



THE  
CHARLES H. BEST  
DIABETES CENTRE

“To keep our children, youth and adults living with Type 1 Diabetes healthy until a cure is found”

# Pump School Manual



**In this Manual,  
you will find:**

- 2**  
Your Insulin Pump Settings
- 3**  
Terminology Review
- 4**  
High Blood Glucose and DKA
- 6**  
Insulin Dose Adjustment Guidelines
- 8**  
Managing Low Blood Glucose
- 10**  
Site Care
- 15**  
Insulin Pump Temporary Removal Guidelines
- 16**  
Taking a Pump Vacation
- 17**  
Traveling with an Insulin Pump
- 19**  
Maintaining Your ADP Eligibility / Understanding  
the Assistive Devices Program (ADP)
- 21**  
Uploading Your Insulin Pump
- 23**  
Preparing for Insulin Pump Start Day
- 25**  
Knowledge Check
- 26**  
Ordering Supplies and Technical Support
- 27**  
The Assistive Devices Program

Copyright © 2020

The Charles H. Best Diabetes Centre.

All rights reserved. This booklet or any portion thereof may not be reproduced or used in any manner whatsoever without the express written permission of The Charles H. Best Diabetes Centre.



# Your Insulin Pump Settings

It is important to keep a written record of your most recent pump settings. That way you will have your pump settings available to you in case your pump malfunctions and the settings cannot be retrieved from the pump.

Please record your current pump settings below. Make sure to update this record any time your pump settings change:

**Date:**

**Basal Rates:**

12AM	:	<u>                    </u>	units per hour
	:	<u>                    </u>	units per hour
	:	<u>                    </u>	units per hour
	:	<u>                    </u>	units per hour
	:	<u>                    </u>	units per hour

**Insulin: Carb Ratio (ICR):**

12AM	:	<u>                    </u>
	:	<u>                    </u>

**Insulin Sensitivity Factor (ISF) or Correction Factor:**

12AM	:	<u>                    </u>
	:	<u>                    </u>
	:	<u>                    </u>

**Blood Glucose Targets:**

12AM	:	<u>                    </u>
	:	<u>                    </u>
	:	<u>                    </u>

Active Insulin Time or Insulin on Board:                      hours

Maximum Bolus Amount:                      units

Maximum Basal Rate:                      units per hour



# Terminology Review

## Terminology Review for Insulin Pump Therapy

### Insulin pumps only use rapid-acting insulin

These are the important terms about insulin pump therapy;

**Basal Rate:** The continuous, small amount of insulin delivered by your pump 24 hours a day

- Replaces long-acting insulin. Your pump's basal insulin replaces your Lantus®, Levemir®, Toujeo®, Tresiba® Basaglar®, or NPH insulin; if you are on a pump you will no longer need to take any of these long-acting insulins.
- Measured in units per hour.
- Controls your blood glucose when you are not eating and overnight.

**Bolus:** The amount of insulin that you give to prevent high blood glucose or to reduce high blood glucose.

*There are two types of bolus:*

**Food Bolus:** A food bolus is a dose of insulin given before you eat to prevent your blood glucose from going too high after you eat.

**Correction Bolus:** A correction bolus is a dose of insulin you give to bring down (or “correct”) a high blood glucose.

**Insulin: Carb Ratio (ICR):** The ratio of the amount of insulin (measured in units) given for a certain number of grams of carbohydrate. The pump setting that controls this is the “insulin to carbohydrate ratio” (also known as the “insulin: carb ratio” or ICR).

**Insulin Sensitivity Factor (ISF) or Correction Factor:**

The amount your blood glucose (measured in mmol/L) is expected to drop if you give 1 unit of insulin.

**Active Insulin or Insulin On Board (IOB):**

- The amount of insulin still “working” from your last bolus.
- This is typically about 3 - 4 hours for most people.
- The bolus calculator subtracts active insulin from a correction bolus. This helps prevent giving too much insulin (“insulin stacking”) when you give a correction bolus, and helps avoid low blood glucose levels.



# High Blood Glucose and DKA

High Blood Glucose... Potentially an Emergency Situation

## Symptoms of High Blood Glucose

- Extreme thirst
- Frequent urge to urinate
- Blurred vision
- Fatigue
- \*Abdominal cramps
- \*Vomiting
- Dry mouth
- Drowsiness
- Headache
- \*Fruity smelling breath
- \*Nausea

\*These symptoms may indicate that you have Diabetic Ketoacidosis (DKA).

DKA is a serious, life-threatening condition which can occur when little or no insulin is present in the body. The body uses fat for fuel instead of glucose when there is not enough insulin. A by-product of burning fat for fuel is ketones. Ketones are acids which cause the body to become more acidic. Ketones cause nausea, abdominal cramps, vomiting and may even cause problems breathing.

## Troubleshooting High Blood Glucose: Is it You or the Pump?

Always remember that your insulin pump is a mechanical device and at some point it may let you down! If your blood glucose is high, you need to figure out if you need to change something you are doing or if the problem is with your pump.

Here are some ways to sort which is which:

### Is it YOU?

- Did you forget to bolus?
- Did you underestimate your carbs?
- Has your insulin expired?  
Has it been exposed to sunlight or extreme temperatures?
- Are your pump settings correct?  
Is your pump's time set correctly?
- Is it time to change your pump site?
- Are you sick? Stressed?

### Is it your Insulin PUMP?

- Are there any alarms or alerts on your pump?
- Is the connection between reservoir and infusion set OK?
- Is the tubing kinked? Are there bubbles or blood in the tubing?
- Is the reservoir/pod empty?
- Is the site dislodged?  
Can you smell insulin?
- Is the cannula kinked?
- Is the infusion site okay?  
Is there redness, swelling or is the site painful?
- Has the pump malfunctioned?



