

# Type 2 Diabetes and Insulin

## Steps in Insulin Management

**Step 1:** Target Fasting Plasma Glucose (FPG) with **Basal insulin**. The target goal for FPG is 70 to 130mg/dL.\* Start with a bedtime dose of Basal insulin 10 units or 0.2 units/kg body weight. Increase the dose 2 units every 3 days until FPG is between 70 to 130 mg/dL.\* The dose maybe increased by 4 units every 3 days if FPG is > 180mg/dL\*.

**Step 2:** Target the premeal glucose, one target at a time. The target goal for premeal glucose is between 70 to 130mg/dL. \*

If pre-lunch glucose is > 130mg/dL\*, start 4 units of Bolus insulin before breakfast.

If pre-supper glucose is > 130mg/L\*, start 4 units of Bolus insulin before lunch **OR** add or increase morning NPH/levemir.

If bedtime glucose is > above target (e.g. >140mg/dL\*), start 4 units of Bolus insulin before supper **OR** Increase evening NPH/levemir.

Increase Bolus insulin by 2 units every 3 days.

As insulin doses get larger (over 10 units), begin to change insulin dose by 10 to 20%.

**Step 3:** If A1C is not at goal, target the post-prandial glucose with Bolus pre-meal insulin. The 2 hour post-prandial glucose target is < 160mg/dL to 180 mg/dL\*.

**\*Note:** Glucose targets should be individualized based on patient comorbidities, needs and response to blood glucose lowering.

**Table 1. Basal Insulin - Intermediate to Long Acting Insulin: onset, peak and duration**

Insulin	Onset	Peak	Duration
NPH (Novolin N®, **Humulin N®)	1 to 3 hours	6 to 10 hours	12 to 20 hours
Levemir (Detemir®) **Glargine (Lantus®)	1 hour 1 hour	None None	12 to 24 hours 24 hours

\*\*Drugs not on IHS National Core Formulary

**Table 2. Bolus Insulin - Shorter Acting Insulin: onset, peak and duration**

Type of Bolus Insulin	Onset	Peak	Duration
Aspart (Novolog ®)	15 to 30 min	30 to 90 min	3 to 5 hours
** <i>Lispro (Humalog ®)</i>	15 to 30 min	30 to 90 min	3 to 5 hours
** <i>Glulisine (Apidra ®)</i>	15 to 30 min	30 to 90 min	3 to 5 hours
Regular (Novolin R®) ** <i>Humulin R ®,</i>	30 to 60 min	1 to 2 hours	5 to 8 hours

\*\*Drugs not on IHS National Core Formulary

**Table 3. Premixed Insulin - Longer and Shorter Acting: onset, peak and duration.** (Consider for people who cannot mix insulin, use an insulin per or whose stable does of insulin is the same as the premix.)

Insulin	Onset	Peak	Duration
Novolin, Novolog 70/30	30 min	2 to 5 hours	18 to 24 hours
** <i>Humulin 50/50</i>	30 min	2 to 4 hours	14 to 24 hours
** <i>Humalog 75/25</i>	15 min	½ to 2 ½ hours	16 to 20 hours

\*\*Drugs not on IHS National Core Formulary

Reference: Nathan, Buse, Davidson, et al. Management of Hyperglycemia in Type 2 Diabetes: a Consensus Algorithm for the Initiation and Adjustment of Therapy. (2009). Diabetes Care **Note:** For the targets stated below, it is important that these be individualized based on patient comorbidities, needs and response to blood glucose lowering. Diabetes Care: 32, 193-203.