Identifying People at High Risk of Type 2 Diabetes

Medscape UK X Guidelines
Primary Care Hacks

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What Is Prediabetes?

- Prediabetes refers to raised blood glucose levels above normal but not above the diagnostic threshold for T2D. **HbA_{1c} values of 42–47 mmol/mol indicate prediabetes**[1] and a **single test** is sufficient. People living with prediabetes have an increased risk of developing T2D
- Depending on what test is used, prediabetes can also be referred to as:[2]
  - **nondiabetic hyperglycaemia** (HbA_{1c} 42–47 mmol/mol[3])
  - **impaired fasting glucose** (FPG ≥6.1 and <6.9 mmol/l[4])
  - **impaired glucose tolerance** (2-hour oral glucose tolerance test ≥7.8 and <11.1 mmol/l[4])
- **Prediabetes is associated with an increased risk of all-cause mortality and CVD in the general population and in those with atherosclerotic CVD.**[5] This has implications for the screening and management of prediabetes in the primary and secondary prevention of CVD[5]
- **Prediabetes is more than just dysglycaemia**. A recent prospective cohort study found that reversion to normoglycaemia in those with prediabetes was only associated with lower risks of death and a longer life expectancy when accompanied by significant lifestyle change such as high levels of physical activity, not smoking, and maintaining a healthy bodyweight.[6]

Identifying Those at High Risk of T2D

NICE PH38 recommends a **two-stage strategy to identify people at high risk of T2D** (and those with undiagnosed T2D)[4]

1. A **risk assessment** should be offered using a validated computer-based risk assessment tool that can use routinely available data from individuals' electronic health records, such as QDiabetes-2018
2. For those with high risk scores for developing T2D (e.g., QDiabetes score ≥10%), a **blood test for HbA_{1c}** should be offered

Additionally, if aged ≥25 years and of South Asian or Chinese descent with BMI >23 kg/m², there is no need to use a risk assessment tool; instead, directly offer an HbA_{1c} blood test.

Matching Interventions to Risk in People with Prediabetes[4,7,8]

Risk factors for developing T2D

- Obesity
- Family history of T2D
- GDM
- MASLD (formerly NAFLD; see also the Primary Care Hack on MASLD/MASH)
- CVD
- OSAHS
- Hypertension requiring treatment (see also the Primary Care Hack on lifestyle changes for managing hypertension)
- PCOS
- Learning disabilities
- SMI, e.g., bipolar disorder or schizophrenia
- Certain medications including regular steroids, statins, and atypical antipsychotics
- People in highly deprived socioeconomic situations

- People aged 25–39 years of South Asian, Chinese, Black African, African–Caribbean descent or other high-risk Black and minority ethnic groups
- A recent retrospective cross-sectional US study suggested the need for screening for T2D among high-risk Asian groups even at healthy BMI levels[7]

- People aged ≥40 years (except pregnant women)
- NICE PH38 stresses that nobody should be excluded from assessment on the basis of age, as everyone can reduce their risk, including those aged ≥75 years

Stage 1
- Use a risk assessment tool such as **QDiabetes-2018**
- If aged ≥25 years and of South Asian or Chinese descent with BMI >23 kg/m², omit the risk assessment tool and instead directly offer an HbA_{1c} blood test

If low or intermediate risk score, e.g. **QDiabetes-2018 <10%,** no HbA_{1c} blood test is required

Give brief advice on the risks of developing T2D and offer verbal and written information about culturally appropriate resources that could help them change their lifestyle, e.g. Diabetes UK's *Information prescriptions for people with diabetes*

Reassess risk at least every 5 years

If high risk score, e.g. **QDiabetes-2018 ≥10%**, offer HbA_{1c} blood test

If HbA_{1c} <42 mmol/mol, the individual is at **moderate risk** of developing T2D

Discuss brief advice on the risks of developing T2D

Offer a brief intervention to help them change their lifestyle, e.g. structured weight-loss programmes

Offer verbal and written information about culturally appropriate resources that could help them change their lifestyle, e.g. Diabetes UK's *Information prescriptions for people with diabetes*

