

# NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

## SCOPE

### 1 Guideline title

Type 2 diabetes: management of type 2 diabetes in adults

#### 1.1 Short title

Type 2 diabetes in adults

### 2 The remit

This is an update of [Type 2 diabetes](#) (NICE clinical guideline 66) and [Type 2 diabetes: newer agents](#) (NICE clinical guideline 87). See section 4.3.1 for details of which sections will be updated. We will also carry out an editorial review of all the recommendations to ensure that they comply with NICE's duties under equality legislation.

This is the scope for 1 of 4 NICE clinical guidelines being developed that address diabetes care. Included below is a summary of the content for each guideline and of the NICE steering committee.

Guideline 1 – **Diabetes in children and young people** (developed by the National Collaborating Centre for Women's and Children's Health)

This guideline will update [Type 1 diabetes in children, young people and adults](#) (NICE clinical guideline 15). It will cover the diagnosis and management of type 1 and type 2 diabetes in children and young people (younger than 18 years). It will include: structured education programmes, behavioural interventions to improve adherence, glucose monitoring strategies, ketone monitoring, insulin regimens for type 1 diabetes and metformin monotherapy for type 2 diabetes.

**Guideline 2 – Diabetes in pregnancy** (developed by the National Collaborating Centre for Women’s and Children’s Health)

This guideline will update [Diabetes in pregnancy](#) (NICE clinical guideline 63). It will cover women of reproductive age who have pre-existing diabetes or who develop diabetes during pregnancy and it will also cover their newborn babies. It will include: target glucose ranges in the preconception period and during pregnancy, glucose monitoring strategies during pregnancy, screening, diagnosis and treatment of gestational diabetes, and postnatal testing for type 2 diabetes.

**Guideline 3 – Type 1 diabetes in adults** (developed by the National Clinical Guideline Centre)

This guideline will update [Type 1 diabetes in children, young people and adults](#) (NICE clinical guideline 15). It will cover adults (18 years or older) with type 1 diabetes. It will include: tests to differentiate type 1 diabetes from type 2 diabetes, structured education programmes, clinical monitoring of glucose control, insulin regimens, ketone monitoring, dietary advice on carbohydrate counting and glycaemic index, and treatment and monitoring of specific complications.

**Guideline 4 –Type 2 diabetes in adults** (developed by the Internal Clinical Guidelines Programme, Centre for Clinical Practice, NICE)

This guideline will update [Type 2 diabetes](#) (NICE clinical guideline 66) and [Type 2 diabetes: newer agents](#) (NICE clinical guideline 87). It will cover adults (18 years or older) with type 2 diabetes. It will include: pharmacological management of blood glucose levels, target values for blood glucose control, self-monitoring of blood glucose levels for blood glucose control, antithrombotic therapy and drug therapy for erectile dysfunction.

## **NICE steering committee**

NICE has set up a steering committee to oversee the production of these clinical guidelines. The group, which includes the Guideline Development Groups' chairs, together with staff from the 3 guidance-producing centres and NICE, will identify and act on any gaps or overlaps across the different guidance topics to ensure that the final guidelines are complementary and consistent. It is intended that the guidance-producing centres will share systematic reviews and cross-refer to recommendations in the other guidelines where appropriate. This update is being undertaken as part of the guideline review cycle.

## **3 Clinical need for the guideline**

### **3.1 *Epidemiology***

- a) Type 2 diabetes is a condition of insufficient insulin production often exacerbated by insulin resistance, the primary treatment for which is weight loss and exercise. Pharmacological measures to increase insulin sensitivity or to increase insulin release can be added to lifestyle interventions, but insulin therapy may eventually be needed by the majority of people as their insulin secretion declines. Like type 1 diabetes, type 2 diabetes has a significant impact on lifestyle in the short term, and is associated with major long-term complications and reduced life expectancy. There are 2.9 million people known to be diagnosed with diabetes in the UK, with an average prevalence of approximately 4.45%. Currently, it is thought that more than 1 in 20 of the UK population has diagnosed or undiagnosed diabetes and incidence rates are increasing. Approximately 90% of adults currently diagnosed with diabetes have type 2 diabetes.
- b) Type 2 diabetes mainly develops in people aged over 40 years, although it is usually diagnosed earlier in people of South Asian,

Chinese, African or African Caribbean family origin. It can occur in all age groups and is increasingly being diagnosed in children. People who are overweight or obese, have inactive lifestyles or have a family history of diabetes are at risk. It is more prevalent in less-affluent populations and in people of South Asian, Chinese, African or African-Caribbean family origin.

