1 # Preventing type 2 diabetes: risk identification
2 # and interventions for individuals at high risk

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4 ## NICE guideline

5 ## Draft for consultation, May 2017

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This guideline covers how to identify adults at high risk of type 2 diabetes. It aims to remind practitioners that age is no barrier to being at high risk of, or developing, the condition. It also aims to help them provide those at high risk with effective and appropriate intensive lifestyle-change programme to prevent or delay the onset of type 2 diabetes. The recommendations in this guideline can be used alongside the NHS Health Check programme.

It does not advocate a national screening programme.

NICE has also produced a guideline on preventing type 2 diabetes – population and community interventions.

Who is it for?

- Commissioners and managers in the NHS, local authorities and the wider public, private, voluntary and community sectors
- GPs, nurses, pharmacists, occupational health specialists, optical practitioners and other health professionals
- People at high risk of developing type 2 diabetes, their families and other members of the public.

We have updated or added new recommendations on intensive lifestyle-change programmes and on metformin for people at risk of type 2 diabetes.

You are invited to comment on the new and updated recommendations in this guideline. These are marked as **[2017]** if the evidence has been reviewed.

You are also invited to comment on recommendations that NICE proposes to delete from the 2012 guideline.

We have not updated recommendations shaded in grey, and cannot accept comments on them. In some cases, we have made minor wording changes for clarification.

See Update information for a full explanation of what is being updated.

This version of the guideline contains the draft recommendations, context and recommendations for research. Information about how the guideline was developed is on the guideline's page on the NICE website. This includes the guideline committee's discussion and the evidence reviews, the scope, and details of the committee and any declarations of interest. The supporting information and evidence for the 2017 recommendations is contained in the addendum.

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Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

1.1 Risk assessment

1.1.1 GPs and other health professionals and community practitioners in health and community venues should implement a two-stage strategy to identify people at high risk of type 2 diabetes (and those with undiagnosed type 2 diabetes). First, a risk assessment should be offered (see recommendation 1.1.3). Second, where necessary, a blood test should be offered to confirm whether people have type 2 diabetes or are at high risk (see recommendation 1.1.4). **[2012]**

1.1.2 Service providers including pharmacists, managers of local health and community services and voluntary organisations, employers and leaders of faith groups should offer validated self-assessment questionnaires or validated web-based tools (for examples, see the Diabetes UK website). They should also provide the information needed to complete and interpret them. The tools should be available in local health, community and social care venues. Examples of possible health venues include: community pharmacies, dental surgeries, NHS walk-in centres and opticians. Examples of community and social care venues include: workplaces, job centres, local authority leisure services, shops, libraries, faith centres, residential and respite care homes and day centres (for older adults and for adults with learning disabilities). **[2012]**

1.1.3 Public health, primary care and community services should publicise local opportunities for risk assessment and the benefits of preventing (or

delaying the onset of) type 2 diabetes. The information should be up-to-date and provided in a variety of formats. It should also be tailored for different groups and communities. For example, by offering translation services and information in languages used locally. **[2012]**

1.1.4 Where risk assessment is conducted by health professionals in NHS venues outside general practice (for example, in community pharmacies) the professionals involved should ensure the results are passed on to the person's GP. **[2012]**

1.1.5 GPs should keep records of all risk assessment results to ensure appropriate follow-up and continuity of care. **[2012]**

1.1.6 Where self-assessment is offered in community venues, health professionals and community practitioners in those venues should encourage people with an intermediate or high risk score to visit their GP to discuss how to manage their risk. Those at high risk should be offered a blood test by their GP. **[2012]**

1.1.7 Ensure health professionals and community practitioners involved with risk assessments in community venues communicate closely with, and receive support from, NHS diabetes risk-assessment and prevention services. They should aim to ensure continuity of care and avoid unnecessary duplication of risk assessments. **[2012]**

1.1.8 Managers in primary and secondary healthcare should ensure staff actively seek out and offer risk assessments to people who might not realise they could be at high risk. This includes people with particular conditions that can increase the risk such as: cardiovascular disease, hypertension, obesity, stroke, polycystic ovary syndrome, a history of gestational diabetes and mental health problems. In addition, people with learning disabilities and those attending accident and emergency, emergency medical admissions units, vascular and renal surgery units and ophthalmology departments may be at high risk. **[2012]**

1
1.2 Encouraging people to have a risk assessment

2 1.2.1 Encourage the following to have a risk assessment:

3 - all eligible adults aged 40 and above, except pregnant women
4 - people aged 25–39 of South Asian, Chinese, African-Caribbean, black
5 African and other high-risk black and minority ethnic groups, except
6 pregnant women
7 - adults with conditions that increase the risk of type 2 diabetes[1]. **[2012]**

8 1.2.2 Explain to people why, even though they feel healthy, they can still be at
9 risk of developing type 2 diabetes. Explain the implications of being at risk
10 and that this can be reduced by making lifestyle changes. **[2012]**

11 1.2.3 Tell people how and where they can be assessed, including at their GP
12 surgery or community pharmacy. Make people aware that they can use a
13 validated self-assessment questionnaire or validated web-based tools (for
14 examples, see the Diabetes UK website). Explain that those who are
15 eligible can be assessed by the NHS Health Check programme. (This
16 programme is for people aged 40–74 who are not on a disease register
17 and have not been diagnosed with coronary heart disease, hypertension,
18 atrial fibrillation, stroke, transient ischaemic attack, type 2 diabetes or
19 kidney disease[2].) **[2012]**

20 1.2.4 Encourage people who are less likely to attend a GP surgery to go
21 elsewhere for a risk assessment. Possibilities include community
22 pharmacies, dental surgeries, NHS walk-in centres and opticians.
23 Assessments may also be offered in community venues. Examples
24 include: workplaces, job centres, local authority leisure facilities, shops,
25 libraries, faith centres, residential and respite care homes and day centres
26 (for older adults and for adults with learning disabilities). **[2012]**

[1] Particular conditions can increase the risk of type 2 diabetes. These include: cardiovascular disease, hypertension, obesity, stroke, polycystic ovary syndrome, a history of gestational diabetes and mental health problems. In addition, people with learning disabilities and those attending accident and emergency, emergency medical admissions units, vascular and renal surgery units and ophthalmology departments may be at high risk.

[2] They will be treated and managed using established health care pathways.

