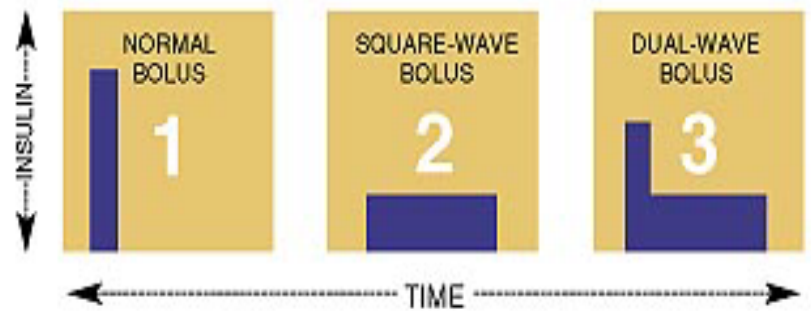
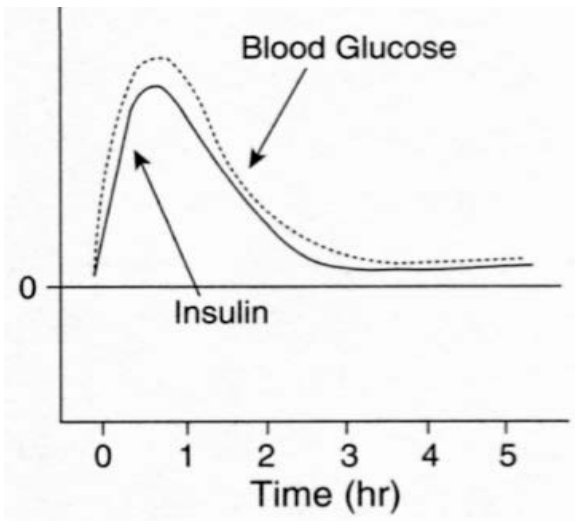


The dual and square-wave bolus

Information for people on a pump looking for tighter control of their glucose levels after meals

Why do we need a different type of bolus?

When you give a bolus it has a certain action in the body. The insulin peaks in one hour and is out of the body in three to five hours. This is similar to the effects of many but not all meals. To assist in better matching foods digestion to the insulin action, your pump has three bolus options: normal, square-wave and dual-wave boluses.



What is a “dual-wave” bolus?

Insulin is delivered in two waves, one immediate wave and the second wave over a set period of time. The total insulin required for the meal is split as a percentage to the first and second wave.

Which foods may require a “dual wave” bolus?

Everyone is different, but some people find the dual-wave can help with the following:

- meals high in fat such as hot chips, rich desserts, creamy and cheesy dishes, pastries and takeaways
- meals high in protein such as meals containing large serves of meat, fish, chicken etc.
- meals high in fat and protein
- very high fibre foods like oats and legumes

- large serves of low GI pastas and rices.

How to identify which meals may need this bolus?

Follow the steps below to help identify which meals may require a different type of bolus.

1. Start with a “normal bolus”.
2. Ensure you are counting carbohydrates accurately.
3. Ensure your insulin to carbohydrate ratio is correct.
4. Check BGLs after three, five and seven hours.
5. Keep a good record of foods eaten and their effects on your BGLs.

Steps for trailing the “dual wave” bolus

1. Complete you pre-meal BGL.
2. Calculate the carbohydrates in your meal.
3. Turn on the bolus feature. For different pumps this feature has different names:
 - a. Animas: “Combo Bolus”
 - b. Medtronic: “Dual-Wave“
 - c. Roche: “Multiwave”.
4. For your carbohydrates and BGL the pump will suggest a total insulin dose. You will then need to change the “split” to distribute the total bolus.
5. The split refers to what percentage of the insulin you would like initially and the percentage you would like extended over a set time period.
6. Decide over how long you would like this insulin to be delivered over.
7. Deliver the bolus.

Recommended starting “splits”

1. Everyone is different. For meals containing carbohydrates plus high amounts of fats and protein start with 60% up front and 40% extended over three hours.
2. For low GI carbohydrates such as pasta begin with 50% up front and 50% extended over two hours.
3. Test and record BGL after three, five and seven hours after you have finished your meal.
4. Review the levels with your team and adjust if needed.

Additional insulin for the effect of fat and protein

Carbohydrates are the main nutrient that affects BGLs. Fat and protein in large amounts can also require insulin, having a delayed effect on BGLs.

If BGLs remain elevated after trailing the “dual-wave”, additional insulin may be needed. This is common for meals with more than 20 grams of fat and or 25 grams of protein. Gradually adding

additional insulin to what is recommended for the carbs can be useful when incorporated with a dual-wave bolus. Your dietitian can talk you through the steps.

What is a “square-wave” bolus?

This type of bolus is when mealtime insulin is delivered by the pump at a constant rate over a set time period. These types of boluses are used less often as you must know the amounts of carbs you plan to eat over an exact time period; for example, eating 30 grams of carbs from popcorn at the movies over two hours.

Square wave boluses are also used in certain medical conditions such as delayed stomach emptying.

Steps for trialling the “square-wave” bolus

1. Complete your pre-meal BGL
2. Calculate the carbohydrate in your meal
3. Turn on the bolus feature. For different pumps this feature has a different name:
 - a. Animas: “Extended”
 - b. Medtronic: “Square-Wave”
 - c. Roche: “Extended”
4. Advise the pump the amount of carbs you plan to eat
5. Advise the pump the time frame over which you plan to eat the carbs

In summary

Knowing how to manage different types of meals when they are consumed will help your glucose control.

Consuming a diet balanced with lean protein, moderate amounts of fat and plenty of vegetables is important for your health and will also help with blood glucose management.

If you would like more information, about eating a balanced diet, trialling different boluses or additional insulin for fat and protein it is important to speak with your dietitian.



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Child and Adolescent Health Service

**This document can be made available in alternative formats
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Child and Adolescent Health Service
15 Hospital Avenue, Nedlands WA, 6009
Telephone: (08) 6456 2222
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