- c) Type 2 diabetes can lead to acute metabolic disturbances such as hyperglycaemia (high blood glucose). If prolonged, hyperglycaemia can cause irreversible complications. These can include microvascular complications such as diabetic retinopathy (eye damage), nephropathy (kidney damage) and neuropathy (nerve damage), and macrovascular complications such as cardiovascular disease (for example, coronary heart disease, cerebrovascular disease and peripheral vascular disease). The UK Prospective Diabetes Study (UKPDS) found that approximately 50% of people newly diagnosed with type 2 diabetes already have complications. The study recognised the need for early diagnosis and screening for people in high-risk groups.
- d) People receiving pharmacological therapy for type 2 diabetes may also be susceptible to hypoglycaemia (low blood glucose). Increasing age and longer duration of diabetes may be associated with an increased risk of hypoglycaemia. Hypoglycaemic episodes range from mild to severe and the most serious episodes can be life-threatening.
- e) It is estimated that approximately 10% of NHS expenditure goes on diabetes care. The presence of diabetic complications can lead to a 5-fold increase in a patient's NHS costs and people with diabetes can experience prolonged stays in hospital. Life-expectancy for people with type 2 diabetes is reduced by an average of 5 to 7 years, and the impact on quality of life can be considerable.

### **3.2 Current practice**

- a) Initial management of type 2 diabetes typically involves lifestyle interventions, although as the condition progresses glucose-lowering therapies may be needed to control blood glucose levels. Many people start on metformin therapy, but some people may require alternative or additional glucose-lowering therapies. Many people may progress to insulin therapy as their insulin secretion declines. Regular monitoring of blood glucose levels can help people with diabetes to manage their risk of developing complications. The current NICE recommended target for blood glucose control in people with type 2 diabetes is haemoglobin A1c (HbA<sub>1c</sub>) of 6.5% (48 mmol/mol is now used in clinical practice). However, specific targets may be individualised to meet people's needs, taking into consideration their risk of hypoglycaemia, cardiovascular risk and other comorbidities.
  
- b) Good management of blood pressure (including the use of angiotensin-converting enzyme [ACE] inhibitors, calcium-channel blockers and diuretics) and the management of blood lipid levels (including the use of statins and fibrates) can help to prevent or delay the onset of microvascular or macrovascular complications.
  
- c) The 2011 review of NICE clinical guidelines 66 and 87 identified new evidence in a number of areas and recommended that the guidelines should be updated. In particular, new evidence was found relating to the pharmacological management of blood glucose. This includes newly licensed combinations, as well as safety concerns about some classes of glucose-lowering therapies. The effect of drugs coming off patent may also have an impact on health-economic issues. There are new members of the dipeptidyl peptidase 4 (DPP-4) inhibitor class of drugs and new indications for licensed class members. New evidence has also arisen relating to the use of aspirin in the primary prevention of cardiovascular disease.

## **4 The guideline**

The guideline development process is described in detail on the NICE website (see section 6, 'Further information').

This scope defines what the guideline will (and will not) examine, and what the guideline developers will consider. The scope is based on the referral from the Department of Health.

The areas that will be addressed by the guideline are described in the following sections.

### **4.1 Population**

#### **4.1.1 Groups that will be covered**

- a) Adults (aged 18 years and older) with type 2 diabetes.
- b) Specific patient sub-groups for whom the management of type 2 diabetes may vary. These may include (but are not restricted to):
  - adults aged 65 years and older
  - people with renal impairment
  - people in specific ethnic groups
  - people in specific cardiovascular risk groups.