1.2.5 Advise people with type 2 diabetes to encourage family members to have their risk assessed. **[2012]**

1.3 Risk identification (stage 1)

1.3.1 GPs and other primary healthcare professionals should use a validated Computer-based risk-assessment tools to identify people on their practice register who may be at high risk of type 2 diabetes. The tool should use routinely available data from patients' electronic health records. If a computer-based risk-assessment tool is not available, they should provide a validated self-assessment questionnaire, for example, the Diabetes Risk Score assessment tool. This is available to health professionals on request from Diabetes UK. **[2012]**

1.3.2 GPs and other primary healthcare professionals should not exclude people from assessment, investigation or intervention on the basis of age, as everyone can reduce their risk, including people aged 75 years and over. **[2012]**

1.3.3 Pharmacists, opticians, occupational health nurses and community leaders should offer a validated self-assessment questionnaire to adults aged 40 and over, people of South Asian and Chinese descent aged 25–39, and adults with conditions that increase the risk of type 2 diabetes[1], other than pregnant women. Or they should tell people how to access specific, validated online self-assessment tools, such as the Diabetes Risk Score featured on the Diabetes UK website. **[2012]**

1.3.4 Pharmacists, opticians, occupational health nurses and community leaders involved in risk assessments should advise people with a high risk score to contact their GP or practice nurse for a blood test. The aim is to check if they have type 2 diabetes or to confirm their level of risk and discuss how to reduce it. **[2012]**

1.3.5 All providers of risk assessments should explain to those attending for a type 2 diabetes risk assessment the implications of being at high risk and the consequences of developing the condition. **[2012]**

1.3.6 All providers of risk assessments should discuss with those attending for a type 2 diabetes risk assessment how to prevent or delay the onset of the condition. This includes being more physically active, achieving and maintaining a healthy weight, eating less fat and eating more dietary fibre. They should also tell people where to get advice and support to maintain these lifestyle changes in the long term. **[2012]**

1.4 Risk identification (stage 2)

1.4.1 Trained healthcare professionals should offer venous blood tests (fasting plasma glucose [FPG] or HbA1c) to adults with high risk scores (stage 2 of the identification process). They should also consider a blood test for those aged 25 and over of South Asian or Chinese descent whose body mass index (BMI) is greater than 23 kg/m^2. The aim is to:

- determine the risk of progression to type 2 diabetes (a fasting plasma glucose of 5.5–6.9 mmol/l or an HbA1c level of 42–47 mmol/mol [6.0–6.4%] indicates high risk) **or**
- identify possible type 2 diabetes by using fasting plasma glucose, HbA1c or an oral glucose tolerance test (OGTT), according to World Health Organization (WHO) criteria. **[2012]**

1.5 Matching interventions to risk

1.5.1 For people at low risk (that is, those who have a low or intermediate risk score), tell the person that they are currently at low risk, which does not mean they are not at risk – or that their risk will not increase in the future. Offer them brief advice. **[2012]**

1.5.2 As part of brief advice:

- Discuss people's risk factors and how they could improve their lifestyle to reduce overall risk.
- Offer encouragement and reassurance.
- Offer verbal and written information about culturally appropriate local services and facilities that could help them change their lifestyle. Examples could include information or support to: improve their diet

(including details of any local markets offering cheap fruit and vegetables); increase their physical activity and reduce the amount of time spent being sedentary (including details about walking or other local physical activity groups and low-cost recreation facilities). The information should be provided in a range of formats and languages. **[2012]**

1.5.3 For people with a moderate risk (a high risk score, but with a fasting plasma glucose less than 5.5 mmol/l or HbA1c of less than 42 mmol/mol [6.0%]):

- Tell the person that they are currently at moderate risk, and their risks could increase in the future. Explain that it is possible to reduce the risk. Briefly discuss their particular risk factors, identify which ones can be modified and discuss how they can achieve this by changing their lifestyle.
- Offer them a brief intervention to help them change their lifestyle: give information about services that use evidence-based behaviour-change techniques that could help them change, bearing in mind their risk profile. Services cited could include walking programmes, slimming clubs or structured weight-loss programmes. (See recommendations 1.11.1–1.14.3.)
- Discuss whether they would like to join a structured weight-loss programme. Explain that this would involve an individual assessment and tailored advice about diet, physical activity and behaviour change. Let them know which local programmes offer this support – and where to find them. **[2012]**

1.5.4 For people confirmed as being at high risk (a high risk score and fasting plasma glucose of 5.5–6.9 mmol/l or HbA1c of 42–47 mmol/mol [6.0–6.4%]):

- When commissioning services to deliver intensive lifestyle-change programmes (see recommendations 1.8.1–1.10.2), prioritise people

with a fasting plasma glucose of 6.5–6.9 mmol/l or HbA1c of 44–47 mmol/mol [6.2–6.4%].

- Tell the person they are currently at high risk but that this does not necessarily mean they will progress to type 2 diabetes. Explain that the risk can be reduced. Briefly discuss their particular risk factors, identify which ones can be modified and discuss how they can achieve this by changing their lifestyle.
- Offer them a referral to a local, evidence-based, quality-assured intensive lifestyle-change programme (see recommendations1.8.1–1.10.2). In addition, give them details of where to obtain independent advice from health professionals. **[2017]**

1.5.5 For people with possible type 2 diabetes (fasting plasma glucose of, 7.0 mmol/l or above, or HbA1c of 48 mmol/mol [6.5%] or above, but no symptoms of type 2 diabetes):

- Carry out a second blood test. If type 2 diabetes is confirmed, treat this in accordance with NICE guidance on type 2 diabetes. Ensure blood testing conforms to national quality specifications.
- If type 2 diabetes is not confirmed, offer them a referral to a local, quality-assured, intensive lifestyle-change programme (see recommendations1.8.1–1.10.2). **[2012]**

1.5.6 For people with a high risk score who prefer not to have a blood test, or who do not use primary healthcare services, discuss the importance of early diagnosis to help reduce the risk of long-term complications. Use clinical judgement, based on the person's risk score, to decide whether to offer them a brief intervention or a referral to an intensive lifestyle-change programme (see recommendations 1.8.1–1.10.2). **[2012]**

1.6 Reassessing risk

1.6.1 Keep an up-to-date register of people's level of risk. Introduce a recall system to contact and invite people for regular review, using the two-stage strategy (see recommendations 1.1.3 and 1.1.4). **[2012]**

1.6.2 Offer a reassessment based on the level of risk. Use clinical judgement to determine when someone might need to be reassessed more frequently, based on their combination of risk factors (such as their body mass index [BMI], relevant illnesses or conditions, ethnicity and age). **[2012]**

1.6.3 For people at low risk (with a low or intermediate risk score) offer to reassess them at least every 5 years to match the timescales used by the NHS Health Check programme. Use a validated risk-assessment tool. **[2012]**

1.6.4 For people at moderate risk (a high risk score, but with a fasting plasma glucose less than 5.5 mmol/l, or HbA1c less than 42 mmol/mol [6.0%]), offer to reassess them at least every 3 years. **[2012]**

1.6.5 For people at high risk (a high risk score and fasting plasma glucose of 5.5–6.9 mmol/l, or HbA1c of 42–47 mmol/mol [6.0–6.4%]), offer a blood test at least once a year (preferably using the same type of test). Also offer to assess their weight or BMI. This includes people without symptoms of type 2 diabetes whose:

