Insulin Algorithm for Type 1 Diabetes in Children and Adults

**Insulins and Abbreviations**

**BASAL**
- Lantus (glargine U100)
- Levemir (detemir)
- Toujeo (glargine U300)\(^3\)
- Tresiba (degludec U100, U200)\(^3\)

**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\(^4\)

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:

a. Insulin to cover carbohydrates ingested

\[
\frac{500}{\text{total daily units insulin}} = \frac{\text{grams carbohydrate covered}}{1 \text{ unit insulin}}
\]

b. Additional insulin if glucose is above goal

\[
\frac{1800}{\text{total daily units insulin}} = \frac{\text{mg/dL glucose reduction}}{1 \text{ unit insulin}}
\]

(Use 1500/total daily units insulin for Reg U100)

**Split-Mix Insulin Therapy\(^4\)**

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

1. 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

2. 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

3. Two injections Premix
   - 2/3 total daily dose is given in the AM; 1/3 in the PM

**Footnotes**

1. If insulin pump therapy is considered, refer to Certified Pump Trainer.
2. See “A1c Algorithm” for decisions on health status based A1c goals.
3. Not FDA approved for Children.
4. Ratio of basal: bolus commonly ranges from 60:40 to 40:60
5. See package insert for dosing.

**Glycemic Goals\(^2,3\)**

Individualize goal based on patient risk factors

<table>
<thead>
<tr>
<th>A1c</th>
<th>&lt;6%</th>
<th>&lt;7%</th>
<th>&lt;8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPG</td>
<td>≤110</td>
<td>120</td>
<td>140 mg/dL</td>
</tr>
<tr>
<td>2h PP</td>
<td>≤130</td>
<td>180</td>
<td>180 mg/dL</td>
</tr>
</tbody>
</table>

See disclaimer at www.tdctoolkit.org/algorithms_and_guidelines.asp