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# Successful self-management of diabetes

Gwen Hall

Considerable ill health in relation to diabetes could be reduced by effective measures to involve people with the condition in their own care. Structured education and care planning are key to allowing people to undertake self-management, and this necessitates a change in practice both for healthcare professionals and people with diabetes. This article explores self-management, outlining the pertinent issues for consideration, such as education and empowerment, as well as a discussion of key articles and contemporary research on self-monitoring of blood glucose as an important aspect of self-management.

## Learning objectives

After reading this article, the participant should be able to:

1. Explain the main concepts behind empowerment and self-management.
2. Outline the aims and objectives of personal diabetes records and care planning.
3. Define the key criteria and specifications for structured education.
4. Describe the use of self-monitoring as it relates to self-management.

## Key words

- Care planning
- Empowerment
- Self-management
- Self-monitoring

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One person is diagnosed with diabetes every 3 minutes in the UK (Diabetes UK, 2009). Regardless of how much time is spent with the healthcare team to care for this condition, the individual with diabetes self-manages 24 hours a day, 365 days a year. It is a huge commitment, suddenly and unexpectedly placed on a person untrained in health and diabetes at diagnosis.

To ensure the best outcomes for these people it is essential to involve them in their own care, and measures to promote empowerment and collaboration through information and education are key to successful self-management.

## Empowerment and care planning

The concept of “empowerment” relates to the partnership between a person with the condition and their healthcare professional, and can be defined as the latter helping the former to discover and develop the inherent capacity to be responsible for their own life (Funnell et

al, 1991). It requires an initial understanding of what the treatment pathway is trying to achieve, and is a continual, information-sharing process, encompassing learning and behaviour change, which aims to allow the person to take responsibility for their own decisions (Meeto and Gopaul, 2004).

For empowerment to be effective it is key that people have the right information to enable them to make informed choices, if they have the capability and desire to do so. They need to be able to agree plans and set goals with the help of their care team, and to do this they need to understand the seriousness of their condition.

The *National Service Framework (NSF) for Diabetes: Standards* (Department of Health [DH], 2001) set out to ensure that people with diabetes are empowered to enhance their personal control over the day-to-day management of their condition. Implications for service planning were highlighted, detailing how the NHS and partner agencies “will need to develop, review and

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audit programmes for empowering people with diabetes” (DH, 2001), including:

- Behavioural change programmes.
- Structured education programmes.
- The provision of information about diabetes and its management.
- Effective care plans.
- Patient-held, accessible records.
- The use of new technologies.

Worryingly, recall of treatment decisions made during the clinic has been found to be inaccurate – not only by the person with diabetes but also by healthcare professionals (Skinner et al, 2007). This suggests that the old clinical consultation model, whereby the healthcare professional gives advice and the person with diabetes listens and acts upon it, is outmoded and ineffective (Skinner et al, 2007; *Box 1*). Middleton et al (2006) even found that the purpose of the consultation was often unclear to both parties.

*The Diabetes Information Jigsaw* report (Association of the British Pharmaceutical Industry [ABPI] et al, 2006) established that 58% of people diagnosed with diabetes do not know what the diagnosis means, and over a third do not know what questions to ask those who provide their care. In addition, it revealed that 60% of people with the condition do not understand what different medicines are available, and many do not understand what their healthcare professional is telling them or the language in which the literature is written. This can lead to feelings of frustration, depression and helplessness for the person with diabetes. The report found that only 17% of people with diabetes receive information about their diabetes treatment every time they are given a prescription.

Standard 3 of the NSF for diabetes (DH, 2001) states that:

*“All children, young people and adults with diabetes will receive a service which encourages partnership in decision-making, supports them in managing their diabetes and helps them to adopt and maintain a healthy lifestyle. This will be reflected in an agreed and shared care plan in an appropriate format and language.”*

The components of this care plan or personal diabetes record were outlined in the NSF delivery strategy (DH, 2003). A personal diabetes record includes an agreed care plan, comprising education and the personal goals of the person with diabetes. It sets out how a person’s diabetes is to be managed until their next review to foster greater understanding and ownership of the goals of diabetes care. It defines health, social care and education needs, how they will be met and who will be responsible, and identifies the named contact.

A care plan is at the heart of a partnership approach to care and is a central part of effective care management. The process of agreeing a care plan offers people active involvement in deciding, agreeing and owning how their diabetes will be managed. While the overall goal is a genuine partnership, the person with diabetes must feel that they are comfortable with what is proposed and that they do not have to bear more responsibility than they wish.

