

# Updated NICE guideline on type 1 diabetes in adults: Implications for primary care

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## Article points

1. Adults with type 1 diabetes should be offered a structured education programme of proven benefit.
2. Adults with type 1 diabetes should generally be supported to aim for a target HbA<sub>1c</sub> level of 48 mmol/mol (6.5%) or lower, but there should be agreed and individualised targets.
3. Adults with type 1 diabetes should be supported to test their blood glucose at least four times a day, and up to 10 times a day under certain circumstances.
4. Multiple daily injection basal–bolus insulin regimens should be offered, rather than twice-daily mixed insulin regimens, as the insulin regimen of choice for all adults with type 1 diabetes.
5. Awareness of hypoglycaemia should be assessed at each annual review.

## Key words

- NICE guidelines
- Type 1 diabetes

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**In this article, the authors, who were members of the guideline development group, present the key recommendations from the updated NICE guideline on type 1 diabetes in adults (NG17), along with other relevant aspects for primary care clinicians.**

**T**he updated guideline on type 1 diabetes in adults was published in August 2015 (NICE, 2015a). It updates the guideline on type 1 diabetes in adults (CG15) from 2004.

The updated guideline has been published in summary form (containing all the recommendations), as information for the public (a version without medical jargon), as a NICE pathway, and as a full version. The full version contains all the evidence that has been assessed and the important “linking evidence to recommendation” sections, which outline the discussion of the guideline development group (GDG) as it developed specific recommendations from the evidence. This is a fundamental part of guideline development, where the latest clinical and cost-effectiveness evidence is considered in comparison with the clinical significance of the research to ensure that a sensible and practical recommendation is made from the viewpoint of patient benefit and use of NHS resources.

The GDG was asked to review all of the recommendations and choose which would be its key priorities. Here we discuss those chosen key recommendations, as well as other significant aspects of the guideline relevant to primary care. With clinical commissioning groups expecting clinicians to manage type 1 diabetes in primary care, it is essential that primary care clinicians are aware of the update and, in particular, its recommendations for practice.

## Key priorities for implementation

Key priorities for implementation are presented in brief in *Box 1* and considered in more detail below.

## Education and information

At present, only a small minority of adults with type 1 diabetes will have attended a structured education programme (Diabetes UK, 2015). This guideline, by placing education as a key priority, seeks to ensure that the offer is made to all. It also means that commissioners should ensure that there is sufficient local course provision so that all can attend. DAFNE (Does Adjustment for Normal Eating) is named as an example, based on the latest evidence showing it to be effective as well as NICE compliant. The use of other structured education programmes is supported by the guideline, provided that the course offered includes the components listed in *Box 2*. Of other note and relevance to primary care is that for those who have not attended structured education, regardless of duration of diabetes, and for those unwilling to attend group education, an alternative should be offered. Therefore, primary care clinicians should be encouraged to provide this support for their patients with type 1 diabetes and ensure that they are being offered appropriate education whether cared for in primary or secondary care and at least have the ability to signpost available resources. The guidance also recommends that adults with type 1 diabetes should be aware that structured education is an integral part of diabetes care.

## Blood glucose control

The GDG realises that the blood glucose control targets (see *Box 1*) are tough but stresses that these need to be individualised collaboratively. The HbA<sub>1c</sub> target is an optimal target that has

**Box 1. A summary of the key priorities for implementation from the updated NICE guideline on type 1 diabetes in adults (NICE, 2015a).**

**Education and information**

- Offer all adults with type 1 diabetes a structured education programme of proven benefit, such as the DAFNE [Dose Adjustment for Normal Eating] programme. Offer this programme 6–12 months after diagnosis.

**Blood glucose control**

- Support adults with type 1 diabetes to aim for a target HbA<sub>1c</sub> level of 48 mmol/mol (6.5%) or lower, to minimise the risk of long-term vascular complications.
- Agree an individualised HbA<sub>1c</sub> target with each adult with type 1 diabetes, taking into account factors such as the person's daily activities, aspirations, likelihood of complications, comorbidities, occupation and history of hypoglycaemia.

**Self-monitoring of blood glucose**

- Support adults with type 1 diabetes to test at least four times a day, and up to 10 times a day if any of the following apply.
  - The target for blood glucose control, measured by HbA<sub>1c</sub> level, is not achieved.
  - The frequency of hypoglycaemic episodes increases.
  - There is a legal requirement to do so (such as before driving, in line with the Driver and Vehicle Licensing Agency advice).
  - During periods of illness.
  - Before, during and after sport.