#### **4.1.2 Groups that will not be covered**

- a) Children and young people with type 1 or type 2 diabetes (this will be addressed in a separate guideline).
- b) Adults (aged 18 years and older) with type 1 diabetes (this will be addressed in a separate guideline).
- c) Diabetes in pregnancy (this will be addressed in a separate guideline).

### **4.2 Healthcare setting**

- a) All settings in which NHS care is received or commissioned.

## **4.3 Clinical management**

### **4.3.1 Key clinical issues that will be covered**

Note that guideline recommendations will normally fall within licensed indications; exceptionally, and only if clearly supported by evidence, use outside a licensed indication may be recommended. The guideline will assume that prescribers will use a drug's summary of product characteristics to inform decisions made with individual patients.

#### **Areas from the original guidelines that will be updated by an evidence review**

a) Pharmacological management of blood glucose levels. The following blood glucose-lowering therapies will be examined as part of treatment strategies involving monotherapy, dual therapy and triple therapy<sup>1</sup>:

- DPP-4 inhibitors:
  - sitagliptin, vildagliptin, linagliptin and saxagliptin
- glucagon-like peptide-1 (GLP-1) receptor agonists:
  - exenatide (conventional formula and prolonged release), lixisenatide and liraglutide
- thiazolidinediones (peroxisome proliferator-activated receptor gamma [PPAR- $\gamma$ ] agonists):
  - pioglitazone
- sulfonylureas
- metformin
- insulin
- acarbose
- meglitinides.

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<sup>1</sup> The following drugs were not previously included in the original guidelines but will be covered in this update: DPP-4 inhibitors (linagliptin and saxagliptin); GLP-1 receptor agonist (lixisenatide).

- b) Target values for blood glucose control:
- HbA<sub>1c</sub>
  - fasting blood glucose
  - post-prandial blood glucose.
- c) Self monitoring of blood glucose levels (finger pricks). This will include:
- Targets
  - Frequency of monitoring
  - Timing
  - Site of testing
- d) Antithrombotic therapy:
- Clopidogrel and aspirin for the primary prevention of cardiovascular disease.
- e) Drug therapy for erectile dysfunction:
- Phosphodiesterase 5 (PDE-5) inhibitors
  - Testosterone therapy
  - Alprostadil.

#### **4.3.2 Clinical issues that will not be covered**

##### **Areas from the original guidelines that will not be updated by an evidence review**

- a) Patient education (including structured education).
- b) Dietary advice.
- c) Management of depression.
- d) Screening for diabetic retinopathy.

- e) Pharmacological management of blood glucose levels:
- sodium glucose cotransporter 2 (SGLT-2) inhibitors. It is intended that these drugs will be covered by NICE technology appraisals guidance. The clinical guideline intends to use these drugs as comparators but will not make new recommendations on their use
  - rosiglitazone (original recommendations removed following European Medicines Agency [EMA] safety warning, September 2010)
  - alogliptin (full license not anticipated to be in time for inclusion within the guideline)
- f) Blood pressure control (including target values and pharmacological management).

**Areas from the original guidelines that will be removed**

- g) No areas from the original guidelines will be removed.

**Areas not covered by the original guidelines or the update**

- h) Diagnosis of type 2 diabetes.
- i) Primary prevention of type 2 diabetes.
- j) Ketone testing of blood glucose and urine
- k) The management of hypoglycaemia, unless this is as a consequence of pharmacological interventions for hyperglycaemia.
- l) The diagnosis and management of diabetic retinopathy.
- m) Peripheral arterial disease comprising peripheral vascular disease (PVD) and peripheral sensory neuropathy (PSN).
- n) Surgical interventions: the use and effectiveness of bariatric surgery for the management of type 2 diabetes (this is covered in [Obesity](#) [NICE clinical guideline 43]).