- first blood test measured fasting plasma glucose at 7.0 mmol/l or above, or an HbA1c of 48 mmol/mol (6.5%) or greater, but
- whose second blood test did not confirm a diagnosis of type 2 diabetes. **[2012]**

1.6.6 At least once a year, review the lifestyle changes people at high risk have made. Use the review to help reinforce their dietary and physical activity goals, as well as checking their risk factors. The review could also provide an opportunity to help people ‘restart’, if lifestyle changes have not been maintained. **[2012]**

1.7 Commissioning risk identification and intensive lifestyle-change programmes

1.7.1 Health and wellbeing boards and public health commissioners should make type 2 diabetes prevention a priority in the joint health and wellbeing strategy. They should identify local needs by:

- Using anonymised, regional and local health data and routinely collected surveillance data on specific population groups or geographical areas to inform the joint strategic needs assessment.
- Mapping local diet, weight management and physical activity services and interventions (for example, slimming clubs). This should include details about locations, opening times and accessibility, staffing levels and the range of professional skills available. It should also include details of any tailored support provided by trained personnel. **[2012]**

1.7.2 Health and wellbeing boards and public health commissioners, working with clinical commissioning groups, should develop a comprehensive and coordinated type 2 diabetes prevention commissioning plan, based on the data collated. This should include:

- Action to raise awareness of the risks of type 2 diabetes.
- A proactive, two-stage approach to identifying people at high risk (and those with undiagnosed type 2 diabetes).
- Evidence-based, quality-assured intensive lifestyle-change programmes. **[2012]**

1.7.3 Health and wellbeing boards and public health commissioners, working with clinical commissioning groups, should ensure the commissioning plan:

- Sets out organisational responsibilities for local type 2 diabetes risk assessments. These could take place in primary care or community pharmacies as part of, or as a local addition to, the NHS Health Check programme, or as a self-assessment in community venues and workplaces.
- Establishes arrangements to invite people of South Asian and Chinese descent aged 25 and over for a risk assessment at least once every 5 years. (Invitations and follow-up could be integrated within the NHS Health Check programme.)
- Encourages employers in public and private sector organisations to include risk assessments in their occupational health service contracts.

- Supports the development of coordinated referral pathways for evidence-based and quality-assured intensive lifestyle-change programmes that cover physical activity, weight management and diet, and which teach behaviour-change techniques.
- Makes it clear that everyone (including older people, those from minority ethnic groups and vulnerable or socially disadvantaged people) should be offered risk assessments and intensive lifestyle-change programmes at times, and in locations, that meet their needs.
- Makes provision for people who may have difficulty accessing, or are unlikely to access, services in conventional healthcare venues.
- Makes it clear that risk-assessment services and intensive lifestyle-change programmes should be delivered by trained practitioners (see recommendations 1.18.1–1.18.5). **[2012]**

1.7.4 Health and wellbeing boards and public health commissioners, working with clinical commissioning groups, should integrate the commissioning plan with the joint health and wellbeing strategy. They should ensure it is delivered through services operating across the NHS, local authorities and other organisations in the private, community and voluntary sectors. **[2012]**

1.7.5 Health and wellbeing boards and public health commissioners should regularly evaluate services in the context of these recommendations and changing local needs. They should use local accountability mechanisms (for example, health scrutiny reports) to examine specific issues. **[2012]**

1.7.6 Health and wellbeing boards and public health commissioners should evaluate or compare the different service options and make the findings publicly available. Assessments should focus on changes in participants' physical activity levels, weight and dietary intake (of fat, saturated fat and fibre) over 12–24 months. **[2012]**

1.8 Quality-assured, intensive lifestyle-change programmes: design and delivery

1.8.1 Provide specially designed and quality-assured intensive lifestyle-change programmes for groups of 10–15 people at high risk of developing type 2 diabetes. **[2012]**

1.8.2 Involve the target community (including community leaders) in planning the design and delivery of the programme to ensure it is sensitive and flexible to the needs, abilities and cultural or religious norms of local people. For example, the programme should offer practical learning opportunities, particularly for those who have difficulties with communication or literacy or whose first language is not English. **[2012]**

1.8.3 Ensure programmes are delivered by practitioners with relevant knowledge and skills who have received externally accredited training (see recommendations 1.18.1–1.18.5). Where relevant expertise is lacking, involve health professionals and specialists (such as dietitians and health psychologists) in the design and delivery of services. **[2012]**

1.8.4 Ensure programmes adopt a person-centred, empathy-building approach. This includes finding ways to help participants make gradual changes by understanding their beliefs, needs and preferences. It also involves building their confidence and self-efficacy over time. **[2012]**

1.8.5 Ensure programme components are delivered in a logical progression. For example: discussion of the risks and potential benefits of lifestyle change; exploration of someone's motivation to change; action planning; self-monitoring and self-regulation. **[2012]**

1.8.6 Ensure groups meet at least eight times over a period of 9–18 months. Participants should have at least 16 hours of contact time either within a group, on a one-to-one basis or using a mixture of both approaches. **[2012]**

1.8.7 Offer more intensive support at the start of the programme by delivering core sessions frequently (for example, weekly or fortnightly). Reduce the

frequency of sessions over time to encourage more independent lifestyle management. **[2012]**

1.8.8 Allow time between sessions for participants to make gradual changes to their lifestyle – and to reflect on and learn from their experiences. Also allow time during sessions for them to share this learning with the group. **[2012]**

1.8.9 Deliver programmes in a range of venues such as workplaces, leisure, community and faith centres, and outpatient departments and clinics. Run them at different times, including during evenings and at weekends, to ensure they are as accessible as possible. **[2012]**

1.8.10 As part of the programme, offer referral to, or seek advice from, people with specialist training where necessary. For example, refer someone to a dietitian for assessment and specialist dietary advice if required. **[2012]**

1.8.11 Offer follow-up sessions at regular intervals (for example, every 3 months) for at least 2 years following the initial intervention period. The aim is to reinforce the positive behaviour change and to provide support, in case of relapse. Larger group sizes may be feasible for these maintenance sessions. **[2012]**

1.8.12 Link the programmes with weight management and other prevention initiatives that help people to change their diet or become more physically active. **[2012]**

1.9 Quality-assured, intensive lifestyle-change programmes: content

1.9.1 Intensive lifestyle-change programmes should offer ongoing tailored advice, support and encouragement to help people:

- undertake a minimum of 150 minutes of 'moderate-intensity' physical activity per week
- gradually lose weight to reach and maintain a BMI within the healthy range

- increase their consumption of wholegrains, vegetables and other foods that are high in dietary fibre
- reduce the total amount of fat in their diet
- eat less saturated fat. **[2012]**

