

## TITLE

**INSULIN ADJUSTMENT - PEDIATRIC**

## SCOPE

Provincial: Specialty Diabetes Outpatient Centres

## DOCUMENT #

HCS-286-01

## APPROVAL AUTHORITY

Vice President, Provincial Clinical Excellence

## INITIAL EFFECTIVE DATE

October 6, 2021

## SPONSOR

Diabetes, Obesity &amp; Nutrition Strategic Clinical Network

## REVISION EFFECTIVE DATE

Not applicable

## PARENT DOCUMENT TITLE, TYPE, AND NUMBER

Not applicable

## SCHEDULED REVIEW DATE

October 6, 2024

**NOTE:** The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

If you have any questions or comments regarding the information in this document, please contact Policy Services at [policy@ahs.ca](mailto:policy@ahs.ca). The Policy Services website is the official source of current approved policies, procedures, directives, standards, protocols, and guidelines. Only the electronic version of this document, as hosted on the Policy Services website or [www.ahs.ca](http://www.ahs.ca), is valid.

**OBJECTIVES**

- To provide direction to **health care professionals** (with pediatric diabetes management expertise) working in a specialty diabetes outpatient centre and to facilitate collaboration with the multidisciplinary care team.
- To standardize the guidance provided to pediatric **patients** with insulin-treated diabetes who are referred to a specialty diabetes outpatient centre.
- To support patients and **families** who are administering insulin in the patient's **home setting**.
  - It is the responsibility of the health care professional to extend involvement to family as determined by the **guardian(s)** and/or patient (as appropriate).

**APPLICABILITY**

Compliance with this document is required by all Alberta Health Services employees, members of the medical and midwifery staffs, students, volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary).

**ELEMENTS****1. Points of Emphasis**

- 1.1 Each Zone shall designate the specialty diabetes outpatient centre(s) that have health care professionals with the required expertise in diabetes management to use this Protocol.

- 1.2 Adjustment of insulin doses requires a collaborative effort from the multidisciplinary care team when engaging and supporting the patient and/or family to achieve glucose targets through self-management of insulin dose adjustment.
- 1.3 A patient-specific **order** from an **authorized prescriber** is required to enact this Protocol.
- 1.4 This Protocol applies to:
- a) Registered Nurses or Pharmacists who are competent to perform the interventions in this Protocol, within their scope of practice; and
  - b) Registered Dietitians who are competent to perform the interventions in this Protocol and when included in their current role.
  - c) The **accountable leader** in collaboration with the health care professional shall determine the initial and ongoing education required for competency to enact this Protocol. This may include specific education on self-management of diabetes and insulin dose adjustments.
    - (i) For Registered Dietitians, the accountable leader refers to the Nutrition Services **Manager**.
- 1.5 Refer to the AHS *Complex and Essential Pediatric Medical Process* Guideline if appropriate.
- 1.6 The health care professionals shall confirm that **informed consent** (express or implied) is received from the patient and/or guardian as appropriate for ongoing treatment recommendations, as per the AHS *Consent to Treatment/Procedure(s): Minors / Mature Minors* Procedure.

## 2. Inclusion Criteria

- 2.1 This Protocol applies only to pediatric patients who are referred by an authorized prescriber to the specialty diabetes outpatient centre, and:
- a) are diagnosed with diabetes mellitus; and
  - b) have been assessed within the past 12 months in a specialty diabetes outpatient centre by the multidisciplinary care team with pediatric expertise.

## 3. Exclusion Criteria

- 3.1 This Protocol is not intended for pediatric patients with diabetes who have not been assessed within the past 12 months in a specialty diabetes outpatient centre with pediatric expertise.