**The following NICE guidance will be cross-referred to**

- o) Identification of arterial risk, interventions to reduce risk (with the exception of aspirin) and blood pressure management:
- [Hypertension](#). NICE clinical guideline 127 (2011).
  - [Lipid modification](#). NICE clinical guideline 67 (2007). An update of clinical guideline 67 is in progress.
  - [Statins for the prevention of cardiovascular events](#). NICE technology appraisal 94 (2006).
- p) Insulin pumps:
- [Continuous subcutaneous insulin infusion for the treatment of diabetes mellitus](#). NICE technology appraisal 151 (2008).
- q) Kidney disease:
- [Chronic kidney disease](#). NICE clinical guideline 73 (2008). An update of clinical guideline 73 is in progress.
- r) Diabetic foot problems:
- [Diabetic foot problems - inpatient management](#). NICE clinical guideline 119 (2011).
  - [Type 2 diabetes - footcare](#). NICE clinical guideline 10 (2004).
- s) Painful neuropathy:
- [Neuropathic pain](#). NICE clinical guideline 96 (2010). An update of clinical guideline 96 is in progress.
  - [Spinal cord stimulation for chronic pain of neuropathic or ischaemic origin](#). NICE technology appraisal 159 (2008).
- t) Monitoring and management of special situations including eating disorders, depression, or other psychological problems:
- [Anxiety](#). NICE clinical guideline 113 (2011).

- [Depression with a chronic physical health problem](#). NICE clinical guideline 91 (2009).
- [Depression in adults](#) (update). NICE clinical guideline 90 (2009).
- [Nutrition support in adults](#). NICE clinical guideline 32 (2006).
- [Eating disorders](#). NICE clinical guideline 9 (2004).

#### **4.4 Main outcomes**

- a) Changes in blood glucose levels (including HbA<sub>1c</sub>).
- b) Changes in weight or body mass index (BMI).
- c) Frequency and severity of hypoglycaemic episodes.
- d) Adverse events.
- e) The development of microvascular and macrovascular complications.
- f) Changes in lipid levels and blood pressure<sup>2</sup>.
- g) Mortality.
- h) Quality of life.
- i) Resource use and cost.

#### **4.5 Review questions**

##### **Pharmacological management of blood glucose levels**

- Which pharmacological blood glucose-lowering therapies should be used as monotherapy to control blood glucose levels in people with type 2 diabetes?

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<sup>2</sup> Treatment strategies that have the primary aim of controlling blood pressure and/or lipid levels are excluded from consideration in this update (see 4.3.2 f and g) however, any effect that included treatments have on blood pressure and/or lipid levels is an outcome of interest.

- Which pharmacological blood glucose-lowering therapies should be used as part of dual therapy to control blood glucose levels in people with type 2 diabetes?
- Which pharmacological blood glucose-lowering therapies should be used as part of triple therapy to control blood glucose levels in people with type 2 diabetes?
- What are the long-term effects of pharmacological interventions to control blood glucose levels in people with type 2 diabetes, including adverse events and impact on development of microvascular and macrovascular complications?

### **Target values for glucose control**

- What are the optimal target values for HbA<sub>1c</sub>, fasting blood glucose and post-prandial blood glucose in people with type 2 diabetes?

### **Self monitoring of plasma glucose**

- Should self monitoring be used to manage blood glucose levels in people with type 2 diabetes?

### **Antithrombotic therapy**

- Should aspirin and/or clopidogrel be used for primary prevention of cardiovascular disease in people with type 2 diabetes?

### **Erectile dysfunction**

- What pharmacological treatment should be used to manage erectile dysfunction in men with type 2 diabetes?

## **4.6 Economic aspects**

Developers will take into account both clinical and cost effectiveness when making recommendations involving a choice between alternative interventions. A review of the economic evidence will be conducted and analyses will be carried out as appropriate. The preferred unit of effectiveness is the quality-adjusted life year (QALY), and the costs considered will usually be only from an NHS and personal social services (PSS) perspective. Further

detail on the methods can be found in 'The guidelines manual' (see 'Further information').

## **4.7 Status**

### **4.7.1 Scope**

This is the final version of the scope.

### **4.7.2 Timing**

The development of the guideline recommendations will begin in October 2012.