# High Blood Glucose and DKA

## Treating High Blood Glucose and DKA

If there is an interruption in the delivery of insulin from your pump, or if you are not absorbing it properly, you will have little to no insulin in your body within 4 hours.

The onset of Diabetic Ketoacidosis can develop quickly if there is an interruption to insulin delivery from a pump.

**Do not ignore a high blood glucose!**

Protocol for Treating High Blood Glucose Readings - blood glucose over 14 mmol/L:

Check for Ketones and follow these guidelines:

### If Ketones are Negative:

Give a correction bolus with the pump (avoid eating if possible).

- Recheck blood glucose in 1.5-2 hours.

If blood glucose has NOT decreased or is higher:

- Give injection by syringe/pen
- Change infusion set (or Pod), change reservoir and insulin

Continue to monitor blood glucose until blood glucose is in target range.

### If Ketones are Positive Or nausea and/or vomiting

- Act immediately!
- **You will need more insulin when ketones are present.** Give correction dose PLUS extra insulin by syringe/pen to clear ketones.

*\*Follow Insulin Dose Adjustment Guidelines on the next page. Change infusion set (or Pod), change reservoir and insulin*

- Monitor BG every 1 hour
- Continue to give correction doses every 2-3 hours. Seek medical attention if ketones > 1.5 and blood glucose is not decreasing.

If you have a high blood glucose reading (>14 mmol/L) and positive ketones, **ALWAYS ASSUME YOU ARE NOT GETTING YOUR INSULIN.**

Illness and infection increase the risk for DKA. If you have nausea and vomiting do **NOT** assume this is “just the flu or food poisoning.” It may actually be DKA. If you have nausea and vomiting, test your blood for ketones.

**If ketones are present... act immediately!** Insulin by syringe/pen is recommended – give the correction bolus using the ISF plus extra insulin for the ketones. See Insulin Dose Adjustment Guidelines.



# Insulin Dose Adjustment Guidelines

The Total **Daily Dose (TDD)** formula helps you decide how much extra rapid-acting insulin you need to take if you have ketones.

1. Add up the number of units of insulin you usually take each day. This information may be accessed under your pump's History/My Records menu, depending on which pump you use (use baseline or usual doses).

**Your TDD = \_\_\_\_ units**

1. Calculate 5% = \_\_\_\_ 10% = \_\_\_\_ 15% = \_\_\_\_ 20% = \_\_\_\_ of TDD.

This is the extra dose or supplement.

2. Follow the chart to decide how much rapid-acting insulin to take every 4 hours in addition to your correction bolus.
3. If not eating as usual, replace the usual carbohydrate with sugar-containing fluids.

Remember, give a correction bolus every 2-3 hours

**YOU WILL NEED MORE INSULIN WHEN KETONES ARE PRESENT**

Give correction dose PLUS extra insulin to clear ketones (See Table on right)

## UNDER 10 YEARS of age

### Give this much *EXTRA* insulin

Blood ketones	Blood sugar 15-20	Blood sugar greater than 20
Less than 0.6mmol/L	No extra insulin	5% of TDD
0.6-1.5mmol/L	5% of TDD	10% of TDD
1.5-3.0mmol/L	10% of TDD	15% of TDD
More than 3.0mmol/L	15% of TDD	20% of TDD
<b>SEEK MEDICAL ATTENTION</b>		

## OVER 10 YEARS of age

### Give this much *EXTRA* insulin

Blood ketones	Blood sugar 4-16	Blood sugar greater than 16
Less than 0.6mmol/L	No extra insulin	10% of TDD
0.6-1.4mmol/L	10% of TDD	15% of TDD
1.5-3.0mmol/L	10% of TDD	20% of TDD
More than 3.0mmol/L	<b>SEEK MEDICAL ATTENTION</b>	

Adapted from BC Children's Hospital Managing Sick Days and Preventing Ketoacidosis Dec 28, 2015



# Insulin Dose Adjustment Guidelines

## Considerations:

- ▶ Always correct a high blood glucose at bedtime and set an alarm to recheck it during the night.
- ▶ Never change your pump site at bedtime unless you have to (ie: If you choose a site with poor absorption you may have high blood glucose all night and wake up in DKA). If you must change your site at bedtime, set an alarm to get up and check your blood glucose overnight.
- ▶ If you have two high blood glucose readings in a row which are not coming down with correction boluses – give insulin by syringe/pen and change the infusion set, reservoir and insulin (or pod).
- ▶ Never exercise when ketones are present.
- ▶ Basal insulin is always required, even if you are unable to eat or have symptoms of nausea and vomiting. Always keep your pump on and infusing insulin.
- ▶ Staying hydrated may help prevent DKA – drink sugar-free fluids; water is preferred.
- ▶ Increase the frequency of blood glucose checks and check for ketones when you feel ill or have a high blood glucose.
- ▶ If you suspect that your pump has malfunctioned, call the 1-800 number located on the back of your pump to report it. The pump companies can usually have a new replacement pump delivered within a few hours.

There is no point in continuing to push buttons to deliver boluses on your pump when you are clearly NOT getting your insulin.

**If in doubt, change it out!**



# Managing Low Blood Glucose

## Managing Low Blood Glucose with Insulin Pump Therapy

Although many people report they have fewer episodes of low blood glucose when using pump therapy compared to multiple daily injections, hypoglycemia is still a risk and will eventually happen with type 1 diabetes. Signs and symptoms of hypoglycemia develop when the glucose supply to the brain is insufficient for normal functioning.

