

Managing Diabetes on a Basal Bolus (multiple injection) Regime for Diabetes

Nutrition and Dietetic Department
New Cross Hospital
Wolverhampton WV10 0QP
Telephone Number 01902 695335



Dr. Hans Clean says “The prevention of infection is a major priority in all healthcare and everyone has a part to play.

- Wash your hands with soap and warm water and dry thoroughly. Use hand gel, if provided, in care facilities.
- If you have symptoms of diarrhoea and vomiting stay at home and do not visit relatives that are vulnerable in hospital or in residential care. You will spread the illness.
- Keep the environment clean and safe. Let’s work together to keep it that way. Prevention is better than cure”.

What is a basal bolus regime?

- It is an insulin regime which works in a similar way to how the body normally produces insulin
- Basal insulin gives background insulin at a constant rate and lasts for approximately 24 hours. You do not need to eat with this insulin.
Glargine (Lantus) or Detemir (Levemir) are examples of basal insulin.
- Bolus insulin is a rapid acting food insulin given at mealtimes. Novo Rapid and Humalog are examples of bolus insulin.

What are the benefits?

- Improve diabetes control.
- Reduce risk of hypos.
- Flexibility with meal times, portion size, food choice.
- Allows you to eat a wider variety of foods and include an occasional sugary food.
- Allows enjoyment of restaurant meals / takeaways.
- Helps predict blood glucose responses to different foods

To achieve these benefits you must regularly check your blood glucose (sugar) and learn how to work out the amount of carbohydrate eaten and insulin needed for the meal.

How do I count carbohydrates?

- Add up the carbohydrate count for the meal using the carbohydrate counting tables or look at the nutrition label of packaged foods.
- The carbohydrate counting tables list the carbohydrate content in one serving of the most common carbohydrate foods eaten. Compare this with your serving to help you work out how much carbohydrate you will be eating.
- Food labels will give you the amount of carbohydrate per 100grams. This should be the total carbohydrate content including both starches and sugars.
- When you know the amount of carbohydrate per 100grams you can weigh a serving of food and use the information to work out the carbohydrate content.

For example:

Cooked rice has 30 grams carbohydrate per 100 grams.

Your serving weighs 200 grams

$$\frac{200 \text{ grams} \times 30 \text{ grams}}{100} = 60 \text{ grams carbohydrate in a serving}$$

- Carbohydrate counting is not an exact science! You can round up or down to the nearest 5 grams of carbohydrate.

Which foods contain carbohydrates?

Carbohydrates are found in:

- Starchy foods such as bread, potato, rice, pasta, chapatti, couscous, beans and lentils, breakfast cereals, biscuits and other products made with flour such as pastry.
- Sugary foods and drinks such as sweet biscuits, cakes, pastries and puddings, sweets, chocolates and sweetened drinks.
- Fruit, fruit juices, some vegetables (peas, sweet corn)
- Dairy foods - milk and yoghurts, ice-cream and custard
- Processed foods - battered and bread-crumbed foods, processed meats such as sausages, salad dressings and 'cook in' sauces.

Foods which do not contain significant amounts of carbohydrate are:

- Protein foods - meat, fish, eggs, cheese and nuts.
- Fats - cooking oils and spreading fats.
- All other vegetables contain minimal amounts of carbohydrate.

Let's practice!

Using 1 unit of insulin to 10g (grams) carbohydrate divide the total carbohydrate of the meal by 10 to give you the dose of rapid acting insulin for the meal.

$$2 \text{ Shredded Wheat} + 200\text{mls milk} = \frac{30\text{g} + 10\text{g carbohydrate}}{10} = 4 \text{ units}$$

$$\text{Sandwich (2 medium slices bread) + 1 medium banana} \\ = \frac{30\text{g} + 20\text{g carbohydrate}}{10} = 5 \text{ units}$$

Average food portion size

Grams carbohydrate

1 medium slice bread	15
1 Weetabix	13
1 pitta bread (from multipack)	30
8 tablespoons cooked pasta	40
4 tablespoons cooked rice	40
1 medium jacket potato	60
4 egg sized boiled potatoes	40
1 digestive / 2 rich tea biscuits	10
1 scone / teacake	30
2 tablespoons sweet corn	15
1 orange / apple / pear	15
1 medium banana	20
1 small fruit (satsuma, kiwi, plum)	5
100-150ml pure fruit juice	15
200ml low fat / full fat milk	10
1 diet yoghurt	15

What is a healthy diet for diabetes?