## **5 Related NICE guidance**

### **5.1 Published guidance**

#### **5.1.1 NICE guidance to be updated**

Depending on the evidence, this guideline might update and replace parts of the following NICE guidance:

- [Type 2 diabetes: newer agents](#). NICE clinical guideline 87 (2009).
- [Type 2 diabetes](#). NICE clinical guideline 66 (2008).
- TA248 (exenatide prolonged-release) and TA203 (liraglutide).

#### **5.1.2 NICE guidance to be incorporated**

This guideline will incorporate the following NICE guidance subject to a technology appraisal review proposal agreement:

- Dapagliflozin in combination therapy for the treatment of type 2 diabetes (ID427)
- Canagliflozin for type 2 diabetes mellitus (ID554)

#### **5.1.3 Other related NICE guidance**

- [Lower limb peripheral arterial disease](#). NICE clinical guideline 147 (2012).
- [Preventing type 2 diabetes: risk identification and interventions for individuals at high risk](#). NICE public health guidance 38 (2012).

- [Patient experience in adult NHS services](#). NICE clinical guideline 138 (2012).
- [Hyperglycaemia in acute coronary syndromes](#). NICE clinical guideline 130 (2011).
- [Ranibizumab for the treatment of diabetic macular oedema](#). NICE technology appraisal guidance 237 (2011).
- [Preventing type 2 diabetes: population and community-level interventions in high-risk groups and the general population](#). NICE public health guidance 35 (2011).
- [Clopidogrel and modified-release dipyridamole for the prevention of occlusive vascular events](#). NICE technology appraisal guidance 210 (2010).
- [Depression with a chronic physical health problem](#). NICE clinical guideline 91 (2009).
- [Depression in adults](#). NICE clinical guideline 90 (2009).
- [Medicines adherence](#). NICE clinical guideline 76 (2009).
- [Continuous subcutaneous insulin infusion for the treatment of diabetes mellitus](#). NICE technology appraisal guidance 151 (2008).
- [Smoking cessation services](#). NICE public health guidance 10 (2008).
- [Obesity](#). NICE clinical guideline 43 (2006).
- [Nutrition support in adults](#). NICE clinical guideline 32 (2006).
- [Four commonly used methods to increase physical activity](#). NICE public health guidance 2 (2006).
- [Type 1 diabetes](#). NICE clinical guideline 15 (2004).

## **5.2 Guidance under development**

NICE is currently developing the following related guidance (details available from the NICE website):

- Fluocinolone acetonide intravitreal implant for the treatment of diabetic macular oedema. NICE technology appraisal guidance. Publication expected November 2012.

- Obesity – working with local communities. NICE public health guidance. Publication expected 2013.
- Type 1 diabetes (update). NICE clinical guideline. Publication expected 2014.
- Diabetes in children (update). NICE clinical guideline. Publication expected 2014.
- Diabetes in pregnancy. NICE clinical guideline. Publication expected 2014.
- Chronic kidney disease (update). NICE clinical guideline. Publication expected 2014.
- Lipid modification (update). NICE clinical guideline. Publication expected 2014.
- Buccal insulin for the management of type 1 diabetes. NICE technology appraisal guidance. Publication date to be confirmed.
- Pegaptanib sodium for the treatment of diabetic macular oedema. NICE technology appraisal guidance. Publication date to be confirmed.
- Ranibizumab for the treatment of macular oedema caused by retinal vein occlusion. NICE technology appraisal guidance. Publication date to be confirmed.
- Canagliflozin for the treatment of type 2 diabetes. NICE technology appraisal guidance. Publication date to be confirmed.
- Dapagliflozin for the treatment of type 2 diabetes. NICE technology appraisal guidance. Publication date to be confirmed.
- Empagliflozin for type 2 diabetes. NICE technology appraisal guidance. Publication date to be confirmed.

## 6 Further information

Information on the guideline development process is provided in the following documents, available from the NICE website:

- [‘How NICE clinical guidelines are developed: an overview for stakeholders the public and the NHS’](#)
- [‘The guidelines manual’](#).

Information on the progress of the guideline will also be available from the [NICE website](#).