### Symptoms may include:

- Hunger
- Tremors/shakiness
- Sweating
- Pallor
- Fatigue/tiredness
- Irritability or mood changes
- Blurred vision
- Confusion
- Loss of consciousness
- Seizures

### GUIDELINES FOR CHILDREN:

#### If blood glucose under 4.0 mmol/L:

**1** Weight under 30 pounds – treat with 5 grams of carb (5 grams = 1 glucose tab or 40 mls of juice)

**2** Weight 30-60 pounds – treat with 10 grams of carb (10 grams = 2-3 glucose tabs or 85 mls of juice)

**3** Weight 60 + pounds – treat with 15 grams of carb (15 grams = 4 glucose tabs or 180 mls of juice or pop)

Recheck blood glucose in 15 min and repeat treatment if blood glucose still low (< 4.0 mmol/L)

### GUIDELINES FOR ADULTS:

#### If blood glucose under 4.0 mmol/L:

15 grams of fast-acting sugar (carbohydrate):

- 4 glucose tabs (Dex 4) or
- 5 giant rockets or
- 180 ml juice
- 265 ml (3/4 can) pop

Recheck blood glucose in 15 min and repeat treatment if blood glucose still low (< 4.0 mmol/L)

**If blood glucose under 3.0 mmol/L, increase fast-acting carbohydrate intake to 20 grams.**



## Managing Low Blood Glucose

If the next meal is more than 60 minutes away, follow-up with a 15-gram snack: E.g. Crackers with peanut butter or cheese

If you have low blood glucose before a meal:

- DO enter your low blood glucose into your Bolus Calculator to receive a negative correction with your food bolus – less insulin!

The risk of severe hypoglycemia increases during sleep when symptoms are less likely to be recognized. Suspect an undetected low blood glucose overnight if you:

- Wake up sweating or soaking wet.
- Have a headache or feel “foggy” in the morning.
- Wake up with an increased pulse.
- Have nightmares.
- Have an unexplained high blood glucose in the morning or after breakfast.

### Preventing Low Blood Glucose on a Pump:

- Check your blood glucose frequently or use a continuous glucose sensor.
- Look for patterns. Do your pump settings need to be adjusted to give you less insulin?
- Count carbs accurately to prevent over-bolusing for food.
- Check blood glucose before, during and after exercise – use Temp Basals set at a lower rate for exercise, especially if the exercise is in the evening.
- Be careful if drinking alcohol as it has a blood glucose lowering effect. Use a lower temp basal or carb up without a bolus.

## DIABETES CANADA™ CLINICAL PRACTICE GUIDELINES

### Diabetes Driving Guidelines:

#### Prevention of hypoglycemia for all insulin-treated drivers.

- ▶ Remember 5 to drive! If your blood glucose is above 5mmol/L you can drive.
- ▶ For a blood glucose 4-5 mmol /L – have a snack with 15 grams of carbohydrate before you start driving. Wait 15 min and recheck your blood glucose to ensure it is over 5 mmol/L.
- ▶ Stop and treat yourself as soon as hypoglycemia and/or impaired driving is suspected (blood glucose under 4 mmol/L). You should not drive for at least 40 min after effective treatment of mild to moderate hypoglycemia.
- ▶ Check your blood glucose at least every 4 hours while driving.

Always carry your meter and have access to fast-acting carbs in the car (console or glove box). If you feel symptoms of low blood glucose:

- stop driving and check blood glucose
- turn off the car
- remove your keys from the ignition

Drivers should check blood glucose every 4 hours on long drives.

Ensure the time and date is set correctly in your meter.



# Site Care

To prevent infection, basic site care includes the use of proper hygiene and sterile technique when changing infusion sites or pods:

- ▶ Wash hands with warm soapy water or use unscented hand sanitizer.
- ▶ Use an alcohol or skin prep wipe to cleanse skin (unless fresh out of the shower).
- ▶ Keep infusion sets sterile.
- ▶ Signs of Site Infection:
  - Redness, inflammation or swelling
  - Pain
  - Warmth
  - Discharge at site of insertion
- ▶ To treat a suspected infection:
  - Apply a warm, clean compress to the area.
  - Apply a topical antibiotic ointment such as Polysporin™ to old site.
  - If the suspected infected area is larger than the size of a dime, seek medical attention immediately. You might require a prescription for an oral antibiotic.

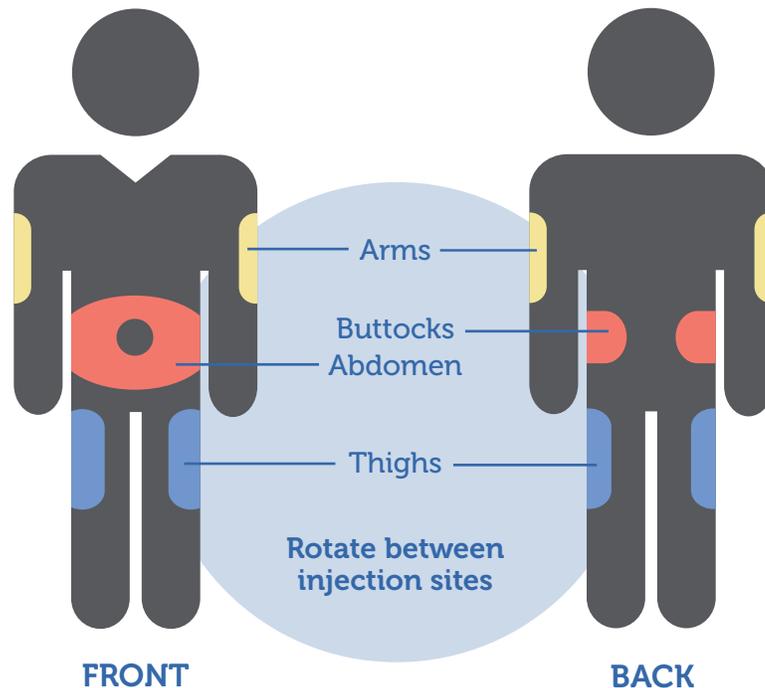
▶ **Changing and rotating infusions sites every 2-3 days is critical to success**

- Repeatedly using the same sites for infusion sets or pods will cause the tissue to become denser in that area. This will eventually lead to poor absorption and “lumps and bumps” in those areas. Rotate to abdomen, buttocks, lower back, outer thighs and even to the backs of your arms if possible. Leaving sites in place longer than 3 days increases the risk of infection, scarring, site failure and high blood glucose.



