Practical Aspects of Insulin Initiation

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Good Diabetes Management

...........is a balancing act
Establish HbA1c Individual Target

An HbA1c test calculates the amount of glucose carried by the red blood cells (haemoglobin) for the last 2 or 3 months. This test is useful for getting an idea of how well blood glucose levels are controlled. In the past, the HbA1c has been measured as a percentage.

To bring New Zealand into line with other countries, a change in the way HbA1c is measured will be phased in from August 2009 – August 2011. The measurement will change from a percentage to a molar unit expressed as millimoles per mol (mmol/mol).

NOTE: After August 2011, only molar units will be used.
Approach to the Management of Hyperglycemia

ADA. 6. Glycemic Targets. Diabetes Care 2015;38(suppl 1):S37. Figure 6.1; adapted with permission from Inzucchi SE, et al. Diabetes Care, 2015;38:140-149
Patient Education Check List: Initiation of Insulin Therapy

• Self-monitoring of blood glucose
• Insulin regimen
• How to administer insulin
• How to store the insulin and how to dispose of ‘sharps’
• Dietary and lifestyle advice
• Managing hypoglycaemia
• Driving: legal and practical issues

(Ministry of Health. New Zealand Primary Care Handbook 2012. Appendix 1, page 112.)
Patient Education Check List: Initiation of Insulin Therapy

• Provide Medic Alert bracelet information
• Provide contact and emergency telephone numbers
• Advise the patient where to get further self-help information
• Provide your patient with appropriate written pamphlets

(Ministry of Health. New Zealand Primary Care Handbook 2012. Appendix 1, page 113.)
Self Monitoring of Blood Glucose

• Why?
  ✓ Blood glucose profile and trouble spots
  ✓ Safety
  ✓ Effectiveness of treatment or lifestyle change
  ✓ Titration of medication or insulin
  ✓ Patient education

• When?
  ✓ Identifying patterns – fasting, pre and post meals
  ✓ Depends on insulin type and profile
Accurate Finger Pricking Technique

• Wash, Dry and Warm hands
• Milk > Prick > Milk
• Wipe away first drop of blood, test using second drop of blood

• Dip into blood drop

• Ensure test strip container closed tightly
• Store meter in its protective bag
## Example of Blood Glucose Testing

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Lunch Before</th>
<th>Lunch After</th>
<th>Dinner Before</th>
<th>Dinner After</th>
<th>Before Bed</th>
<th>O/Night</th>
<th>Remarks: activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.3</td>
<td>8.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.6</td>
<td></td>
<td>4.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>walked 3pm</td>
</tr>
<tr>
<td>11.5</td>
<td>6.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.8</td>
<td>9.2</td>
<td>5.1</td>
<td>7.7</td>
<td></td>
<td></td>
<td></td>
<td>walked 3pm</td>
</tr>
<tr>
<td>12.7</td>
<td></td>
<td>7.2</td>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
<td>Birthday dinner</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Insulin/Device Choice

- Insulin to suit blood glucose level profile
- Insulin to suit patient lifestyle
- Device to suit patient
Insulin Pens

