My Sick Day Plan
For Type 1 Diabetes

Why is it important to manage sick days?

- When you have type 1 diabetes, you have a higher chance of going into diabetic ketoacidosis (DKA) when you are sick, including colds, flu or an infection.
- Your body may need more insulin than usual and your blood sugar (glucose) may be higher than usual when you are sick.
- When you do not have enough insulin, your body starts burning fat, instead of sugar for energy. This breakdown of fat produces ketones (an acid). DKA can occur when high levels of ketones build up in the body.

DKA is a serious, life-threatening condition and requires immediate medical attention.

Be Prepared

Before an illness occurs:

- Review the information in this handout.
- Understand how to use the insulin adjustment guidelines for sick days and know which option is right for you (on page 4 and 5).
- Keep a sick day kit (on page 6) on hand and replace any expired items in the kit as needed.
- Have the following contact numbers available.
- Contact your diabetes care team or doctor if you have any questions.

Contact Numbers

Provincial Health Line (24 hours)	Health Link BC	811
Diabetes Specialist	Dr.	
Diabetes Centre		
Family Doctor	Dr.	
Hospital switchboard	ENDO on call	
Pharmacy		
Insulin pump company		

What are the steps to prevent DKA and stay out of the hospital?

To remember the important steps, think of the word **S-I-C-K**.

S is for blood sugar testing

Test your blood sugar every 4 hours, day and night.
Test every 2 hours when blood sugars are above 14 mmol/L.

Note: Sensor glucose results (FreeStyle Libre, Dexcom®, Medtronic Guardian™/Enlite™) may be less accurate when you are dehydrated. Do a finger-stick test to confirm when necessary.
Signs + symptoms of dehydration include irritability, headache, confusion and less frequent urination.

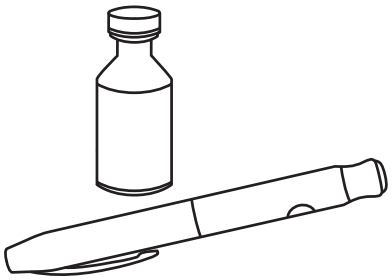
I is for insulin

To avoid DKA, always take your insulin when you are sick, even if you are eating less.

Your **long-acting insulin** (background insulin):

_____ (name)

- Take your usual dose(s) or as instructed by your doctor.



Your **rapid- or short-acting insulin** (mealtime + correction insulin):

_____ (name)

- If you can eat, take your usual meal dose.
- If you cannot eat, hold your meal dose.
- If blood sugar is above target **and** there are no ketones, take your usual correction dose.
- **If ketones are present**, you will need **extra** insulin to correct the high blood sugar. See page 4 and 5 for guidance.

C is for carbohydrate + fluid

Drink a minimum of 8 to 10 cups (250 mL each) of fluid a day to keep hydrated.

If you are eating your usual meals with carbohydrate, drink mostly “sugar-free” fluids (less than 0.5 gram carbohydrate per serving) like water, club soda, diet soft-drinks, and broth.

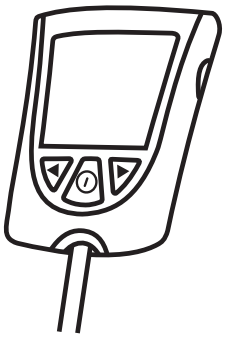
If you have trouble eating, include sugar-containing fluids like fruit juice, regular soft drinks or sport drinks as part of your fluid intake. A general guideline is to eat or drink 15 grams of carbohydrate every hour OR 45 grams of carbohydrate every 3 to 4 hours.

Each of the following food and drink provides about 15 grams of carbohydrate.

