

Guidelines for the Safe Management of Insulin Pump Therapy in Hospital

Diabetes, Obesity & Nutrition Strategic Clinical Network

Version: 2.1
Last updated: June 28, 2021

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We would like to acknowledge the numerous individuals who had input into developing these guidelines including: Adult and Pediatric Endocrinologists, General Internal Medicine Specialists, Anesthesiologists, Diabetes Educators, Obstetricians, Patients, Nurses, Dietitians, Pharmacists, and Emergency Department clinicians (see [Appendix 3](#) for working group membership).

1. Background

Insulin pump therapy use is increasing in Alberta. The Alberta Health Insulin Pump Therapy Program (AH IPT), launched on June 1, 2013, provides funding support to children and adults for insulin pump and/or insulin pump supplies. Funding support is for individuals who meet established eligibility criteria. For more information on the AH IPT program, please visit: [Specialized drug benefits | Alberta.ca](#). With growing pump use, health care providers in hospital and emergency settings will see increasing numbers of individuals using pump therapy.

These guidelines have been created by the Diabetes Obesity Nutrition Strategic Clinical Network™ (DON SCN™), and the provincial Insulin Pump Therapy (IPT) working group. They have been developed to assist providers (including non-diabetes specialists) in caring for patients with insulin pumps safely and effectively during procedures and hospital encounters. These guidelines also support patients on the insulin pump to continue to use their pumps in hospitals across Alberta, where appropriate, and advocate for self-management (by the patient or family member). They also guide the clinician in the hospital environment on how to transition the patient to alternate insulin therapy, when the patient is unable to self-manage with their insulin pump.

The safe management of Insulin Pump Therapy in acute care guidelines are part of a larger Diabetes Inpatient Management initiative (see [Appendix 5](#)).

2. Primary Objective

Patient Safety

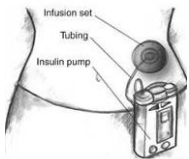
To ensure that patients with Type 1 diabetes on the insulin pump are managed in a safe and effective manner during procedures and hospital encounters

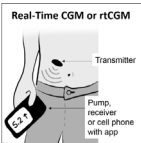
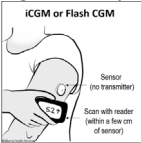
3. Key Message

“If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”

4. Insulin Pump Terminology

Key Message: “If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”

<p>Continuous subcutaneous insulin infusion (CSII) pump (also known as insulin pump)</p>  <p>(2020) Alberta Health Services</p>	<p>A battery operated programmable device that delivers only rapid-acting insulin 24 hours a day. The insulin is held in a reservoir and is delivered through a removable soft cannula (or needle) inserted into the subcutaneous layer of the skin, which is changed by the patient every 48-72 hours, or sooner as needed. With most pumps, this cannula is connected to a plastic tubing (infusion set) that is attached to the pump where the insulin is held. Other pumps use an insulin-containing pod taped directly to the skin (the pod holds the insulin and a handheld device is used for programming the pump). The insulin pump is programmed to deliver basal and bolus insulin.</p>
<p>Basal rate/basal insulin infusion</p>	<p>The pump delivers small amounts of insulin in a continuous fashion. This continuous background insulin infusion is measured in units/h. Rates are variable and differ between individuals and differ across a 24-h period within the same individual. Some individuals have different basal profiles for different times or activities (e.g. work vs. non-work days, exercise, illness, etc.).</p> <p>Only rapid acting insulin is used in the pump. There is no long or intermediate-acting insulin used in the pump.</p>
<p>Bolus insulin</p>	<p>This is the amount of insulin given for a meal or snack. The patient determines this dose based on the estimated amount of carbohydrates to be consumed for that meal/snack and is calculated from their individual Insulin:Carbohydrate ratio (ICR).</p> <p>EXAMPLE: ICR 1:10 = 1 unit of insulin/10g of carbohydrate</p>
<p>Correction insulin (and Insulin Sensitivity Factor)</p>	<p>The anticipated amount of insulin needed to correct for hyperglycemia. This is based on the Insulin sensitivity factor (ISF). Individualized ISF allows calculation of a correction dose expected to reduce glucose by X mmol/L</p> <p>EXAMPLE: ISF = 2.5, 1 unit of insulin should reduce glucose by 2.5 mmol/L</p>
<p>Partial (hybrid) Closed Loop Pumping</p>	<p>Partial (hybrid) closed loop insulin pumps are integrated with Continuous Glucose Monitor (CGM) devices. This technology is rapidly growing and changing.</p> <p>The artificial intelligence algorithms in these pumps use the data from CGM to automatically adjust basal insulin without the user’s interaction. Bolus insulin is determined by the user. Some manufacturers have Health Canada approved devices.</p> <p>Looping: Individual user develops their own app and algorithm to integrate an existing insulin pump, CGM, and single board computer, Not Health Canada approved.</p>

<p>Continuous Glucose Monitoring System (CGM)</p>	<p>Monitors interstitial glucose values. Data is intended to provide information related to trends in glycemic management. A glucose sensor (small electrode) is inserted under the skin and measures interstitial glucose every 1-5 minutes. The readings are sent wirelessly to a device, either automatically or manually by scanning the sensor with a reader. There are two major types of CGM (real-time CGM or intermittent CGM/Flash).</p> <p>Interstitial glucose readings lag behind blood glucose readings by 5-15 minutes and results can be inaccurate when glucose levels change rapidly (after treating a low BG or after a meal). Therefore, CGM results don't always match capillary (fingerstick) blood glucose readings. Conditions common to the hospital population may impact the accuracy of glucose sensors.</p> <p>Some pumps have the ability to integrate a CGM with the insulin pump, which is able to:</p> <ol style="list-style-type: none"> 1) Assess interstitial glucose every 5 min 2) Alert the user of high or low glucose readings 3) Alert the user of rapid changes in glucose 4) Temporarily suspend insulin delivery if a low glucose alert does not result in user acknowledgement. CGM may be in use without the alert or suspend features enabled. 5) Some pumps are able to respond to the CGM glucose readings and adjust the basal rate continuously (partial closed loop pumps). <p>This technology is rapidly growing and changing. At the present time and for most CGM available, the glucose readings provided are used to prompt capillary glucose testing and rate of change indicators can aid user in insulin self-adjustment. Currently this technology does not eliminate the need for confirmation of glucose by capillary testing prior to insulin adjustment for most available CGM.</p>
<p>Real-Time CGM (rtCGM)</p>  <p>(2020) Alberta Health Services</p>	<p>Real-time CGMs (rtCGM, e.g. Dexcom and Medtronic) have a transmitter attached to the sensor to continuously send glucose results to a reading device (this maybe the insulin pump, a stand alone receiver or an app on a smartphone/watch). For some, capillary (fingerstick) blood glucose readings are required for calibration.</p>
<p>Intermittent Continuous Glucose Monitor (iCGM) or Flash Glucose Monitoring System (Flash)</p>  <p>(2020) Alberta Health Services</p>	<p>The person with diabetes manually scans the iCGM sensor with a handheld reader to see current and stored results.</p> <p>First generation iCGM does not have automated alarms for when glucose levels reach certain limits. But the next generation one does.</p> <p>Capillary (fingerstick) blood glucose testing is not needed for calibrations but is needed at other times (to confirm hypoglycemia and determine insulin management).</p>

5. Procedure for the Safe Self-Management of Insulin Pump Therapy in Hospital

Purpose: To ensure safe and effective administration of insulin for patients with diabetes using their own external continuous subcutaneous insulin infusion pump during procedures and hospital encounters.

