Helping people at high risk of type 2 diabetes: Using the WAKEUP materials

Philip H Evans, Colin J Greaves

People with prediabetes (those who have "borderline" hyperglycaemia) are at high risk for developing type 2 diabetes, but progression to diabetes is by no means inevitable. A number of interventions for individuals who are at high risk have been shown to reduce the risk. The WAKEUP (Ways of Addressing Knowledge Education and Understanding in Pre-diabetes) information toolkit for people with prediabetes and their health practitioners was developed in 2007 and updated in 2014. Principles for delivering a brief intervention based on the freely available WAKEUP materials are presented.

Despite the best efforts of clinicians and governments, the epidemic of type 2 diabetes continues worldwide. It is estimated that in 2013, there were 382 million people in the world with diabetes (International Diabetes Federation, 2014), of which around 90% have type 2 diabetes. Current rates of diagnosis are exceptional; for example, 21 million people were diagnosed with diabetes in the US in 2010 (Selph et al, 2015). At a practice level in the UK, individual practices, with an average list size, may well be diagnosing one patient every fortnight with type 2 diabetes (Evans et al, 2008; 2013).

In addition to this epidemic of type 2 diabetes, there are an increasing number of people with so-called "prediabetes". People with prediabetes have "borderline" hyperglycaemia when assessed by various glucose measures such as a fasting blood glucose, an oral glucose tolerance test or, more often, an HbA_{1c} estimation. It was recently estimated that one-third of adults in the UK meet the US criteria for prediabetes (Mainous et al, 2014).

How is prediabetes defined?

Traditionally, people with prediabetes were categorised into one of two hyperglycaemic states, varying with the glucose test that was used. These included impaired fasting glucose (IFG), diagnosed using a fasting blood glucose test, or impaired glucose tolerance (IGT), diagnosed by an oral glucose tolerance test. However, the criteria for prediabetes have changed gradually over the years since the condition was first defined by the American Diabetes Association (ADA) in 1997 (Expert Committee on the Diagnosis and Classification of Diabetes Mellitus, 1997).

The situation was much simplified in 2009 when international guidance was issued (International Expert Committee, 2009), confirming that HbA_{1c} could also be used to diagnose prediabetes (see *Table 1*). This

Table 1. Diagnostic criteria for prediabetes and diabetes.

Measure*	Prediabetes	Diabetes
Fasting plasma glucose	5.5–7.0 mmol/L	>7.0 mmol/L
2-hour glucose post-OGTT	7.8–11.1 mmol/L	>11.1 mmol/L
HbA_{1c}	42–47 mmol/mol (6.0–6.4%)	>47 mmol/mol (6.4%)

*Measurements (apart from OGTT) need repeating unless urgent action is needed. OGTT=oral glucose tolerance test.

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Article points

1. People with prediabetes are increasingly being diagnosed in primary care.
2. Resources to facilitate medical management and encourage lifestyle change are sparse.
3. The WAKEUP (Ways of Addressing Knowledge Education and Understanding in Pre-diabetes) toolkit provides an opportunity to work with people with prediabetes to provide basic information about their diagnosis and to begin to address lifestyle and other cardiovascular risk factors.

Key words

- Lifestyle change
- Prediabetes
- Prevention
- WAKEUP toolkit

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consensus proposed that an HbA_{1c} level of 42–47 mmol/mol (6.0–6.4%) should indicate prediabetes (see *Table 1*), although the ADA (2010) subsequently adopted levels of 39–47 mmol/mol (5.7–6.4%; ADA, 2010).

Why is prediabetes important?

Prediabetes is important for several reasons. People with borderline blood glucose measurements (prediabetes) are at high risk of developing type 2 diabetes, with studies showing a risk as high as 55% over 10 years (Diabetes Prevention Program Research Group et al, 2009). People with prediabetes are also at increased risk of coronary artery disease (Levitan et al, 2004).

Perhaps the most important aspect of prediabetes is the fact that progression to diabetes is by no means inevitable and there are a number of evidence-based interventions that have been shown to reduce or prevent progression to type 2 diabetes in those individuals who are at high risk. It seems that the cornerstone of care for people at high risk is lifestyle intervention and, to a lesser extent, pharmaceutical interventions such as metformin. A recent systematic review for the US Preventive Services Task Force found that treatment of IFG or IGT was consistently associated with delayed progression to diabetes (Selph et al, 2015).

However, in 2014 there was an interesting debate, led by Yudkin and Montori (2014), who questioned the whole concept of the diagnosis of prediabetes. They observed that the term itself was not helpful because many individuals to whom it is applied will not actually develop diabetes, and they also argued that overdiagnosis of prediabetes would generate extra expenditure on pharmaceuticals while being associated with the possibility of harm to some patients. In addition, they questioned the extension of the lower HbA_{1c} definition (using the ADA criteria) and called for a more population-based approach to the prevention of diabetes, concluding that the term "prediabetes" should be put in "cold storage". Despite this, the arguments for early identification and intervention to prevent type 2 diabetes are strong, and both population-level interventions and individual-level interventions for people at high risk have been recommended by NICE (2011; 2012).

