



## Identifying patients at risk of type 2 diabetes

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# Identifying patients at risk of type 2 diabetes

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**What** are the risk factors for type 2 diabetes?

**How** should risk assessment be carried out?

**How** should high-risk patients be managed?



**AT PRESENT THERE ARE NEARLY 3 MILLION PEOPLE WITH DIABETES IN THE UK. IT IS PREDICTED THAT**

this number will almost double by 2025. Nine out of ten of these individuals will have type 2 diabetes.

It is clear that we must act to identify those at risk and intervene before the disease process becomes established. It is estimated that one in seven adults have impaired glucose regulation<sup>2</sup> and up to 12% of these will develop type 2 diabetes each year.<sup>1</sup>

The impact of obesity on the development of type 2 diabetes cannot be overemphasised with a 1 kg/m<sup>2</sup> increase in BMI raising the risk of impaired fasting glycaemia by 9.5% and of developing new-onset type 2 diabetes by 8.4%. A 1 cm increase in waist circumference increases the risks by 3.2% and 3.5% respectively.

In July 2012, NICE published guidance on the identification (see figure 1, p26) and management of type 2 diabetes in adults who are at high risk which should

help primary care clinicians to tackle this potential time bomb.<sup>3</sup>

## **RISK ASSESSMENT**

The guidance advises using a validated risk assessment tool to identify patients at risk of diabetes. Individuals could use a self-assessment tool or opportunistic assessment could be offered at GP surgeries, community pharmacies, dental surgeries, occupational health departments, optical practices, leisure facilities and care homes.

Suitable tools include:

- FINDRISC, a self-assessment questionnaire developed in Finland
- Diabetes UK risk score devised by Leicester University ([www.diabetes.org.uk/Riskscore](http://www.diabetes.org.uk/Riskscore))
- Cambridge diabetes risk score
- Leicester practice score
- QDiabetes risk calculator ([www.qdscore.org](http://www.qdscore.org))

The latter three risk scores are well suited to GPs as they use a validated computer-based risk assessment tool using data routinely available from

electronic health records to identify patients on the practice register at high risk of type 2 diabetes.

Risk factors used by such tools include: age; ethnicity; weight; first-degree relative with type 2 diabetes; low birthweight and sedentary lifestyle.

Certain comorbidities increase the risk of type 2 diabetes, these include:

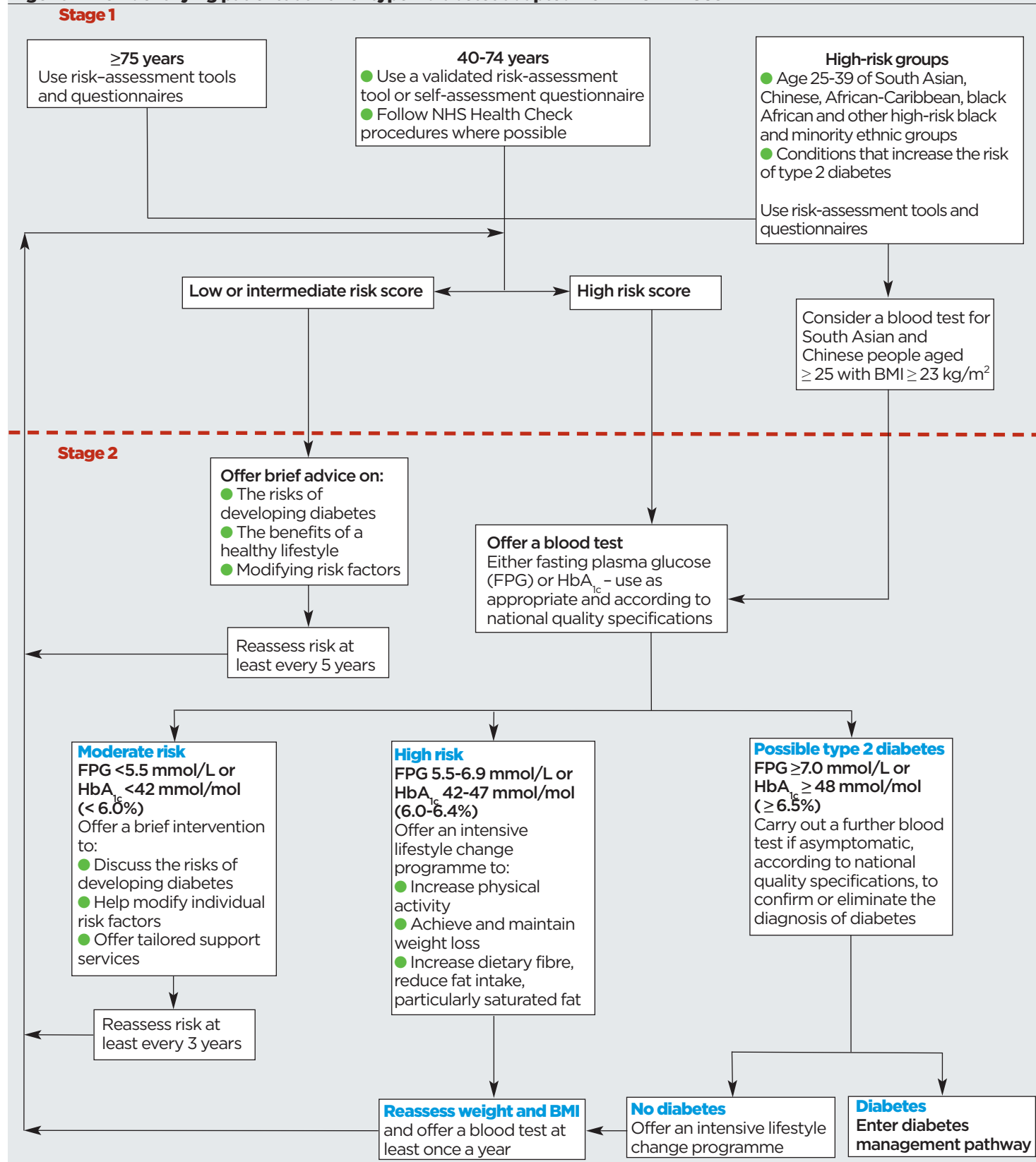
- cardiovascular disease
- cerebrovascular disease
- polycystic ovary syndrome
- a history of gestational diabetes
- mental health problems

