**Insulin Prescribing**

**Types of insulin**
- **Rapid acting** (given at start of meal)
  - Novorapid (Aspart)
  - Humalog (Lispro)
  - Apidra (Glulisine)
- **Short acting** (given 15-30 mins before a meal)
  - Actrapid
  - Humulin S
- **Intermediate acting** (usually given once/twice daily or as part of mix)
  - Humulin I
  - Insulatard
  - Insuman basal
- **Long acting** (usually given once daily)
  - Lantus (Glargine)
  - Levemir (Detemir)
  - Tresiba (degludec)

**Regimens**
- **Basal bolus regimen** (basal long acting insulin given at night with rapid acting insulin given before every meal):

- **Twice daily pre-mixed regimen** (mixed intermediate and short/rapid insulin given BD, before breakfast and before dinner):

- **Other insulin regimes used in type 2 diabetes** (in addition to above)
  - Once daily morning/evening regimen (intermediate acting insulin may be given in the morning to supplement daytime oral hypoglycaemic medication or in the evening to reduce overnight/morning glucose levels; long acting insulin may also be used but is less common)
  - Twice daily intermediate regimen (less common)
Variable rate insulin infusions

- Used for diabetic patients who are nil by mouth e.g. peri-operatively
- The capillary glucose is checked 1-2 hourly and the rate of insulin infusion is modified accordingly (as per a pre-made protocol)
- Continuous IV fluids containing glucose must also be given to maintain basal glucose levels and hydration

Starting a variable rate insulin infusion
- Most hospitals have a variable rate insulin infusion chart which just needs a signature
- Continuous IV fluids also need prescribing as below
- If the patient is taking long acting insulin, this should be continued throughout (but short/rapid acting insulin must be suspended)

During a variable rate insulin infusion
- Continuous IV fluids
  - Surgical patients: 5% glucose/0.45% saline/ 0.15% KCl at 80ml/h
  - Medical patients: 5% glucose (1L with 20mmol KCl) at 100ml/h (unless capillary glucose is >15mmol/L, then give 0.9 saline until it returns to <15mmol/L)
- Check plasma Na⁺ and K⁺ daily
- Re-sign the variable rate insulin infusion chart daily
- The protocol’s infusion rates can be modified if the patient is particularly insulin resistant/sensitive

Stopping a variable rate insulin infusion
- Confirm patient is eating and drinking
- Ensure the patient has their long acting insulin on-board (given at least 1 hour before stopping)
- Give their usual mixed/rapid acting insulin at usual mealtime and wait 30 minutes before stopping the variable rate insulin infusion
- Monitor capillary glucose QDS for at least 24 hours

Example variable rate insulin infusion protocol

<table>
<thead>
<tr>
<th>Capillary glucose (mmol/L)</th>
<th>Infusion rate (UNITS/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4</td>
<td>Stop insulin</td>
</tr>
<tr>
<td>4-7</td>
<td>1</td>
</tr>
<tr>
<td>7-10</td>
<td>2</td>
</tr>
<tr>
<td>10-15</td>
<td>3</td>
</tr>
<tr>
<td>&gt;15</td>
<td>6</td>
</tr>
</tbody>
</table>

Insulin infusion is made up of 50 UNITS Actrapid insulin in 50ml 0.9% saline
**Insulin prescribing rules**

- Prescribe on insulin prescription chart if available (and write ‘insulin as per insulin prescription chart’ at all relevant times on main inpatient drug chart)
- You must write “UNITS” (do not abbreviate to U)
- Specify the brand name
- Indicate the device the patient uses (e.g. disposable pen, vial, pen cartridge)
- Write “pre-breakfast/lunch/dinner” rather than times if the insulin must be taken pre-meal
- Ensure you corroborate their prescription if unsure of a dose, never estimate

Example insulin prescription chart (basal bolus regimen):

<table>
<thead>
<tr>
<th>Time</th>
<th>Insulin name</th>
<th>Device</th>
<th>Dose</th>
<th>Doctor name (bleep)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-breakfast</td>
<td>Novorapid</td>
<td>Pen cartridge</td>
<td>5 UNITS</td>
<td>C Mansbridge (2272)</td>
<td>Cm</td>
<td>07/07/2015</td>
</tr>
<tr>
<td>Pre-lunch</td>
<td>Novorapid</td>
<td>Pen cartridge</td>
<td>5 UNITS</td>
<td>C Mansbridge (2272)</td>
<td>Cm</td>
<td>07/07/2015</td>
</tr>
<tr>
<td>Pre-dinner</td>
<td>Novorapid</td>
<td>Pen cartridge</td>
<td>7 UNITS</td>
<td>C Mansbridge (2272)</td>
<td>Cm</td>
<td>07/07/2015</td>
</tr>
<tr>
<td>Bedtime</td>
<td>Lantus</td>
<td>Vial</td>
<td>16 UNITS</td>
<td>C Mansbridge (2272)</td>
<td>Cm</td>
<td>07/07/2015</td>
</tr>
</tbody>
</table>

Example insulin prescription chart (twice daily pre-mixed regimen regimen):

<table>
<thead>
<tr>
<th>Time</th>
<th>Insulin name</th>
<th>Device</th>
<th>Dose</th>
<th>Doctor name (bleep)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-breakfast</td>
<td>Humulin M3</td>
<td>Pen cartridge</td>
<td>24 UNITS</td>
<td>C Mansbridge (2272)</td>
<td>Cm</td>
<td>07/07/2015</td>
</tr>
<tr>
<td>Pre-dinner</td>
<td>Humulin M3</td>
<td>Pen cartridge</td>
<td>22 UNITS</td>
<td>C Mansbridge (2272)</td>
<td>Cm</td>
<td>07/07/2015</td>
</tr>
</tbody>
</table>

**Acute management of hypo/hyperglycaemia**

- See notes on [diabetic emergencies](#)