

## Basal Bolus / Multiple Daily Injections

The normal pancreas secretes basal insulin all day - when you eat, it releases a bolus of insulin to cover the rise in blood sugars. Basal bolus regime, or MDI as it is also known, aims to mimic the normal pancreas. You will inject yourself every evening before bed at the same time every night with your basal insulin called Lantus.

**Lantus (Basal):** is a long acting basal insulin that last for 24 hours. It works by slowly releasing insulin into your body over a whole day and night. This produces a constant level of insulin that helps control your blood sugar between meals. It is very important to rotate injection sites. Do not give Lantus and Novorapid in the same site or at the same time.

**Novorapid or Humalog (Bolus):** Is a rapid acting insulin and should be given 10-15 minutes before eating. You will be given an insulin to carbohydrate ratio (I: CHO), which helps you match the insulin to the amount on CHO in your food. You need to give at least 3 hours between Novorapid/Humalog injections to prevent stacking of insulin causing hypoglycaemia/low blood sugar.

**Corrections:** From now on you will be correcting for blood sugars over **13mmols/l**. You give a correction dose with mealtime insulin to prevent stacking of insulin causing hypoglycaemia/low blood sugar.

**Hypoglycaemia:** If you go low (<4mmol/L) on this regime you treat your low with 50mls Lucozade/100mls fizzy drink/juice/3 glucose sweets. Wait 10 minutes and re-check, if blood glucose still low repeat Lucozade. Once blood glucose level is over 4mmols take 15gm CHO snack e.g. 2 plain biscuits, slice of bread or piece of fruit.

**\*\*\* Always consider reason for low\*\*\***

### Common causes for Low Blood sugars:

1. Miscalculation in CHO counting.
2. Miscalculation in bolus insulin.
3. Exercise with no adjustment.
4. Illness.
5. Did not finish meal.

The fasting blood sugar in the morning is a good indication of how the Lantus dose is working. If low waking up it is likely the Lantus dose is too high – you will need to **reduce** this the following night by 10% to prevent another low from happening. Do not wait for patterns of lows, if you have one unexplained low then you must adjust the insulin causing that low immediately.

If you are low after a meal, this may be due to your ratio for that meal. To test if your ratio is right check a blood sugar 2 hours after eating. If the blood sugar is low it is likely the ratio for that mealtime is incorrect and needs to be changed. If your ratio is 1:10 you should try changing it to 1:12 or 1:15. This means you would be getting less insulin for that mealtime, thus prevent a low from re-occurring.

**Hyperglycaemia:** Always check for ketones if blood sugar **>14mmols**, if ketones are >1.0 you need to phone the hospital immediately on **01-428 2819**, or out of hours emergency number **01- 409 6121**.

**\*\*\* Always consider reason for high\*\*\***

### Common causes for High Blood sugars:

1. Miscalculation in CHO counting.
2. Miscalculation in bolus insulin.
3. Illness.
4. Injecting into lumpy site.
5. Insulin coming back out from site.
6. Missed bolus injection
7. Missed Lantus injection
8. Stress & anxiety.

The fasting blood sugar in the morning is a good indication of how the Lantus dose is working. If you have a pattern of highs waking up the Lantus dose is too low this would need to be increased the following night by 10% to prevent further high blood sugars from occurring. Always give 3 days for an insulin adjustment to work fully. Always wait for patterns of high blood sugars before adjusting the insulin to rule out other reasons for highs.

If you are high after a meal, your ratio may be incorrect. Check a blood sugar 2 hours post eating. If the blood sugar is high it is likely that the ratio for that mealtime is incorrect and needs to be changed. If the ratio is 1:10 you should try changing it to a ratio of 1:8. This means you will be getting more insulin for that mealtime, thus prevent a high from re-occurring.

**\*\* Remember to give the insulin dose for your carbs AND the insulin for the correction together \*\***

Try to stick to 4-5 injections a day. Leave a gap of three hours between Novorapid/Humalog injections this includes correction doses. Insulin will stack and cause hypoglycaemia if injections are given too close together.

When changing over to this regime start with the Lantus first. Drop your usual pm long acting insulin Insulatard/Levemir/Humulin I and give your dose of Lantus at a time that suits you in the evening. The following morning start with your Novorapid/Humalog I:CHO ratios.

**\*\*It is very important that you do not miss any injections on this regime as you run a higher risk of DKA \*\***

The main advantage to this regime is flexibility. However you will only get out what you put in.

**Rules for this Regime:**

1. Give your insulin.
2. Eat three/four times a day.
3. Count Carbohydrates correctly.
4. **No snacking.**
5. Always check for ketones when high.
6. Correct high blood sugars
7. If blood sugars are high/or you feel unwell always check for ketones. If ketones >1.0 then phone the hospital.

**\*\*\* To get you established on this regime we need accurate blood sugars and accurate food Diaries. \*\*\***

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