1 Diabetes prevention

Figure 1.1 Graph to show rising HbA1c levels and diagnosis of type 2 diabetes.

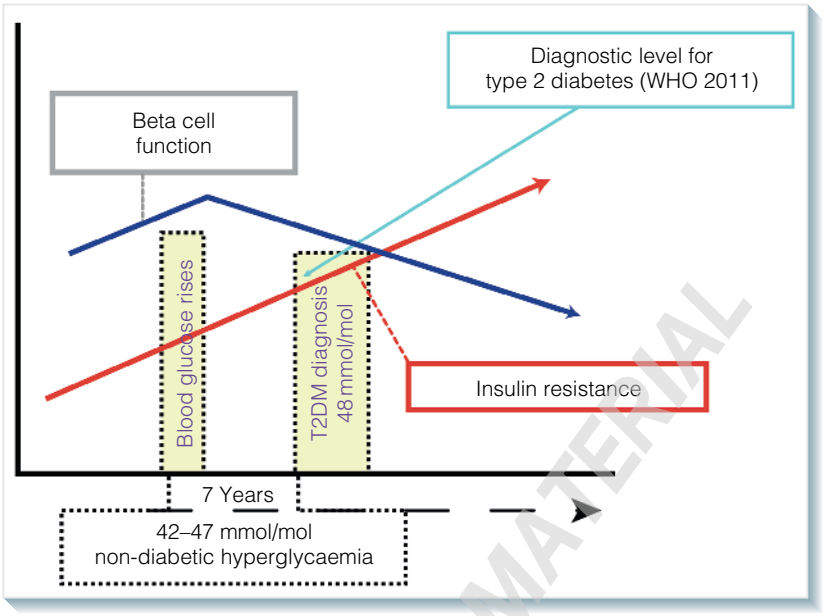

Figure 1.2 HbA1c.

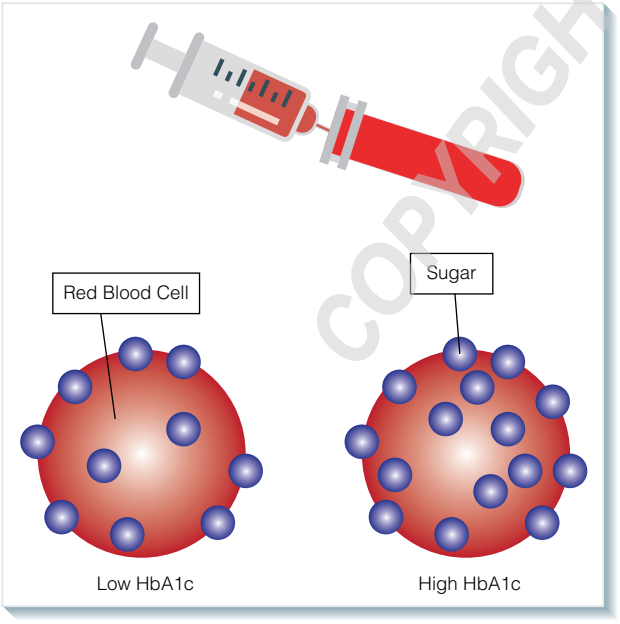

Figure 1.3 One Less Challenge. *Source:* Africa Studio/Adobe Stock.

Figure 1.4 Signs and symptoms of metabolic syndrome.

- Lethargy
- Tiredness
- Difficulty concentrating
- Weight gain (especially around the middle)
- Hypertension
- Hyperlipaemia
- Hyperglycaemia

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This chapter is to help you understand what diabetes prevention involves and how you can help people at risk of type 2 diabetes to reduce their risk. A record number of people across the UK and worldwide are living with type 2 diabetes, and this figure has more than doubled since 1996. The International Diabetes Federation (IDF 2021) reported that 537 million people are known to have diabetes worldwide, with predictions that this will rise to 783 million by 2045.

Type 2 diabetes is largely preventable, and the World Health Organization (WHO 2019) has recognized that diabetes predominantly affects people who are most vulnerable, with three in four adults with diabetes aged 20–79 living in low- and middle-income countries. Diabetes costs the worldwide healthcare system at least £720 billion, a rise of 316% in total health expenditure since 2006.

Every two minutes someone discovers they have type 2 diabetes, a serious health condition that can cause long-term health problems. Type 2 diabetes causes about 90% of all types of diabetes worldwide. Intervention to prevent type 2 diabetes and target those most at risk of non-diabetic hyperglycaemia should be timely and outcomes can be favourable with early intervention and referral for people this affects.

Diabetes prevention programmes are becoming increasingly available worldwide. The programme in the UK is organized by NHS England, Public Health England and Diabetes UK and delivers a behavioural platform to support people in reducing their risk of developing type 2 diabetes, or in reversing the diagnosis if newly diagnosed. This programme is provided nationwide, and people can be referred via their GP practice or secondary care. The programme is delivered by different providers in primary care networks (**PCN**s) and involves a group class, a health coach and/or access to a personalized app to help motivate the patient to lose weight and be more physically active.

People are at risk when the level of HbA1c (an average of the last six to eight weeks of blood glucose levels) is raised (World Health Organization 2011). The diagnostic level of HbA1c for type 2 diabetes is 48 mmol/mol. Non-diabetic hyperglycaemia is diagnosed at 42–77 mmol/mol and this places people 'at risk' for type 2 diabetes (Figure 1.1). The interval from the onset of rising HbA1c levels to the diagnosis of type 2 diabetes is on average seven years; this period is a window of opportunity that allows the detection of non-diabetic hyperglycaemia and appropriate prevention strategies to be offered. Measurement of HbA1c is usually undertaken during a routine health review in general practice but might also take place during a preoperative screening or as part of an inpatient biochemistry profile.

HbA1c reflects the amount of glucose that binds to red blood cells (**RBC**s) when they are manufactured in the bone marrow. The blood glucose level at the time the RBCs are produced is the amount that binds to those RBCs for their lifespan, on average 12 weeks (Figure 1.2). Thus an HbA1c measurement comprises some older RBCs, some newer ones and some middle-aged ones, so that the HbA1c value is considered the average of all these RBCs, thus allowing six to eight weeks of glucose control.

The NHS National Diabetes Prevention Programme (Diabetes 2022) in the UK focuses on three main goals of behavioural intervention: (i) weight loss, (ii) achievement of individualized dietary recommendations, and (iii) achievement of recommended individualized physical activity recommendations. Person-centred goal setting with each individual is essential to engage people with their programme and to support each individual in achieving their personal goals in diabetes prevention and health gain. One approach for weight loss is to recommend 'one less' as this can be easily understood and can be meaningful for people to engage with. For example, one less slice of bread is equivalent to a saving of 32 kcal, and over seven days this amounts to 224 kcal less consumed (Figure 1.3). This can be adapted into people's daily routines and built upon by individuals as they achieve some weight reduction.

Screening people for diabetes can help to find people at high risk. Health professionals have a number of strategies to try to prevent type 2 diabetes and engage people in their own personal health. The Diabetes UK three-minute 'at risk' assessment is a good approach to use (https://riskscore.diabetes.org.uk/start) as this is individualized and offers support for people in their own homes (Figure 1.4).

References

Diabetes UK (2022). NHS Diabetes Prevention Programme. www.diabetes.org.uk/professionals/resources/shared-practice/nhs-diabetes-prevention-programme (accessed 1 April 2022).

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