- When planning pregnancy, during pregnancy and while breastfeeding.
- If there is a need to know blood glucose levels more than four times a day for other reasons (e.g. impaired awareness of hypoglycaemia or high-risk activities).

- Advise adults with type 1 diabetes to aim for:

- A fasting plasma glucose level of 5–7 mmol/L on waking. *AND*
- A plasma glucose level of 4–7 mmol/L before meals at other times of the day.

**Insulin therapy**

- Offer multiple daily injection basal–bolus insulin regimens, rather than twice-daily mixed insulin regimens, as the insulin injection regimen of choice for all adults with type 1 diabetes. Provide the person with guidance on using multiple daily injection basal–bolus insulin regimens.

**Awareness of hypoglycaemia**

- Assess awareness of hypoglycaemia in adults with type 1 diabetes at each annual review.

**Care of adults with type 1 diabetes in hospital**

- Enable adults with type 1 diabetes who are hospital inpatients to self-administer subcutaneous insulin if they are willing and able and it is safe to do so.

been shown to be associated with the lowest risk of vascular complications and increased quality adjusted life-years (as covered in section 8.1 of the full guideline [<http://bit.ly/1VDrrik>]). It is therefore a gold standard to be aimed for as an ideal and may not be appropriate for all. The GDG hoped that recommending this ideal target might help to avoid the clinical inertia associated

with other higher targets, which may, particularly in younger people, be leaving individuals at unnecessary risk of complications in the future.

**Self-monitoring of blood glucose**

The recommendations relating to self-monitoring of blood glucose (SMBG) have a good evidence base. Primary care clinicians and healthcare

**Box 2. Components required in a structured education programme for adults with type 1 diabetes (NICE, 2015a).**

- It is evidence-based, and suits the needs of the person.
- It has specific aims and learning objectives, and supports the person and their family members and carers in developing attitudes, beliefs, knowledge and skills to self-manage diabetes.
- It has a structured curriculum that is theory-driven, evidence-based and resource-effective, has supporting materials, and is written down.
- It is delivered by trained educators who have an understanding of educational theory appropriate to the age and needs of the person, and who are trained and competent to deliver the principles and content of the programme.
- It is quality assured, and reviewed by trained, competent, independent assessors who measure it against criteria that ensure consistency.
- The outcomes are audited regularly.

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professionals in medicines management need to act upon these recommendations to ensure that adults with type 1 diabetes are provided with the number of boxes of SMBG test strips per month that they require. The cost difference associated with four (and even up to 10) test strips was negligible in comparison with the benefit (covered in section 8.2 of the full guideline [<http://bit.ly/1VDrrik>]).

People with type 1 diabetes should not be deterred from testing, and primary care must provide sufficient strips for individuals to test up to 10 times per day, and in certain cases more. This is vital for effective self-management of this complex condition, and to avoid adverse effects on lifestyle, work and driving (and the potential medico-legal implications of patients being refused test strips should also not be forgotten). With the implementation of this guidance, the distress for individuals of being refused test strips will be avoided.

The fasting target of 5–7 mmol/L is new and is based on research demonstrating that a fasting glucose of less than 5 mmol/L is more likely to be associated with a low glucose during the night (Choudhary et al, 2013). Therefore, the recommendations suggest a pre-bed target that is associated with a fasting glucose in the range of 5–7 mmol/L, to avoid overnight lows.

#### **Insulin therapy**

The guideline recommends multiple daily injections (MDIs) as the insulin regimen of choice. People currently on twice-daily mixed insulin regimens should be given the opportunity to understand this recommendation and to discuss with their diabetes team whether they should consider moving to the MDI regimen. It should be borne in mind that this is not a simple insulin regimen switch and offering a structured education package would be essential to support this change.

#### **Awareness of hypoglycaemia**

The recommendation to assess awareness of hypoglycaemia at the annual review highlights the concern of the GDG that this is being neglected. It will need to be performed in general practice if the adult with type 1 diabetes

is not attending secondary care. A further recommendation in the guideline suggests that the Gold score or Clarke score (see page 380 of the full guideline [<http://bit.ly/1VDrrik>]), or a similar validated tool, should be used to quantify awareness of hypoglycaemia. For these to be effective, it is crucial that they are used appropriately. Perhaps this should be a focus of continuing professional development training for all those involved in the management and annual assessment of people with type 1 diabetes in primary care. Hypoglycaemia unawareness may be more common than clinicians realise, and because it is a risk to both the person with diabetes and the people around them (with potentially significant impacts on activities such as driving), it is essential that affected individuals are helped to identify that they have the problem and are then managed appropriately.