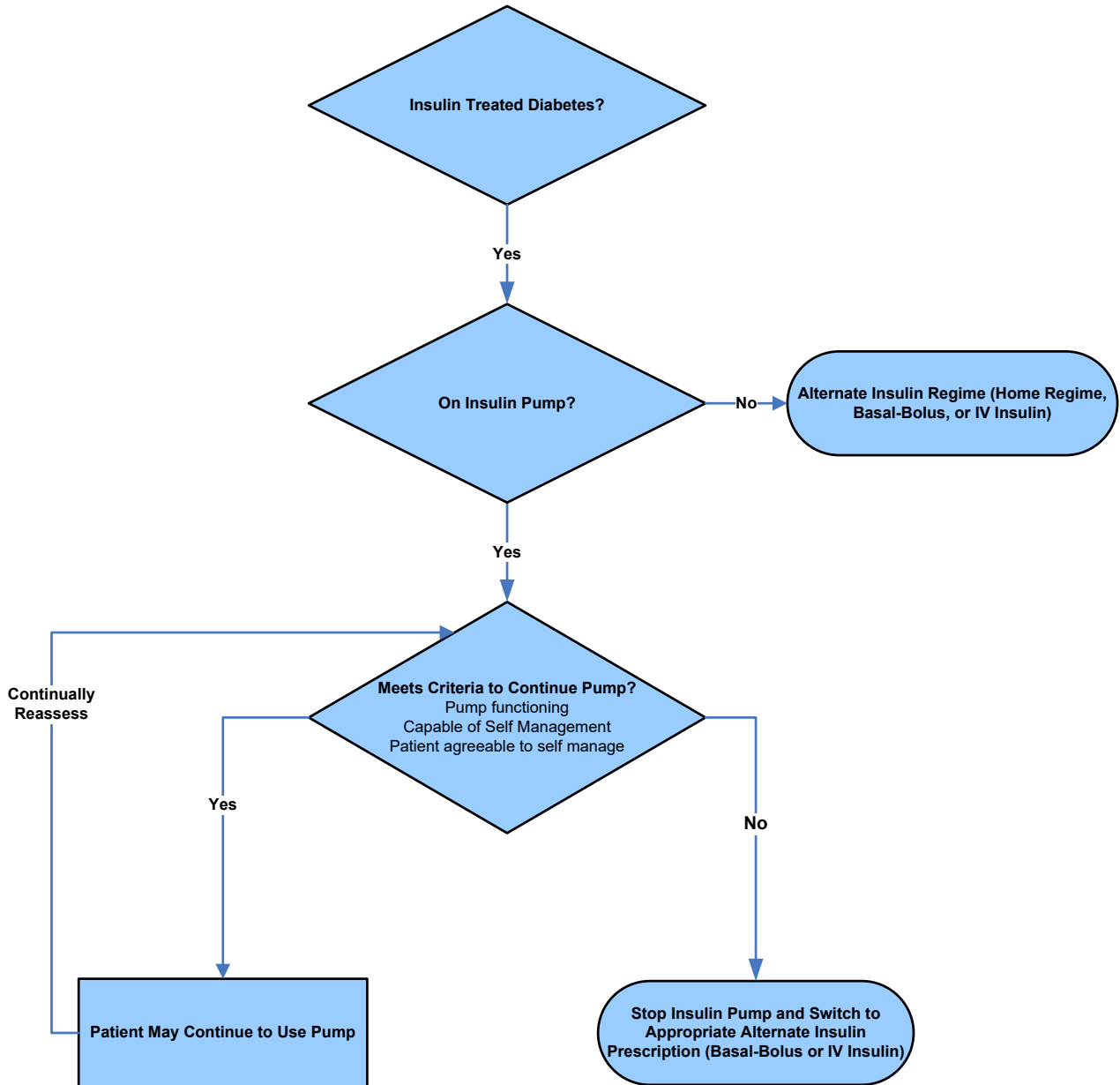
Enacted by: Nurse, MD or other prescriber

Steps for Safe Self-Management of Insulin Pump in Hospital

- 1) MD or prescriber must assess patient's ability to self-manage with the insulin pump using the following tools:
 - a) *Algorithm for Assessing Self-Management of Insulin Pump in Hospital* (see [Section 6](#))
 - b) *Criteria for Self-Management of Insulin Pump* (see [Section 7](#))
 - c) *Self-Management Terms for and Expectations of Patients* (see [Section 8](#))
- 2) If a patient is appropriate for self-management of the insulin pump in hospital:
 - a) Patient (guardian/caregiver if under age18) must read, agree and sign the **Patient Agreement to Self-Manage Insulin Pump In-Hospital** (see [Section 9](#)). The completed form is placed (scanned) into chart.
 - b) Patient (guardian/caregiver if under age18) must complete the **Insulin Pump Information Sheet** (AHS form # 20114) (see [Section 9](#)). The completed form is placed (scanned) into chart.
 - c) MD or prescriber must complete the **In-Hospital Orders for Self-Management of Insulin Pump** (Connect Care or AHS bond form # 20102 or AHS NCR form # 20976 or SCM order set) (see [Section 9](#)). The completed form is placed into chart.
 - d) Patient (guardian/caregiver if under age18) must complete the **In Hospital Insulin Pump Therapy Patient Bedside Logbook** daily (AHS form #20189) (see [Section 9](#)). The completed form is placed (scanned) into the chart daily.
 - e) Nurse to review and sign the **In Hospital Insulin Pump Therapy Patient Bedside Logbook** (AHS form #20189) at the end of each shift. The completed form is placed (scanned) into chart daily.
 - f) Nurse will test blood glucose (BG) as ordered (minimum 4 times daily before mealtimes and bedtime), document in the patients chart and will share result with patient.
- 3) The patient must be assessed **daily** by the most responsible physician or prescriber, to ensure that they continue to meet criteria for self-management.
- 4) If they no longer meet criteria for self-management they are to be switched to an alternate regime of insulin (see [Section 13](#))

6. Algorithm for Assessing Self-Management of Insulin Pump in Hospital

Key Message: "If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)"



7. Criteria for Self-Management of Insulin Pump

Patient is able to self-manage if all of the following criteria are met:

(Most responsible health practitioner's responsibility to assess)

- 1) Mentally
 - a) Alert and oriented x 3
- 2) Physically
 - a) Has no physical/dexterity limitations
 - b) Alternatively, if patient unable to self-manage, a non-health system caregiver (i.e. family member/guardian) is available to provide support/assistance to manage insulin pump 24 hours/day
- 3) Medically stable
- 4) No identified reasons for **pump discontinuation***

***Criteria for pump discontinuation:**

- 1) Cognitive or psychological limitations
 - a) Altered, deteriorating or fluctuating changes to state of consciousness and/or cognitive status, including use of medications that may interfere with cognition or may be sedating (e.g. narcotics)
 - b) Mental status that interferes with the patient's ability to self-manage (e.g. if patient experiences suicidal thoughts, behaviours and/or has made attempt(s) to die by suicide)
- 2) Medical conditions:
 - a) **DKA, or persistent unexplained hyperglycemia**
 - b) Persistent/recurrent severe hypoglycemia
 - c) Critically ill (sepsis, trauma) and needs intensive care
 - d) Other inter-current illnesses where use of the insulin pump is risky or non-effective, as determined by the medical staff
- 3) Pump functionality or performance limitations:
 - a) Pump not functioning
 - i) Hyperglycemia fails to respond to appropriate action (bolus insulin)
 - b) Insufficient pump supplies (the hospital can not provide insulin pump supplies)
 - c) Physical limitations to using the insulin pump
- 4) The patient chooses not to or unable to participate in self-care or to agree to self-management terms
- 5) Non-health system guardian or caregiver support/assistance (for patients under 18), required to manage insulin pump, is **not available 24 hours/day**