- Eat regular meals.
- Include a breakfast, light meal and main meal.
- Always include a starchy carbohydrate food at each meal such as bread, cereal, potato, rice, pasta, chapatti, yam, green banana, noodles.
- Eat 3 portions of fruit and 2 or more portions of vegetables or salad each day. Have fruit as a snack or after a meal. At your main meal cover half your plate with 2-3 different vegetables. Add salad to your sandwiches.
- Cut back on fat - fried foods, pastry, crisps. Choose low fat milk, cheese and yoghurt.
- High fat foods such as fish and chips, pizza, burger and fries, Chinese, Indian and pasta meals are usually much higher in carbohydrate and fat and may take longer to digest.
- You may find giving insulin as soon as you have finished eating or splitting insulin dose works better with high fat meals. Ask for advice.

Do I need to eat snacks?

- The insulin given with meals lasts only for a short time. This means you are less likely to suffer a hypo between meals. Snacks are therefore optional.
- Snacks do not require insulin if midmorning and mid-afternoon snacks are kept to 15 grams of carbohydrate. For example a portion of fruit or a cereal bar or 2 plain biscuits or packet of low fat crisps or glass of milk.

For your bedtime snack you may eat up to 30 grams, carbohydrate such as cereal and milk / 2 slices of bread

- The long acting background insulin has fewer risks of hypo throughout the night so a bedtime snack may not be necessary. This is very individual and you may find that you do require a small supper snack such as a bowl of high fibre cereal or bread.
- If you have been exercising or drinking alcohol during the evening it is a good idea to have a bedtime snack as there is a greater risk of hypoglycaemia in the night.

How does exercise affect diabetes?

- Physical activity is encouraged as it improves health, regulates weight and has positive effects on blood glucose levels. Ideally a minimum of 30 minutes activity a day on five days a week is recommended.
- As exercise usually lowers blood glucose you may need to compensate by eating a carbohydrate snack before exercising or reducing the rapid acting meal insulin at the meal prior to the exercise. You may need to do both. Ask the doctor, nurse or dietitian usually seen at diabetes clinic for more advice.
- If the activity is strenuous such as playing a sport, you may need to reduce the insulin dose for the meal following exercise. The effects of increased activity can last for up to 24 hours. A starchy carbohydrate supper is advised.
- Fast acting carbohydrates are good for short bursts of intense exercise e.g. sports drinks/fruit juices.
- Medium acting carbohydrates are better for longer periods of exercise e.g. cereal bars, fruit scone, chocolate covered biscuits.
- You should never exercise if you are unwell, have ketones or if blood glucose $>13\text{mmol/l}$ check for ketones first.

What about alcohol?

- If you are old enough to drink, then the carbohydrate in alcohol should not be counted. Alcohol can lower blood glucose, even up to the next day so make sure you do not drink on an empty stomach. Take care with alcopops and liqueurs. They are sugary and can higher the blood glucose first but lower it later on.
- Keep a check on your blood glucose levels after drinking alcohol to monitor the effect of all types of alcoholic drinks on your blood glucose levels.
- A supper snack is recommended after drinking alcohol in the evening.
- Keep to recommended daily limits for alcohol:

Female = 2 units

Male = 3 units

1 unit is 1 small glass wine

1 pub measure spirits

250ml beer, lager or cider

How much insulin should I give?

Basal (background) insulin

- You will be given a starting dose for Glargine (Lantus) or Detemir (Levemir). This will be adjusted, usually weekly to achieve pre breakfast (fasting) blood sugars between 4-7mmol/l.
- It must be given at the same time each day. Your diabetes specialist will help you decide on a convenient time to give this insulin.
- The dose needs to be correct before you can achieve the right dose for the bolus (meal) rapid insulin.

