Medtronic

SmartMDI InPen™ Dose Calculator

There are 4 different scenarios that the dose calculator uses. Each scenario considers current glucose and the timing of the last injection dose.

	<2 hours since last dose	>2 hours since last dose
Current glucose >10mmol/L	Formula 1	Formula 1
Current glucose between target and 10mmol/L	Formula 1	Formula 3
Current glucose between 3.1mmol/L and target	Formula 2	Formula 3
No glucose entered	Formula 4	

Formula 1:

- If current glucose is above 10mmol/L, or between target glucose and 10mmol/L AND it is within 2 hours of last dose, the calculator will subtract Active Insulin from the correction estimate, then adds this to the food estimate to obtain the Total Bolus Estimate
- If the Active Insulin amount is greater than the correction estimate, the Total Bolus Estimate is based only on the food estimate.

$$\text{TBE} = \underbrace{\frac{\text{Carbs entered}}{\text{ICR}}}_{\text{Food estimate}} + \underbrace{\frac{\text{Current Glucose} - \text{Target Glucose}}{\text{ISF}}}_{\text{Correction estimate}} - \text{Active Insulin on board}$$

Formula 2:

- If current glucose is less than target glucose AND it is within 2 hours of the last dose, the food estimate by the correction estimate to obtain the Total Bolus Estimate

$$\text{TBE} = \underbrace{\frac{\text{Carbs entered}}{\text{ICR}}}_{\text{Food estimate}} + \underbrace{\frac{\text{Current Glucose} - \text{Target Glucose}}{\text{ISF}}}_{\text{Correction estimate}}$$

Note that in this situation, active insulin is NOT considered.

Formula 3:

- If it has been more than 2 hours since the last injection and current glucose is above 3.1mmol/L and below 10mmol/L, the dose calculator adds the correction estimate AND SUBTRACTS active insulin from the food estimate to obtain the Total Bolus Estimate
- Note that if glucose is below target, the food estimate will be reduced by both the correction estimate and the active insulin.

$$\text{TBE} = \underbrace{\frac{\text{Carbs entered}}{\text{ICR}}}_{\text{Food estimate}} + \underbrace{\frac{\text{Current Glucose} - \text{Target Glucose}}{\text{ISF}}}_{\text{Correction estimate}} - \text{Active Insulin on board}$$

Formula 4:

- If no glucose entered or SG available, the Total Bolus Estimate is based only on the food estimate.

$$\text{TBE} = \underbrace{\frac{\text{Carbs entered}}{\text{ICR}}}_{\text{Food estimate}}$$

Additional notes:

- Total bolus estimates are rounded down to the nearest 0.5U.
- If glucose is <= 3.1 mmol/L, the dose calculator will recommend eating fast acting carbohydrates to raise glucose.
- For fixed dose or meal estimation modes, the food estimate is the dose provided by the healthcare provider for the meal selected in the calculator.
- If the total bolus estimate is negative and the calculator is in carb counting mode, the calculator will recommend eating X grams of carbohydrates as calculated by carbs = – (total bolus estimate) * ICR.
- The Active Insulin Curve estimation follows the graph adapted from Mudaliar and colleagues, Diabetes Care, Volume 22, Number 9, Sept. 1999, page 1501.

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