8. Self-Management Terms for and Expectations of Patients

(All of the following must be met):

- 1) **Does not meet any criteria for discontinuation of pump** (see [Section 7](#))
- 2) Patient will be required to:
 - a) **Provide all pump settings** on the *Insulin Pump Information Sheet (AHS form # 20114)* (see [Section 9](#))
 - i) Basal rate settings
 - ii) Insulin:carbohydrate ratio (ICR) settings
 - iii) Insulin sensitivity factor (ISF) settings
 - iv) Average total daily dose, percent basal
 - (a) Medtronic: main menu>utilities>daily totals
 - (b) Animas Ping & Vibe: main menu > history >total daily dose
 - (c) Roche Combo: my data>daily totals
 - (d) Omnipod: home screen>my records>insulin delivery
 - (e) Tandem: home screen>options>history>pump history
 - (f) Ypsomed: home screen>basal rate icon>review basal program
 - v) Active insulin on board and glucose targets
 - vi) If using auto-off feature
 - vii) If using a Continuous Glucose Monitor (CGM) sensor:
 - (a) report if low glucose suspend is on or off
 - (b) report if using automode with partial closed loop insulin pump (Medtronic G670, G770, Tandem t-slim)
 - (c) Report if using other non-Health Canada approved algorithms
 - b) **Provide all necessary supplies to run insulin pump (no supplies provided by AHS)**
 - i) Insulin pump
 - ii) Insulin cartridge (reservoir or pods)
 - iii) Tubing and infusion sets
 - iv) Batteries (plus extra) for the pump
 - v) Dressings (if applicable)
 - vi) Insulin – only if non-formulary [glulisine (Apidra®)]
 - c) **Change the infusion set every 48-72 hours, or sooner as needed for:**
 - i) Skin problems
 - ii) Two blood glucose readings greater than 14.0 mmol/L in 4 hours
 - iii) Immediately if BG is greater than 14.0 mmol/L and positive for ketones
 - d) **Allow testing of blood sugar by hospital staff** a minimum 4x/day (prior to meals and bedtime) using hospital blood glucose (BG) meter
 - i) you may test more often using your own BG meter/ flash glucose monitor(Flash)/ continuous glucose monitor(CGM)
 - ii) if using a home BG meter/ flash glucose monitor(Flash)/ continuous glucose monitor(CGM), you must still allow hospital BG meter testing. See [Appendix 2](#).

- e) Allowing hospital staff to test ketones if blood sugar values are above 14.0 mmol/L. (Check for **serum/capillary ketones** or **urine ketones** if BG values above 14.0 mmol/L)
 - f) Complete **Insulin Pump Therapy Patient Bedside Logbook** (AHS form #20189) including CBG results, ketone testing results, meal bolus and correction doses given, basal rate, infusion set changes and when pump suspended/reconnected.
 - g) Patient must contact nursing staff if (*any of the following situations arise*):
 - i) Experiencing any signs and symptoms of low blood sugar
 - ii) Blood glucose below 4.0 mmol/L
 - iii) Blood glucose above 14.0 mmol/L
 - iv) Pregnant patient, when the majority of blood glucose readings are above 7.0 mmol/L
 - v) There is a problem with their pump and/or if they have called the pump company's 24 hour "1-800 assistance line"
 - vi) If they feel they can no longer self-manage the pump
- 3) Patient understands that the **pump may be discontinued** and a different method of insulin delivery will be provided for any of the following:
- a) Physician or Nurse Practitioner's order
 - b) Not physically, emotionally or mentally capable of managing the insulin pump at the time
 - c) Procedures with expected electromagnetic field exposure:
 - i) Radiologic procedures (other than ultrasound)
 - ii) **MRI (NOTE: remove metal cannula for MRI – found on some pump insertion sets and all CGM systems)**
 - iii) CT scan
 - iv) Nuclear Stress Test (just for the scan, not the exercise component)
 - v) PET scans
 - vi) Cardiac catheterization
 - vii) Procedures requiring a general anesthetic
 - viii) Electric shock for defibrillation (cardioversion)
 - d) Other reasons deemed necessary by attending physician or medical staff where the use of the insulin pump is risky or non-effective
 - e) The patient chooses not to or unable to participate in self-care or to agree to self-management terms

9. Required Forms and Order Set for Self-Management of Insulin Pump Therapy in Hospital

The following 4 documents / forms are required when the patient is self-managing their insulin pump in the hospital:

1. **Patient Agreement to Self-Manage Insulin Pump In-Hospital** (AHS form # 20369)
To be completed by patient (guardian/caregiver if under age 18) and placed on the patient chart
(see [Section 9](#) or for a printable form, see <http://www.albertahealthservices.ca/frm-20369.pdf>)
2. **Insulin Pump Information Sheet** (AHS form # 20114)
To be completed by patient (guardian/caregiver if under age 18) and placed on the patient chart
(see [Section 9](#) or for a printable form, see <http://www.albertahealthservices.ca/frm-20114.pdf>)
3. **In-Hospital Orders for Self-Management of Insulin Pump**
(AHS form # 20102)
Completed by MD or other prescriber and placed on the patient chart
(see [Section 9](#) or for a printable form, see <http://www.albertahealthservices.ca/frm-20102.pdf>)
OR
(AHS NCR form # 20976)
Completed by MD or other prescriber and placed on the patient chart. Paper based order form with carbon copy available for order through data group in each Zone
**this form is the same as AHS form # 20102*
OR
In-Hospital Orders for Self-Management of Insulin Pump (SCM users)
Completed by the MD or other prescriber through Sunrise Clinical Manager electronic medical record in Calgary Zone
OR
Insulin Pump Therapy (adult) OR Insulin Pump Therapy (pediatric) (Connect Care users)
Completed by the MD or other prescriber through Connect Care electronic medical record ordering procedures
4. **Insulin Pump Therapy Patient Bedside Logbook** (AHS form #20189)
To be completed by patient (guardian/caregiver if under age 18). Nurse to sign at the end of every shift to confirm logbook has been completed. Nurse to review and file (scan) in patient chart daily.
(see [Section 9](#) or for a printable form, see <http://www.albertahealthservices.ca/frm-20189.pdf>)

Patient Agreement to Self-Manage Insulin Pump In-Hospital

([AHS form # 20369](#)) To be completed by patient (guardian if under age 18) and placed on the patient chart



Patient Agreement to Self-Manage Insulin Pump In-Hospital

(To be read and signed by patient / guardian and placed in patient chart)

Last Name (Legal)		First Name (Legal)	
Preferred Name <input type="checkbox"/> Last <input type="checkbox"/> First		DOB(dd-Mon-yyyy)	
PHN	ULI <input type="checkbox"/> Same as PHN	MRN	
Administrative Gender <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Non-binary/Prefer not to disclose (X)			

For your safety and optimal medical care during hospitalization, we request that you review this form outlining what is expected of you in hospital to self-manage your diabetes with your insulin pump. If you feel that you cannot carry out these responsibilities, we would like to treat your diabetes with insulin injections and/or intravenous insulin and discontinue the use of your insulin pump.

