

Identifying Type 2 diabetes early

Diabetes UK has been calling for early identification of people with Type 2 diabetes for many years, to reduce the impact of diabetes on individuals and on NHS resources. However, up to 750,000 people with Type 2 diabetes remain undiagnosed in the UK, despite evidence showing that people with Type 2 diabetes have the condition for between nine and twelve years¹ before diagnosis. The UKPDS² showed that up to 50 per cent of people with Type 2 diabetes had already developed complications such as cardiovascular disease, neuropathy, nephropathy and retinopathy by the time they were diagnosed with the condition.

Who should be screened?

General population screening is not recommended; instead Diabetes UK recommends targeted case finding among high risk groups. The following people should be screened for diabetes:

a) White people aged over 40 years and people from black (including people of African-Caribbean origin), Asian and minority ethnic groups aged over 25 with one or more of the risk factors below:

- a first degree family history of diabetes and/or
- overweight/obese/morbidly obese with a BMI of 25 kg/m² and above, with a sedentary lifestyle and/or
- waist measurement $\geq 94\text{cm}$ (≥ 37 inches) for white and black men, and $\geq 90\text{cm}$ (≥ 35 inches) for Asian men, and $\geq 80\text{cm}$ (≥ 31.5 inches) for white, black and Asian women.

b) People who have ischaemic heart disease, cerebrovascular disease, peripheral vascular disease or treated hypertension.

c) Women who have had gestational diabetes, who have tested normal following delivery (screen within six weeks of delivery and then one year post-partum and then three-yearly).

d) Women with polycystic ovary syndrome who have a BMI ≥ 30 .

e) People who are known to have impaired glucose tolerance or impaired fasting glycaemia.

f) People who have severe mental health problems.

g) People who have hypertriglyceridaemia not due to alcohol excess or renal disease.

The more risk factors a person has, the more likely they are to be at risk of diabetes and the greater the sensitivity and specificity of a screening test. Evidence is not currently strong enough to weight individual risk factors.

References

¹Diabetes UK (2000) UK Diabetes Information Audit and Benchmarking Service (UKDIABS) London: Diabetes UK

²UKPDS Group (1990) UK Prospective Diabetes Study 6. Complications in newly diagnosed Type 2 diabetic patients and their association with different clinical and biochemical risk factors. *Diabetes Research* **13**: 1-11

The importance of waist measurement

Waist circumference is a very practical way to assess body fat, particularly abdominal fat, and is a good predictor of increased health risk, including risk of Type 2 diabetes. A person's waist circumference has been shown to be an independent risk factor for people with a normal body mass index (BMI). Indeed, for older people and people of South Asian origin it has been shown to be more useful than BMI as a predictor of health risk. (Although more accurate than body weight alone, risk assessment using BMI may overestimate body fat in people who are very muscular or underestimate body fat in those who have lost muscle mass.) It is important people are informed that the measurements on their trousers are not always accurate and that an actual measurement is taken. When measuring waist circumference, the measurement needs to be taken at the mid-point between the top of the hip bone and the lowest rib. Ensure the tape is snug but does not compress the skin and is parallel to the floor. The measurement should be made when the patient has breathed out.

What screening method should be used?

Choice of screening methods should be based on local circumstances, such as the availability of staff, methods of follow up, etc. As a screening programme, though random testing may be easier to do, for diagnosing it is better to use fasting or OGTT.

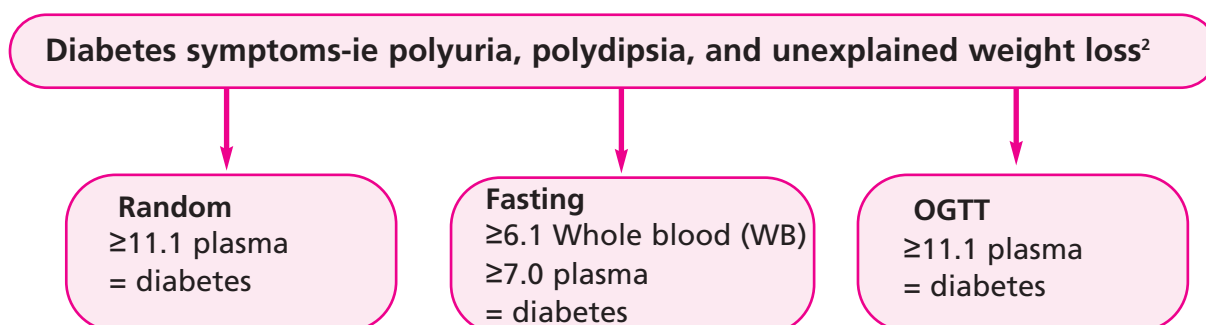
Oral glucose tolerance test (OGTT). This is the 'gold standard' for assessment of carbohydrate tolerance. While a full supervised OGTT would represent the best possible screening test for diabetes it is not usually practical when large numbers of people are being screened.