## Site Care

Stand up when inserting a pump site!



Depending on the pump and infusion set you choose, you may require assistance to insert your infusion set or pod into sites such as the back of the arms and lower back. Make an appointment to bring your loved one into the Best Centre and we are happy to assist with training. Proper site rotation is critical to the successful use of an insulin pump. Avoid moles, scar tissue, bruises, tattoos and over-used sites.

Most people on pumps will rarely encounter a site problem and do not need any additional products to protect the skin or help the infusion sets or pods stick. However, for a small number of people, the cannula or metal needle, even the insulin itself - can trigger a sensitivity or allergic reaction.

## Site Care

### Detecting Site Problems:

Do you regularly experience itchiness/irritation or redness?

When you remove your infusion set or pod, do you have a patch of red skin that is the same shape as your infusion set dressing?

Do you have itchiness, swelling or redness at the site where the cannula enters your body?

Any of the symptoms on the left may indicate a sensitivity or allergy to some part of the insulin infusion system. Removing the infusion set can also cause irritation and you may need a product to assist with removal. You may call the Pump Company's Technical Support number for suggestions on which products may be used to assist with these issues or refer to the list below.

### Products to prevent skin irritation under the Infusion Set or Pod:

- ▶ **Skin Prep™ or IV Prep™:** A wipe which forms an invisible protective barrier film when dry.
- ▶ **3M Cavilon™ Wipes or Spray:** Sting-free, waterproof, protective barrier film.
- ▶ **ConvaTec AllKare®:** A wipe which forms an invisible protective barrier film when dry.
- ▶ **Liquid Bandage:** Available at most pharmacies. Use a Q Tip to paint it on the skin which forms an invisible barrier when dry.
- ▶ **Hollister Skin Gel Protective Wipes:** Provides an invisible barrier when dry and may help prevent skin irritation from adhesive removal.
- ▶ **Torbot Skin Tac™:** Hypo-allergenic, latex-free, “tacky” skin barrier.
- ▶ **3M Tegaderm™ Dressing OR IV 3000:** Clear “saran-wrap style”, waterproof, sterile barrier. Apply to cleansed skin and insert infusion site through dressing for a physical barrier between skin and infusion set. May also assist to hold the infusion set or pod in place.

### Products to assist in the safe removal of Infusion Sets or Pods:

- ▶ **Baby Oil/Baby Oil Gel:** Soft moisturizer; apply around infusion tape, soak, gently remove set.
- ▶ **Remove (by Smith and Nephew):** Liquid adhesive remover to remove infusion sets/pods.
- ▶ **Delasco Detachol®:** Liquid adhesive remover; apply to easily remove infusion sets/pods.

### Helping your Infusion Set or Pod stick:

- ▶ **Torbot Skin Tac™:** Hypo-allergenic, latex-free, dries “tacky” to help the site stick to the skin.
- ▶ **3M Tegaderm™ Dressing or IV 3000:** Clear “saran-wrap style”, waterproof, sterile barrier. Apply to cleansed skin and insert infusion site through dressing for a physical barrier between skin and infusion set. *May also assist to hold the infusion set or pod in place.*
- ▶ **Delasco Mastasol®:** Liquid adhesive, “crazy glue” for skin.

*\*Must use an adhesive remover to prevent damage to the skin during site removal.*



# Site Care

## Holding your Infusion Set or Pod in Place:

- ▶ **Hypafix® or Mefix Tape®:** Adhesive dressing retention tape.
- ▶ **“Tuff Grips” Retention Tape:** Fun, flexible and colorful adhesive shapes to wear over infusion sets or pods.
- ▶ **3M Coban™ Self Adherent Wrap:** Comfortable, lightweight, self-adherent wrap.
- ▶ **Hockey Tape:** Comfortable, self-adherent and comes in many colors.
- ▶ **Arm, Leg, Thigh and Tummy bands:** Available from many different sources online. Measured to fit, washable fabric.
- ▶ **KT Tape:** Latex free, water-resistant and sweat proof. Kinesiology tape is comfortable and available in a variety of colors, sold at most sporting goods stores.

## Infusion set insertion may cause slight discomfort, especially with children...

### Some tips for parents/caregivers:

- ▶ Prepare the infusion set/pod out of sight.
- ▶ Be matter-of-fact and firm. Do not negotiate with outrageous promises.
- ▶ Emla™ cream may be used to numb the area ▶ ensure removal with alcohol swab or sites will NOT stick.
- ▶ An ice pack may be used to numb the area first, dry well.
- ▶ Lots of hugs, kisses and praise after site change.

People who wear pumps generally become very creative regarding where they choose to wear their Insulin Pump or Pod. Factors to consider typically include what you are wearing – a dress, low/high waisted pants, tight body suit, bathing suit, uniform, etc.

Infusion sites or pods should never be worn on the beltline. Increased pressure from restrictive clothing may interrupt insulin delivery and cause “No Delivery” or “Occlusion” alarms.

## Tips and Tricks from people who wear pumps:

- ▶ Call your insurance company and have the value of your pump added to contents insurance.
- ▶ For rechargeable pumps, always carry a charging cable with you or leave one in your car to avoid a low or depleted battery situation.
- ▶ Ensure you carry an extra infusion set, pod, battery and coin to open the battery compartment in your meter case.
- ▶ Always carry a syringe/pen and insulin with you, even on day trips.
- ▶ Wrap the tubing around your pump and use the clip provided to clip on your waistband as you would a cell phone. Alternatively, place inside a cell phone case clipped to your waist!
- ▶ Hide the pump in your bra or under the bra strap under your arm. Place in a small baby sock to prevent sweating.



