Portland Protocol for Continuous IV Insulin Infusion

ICU patients Target: 70 – 110

   Medical & Surgical Patients: Continue Portland Protocol throughout ICU stay.

2. For patients previously undiagnosed diabetes (DM) who present with hyperglycemia: start PDX protocol if blood glucose (BG) level > 120 mg/dl x 2 consecutive readings OR >150 at any one time. Consult endocrinologist on POD 2 for DM workup and follow-up orders.

3. Start insulin infusion via pump “piggybacked” to normal saline IV as follows:

<table>
<thead>
<tr>
<th>Blood Glucose (mg/dL)</th>
<th>Intravenous Insulin Bolus (U)</th>
<th>Initial Insulin Rate (Units/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Type 2 DM Preoperatively Type 1 DM Preoperatively</td>
</tr>
<tr>
<td>80–119</td>
<td>0</td>
<td>0.5  1</td>
</tr>
<tr>
<td>120–179</td>
<td>0</td>
<td>1  2</td>
</tr>
<tr>
<td>180–239</td>
<td>4</td>
<td>2  3.5</td>
</tr>
<tr>
<td>240–299</td>
<td>8</td>
<td>3.5  5</td>
</tr>
<tr>
<td>300–359</td>
<td>12</td>
<td>5  6.5</td>
</tr>
<tr>
<td>≥ 360</td>
<td>16</td>
<td>6.5  8</td>
</tr>
</tbody>
</table>

4. Test BG level by finger-stick, arterial or venous line drop sample.
   The frequency of BG testing is as follows:
   a. If BG ≥ 150 or < 70: check BG every 30 minutes.
   b. If BG 70 -150: may check BG every hour.
   c. When titrating epinephrine, check BG every 30 minutes.
   d. When BG is 70 - 110 and insulin rate remains unchanged x 4hr., then may test q. 2 hrs.

5. Insulin titration:
   Blood Glucose (mg/dL) Action
   < 50 Stop insulin; give 25 mL D50; Recheck BG in 30 minutes.
   When blood glucose > 60, restart with rate 50% of previous rate.
   Stop insulin; if previous BG >100, give 25 mL D50.
   50–59 Recheck BG in 30 minutes
   When BG > 60, restart with rate 50% of previous rate.
   If ≥ last test result, continue current rate.
   If lower than last BG by 20 mg/dl or more, decrease rate by 50%
   If within 20 mg/dL of last BG, decrease rate by 0.5
units/hour.

Same rate -- EXCELLENT! You are in the Target Range!

**70–110**

**TITRATE DRIP AT WILL TO MAINTAIN BG in TARGET RANGE**

If < 20 mg/dL lower than last test – increase rate by 0.5 units/h.

**111–150**

If 20 - 80 mg/dL lower than last test – keep same rate
If more than 80 mg/dL lower – decrease rate by 25%.

If ≥ 30 mg/dL lower than last BG, keep same rate.
If < 30 mg/dL lower than last test (OR if higher than last test), increase rate by 1 Unit/h

**Recheck BG in 30 minutes**

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**Blood Glucose (mg/dL) Action**

If ≥ 50 mg/dl lower than last test – same rate
If < 50 mg/dl lower than last test OR if higher than last test --

**181 - 240**

Bolus with 4 units AND increase rate by 2 unit/hr
(RECHECK BG IN 30 MINUTES)

If ≥ 100 mg/dl lower than last test – same rate
If < 100 mg/dl lower than last test OR if higher than last test --

**> 240**

IV bolus with regular insulin as per “Initial IV Insulin Bolus” dosage scale above (see Item #3) AND Double Insulin drip rate
(RECHECK BG IN 30 MINUTES)
> 300 X 4 consecutive readings  
Call MD for additional IV bolus orders.

**NOTE**  
If BG 151 – 240 mg/dl and has not decreased after 3 consecutive increases in insulin, then bolus with 4 units and double insulin rate.

6. 1800 ADA Diabetic diet starts with any PO intake – Begin with Full Liquids and advance as tolerated.

7. **Post meal S.Q. Humalog Insulin Supplement** in addition to insulin drip at mealtimes:
   - **If consistently eating,** give S.Q. Humalog 15 min. premeal;
   - **If uncertain of oral intake,** then give postmeal.
   - **a. Test BG 2hr after SQ Humalog.**  
     - If > 125, then increase next meal-related dose by one “row”.  
     - If < 80 decrease next meal-related dose by one “row”.

<table>
<thead>
<tr>
<th>Drip Rate</th>
<th>Eats &gt; 50% of meal</th>
<th>Eats &lt; 50% of meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>4 units SQ</td>
<td>2 units SQ</td>
</tr>
<tr>
<td>2-4</td>
<td>6 units SQ</td>
<td>3 units SQ</td>
</tr>
<tr>
<td>4-6</td>
<td>8 units SQ</td>
<td>4 units SQ</td>
</tr>
<tr>
<td>6-8</td>
<td>10 units SQ</td>
<td>5 units SQ</td>
</tr>
<tr>
<td>8-10</td>
<td>12 units SQ</td>
<td>6 units SQ</td>
</tr>
<tr>
<td>&gt;10</td>
<td>14 units SQ</td>
<td>7 units SQ</td>
</tr>
</tbody>
</table>