#### 4. Acquiring Information

- 4.1 The health care professional should take the following patient information into consideration when determining dose adjustments, if the information is available:
- a) age;
  - b) reported self-monitored blood glucose (SMBG) and/or Flash glucose monitoring (Flash) or continuous glucose monitoring (CGM) value(s);
  - c) height and weight;
  - d) diet / nutrition plan;
  - e) activity level; and
  - f) current health status.
- 4.2 The health care professional shall:
- a) confirm the patient's identity by using at least two (2) patient identifiers as per the AHS *Patient Identification Policy*, such as but not limited to:
    - (i) both the patient's first and last name (considered one [1] identifier); and/or
    - (ii) full date of birth (inclusive of day, month, and year) and/or
    - (iii) **unique lifetime identifier (ULI)**;
  - b) confirm the patient's preferred method for follow-up contact (e.g., phone number).
- 4.3 When the patient's and/or family's request for support with glucose values, insulin dose, and ketone management is received, the health care professional shall when clinically relevant:
- a) obtain and record current SMBG and/or Flash or CGM values, insulin doses self-administered by the patient and/or family, and other relevant information in the **health record**;
  - b) complete a chart review (e.g., current insulin dose orders, frequency of administration, nutrition plan, review puberty status, if applicable);
  - c) inquire with the patient and/or family if any significant changes in lifestyle have been made, which may include but are not limited to:
    - (i) insulin administration;
    - (ii) home nutrition and diet routines;

- (iii) current or recent illness;
  - (iv) changes in height and/or weight (e.g., growth spurts);
  - (v) ketones management; and/or
  - (vi) daily schedule (e.g., school, physical activity);
- d) review the calculated current average total daily insulin dose in units per kilogram (kg) body weight per day, using the most recently recorded or estimated weight and recalculate if there have been weight changes since the last review;
- e) determine if a pattern of hypoglycemia or hyperglycemia is reported using the pattern management principles, including but not limited to the following:
- (i) a pattern of hypoglycemia is to be adjusted prior to a pattern of hyperglycemia; and
  - (ii) a pattern of hyperglycemia may require assessment of basal insulin to achieve fasting glucose targets prior to adjustment of bolus insulin dose;
- f) collaborate with the patient and/or family to achieve glucose targets.

## 5. Insulin Adjustment

- 5.1 When the health care professional is informed that the ketone status is negative, they may provide recommendations to the patient and/or family to adjust an insulin dose up to 15% or 0.5 units (whichever is higher) of the current total daily dose of insulin to a glucose target as follows:
- a) for most patients:
    - (i) fasting or pre-prandial glucose targets 4.0 - 8.0 millimoles per litre (mmol/L); and
    - (ii) two (2) hour post-prandial glucose targets 5.0 - 10.0 mmol/L.
  - b) individualized glucose targets identified on patient's chart if applicable; or
  - c) pre-prandial glucose targets of 6.0 – 10.0 mmol/L for patients that have had severe or excessive (three [3] or more) hypoglycemia events per week or have hypoglycemia unawareness.
- 5.2 Dose adjustments exceeding 15% or 0.5 units (whichever is higher) require review and direction by the authorized prescriber.

- a) Exception: dose adjustments for prevention of hypoglycemia and/or frequent hypoglycemia (three [3] or more episodes) may require a larger percentage decrease, by 50%, in insulin adjustment based on discussion with the patient and the health care professional's discretion.
- 5.3 Re-evaluation of SMBG values and insulin doses shall be determined in collaboration with the patient.
- 5.4 Health care professionals with education and training in insulin adjustments for insulin pump therapy shall consider the technology the patient is using for insulin pump therapy when providing insulin adjustment advice to the patient and family.
- 5.5 When the health care professional is informed that the ketone status is positive, they may recommend to the patient and/or family a single insulin correction dose up to 25% of the total daily dosage.
- a) Dose adjustments during ketosis exceeding 25% of total daily dose require review and direction from an authorized prescriber.
  - b) Collaboration between the patient and/or family and health care professional to determine frequency of re-evaluation (e.g., every two [2] to four [4] hours) may be required depending on the patient's response to the insulin adjustment and clinical status.
  - c) Contact the authorized prescriber if more than two (2) corrections of insulin are administered and ketones persist.
    - (i) If an authorized prescriber is not readily available, refer patient to the local emergency department as soon as possible for assessment and evaluation to rule out diabetic ketoacidosis.

## 6. Education and Follow-Up

- 6.1 Insulin dose adjustments and follow-up care requires a collaborative effort and multidisciplinary approach with the health care team, which may involve an array of strategies and include the patient and/or family:
- a) providing education that supports the patient and/or family autonomy in self-management insulin dose adjustment(s); and
  - b) determining what appropriate follow-up care is required.
- 6.2 To ensure success with self-management of diabetes, the patient and/or family may require additional support and education from the health care professional and multidisciplinary care team, including:
- a) SMBG and/or Flash or CGM routines (e.g., hand hygiene, testing before eating and exercise, routine review of trends in glycemc control);

- b) diet and nutrition routines (e.g., carbohydrate counting, mealtime routines, sick day management);
- c) subcutaneous insulin injection technique and site rotation; and
- d) physical activity management.