These are the responsibilities for self-management of your insulin pump during your hospital stay:

- 1) Understanding the potential risk of using your insulin pump in the hospital:
 - a) high and low blood glucose
 - b) diabetic ketoacidosis; and
 - c) infection
- 2) Completing the **Insulin Pump Information Sheet** (Form # 20114) which will provide all pump settings to your Physician or Most Responsible Health Practitioner.
- 3) Providing all necessary supplies to run your insulin pump:
 - a) insulin pump
 - b) insulin cartridge or pods
 - c) tubing and infusion sets
 - d) extra batteries for the pump
 - e) dressings (if applicable); and
 - f) insulin – only if non-formulary such as [glulisine (Apidra®)]
- 4) Changing the infusion set every 48-72 hours or sooner as needed for:
 - a) skin problems; or
 - b) if two blood glucose readings are greater than 14.0 mmol/L (with trace/negative ketones) in 4 hours
 - c) immediately if blood glucose reading greater than 14.0 mmol/L and **positive** for ketones
- 5) Allowing hospital staff to test your blood sugar a minimum of 4 times per day (prior to meals and bedtime) using a hospital blood glucose meter.
 - a) you may test more often using your own home blood glucose meter/flash glucose monitor(Flash)/continuous glucose monitor(CGM)
 - b) if using a home blood glucose meter/flash glucose monitor(Flash)/continuous glucose monitor(CGM), you must still allow hospital meter testing.
- 6) Allowing hospital staff to test **ketones** if blood glucose values are greater than 14.0 mmol/L
- 7) Completing the **Insulin Pump Therapy Patient Bedside Logbook** (Form # 20189) daily
- 8) Informing nursing staff if:
 - a) you have any signs and symptoms of low blood sugar
 - b) blood sugar less than 4.0 mmol/L
 - c) blood sugar 14.0 mmol/L or greater
 - d) you are pregnant and the majority of your sugars are over 7.0 mmol/L
 - e) you have a problem with your pump and/or if you called the pump company's 24 hour "1-800 assistance line"; or
 - f) you feel like you can no longer self-manage your pump



**Patient Agreement to Self-Manage
Insulin Pump In-Hospital**

Last Name <i>(Legal)</i>		First Name <i>(Legal)</i>	
Preferred Name <input type="checkbox"/> Last <input type="checkbox"/> First		DOB <i>(dd-Mon-yyyy)</i>	
PHN	ULI <input type="checkbox"/> Same as PHN	MRN	
Administrative Gender <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Non-binary/Prefer not to disclose (X)			

- 9) Understanding that your insulin pump **may be discontinued** and a different insulin delivery provided for if any of the following occurs:
- Physician or Nurse Practitioner's order
 - you are not physically, emotionally or mentally capable of managing the insulin pump at the time
 - undergoing a radiology procedure other than an ultrasound
 - having a procedure under a general anesthetic
 - other reasons deemed necessary by your attending physician or most responsible health care provider where the use of the insulin pump is risky or non-effective
 - you choose not to or are unable to participate in self-care or to agree to self-management terms

<input type="checkbox"/> I have read what is expected of me to self-manage my diabetes using my insulin pump in hospital. I am satisfied with and understand the information I have been given, and I agree to fulfill the self-management responsibilities.		
Patient/Guardian <i>(print)</i>	Patient/Guardian <i>(sign)</i>	Date <i>(dd-Mon-yyyy)</i>

Insulin Pump Information Sheet

([AHS form # 20114](#)) To be completed by patient (guardian/caregiver if under age 18) and placed on the patient chart



Last Name (Legal)		First Name (Legal)	
Preferred Name <input type="checkbox"/> Last <input type="checkbox"/> First		DOB (dd-Mon-yyyy)	
PHN	ULI <input type="checkbox"/> Same as PHN	MRN	
Administrative Gender <input type="checkbox"/> Male <input type="checkbox"/> Female		<input type="checkbox"/> Non-binary/Prefer not to disclose (X) <input type="checkbox"/> Unknown	

Insulin Pump Information Sheet

1. This form must be completed by a Patient (Guardian/Caregiver if under 18) who has agreed, along with the most responsible health practitioner, that they will be responsible for self management of insulin pump while in hospital. Patient (Guardian/Caregiver if under 18) must provide their own pump, and pump supplies while in hospital.
2. Patient (Guardian/Caregiver if under 18) will provide pump information and pump settings, and return completed form to the nurse, who will place or file in chart

Pump Information							
Manufacturer		Model Number			Customer Support Phone		
Insulin Type (check one) <input type="checkbox"/> lispro (HumaLOG®) <input type="checkbox"/> aspart (Novorapid®) <input type="checkbox"/> Other (specify) _____		Do you use a CGM or Flash? <input type="checkbox"/> Yes <input type="checkbox"/> No Low Glucose Suspend? <input type="checkbox"/> On <input type="checkbox"/> Off <input type="checkbox"/> Not Applicable		Auto Off feature <input type="checkbox"/> On <input type="checkbox"/> Off (pump shuts off after _____ hours) <input type="checkbox"/> Automode <input type="checkbox"/> Algorithm			
Typical Total Daily Dose of Insulin _____ units/24 hours							
Pump Settings							
Basal Rate(s) units/hr		Insulin:Carbohydrate Ratio (ICR)		Correction/Insulin Sensitivity Factor(s) (ISF)		Target Glucose mmol/L	
Time (hh:mm)	Rate	Time (hh:mm)	1 unit:gram carb	Time (hh:mm)	1 unit lowers glucose by this amount (mmol/L)	Time (hh:mm)	Glucose
						Insulin Active Time (hrs)	
Bolus Insulin (Not using ICR)							
Units _____ <input type="checkbox"/> With Breakfast/feed at Time (hh:mm) _____		Units _____ <input type="checkbox"/> With Lunch/feed at Time (hh:mm) _____		Units _____ <input type="checkbox"/> With Dinner/feed at Time (hh:mm) _____		Units _____ <input type="checkbox"/> With Other _____ at Time (hh:mm) _____	
Patient/Guardian/Caregiver Name (print)			Patient/Guardian/Caregiver Signature			Date (yyyy-Mon-dd)	

20114 (Rev 2021-05)

Side A

IPT terminology on the reverse of form

In-Hospital Orders for Self-Management of Insulin Pump

([AHS form # 20102](#) or AHS NCR form # 20976 or SCM Insulin Pump Therapy Order Set or CC Insulin Pump Therapy Order Set Adult OR Pediatric) **Completed by MD or other prescriber**



In Hospital Orders for Self Management of Insulin Pump

Last Name <i>(Legal)</i>		First Name <i>(Legal)</i>	
Preferred Name <input type="checkbox"/> Last <input type="checkbox"/> First		DOB <i>(dd-Mon-yyyy)</i>	
PHN	ULI <input type="checkbox"/> Same as PHN	MRN	
Administrative Gender <input type="checkbox"/> Male <input type="checkbox"/> Female		<input type="checkbox"/> Non-binary/Prefer not to disclose (X) <input type="checkbox"/> Unknown	

Use this order set only if the most responsible health practitioner has determined that patient meets criteria **and**, Patient (Guardian if under age 18) agrees to the self management of insulin pump in hospital responsibilities

1. Discontinue all previous insulin orders
2. Orders marked with are active by default, unless crossed out and initialed by prescriber. Boxed orders () require prescriber check mark () to be initiated