- 4 pieces of melba toast
- 5 Breton or 6 soda crackers
- 1 slice of bread or toast
- 1 cup chicken noodle soup
- 1 small apple or pear or banana
- ½ cup unsweetened applesauce
- ½ cup regular gelatin (e.g. Jell-O®)
- ¾ cup fruit juice or regular soft drink
- 1 cup original Gatorade® or Powerade®
- 1 double popsicle
- 1 bottle of Boost Diabetic®
- 1 bottle of Glucerna® = 21 grams carb

K is for ketone testing

Have blood ketone test strips (+ matching glucose metre) or urine ketone test strips ready, in case of illness.



During illness, check ketones in your blood or urine every 2 to 4 hours when:

- Your blood sugar is above 14 mmol/L on two tests in a row (4 hours apart).
- Your blood sugar is above 10 mmol/L and you are taking a diabetes medication called an SGLT2 inhibitor (Invokana®, Forxiga® or Jardiance® or combination pills containing these).
  If you have ketones, stop the SGLT2 inhibitor and contact your doctor right away for further instructions.
- You have any signs + symptoms of DKA: abdominal pain, nausea, vomiting, extreme thirst, fruity-smelling breath, rapid and difficulty breathing, rapid heart rate.

For Insulin Pump Users

In addition to illness, check for other causes of high blood sugar and ketones. These include:

- Disrupted insulin delivery due to:
  - kinked tubing or cannula
  - pump disconnection
  - infusion site issue
  - pump malfunction
- Suspended insulin delivery
- Incorrect basal program running
- Expired or denatured (bad) insulin
- If there is a site, tubing or cannula issue, take a correction dose with an insulin pen or syringe first and change your insulin infusion set OR insulin pod with new insulin right away.
- Contact your insulin pump company immediately if your pump is not working properly.

What should I do when I have ketones?

When your blood ketones are 0.6 mmol/L or more OR urine ketones are above trace, you need a larger dose of rapid or short-acting insulin than usual to correct a high blood sugar.

- If you are eating, add the larger correction dose **on top of** your usual meal dose.
- If you are not eating, take the larger correction insulin dose on its own.
- Recheck blood sugar + ketones in 2 to 4 hours.
- If needed, you can take rapid-acting or short-acting insulin every 4 hours for high blood sugar. Continue using the larger correction dose until the blood or urine ketones have cleared.
- Drink 1 cup of sugar-free fluids every hour.

Below are 3 different options for determining the larger correction insulin dose.
Your diabetes care team or doctor can help you choose the right option and explain the steps.

☐ Option 1

Choose this option if you use an insulin sensitivity factor (ISF) to calculate your correction dose.

$$1.5 \times \frac{\text{(Blood sugar minus Target sugar)}}{\text{ISF}} = \text{units to correct high blood sugar with ketones}$$

Example

- Susan's blood sugar is 18 mmol/L and her blood ketone level is 1.2 mmol/L.
- Normally, she uses an ISF of 3 mmol/L for correction when her blood sugar is above her target blood sugar of 6 mmol/L.
- She is not planning to eat but will drink 1 cup of sugar-free fluid per hour to keep hydrated.

To correct the high blood sugar with ketones

- Normally, Susan would take (18 – 6) ÷ 3 = 4 units rapid-acting insulin for correction.
- Since she has ketones, she will take **1.5 times** her usual correction dose: 1.5 x 4 = **6 units.**

☐ Option 2

Choose this option if you use a correction table given by your doctor.

1.5 x usual correction insulin dose = units to give to correct high blood sugar with ketones

Example

- John's blood sugar is 18 mmol/L and he has moderate urine ketones.
- He refers to the correction table from his doctor and determines that he would normally take 6 units of rapid-acting insulin for correction.
- He is also eating his lunch and normally takes 5 units for his lunch.

To correct the high blood sugar with ketones and to cover his lunch

- John will take **1.5 times** his usual correction dose of 6 units: (1.5 x 6 units) = 9 units.
- He adds this 9 units to his lunch dose of 5 units for **a total of 14 units of rapid-acting insulin**.

