







A Guide to Insulin Pumps at School

Many students with type 1 diabetes use insulin pumps, which allow them to receive insulin without injections. Several pumps are available, each with different features.

With any pump, the student needs to replace the “site” every 2 or 3 days. This will be done at home. If for some reason the pump stops delivering insulin, blood sugar levels will rise. A student’s [care plan](#) will have instructions on what to do.

Although pumps are becoming increasingly automated, they all require a user to enter the current glucose level and amount of carbohydrates to be eaten (meal or snack) so the pump can calculate how much insulin is needed. This dose of insulin before eating is called a **bolus**. See page 4 for a full glossary of terms.

This table shows the features of the pumps commonly used in Canada as of May 2019.

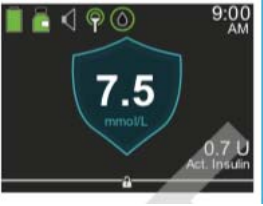
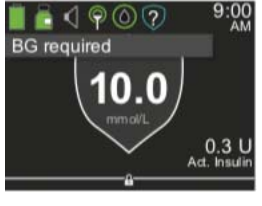


	Omnipod (Tubeless)	T:slim	Medtronic 630G	Medtronic 670G
				
Bolus	Standard bolus using a remote control (PDM)	Standard bolus using the pump	Standard bolus using the pump	Standard bolus using the pump
Basal (background) insulin	Standard	Standard	Standard	Standard OR Automatic adjustment (Automode)
BG checks	Integrated meter (part of PDM) sends the BG wirelessly to pump	Manual entry into pump. When using optional CGM, BG is auto-populated	Linked meter sends BG wirelessly to pump	Linked meter sends BG wirelessly to pump
CGM integration	No, but can be used separately	Yes. Optional: Dexcom	Yes, optional: Enlite or Guardian 3Enlite sensor	Yes, optional: Guardian 3Guardian sensor

MEDTRONIC Minimed 670G AUTO MODE QUICK GUIDE

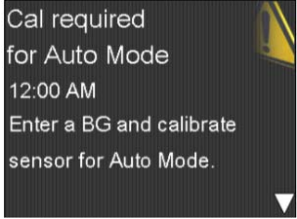
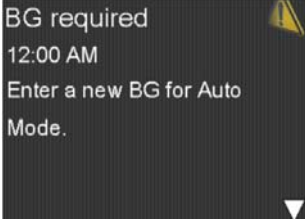
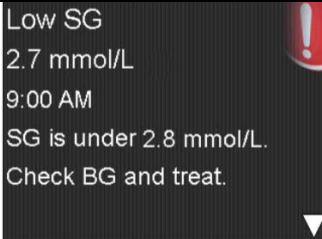

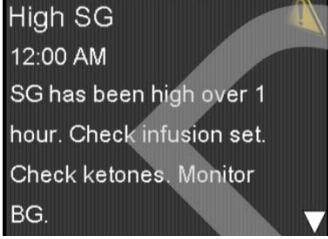
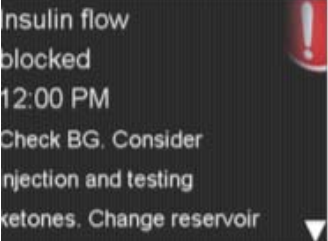
This pump has a feature that automatically adjusts the background insulin delivery based on information about glucose levels from the Guardian3 CGM transmitter. Insulin boluses for meals still need to be given the same way as with other pumps. You can watch this 2-minute [video](#) to see how the MiniMed 670G system works.