The Healthcare Commission (2007) found that services were falling far short of providing people with diabetes with this information. The report revealed that between 34% and 61% of people with diabetes across all PCTs had agreed

**Page points**

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2. A care plan is at the heart of a partnership approach to care and is a central part of effective care management.
3. The process of agreeing a care plan offers people active involvement in deciding, agreeing and owning how their diabetes will be managed.

**Box 1. The old versus new clinic consultation model.**

Person says	Healthcare professional responds	
	Old model	New model
I am too busy to take more exercise	You need to do this to prevent complications	What sort of activity do you enjoy? What would help you incorporate that in your busy life?
I cannot lose weight	You will need to go on insulin if we cannot get your blood glucose levels down. Losing weight might prevent that.	What have you tried that has worked? What do you understand about the local schemes available to you?
I have not been able to test my blood glucose levels four times a day.	It is hard at first, but just keep trying. You really need to keep track of it.	What is preventing you from doing that? Do you know what the numbers mean?
I have not been taking those tablets regularly	They are really important, do keep trying to remember.	Tell me about your reasons. Do you know what they are for and how they work?

Adapted from: Funnell (2000)

### Page points

1. NICE (2003) recommends that structured patient education be made available to all people with diabetes at the time of initial diagnosis, and then as required on an ongoing basis, based on a formal, regular assessment of need.
2. Structured education programmes should use a variety of techniques to promote active learning, engaging individuals in the process of learning and relating the content of programmes to personal experience.
3. There are several programmes that meet the recommendations, notably DAFNE (Dose Adjustment For Normal Eating), DESMOND (Diabetes Education and Self Management for Ongoing and Newly Diagnosed) and X-PERT.

a plan to manage their condition, and that between 1% and 53% of people with diabetes across all PCTs reported attending an education course on how to manage their diabetes.

The Government document *Our Health, Our Care, Our Say* (DH, 2006) states that:

*“By 2008 we would expect everyone with both long-term health and social care needs to have an integrated care plan if they want one. By 2010 we would expect everyone with a long-term condition to be offered a care plan.”*

There is a lot of work to do to achieve that aim. The “Year of Care” programme is a 3-year project, started in 2008, to investigate effective methods of empowering people with long-term conditions and supporting them to self-care. It sets out to learn how routine care can be redesigned and commissioned to provide a personalised approach. Diabetes is in the vanguard of the programme, and practical resources and templates are available on the internet (<http://tinyurl.com/mn3krw>). This represents a huge cultural change both for people with long-term conditions and healthcare professionals.

### Structured education

The knowledge of people with diabetes about their condition tends to be poor – as evidenced by *The Diabetes Information Jigsaw* report (ABPI et al, 2006) – and could be improved through increased availability of structured education programmes.

NICE (2003) recommends that structured patient education be made available to all people with diabetes at the time of initial diagnosis, and then as required on an ongoing basis, based on a formal, regular assessment of need. The education should be provided by an appropriately trained multidisciplinary team to groups of people with diabetes, unless group work is considered unsuitable for an individual.

Structured education programmes should use a variety of techniques to promote active learning, engaging individuals in the process of learning and relating the content of programmes to personal experience. They should be adapted,

where possible, to meet the different needs, personal choices and learning styles of people with diabetes, and should be integrated into routine care over the longer term. Four criteria need to be included in a programme to meet the NICE recommendations (DH and Diabetes UK, 2005):

- A structured, written curriculum.
- Provision of trained educators.
- Quality assurance.
- An audit process.

NICE (2003) acknowledges that the length, content and style of educational options varies greatly between services. Some of the educational programmes offered are unstructured, few have been formally evaluated, and few individuals who deliver education have been formally trained for this purpose. There are, however, several programmes that do meet the recommendations, notably DAFNE (Dose Adjustment For Normal Eating; DAFNE Study Group, 2002), DESMOND (Diabetes Education and Self Management for Ongoing and Newly Diagnosed; Davies et al, 2008) and X-PERT (Deakin et al, 2006), with many others in the pipeline.

Education provided by a healthcare professional during a short consultation where other clinical factors are assessed does not meet the NICE recommendations. If it involves a discussion between a trained healthcare professional and the person with diabetes, however, it may provide a useful stopgap. In the rushed setting of the diabetes clinic it may be difficult to adhere to good consultation skills (open questions, goal setting, listening, questioning, summarising). An example of a more inclusive approach is outlined in *Box 1*.