Reassess risk at least every 3 years

If HbA_{1c} 42–47 mmol/mol, the individual is at **high risk** of developing T2D

If HbA_{1c} ≥48 mmol/mol, this is **suggestive of T2D**

Repeat HbA_{1c} blood test within 4 weeks to confirm diagnosis. If repeat HbA_{1c} ≥48 mmol/mol, a diagnosis of T2D is confirmed and should be managed as usual

If repeat HbA_{1c} <48 mmol/mol, follow recommendations below

Discuss brief advice on the risks of developing T2D

Offer referral to a local, evidence-based, quality-assured intensive lifestyle change programme to increase physical activity and achieve and maintain weight loss

Offer verbal and written information about culturally appropriate resources that could help them change their lifestyle, e.g Diabetes UK's *Information prescriptions for people with diabetes*

Offer an HbA_{1c} blood test and reassess weight at least annually

Special Populations of Note

People Living with an Eating Disorder

- The prevalence of T2D is higher in people with binge eating disorder than the general population[9]
- Additional caution should be taken discussing prediabetes and weight loss with people who are living with or suspected to have an eating disorder, as weight-loss interventions may be contraindicated and may exacerbate the condition.[9]

Gestational Diabetes

- **Women with a history of GDM are almost 10 times more likely to develop T2D** over their lifetime than women without a history of GDM[10]
- For women previously diagnosed with GDM and whose blood glucose levels return to normal after birth, NICE and SIGN both recommend:[11,12]
  - lifestyle advice (including weight management, diet, and exercise)
  - **offer an FPG 6–13 weeks after delivery** to exclude T2D (HbA_{1c} should not be used until 3 months postpartum but can be used if an FPG has not been carried out by 13 weeks). Practically, this can be part of the 6-week postnatal check
    - **if FPG <6.0 mmol/l** (HbA_{1c} <39 mmol/mol), there is a low probability of T2D. Lifestyle advice should be reinforced; ensure they are under recall for **lifelong annual HbA_{1c}** to check for progression to T2D
    - **if FPG 6.0–6.9 mmol/l** (HbA_{1c} 39–47 mmol/mol), the individual is at high risk of developing T2D and the *Matching Interventions to Risk* flowchart should be followed
    - **if FPG ≥7.0 mmol/l** (HbA_{1c} ≥48 mmol/mol), a diagnosis of T2D is likely and the *Matching Interventions to Risk* flowchart should be followed.

Polycystic Ovary Syndrome

- **Women living with PCOS are 1.4 times more likely to develop T2D** over their lifetime than women without PCOS[3]
- This increased risk is **independent of baseline bodyweight**;[13] NICE recommends assessing glycaemic status with an HbA_{1c} blood test at baseline in **all** women living with PCOS. Thereafter, glycaemic assessment should take place **every 1–3 years lifelong**, depending on the presence of other risk factors for developing T2D.[14]

People Living with Severe Mental Illness

- **People living with SMI are 1.3 times more likely to develop T2D** over their lifetime than people without SMI[3]
- The *Lester UK adaptation: positive cardiometabolic health resource* 2023 update gives recommendations relating to monitoring physical health in people living with SMI such as psychosis and schizophrenia.[15] The aim of this resource is to help reduce the **health inequality of a 15–20-year mortality gap** in people living with SMI[16]
- For all people in the 'red zone' as depicted in the *Lester UK adaptation* intervention framework for people experiencing psychosis and schizophrenia, including those with HbA_{1c} ≥42 mmol/mol: **don't just screen, intervene!**
- Care should always be person-centred, tailoring discussion to the needs of the person to enable shared decision-making. Refer for investigation, diagnosis, and treatment as appropriate
- For those at high risk of T2D (HbA_{1c} of 42–47 mmol/mol), offer referral to an evidence-based lifestyle change programme. If ineffective, offer metformin modified release if safe and appropriate. Aim for HbA_{1c} <42 mmol/mol.