<input checked="" type="checkbox"/> Patient/Guardian has read and accepted the terms of the Patient Agreement to Self-Manage Insulin Pump In-Hospital <i>(Form 20369)</i> <input checked="" type="checkbox"/> Patient/Guardian to sign the Patient Agreement to Self-Manage Insulin Pump In-Hospital <i>(Form 20369)</i> . Completed form to be placed on chart. <input checked="" type="checkbox"/> Patient (Guardian/Caregiver if under age 18) to complete Insulin Pump Information Sheet <i>(Form 20114)</i> <input checked="" type="checkbox"/> Patient (Guardian/Caregiver if under age 18) to complete Insulin Pump Therapy Bedside Logbook daily <i>(Form 20189)</i> <input checked="" type="checkbox"/> Nurse to review and sign Insulin Pump Therapy Bedside Logbook <i>(Form 20189)</i> at the end of each shift. Completed form to be placed into chart daily <input checked="" type="checkbox"/> Do not stop or suspend the insulin pump unless physician provides alternative regime of insulin. (If pump stopped, basal insulin must be replaced within 2 hours to prevent Diabetic Ketoacidosis (DKA))			
Bedside Blood Glucose Monitoring <i>(use hospital meter)</i>			
<input checked="" type="checkbox"/> Before meals and bedtime <input checked="" type="checkbox"/> 2 hours after site change <input type="checkbox"/> 0300 hours <input type="checkbox"/> Every _____ hours <input type="checkbox"/> Other <i>(specify)</i> _____			
Insulin Type <i>(Choose One, for use in pump)</i>			
<input type="checkbox"/> lispro <i>(HumaLOG®)</i> <input type="checkbox"/> aspart <i>(Novorapid®)</i> <input type="checkbox"/> Other <i>(specify)</i> _____			
Hyperglycemia			
<input checked="" type="checkbox"/> If blood glucose is over 14.0 mmol/L, check ketones. If positive for ketones, patient to self administer correction insulin by syringe OR pen AND change infusion set. Nurse to notify most responsible health practitioner.			
Hypoglycemia			
<input checked="" type="checkbox"/> Do not remove or stop Insulin Pump Therapy without Physician Order <input checked="" type="checkbox"/> Treat according to Hypoglycemia protocol			
Other Orders			
<input checked="" type="checkbox"/> Patient to change site every _____ day(s) (usually every 2-3 days), starting Date <i>(dd-Mon-yyyy)</i> _____			
Pump Settings <i>(Patient to manage pump according their specified settings)</i>			
<input checked="" type="checkbox"/> Refer to Insulin Pump Information Sheet <i>(Form 20114)</i> and Insulin Pump Therapy Bedside Logbook daily <i>(Form 20189)</i>			
Physician Name <i>(print)</i>	Physician Signature	Date <i>(dd-Mon-yyyy)</i>	Time <i>(hh:mm)</i>

20102(Rev2021-06)

IPT criteria on back of paper-based order set

**Guidelines for the Safe Management of Insulin Pump Therapy in Hospital
Diabetes Obesity Nutrition SCN June, 2021**

Insulin Pump Therapy Patient Bedside Logbook

([AHS form #20189](#)) To be completed by patient (guardian/caregiver if under age 18)



Insulin Pump Therapy Patient Bedside Logbook

1. Patient (Guardian/Caregiver if under 18) to fill out daily
2. Nurse to sign at the end of every shift to confirm logbook has been completed. Nurse to review and file in patient chart file in patient chart daily.

Last Name <i>(Legal)</i>		First Name <i>(Legal)</i>	
Preferred Name <input type="checkbox"/> Last <input type="checkbox"/> First		DOB <i>(dd-Mon-yyyy)</i>	
PHN	ULI <input type="checkbox"/> Same as PHN	MRN	
Administrative Gender <input type="checkbox"/> Male <input type="checkbox"/> Female		<input type="checkbox"/> Non-binary/Prefer not to disclose (X) <input type="checkbox"/> Unknown	

Date <i>(dd-Mon-yyyy)</i>	0800h	0900h	1000h	1100h	1200h	1300h	1400h	1500h
Blood glucose <i>(mmol/L)</i>								
Ketones positive								
Carbohydrates <i>(grams)</i>								
Meal Bolus & Correction dose <i>(units)</i>								
Basal rate <i>(units/hr)</i>								
Site/set change								
Pump suspended/removed								
Pump reconnected								
	1600h	1700h	1800h	1900h	2000h	2100h	2200h	2300h
Blood glucose <i>(mmol/L)</i>								
Ketones positive								
Carbohydrates <i>(grams)</i>								
Meal Bolus & Correction dose <i>(units)</i>								
Basal rate <i>(units/hr)</i>								
Site/set change								
Pump suspended/removed								
Pump reconnected								
	2400h	0100h	0200h	0300h	0400h	0500h	0600h	0700h
Blood glucose <i>(mmol/L)</i>								
Ketones positive								
Carbohydrates <i>(grams)</i>								
Meal Bolus & Correction dose <i>(units)</i>								
Basal rate <i>(units/hr)</i>								
Site/set change								
Pump suspended/removed								
Pump reconnected								
Comments								
Signatures								
Nurse signature <i>(end of shift _____h)</i>	Nurse signature <i>(end of shift _____h)</i>		Nurse signature <i>(end of shift _____h)</i>					

20189(2021-06)

10. Guidelines for Management of Insulin Pump Therapy Emergencies

Key Message: “If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”

Potential insulin pump emergencies are managed in a similar manner to any other patient with type 1 diabetes

- 1) **DIABETIC KETOACIDOSIS (DKA)** can occur very quickly (2-4 hours) if insulin delivery is disrupted for any reason because:
 - The insulin pump only delivers rapid acting insulin (continuously to cover basal requirements and in bolus fashion to cover meals and correct for high blood sugars)
 - Patients on the insulin pump **do not** use intermediate or long acting insulin

Pump patients feeling unwell require **immediate assessment** for DKA:

- Typical symptoms of DKA include lethargy, nausea, vomiting, abdominal pain, intercurrent illness
- Perform assessment of hydration status
- Urgent lab testing for blood glucose, serum electrolytes, capillary blood gas and urine/serum ketones
- If patient on an SGLT2 inhibitor (canagliflozin (Invokana), dapagliflozin (Forxiga), empagliflozin (Jardiance), ertugliflozin (Steglatro) DKA may be present even if glucose is within normal range
- *AHS employees please see AHS Clinical Knowledge Topics:*
 - [Diabetic Ketoacidosis, Adult - Emergency Department \(DKA, Diabetes\) \(ahsnet.ca\)](#)
 - [Diabetic Ketoacidosis, Adult - Inpatient \(ahsnet.ca\)](#)
 - [Diabetic Ketoacidosis, Pediatric - Emergency and Inpatient \(ahsnet.ca\)](#)

Treatment of hyperglycemia/DKA:

- If DKA is confirmed, treat as one would for any individual with Type 1 diabetes, including **IV insulin**
- **Do not** rely on the insulin pump for insulin delivery
- Disconnect/suspend pump and remove insertion set
- If severe hyperglycemia, but not in DKA, and there is any concern regarding the integrity of the pump system, administer insulin via another route (SC or IV)

- 2) **SEVERE HYPOGLYCEMIA**

- Suspend or disconnect the pump until blood glucose readings are above 6.0 mmol/L
- Once above 6.0 mmol/L, restart the insulin pump
- The patient will quickly become insulin deficient if the pump is disconnected for >2 hours
- Following a severe hypoglycemic episode, instruct patient to reduce both the basal and bolus doses of insulin by approximately 20% for several days

- 3) **INFUSION SITE ABSCESS OR INFECTION**

Most are secondary to *Staphylococcus aureus*

- Remove and discard infusion set and reservoir
- Have patient insert new infusion set at a new site, prepped with an antiseptic wipe
- Incise and drain abscess, send debrided material for culture and susceptibility testing

- Treat with cloxacillin
- In high resistance areas, use antibiotic with methicillin-resistant *Staphylococcus aureus* (MRSA) coverage (Refer to local antibiogram)

NOTE: If the patient on insulin pump therapy is treated for any of the above 3 issues in the Emergency Department and not admitted to hospital, they should be instructed to contact their Diabetes Insulin Pump Clinic or their Diabetes in Pregnancy Clinic (if applicable) for reassessment of the insulin regimen and further pump education. You are asked to consider sending a referral to an approved insulin pump clinic in your area to ensure that follow up occurs.

