Insulin Dose Adjustments

**Goal:** To have the majority of pre-meal blood sugars in the target range. Some high and low blood sugars are still to be expected.

**Toolkit for Insulin Dose Adjustments:**
Fine tuning or making adjustments to insulin doses helps to keep blood sugars in the target range. In order to adjust insulin safely, you need to:

1. Check meter date and time to be sure they are correct
2. Test blood sugars at least 4 times per day
3. Record blood sugars in a log book each day according to time of day/meal (see samples).

**Deciding if a dose adjustment is needed:**
1. Look for **patterns** of high and/or low blood sugars at each time of day
2. Can you find a reason for the highs and/or lows?
   - After eating a meal?
   - Snacking without taking insulin?
   - Higher or lower activity?
   - Sick days?
   - Use of expired insulin?
   - Missed doses?
   - Leakage?
   - No obvious reason?
3. If there are **more** than 2 unexplained blood sugars below 70 in 1 week during the day, or any blood sugars below 70 overnight, you may need a lower insulin dose.
4. If more than half of blood sugars at a certain time of day are above target, you may need a higher insulin dose.

**Adjusting your diabetes regimen:**
1. Understand how each insulin works (see insulin time action table below)
2. Make one change at a time
   - May need insulin dose adjustment
   - Consider giving insulin for snacks
   - May need insulin dose adjustment or extra snack before exercise
   - Check ketones, may need extra insulin
   - New insulin vial/pen
   - Reminders (phone alarms) at insulin times
   - Check injection technique
   - May need insulin dose adjustment

**General Rules for insulin dose adjustments:**
1. Fix low blood sugars first
2. Fix time of day with the most high sugars
3. Adjust dose by 10%
4. **Give changes 3-5 days for lows or 5-7 days for highs before making**

Developed by the Washington University/ St. Louis Children’s Hospital Diabetes Team 2014
### Insulin Time Actions

<table>
<thead>
<tr>
<th>Type of Insulin</th>
<th>Starts Working (onset)</th>
<th>Working Hardest (peak)</th>
<th>Lasts (duration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humalog, Novolog or Apidra (lispro, aspart, glulisine)</td>
<td>10 to 15 minutes</td>
<td>60 to 90 minutes</td>
<td>3 to 4 hours</td>
</tr>
<tr>
<td>Lantus (glargine)</td>
<td>2 to 4 hours</td>
<td>No peak</td>
<td>20 to 24 hours</td>
</tr>
<tr>
<td>Levemir (detemir)</td>
<td>3 to 8 hours</td>
<td>No peak</td>
<td>6 to 23 hours</td>
</tr>
</tbody>
</table>


### Example Target Ranges

<table>
<thead>
<tr>
<th>Infant/Toddlers (0-4yrs)</th>
<th>Sometime feel lows (5-10yrs)</th>
<th>Always/Usually Feel Lows (8-21yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-200</td>
<td>80-180</td>
<td>70-150</td>
</tr>
</tbody>
</table>

### How to decide which dose to adjust:

<table>
<thead>
<tr>
<th>Time out of Target</th>
<th>Insulin dose to Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning/Breakfast</td>
<td>Long acting (Lantus/Levemir) or basal on a pump</td>
</tr>
<tr>
<td>Lunch</td>
<td>Breakfast insulin-to-carb dose or correction</td>
</tr>
<tr>
<td>Dinner</td>
<td>Lunch insulin-to-carb dose or correction</td>
</tr>
<tr>
<td>Bedtime</td>
<td>Dinner insulin-to-carb dose or correction</td>
</tr>
</tbody>
</table>

### Time to Practice with your Logbook!

Step 1: Look for patterns of highs and/or lows at each time of day
Step 2: If there are multiple unexplained lows at the same time of day – lower the dose before that time.
Step 3: If there are multiple above target blood sugars– increase the dose before that time.
Step 4: Keep monitoring blood sugars. Review again in 5-7 days to see if another adjustment is needed.
Call your Diabetes Team if you are not sure if a change is needed or if you are not sure what change to make.
Call if after 3 changes blood sugars are still not in target. 314-454-6051

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