It is difficult to estimate the potential long-term cost savings that may be associated with structured education initiatives. If it is assumed that education can play a part in preventing hard outcomes in people with diabetes then a rudimentary analysis is possible (*Table 1*). In a review of published studies, Clark (2008) found that only duration of education and support predicted a programme’s success. The same author noted similar effects between group and individual approaches to education and included telephone and peer-support groups in effective solutions. In their assessment of the

DESMOND programme, Davies et al (2008) found that although clinical parameters did not seem to improve over 12 months, psychological effects were positive.

On gauging success of patient-education models, NICE (2003) advocates the most important outcome measures as:

- HbA<sub>1c</sub> levels.
- Pre- and post-meal blood and plasma glucose levels.
- The prevention of acute episodes of hypoglycaemia and hyperglycaemia.
- A reduction in other macrovascular risk factors, such as dyslipidaemia, high blood pressure, smoking and obesity.
- Short-term quality of life, adverse events and treatment tolerance.
- Long-term effects on the incidence of diabetes complications, quality of life and mortality.

As more education programmes for people with diabetes are organised and researched, further details on effectiveness will emerge.

### Medication and information prescriptions

The DH (2006), in *Our Health, Our Care, Our Say*, made a commitment to improving access to appropriate information for people with health or social care needs. The document outlined how, from 2008, information prescriptions (IPs) would be offered to everyone with a long-term condition or social care need, in consultation with a health or social care professional. Unfortunately, anecdotal evidence suggests that this has not been widely adopted.

IPs are a guide to relevant and reliable information sources which are designed to allow people to feel more in control of their condition and to help them maintain their independence through self-management. This includes information, for example, about conditions and treatments, care services, benefits and support groups. IPs also contain links or signposts to sources of information about local health, social care, and other services such as phone numbers and websites (DH, 2006).

Understanding the effects of medication forms an important aspect of education and self-management. Not taking medication – whether termed non-adherence or non-compliance

**Table 1. Diabetes education versus diabetes-related complications: A cost comparison.**

<b>For people with type 1 diabetes:</b>	
Cost of DAFNE education programme per participant:	£545
Cost to train two DAFNE educators and one doctor (the minimum required to run a DAFNE course):	£2615
Overall cost saving per DAFNE-trained person:	£668
<b>For people with type 2 diabetes:</b>	
Cost of DESMOND education programme per person:	£60
Cost to train DESMOND educator for first year:	£800
Plus per year thereafter:	£440
<b>The 2002 cost of treatment</b>	
Heart attack	£4070
Stroke	£2367
Retinopathy	£872
Amputation	£8459

DAFNE = Dose Adjustment For Normal Eating; DESMOND = Diabetes Education and Self Management for Ongoing and Newly Diagnosed

Adapted from: Clarke et al (2003; 2005); Loveman et al (2003)

– is costly both in terms of financial expense to the NHS, and in terms of diabetes-related complications for the person with the condition.

Cramer et al (2008) found non-compliance with cardiovascular and antidiabetes medication to be a significant problem, with around 30% of days “on therapy” not covered by medication and only 59% of patients taking medication for more than 80% of their days “on therapy” in a year. Morris (2004) supported these findings and illustrated the importance of tailoring medications to suit the individual. Cutting the number of times drugs were taken and using combination therapies were found to be effective in increasing adherence to medication.

### Competency and self-management

The National Prescribing Centre (2007) has published a competency framework for shared decision-making with people with diabetes that contains valuable and practical advice on building a partnership to improve concordance with medication. The framework comprises three levels: building a relationship, managing a shared consultation, and sharing a decision. These levels focus on areas such as listening

### Page points

1. Practical examples of effective encouragement of self-care are provided in the document *Care Planning in Diabetes* from the Joint Department of Health and Diabetes UK Care Planning Working Group (2006).
2. Self-monitoring of blood glucose (SMBG) is an accepted tool to enable people with type 1 diabetes to control their blood glucose levels through self-adjustment of their insulin regimen.
3. People with type 2 diabetes treated with sulphonylureas or insulin may also be subject to hypoglycaemia, and SMBG is seen by many healthcare professionals as a key component of self-care in this population. However, controversy still exists regarding its effectiveness in this population.

and communication, exploring the purpose of the consultation, information-sharing and knowledge, and deciding on an agreed management and monitoring strategy.