Prefilled insulin pens

Reusable devices for use with cartridges
Pen Needles

- Needles prescription - 100 needles for 3 months
- 4 or 5 mm needles for most adults – no pinch technique
- Change needle every 1 – 3 injections
## NOVO NORDISK - BALANCING INSULIN AND DELIVERY.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Presentation</th>
<th>Schematic Time-Action Profile*</th>
<th>Insulin Profile*</th>
</tr>
</thead>
<tbody>
<tr>
<td>NovoRapid®</td>
<td>3ml Penfill®</td>
<td>3vials 10ml Vial</td>
<td>Onset: 10-20 minutes, Peak: 1-3 hours, Duration: 3-5 hours</td>
</tr>
<tr>
<td>Levemir®</td>
<td>FlexPen®</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actrapid®</td>
<td>3ml Penfill®</td>
<td></td>
<td>Onset: 30 minutes, Peak: 1-3 hours, Duration: 8 hours</td>
</tr>
<tr>
<td>Protaphane®</td>
<td>3ml Penfill®</td>
<td></td>
<td>Onset: 1-2 hours, Duration: 1.5 hours</td>
</tr>
<tr>
<td>PenMix® 30 &amp; Mixtard® 30 (10mL)</td>
<td>3ml Penfill®</td>
<td></td>
<td>Onset: 30 minutes, Peak: 2-6 hours, Duration: 24 hours</td>
</tr>
<tr>
<td>PenMix® 10</td>
<td>3ml Penfill®</td>
<td></td>
<td>Onset: 30 minutes, Peak: 2-6 hours, Duration: 24 hours</td>
</tr>
<tr>
<td>PenMix® 20</td>
<td>3ml Penfill®</td>
<td></td>
<td>Onset: 30 minutes, Peak: 2-6 hours, Duration: 24 hours</td>
</tr>
<tr>
<td>PenMix® 40</td>
<td>3ml Penfill®</td>
<td></td>
<td>Onset: 30 minutes, Peak: 2-6 hours, Duration: 24 hours</td>
</tr>
</tbody>
</table>

**Please review Data Sheet before prescribing. Full Data Sheet is available from the Novo Nordisk Customer Care Centre 0800 733 737. In clinical practice, the duration of insulin action may be shorter or longer than the durations specified. Variations between and within patients may occur depending upon injection site, insulin dosage, as well as diet and exercise. © Registered trademark of Novo Nordisk A/S. Novo Nordisk Pharmaceuticals Ltd PO Box 1768 Pakuranga, Auckland www.novonordisk.co.nz**

### Lilly Insulin Range

<table>
<thead>
<tr>
<th>Brand Name*</th>
<th>Type of Insulin (generic name / Product Description)</th>
<th>Presentation</th>
<th>Schematic Action Profile*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humalog®</td>
<td>Insulin lispro RAPID-ACTING</td>
<td>10ml vials and 3ml cartridges</td>
<td>Onset: 3-5 minutes, Duration: 5-6 hours</td>
</tr>
<tr>
<td>Humulin® R</td>
<td>Insulin neutral (Protamine)</td>
<td>3ml cartridges</td>
<td>Onset: 30 minutes, Duration: 3-4 hours</td>
</tr>
<tr>
<td>Humulin' NPH</td>
<td>Insulin neutral (Protamine)</td>
<td>3ml cartridges</td>
<td>Onset: 1 hour, Duration: 16-18 hours</td>
</tr>
<tr>
<td>Humalog® Mix25</td>
<td>Insulin lispro, Protamine suspension Ribe (PREMIXED INSULIN LEPRO)</td>
<td>10ml vials</td>
<td>Onset: 30 minutes, Duration: 16-18 hours</td>
</tr>
<tr>
<td>Humalog® Mix50</td>
<td>Insulin lispro, Protamine suspension Ribe (PREMIXED INSULIN LEPRO)</td>
<td>10ml vials</td>
<td>Onset: 30 minutes, Duration: 16-18 hours</td>
</tr>
</tbody>
</table>

**FULL RANGE NOW FUNDED**

**Humulin® Luxura can only be used with Lilly 3ml insulin cartridges, before prescribing please review the product data sheet.**

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![Image of a pen and a box of Lantus SoloStar](image-url)
Insulin Doses in Type 2 Diabetes

• Individual
  ✓ Different doses for different patients
  ✓ No maximum or minimum dose
• Requirements depend on
  ✓ insulin resistance
  ✓ beta cell function (decreases over time)
Insulin Doses in Type 2 Diabetes

• Start low dose and increase
• Dose changes can be made by phone, email
• Set a target blood glucose range depending on risks and benefits

✓ Preventing complications
✓ Avoiding hypoglycaemia

• Correct dose when BGL within target range
• Expectation that dose will change over time
• Constantly review
Insulin Doses in Type 2 Diabetes