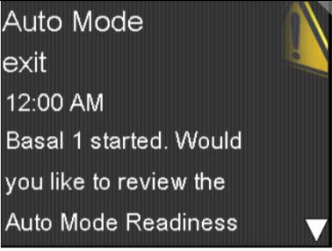



Here are of the key features you should know about this pump. **Note: SG refers to the sensor glucose value.**

PUMP MODES

	SmartGuard Auto Mode	Auto Mode: Safe Basal	Manual Mode
Home screen display	 <p>Blue shield</p>	 <p>Grey shield with white outline</p>	 <p>Without CGM</p>  <p>With CGM</p>
Availability	Auto Mode is active.	Pump automatically transitions to Safe Basal when SGs are not available. This is a bit like a back-up generator that keeps essential power on until the system is back online. If you need to take an action to get back into AutoMode, the pump will guide you.	When Auto Mode is not active (functions like a regular pump).
Basal	Automatically adjusts basal insulin every 5 minutes depending on the SG value.	Automatically adjusts basal insulin every 5 minutes depending on the SG value.	Automatically adjusts basal insulin every 5 minutes depending on the SG value.
Bolus	User must enter carbs into pump. The pump will recommend a bolus and a correction (extra insulin to bring blood glucose into target range) as needed.	Must enter carbs into pump. The pump will recommend a bolus and a correction as needed.	Enter carbs and BG and the programmed Bolus Wizard will recommend insulin dose for meal and correction as needed.

COMMON ALERTS AND ALARMS

Feature	Screen	What does this mean?
Calibration alert		A BG is needed to continue in Auto Mode. Check BG and enter reading into the pump. It will ask if you want to calibrate the meter – select “YES”.
BG Alert		A new BG is needed to continue in Auto Mode. Check BG and enter reading into the pump. When asked to calibrate, you can select “NO”.
Alarms		BG is low on sensor. Follow instructions on the screen. Check BG. If low, treat as per recommendations for hypoglycemia in student’s care plan.
Alarms		When you enter a BG, the pump may suggest a correction bolus. Follow the instructions on the screen.
		The sensor is detecting a high BG that is not correcting. Follow instructions on the screen. Monitor and enter BG. If BG is higher than the threshold identified in the student’s care plan or if ketones present, proceed as directed in care plan for hyperglycemia .
		This indicates that there is no insulin delivery. Check BG and refer to recommendations for hyperglycemia in student’s care plan . The student may need an insulin injection and will require a set change.

<p>Exit Auto Mode</p>		<p>This typically happens if an alarm needing attention is ignored.</p> <p>Read the pump screen for information and what steps to take next.</p> <p>The pump will continue to deliver insulin at a fixed rate, but won't be self-adjusting. You can give usual boluses for meals and corrections.</p>	
<p>EXERCISE</p>			
<p>When in Auto Mode, the pump will continue to self-adjust. There is an option to enter a temporary target BG of 8.3 mmol/L during exercise. This should be indicated in the student's care plan.</p> <p>If in manual mode, this is the same as for a standard pump. Follow directions in the student's care plan.</p>			
<p>To enter a temporary target BG for exercise</p>			

Glossary

- **CGM:** Continuous glucose monitor
- **Standard bolus:** A bolus is a dose of insulin given before eating. See the student' care plan for details: For all pumps, give as outlined in ICP – enter carbohydrates and BG as directed and the pump will calculate the dose to be given.
- **Standard basal:** Basal (or background) insulin is a small dose given continuously through the pump to regulate blood sugar between meals and snacks. These basal rates are preprogrammed into the pump by the student/family.
- **Automatic adjustment basal:** This is a specific feature where the pump automatically alters the amount of basal insulin given every 5 minutes in response to the glucose readings from an integrated CGM.
- **Integrated meter, PDM:** The PDM (“personal diabetes manager”) is a wireless, hand-held device that is used to program the OmniPod. It has a built- in/ integrated glucose meter to enable users to take a fingerstick. Even though the pump has the BG information, the user still needs to tell the pump when to give an insulin bolus.

Diabetes@School is a collaboration of the Canadian Paediatric Society, Canadian Pediatric Endocrine Group, and Diabetes Canada. For more information on supporting students with diabetes, visit www.diabetesatschool.ca.