Let's practice: Your blood sugar is 15.2 before dinner + you have moderate urine ketones

1. When your blood sugar is 15.2, you would normally take a correction dose of _____ units (use your ISF or correction table).
2. With ketones present, multiply your correction dose by 1.5: _____ units x 1.5 = _____ units
3. If you are eating, add this larger correction dose to your meal insulin dose.
4. Drink sugar-free fluids every hour.
5. Retest blood sugar + ketones in 2 to 4 hours

☐ **Option 3**

Choose this option if you do NOT use an ISF or a correction table for high blood sugar.

First, calculate your total daily dose (TDD) of insulin. Add up the units of insulin (all kinds) that you take on average each day.

Your TDD = _____ + _____ + _____ = _____ **units**

Daily long-acting dose | Daily meal time doses | Daily correction doses

Based on your TDD, use either Table A or B below.

Table A: Your TDD of insulin is less than 50 units		
Blood sugar level (mmol/L)	Rapid or short-acting insulin to give if: **No or trace urine ketones *OR* Blood ketones are 0.5 or less**	Rapid or short-acting insulin to give if: **Urine ketones are above trace *OR* Blood ketones are 0.6 or more**
14 to 17	2 units	3 units
17.1 to 20	3 units	4 units
Over 20	4 units	6 units

Table B: Your TDD of insulin is 50 units or more		
Blood sugar level (mmol/L)	Rapid or short-acting insulin to give if: **No or trace urine ketones *OR* Blood ketones are 0.5 or less**	Rapid or short-acting insulin to give if: **Urine ketones are above trace *OR* Blood ketones are 0.6 or more**
14 to 16	3 units	4 units
16.1 to 18	4 units	6 units
18.1 to 20	5 units	7 units
Over 20	6 units	9 units

Should I take my other medications when I'm sick?

If you can drink fluids to stay hydrated, continue taking your other medications. If you have signs + symptoms of dehydration, you may need to stop certain medications **temporarily** (for a few days). Restart them when you are feeling better.

Ask your doctor for directions if you take the following types of medications:

- Blood pressure pills
- Water pills (diuretics)
- Diabetes pills (SGLT2 inhibitor, metformin)
- Non-steroidal anti-inflammatory drugs (example: aspirin, ibuprofen, naproxen)

What should I keep in my sick day kit?

- This handout with contact numbers
- A list of current medications
- Unopened insulin (keep in fridge)
- Glucose metre + glucose strips
- Blood ketone strips + the matching metre OR urine ketone strips—check expiry date
- Thermometer
- Sugar-free drinks
- Carbohydrate food + drinks (see page 2)
- Glucose tablets
- Glucagon (nasal or injectable)
- Over-the-counter cold + flu products to treat fever, cough, vomiting or diarrhea—Speak with your pharmacist before buying

When should I get help?

Call you doctor or diabetes team when:

- You have diarrhea or vomiting and you cannot eat or drink anything for 4 hours.
- You vomit more than two times in 12 hours.
- You have a fever over 38°C for more than 24 hours.
- You are sick for more than 24 hours and you start to feel worse.
- Your blood sugar stays above 14 mmol/L and/or ketones stays the same or higher after 2 doses of insulin.
- You are unable to keep your blood sugar above 4 mmol/L.
- You have **signs + symptoms of a leg or foot infection**: red coloured skin, skin warm to touch, pain, an open sore or blister.
- You have **signs + symptoms of a urinary tract infection**: strong urge to urinate, burning feeling when urinating, foul or strong smelling urine, frequent but small amounts of urine.

Go directly to nearest emergency room when:

- You have **signs + symptoms of DKA**: abdominal pain, nausea, vomiting, extreme thirst, fruity-smelling breath, rapid and difficulty breathing, rapid heart rate.
- You have **signs + symptoms of dehydration**: irritability, headache, confusion, less urination.
- You have **urine or blood ketones** for more than 6 hours.
- Your blood ketones are above 3.0 mmol/L.

Making better
decisions together
with patients
and families

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