*When might changes need to be made?*

- Hypoglycaemia
- Weight change
- Lifestyle change
- BGLs consistently > 15 mmol/L or out of target range
- Illness - chronic or acute
- Steroids/medications causing hyperglycaemia
- HbA1c not on target
Titrating Insulin

- Review glucose profiles regularly
- Check for hypos
- Assess and promote healthy lifestyle
- Look for BGL “trouble spots”
- Adjust the insulin peaking during the “trouble spots”
- If no insulin peaking at that time, consider introducing an additional insulin or a change in insulin regime
Injection Sites

• The abdomen is generally the preferred injection site.
Injection Sites

- Insulin absorption can be different between sites
- Lantus is reported to have consistent absorption regardless of injection site.
- Lantus can sting a little, due to acidic nature
- Inject insulin at room temperature
- Thigh is OK for nocte insulin
- Arms and buttocks not recommended
- Rotating injection sites is important for avoiding lipohypertrophy.

How to Administer Insulin

✔ MIX cloudy insulin by inverting pen 10 times
✔ PRIME pen before every injection (air shot) by:
  • DIAL up to 2 units, point needle to ceiling
  • watch needle tip as push in plunger
  • repeat until more than 2 drops of insulin expelled from needle
✔ DIAL up dose to give
✔ INJECT, depress plunger and HOLD for 10 seconds
✔ CHANGE needle after 1-3 injections
✔ NEVER store pen in fridge
✔ KEEP insulin out of direct sunlight or intense heat
✔ DO NOT use insulin that has been frozen, is expired or if the cartridge is damaged
✔ KEEP insulin out of reach of children
How to Store Insulin

- “Spare insulin” store in fridge
  - Preferably kept in its original packaging
- “In use insulin” < 25°C for 28 days
How to Dispose of ‘Sharps’

• Lancets and pen needles must be disposed of safely
• Local DHB have sharps disposal schemes
• In CCDHB, need to buy a sharps disposal container, or use solid plastic container, and can dispose of for free at local pharmacy
• Do not put sharps containers in domestic rubbish or recycling bins
Dietary and Lifestyle Advice
Physical Activity

• ↓ blood glucose
• ↑ sensitivity to insulin
• Helps ↓ weight, ↓ BP & ↓ lipids
• 30 mins per day
• Can be 10 mins x 3
• Anything that gets the body moving!
• Caution with existing complications
Managing Hypoglycaemia

• How to recognise symptoms
• How to manage and prevent hypoglycaemia
Driving: Legal and Practical Issues

Everyone starting insulin MUST be made aware of their responsibilities regarding driving.

Regular blood glucose testing, maintain a reasonable level of glycaemic control and hypoglycaemia avoidance/management is of the utmost importance.
Driving: Legal and Practical Issues

Any Type 2 patients on insulin who wish to hold a passenger licence, heavy vehicle licence or driving instructor licence are likely to require:

1. **Six-monthly medical certificate from a GP documenting:**
   - adherence to treatment
   - proof of regular self-testing of blood glucose with satisfactory levels
   - the absence of hypoglycaemic episodes or unawareness
   - the absence of significant diabetic complications

2. **A regular pattern of shifts with adequate meal breaks**

3. **A satisfactory annual specialist review**

Safety and Information

- Provide Medic Alert bracelet information
- Provide contact and emergency telephone numbers
- Advise the patient where to get further self-help information
- Provide your patient with appropriate written pamphlets

(Ministry of Health. New Zealand Primary Care Handbook 2012. Appendix 1, page 113.)
Sick Day Management
Travel

Preparation & precautions:

• Vaccinations
• Customs letter detailing all medication
• Customs (200mls maximum rule for liquids)
• Hypo treatment
• All diabetes supplies i.e. medication, insulin, pens, needles and testing equipment MUST be in hand luggage.
• Travel plan to negotiate time zones for insulin taking
• First aid kit
• Sick day action plan
• Consider insulin storage while away
• Possible changes in lifestyle while away, for example, diet, increased exercise
Diabetes Nurse Input

Islets of Humor

by Theresa Garnero