# In the consultation room
# Practicalities of insulin initiation

Gwen Hall

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### About this series

The aim of the "In the consultation room" series is to provide readers with brief, practical reviews of key aspects of diabetes care that should be covered in the clinic setting.

### Author

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**Author's introduction**

In this edition we consider the practicalities of insulin initiation in adults with type 2 diabetes. Standards to be considered here were published in the previous edition (Hall, 2013) and should be read in conjunction with this article. In addition, TREND-UK has published competences you should meet (TREND-UK, 2011). It should also be borne in mind that you may need specialist support. Finally, it is not within the scope of this short article to make you proficient in initiating insulin but it will provide pointers to other sources of information to support good practice.

In this brief look at the practicalities of insulin initiation, the first important question to ask is: Where should insulin be used? The answer to that is as follows:

- In newly diagnosed type 1 diabetes.
- Where a patient is symptomatic (e.g. weight loss, lethargy).
- Where there is failure to meet agreed targets on maximum-tolerated doses of non-insulin therapy.
- In steroid-induced diabetes.
- In gestational diabetes.
- In people with diabetes and post-acute myocardial infarction (following the DIGAMI study [Malmberg, 1997]).

Here we focus on those people who have type 2 diabetes.

## Which insulin?

Firstly, you need to know the time–action profile of various insulins and the difference between "human" and analogue insulins. Refer to Diabetes UK wallcharts on insulin, pen devices and monitoring equipment (available from http://bit.ly/Yo1zJB [accessed 07.06.13]) and undertake the *Safe Use of Insulin* e-module if you have not previously done so (NHS Diabetes, 2010).

In general, the insulin should be chosen to match the individual's life, rather than the individual having to change his or her life to match the insulin. Some specific things to consider here are:

- Dexterity.
- Vision.
- Eating patterns.
- Lifestyle.
- Occupation.
- Agreed frequency of injections.
- Ability to grasp techniques.

## Initiation

Whatever the insulin that is to be initiated, you should support the person with diabetes in performing a "dummy" injection as early as possible as it can help allay any fears they may have with regard to the injection itself.

In type 2 diabetes, NICE (2008; 2009) and SIGN (2010) guidelines recommend beginning with NPH (Neutral Protamine Hagedorn) "human" insulin (Insulatard®, Humulin I® or Insuman® Basal), although some alternatives are recommended – including long-acting analogues – under certain circumstances (for which you are referred to the full guidelines). Some points on NPH insulin to consider are as follows.

- It has an intermediate-duration action (Diabetes UK, 2012):
  - Longer than that of the short-/rapid-acting insulins.
  - Not as long as that of the insulin analogues glargine (Lantus®) and detemir (Levemir®).
- It is generally taken once or twice daily (NICE, 2009).
- If taken at bedtime, its peak of action can be associated with nocturnal hypos (e.g. Horvath et al, 2007).
- Fear of hypos, in my experience, encouraged many health professionals to change to the newer analogues.

- Finally, continuation of other medication needs to be considered.

Alternatively, NICE advises that if the $HbA_{1c}$ is 75 mmol/mol (9%) or greater then a pre-mixed insulin should be used. Points to consider are given below.

- These combine an intermediate-acting insulin with either a short-acting ("human") one or a rapid-acting (analogue) one.
- They are generally taken once or twice a day (NICE, 2009), normally before meals (Diabetes UK, 2012).
- They may need to be accompanied with a snack at bedtime if blood glucose lows or hypoglycaemia are occurring in the night.
- These are cloudy insulins and must be re-suspended before use.
- The main difference for discussion with the person with diabetes on pre-mixed preparations is that the "human" insulins should be taken a period of time before food (the periods recommended for each preparation are given in Diabetes UK, 2012), while the analogues should be taken immediately before food or even straight after food if necessary.

There is no clear evidence to suggest that any particular approach has significant advantages if hypoglycaemia and weight gain are taken into account (Holman et al, 2009; Lasserson et al, 2009).

