



# GET OPTIMIZED

## BOLUS INSULIN

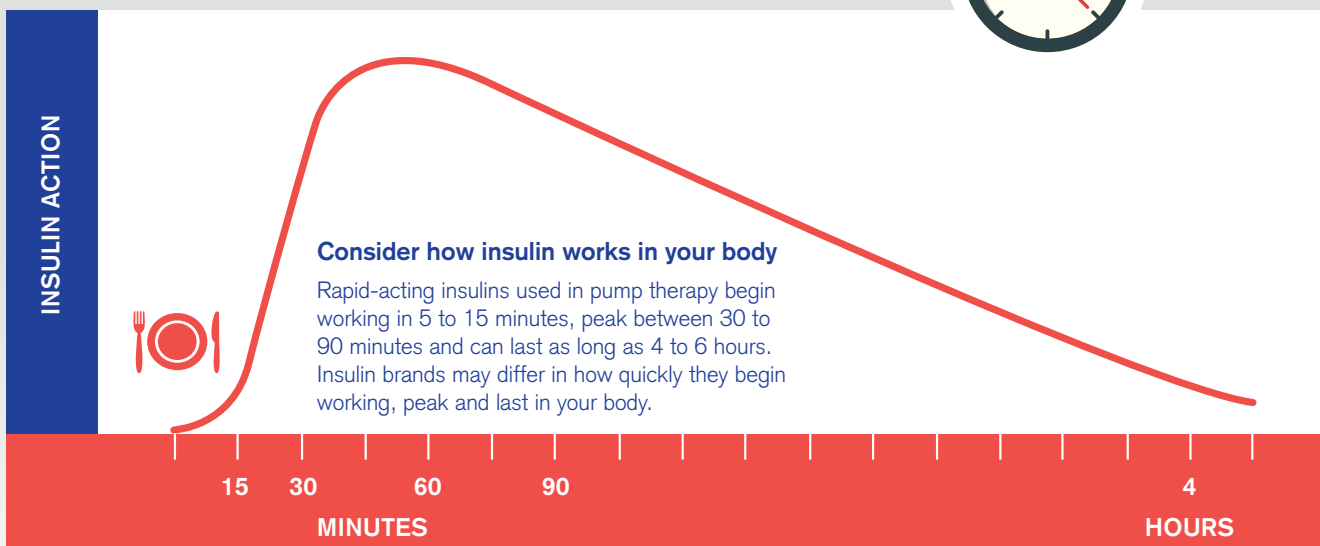
The fundamentals of bolus insulin and the importance of its delivery

### WHY ARE BOLUSES SO IMPORTANT?

The pancreas releases a burst of insulin at mealtimes in response to the amount of carbohydrate you eat. With diabetes, your pancreas can no longer produce the insulin you need. So, you must take mealtime insulin to match the amount of carbohydrate you eat. This burst of insulin is known as a bolus.<sup>1</sup>

Bolus calculators on insulin pumps suggest a bolus amount based on your blood glucose (BG) level and carbohydrate intake. The pump also takes into consideration insulin that is still working in the bloodstream from a previous bolus. This is known as 'insulin on board' (IOB) and is used in the calculation to ensure you do not take too much insulin.<sup>2</sup>

### WHEN SHOULD YOU BOLUS?<sup>2</sup>



- **When should you take your bolus before meals?**
  - When possible, take your bolus 15 to 20 minutes before a meal for improved BG after meals
- **Should you worry about previous boluses?**
  - The bolus calculator is equipped to subtract for insulin on board (IOB) from your previous bolus
  - This can limit the risk of "stacking" or overlapping your boluses