## 7. Documentation

7.1 The health care professional shall document in the patient's health record:

- a) acquired information from the patient and/or family;
- b) recommended insulin dose adjustments and rationale;
- c) all education/interventions provided; and
- d) follow-up care recommendations.

## DEFINITIONS

**Accountable leader** means the individual who has ultimate accountability to ensure consideration and completion of the listed steps in the management of the *Insulin Adjustment - Pediatric* Protocol. Responsibility for some or all of the components of management may be delegated to the appropriate level responsible administrative leader, but accountability remains at the senior level.

**Authorized prescriber** means a health care professional who is permitted by federal and provincial legislation, their regulatory college, Alberta Health Services, and practice setting (where applicable) to prescribe medications.

**Family(-ies)** means one or more individuals identified by the patient as an important support, and who the patient wishes to be included in any encounters with the health care system, including but not limited to, family members, legal guardians, friends, and informal caregivers.

**Guardian** means, where applicable:

For a minor: a guardian as defined by the *Family Law Act* (Alberta), a divorced parent with custody of the minor, or a person appointed pursuant to a will, personal directive, court order, agreement or by authorization of legislation (e.g., *Child, Youth and Family Enhancement Act* [Alberta]).

**Health care professional** means an individual who is a member of a regulated health discipline, as defined by the *Health Professions Act* (Alberta), and who practices within scope and role.

**Health record** means the collection of all records documenting individually identifying health information in relation to a single person.

**Home setting** means places where patients live and receive care but are not health care facilities (and includes but is not limited to patients' private homes, Supportive Living Level 1 [SL1], and Supportive Living Level 2 [SL2] sites).

**Informed consent** means the patient's agreement (or alternate decision-maker) to undergo a treatment/procedure after being provided, in a manner the patient can understand, with the relevant information about the nature of the treatment/procedure(s), its benefits, potential risks and alternatives, and the potential consequences of refusal.

**Manager** means the individual(s) who has the delegated human resource authority for directly planning, monitoring, and supervising direct (employee) reports.

**Order** means a direction given by a regulated health care professional to carry out specific activity(-ies) as part of the diagnostic and/or therapeutic care and treatment to the benefit of a patient. An order may be written (including handwritten and/or electronic), verbal, by telephone, or facsimile.

**Patient** means all persons, inclusive of residents and clients, who receive or have requested health care or services from Alberta Health Services and its health care providers. Patient also means, where applicable:

- a) a co-decision-maker with the person; or
- b) an alternate decision-maker on behalf of the person.

**Unique lifetime identifier (ULI)** means a unique and permanent number assigned to all persons who receive health services in Alberta. ULIs are assigned to all Alberta residents, residents of other provinces/territories, or other countries.

## REFERENCES

- Alberta Health Services Governance Documents:
  - *Complex and Essential Pediatric Medical Process* Guideline (#HCS-230-01)
  - *Consent to Treatment/Procedure(s): Minors / Mature Minors* Procedure (#PRR-01-03)
  - *Patient Identification* Policy (#PS-06)
- Non-Alberta Health Services Documents:
  - *Building Competency in Diabetes Education: the Essentials (5th Ed.)* (Diabetes Canada)
  - *Clinical Practice Consensus Guidelines* (2018) (International Society for Pediatric and Adolescent Diabetes)
  - *Clinical Practice Guidelines* (2018) (Diabetes Canada)
  - *Position Statement: Insulin Dose Adjustment and Diabetes Self-Management Education* (College of Dietitians of Alberta)

© 2021, Alberta Health Services, Policy Services



This work is licensed under a Creative Commons Attribution-Non-commercial-Share Alike 4.0 International license. The licence does not apply to AHS trademarks, logos or content for which Alberta Health Services is not the copyright owner. This material is intended for general information only and is provided on an "as is", "where is" basis. Although reasonable efforts were made to confirm the accuracy of the information, Alberta Health Services does not make any representation or warranty, express, implied or statutory, as to the accuracy, reliability, completeness, applicability or fitness for a particular purpose of such information. This material is not a substitute for the advice of a qualified health professional. Alberta Health Services expressly disclaims all liability for the use of these materials, and for any claims, actions, demands or suits arising from such use.