Bolus (meal) insulin

- The dose given will depend on how much carbohydrate you eat. You can work this out using the carbohydrate tables at the back of this booklet.
- This insulin should be given just before you eat but it can be given during the meal and up to 15 minutes after the start of the meal. This is useful if you are eating out, unsure of how much you will be eating or you are hypoglycaemic (blood glucose less than 4 mmol/l) before your meal.

Typically 1 unit of rapid acting insulin will cover between 5-20 grams of carbohydrate. You will be advised on how much carbohydrate to 1 unit of insulin.

Can I check if I have given the right dose of insulin?

- Test your blood glucose before the meal and 2 hours later. If you have given enough insulin your blood glucose will have remained the same or will be only 2-3mmol/l higher.
- If the blood glucose is higher then you will not have given enough meal insulin.
- If lower you will have given too much insulin.
- Keeping a record using your diet diary will help you to make adjustments. Learn from it and find out what works for different meals and at different times of the day.
- Your body's sensitivity to insulin can vary at different times of the day. Blood glucose can be affected by the type of food eaten for example glycaemic index and level of physical activity.

What if my blood glucose is high?

- A correction dose can be added on to the meal insulin if the blood glucose reading is too high. Check with your diabetes specialist first. For example if the insulin dose was not enough at the previous meal.
- 1 unit of rapid acting insulin will usually lower the blood glucose by around 2.5mmol/l - 5mmol/l
E.g. Pre meal blood glucose is 12 mmol/l and the target is 7mmol/l. You will need to lower the blood glucose by 5mmol/l. This means adding an extra 2 units of rapid acting insulin ($2 \times 2.5 = 5$) to your meal insulin dose.
- If you are giving a lot of correction doses contact the diabetes specialist for further advice to guide you on the background insulin dose / ratios.

For further advice contact your

Registered Dietitian: _____

Telephone Number: _____

Diabetes Specialist Nurse: _____

Telephone Number: _____

Useful references:

- Food and Diet counter
Dr. Wynnie Chan. ISBN 0-600-60709
- Collins Gem Carbohydrate Counter. ISBN 0-600-60709-7
- The Fat, Fibre and Carbohydrate Counter
Dell Stanford ISBN 1-85391-803-2
- Carbs and Cals – Chris Cheyette and Yello Balolia
www.carbsandcals.com
info@carbsandcals.com

If you require this document in an alternative format e.g., larger print, different language etc., please inform one of the healthcare staff.

Punjabi

ਜੇ ਤੁਹਾਡੇ ਲਈ ਇਸਦੀ ਕੋਈ ਹੋਰ ਢੰਗ ਦੀ ਜ਼ਰੂਰਤ ਹੈ ਜਿਵੇਂ ਵੱਡੇ ਅੱਕਰ, ਵੱਖਰੇ ਭਾਸ਼ਾ ਆਦਿ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਇਸ ਸੇਵਾ ਦੇ ਕੋਈ ਸਾਥੀ ਸੰਪਰਕ ਕਰੋ।

Polish

Aby uzyskać niniejszy dokument w innym języku lub formacie, np. pisany dużą czcionką, itp., prosimy skontaktować się z przedstawicielem personelu medycznego.

Russian

Если данный документ требуется Вам в альтернативном формате, например крупным шрифтом, на другом языке и т.п., просьба сообщить об этом одному из сотрудников здравоохранения.

Lithuanian

Jei pageidaujate šį dokumentą gauti kitu formatu, pvz., padidintu šriftu, išverstą į kitą kalbą ir t. t., prašėkite apie tai sveikatos priežiūros darbuotojui.

Kurdish

ئەگەر تۆم بەئێوەدا بەهێڵێکە بە ئێنگلیزیکی دەتوانێت بە ئێوەوە چۆنی گۆڕێت، زۆرێکی دەتوانێت، ئەگەر تۆم بەئێوەدا بە ئێوەوە گۆڕێت، ئەگەر تۆم بەئێوەدا بە ئێوەوە گۆڕێت، ئەگەر تۆم بەئێوەدا بە ئێوەوە گۆڕێت.



www.nhsdirect.nhs.uk
Dial 08454647

Whenever you need health advice and information

Designed & Produced by the Department of Medical Illustration,
New Cross Hospital, Wolverhampton, WV10 0QP Tel: 01902 695377.