#### **Care of adults with type 1 diabetes in hospital**

The guideline has a whole section on recommendations on the care of adults with type 1 diabetes in hospital, but as these have no specific significance for primary care they will not be discussed in detail.

#### **Other significant recommendations that will impact primary care**

##### **Choice of insulin**

Many of the recommendations in the guideline are non-controversial and support what is currently seen as best practice. However, there are others where an evidence base is emerging that means current practice needs to change. In the area of which insulin to recommend, the GDG felt that there was an emerging evidence base to suggest that analogue insulins should be the first choice for adults with type 1 diabetes. The following recommendations have therefore been made.

- 1** Offer twice-daily insulin detemir as basal insulin therapy.
- 2** Consider, as an alternative, basal insulin therapy:
  - a an existing insulin regimen being used by the person that is achieving the agreed targets;

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b once-daily insulin glargine or insulin detemir if twice-daily basal insulin injection is not acceptable to the person, or once-daily insulin glargine if insulin detemir is not tolerated.

3 Offer rapid-acting insulin analogues injected before meals, rather than soluble human or animal insulins, for meal-time insulin replacement in adults with type 1 diabetes.

This is not new practice in type 1 diabetes, but is very different to the insulin guidance for type 2 diabetes, which continues to recommend human insulin as basal insulin at the first step (NICE, 2015b). As is described in section 9.2 of the full guideline [<http://bit.ly/1VDrrik>], the basal insulin choice in type 1 diabetes is based on the latest evidence from studies of the condition. The evidence is in general weak, but the GDG felt it significant enough to offer a clinical difference and made recommendations accordingly. Previously, there may have been a practice of rapid-acting analogues being given during or after a meal, but this is not ideal or recommended unless in very specific circumstances.

### Insulin delivery

With regard to insulin delivery, the advice in this update, it seems, is also going to be adopted in the updated NICE guideline for the management of type 2 diabetes and thus is particularly worthy of discussion here. Of major note for all primary care clinicians advising and supporting people who inject insulin is the advice on needle length. Having reviewed the latest research evidence, the GDG felt there to be no one optimal needle length and no clinically significant evidence to make more specific guidance than patients should be offered a needle that is 8 mm or less in length. Adults with type 1 diabetes who are experiencing problems such as pain, local skin reactions and injection-site leakage, or new problems with glycaemic control, should be offered the opportunity to try different needles to the ones they are using.

The GDG highlighted that the quality of the evidence was weak and open to bias and identified needle length and injection site rotation as areas requiring further research. Until further research is published, primary care clinicians need to be aware that needle length should, fundamentally,

be based on individual patient choice, with consideration given to the depth of subcutaneous tissue at different injection sites and the volume being injected.

### Metformin

The GDG felt that there was an emerging evidence base for metformin use and so made the following recommendation: Consider adding metformin to insulin therapy in adults with type 1 diabetes and a BMI of 25 kg/m<sup>2</sup> or above who want to improve their blood glucose control while minimising their effective insulin dose.

### Ketone self-monitoring for the prevention of diabetic ketoacidosis

The guideline recommends consideration of ketone monitoring (blood or urine) to facilitate self-management of an episode of hyperglycaemia. Primary care should be willing to prescribe the appropriate test strips to facilitate this recommendation.

### Managing hypoglycaemia

The guideline recommends the use of intramuscular glucagon given by a family member or friend who has been shown how to use it. Primary care can facilitate this recommendation by prescribing glucagon and ensuring that someone other than the person with diabetes is aware of how and when to use it.

### Thyroid disease monitoring

The guideline recommends that thyroid-stimulating hormone be measured at annual review. This will need to be carried out in the primary care setting if that is where the person with type 1 diabetes is receiving routine care.

### Aspirin

The guideline notes that aspirin should not be offered for the primary prevention of cardiovascular disease in adults with type 1 diabetes.

### Conclusion

It is clear from this article that primary care not only needs to be aware of these updated type 1 diabetes guidelines for adults but also needs to be prepared to play its part in implementing them. ■

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