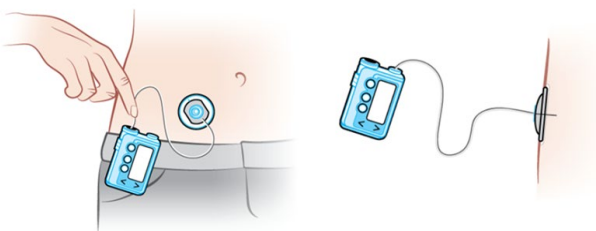
Current referral information to approved insulin pump clinics is available at:
<http://www.health.alberta.ca/services/insulin-pump-therapy-program.html>

If assistance is required in managing a pump-related emergency, please consult endocrinology on call (if available) at your site, or the patient’s diabetes physician. If the patient requires technical assistance with their insulin pump they can contact the 1-800 number on the back of the pump.

4) Cardiac Arrest / Code Blue

- Remove the insulin pump attachment at the skin (pod or tubing attachment) and place the pump in safe and dry place with patient’s name and ID #.
- Infusion set with tubing to be discarded in a sharps container. Pod attachment is to stay with the handheld pump device.
- Ideally, the insulin pump should be SUSPENDED as soon as possible (by the patient if possible or by a family member) since the flow of insulin will continue and this moisture could damage the pump. Should the patient or caregiver be unable to suspend the pump, contacting the 1-800 number on the back of the pump will provide support on “how to” suspend the pump.

Insulin pump with tubing



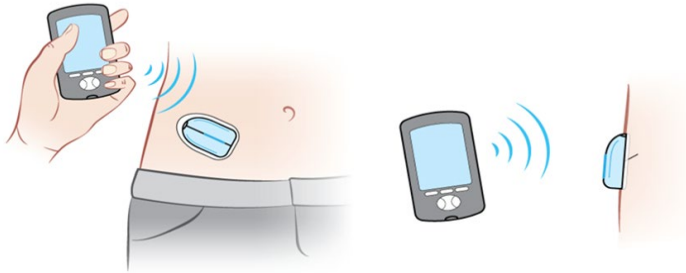
Infusion set (soft tubing or metal cannula) can be disposed in a sharps container once removed.

© Alberta Health Services (2018) [Insulin Pump Therapy](#)



Examples of infusion set(s) associated with the insulin pump (with tubing)

Insulin pump without tubing

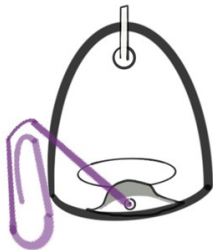


Pod to be kept with the device (PDM) once suspended.
Do not discard the pod before deactivating the pod.

© Alberta Health Services (2018) [Insulin Pump Therapy Learning Module \(alberta.ca\)](http://alberta.ca)

Screaming Pod

Screaming pods occur when the pod cannot be deactivated by the handheld device (PDM). Screaming pods can be silenced with a paperclip. Insert a paperclip into the small hole on the bottom (the side opposite where the cannula is) of the pod as shown. Push the paperclip in until you hear a “*little click*”, that “click” is breaking the circuit that silences the audible scream.



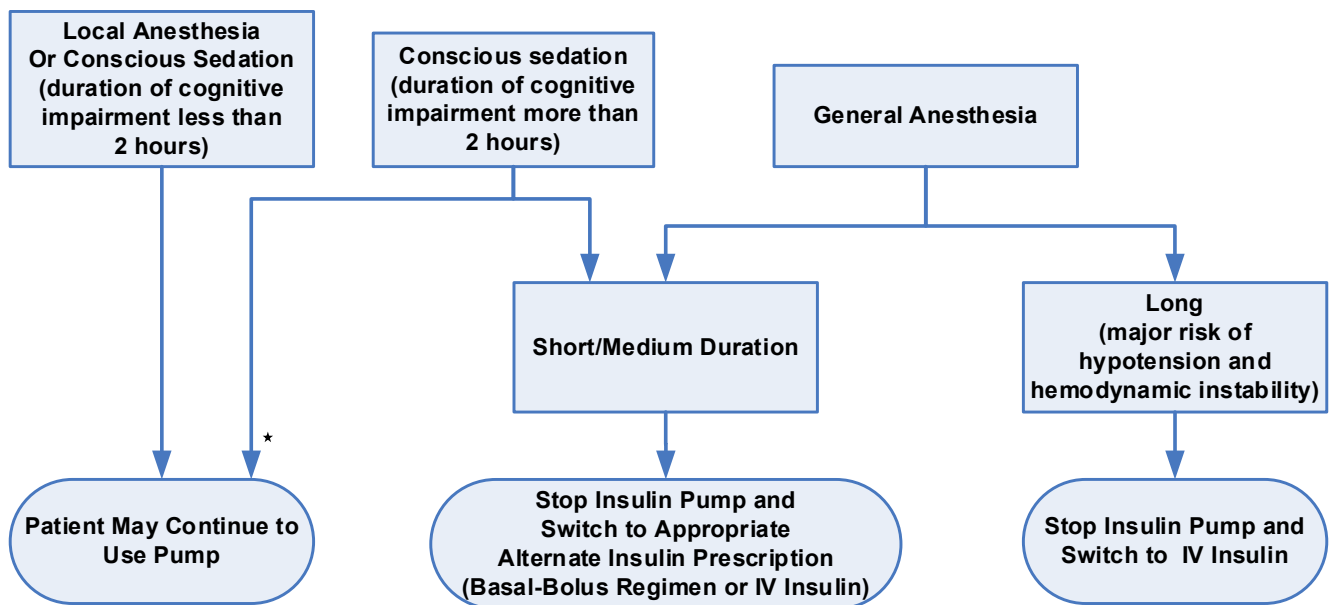
[OmniPod Insulin Management System - Diabetes Educators Calgary](http://alberta.ca) (2021)

REFERENCES: Diabetes Canada Clinical Practice Guidelines Expert Committee. *Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada*. Can J Diabetes. 2018;42(Suppl 1):S1-S325.

