

Understanding Insulin On Board (IOB)

What Is Insulin On Board?

Insulin on board (IOB) refers to insulin that is still active in your body from previous bolus doses. All insulin pumps have an IOB feature that allows the pump to calculate any remaining insulin in the body from recent boluses. When this feature is activated, your pump has the ability to subtract IOB when administering bolus insulin in response to carb intake and blood glucose readings to prevent insulin from overlapping or “stacking” that can cause hypoglycemia. It also allows greater flexibility to give multiple boluses for frequent snacking or corrections without increased risk.

How Does Insulin On Board Work?

Different pumps have different ways of calculating IOB and how it is applied when making bolus calculations. Understanding how your pump calculates IOB allows you to tailor your settings to what works best for you.

Medtronic Paradigm

- All boluses (meal and correction) are taken into account when IOB is calculated.
- IOB is only deducted from correction boluses, so the full amount of IOB is not always deducted. IOB is never deducted from meal boluses, only correction boluses.
- For example, if the correction bolus is 3 units and there are 2 units of IOB, the full 2 units are deducted. But if the correction bolus is 1 unit, only 1 of the 2 units of IOB will be deducted
- If the blood sugar is below target, no IOB will be deducted.
- Perspective: here the IOB acts as a good reminder of all the insulin that is still active.

Animas Ping/Vibe

- All boluses (meal and correction) are taken into account when IOB is calculated,
- If the blood sugar is above target, IOB is only deducted from correction bolus amounts (same as Medtronic)
- When blood sugar is below target, the full amount of IOB is deducted from the total bolus (including the food portion). A small difference in blood sugar (just above vs. just below the target BG) can result in very different bolus calculations.
- For example, if your target BG is 7 mmol/l, your current reading is 10 mmol/l, and your total bolus (5 for the meal + 2 for correction) is 7 units. Without any IOB, you would receive the full 7 units. But if you have 4 units of IOB, the correction bolus is reduced to zero, and the recommended dose would be just the 5 units for the meal. But if your blood sugar is 5 mmol/l, and the usual dose is 4 units (5 for the food, -1 for the blood sugar), the 4 units of IOB would be deducted from the 4 unit total, resulting in a recommended dose of zero.

OmniPod/AccuChek

- Both of these systems only consider boluses that were given to correct high blood sugars when calculating IOB.
- For example, if you gave 6 units for a meal and 2 units to cover an above-target reading, the 6 units is ignored in all IOB calculations. Only the 2 unit correction portion is taken into account.
- The pump deducts far less IOB than what is actually present in the body because it works on the assumption that any insulin left from a meal bolus is still covering what is still digesting from that meal. This leads to much lower IOB calculations than other pumps, and hence less bolus reduction (more aggressive boluses).