(WHO diagnostic threshold: presence of symptoms plus two hour plasma glucose concentration ≥ 11.1 mmol/l two hours after 75g anhydrous glucose).

Fasting blood glucose. Fasting blood glucose is a remarkably constant parameter on a day-to-day basis in both people without diabetes and those with Type 2 diabetes. In a screening context it is a useful single test, although it will inevitably miss those people with a carbohydrate intolerance whose hyperglycaemia is only manifest after a carbohydrate load. Fasting tests are best done first thing in the morning before breakfast. (WHO diagnostic threshold: presence of symptoms plus fasting plasma glucose concentration ≥ 7.0 mmol/l (whole blood ≥ 6.1 mmol/l)).

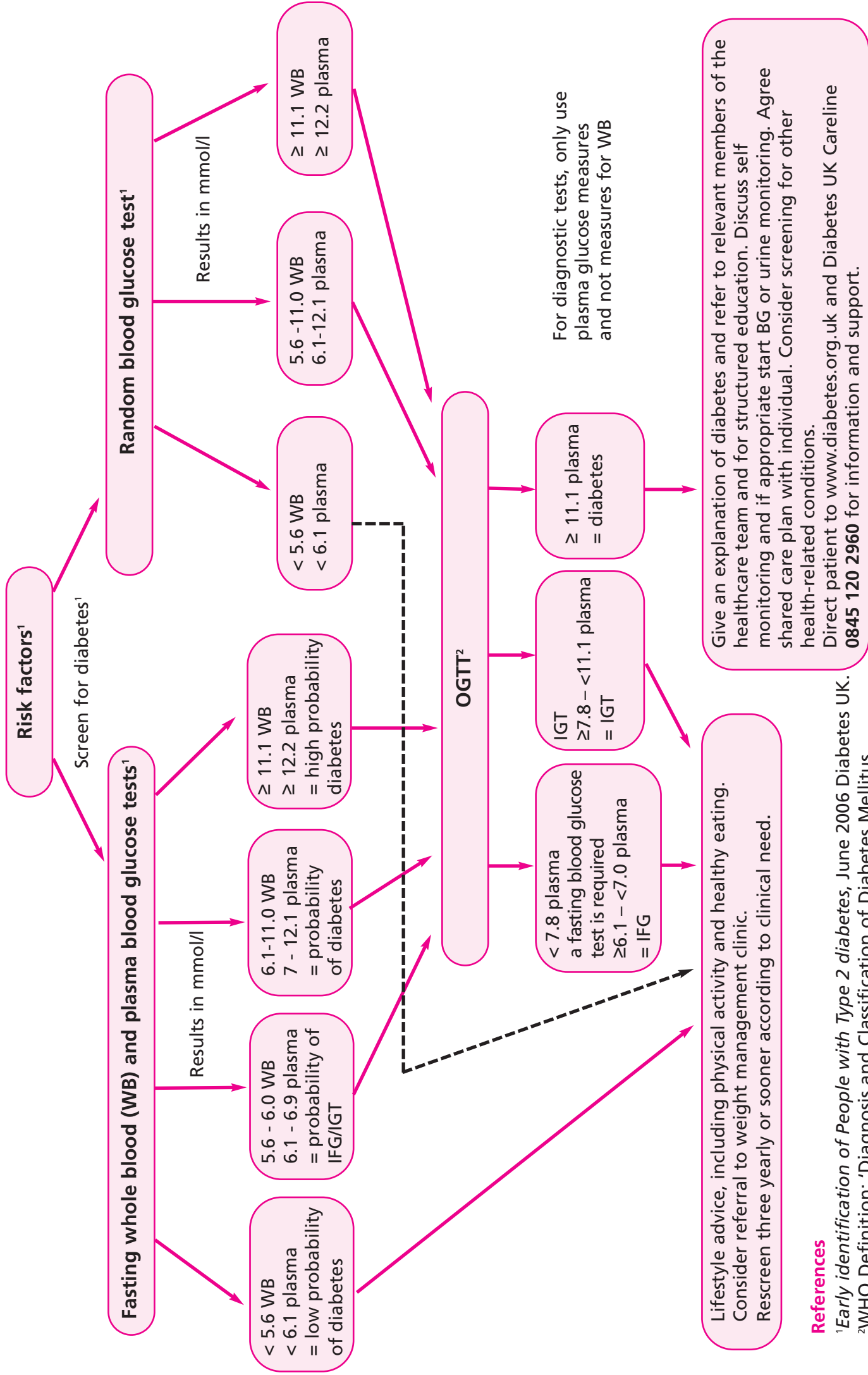
Random blood glucose. Screening with this test is not as sensitive or specific as either a fasting blood glucose test or a two-hour OGTT but may be the most practical test. Very high results are a good indicator of impaired fasting glucose (IFG) and impaired glucose tolerance (IGT), but for patients with results in the range 6-10 mmol/l they may need to be rescreened using a fasting test as sensitivity is not so good at lower figures. (WHO diagnostic threshold: presence of symptoms plus a random venous plasma glucose concentration ≥ 11.1 mmol/l).