## Site Care

It is said that “necessity is the mother of invention” and there are indeed many options out there to help you wear your pump discreetly if needed.

Check out your Insulin Pump company’s website for ideas, as well as other online websites.

### Tips and Tricks *Continued*

- ▶ Use a fanny pack or Spibelt™ (check out Running Room or your favorite sports store) to carry pump, meter, lancet and tablets.
- ▶ Place the pump under your pillow while sleeping.
- ▶ Anchor the pump to your arm using an iPod running band.
- ▶ Place the pump in a high sock or boot with tubing running down the pant leg.

### Considerations for wearing your waterproof insulin pump while swimming:

- ▶ OmniPod is waterproof to a depth of 25 feet for up to 60 min.
- ▶ Medtronic 670G is waterproof to a depth of 12 feet for up to 24 hours.
- ▶ Tandem is water tight to a depth of 9.8 feet for 30 min.
- ▶ YpsoPump is waterproof to a depth of 3 feet for up to 60 min.
- ▶ How long will you be in the water?
- ▶ Will you lose your tubed pump in the lake while water skiing?
- ▶ Are you sure there are no cracks that will void your warranty? Please check with your pump company before wearing your pump in the water.

\* Pumps may be removed for short periods of time while swimming. See Temporary Removal Guidelines.



# Insulin Pump Temporary Removal Guidelines (less than 24 hrs)

Typically, you should be able to disconnect from your pump for 1-2 hours before seeing a significant rise in blood glucose, especially when you are active. How quickly your blood glucose rises is individual and depends on your insulin sensitivity, your activity level and your current state of health.

There may be some circumstances where you want or need to remove your pump for a short period of time, such as:

- ▶ Running out of supplies.
- ▶ Pump malfunction and a replacement is not available right away.
- ▶ Diagnostic procedures or hospitalization.
- ▶ Taking a pump “break” (e.g.: beach day).

While you are off your pump, it is best to stick as close to a basal-bolus routine as possible.

For short term pump removal (under 24 hours) replace basal and bolus insulin with rapid-acting insulin via syringe/pen every 4 hours:

- ▶ Add up 4 hours of missed basal.
- ▶ Determine insulin needed for carbs.
- ▶ Determine insulin needed for correction bolus if blood glucose over target.
- ▶ Add together and give as an injection of rapid-acting insulin every 4 hours.

## EXAMPLE:

At 8am Mary’s blood glucose is 12.4 and she plans to eat 40 grams of carb for breakfast.

Mary will be removing her pump for the next 4 hours.

carb ratio = 1:10

sensitivity/correction factor = 2.0

target = 6.0 mmol/L

basal rate from 8-12pm is 0.80 u/hr.

- Correction bolus:  $12.4 - 6 = 6.4 \div 2.0 = 3.2u$
- Food bolus:  $40 \div 10 = 4u$
- Basal replacement:  $0.80 \times 4 \text{ hours} = 3.2u$

This totals:  $3.2 + 4 + 3.2 = 10.4$  units. At 8am give 10 or 10.5u of rapid-acting insulin by syringe/pen.

If Mary decides to stay off pump for longer than 4 hours, the next dose will be needed at noon.

**\*Remember, if you plan to be off your pump overnight, you must give missed basal and correction doses every 4 hours overnight by syringe/pen.**



# Taking A Pump Vacation

Taking a Pump Vacation...for more than 24 hours

... beach days, lost pump, vacations...

If you decide you want to take a pump “vacation” for longer than 24 hours, you will need to resume your long-acting insulin by syringe/pen as well as rapid-acting insulin for meals and correction doses. Lantus, Basaglar, Toujeo and Levemir are the preferred long-acting insulins as they have no “peak”. Lantus, Basaglar and Toujeo may be given once daily, while Levemir is typically split into two daily doses taken 12 hours apart.

- ▶ Calculate the total daily dose of basal insulin given by your pump over 24 hours. This information may be found under your Daily Totals, History or Basal menu, depending on which pump you use. Call the technical support number found on the back of your pump if you need help to find the basal total daily dose.
- ▶ Give as one dose of Lantus, Basaglar, Toujeo OR two half-doses of Levemir every 12 hours.
- ▶ \*Call the Best Centre for assistance if you are using Toujeo or Tresiba. You will need a plan to wean yourself off long-lasting insulin before starting on your pump again.

Adapted from: <http://www.fit4diabetes.com/canada-english/fit-technique-plus/>

**When you do restart your insulin pump, you must set a temporary (temp) basal rate of minus 90% until the time of your last dose of long-acting insulin.**

**Example: Jim gave 12 units of Lantus at 8pm last evening. He restarted his pump at 8am and set a Temporary basal rate of -90% until 8pm this evening.**

***\*SEVERE hypoglycemia (very low blood glucose) can occur if basal insulin is injected when pump is also delivering basal insulin.***

## Important Considerations:

- ▶ More frequent blood glucose monitoring will be required to assess if your injection routine is working.
- ▶ For exercise or activity, extra snacks may be needed or bolus insulin reduced.
- ▶ Basal insulin is stable at room temperature for one month.
- ▶ Bolus insulin must be taken before each carb-containing snack or meal, and for blood glucose over target.
- ▶ Carry an insulin pen or syringe with rapid-acting insulin at all times.

# Traveling with an Insulin Pump

## Traveling with an Insulin Pump

Good news – traveling with an insulin pump is easier than injections!

When crossing time zones, all you need to do is change the time in your pump and your settings will automatically sync up to the new time zone.