These guidelines are available online at: (<http://guidelines.diabetes.ca/Browse/Chapter15>)

11. Algorithm for the Safe Use of Insulin Pump during Procedures and Surgery

Key Message: “If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”



* This option applies only to patients who have a family member/caregiver that is able and available to manage the insulin pump until the patient is no longer cognitively impaired and able to self-manage the insulin pump

12. Guidelines for Managing Pump during Radiologic Procedures

Key Message: *“If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”*

The insulin pump (including pods) (see [Section 4](#)) and/or the continuous glucose monitoring system (CGM or Flash: sensor and transmitter) should NOT be worn for procedures with expected exposure to electromagnetic field:

- Radiologic procedures (other than ultrasound)
- **MRI (NOTE: remove metal cannula for MRI – found on some pump insertion sets and CGM)**
- CT scan
- Nuclear Stress Test (just for the scan not the exercise component)
- PET scan
- Cardiac catheterization
- Electric shock for defibrillation

If the procedure is less than 1 hour:

- Remove insulin pump* and CGMS and keep outside the procedure room in a safe and dry place with patient’s name and ID #
- Once procedure complete, patient will reconnect pump and check blood sugar with administration of a correction dose for hyperglycemia if required

If procedure 1-2 hours:

- The patient should administer a bolus dose before disconnecting the insulin pump
- The bolus dose is a calculation of the basal dose which would have been administered over the next 1-2 hours
- EXAMPLE: Procedure is 2 hours long
 - Basal rate at that time is 0.8 units/hour
 - The patient will administer $0.8 \times 2 = 1.6$ units as a bolus
- Remove pump* and/or CGM and keep outside the procedure room in a safe and dry place with patient’s name and ID #
- Once procedure complete, patient will reconnect pump and check blood sugar with administration of a correction dose for hyperglycemia if required

If procedure more than 2 hours:

- The insulin pump should be discontinued* and either basal bolus sc insulin or IV insulin should be initiated
- See “Guidelines for switching from insulin pump to basal/bolus insulin” (see [Section 13](#))

*If/when the pump is removed, the flow of insulin will continue and this moisture could damage the pump. Therefore, have patient suspend pump and once reconnected after the procedure, the **pump must be unsuspending**.

13. Guidelines for Switching between Insulin Pump Therapy and Subcutaneous Insulin or IV insulin

Key Message: “If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”

Switching from Insulin Pump to Subcutaneous (sc) Basal Bolus insulin

The calculations below will provide a safe transition between the insulin pump and subcutaneous basal/bolus insulin therapy. However, when transitioning between modes of insulin delivery, review of capillary glucose monitoring is required to assess the adequacy of the insulin doses provided and adjustments made based on these results.

If available at your site (for adults):

Use one of the following to enter orders for basal bolus insulin therapy:

- For non-electronic / paper based facilities:
Basal Bolus Insulin Therapy (BBIT) Adult Inpatient Order Set (AHS form 19885 or Covenant Health CV-0701)
- For Calgary Zone SCM facilities:
Basal Bolus Insulin Therapy Order Set
- For Connect Care facilities:
Basal Bolus Insulin Therapy (BBIT) Order panel

BASAL Dose Calculation

- 1) Take average of **total daily doses** (TDD) (available on pump)
- 2) Divide by 2 to get the Total Daily Basal dose
- 3) Administer glargine or detemir as single dose once/day or in equally divided doses twice daily. Alternatively, Humulin N can be administered twice daily if there is a contraindication to glargine or detemir
EXAMPLE: TDD = 60 units
a) $60 \div 2 = 30$ units Total basal dose
b) 30 units once daily
OR
 $30 \div 2 = 15$ units given twice daily (Breakfast and bedtime)
- 4) Discontinue pump 2 hours after the first dose of basal insulin is administered

BOLUS FOR MEALS Options

- 1) Patient may use their existing insulin:carbohydrate ratios (ICR)
EXAMPLE: 1:10 means 1u of rapid insulin takes care of 10g of carbohydrate
OR
- 2) If patient typically eating only 3 meals/day (no snacks), take half of usual total daily dose, divide by 3 and administer with meals
EXAMPLE: TDD 60 units
 $60 \div 2 = 30$ units
 $30 \div 3 = 10$ units with each meal
OR
- 3) If patient was typically eating 3 meals/day and between meal snacks, take half of usual total daily dose, divide by 4 and administer with meals
EXAMPLE: TDD 60 units
 $60 \div 2 = 30$ units

$30 \div 4 = 7.5$ units (round to 7 or 8 units) with each meal

CORRECTION INSULIN Options

- 1) Patient may use their existing insulin sensitivity factor (ISF)

OR

- 2) Create a correction sliding scale based on their ISF

EXAMPLE:

- a) ISF of 2 means 1 unit of rapid insulin will drop sugars by 2 mmol/L
 b) May create a correction sliding scale that administers 1 extra unit of rapid insulin for every 2 mmol/L above 8 mmol/L

	Action
4.0-8.0	No correction
8.1-10.0	1 unit rapid acting insulin sc
10.1-12.0	2 unit rapid acting insulin sc
12.1-14.0	3 unit rapid acting insulin sc
14.1-16.0	4 unit rapid acting insulin sc, check ketones
16.1-18.0	5 unit rapid acting insulin sc, check ketones
>18.0	notify MD, check ketones

OR

- 3) *If available at your site (for adults); use:*

- For paper based facilities: **Basal Bolus Insulin Therapy (BBIT) Adult Inpatient Order Set** (AHS form 19885 or Covenant Health form CV- 0701)
- For Calgary Zone SCM: Basal Bolus Insulin Therapy Order Set
select a scale for “Correction for Hyperglycemia” based on the total daily dose (TTD) of insulin
- For Connect Care facilities: Basal Bolus Insulin Therapy (BBIT) Order panel
select a scale for “Correction for Hyperglycemia” based on the total daily dose (TTD) of insulin

Switching from Subcutaneous Basal/Bolus Insulin Back to Insulin Pump

- 1) If patient is capable and willing to self-manage, restart pump on original settings if appropriate or consult Diabetes Consult Service or Endocrinology to assist with rate adjustments
- 2) Discontinue all previous insulin orders
- 3) Restart pump at the time of the next scheduled dose of basal insulin to prevent insulin stacking. Instruct patient to consider a reduced temporary basal rate for the first 12 hours if they have been on twice daily basal insulin.
- 4) Check glucose 2 hours after pump restart to ensure site is working well

Switching from IV Insulin Back to Insulin Pump

- 1) If patient is capable and willing to self-manage, restart pump on original settings if appropriate or consult Diabetes Consult Service or Endocrinology to assist with rate adjustments
- 2) Continue IV insulin infusion for the first 2 hours of the pump restart to allow the formation of a subcutaneous depot of insulin
- 3) Patients in Diabetic Ketoacidosis (DKA) may be transitioned back to the pump after resolution of the diabetic ketoacidosis
- 4) Check glucose 4 hours after pump restart (2 hours after IV insulin stopped) to ensure site is working well

14. Guidelines for Managing the Insulin Pump in a Pregnant Patient

Key Message: *“If pump stopped, must replace basal insulin within 2 hours to prevent Diabetic Ketoacidosis (DKA)”*

Patients with Type 1 diabetes may be managed with the insulin pump during their pregnancy. They are followed closely as outpatients by a diabetes specialty team, including a diabetes specialist, nurse and dietician, most often in a Diabetes in Pregnancy Clinic setting.

When a pregnant patient with diabetes on the insulin pump is admitted to hospital, it is imperative to **consult the endocrinology consult service or diabetes specialty consult service** (whoever manages diabetes in pregnancy in your hospital). Some hospitals may have specific pre-admission orders in place for the patient as well.