Practical examples of effective encouragement of self-care are provided in the document *Care Planning in Diabetes* from the Joint Department of Health and Diabetes UK Care Planning Working Group (2006). One successful element from the document involves the GP practice sending results of blood tests and investigations to the person with diabetes in advance of their clinic appointment with a letter suggesting questions they might like to discuss.

Empowerment and self-management can be achieved through individuals and healthcare professionals working together to agree plans for the future. It is a much more effective use of time for both parties in the long-run – and diabetes is a long-term condition.

### Self-monitoring of blood glucose as part of self-management

This article has so far considered some of the general concepts and issues surrounding self-management. An important aspect of this, for many people, is self-monitoring of glucose levels, which is discussed in the following paragraphs. While self-monitoring encompasses more than glycaemic control alone, including aspects of diet, blood pressure, cholesterol, weight and physical activity, a full discussion of all of these is outside the remit of this article.

The following information briefly explores the main issues pertaining to self-monitoring of blood glucose (SMBG) as a practical example of self-management. For a more in-depth review of the subject, please see the consensus recommendations by Owens et al (2005; *Box 2*).

SMBG is an accepted tool to enable people with type 1 diabetes to control their blood glucose levels through self-adjustment of their insulin regimen (Owens et al, 2005). It is valuable too in the prevention and detection of hypoglycaemia.

People with type 2 diabetes treated with sulphonylureas or insulin may also be subject to hypoglycaemia, and SMBG may be seen as a key component of self-management in this

population. However, controversy still exists regarding its effectiveness in type 2 diabetes (Owens et al, 2005). On the one hand it is seen as an expensive option with little evidence to support it; on the other it is seen as a vital tool in engaging people with diabetes in their own care. The paragraphs that follow illustrate these differences of opinion.

Martin et al (2006) found that SMBG was associated with decreased diabetes-related morbidity and all-cause mortality in people with type 2 diabetes. The association was also observed in a subgroup of participants who were not receiving insulin. The authors' opinion was that SMBG may be associated with a healthier lifestyle and better disease management.

Peel and Lawton (2007) found that clinical uncertainty about the efficacy and role of SMBG in people with type 2 diabetes was mirrored in individuals' accounts. People tended not to act on their self-monitoring results, in part because of a lack of education about the appropriate response to readings – a fact well recognised by healthcare professionals working with people with diabetes. The authors stressed that healthcare professionals should be explicit about whether and when such patients should self-monitor and how they should interpret and act upon the results, especially high readings. This may be seen as an argument for improved education rather than for restrictions in SMBG and is reflected in the latest guidance from NICE (2009; *Box 3*). The Scottish Intercollegiate Guidelines Network (SIGN) published their recommendations in 2001, with NHS Tayside Diabetes *Managed Clinical Network Handbook* (NHS Tayside, 2009) providing more recent advice.

Simon et al (2008), on behalf of the DiGEM (Diabetes Glycaemic Education and Monitoring) study group, found that SMBG – with or without additional training in incorporating the results into self-care – was associated with higher costs and lower quality of life in people with non-insulin treated type 2 diabetes. The authors felt SMBG was unlikely to be cost-effective in addition to standardised, usual care.

Furthermore, Farmer et al (2009), again on behalf of the DiGEM study group, found no convincing evidence to recommend routine

use of SMBG by reasonably well-controlled, non-insulin-treated people with type 2 diabetes. However, the authors did consider that clinical judgement is required to identify those who would benefit, including people at high risk of hypoglycaemia, those motivated to make alterations to behaviour that lead to consistent changes in blood glucose levels, and where there is strong patient preference. The

authors stated that if HbA<sub>1c</sub> levels remain >8% (>64 mmol/mol), then self-monitoring may provide motivation for medication adherence and lifestyle measures, as insulin therapy may be required in this group (Farmer et al, 2009).

A small study from Ireland comprising 96 participants in the monitoring group (O’Kane et al, 2008) is frequently quoted as a reason for restricting access to SMBG testing strips.