Metformin

- NICE recommends using clinical judgement on whether (and when) to offer metformin to support lifestyle changes in people at risk of T2D with rising HbA_{1c} blood tests. Consider metformin if:[4]
  - HbA_{1c} continues to rise despite participation in an intensive lifestyle change programme
  - the individual is unable to participate in a lifestyle change programme, particularly if BMI is >35 kg/m^2
- If commencing metformin, **start low and go slow**, e.g. 500 mg once daily and increase gradually as tolerated to 2000 mg daily. If the individual is intolerant of standard-release metformin, consider using modified-release metformin[4]
- Prescribe metformin for 6–12 months initially. Check HbA_{1c} at 3-month intervals and stop metformin if no benefit is seen.[4]

Managing Prediabetes—Key Interventions

- By making changes to diet, increasing physical activity, and losing weight, **around half of cases of T2D can be prevented or delayed**[17]
- Review coexisting risk factors such as blood pressure, lipids, and smoking status
- Pharmacological interventions, most notably incretin therapies, may be appropriate as an adjunct to a reduced-calorie diet and increased physical activity for weight management in adults with overweight or obesity[18]—see also the Primary Care Hack on liraglutide, semaglutide, and tirzepatide for managing overweight and obesity in primary care
- Bariatric and metabolic surgery may also be appropriate for certain individuals; referral for MDT assessment is recommended if a person has prediabetes, has received optimal nonsurgical weight-management treatment, has a BMI >35 kg/m^2 (or 32.5 kg/m^2 in people with a South Asian, Chinese, other Asian, Middle Eastern, Black African, African–Caribbean, or Arab family background), and agrees to adhere to the requirements for long-term follow up[19]
- Also see *Metformin*, above
- In the SURMOUNT-1 trial, 3 years of treatment with tirzepatide in people living with obesity and prediabetes resulted in significant and sustained weight reduction (nearly 20% with tirzepatide 15 mg) and 90% fewer new diagnoses of T2D compared to placebo.[20]

Clinical Coding

- SIGN recommends a more uniform approach to coding in primary care of those at high risk of T2D:[8]
  - consider maintaining a register of people at high risk of developing T2D and offering then an annual review. This annual review should also cover any coexisting cardiometabolic long-term conditions
  - a single read code (**C11y500—'pre-diabetes'**) is recommended for all cases of prediabetes, including impaired glucose tolerance, impaired fasting glucose, and nondiabetic hyperglycaemia
  - the additional recall code is recommended to ensure that these individuals are properly followed up (**66Az—'high risk of diabetes annual review'**).

Useful Resources

For Patients

- Diabetes UK: *Prediabetes*
- Diabetes UK: *Weight loss and diabetes*
- Diabetes UK: *Type 2 diabetes—know your risk*
- QDiabetes-2018 risk calculator
- Diabetes Research Centre: *Could you have type 2 diabetes?*
- Diabetes Scotland: *Your guide to type 2 diabetes*
- NHS Lose Weight website.

For Healthcare Professionals

- Diabetes UK: *Information prescriptions for healthcare professionals*
- *UK Chief Medical Officers' physical activity guidelines*
- Gardner M, Wang J, Hazlehurt J et al. Risk of progression from prediabetes to type 2 diabetes in a large UK adult cohort. *Diabet Med* 2023; **40**(3): e14996.
- Public Health Scotland: *Challenging weight stigma learning hub*
- Babysteps online programme for GDM.

Abbreviations
BMI=body mass index; **CVD**=cardiovascular disease; **FPG**=fasting plasma glucose; **GDM**=gestational diabetes mellitus; **HbA_{1c}**=glycated haemoglobin; **MASH**=metabolic dysfunction-assocated steatohepatitis; **MASLD**=metabolic dysfunction-associated steatotic liver disease; **MDT**=multidisciplinary team; **NAFLD**=nonalcoholic fatty liver disease; **OSAHS**=obstructive sleep apnoea/hypopnoea syndrome; **PCOS**=polycystic ovary syndrome; **PH**=Public Health Guideline; **SIGN**=Scottish Intercollegiate Guidelines Network; **SMI**=severe mental illness; **T2D**=type 2 diabetes.