If patient is admitted antepartum:

- 1) Patient may be able to self-manage with the insulin pump, assuming they meets criteria for self-management (*see **Assessment of Capability to Self-Manage**)
- 2) Diabetic ketoacidosis (DKA) is associated with significant morbidity and mortality in the patient, and up to a 50% risk of mortality in the fetus. Therefore:
 - a) Hyperglycemia with blood glucose above 14.0 mmol/L should prompt ketone testing (urine or serum)
 - b) If positive for ketones and/or if they exhibit typical DKA symptoms, they should be assessed for DKA. (Perform assessment of hydration status and urgent lab testing for blood glucose, serum electrolytes, capillary blood gas and urine/serum ketones)
 - c) If DKA confirmed, treat as one would treat anyone with Type 1 diabetes, including intravenous (IV) insulin.

If patient admitted for Labour and Delivery:

- 1) The patient may be able to continue the pump during labour and delivery with adequate planning and preparation and close follow-up during labour and delivery by their diabetes care team. This practice may vary by Zone, Hospital or care provider.
- 2) A well thought out and clear plan should be in place prior to admission.
- 3) If a plan is not in place, the patient should be switched to intravenous insulin, aiming for sugars between 4.0-7.0 mmol/L.
- 4) At any point during labour and delivery, if the patient is not able to self-manage (see [Section 6](#)) then the patient should be switched to intravenous insulin, aiming for sugars between 4.0-7.0 mmol/L.
- 5) **After delivery, patient’s insulin requirements drop.** They should reduce their insulin doses to the post-partum pre-specified settings suggested by the diabetes care team immediately. If a plan is not in place, please contact the diabetes care team immediately.

Post-partum:

- 1) If the patient was able to remain on the insulin pump through labour and delivery, they should reduce their insulin doses to the post-partum pre-specified settings suggested by their diabetes care team. If a plan is not in place, please contact the diabetes care team immediately.
- 2) If the patient was on IV insulin, the insulin pump may be resumed using the post-partum insulin dose settings pre-specified by the diabetes care team. Stop the IV insulin 2 hours after the pump is resumed.
- 3) Be aware that the dose of insulin will change based on the patient's diet and whether or not the patient is breastfeeding. Therefore, frequent monitoring of blood sugars is indicated (4 to 7 times/day).
- 4) Follow-up after discharge should be with the patient's diabetes in pregnancy care team.

Appendix 1: Safer Practice Notice, Insulin Pump Therapy

Link to AHS Safer Practice Notice: <http://www.albertahealthservices.ca/assets/info/hp/ps/if-hp-ps-notice-insulin-pump-2015-08-13.pdf>





Alberta Health Services

Safer Practice Notice

Status

- Active
- Updated
- Resolved

Zone Application

- Provincial
- North
- Edmonton
- Central
- Calgary
- South

13 August 2015

For Information of:

- Emergency Departments
- Acute Care settings
- Diagnostic Imaging
- Physicians
- Nurses
- Pharmacists

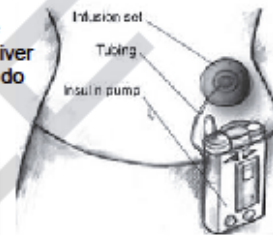
Contact

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Glenda.Moore@albertahealthservices.ca

Safe Insulin Pump Therapy in Acute Care

Issue

Insulin pump therapy is becoming more common in the care of patients with type 1 diabetes. Insulin pumps deliver continuous subcutaneous *rapid acting* insulin. Patients do not receive intermediate or long acting insulin.



Severe hyperglycemia and/or Diabetic Ketoacidosis (DKA) can result when Insulin Pump Therapy is stopped for as little as 2-4 hours and insulin is not replaced - even if glucose values are normal or low when pump is discontinued.

Action

- If insulin pump is stopped, basal insulin must be replaced within 2 hours to prevent Diabetic Ketoacidosis (DKA)
- If DKA develops, it must be treated with IV insulin. The pump should not be used to deliver insulin. Follow Emergency department DKA protocol.
- If severe hyperglycemia, but not in DKA; and there is concern regarding the integrity of the pump system, discontinue the pump and administer insulin via another route (sc or IV)
- For severe hypoglycemia; suspend or disconnect pump. Once blood glucose above 6.0 mmol/l, insulin must be replaced (pump, sc, or IV)
- The insulin pump should be removed for all radiologic procedures, except ultrasound, due to exposure to electromagnetic fields. The pump should be discontinued, and sc or IV insulin treatment should be initiated before procedure, for any procedure longer than 2 hours, or requiring general anaesthetic.
- If unfamiliar with insulin pump therapy; contact Endocrinology on-call, Certified Diabetes Educator, or your local Diabetes expert

Resources

Provincial resources (policy, guidelines and order set) are being developed as part of the DON SCN Diabetes Inpatient Management initiative. Current resources available:

- Calgary Zone insulin pump website: <http://ucalgary.ca/cdm/pump>
- Video: Safety & Insulin Pumps in Emergency and Hospital Situations courtesy of Diabetes Care Program of Nova Scotia: <http://youtu.be/SC3dAJqMJHM>

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Appendix 2: Safer Practice Notice, Home Glucose Monitoring Devices

Link to AHS Safer Practice Notice: [SPN- Safety Concerns regarding us of Home Glucose Monitoring Devices in Acute Care \(albertahealthservices.ca\)](https://www.albertahealthservices.ca/spn_safety_concerns_regarding_use_of_home_glucose_monitoring_devices_in_acute_care.aspx)





Safer Practice Notice

Status

- Active
- Updated
- Resolved

Zone Application

- Provincial
- North
- Edmonton
- Central
- Calgary
- South

27 October 2020

For Action By:

- Acute Care
- Emergency Departments
- Urgent Care
- Diagnostic Imaging
- EMS
- Nurses
- Physicians
- Pharmacists

Contact:

Diabetes Obesity Nutrition (DON)
Strategic Clinical Network (SCN)
don.scn@ahs.ca

Safety Concerns regarding use of Home Glucose Monitoring Devices in the Acute Care Setting

Including Continuous Glucose Monitors (CGM), Flash Glucose Monitors (Flash) and Blood Glucose Monitors (BGM)

Issue

- There are several different types of glucose monitoring devices used by patients with diabetes in the community. Some test interstitial glucose, while others test blood glucose.
- CGM and Flash measure the glucose levels found in the interstitial fluid. Interstitial glucose results are not the same as a capillary or lab blood glucose results.



- Conditions common to the hospital population may affect sensor readings (CGM and Flash), rendering them inaccurate.
- Home glucose monitoring devices do not undergo the same quality assurance testing as the Point of Care Test (POCT) approved AHS blood glucose meter.
- If glucose results from home glucose monitoring devices are used, there is a risk of:
 - not responding to hypoglycemia or hyperglycemia in a timely fashion;
 - treating hypoglycemia when not necessary; and
 - inaccurate dosing of insulin or other diabetes medications.

The glucose value from the patient's home glucose monitoring device should not be used to determine the administration/ adjustment of insulin or other diabetes medication(s), or to determine the treatment for hypoglycemia.

Action

- Use the AHS POCT blood glucose meter to decide on insulin dose or adjustment of diabetes medication(s) in hospital.
- Before the treatment of hypoglycemia or hyperglycemia, the patient's blood glucose must be checked with the AHS POCT blood glucose meter.
- Do not compare glucose results from the home glucose monitor to the AHS POCT blood glucose meter results.
- For patients who continue to use their home device(s), the glucose values from these devices should not be used to make treatment decisions.
- Remove CGM or Flash sensor prior to all diagnostic imaging procedures, except Ultrasound.

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Appendix 3: IPT Working Group Members and Content Contributors

We would like to acknowledge the following individuals for their contributions to the creation of these resources / tools for the safe management of Insulin Pump Therapy in acute care:

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Appendix 4: References

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