NICE also recommends that other health professionals such as pharmacists, opticians and occupational health nurses should either offer a validated self-assessment questionnaire or provide information on how to access online self-assessment tools to people aged 40 or more (excluding pregnant women), those of South Asian and Chinese descent aged 25–39 years and those with conditions that increase the risk of type 2 diabetes (see above).

Individuals found to have a high risk »

**Figure 1**

**Algorithm for identifying patients at risk of type 2 diabetes adapted from NICE PHG38<sup>5</sup>**



# key points

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**At present there are nearly 3 million people with diabetes** in the UK. It is predicted that this number will almost double by 2025. Nine out of ten of these individuals will have type 2 diabetes. It is estimated that one in seven adults have impaired glucose regulation and up to 12% of these will develop type 2 diabetes each year. The impact of obesity on the development of type 2 diabetes cannot be overemphasised, with a 1 kg/m<sup>2</sup> increase in BMI raising the risk of impaired fasting glycaemia by 9.5% and of developing new-onset type 2 diabetes by 8.4%. A 1 cm increase in waist circumference increases the risks by 3.2% and 3.5% respectively.

**NICE advises using a validated risk assessment tool** to identify patients at risk of diabetes. Risk factors used by such tools include: age; ethnicity; weight; first-degree relative with type 2 diabetes; low birthweight and sedentary lifestyle. Certain comorbidities increase the risk of type 2 diabetes, these include: cardiovascular and cerebrovascular disease; polycystic ovary syndrome; a history of gestational diabetes; and mental health problems.

**The initial screening blood test could be a fasting plasma glucose, HbA<sub>1c</sub>, or an oral glucose tolerance test**, according to WHO criteria. NICE recommends that high-risk patients should be offered a programme encouraging them to undertake a minimum of 150 minutes of moderate intensity physical activity a week, gradually lose weight to reach and maintain a BMI within the healthy range, increase consumption of whole grains, vegetables, and other foods that are high in dietary fibre, reduce the total amount of fat in their diet and eat less saturated fat.

**Patients with a high risk score and fasting plasma glucose 5.5–6.9 mmol/L or HbA<sub>1c</sub> 42–47 mmol/mol (6.0–6.4%) and those without symptoms of type 2 diabetes with a fasting plasma glucose  $\geq$  7.0 mmol/L, or an HbA<sub>1c</sub>  $\geq$  48 mmol/mol ( $\geq$  6.5%) at their first blood test (but whose second blood test did not confirm a diagnosis of type 2 diabetes)** should be monitored with a blood test and weight/BMI measurement at least once a year.

**Metformin should be given to support lifestyle change** for adults who are at high risk with fasting plasma glucose or HbA<sub>1c</sub> that shows progression towards type 2 diabetes. NICE advises using clinical judgement on whether to offer orlistat to people with a BMI  $\geq$  28 as part of an overall plan for managing obesity.

