g. during the next day's visit to the unit) for mild hypoglycemia requiring oral treatment

Ensure recorded on Insulin Administration and Blood Glucose Record, and other documentation in MAR and patient chart. Place a copy of protocol in patient chart.

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