Need for action on prediabetes

The recently introduced NHS Health Check Programme (2009) and continued opportunistic screening in general practices (Evans et al, 2008) have started to reveal an increasingly large number of people with prediabetes, whose cardiovascular and diabetes risk needs to be addressed. There is also recognition by most health practitioners that there is an increasing need for the provision of general information and lifestyle advice to patients.

NICE, in 2012, recommended referral of patients with prediabetes to a local quality-assured evidence-based intensive lifestyle intervention programme (Chatterton et al, 2012), which is reaffirmed by the IMAGE guidance (Paulweber et al, 2010).

A National Diabetes Prevention Programme for England was announced by the NHS and Public Health England in March 2015. Seven pilot sites have been commissioned and it is expected that full-scale roll-out will happen over the next 4–5 years (Wise, 2015). In the interim, within most areas, the responsibility for advising the increasing number of people identified with prediabetes falls mainly to GPs and their practice nurse teams.

WAKEUP study

In 2007, we worked with patients and clinicians with funding from Diabetes UK to develop an educational package for people with prediabetes and their health professionals (Evans et al, 2007). The WAKEUP (Ways of Addressing Knowledge Education and Understanding in Pre-diabetes) package was developed via an action research process and made available on the Internet for health professionals to use.

The key messages about prediabetes that we identified included: [a] the seriousness of the condition; [b] the preventability of progression to diabetes; and [c] the need for

lifestyle change. As well as feedback on the acceptability and use of the toolkit, four main themes were identified in the data:

- Knowledge and education needs (of both patients and health professionals).
- Communicating knowledge and motivating change.
- Redesign of practice systems to support pre-diabetes management.
- The role of the health professional.

The WAKEUP toolkit was designed to address these needs and found to be an acceptable and useful resource for both patients and health practitioners (Evans et al, 2007).

The toolkit itself consisted of a "desktop guide for busy practitioners" – a single A4 page (with additional information on the rear) identifying key information about prediabetes for primary care practitioners (both doctors and nurses) – and a short A5 patient booklet entitled "So you have prediabetes?". This was given to patients along with a simple sheet outlining the diagnostic criteria.

In 2014, it became clear that the materials that we had produced needed updating. The publication of NICE public health guidance in 2012 and the introduction of HbA_{1c} as an appropriate test for diagnosing prediabetes were both incorporated into the revised WAKEUP materials (see *Figure 1*), which are now available to download and print at no cost from: **http://bit.ly/1e3D7XA** (redirects to: http://medicine.exeter.ac.uk/research/healthserv/primarycare/projects/recentlycompletedstudies/wakeup/).

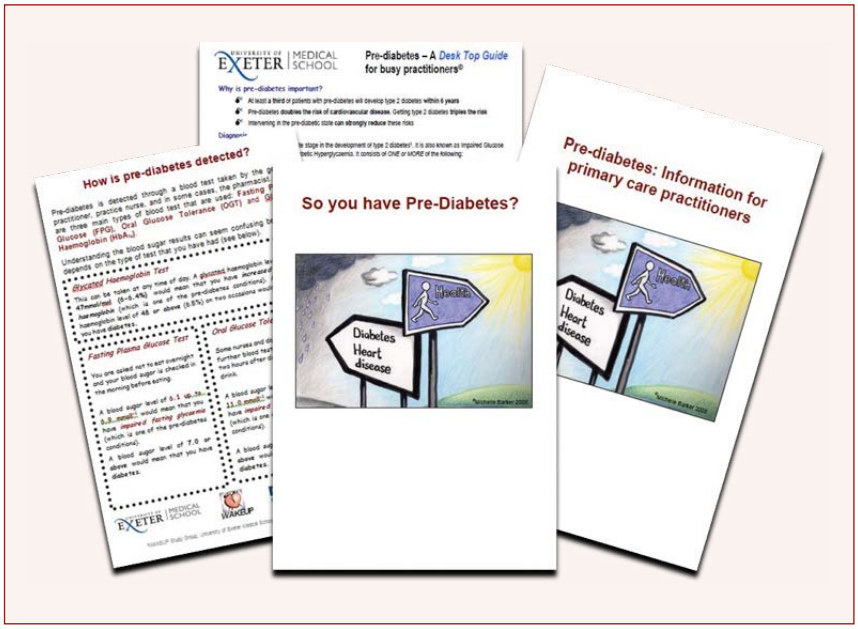

Figure 1. The WAKEUP materials.