### To prepare for your trip before you go:

- ▶ Obtain a travel letter from the Best Centre permitting you to have blood glucose meters, a blood ketone meter, syringes, lancets, pump supplies, glucagon and sensor supplies etc. on the airplane.
- ▶ Document the current settings on your pump and take them with you.
- ▶ Contact the pump company about a “loaner” program in the event that your pump malfunctions while you are away, as most pump companies now provide this service.
- ▶ Obtain a copy of your prescription for insulin and strips.
- ▶ Ensure you have the pharmaceutical label identifying your insulin. If the label is on the box containing the insulin, ensure you carry it in that original packaging.
- ▶ Call Customer Support to inquire if a replacement pump can be shipped to your destination country if your pump malfunctions. Also inquire if there is another Tech Support number to call outside of Canada.

**Be aware that... Insulin needs to be packed in an insulated container to keep it cool on your trip. Frio packs are convenient and reusable.**

- ▶ A tubed pump should not be put through the conveyor belt that scans your carry-on luggage. It cannot be on your body if you have to use the body scanner either – disconnect and have someone hold it for you. OmniPod is safe to go through both the conveyor belt and body scanner.

**Insulin, pumps and tubing DO NOT like to be exposed to extreme temperatures.**

- **Medtronic, Tandem and Ypsomed:** ensure the tubing is not hanging out of your jacket on the ski hill - it will freeze your insulin! Remove pump for hot tubs and saunas.
- **OmniPod:** no issues on the ski hill. For the hot tub, place pod on your arm and have it resting on the rim of the hot tub so you don't boil your insulin.

## Traveling with an Insulin Pump

You should take twice the amount of supplies you think you will need and pack them in your carry-on. Luggage frequently gets lost and the temperature in the luggage compartment may not be suitable for your insulin.

### Diabetes Supplies Checklist:

- ▶ A hard copy of current pump settings
- ▶ A back-up vacation loaner pump
- ▶ Infusion sets, cartridges or pods (twice what you think you will need) and insertion device
- ▶ Insulin (rapid and long-acting)
- ▶ Syringes or insulin pens and pen tips
- ▶ Blood glucose monitor and test strips
- ▶ Lancing device and lancets
- ▶ Ketone meter and test strips
- ▶ Any other medications you require (e.g. Gravel®)
- ▶ Medic Alert ID
- ▶ Extra batteries/charging cable for meter/CGM/pump
- ▶ Extra battery cap and/or cartridge cap for pump
- ▶ Extra pump clip and/or pump case
- ▶ Sharps container (an empty water bottle will do)
- ▶ Skin preparation dressings or adhesive
- ▶ Sensors (if you use CGM) and insertion device
- ▶ Emergency contact numbers
- ▶ Hypoglycemia treatment (glucose tabs), glucagon/Baqsimi glucagon nasal powder

Remember to check your blood glucose more frequently when travelling as we often encounter a lot more - OR - a lot less activity while on vacation!

#### *Enjoy!*

Your insulin pump should be added to your house insurance policy in the event the pump is lost or stolen.

You should never be left without a replacement insulin pump for more than a few hours.



# Maintaining Your ADP Eligibility / Understanding the Assistive Devices Program (ADP)

## ADP – Assistive Devices Program for Insulin Pumps and Supplies

Individuals with type 1 diabetes who regularly attend a Diabetes Education Program and treat their diabetes with multiple daily injections may be suitable candidates for insulin pump therapy. Established eligibility criteria to access this program:

- ▶ Must be living with type 1 diabetes for at least one year.
- ▶ Must have demonstrated a commitment to blood glucose monitoring (4 times/day) or use CGM.
- ▶ Must have a good understanding of carbohydrate counting.
- ▶ Must participate in an insulin pump education program.
- ▶ Must attend regular diabetes clinic appointments.
- ▶ The Assistive Devices Program covers 100% of the price of the insulin pump, paid directly to the supplier on your behalf. An annual grant of \$2,400 is paid directly to the patient in four equal payments on a quarterly basis. Expect to receive the first \$600 grant within 8-12 weeks of starting on the pump. Depending on which pump and/or infusion set you choose, the grant money should cover most of the cost for the monthly supplies needed. All pump companies will perform an insurance investigation to determine if any extra costs for supplies will be covered by insurance plans. Original receipts for monthly supplies should be kept for up to two years in the event of an ADP audit.



# Maintaining Your ADP Eligibility / Understanding the Assistive Devices Program (ADP)

- ▶ You will need to cover the upfront cost of supplies until you receive your ADP grant.
- ▶ To maintain eligibility for ongoing funding (\$600 quarterly), the Government of Ontario has implemented strict medical criteria which must be met and will be re-assessed on a yearly basis. A renewal letter will be sent directly to you every year. You must complete the renewal letter with a Diabetes Educator at the Best Centre to maintain eligibility for the supply grant.
- ▶ Children and youth (18 years old and younger) will be eligible for continued funding of insulin pump supplies if the following criteria are met:
  - no more than one episode of DKA within the last 12 months
  - adequate frequency of blood glucose monitoring to ensure the safe and effective use of the insulin pump – blood glucose monitoring at least 4 times a day or use of CGM
  - A1C less than 10% for the two readings at least 3 months apart
  - adequate frequency of infusion set changes and site rotation to ensure healthy insertion sites – infusion sets must be changed a minimum of every 2 – 3 days
  - consistent pattern of effective pump management
  - carbohydrate counting and delivery of bolus insulin for all meals
  - minimum of 3 clinic visits in the last 12 months.
- ▶ Adults 19 years of age and older will be eligible for continued funding for insulin pump supplies if they meet the following medical eligibility criteria at the time of the annual renewal:
  - continues to demonstrate an ongoing commitment to blood glucose monitoring a minimum of 4 times a day, or use of CGM
  - continues to demonstrate successful sick day management
  - has demonstrated that they have benefited from Insulin Pump Therapy which is defined by one of the following:
    - improved quality of life
    - improved A1C results
    - reduction in the number of hypoglycemic events
    - reduction in the number of DKA episodes
    - improved management of the “dawn phenomenon”
    - has demonstrated a commitment to long term diabetes follow-up through regular assessments by the diabetes educators at the Best Centre every 6 months and as directed by their physician.

