### Additional file 1: details of the Tight Glucose Protocol

Measure glucose 1 hour after admission with point of care measurement:
- When without insulin administration glucose ≤ 6.0 => do not start protocol
- When during admission glucose rises above 6 mmol/L => start protocol

When glucose > 6.0 mmol/L than (glucose concentration/5) = initial pump rate for insulin and start 2L glucose 5%/24 hour intravenously and measure glucose concentration after 1 hour.

**Glucose ≥ 3.5 and ≤ 4.5**
- Glucose ↑
- Glucose = or < 1.0/hr ↓
- Glucose is > 1.0/hr ↓

**Glucose ≥ 4.5 and ≤ 6.0**
- Glucose is > 1.5/hr ↑
- Glucose is < 1.5/hr ⇒ or ≤ 1.5/hr ↓
- Glucose is 1.5-3.0/hr ↓
- Glucose is > 3.0/hr ↓

**Glucose > 6.0 and ≤ 9.0**
- Glucose is > 3.0/hr ↑
- Glucose is < or < 1.5/hr ↓
- Glucose is 1.5-4.0/hr ↓
- Glucose is > 4.0/hr ↓

**Glucose > 9.0**
- Glucose ↑
- Glucose is 4.0-6.0/hr ↓
- Glucose is > 6.0/hr ↓

**Change insulin group**
- Increase pump rate 2xΔ
- Increase pump rate 1xΔ
- No change
- Decrease pump rate 1xΔ
- Stop pump during 30 minutes then decrease pump rate 2xΔ

<table>
<thead>
<tr>
<th>Glucose &lt; 3.5</th>
<th>Current pump rate</th>
<th>Pump rate 1x Δ</th>
<th>Pump rate 2x Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3-6</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.5-9.5</td>
<td>1.5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10-14.5</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>15-19.5</td>
<td>3</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>20-24.5</td>
<td>4</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>&gt;25</td>
<td>&gt;5</td>
<td>&gt;10</td>
<td></td>
</tr>
</tbody>
</table>

**Measure glucose after 1 hour**

Is the glucose concentration twice in a row >4.5 and < 6 mmol/L?

- No
- Yes

**Is or will the administration of food be decreased or stopped? Is there gastric retention?**

Definition of gastric retention: more fluid is aspirated through the nasogastric tube than administered prior.
(retention is not applicable for nutrition via duodenal tube or Total Parenteral Nutrition)

- Yes
- No

**Check glucose concentration every 4 hour**

Is the glucose concentration > 4.5 and < 6 mmol/L?

- No
- Yes

Administer insulin preferably peripheral or near connection central line.
Always turn off insulin pump when transporting patient.