Flow diagram for early identification of Type 2 diabetes (symptomatic individuals)



If figures are not diagnostic of diabetes perform OGTT (see flow diagram on facing page) and if diagnosed with diabetes provide care as detailed on facing page.

Flow diagram for early identification of Type 2 diabetes (asymptomatic individuals)



References

¹Early identification of People with Type 2 diabetes, June 2006 Diabetes UK.

²WHO Definition; 'Diagnosis and Classification of Diabetes Mellitus and its Complications.'

Acting on test results

It is important to consider the impact a positive screening result may have on an individual. Diabetes is a chronic condition with potentially disabling outcomes and a high mortality rate. As well as medical considerations, there may also be an impact on lifestyle, including employment and insurance issues. Patients with a family history of the condition may well have had negative experiences of living with diabetes.

What to do if the screening test is negative but the person has symptoms

If the screening test result is negative but the individual shows symptoms or signs suggestive of diabetes or its complications, s/he should be told that diabetes has not been excluded. A further test (ideally OGTT) should be undertaken to establish true diagnosis. If the OGTT shows that the person does not have diabetes but does have IGT (≥ 7.8 mmol/l < 11.1 mmol/l plasma) or a subsequent fasting blood glucose test suggests IFG (≥ 6.1 mmol/l < 7.0 mmol/l fasting plasma glucose) they should be given lifestyle advice and considered for referral for weight management where appropriate. Rescreen every three years or sooner according to clinical need.

What to do if the screening test is negative and the person has no symptoms

If the person has no symptoms, information, advice and support should be provided to help them change behaviour as appropriate and reduce risk factors, where possible. They may not have diabetes currently or raised blood glucose levels, but they will still be at risk of developing diabetes, and cardiovascular disease, in the future.

What to do if screening test is positive

If the screening test result is positive, the person should be given written details of the nature of the screening procedure and the precise result of the test. S/he should be told that the test has indicated a possible rise in blood glucose that needs further checking and should be reassured as far as possible.

Therapy should not be instigated until diagnosis has been confirmed. The person should be asked not to make any changes in diet or drug therapy but should make a routine appointment with the GP in the two to four weeks following screening (an earlier appointment may be necessary if the person is symptomatic). Diagnosis should then be confirmed by a formal glucose assay performed by a reputable laboratory. If this is not possible, refer the person to a diabetes clinic for further assessment.

Where no symptoms are present, diagnosis should not be based on a single venous plasma glucose test result. At least one additional venous plasma glucose test result on another day with a value in the diabetic range is essential – either fasting, from a random sample or from the two hour post glucose load. If the fasting or random values are not diagnostic, the two hour value should be used. It is also recommended that for the elderly and some minority ethnic groups this value be used.

Once a diagnosis of Type 2 diabetes has been confirmed, the person should be given an explanation of diabetes and referred to relevant members of the diabetes team and for structured education. Direct patient to www.diabetes.org.uk or Diabetes UK Careline **0845 120 2960** for information and support. Discuss self monitoring and, if appropriate, start blood glucose or urine monitoring. Agree a shared care plan with the individual and consider screening them for other health-related conditions.



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