 <p><b>PRIMARY CARE / HOME CARE PRACTICE GUIDELINES</b></p>	<b>Practice Guideline:</b> Emergency Management of Hypoglycemia ( <b>Adult / Child</b> )	<b>Guideline Number</b> PCPG2
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## 1. **PRACTICE OUTCOME**

- To identify hypoglycemia and provide an emergency response to Adult and Child populations based on evidence based practice
- The goal of treatment for hypoglycemia is to detect and treat a low blood glucose level promptly by using an intervention that provides the fastest rise in blood glucose to a safe level, to eliminate the risk of injury and to relieve symptoms quickly in order to improve patient outcomes
- To provide patient education post emergency with a focus towards self-management to prevent, detect and treat further episodes of hypoglycemia and optimize blood sugar control within an interprofessional team working with the patient to improve outcomes

## 2. **DEFINITIONS**

**Hypoglycemia** is defined by

- Low blood glucose (<4 mmol / L if on insulin or secretagogue)
- Patient symptoms respond to administration of a carbohydrate
- Development of neurogenic or neuroglycopenic symptoms

<b>Neurogenic (autonomic) Early Signs</b>	<b>Neuroglycopenic Late Signs</b>
Trembling	Difficulty Concentrating
Palpitations	Confusion
Sweating	Weakness
Anxiety	Drowsiness
Hunger	Vision Changes
Nausea	Difficulty Speaking
Tingling	Dizziness
	Headache


- Note: Patients with diabetes who have autonomic neuropathy may not have any warning symptoms before developing neuroglycopenia. Not all BG < 4.0 are symptomatic even in those without autonomic neuropathy. Therefore, all results < 4 should be treated regardless of symptoms, ensuring that the monitor is properly calibrated and good technique is used [See Point of Care testing; Blood Glucose Monitoring](#).

**Severity of hypoglycemia** is defined by clinical manifestations as described below:

**Mild:** Blood glucose <4 mmol/L. Autonomic symptoms are present. The patient is able to self-treat.

**Moderate:** Blood glucose range between mild-severe levels 2.8-4 mmol/L. Autonomic and neuroglycopenic symptoms are present. The patient is able to self-treat.

**Severe:** Blood glucose <2.8 mmol/L. Patient requires assistance of another person. Unconsciousness may occur.

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### 3. **GUIDELINES**

#### **CLINICAL TEAM AND PATIENT EDUCATIONAL RECOMMENDATIONS:**

Clinic Team Educational Resources to support	<a href="#">Clinic Team Education Power point and Video Hypoglycemia in the Adult</a> <a href="#">Clinic Team Education Type 1 Diabetes in Children and Adolescents Hypoglycemia</a>
Patient Diabetes Resources for Hypoglycemia	<a href="#">Lows and Highs - Canadian Diabetes Association</a> <a href="#">Managing Your Blood Glucose</a>

#### **ASSESSMENT**

1. **Onset:** Sudden onset with rapid progression of symptoms
2. **Usual Causes**
  - a. Too much insulin or medication (insulin secretagogues)
  - b. Delayed or missed meal, insufficient amount of carbohydrate
  - c. More than usual amount of exercise
  - d. Alcohol consumption can cause delayed hypoglycemia
3. **Signs and Symptoms**
  - a. Development of neurogenic or neuroglycopenic symptoms. Can progress to unconsciousness, seizures or coma.

**Note:** In the Adult, these symptoms may also be suggestive of stroke.


#### **INTERVENTION**

1. Treat hypoglycemia according to Guidelines for Treatment of Hypoglycemia in **Section 5 and outlined in Appendix A**  
**NOTE:** Per WRHA autosubstitution policy, all orders for 15g of oral glucose are to be substituted with 4 x 4g Tabs (16g total)
2. **Activate 911** if patient does not respond to treatment after two doses of glucose tablets, patient loses consciousness or clinical signs of progressing deterioration, including hypoxia hypotension, tachycardia or bradycardia.
3. Continue with emergency response/treatment as outlined in Primary Care Emergency Response guidelines, including checking vital signs and communicating with EMS and ER personnel as appropriate.
4. Team Consultation to occur for medication or insulin adjustment as required post event.
5. Ensure the patient has been provided education on the signs and symptoms of hypoglycemia along with a copy of the Canadian Diabetes tool for hypoglycemia post event.
6. Document treatment on Appendix A, and place on the patient record.