**Box 2. Consensus recommendations regarding self-monitoring of blood glucose.\***

Diabetes type	Treatment group	Monitoring regimen
Type 1 diabetes	All people with type 1 diabetes	<ul style="list-style-type: none"> <li>SMBG should be regarded as an integral part of treating all people with type 1 diabetes.</li> <li>People with type 1 diabetes should be educated to SMBG and adjust treatment appropriately.</li> <li>The majority of people with type 1 diabetes should consider SMBG four or more times per day to prevent hypoglycaemia and control hyperglycaemia.</li> <li>Frequent SMBG may be required to avoid metabolic emergencies such as diabetic ketoacidosis.</li> </ul>
Diabetic pregnancy	Diabetic pregnancy	<ul style="list-style-type: none"> <li>Pregnant women with type 1 diabetes, plus those with type 2 diabetes requiring insulin and those with gestational diabetes requiring insulin should SMBG at least four times per day to include both fasting and postmeal blood glucose measurements.</li> <li>In diet-treated people it may be necessary to SMBG with the same frequency as insulin-treated people to ensure strict glycaemic control.</li> <li>In insulin-treated people increased frequency of testing may be necessary in the first trimester when the risk of hypoglycaemia is greatest.</li> </ul>
Type 2 diabetes	Intensive insulin therapy	<ul style="list-style-type: none"> <li>People who adopt intensive insulin therapies require regular feedback regarding SMBG levels.</li> <li>People with type 2 diabetes who use a multiple daily insulin regimen should SMBG in the same way as those with type 1 diabetes.</li> <li>Fasting blood glucose should be tested daily during basal insulin dose titration.</li> </ul>
Type 2 diabetes	Conventional insulin therapy	<ul style="list-style-type: none"> <li>People with type 2 diabetes who are using a conventional insulin regimen and who have stable control should SMBG two or three times a week.</li> <li>People with type 2 diabetes who are using a conventional insulin regimen and who have less stable control should SMBG at least once daily, varying the time of testing between fasting, premeal and postmeal.</li> <li>Fasting blood glucose should be tested daily during basal insulin dose titration.</li> </ul>
Type 2 diabetes	Combined insulin and oral antidiabetes therapy	<ul style="list-style-type: none"> <li>Fasting blood glucose should be tested daily during basal insulin dose titration.</li> <li>People with type 2 diabetes who use insulin and oral antidiabetes agents should SMBG at least once daily, varying the time of testing between fasting, premeal and postmeal.</li> </ul>
Type 2 diabetes	Diet and exercise	<ul style="list-style-type: none"> <li>People with type 2 diabetes who have good control on diet and exercise, metformin or TZD treatment do not need SMBG monitoring, unless they are destabilised by other factors.</li> <li>Glycaemic control managed through diet and exercise in people with type 2 diabetes is best monitored through HbA<sub>1c</sub> testing.</li> <li>People with type 2 diabetes managed only on diet and exercise do not normally require routine SMBG. Informed people may choose SMBG as a means of monitoring lifestyle changes.</li> </ul>
Type 2 diabetes	Metformin (+/- TZD)	<ul style="list-style-type: none"> <li>As for diet and exercise.</li> </ul>
Type 2 diabetes	TZD (+/- metformin)	<ul style="list-style-type: none"> <li>As for diet and exercise.</li> </ul>
Type 2 diabetes	Sulphonylurea alone (or in combination with other oral antidiabetes agents)	<ul style="list-style-type: none"> <li>Hypoglycaemia may be more common than assumed in people with type 2 diabetes on sulphonylureas and SMBG will reveal this situation.</li> </ul>

\*Readers should note that these recommendations were made in 2005, prior to the launch of the latest antidiabetes therapies for type 2 diabetes. SMBG = Self-monitoring of blood glucose; TZD = Thiazolidinedione.

Source: Owens et al (2005)

Page points

1. Reliance on HbA<sub>1c</sub> as a marker of long-term glycaemic control is an accepted practice, but self-monitoring and history should be taken into consideration as frequent hypoglycaemic episodes may result in a low HbA<sub>1c</sub>, while adversely affecting quality of life.
2. Although NICE (2009) suggests urine monitoring could be discussed with people with diabetes, there is a lack of published evidence as to its effectiveness.
3. Effective self-management can have significant benefits for the person with diabetes if it engages them in their own care and is supported by structured education, suitable to their needs.