1.9.2 Established behaviour-change techniques should be used (see NICE guidance on behaviour change: the principles for effective interventions), including at least all of the following:

- Information provision: to raise awareness of the benefits of and types of lifestyle changes needed to achieve and maintain a healthy weight, building on what participants already know.
- Exploration and reinforcement of participants' reasons for wanting to change and their confidence about making changes. This may include using motivational interviewing or similar techniques suitably adapted for use in groups.
- Goal setting: prompting participants to set achievable and personally relevant short- and long-term goals (for example, to lose 5–10% of their weight in 1 year is a realistic initial target, or to be more physically active).
- Action planning: prompting participants to produce action plans detailing what specific physical activity or eating behaviour they intend to change – and when, where and how this will happen. They should start with achievable and sustainable short-term goals and set graded tasks (starting with an easy task and gradually increasing the difficulty as they progress towards their goal). The aim is to move over time towards long-term, lifestyle change.
- Coping plans and relapse prevention: prompting participants to identify and find ways to overcome barriers to making permanent changes to their exercise and eating habits. This could include the use of strategies such as impulse-control techniques (to improve management of food cravings). **[2012]**

1.9.3 Participants in intensive lifestyle-change programmes should be encouraged to involve a family member, friend or carer who can offer

emotional, information, planning or other practical support to help them make the necessary changes. For example, they may be able to join the participant in physical activities, help them to plan changes, make or accept changes to the family's diet or free up the participant's time so they can take part in preventive activities. (It may sometimes be appropriate to encourage the participant to get support from the whole family.) **[2012]**

1.9.4 Participants should be encouraged to use self-regulation techniques. This includes self-monitoring (for example, by weighing themselves, or measuring their waist circumference or both). They should also review their progress towards achieving their goals, identify and find ways to solve problems and then revise their goals and action plans, where necessary. The aim is to encourage them to learn from experience. **[2012]**

1.10 Quality-assured, intensive lifestyle-change programmes: evaluation

1.10.1 Evaluate intensive lifestyle-change programmes by recording people's health outcomes at 12 months, or more frequently, if appropriate (for example, every 6 months). As a minimum, include the following measures:

- number and demographics of adults registered
- level of attendance
- changes in the amount of moderate to vigorous physical activity undertaken each week
- changes in dietary intake, with a focus on total intake of fat, saturated fat and fibre
- changes in weight, waist circumference or BMI
- changes in fasting plasma glucose or HbA1c levels. **[2012]**

1.10.2 Conduct an annual audit of how the programme was delivered For example[3], check the:

[3] This is an edited version of recommendation 7 in Behaviour change: the principles for effective interventions. (NICE public health guidance 6)

- number of educators involved
- level of training
- number and demographics of adults registered
- level of uptake for example, the percentage of those invited who attend the first session
- programme content (for example, the use of behaviour-change techniques and empathy-building skills)
- methods of delivery. **[2012]**

1.11 Raising awareness of the importance of physical activity

1.11.1 Find out what people already know about the benefits of physical activity and the problems associated with a sedentary lifestyle. Where necessary, provide this information. In addition, explain that being more physically active can help reduce their risk of type 2 diabetes, even when that is the only lifestyle change they make. **[2012]**

1.11.2 Explain that the government recommends a minimum of 150 minutes of 'moderate-intensity' activity per week which can be taken in bouts of 10 minutes or more. Explain that people can also meet the minimum recommendation by doing 75 minutes of 'vigorous-intensity' activity spread across the week – or by combining bouts of moderate and vigorous-intensity activity. Explain that this should include activities to increase muscle strength on 2 days a week. (See the full recommendations in Start active, stay active for examples.) **[2012]**

1.11.3 In cases where it is unrealistic to expect someone to meet the recommended minimum, explain that even small increases in physical activity will be beneficial – and can act as a basis for future improvements. **[2012]**

1.11.4 Explain that people should also reduce the amount of time they spend sitting at a computer or watching TV. Encourage them to be more active during work breaks, for example, by going for a walk at lunchtime. **[2012]**

1.11.5 Explain that some people may need to be more physically active to help lose weight or maintain weight loss (see NICE guidance on obesity). **[2012]**

1.12 Providing tailored advice on physical activity

1.12.1 Help people to identify which of their activities involve 'moderate' or 'vigorous' physical activity and the extent to which they are meeting the national minimum recommendation on physical activity. Use a validated tool such as the Department of Health's general practitioner physical activity questionnaire or the international physical activity questionnaire (IPAQ). **[2012]**

1.12.2 Encourage people to choose physical activities they enjoy or that fit easily within their daily lives. For example, they may choose to do specific activities such as walking, cycling, swimming, dancing or aerobics. Or they could build physical activity into their daily life – for example, by walking or cycling instead of using a car for short journeys, and by taking the stairs instead of the lift. **[2012]**

1.12.3 Encourage people to set short and long-term goals for example, on how far they walk or cycle, or the number or length of activities undertaken every week. In addition, encourage them to keep a record of their activity for example, by using a pedometer, and to record the things that make it easier or harder. Help them to find other ways to identify and overcome any barriers to physical activity. **[2012]**

1.12.4 Consider referring people who want structured or supervised exercise to an exercise referral scheme or supervised exercise sessions, as part of an intensive lifestyle-change programme. **[2012]**

1.12.5 Provide information on local opportunities for physical activity. **[2012]**

For more recommendations on increasing physical activity, see NICE guidance on promoting physical activity in the workplace; physical activity and the environment and four commonly used methods to increase physical activity.

1.13 Weight management advice

1.13.1 Advise and encourage overweight and obese people to reduce their weight gradually by reducing their calorie intake. Explain that losing 5–10% of their weight in 1 year is a realistic initial target that would help reduce their risk of type 2 diabetes and also lead to other, significant health benefits. **[2012]**

1.13.2 Use evidence-based behaviour-change techniques to help overweight and obese people eat less, be more physically active and make long term changes to their diet that result in steady weight loss (see recommendations 1.1.14–1.14.3). **[2012]**

1.13.3 Motivate and support overweight and obese people to continue to lose weight until they have achieved – and can maintain – a BMI within the healthy range. (For the general population, the healthy range is between 18.5 and 24.9 kg/m^2. For people of South Asian or Chinese descent, the range is likely to be between 18.5 and 22.9 kg/m^2.) **[2012]**

1.13.4 Encourage people to check their weight and waist measurement periodically. Provide brief advice about how to measure their waist correctly (for an example, visit the British Heart Foundation website). **[2012]**

1.13.5 Offer people with a BMI of 30 kg/m^2 or more (27.5 kg/m^2 or more if South Asian or Chinese) a structured weight-loss programme as part of, or to supplement, the intensive lifestyle-change programme. Or, if more appropriate, offer them a referral to a dietitian or another appropriately trained health professional. Ensure they are given a personal assessment and tailored advice about diet, physical activity and what techniques to use to help change their behaviour. **[2012]**