Using the WAKEUP materials

The WAKEUP materials can be used in several ways in clinical practice. The simplest approach is to provide information (i.e. give the information booklet [and the diagnosis sheet if needed] to patients and let them "fend for themselves"). This is a low-cost method but perhaps not an ideal option. At the very least a brief discussion and referral to local weight-management services would seem an appropriate additional response. The booklet can be used to facilitate discussion (e.g. using the visual aids on risk on page 5 to explain and discuss the prognosis with or without lifestyle change). Beyond these applications, the booklet may be used as part of a more considered brief (or fuller) intervention, delivered across several sessions. Further information that is available on supporting lifestyle behaviour change for diabetes prevention is listed in *Box 1*, while principles for delivering a brief intervention based on the WAKEUP materials are provided in *Figure 2* and *Box 2*.

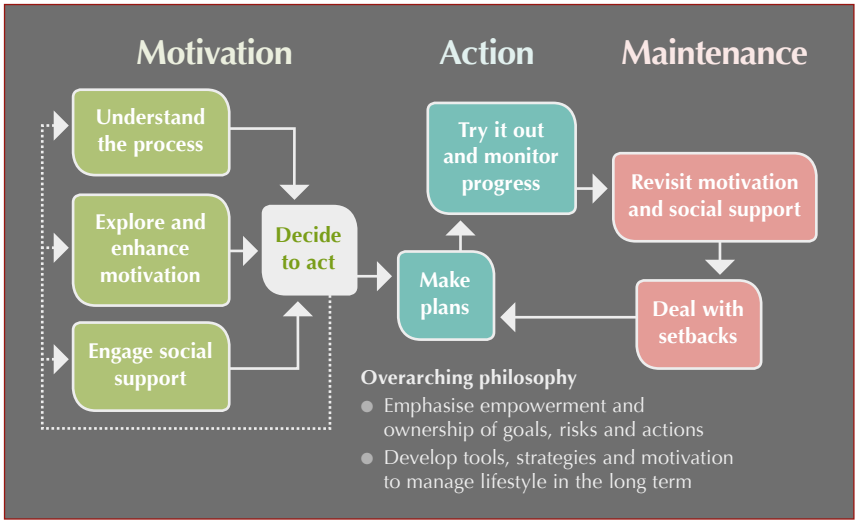

Figure 2. The process model for lifestyle behaviour change (Lindström et al, 2010; Greaves, 2012).

Box 1. Useful resources for supporting lifestyle change.

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Conclusion

People with prediabetes are increasingly being diagnosed in primary care, following opportunistic screening or systematic NHS health checks. Resources to facilitate medical management and encourage lifestyle change are sparse. The WAKEUP information toolkit provides a practical, primary care-focused opportunity to work with individuals to provide basic information about their prediabetes and to start to address lifestyle and other cardiovascular risk factors. ■

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Box 2. Principles for supporting lifestyle change.

The first step on the journey of behaviour change is to establish a clear and strong motivation for change. As reasons for change vary from person to person, this process needs to be individually tailored. Even when people seem to be motivated at the outset, it can be useful to spend time exploring and consolidating their motivation to make the reasons for change explicit. This is what will keep them going when they face challenges, so the more salient and accessible you can make these motives, the better. Motivation requires the patient to be able to: [a] see what the benefits of making a change might be (e.g. How would you feel if you were able to lose 10 kg over the next few years? What would your life be like if you were to gain 10 kg?); and [b] feel confident that change is possible. If the journey seems futile, people will be reluctant to set off, and trying to "persuade them" or talk about what actions they "need to" do will only generate resistance. To build confidence, you can try to identify barriers and break down the problem into more manageable steps.

The second step is to decide what to change. This requires good, reliable knowledge, such as what constitutes a healthy diet or what counts as "moderate-intensity" physical activity. We should also encourage people to plan and make changes that are enjoyable, rewarding and easily managed as part of the their daily or weekly routines. This type of change is much more likely to be sustained than changes which cause discomfort or embarrassment or that are difficult to integrate with the individual's existing lifestyle. It can also be helpful at the planning stage to try to pre-empt any problems that might occur and think about how to stop this happening (making a "coping plan").

The third step is essentially a process of "learning from experience". This often requires several rounds of trial and error, and individuals may need to be supported through this process over time; for instance, it usually takes six or seven attempts before succeeding in stopping smoking. Once again, solving problems and addressing barriers to change are key processes here. Progress review and problem-solving should ideally be engaged with at each contact with the patient, for as long as they need support.

Throughout: It should be noted that the way that interventions are delivered is just as important as their content – the use of a "person-centred, empathy-building approach" (Miller and Rollnick, 2002) is particularly important at the motivation stage. Individuals will only make changes if they decide that it is something that they want to do – we cannot tell them how to live their lives, or control their behaviour once they have left the consultation room!

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