A 90-day trial period begins on the day you initiate Insulin Pump Therapy.

The purpose of this trial is to ensure you are a suitable candidate for Insulin Pump Therapy.

# Uploading Your Insulin Pump

Email the Best Centre at [bloodsugars@charleshbest.com](mailto:bloodsugars@charleshbest.com) each time you have uploaded your pump. If you require technical assistance at any time during the upload, call the Technical Support number located on the back of your pump.

It is expected that you upload your insulin pump daily in the first few weeks so that your Diabetes Team can analyze your blood glucose data and suggest appropriate adjustments to your basal rates, carb ratios and sensitivity factor. You must go online to register and create an account for your chosen insulin pump before you upload your data. Ensure this is done before you start on insulin in your pump next week.

## Medtronic and Enlite/Gaurdian Sensors:

go to <https://carelink.medtronic.eu>

- ▶ Click on “Sign Up Now” to create a Carelink Personal account
- ▶ Login to your account and choose “Upload”, enter the SN (serial number) of your pump (located on the back of your pump)
- ▶ Plug your Contour Next Link Blood Glucose Meter into the USB port on your computer and use it to wirelessly upload your pump.
- ▶ Disconnect the pump from your body and place it next to your Contour Next Link Meter
- ▶ After uploading your pump for the first time, email your username and password to the Best Centre so they may access your data and adjust your settings appropriately.

**Tandem:** go to [www.diasend.com](http://www.diasend.com)

- ▶ Click “register here” to create an account
- ▶ Enter your personal information to set up an account
- ▶ Enter clinic ID:76-34950 to share your data
- ▶ Confirm registration and click “continue”
- ▶ Choose the appropriate Diasend Uploader to be installed on your computer (PC or Mac) and create a Desktop Icon
- ▶ Double click the Diasend Icon on the desktop
- ▶ Disconnect the pump from your body and connect the USB cable to your computer and pump. Do not unplug the cable until the upload is complete
- ▶ Enter your email address and password, click “sign in” to view your data



# Uploading Your Insulin Pump

**OmniPod:** go to [www.diasend.com](http://www.diasend.com)

- ▶ Click “register here” to create an account
- ▶ Enter your personal information to set up account
- ▶ Enter Clinic ID: 03-63829 to share your data
- ▶ Confirm registration and click “continue”
- ▶ Choose the appropriate Diasend Uploader to be installed on your computer (PC or Mac) and create a Desktop Icon
- ▶ Double click the Diasend Icon on the desktop
- ▶ Connect the USB cable to your computer and PDM. Do not unplug the cable until the upload is complete
- ▶ Enter your email address and password, click “sign in” to view your data

**YpsoPump:** go to **Apple app store or Google Play and search Ypsomed (green and white icon). You must set up the App before sending reports.**

**How to send a report:**

- ▶ Go to **Main Menu** (green lines icon, top left corner).
- ▶ Select **"PDF Report"**
- ▶ Tap **"Today"** and change to **"last month"** and tap **"ok"**.
- ▶ Select **"Export"**.
- ▶ Tap the **share icon**, top right corner (iPhone: rectangle with an arrow, Android: lines connected by dots).
- ▶ Select **"Mail"**.
- ▶ Email: **bloodsugars@charleshbest.com** and send.



# Preparing for Insulin Pump Start Day

## Attention Parents:

It is strongly recommended that you take the day off of work and remove your child from school the day your child starts on insulin in their pump. If you must return to work, it is your responsibility to ensure you have a caregiver attend Pump School with you (depending on the age of your child).

Insulin pump start day is usually very exciting and you may feel a bit nervous as well. Ensure you have adequate time to learn this new skill, especially in the first few days. You may want to take the day off work or school after you start on insulin in your pump. Ensure you will be starting this new therapy at a “normal” time – Insulin Pump starts should not be booked during times of disrupted schedules. This includes vacations, summer camps, final exams, etc.

## PRACTICE, PRACTICE, PRACTICE!

Take the pump out of the box it came in, insert the batteries, set the time and date and open your manual to practice button pushing.

Medtronic pump users, go to:

<https://www.medtronic.com/ca-en/diabetes/home/support/product-support/minimed-670g.html>. Use your pump to follow along with the online tutorial.

OmniPod pump users, go to:

<https://www.myomnipod.com/en-ca/podder-support/videos>

Follow along with the video tutorials and practice programming settings in your PDM, but do not fill or fire your pod.

Tandem pump users:

**Pre-Training Videos and Resources:**

Completion of the training videos below is required in order to attend training, you may also wish to save them as a refresher for after training.

1. How to fill a Tandem pump cartridge <https://www.youtube.com/watch?v=1B9knJKpksQ&feature=youtu.be>
2. How To Insert A New AutoSoft™ 90 Infusion Set Insulin Pump Infusion Set [https://youtu.be/S8\\_\\_zp7PdZM](https://youtu.be/S8__zp7PdZM)
3. How To Insert A New AutoSoft™ 30 Insulin Pump Infusion Set <https://youtu.be/9HVLDGZBcAc>
4. How To Insert A New TruSteel™ Insulin Pump Infusion Set <https://youtu.be/geB83jHwsgo>
5. How To Insert A New VariSoft™ Insulin Pump Infusion Set <https://youtu.be/O7PKOMcogOU>



# Preparing for Insulin Pump Start Day

6. Navigating the touch screen: <https://www.youtube.com/watch?v=qMfQNC0Mqbl&index=1&list=PLaVPFQzKqgRmCoJ4T6oNF7v3EWcnDCobu%20%96>

7. Personal Profiles: [https://www.youtube.com/watch?v=wpz-8Da0DU\\_w&list=PLaVPFQzKqgRmCoJ4T6oNF7v3EWcnDCobu&index=2](https://www.youtube.com/watch?v=wpz-8Da0DU_w&list=PLaVPFQzKqgRmCoJ4T6oNF7v3EWcnDCobu&index=2)

8. How to bolus: <https://www.youtube.com/watch?v=lmL-hOHyrQk&list=PLaVPFQzKqgRmCoJ4T6oNF7v3EWcnDCobu&index=3>.

**YpsoPump:** go to Apple app store or Google Play and download the Ypsomed app (green and white icon). Complete the tutorial to ensure you understand use of the bolus calculator.