1.13.6 GPs and other health professionals should continue to monitor, support and care for people with a BMI of 30 kg/m^2 or more (27.5 kg/m^2 or more if South Asian or Chinese) who join slimming clubs or other weight-loss programmes. **[2012]**

1.13.7 GPs should consider offering orlistat, in conjunction with a low-fat diet, to help those who are unable to lose weight by lifestyle-change alone (see recommendations 1.20.1–1.20.6). **[2012]**

1.13.8 If the weight management interventions in recommendations 1.13.1–1.13.7 have been unsuccessful, refer people to a specialist obesity management service (see NICE guidance on obesity). **[2012]**

1.14 Dietary advice

1.14.1 Find out what people already know about the types and amounts of food and drink that can help reduce the risk of type 2 diabetes. Provide this information where necessary. Explain that increasing dietary fibre intake and reducing fat intake (particularly saturated fat) can help reduce the chances of developing type 2 diabetes. **[2012]**

1.14.2 Help people to assess their diet and identify where and how they could make it healthier, taking into account their individual needs, preferences and circumstances. (For example, take into account whether they need to lose weight or if they have a limited income.) **[2012]**

1.14.3 Encourage people to:

- Increase their consumption of foods that are high in fibre, such as wholegrain bread and cereals, beans and lentils, vegetables and fruit.
- Choose foods that are lower in fat and saturated fat, for example, by replacing products high in saturated fat (such as butter, ghee, some margarines or coconut oil) with versions made with vegetable oils that are high in unsaturated fat, or using low-fat spreads.
- Choose skimmed or semi-skimmed milk and low-fat yoghurts, instead of cream and full-fat milk and dairy products.
- Choose fish and lean meats instead of fatty meat and processed meat products (such as sausages and burgers).
- Grill, bake, poach or steam food instead of frying or roasting (for example, choose a baked potato instead of chips).

- Avoid food high in fat such as mayonnaise, chips, crisps, pastries, poppadums (papads) and samosas.
- Choose fruit, unsalted nuts or low-fat yoghurt as snacks instead of cakes, biscuits, bombay mix or crisps. **[2012]**

1.15 Vulnerable groups: information and services

1.15.1 Provide up-to-date information in a variety of formats about local opportunities for risk assessment and the benefits of preventing (or delaying the onset of) type 2 diabetes. This should be tailored for different groups and communities. For example, messages could be provided in a visual, Braille or audio format. **[2012]**

1.15.2 Provide integrated risk-assessment services and intensive lifestyle-change programmes for prisons and residential homes, as appropriate. **[2012]**

1.15.3 Offer longer appointment times or outreach services to discuss the options following a risk assessment and blood test. **[2012]**

1.15.4 Ensure intensive lifestyle-change programmes are delivered by sensitive, well trained and dedicated people who are also trained to work with vulnerable groups. **[2012]**

1.15.5 Offer to refer travellers and people from other mobile populations to prevention initiatives in the area they are moving to. Or use electronic communications (for example, telephone or text messages as appropriate) to deliver programmes or provide ongoing support. Ensure confidentiality is maintained. **[2012]**

1.16 Vulnerable groups: supporting lifestyle change

1.16.1 Ensure all staff involved in the care of vulnerable groups understand the risk factors for type 2 diabetes and how they can help people reduce their risk. Staff should also be able to recognise and address (where possible) issues which mean someone gives their health a low priority. **[2012]**

1.16.2 Make all staff aware of the benefits of physical activity and reducing the time spent being sedentary. Where possible, encourage them to increase the opportunities for those in their care to be physically active. **[2012]**

1.16.3 Ensure staff offer to refer people to risk-assessment services and quality-assured, intensive lifestyle-change programmes in the community. Or, where necessary, arrange for them to be provided in convenient, familiar local venues such as residential care homes or day centres. (See also recommendations 1.1.1–1.10.2 for advice on risk assessment and intensive lifestyle-change programmes.) **[2012]**

1.16.4 Educate those involved in buying or preparing food in residential care, day centres and psychiatric units about what constitutes a healthy diet and how to prepare healthy meals[4]. **[2012]**

1.17 Intensive lifestyle-change programmes: quality assurance

1.17.1 Set up a national accreditation body to benchmark, audit, accredit and share effective practice in type 2 diabetes prevention. This body should:

- Conduct research to establish and implement effective practice.
- Provide a national, quality-assured training programme and a central database of effective curriculum resources for intensive lifestyle-change programmes. The programme and resources should meet criteria developed by the Department of Health and Diabetes UK Patient Education Working Group (PEWG).
- Evaluate the effectiveness of the national training and accreditation programme. This includes its impact on practice and outcomes for participants. **[2012]**

[4] This is from Preventing type 2 diabetes – population and community interventions (NICE public health guidance 35).

1.18 Training and professional development

1.18.1 The national accreditation body for type 2 diabetes prevention (see recommendation 1.17.1) should work with others[5] to:

- ensure training about risk factors for type 2 diabetes and how to prevent or delay it, is part of the core curriculum for healthcare undergraduates and postgraduates
- provide training for health professionals and community practitioners on how to provide brief advice and brief interventions
- provide accredited training which meets nationally defined criteria for health professionals and community practitioners who are delivering risk assessments and intensive lifestyle-change programmes, and for other providers of advice on diet and physical activity who may wish to develop a type 2 diabetes prevention programme
- provide additional, specialised training for those working with vulnerable groups including, for example, people with mental health problems or learning disabilities, refugees and gypsy and traveller populations. **[2012]**

1.18.2 The national accreditation body for type 2 diabetes prevention and others[5]should ensure training on delivering risk assessments, intensive lifestyle-change programmes, dietary and physical activity advice increases participants' understanding of type 2 diabetes and its complications. It should also cover: behaviour-change theories and techniques, awareness-raising, how to communicate risk and how to tailor interventions to meet individual need. In addition, participants should learn how to assess, audit and evaluate type 2 diabetes prevention programmes. **[2012]**

[5] Commissioners and providers of public health services; managers of type 2 diabetes risk-assessment and prevention services; schools of medicine, healthcare faculties, royal colleges and professional associations offering professional healthcare qualifications such as dietetics, nursing, physiotherapy, podiatry and occupational health; voluntary organisations; commercial training organisations.

