

# Insulin Algorithm for Type 1 Diabetes in Children and Adults<sup>1</sup>

## Insulins and Abbreviations

### BASAL

Lantus (glargine U100)  
Levemir (detemir)  
Toujeo (glargine U300)<sup>3</sup>  
Tresiba (degludec U100, U200)<sup>3</sup>

### BOLUS (Prandial)

Reg (Regular insulin U100, U500)  
RAI Rapid-Acting Insulin  
Apidra (glulisine)  
Humalog (lispro U100, U200)  
Novolog (aspart U100)

### IAI's (Intermediate-acting insulins)

Humulin N (NPH)  
Humulin R (Regular U500)  
Novolin N (NPH)

### PREMIX3

Humalog Mix (lispro protamine/lispro 75/25)  
Humulin (NPH/Reg 70/30)  
Novolin (NPH/Reg 70/30)  
NovoLog Mix (aspart protamine/aspart 70/30)

## Intensive Insulin Therapy

Basal: Bolus ratio should be approximately 50% basal and 50% Bolus<sup>4</sup>

Intensive therapy can be administered using insulin pens, pumps or syringes

Begin 0.1-0.3 (children) or 0.3-0.5 (adults) units insulin/kg/day and titrate to goal

Basal QD Lantus, Toujeo, Tresiba; QD or BID Levemir

Bolus 20-30 min before meals: Reg

0-15 min before meals: RAI's

If meal skipped, then skip bolus

Bolus dose includes:

- Insulin to cover carbohydrates ingested  

$$[500/\text{total daily units insulin}] = [\text{grams carbohydrate covered}/1 \text{ unit insulin}]$$
- Additional insulin if glucose is above goal  

$$[1800/\text{total daily units insulin}] = [\text{mg/dL glucose reduction}/1 \text{ unit insulin}]$$
 (use 1500/total daily units insulin for Reg U100)

## Glycemic Goals<sup>2,3</sup>

Individualize goal based on patient risk factors

A1c	≤6%	<7%	<8%
FPG	≤110	120	140 mg/dL
2h PP	≤130	180	180 mg/dL

## Split-Mix Insulin Therapy<sup>4</sup>

Begin 0.1-0.3 (children) or 0.3-0.5 (adults) units insulin/kg/day and titrate to goal

- Two injections using NPH + Reg or RAI  
 2/3 total daily units insulin is given in the AM and 1/3 given in the PM  
 Morning ratio of NPH:Reg/RAI is 2:1  
 Evening ratio is 1:1
- Three injections using NPH + Reg or RAI  
 2/3 total daily units is given in the AM, 1/6 in the PM and 1/9 at bedtime  
 Morning ratio of NPH:Reg/RAI is 2:1  
 Evening insulin is Reg/RAI  
 Bedtime insulin is NPH
- Two injections Premix  
 2/3 total daily dose is given in the AM; 1/3 in the PM

## Footnotes

<sup>1</sup> If insulin pump therapy is considered, refer to Certified Pump Trainer.

<sup>2</sup> See "A1c Algorithm" for decisions on health status based A1c goals.

<sup>3</sup> Not FDA approved for Children.

<sup>4</sup> Ratio of basal: bolus commonly ranges from 60:40 to 40:60

<sup>5</sup> See package insert for dosing.

- Follow A1c every 3 months and adjust regimen to maintain glycemic targets
- If not at goal: Repeat Diabetes Education with Certified Diabetes Educator  
 Begin Continuous Glucose Monitoring System  
 Consider adding pramlintide<sup>5</sup> if post prandial glucose not stable