**Box 3. Self-monitoring of plasma glucose: NICE (2009) recommendations.**

Self-monitoring of plasma glucose should be available to:	<ul style="list-style-type: none"> <li>• Those on insulin treatment.</li> <li>• Those on oral glucose-lowering medications to provide information on hypoglycaemia.</li> <li>• Assess changes in glucose control resulting from medications and lifestyle change.</li> <li>• Monitor changes during intercurrent illness.</li> <li>• Ensure safety during activities, including driving.</li> </ul>
Include in the discussion:	<ul style="list-style-type: none"> <li>• The purpose of self-monitoring.</li> <li>• How to interpret and act on the results.</li> </ul>
Action:	<ul style="list-style-type: none"> <li>• Offer to a person newly diagnosed only as an integral part of self-management education.</li> </ul>
Monitoring:	<ul style="list-style-type: none"> <li>• Assess at least annually, and in a structured way:                             <ul style="list-style-type: none"> <li>– Self-monitoring skills.</li> <li>– The quality and frequency of testing.</li> <li>– The use made of the results obtained.</li> <li>– The impact on quality of life.</li> <li>– The continued benefit.</li> <li>– The equipment used.</li> </ul> </li> </ul>
If self-monitoring is appropriate but blood glucose monitoring is unacceptable to the individual, discuss the use of urine glucose monitoring.	

Adapted from: NICE (2009)

The authors concluded that people with newly diagnosed type 2 diabetes had no beneficial effects from SMBG, but that it was associated with higher scores on a depression sub-scale. The size of the study (among other things), however, leads others to argue with its validity in the larger population (see *British Medical Journal* rapid responses: <http://tinyurl.com/ktejb2>).

Reliance on HbA<sub>1c</sub> as a marker of long-term glycaemic control is an accepted practice, but self-monitoring data and patient history should also be taken into consideration as frequent hypoglycaemic events may result in a low HbA<sub>1c</sub> level, while adversely affecting quality of life.

**Conclusion**

Effective self-management can have significant benefits for the person with diabetes if it engages them in their own care and is supported by structured education, suitable to their needs. It should encompass all areas of physical and emotional health and enable the individual with diabetes to feel a central part of the team caring for them.

Practical templates and guides are available to support the healthcare professional in adopting this care-planning approach, and *Box 4* provides a case study that highlights some of the practical issues related to self-management. ■

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#### Box 4. Case study.

##### Narrative

Mr J is 62 years old and has had type 2 diabetes for 12 years. His medication regimen has escalated over the years and he is now taking metformin 500 mg three times a day, gliclazide 160 mg and rosiglitazone 4 mg twice a day, and aspirin and simvastatin 40 mg at night. He is a gardener with a BMI of 38 kg/m<sup>2</sup> and his wife does all the cooking and shopping. He self-monitors his blood glucose twice a day: before breakfast and at his evening meal. His annual HbA<sub>1c</sub> levels have ranged from 7.5% to 8.8% (58–73 mmol/mol), and his most recent HbA<sub>1c</sub> level, taken 2 weeks ago, is 7.7% (61 mmol/mol). Mr J is attending for his annual review at the GP surgery – he rarely attends otherwise. He has no complaints but demonstrates a poor understanding of diabetes and is surprised that his care team want to discuss insulin therapy with him as he feels the same as usual and is able to carry out his job.

##### Discussion

Mr J has been encouraged to bring his wife to the consultation where a joint appointment with the dietitian has been arranged. His care team discuss how his medication works and provide sources of further information to allow him to make informed choices. During this discussion it becomes evident that Mr J regularly misses his lunchtime medication and does not take his medication when he feels “wobbly”, which happens quite often. He has been in the habit of eating chocolate and biscuits after these events. He now understands that over-treating hypoglycaemia may be discouraging weight loss and contributing to his high HbA<sub>1c</sub> level. His care team discuss more effective methods of blood glucose monitoring that would be meaningful to Mr J and encourage him to participate in decision-making regarding his care and medication. He opts to try a fixed-dose combination of metformin and rosiglitazone twice a day, and to monitor at different times to assess the effect of gliclazide as he now realises that class of drug can cause hypoglycaemia.

Mr J leaves the surgery with an agreed and shared care plan. He is more knowledgeable about his diabetes and, together with his wife, has agreed to a more sensible eating plan to reduce his weight. Instead of waiting another year for review he has agreed to telephone the practice nurse with his results to help him understand how to reduce potential hypoglycaemic episodes. He has also enrolled in a structured education programme held locally.