1.18.3 The national accreditation body for type 2 diabetes prevention and others[5] should establish competencies for practice and provide accredited training for other potential providers such as lay educators or voluntary sector organisations. **[2012]**

1.18.4 Managers of type 2 diabetes risk assessment and prevention services should provide opportunities at least every 3 years for staff to attend accredited training and refresher courses on how to deliver an intensive lifestyle-change programme. Training should be cascaded down through the team(s) via formal and informal in-service training. In addition, peer review processes should be used to encourage sharing of good practice. **[2012]**

1.18.5 Managers of type 2 diabetes risk assessment and prevention services should offer training to community and faith leaders, staff in local authority leisure services, day centres, residential and respite care homes and staff in occupational health departments. The training should cover:

- how to carry out an initial risk assessment using validated self-assessment risk questionnaires
- effective ways to communicate someone's level of risk, the consequences of type 2 diabetes and the benefits of change
- how to give brief advice on reducing the risk of type 2 diabetes
- how to refer on for appropriate interventions. **[2012]**

1.19 Metformin

1.19.1 Use clinical judgement on whether (and when) to offer standard-release metformin[6] to support lifestyle change for people whose HbA1c or fasting plasma glucose blood test results have deteriorated if:

- this has happened despite their participation in an intensive lifestyle-change programme **or**

[6] At the time of consultation (May 2017), metformin did not have a UK marketing authorisation for this indication. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Prescribing guidance: prescribing unlicensed medicines for further information.

- they are unable to participate in an intensive lifestyle-change programme

particularly if they have a BMI greater than 35. **[2017]**

1.19.2 Discuss with the person the potential benefits and limitations of taking metformin, taking into account their risk and the amount of effort needed to change their lifestyle to reduce that risk. Explain that long-term lifestyle change can be more effective than drugs in preventing or delaying type 2 diabetes. Encourage them to adopt a healthy diet and be as active as possible. Where appropriate, stress the added health and social benefits of physical activity (for example, point out that it helps reduce the risk of heart disease, improves mental health and can be a good way of making friends). Advise them that they might need to take metformin for the rest of their lives and inform them about possible side effects. **[2012]**

1.19.3 Continue to offer advice on diet and physical activity along with support to achieve their lifestyle and weight-loss goals. **[2012]**

1.19.4 Check the person's renal function before starting treatment, and then twice yearly (more often if they are older or if deterioration is suspected). **[2012]**

1.19.5 Start with a low dose (for example, 500 mg once daily) and then increase gradually as tolerated, to 1500–2000 mg daily. If the person is intolerant of standard metformin consider using modified-release metformin. **[2012]**

1.19.6 Prescribe metformin for 6–12 months initially. Monitor the person's fasting plasma glucose or HbA1c levels at 3-month intervals and stop the drug if no effect is seen. **[2012]**

1.20 Orlistat

1.20.1 Use clinical judgement on whether to offer orlistat to people with a BMI of 28.0 kg/m^2 or more, as part of an overall plan for managing obesity. Take into account the person's risk and the level of weight loss and lifestyle change required to reduce this risk. **[2012]**

1.20.2 Discuss the potential benefits and limitations of taking orlistat and its side effects. **[2012]**

1.20.3 Advise the person to follow a low-fat diet that provides 30% of daily food energy as fat, distributed over three main meals a day. Offer information and regular support from a dietitian or another appropriate healthcare professional. **[2012]**

1.20.4 Agree a weight-loss goal with the person and regularly review it with them[7]. **[2012]**

1.20.5 Review the use of orlistat after 12 weeks. If the person has not lost at least 5% of their original body weight, use clinical judgement to decide whether to stop the orlistat. However, as with adults who have type 2 diabetes, those at high risk of the condition may lose weight more slowly than average, so less strict goals may be appropriate. **[2012]**

1.20.6 Use orlistat for more than 12 months (usually for weight maintenance) only after discussing the potential benefits, limitations and side effects with the person concerned. **[2012]**

Putting this guideline into practice

[This section will be finalised after consultation]

NICE has produced tools and resources [link to tools and resources tab] to help you put this guideline into practice.

Putting recommendations into practice can take time. How long may vary from guideline to guideline, and depends on how much change in practice or services is needed. Implementing change is most effective when aligned with local priorities.

Changes recommended for clinical practice that can be done quickly – like changes in prescribing practice – should be shared quickly. This is because healthcare

[7] This is part of a recommendation from Obesity (NICE clinical guideline 43).

professionals should use guidelines to guide their work – as is required by professional regulating bodies such as the General Medical and Nursing and Midwifery Councils.

Changes should be implemented as soon as possible, unless there is a good reason for not doing so (for example, if it would be better value for money if a package of recommendations were all implemented at once).

Different organisations may need different approaches to implementation, depending on their size and function. Sometimes individual practitioners may be able to respond to recommendations to improve their practice more quickly than large organisations.

Here are some pointers to help organisations put NICE guidelines into practice:

1. **Raise awareness** through routine communication channels, such as email or newsletters, regular meetings, internal staff briefings and other communications with all relevant partner organisations. Identify things staff can include in their own practice straight away.

2. **Identify a lead** with an interest in the topic to champion the guideline and motivate others to support its use and make service changes, and to find out any significant issues locally.

3. **Carry out a baseline assessment** against the recommendations to find out whether there are gaps in current service provision.

4. **Think about what data you need to measure improvement** and plan how you will collect it. You may want to work with other health and social care organisations and specialist groups to compare current practice with the recommendations. This may also help identify local issues that will slow or prevent implementation.

5. **Develop an action plan**, with the steps needed to put the guideline into practice, and make sure it is ready as soon as possible. Big, complex changes may take longer to implement, but some may be quick and easy to do. An action plan will help in both cases.

6. **For very big changes** include milestones and a business case, which will set out additional costs, savings and possible areas for disinvestment. A small project group could develop the action plan. The group might include the guideline champion, a senior organisational sponsor, staff involved in the associated services, finance and information professionals.

7. **Implement the action plan** with oversight from the lead and the project group. Big projects may also need project management support.

8. **Review and monitor** how well the guideline is being implemented through the project group. Share progress with those involved in making improvements, as well as relevant boards and local partners.

NICE provides a comprehensive programme of support and resources to maximise uptake and use of evidence and guidance. See our into practice pages for more information.

Also see Leng G, Moore V, Abraham S, editors (2014) Achieving high quality care – practical experience from NICE. Chichester: Wiley.

Context

Diabetes is a chronic disease characterised by an inability to regulate blood glucose. It is one of the most prevalent and costly chronic diseases. There are 3.9 million people living with diabetes in the UK, and 90% of those with the condition have type 2 diabetes. Type 2 diabetes occurs when the pancreas no longer produces enough insulin to maintain a normal blood glucose level, or the body is unable to use the insulin that is produced (known as insulin resistance).

People with type 2 diabetes have an increased risk of coronary heart disease, peripheral vascular disease and stroke, and they are more likely to have hypertension, dyslipidaemia (abnormal blood lipid and lipoprotein levels) and obesity. People who are overweight or obese are more likely to develop type 2 diabetes, and the risk rises as body weight increases.