### 4. **EQUIPMENT/SUPPLIES REQUIRED**

Blood Glucose testing strips	Needles 23 gauge, 1" needle & syringe
Blood Glucose monitor	Alcohol swabs
Glucose tablets	Oximeter
Glucagon	

**SCOPE:** Applicable to all WRHA Primary Care Direct Operations Clinics, Quick Care Clinics and WRHA Fee for Service Staff Community Intravenous therapy Program (CIVP) clinics only

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## 5. RESOURCES/QUICK REFERENCE SHEETS

<b>ADULT Treatment Guidelines for Hypoglycemia (Patients &gt; 5 YRS)</b>		
<b>Mild-Moderate Hypoglycemia</b> <b>Blood glucose 2.8-4 mmol/L</b>	<b>Severe Hypoglycemia (If conscious)</b> <b>Blood Glucose &lt;2.8 mmol/L</b>	<b>Severe Hypoglycemia (If unconscious)</b> <b>Blood Glucose &lt;2.8 mmol/L</b>
1. Check blood glucose 2. Treat with 15 g glucose 3. Wait 15 minutes 4. Retest 5. Treat with another 15 g of glucose if blood glucose remains <4.0 mmol/L 6. Retest	1. Check blood glucose 2. If patient conscious treat with 20 g glucose 3. Wait 15 minutes 4. Retest 5. Treat with another 15 g of glucose if blood glucose remains <4 mmol/L 6. Retest. If blood glucose remains <4 mmol/L, activate EMS	1. <b>CAB (Compressions, Airway, and Breathing) assessment and check for medic alert.</b> 2. <b>Activate Emergency Medical System</b> 3. <b>Check vital signs (blood pressure, heart rate, oxygen saturation, and respiratory rate) and blood glucose</b> 4. <b>Administer 1 mg Glucagon SC/IM (deltoid). Place in recovery position.</b> 5. <b>Reassess vital signs q 5 minutes.</b>

Source CDA, 2013 *Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada: pharmacologic management of Type 1 Diabetes in Adults Chapter 14.*

### IMPORTANT CONSIDERATIONS:


- If the next meal is 30 minutes or more away, have the patient eat a source of carbohydrate and protein as soon as they are able. This can be in the form of cheese and crackers or a half a sandwich.
- If the patient has taken Prandase/Acarbose (alphaglucosidase inhibitor) and is experiencing hypoglycemia, it must be treated with 15 g glucose tablets or, if unavailable, 250 mL of milk or 3 tsp. of honey only.
- When BG >5 mmol/L for at least 45 minutes it is considered safe for the patient to drive
- For patients at risk of severe hypoglycemia, support persons should be taught how to administer glucagon by injection
- Print the following patient resources for Diabetes education regarding Hypoglycemia:

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[Lows and Highs - Canadian Diabetes Association](#)  
[Managing Your Blood Glucose](#)

CHILD Treatment Guidelines for Hypoglycemia (Patients < 5 YRS)				
Mild-Moderate Hypoglycemia Blood glucose 2.8-4 mmol/L			Severe Hypoglycemia Blood Glucose <2.8 mmol/L	
1. Check blood glucose				
2. Treat depending on patient weight	<15 kg	15–30 kg	>30 kg	1. Child-CAB (Compressions, Airway, and Breathing) assessment and check for medic alert. Neonate – ABC (Compressions-Airway-Breathing) 2. Activate Emergency Medical System 3. Check vital signs (blood pressure, heart rate, oxygen saturation, and respiratory rate) and blood glucose 4. Administer Glucagon 0.5 mg SC or IM (deltoid). 5. Wait 20 minutes 6. Retest 7. Repeat with same dose if BG has not increased in 20 minutes. Place in recovery position. 8. Reassess Vital Signs q 5 minutes.
Amount of carbohydrate	5 g	10 g	15 g	
Carbohydrate source	1	2 or 3	4	
Apple or orange juice, regular soft drink, sweet beverage (cocktails)	40 ml	85 ml	125 ml	
IF CHILD is unable or refusing to take oral Dose Administer Glucagon 10 mcg X (years of age) SC/IM (deltoid) Dose Range: 20 - 150 mcg				
3. Wait 15 minutes				
4. Retest				
5. Treat with another dose (as above) of glucose if blood glucose remains <4 mmol/L				
6. Retest				

Source CDA, 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada: pharmacologic management of Type 1 Diabetes in Children and Adolescents Chapter 34 Table 2.

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### IMPORTANT CONSIDERATIONS:

- If the next meal is 30 minutes or more away, have the patient eat a source of carbohydrate and protein as soon as they are able. This can be in the form of cheese and crackers or a half a sandwich.
- For patients at risk of severe hypoglycemia, support persons should be taught how to administer glucagon by injection
- Print the following patient resources for Diabetes education regarding Hypoglycemia:

[Lows and Highs - Canadian Diabetes Association  
Managing Your Blood Glucose](#)

### SOURCE/REFERENCES

1. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2013;37 (suppl 1):S1-S212. [Canadian Diabetes Association Clinical Practice Guidelines 2013](#)
2. Hypoglycemia (2013). Canadian Diabetes Association [CDA Chapter 14](#)
3. Diane Wherrett MD, FRCPC Céline Huot MD, MSc, FRCPC Beth Mitchell PhD, Danièle Pacaud MD, FRCPC Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada: pharmacologic management of Type 1 Diabetes in Children and Adolescents. Can J Diabetes 2013;34 :S61-S68. Examples of Carbohydrate for treatment of Mild to Moderate Hypoglycemia [CDA Chapter 34](#)
4. Canadian Heart and Stroke Foundation (retrieved August 2014) [The 2010 Guidelines for Cardiopulmonary Resuscitation \(CPR\) and Emergency Cardiovascular Care \(ECC\)](#)

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