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## Online CPD activity

Visit [www.diabetesandprimarycare.co.uk/cpd](http://www.diabetesandprimarycare.co.uk/cpd) to record your answers and gain a certificate of participation

Participants should read the preceding article before answering the multiple choice questions below. There is ONE correct answer to each question. After submitting your answers online, you will be immediately notified of your score. A pass mark of 70% is required to obtain a certificate of successful participation; however, it is possible to take the test a maximum of three times. Before accessing your certificate, you will be given the opportunity to evaluate the activity and reflect on the module, stating how you will use what you have learned in practice.

- Regarding the concept of empowerment in people with diabetes, which of the following statements is not true? Select ONE option only.**
  - Provision of relevant and up-to-date information is key.
  - It is a partnership between the person with diabetes and the healthcare care team.
  - Knowledge and understanding of diabetes is essential for the individual to take responsibility for their condition, if they desire to do so.
  - Healthcare professionals can empower people with diabetes through strict treatment regimens to lower HbA<sub>1c</sub> levels.
  - Empowerment is a continual process that aims to allow the person to take responsibility for his or her own decisions.
- When considering the success of structured education, which of the following does NICE (2003) not advocate as an important outcome measure? Select ONE option only.**
  - Pre- and post-meal blood and plasma glucose levels.
  - HbA<sub>1c</sub> levels.
  - A reduction in other macrovascular risk factors.
  - The prevention of acute hypoglycaemic and hyperglycaemic episodes.
  - A reduction in medication usage.
- The National Service Framework for diabetes (Department of Health, 2001) recognised that NHS and partner agencies will need to develop, review and audit programmes for empowering people with diabetes. These include all but one of the following. Which one is not included? Select ONE option only.**
  - Behavioural change programmes.
  - Structured education programmes.
  - Improved communication programmes between primary and secondary care.
  - The provision of information about diabetes and its management.
  - Effective care plans.
- Four key criteria need to be included in a programme to meet the recommendations for structured education (Department of Health [DH] and Diabetes UK, 2005). Which of the following is not one of them? Select ONE option only.**
  - Audit procedures.
  - Delivery to groups of people.
  - Quality assurance.
  - A structured, written curriculum.
  - Provision of trained educators.
- All but one of the following educational tools and programmes meet the DH and Diabetes UK (2005) recommendations for structured education. Which one does not meet these recommendations? Select ONE option only.**
  - DAFNE (Dose Adjustment For Normal Eating).
  - Conversation maps.
  - DESMOND (Diabetes Education and Self-management for Ongoing and Newly-Diagnosed).
  - X-PERT.
  - The Diabetes Manual (University of Warwick).
- The 2009 NICE guideline on the management of type 2 diabetes suggested that self-monitoring of blood glucose (SMBG) should be available to a number of specific patient groups. Which of the following was not one of these? Select ONE option only.**
  - To monitor changes during intercurrent illness.
  - In people well stabilised on lifestyle interventions only.
  - In people taking oral antidiabetes drugs to provide information on hypoglycaemia.
  - To ensure safety during activities, such as driving.
  - In people treated with insulin.
- According to the consensus recommendations by Owens et al (2005), SMBG is not required in four of the following five groups of people. In which group of people with type 2 diabetes did Owens et al recommend SMBG? Select ONE option only.**
  - People with type 2 diabetes that have good control on diet and exercise.
  - People who have good control on metformin.
  - People with good control on thiazolidinediones.
  - People with good control on insulin.
  - People with stable control on sulphonylureas.
- A 23-year-old woman with type 1 diabetes is currently at 18 weeks in her first pregnancy. According to guidance for SMBG discussed in this article, how often should she be self-monitoring her blood glucose? Select ONE option only.**
  - Once daily.
  - Three times a day after meals.
  - Twice daily.
  - Four times daily.
  - Only as required.
- A 76-year-old man with type 2 diabetes is well controlled on diet and exercise. According to recommendations on SMBG discussed in this article, how often should he be self-monitoring his blood glucose? Select ONE option only.**
  - Once daily.
  - Three times a day after meals.
  - Twice daily.
  - Four times daily.
  - Only as required.
- A 61-year-old woman is on stable regimen of twice-daily mixed insulin. Her current control is stable with an HbA<sub>1c</sub> level of 7.0% (53 mmol/mol). According to recommendations discussed in this article, how often should she SMBG? Select ONE option only.**
  - Once daily.
  - Two to three times per week.
  - Twice daily.
  - Four times daily.
  - Only as required.