1 This guidance focuses on identifying people at high risk of type 2 diabetes and
2 offering them effective lifestyle-change programmes to prevent or delay the
3 condition.

4 Since the guideline was published in 2012 there have been concerns that the current
5 criteria for offering intensive lifestyle-change programmes are too inclusive and that
6 significant resource would be committed on people at lower risk of developing type 2
7 diabetes. The level of risk needed to be reviewed to identify when it is most
8 appropriate to promote individualised interventions to prevent the development of
9 type 2 diabetes, in terms of individual risk and NHS resources.

10 One of the aims of the 2017 update, therefore, was to assess the clinical and cost
11 effectiveness of intensive lifestyle modification programmes in subgroups of this high
12 risk population to enable commissioners to target the intervention to people who will
13 derive most benefit. A second aim was to assess the clinical and cost effectiveness
14 of metformin and digitally delivered lifestyle interventions among the same
15 population subgroups.

16 *More information*

[The following sentence is for post-consultation versions only – editor to update hyperlink with guideline number] You can also see this guideline in the NICE pathway on [pathway title]. [Note: this should link to the specific topic pathway, not to the overarching one.]

To find out what NICE has said on topics related to this guideline, see our web page on diabetes.

[The following sentence is for post-consultation versions only – editor to update hyperlink with guideline number]See also the evidence reviews and information about how the guideline was developed, including details of the committee.

17

18 Recommendations for research

19 The guideline committee has made the following recommendations for research.

1 Identification and monitoring

Which combination of risk-assessment tools and blood tests (HbA1c or fasting plasma glucose [FPG]) are most cost effective and effective at identifying and assessing the risk of type 2 diabetes among populations at high risk? In addition, how frequently should testing take place to be efficient? How does effectiveness and cost effectiveness vary for different black and minority ethnic groups, for example, African-Caribbean and black African; people aged 18–40, people aged 75 and over, and for high-risk vulnerable adults?

What are the demographic characteristics and rates of progression to type 2 diabetes among people with a high risk score but normal blood glucose levels (fasting plasma glucose of less than 5.5 mmol/l or HbA1c of less than 42 mmol/mol)? How does this compare with people who have both a high risk score and blood glucose levels that indicate impaired glucose regulation (fasting plasma glucose 5.5–6.9 mmol/l or HbA1c 42–47 mmol/mol (6.0–6.4%)?

What are the most effective and cost-effective methods of increasing uptake of type 2 diabetes risk assessments and monitoring among those at greatest risk? Those at greatest risk include people from lower socioeconomic and black and minority ethnic groups, and those aged 75 or over.

2 Lifestyle interventions

Which components of an intensive lifestyle-change programme contribute most to the effectiveness and cost effectiveness of interventions to prevent or delay type 2 diabetes in those at high risk? How does this vary for different black and minority ethnic groups, for people of different ages for example, aged 18–24, 25–39 and 75 and over, and for vulnerable adults?

How effective and cost effective are different types of dietary regime in reducing short- and long-term blood glucose levels and preventing or delaying type 2 diabetes? How does this vary for different subgroups, for example, African-Caribbean and black African and other minority ethnic groups and for people of different ages, for example, aged 18–24, 25–39 and 75 and over?

How effective and cost effective are different types (and levels and frequency) of physical activity in reducing short- and long-term blood glucose levels and preventing or delaying type 2 diabetes? How does this vary for different subgroups, for example, different black and minority ethnic groups and people of different ages, for example, aged 18–24, 25–39 and 75 and over?

3 Vulnerable groups

What are the most effective and cost-effective methods for identifying, assessing and managing the risk of type 2 diabetes among high-risk, vulnerable adults? This group includes: frail older adults, homeless people, those with severe mental illness, learning or physical disabilities, prisoners, refugees, recent migrants and travellers.

More detail on the gaps in the evidence identified during development of this guidance is provided in appendix D.

Update information

May 2017

New recommendations have been added on intensive lifestyle-change programmes and metformin for people at risk of type 2 diabetes.

Recommendations are marked as **[2017]** if the recommendation is new or the evidence has been reviewed.

NICE proposes to delete some recommendations from the 2012 guideline, because either the evidence has been reviewed and the recommendations have been updated, or NICE has updated other relevant guidance and has replaced the original recommendations. Recommendations that have been deleted or changed sets out these recommendations and includes details of replacement recommendations. Where there is no replacement recommendation, an explanation for the proposed deletion is given.

Where recommendations are shaded in grey and end **[2012]**, the evidence has not been reviewed since the original guideline.

See also the original NICE guideline and supporting documents.

1 ***Recommendations that have been deleted or changed***

Recommendations to be deleted **Recommendation in 2012 guideline**	**Comment**
Recommendation to be deleted: Use clinical judgement on whether (and when) to offer standard-release metformin[8] to support lifestyle change for people whose HbA1c or fasting plasma glucose blood test results have deteriorated if: • this has happened despite their participation in an intensive lifestyle-change programme, **or** • they are unable to participate in an intensive lifestyle-change programme. **[2012]** (19 [part])	Replaced by: Use clinical judgement on whether (and when) to offer standard-release metformin[9] to support lifestyle change for people whose HbA1c or fasting plasma glucose blood test results have deteriorated if: • this has happened despite their participation in an intensive lifestyle-change programme, **or** • they are unable to participate in an intensive lifestyle-change programme particularly if they have a BMI greater than 35. **[2017]** (1.19.1)

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3

[8] At the date of publication (July 2012), metformin did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.

[9] At the time of consultation (May 2017), metformin did not have a UK marketing authorisation for this indication. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Prescribing guidance: prescribing unlicensed medicines for further information.

Changes to recommendation wording for clarification only (no change to meaning)

Recommendation numbers in current guideline	Comment
Recommendations 1.5.2, 1.8.10, 1.9.3, 1.10.1, 1.13.8, 1.18.1, 1.18.2 and 1.18.3	Minor edits have been made to these recommendations for clarity. This was needed because the guideline has been put into a new template in which the recommendations from the original guideline have been separated into several recommendations.

Glossary

Behaviour change

Evidence-based behaviour-change advice includes:

- helping people to understand the short, medium and longer-term consequences of health-related behaviour
- helping people to feel positive about the benefits of changing their behaviour
- building the person's confidence in their ability to make and sustain changes
- recognising how social contexts and relationships may affect a person's behaviour
- helping plan changes in terms of easy steps over time
- identifying and planning for situations that might undermine the changes people are trying to make (including planning explicit 'if–then' coping strategies to prevent relapse)
- encouraging people to make a personal commitment to adopt health-enhancing behaviours by setting (and recording) achievable goals in particular contexts, over a specified time
- helping people to use self-regulation techniques (such as self-monitoring, progress review, relapse management and goal revision) to encourage learning from experience
- encouraging people to engage the support of others to help them to achieve their behaviour-change goals.