## Which dose to start

Once-a-day regimens, either NPH or pre-mixed preparations, often start with 10 units at bedtime, but they may be much higher depending on:

- Weight.
- Duration of diabetes.
- Duration and amount of tolerated oral therapy.
- Previous $HbA_{1c}$ results.

Check fasting pre-breakfast blood glucose levels and titrate to target. Once fasting levels are stable, reassess for need for additional short-/rapid-acting boluses before meals (a "basal plus" regimen).

In a twice-daily pre-mixed regimen, two-thirds of the daily dose is normally given in the morning and a third in the evening, but this will need titration to match individuals' blood glucose monitoring results.

It would not be usual for a full basal–bolus regimen to be the starting insulin regimen in primary care, although the team will need to know how to manage it for some individuals. It is outside the scope of this article.

Some algorithms suggest that basal insulin is started at 10 units or 0.1–0.2 units/kg body weight (Crasto et al, 2009; Royal College of Nursing, 2012), but be cautious in slim individuals, who can be very insulin sensitive. They, and those with poor renal function, steroid use or other comorbidities, may benefit from specialist support. ■

### Author's conclusion

Starting insulin is not easy for health professionals and people with diabetes alike. It takes time and experience and should not be undertaken unless you are confident and have support. There is a wide choice of insulins and devices – the trick is to help the individual choose the one that matches their lifestyle and not to ask them to change their lifestyle to match the insulin you know.


Crasto W, Jarvis J, Khunti K, Davies MJ (2009) New insulins and new insulin regimens: a review of their role in improving glycaemic control in patients with diabetes. *Postgrad Med J* **85**: 257–67

Diabetes UK (2012) *Insulins* (wallchart). Diabetes UK, London. Available at: http://bit.ly/1bd6IFL (accessed 07.06.13)

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Holman RR, Farmer A, Davies Met al (2009) Three year efficacy of complex insulin regimens in type 2 diabetes. 4T Study Group. *N Engl J Med* **361**: 1736–47

Horvath K, Jeitler K, Berghold A et al (2007) Long-acting insulin analogues versus NPH insulin (human isophane insulin) for type 2 diabetes mellitus. *Cochrane Database Syst Rev* **2**: CD005613

Lasserson DS, Glaaziou P, Perera R et al (2009) Optimal insulin regimens in type 2 diabetes mellitus: systematic review and meta-analyses. *Diabetologia* **52**: 1990–2000

Malmberg K (1997) Prospective randomised study of intensive insulin treatment on long term survival after acute myocardial infarction in patients with diabetes mellitus. DIGAMI (Diabetes Mellitus, Insulin Glucose Infusion in Acute Myocardial Infarction) Study Group. *BMJ* **314**: 1512–5

NHS Diabetes (2010) *Safe use of insulin*. NHS Diabetes, Newcastle Upon Tyne. Available at: http://www.diabetes.nhs.uk/safety/ (accessed 07.06.13)

NICE (2008) *Type 2 diabetes (CG66)*. NICE, London. Available at: http://www.nice.org.uk/CG66 (accessed 07.06.13)

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Royal College of Nursing (2012) *Starting injectable treatment in adults with Type 2 diabetes*. RCN, London. Available at: http://bit.ly/b15lQQ (accessed 07.06.13)

SIGN (2010) *Management of diabetes: A national clinical guideline*. SIGN, Edinburgh. Available at: http://www.sign.ac.uk/pdf/sign116.pdf (accessed 07.06.13)

TREND-UK (2011) *An Integrated Career and Competency Framework for Diabetes Nursing* (3rd edition). SB Communications Group, London. Available at: www.trend-uk.org (accessed 07.06.13)


**Further reading and resources**

A. Remember to provide the insulin passport (details available from http://bit.ly/19619wb [accessed 07.06.13])

B. Titration and technique is covered in the Royal College of Nursing (2012) guide *Starting injectable treatment in adults with Type 2 diabetes*.

C. Other sensible advice is available in the *Guidelines for Insulin Initiation and Adjustment in Primary Care in patients with Type 2 Diabetes* (available from http://bit.ly/18bD6MP [accessed 07.06.13]).