### Consider the type of food you are eating

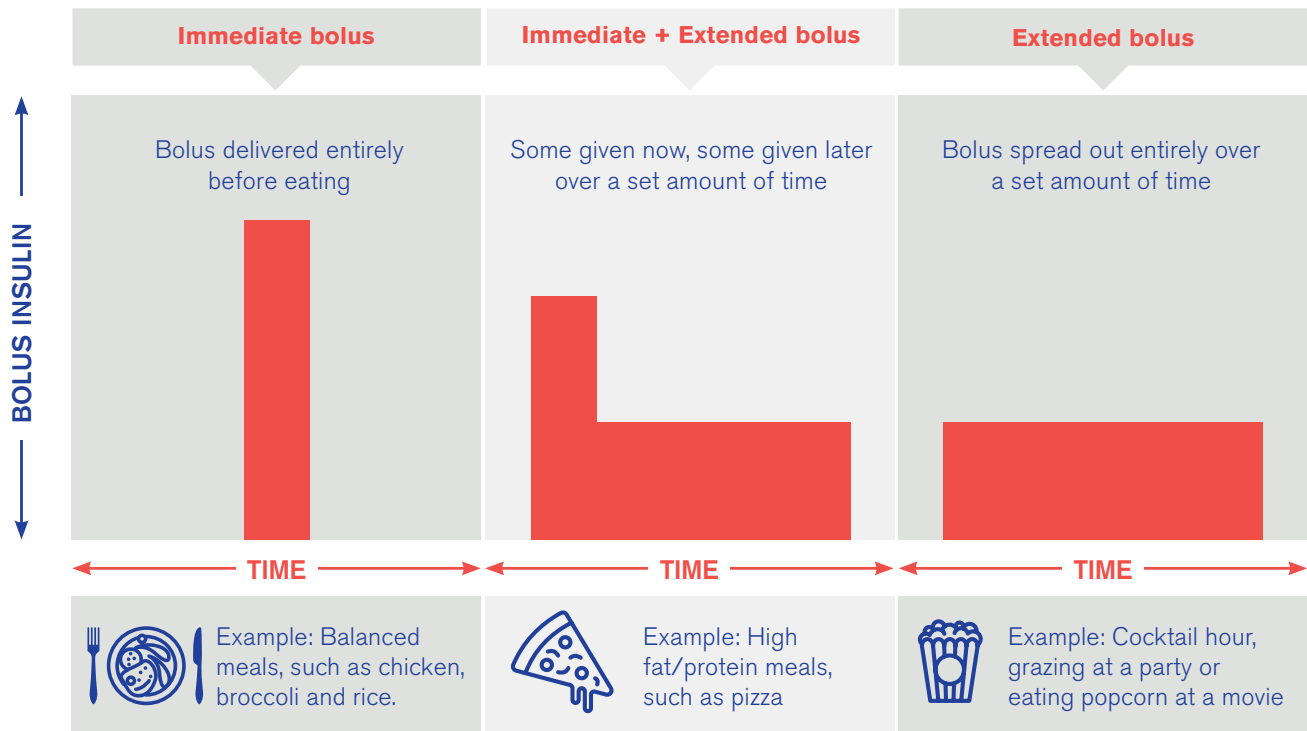


Accurate carb counting and eating balanced meals at home can be easy, but what about eating out? Dining out at a restaurant or gathering can be challenging. You may find yourself eating different foods under very different situations.

After eating out, it is not uncommon to see variable trends in BG, especially if the meal is higher in fat, protein and carbs. Meals like this could cause BGs to be below or at target initially, then rise above target hours later. You can accommodate for different types of food by using the advanced bolus feature on your pump.

# WHAT TYPES OF BOLUSES ARE AVAILABLE?

Insulin pumps have the ability to provide different bolus delivery options, such as immediate, extended, or a combination of the two.



## HOW DO YOU DECIDE WHICH TYPE OF BOLUS TO USE?

Start by looking for patterns. How is your BG reacting to what you have eaten? If out-of-target blood glucose levels are not related to miscounting carbs, then consider the types of foods you are eating. High fat/protein meals could elevate BG several hours after eating. Refined and processed foods, like white bread and corn flakes, can cause an early, quick rise in BG.

Bolus suggestions for different meals <sup>3</sup>		
High fat	Protein	High glycemic index (GI)
<ul style="list-style-type: none"> <li>For meals <math>\geq 40</math> g of fat, consider increasing your total bolus dose 30%–35%</li> <li>Try setting an extended bolus 50% now, 50% over 2–2.5 hours as a starting point</li> </ul>	<ul style="list-style-type: none"> <li>For protein-only meals with <math>\leq 75</math> g of protein, insulin may not need to be adjusted</li> <li>For meals with at least 30 g carbohydrate and 40 g protein, consider increasing your total bolus by 15%–20%</li> </ul>	<ul style="list-style-type: none"> <li>High GI foods may need more insulin immediately and less later</li> <li>Consider dosing 20 minutes or more before eating</li> </ul>

After trying these bolus suggestions, monitor your blood glucose levels and make adjustments for next time. Discuss alternate bolus options with your healthcare provider.

# PUTTING KNOWLEDGE INTO PRACTICE

Below are some examples of bolus adjustments and how to use the advanced bolus features.

## GIVE IT A TRY!

Use the space below to record the meals you eat and the bolus adjustments or advanced bolus features you use. Bring the completed table back to your Diabetes Health Care Team for more guidance on how to use the advanced bolus features from your insulin pump.

	1	2	3	4	5
<b>Meal</b>	1 cup of chicken pad thai	1.5 cups of chicken penne in creamy asiago sauce			
<b>Nutritional information</b>	30g fat 37g carb 21g protein	60g fat 45g carb 62g protein			
<b>Bolus adjustment &amp; advanced bolus feature used</b>	<ul style="list-style-type: none"> <li>Pre-bolus 20 minutes before meal</li> <li>Immediate bolus only</li> </ul>	<ul style="list-style-type: none"> <li>Increase recommended bolus by 20%</li> <li>50% of bolus immediately and the other 50% extended over 2 hours</li> </ul>			
<b>Blood glucose 2 hours after eating</b>	9.2 mmol/L	8.9 mmol/L			
<b>Blood glucose 4 hours after eating</b>	6.5 mmol/L	7.0 mmol/L			
<b>Blood glucose 6 hours after eating</b>	6.0 mmol/L	6.6 mmol/L			
<b>Other factors that may affect blood glucose (Ex. Unexpected exercise, post-meal snack etc.)</b>	<ul style="list-style-type: none"> <li>30 min leisure walk approximately 5 hours after lunch</li> </ul>	N/A			

**References:** **1.** Diabetes Canada. Glycemic management in adults with type 1 diabetes. Accessed May 2019 at <http://guidelines.diabetes.ca/cpg/chapter12>. **2.** Bolderman K. (2013). Putting your patients on the pump (2nd ed.). American Diabetes Association. **3.** Bell KJ, Smart CE, Steil GM, *et al.* Impact of fat, protein, and glycemic index on postprandial glucose control in type I diabetes: implications for intensive diabetes management in the continuous glucose monitoring era. *Diabetes Care* 2015;38:1008–1015.

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