**Go to:** <https://www.ypsomed-diabetescare.com/en-CA/services/handling-videos.html> and use your YpsoPump to follow along with all of the handling videos.

You will need to adjust your long-acting insulin the day before you go “live” on insulin in your pump.

Long-acting Insulin Dose: \_\_\_\_\_ at \_\_\_\_\_ on \_\_\_\_\_  
(dose in units) (time) (date)

## What you need to bring to your appointment on Pump Start Day:

- ▶ Insulin Pump and the box it came in, including infusion sets and reservoirs
- ▶ Blood glucose meter and strips
- ▶ Rapid-acting insulin

You must make a follow-up appointment within 4-6 weeks of starting on insulin in your pump. Pump Therapy differs from Multiple Daily Injections and you will need help to “learn the ropes” and manage your pump independently.

# Knowledge Check

## Questions for discussion:

- A. I lost my waterproof pump in the lake while I was wake boarding. What do I do now?**
- Buy a new one.
  - Call the 1-800 number to ask if you can have a loaner pump until you figure out your house insurance claim.
  - Go to the local pharmacy and obtain syringes to give rapid insulin every 4 hours.
  - Give both long and rapid-acting insulin.
- B. I ran out of infusion sets and it's Fri night. What do I do now?**
- Call the Best Centre.
  - Call the late night pharmacy and ask if they have any in stock.
  - Call the Pump Company to ask if they can ship me some.
  - Take rapid-acting insulin by syringe/pen every 4 hours until I can get some tomorrow.
- C. My child becomes very anxious on pump site change day. What should I do?**
- Insist he/she watch while I fill the reservoir and prime the tubing.
  - Use an ice pack to numb the area I am going to insert it in.
  - Leave the site in for 5 days so I don't have to change it as often.
  - Be matter of fact, no negotiating and prepare the reservoir and infusion sets out of sight.
- D. My child has been forgetting to bolus at school recently. What should I do?**
- Tell her to skip lunch.
  - Set a BG or Bolus Reminder in her pump to alarm at lunch time.
  - Don't worry, she will grow out of it.
  - Text every day at lunch to remind her to bolus.
  - Ask the teacher if she could remind her to bolus.
- E. What do I do if my pump breaks while on vacation?**
- Cry.
  - Use my old pump that I brought with me.
  - Give insulin by syringe/pen every 4 hours.
  - Call the pump company.
- F. Where should I keep a record of my Pump Settings?**
- In my chart at the Best Centre.
  - In my pump.
  - In my wallet.
  - On the website where I upload my pump.
- G. My pump is alarming and I think it is broken. What is my next step?**
- Cry.
  - Call the Insulin Pump Company.
  - Check my blood glucose and give fast-acting insulin by syringe/pen every 4 hours.
  - Go to my upload and look at my insulin pump settings to program the new pump.



## Ordering Supplies and Technical Support

### **Medtronic Diabetes:**

4-year warranty with “Continuation of Therapy Program” – if pump malfunctions after warranty is complete, a loaner pump will be provided at no cost until you qualify for a new pump through ADP or insurance.

[www.medtronicdiabetes.ca](http://www.medtronicdiabetes.ca)

Order Desk/Customer Care: 1-800-284-4416

Order Desk/Customer Care Email: [medtronicdiabetescc@medtronic.com](mailto:medtronicdiabetescc@medtronic.com)

24-hour Technical Support: 1-800-MINIMED (646-4633)

### **OmniPod Canada:**

5-year warranty on PDM.

[www.myomnipod.ca](http://www.myomnipod.ca)

Customer Care: 1-855-763-4636

24-hour Technical Support: 1-855-763-4636

### **Tandem Diabetes Care:**

5-year warranty on pump.

[www.tandemdiabetes.ca](http://www.tandemdiabetes.ca)

Customer Care: 1-833-509-3598

24-hour Technical Support: 1-833-509-3598

### **Ypsomed Diabetescare:**

5-year warranty on pump.

[www.ypsomed-diabetescare.ca/](http://www.ypsomed-diabetescare.ca/)

Customer Service: 1-833-695-5959 option 3

24-hour Technical Support: 1-833-695-5959 option 1

With the exception of OmniPod, most pharmacies will carry pump supplies if you ask them to. Pump supplies may also be purchased through online pharmacies such as Diabetes Depot and Diabetes Express.

### **Diabetes Depot:**

1-888-678-8887

[www.diabetesdepot.org](http://www.diabetesdepot.org)

### **Diabetes Express:**

1-866-418-3392 OR 416-603-9727

[www.diabetesexpress.ca/insulin-pump-supplies-c-37.html](http://www.diabetesexpress.ca/insulin-pump-supplies-c-37.html)





THE  
CHARLES H. BEST  
DIABETES CENTRE

[charleshbest.com](http://charleshbest.com) | [bestdiabetes@charleshbest.com](mailto:bestdiabetes@charleshbest.com) | 905-620-0360

360 Columbus Road East,  
Whitby, Ontario L1M 1Z5

Charity # 13662 3295 RR0001