## Useful information

### Diabetes UK

[www.diabetes.org.uk](http://www.diabetes.org.uk)

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score are advised to contact their GP practice for a fasting plasma glucose or HbA<sub>1c</sub> test.

If the fasting plasma glucose is  $\geq$  7.0 mmol/L, or HbA<sub>1c</sub>  $\geq$  48 mmol/mol ( $\geq$  6.5%), but with no symptoms of type 2 diabetes, a second blood test should be offered to identify possible type 2 diabetes.

The initial screening blood test could be a fasting plasma glucose, HbA<sub>1c</sub>, or an oral glucose tolerance test, according to WHO criteria. However, it is likely that most practices will choose an HbA<sub>1c</sub> which removes the need for fasting and is quick and easy to perform.

## MANAGEMENT

NICE recommends that high-risk patients should be offered a programme encouraging them to undertake a minimum of 150 minutes of moderate intensity physical activity a week, gradually lose weight to reach and maintain a BMI within the healthy range, increase consumption of whole grains, vegetables, and other foods that are high in dietary fibre, reduce the total amount of fat in their diet and eat less saturated fat.

These programmes may be delivered to groups of 10–15 people who meet at least eight times over 9–18 months. Participants should have at least 16 hours of contact time either within a group, on a one-to-one basis, or a combination of both approaches.

Follow-up sessions should be at regular intervals for at least two years after the initial intervention period. For those attending group programmes, larger group sizes may be feasible for these maintenance sessions. NICE advocates the use of behavioural change techniques to support lifestyle change with participants advised to set achievable, and personally relevant, short- and long-term goals such as losing 5–10% of their weight in one year.

Furthermore, the guidance recommends that patients with a BMI of  $\geq$  30 ( $\geq$  27.5 if South Asian or Chinese) should undertake a structured weight loss programme as part of, or as a supplement to, the intensive programme of lifestyle change.

Patients with a high risk score and fasting plasma glucose 5.5–6.9 mmol/L or HbA<sub>1c</sub> 42–47 mmol/mol (6.0–6.4%) and those without symptoms of type 2 diabetes with a fasting plasma glucose  $\geq$  7.0 mmol/L, or an HbA<sub>1c</sub>  $\geq$  48 mmol/mol ( $\geq$  6.5%) at their first blood test (but whose second blood test did not confirm a diagnosis of type 2 diabetes) should be monitored with a blood test

and weight/BMI at least once a year.

NICE considers the use of metformin and orlistat in high-risk patients. Metformin should be given to support lifestyle change for adults who are at high risk with fasting plasma glucose or HbA<sub>1c</sub> that shows progression towards type 2 diabetes despite participation in an intensive programme of lifestyle change or who are unable to participate because of disability or medical reasons.

Starting with a low dose (500 mg once daily) is recommended increasing gradually, as tolerated, to 1,500–2,000 mg daily. If the patient is intolerant of standard metformin the modified release preparation can be considered. This should continue for 6–12 months with a fasting plasma glucose or HbA<sub>1c</sub> measured at three monthly intervals. Metformin should be stopped if the HbA<sub>1c</sub>, or other measure, does not show a trend to improvement.

NICE advises using clinical judgement on whether to offer orlistat to people with a BMI  $\geq$  28 as part of an overall plan for managing obesity.

A low-fat diet that provides 30% of energy as fat, distributed over three main meals a day should be advised and referral to a dietician or 'other appropriate healthcare professional' considered.

Orlistat use should be reviewed after 12 weeks and stopping considered if weight loss of at least 5% of original body weight has not been achieved.

## CONCLUSION

The NHS Health Check programme ensures that everyone aged 40–74 years who has not been diagnosed with diabetes, CKD or vascular disease is offered an initial risk assessment. The programme offers those at increased risk of diabetes a blood test (fasting glucose or HbA<sub>1c</sub>) and offers advice on weight loss, diet and physical activity.

This new NICE guidance dovetails with the NHS Health Check programme but clear and timely communication between risk assessment providers and primary care will be essential for it to succeed. Furthermore, primary care will need to co-ordinate closely with community-based lifestyle and weight management services to deliver the lifestyle change component.

## REFERENCES

- 1 Diabetes UK. Diabetes in the UK 2012. Key statistics on diabetes. 2012 [www.diabetes.org.uk](http://www.diabetes.org.uk)
- 2 Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia. Report of a WHO/IDF consultation. 2006
- 3 National Institute for Health and Clinical Excellence. PHG38. Preventing type 2 diabetes: risk identification and interventions for individuals at high risk. NICE. London. 2012