(This is adapted from NICE's guidance on behaviour change: the principles for effective interventions.)

Brief advice

Typically, for diabetes prevention, brief advice might consist of a 5–15 minute consultation. The aim is to help someone make an informed choice about whether to make lifestyle changes to reduce their risk of diabetes. The discussion covers what that might involve and why it would be beneficial. Practitioners may provide written information in a range of formats and languages about the benefits and, if the person is interested in making changes, may discuss how these can be achieved and sustained in the long term.

Brief intervention

Brief interventions for diabetes prevention can be delivered by GPs, nurses, healthcare assistants and professionals in primary healthcare and the community. They may be delivered in groups or on a one-to-one basis. They aim to improve someone's diet and help them to be more physically active. A patient-centred or 'shared decision-making' communication style is adopted to encourage people to make choices and have a sense of 'ownership' of their lifestyle goals and individual action plans. Providers of brief interventions should be trained in the use of evidence-based behaviour-change techniques for supporting weight loss through lifestyle change.

Computer-based risk-assessment tools

These tools identify a set of risk characteristics in patient health records. They can be used to interrogate GP patient databases and provide a summary score to indicate someone's level of risk. Examples include the Cambridge diabetes risk score and the Leicester practice score.

Diabetes prevention programmes

Diabetes prevention programmes comprise two integrated components: first, risk identification services and second, intensive lifestyle-change programmes.

Participants are acknowledged as the decision-makers throughout the process. Also see 'Intensive lifestyle-change programmes'.

Glycated haemoglobin (HbA1c)

Glycated haemoglobin (HbA1c) forms when red cells are exposed to glucose in the plasma. The HbA1c test reflects average plasma glucose over the previous 8–12 weeks. Unlike the oral glucose tolerance test, an HbA1c test can be performed at any time of the day and does not require any special preparation, such as fasting.

HbA1c is a continuous risk factor for type 2 diabetes. This means there is no fixed point when people are (or are not) at risk. The World Health Organization recommends a level of 48 mmol/mol (6.5%) for HbA1c as the cut-off point for diagnosing type 2 diabetes in non-pregnant adults. For the purposes of this guidance, the range 42–47 mmol/mol (6.0–6.4%) is considered to be 'high risk'.

Impaired fasting glucose (IFG)

Impaired fasting glucose is defined as a fasting plasma glucose between 6.1 and 6.9 mmol/l.

Impaired glucose tolerance

This is a risk factor for future diabetes and/or other adverse outcomes. The current WHO diagnostic criteria for impaired glucose tolerance are: a fasting plasma glucose of less than 7.0 mmol/l and a 2-hour venous plasma glucose (after ingestion of 75 g oral glucose load) of 7.8 mmol/l or greater, and less than 11.1 mmol/l.

Impaired glucose regulation (IGR)

This is a risk factor for future diabetes and/or other adverse outcomes. The term covers blood glucose levels that are above the normal range but are not high enough for the diagnosis of type 2 diabetes. It is used to describe the presence of impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) as defined by the WHO.

- IFG is defined as fasting plasma glucose 6.1 to 6.9 mmol/l. IGT is defined as a fasting plasma glucose (FPG) less than 7 mmol/l and 2-hour venous plasma

glucose (after ingestion of 75 g oral glucose load) of 7.8 mmol/l or greater and less than 11.1 mmol/l.

Impaired fasting glucose and impaired glucose tolerance can occur as isolated, mutually exclusive conditions or together, that is, fasting plasma glucose between 6.1 and 6.9 mmol/l and 2-hour glucose of 7.8 mmol/l or greater and less than 11.1 mmol/l during the oral glucose tolerance test.

Intensive lifestyle-change programmes

A structured and coordinated range of interventions provided in different venues for people identified as being at high risk of developing type 2 diabetes (following a risk assessment and a blood test). The aim is to help people become more physically active and to improve their diet. If the person is overweight or obese, the programme should result in weight loss. Programmes may be delivered to individuals or groups (or involve a mix of both) depending on the resources available. They can be provided by primary care teams and public, private or community organisations with expertise in dietary advice, weight management and physical activity.

Level of risk

The terms 'high', 'intermediate' and 'low' risk are used to refer to the results from a risk assessment tool. These terms are used instead of specific numerical scores because the tools have different scoring systems. The term 'moderate risk' is used to denote a high risk assessment score where a blood test did not confirm that risk (FPG less than 5.5 mmol/l or HbA1c less than 42 mmol/mol [6.0%]). A fasting plasma glucose of 5.5–6.9 mmol/l or an HbA1c level of 42–47 mmol/mol [6.0–6.4%] indicates high risk.

Moderate-intensity physical activity

Moderate-intensity physical activity requires an amount of effort and noticeably accelerates the heart rate. Examples include brisk walking, housework and domestic chores. On an absolute scale, moderate-intensity is defined as physical activity that is between 3 and 6 metabolic equivalents (METs).

Oral glucose tolerance test

An oral glucose tolerance test involves measuring the blood glucose level after fasting, and then 2 hours after drinking a standard 75 g glucose drink. Fasting is defined as no calorie intake for at least 8 hours. More than one test on separate days is required for diagnosis in the absence of hyperglycaemic symptoms.

Vigorous-intensity physical activity

Vigorous-intensity physical activity requires a large amount of effort, causes rapid breathing and a substantial increase in heart rate. Examples include running and climbing briskly up a hill. On an absolute scale, vigorous intensity is defined as physical activity that is above 6 metabolic equivalents (METs).

Weight-loss programmes

Effective weight-loss programmes are structured lifestyle-change programmes to help people lose weight in a sustainable way. They:

- are based on an assessment of the individual
- address the reasons why someone might find it difficult to lose weight
- are tailored to individual needs and choices
- are sensitive to the person’s weight concerns
- are based on a balanced, healthy diet
- encourage regular physical activity
- utilise behaviour-change strategies.

Weight management

In this guidance, the term weight management includes:

- assessing and monitoring body weight
- preventing someone from becoming overweight (body mass index [BMI] of 25–29.9 kg/m², or 23–27.4 kg/m² if they are of South Asian or Chinese descent)
- preventing someone from becoming obese (BMI greater than or equal to 30 kg/m², or 27.5 kg/m² or above if they are of South Asian or Chinese descent)
- helping someone who is overweight or obese to achieve and maintain a 5–10% weight loss and progress to a healthy weight (BMI of 18.5–24.9 kg/m², or 18.5 to

1 22.9 kg/m^2 if they are of South Asian or Chinese descent) by adopting a healthy
2 diet and being physically active.

3 For other public health and social care terms see the Think Local, Act Personal Care
4 and Support Jargon Buster.

5 ISBN: