

HSCB Guideline:

Self Monitoring of Blood Glucose (SMBG)

For Adults (September 2017)

Introduction

Self-monitoring of blood glucose (SMBG) is a key part of diabetes care. Blood glucose readings inform individual's management plans, which aim to target good glycaemic control. SMBG can support the empowerment model of care. It should only be offered through a healthcare professional (HCP) supported education process, which is developed in agreement with the patient.

This document aims to provide guidance to GPs and practice nurses on appropriate SMBG. There will be occasions when a patient and/or HCP will agree to differ from this guidance, e.g. risk of hypoglycaemia, or if occupation or lifestyle requires more frequent SMBG. However, reasons for acting outside of this guidance should be justified and documented appropriately in the patient's clinical record.

This guideline can be used by GP practices to carry out a review of patients who are currently being prescribed blood glucose strips to check the appropriateness of prescribing and the quantities of test strips issued.

Please also refer to HSCB Guideline for Primary and Secondary Care on the Choice of Blood Glucose Meters and Test Strips for Patients with Type 2 Diabetes, September 2017

<http://niformulary.hscni.net/Formulary/Adult/6.0/6.1/6.1.6/Pages/default.aspx>

Who should be testing their blood glucose levels?

Type 1 diabetes

- It is essential for all patients with type 1 diabetes to test their blood glucose levels.

All patients with type 1 diabetes must test four times daily. However, the following patients may need to test more frequently (up to 10 times daily):¹

- Undergoing treatment / lifestyle changes **or**
- Experiencing an inter-current illness **or**
- Using insulin pumps **or**
- During pregnancy or planning a pregnancy **or**
- Before, during and after sport **or**
- Increased frequency of hypoglycaemia or potential unawareness **or**
- There is a legal requirement to do so (such as driving, in line with the DVLA)

See Appendix 1 for further information.

The precautions that people treated with insulin are required to take while driving are detailed in the DVLA leaflet in appendix D of the following document:

['Assessing fitness to drive: a guide for medical professionals'](#)

(Note: NICE¹ recommends that ketone monitoring is considered as part of 'sick day rules' to facilitate self-management of an episode of hyperglycaemia for patients with Type 1 diabetes. Patients who use insulin pumps may, due to pump malfunction or disconnect not receive their prescribed amount of insulin and develop hyperglycaemia and so should carry out ketone testing. Detailed guidance on Ketone testing is beyond the scope of this document)

Type 2 Diabetes

- People with type 2 diabetes in the following categories are required to carry out frequent SMBG:²

- The person is on insulin **or**
- There is evidence of hypoglycaemic episodes **or**
- The person is on oral medication* that may increase their risk of hypoglycaemia while driving or operating machinery **or**
- The person is pregnant, or is planning to become pregnant **or**
- Poor glycaemic control **or**
- Raised or low HbA1c

* Oral medications that can increase the risk of hypoglycaemia include:

- Sulfonylureas (e.g. Gliclazide, Glimepiride, Tolbutamide, Glipizide, Glibenclamide)
- Glinides (Repaglinide, Nateglinide)

- People with type 2 diabetes who are not in the above categories may be considered for **short-term SMBG with review** in the following situations:
- Newly diagnosed patients: offer SMBG only as an integral part of self-management education. The purpose of SMBG should be discussed, education should be provided on the interpretation of results and any necessary actions to be taken
 - To assess changes in glucose control resulting from medication and lifestyle changes
 - When starting treatment with oral or intravenous corticosteroids
 - To confirm suspected hypoglycaemia
 - During acute inter current illness

What is the advice for drivers around SMBG if prescribed a sulfonylurea or a glinide?

The DVLA provide advice depending on whether the person holds a group 1 (car, motorcycle) or a group 2 licence (lorry, bus, taxi driver). This is summarised in Table 1 below. Full details can be found at: [‘Assessing fitness to drive: a guide for medical professionals’](#)

Additionally, Diabetes UK NI have a useful reference document on their website: https://diabetes-resources-production.s3-eu-west-1.amazonaws.com/diabetes-storage/2017-08/Information%20on%20Driving%20and%20Diabetes%20for%20HCPs_March2015.pdf

This document states the following in relation to group 1 drivers:

‘Drivers with a Group 1 license on insulin are advised to test their blood glucose before driving. For patients on sulphonylureas this would greatly increase the need for testing and associated costs. The greatest risk of hypoglycaemia is in the first 3 months of sulphonylurea treatment, so it seems sensible to maintain current practice and only encourage extra testing in those patients who are starting treatment, experiencing hypoglycaemia or with reduced awareness. A medication review should also take place to reduce the risk’.

Table 1

DVLA guidelines for SMBG if taking a sulfonylurea or a glinide³	
Group 1 drivers	<ul style="list-style-type: none">▪ It may be appropriate to monitor blood glucose (depending on clinical factors including frequency of driving) at times relevant to driving to enable the detection of hypoglycaemia.▪ A meter with a memory is not needed.
Group 2 drivers	<ul style="list-style-type: none">▪ Must regularly monitor blood glucose at least twice daily and at times relevant to driving.▪ A meter with a memory is needed.

How should patients with type 2 diabetes using SMBG be reviewed?

If adults with type 2 diabetes are self-monitoring their blood glucose levels, a structured assessment should be carried out at least annually². The assessment should include:

- Self-monitoring skills – this is especially important if patients are testing infrequently
- Whether the testing frequency is appropriate
- Checking that the person knows how to interpret the blood glucose results and what action to take
- The impact on the person's quality of life
- The continued benefit to the person
- The equipment used

Who does not need to test their blood glucose levels?

In general,

- Those with type 2 diabetes who are controlled by diet and exercise alone
- Patients with type 2 diabetes who are controlled by metformin alone, or in combination with pioglitazone, a gliptin, GLP1 agonist or SGLT-2 inhibitor.

Glycaemic control in these cases is best monitored through HbA1c testing.

There may be occasions when the above categories of patients do need to carry out **short term SMBG** (see notes above).

Appendix 1: Recommended regimes for self-monitoring of blood glucose (SMBG) in people with diabetes⁴

Diabetes Type	Treatment Group	Monitoring Regime A management plan should be developed and agreed with the individual	Usual Blood Glucose Strip Requirement	
			Initiation	Repeat prescription
Type 1 diabetes	All people with type 1 diabetes	<ul style="list-style-type: none"> SMBG is an integral part of treating type 1 diabetes. Patients should be educated on SMBG and adjust treatment accordingly. All patients with type 1 diabetes should monitor their blood glucose levels 4 times a day. Some patients with type 1 diabetes may need to test up to 10 times a day if any of the following apply: <ul style="list-style-type: none"> Desired target for blood glucose control, measured by HbA1c level, is not achieved Frequency of hypoglycaemic episodes increases There is a legal requirement to do so (such as driving, in line with the DVLA) During periods of illness Before, during and after sport When planning pregnancy, during pregnancy and while breastfeeding. See NICE Guideline on Diabetes in Pregnancy https://www.nice.org.uk/guidance/ng3 If there is a need to know blood glucose levels more than 4 times a day for other reasons¹. 	100 strips (2 boxes; pack size 50)	Minimum 2 to 3 boxes (pack size 50) each month. But may need more; up to a maximum of 6 boxes (pack size of 50) per month.
Intensive management or loss of hypoglycaemic awareness	Frequent testing is essential in insulin pump therapy users, those unwell, or carbohydrate counting	<p>A management plan should be developed and agreed with the individual</p> <ul style="list-style-type: none"> Up to 8 or more tests daily 	250 strips (5 boxes; pack size 50)	4 to 5 boxes (pack size 50) every Month [but may need less]
Pre-pregnancy, pregnancy in type 1 & type 2 & gestational diabetes	All women with diabetes who are planning a pregnancy, pregnant women with diabetes and gestational diabetes	<p>All should perform SMBG at least 4 times a day (in some cases up to 8 times a day), to include both fasting and post prandial blood glucose measurements⁵. See NICE Guideline on Diabetes in Pregnancy https://www.nice.org.uk/guidance/ng3 for specific monitoring required for individual patient circumstances.</p> <p>*Pregnant women with type 1 diabetes may experience frequent hypos (especially at the start of pregnancy) and so may need to perform additional SMBG.</p>	150 strips (3 boxes; pack size 50) for the first month	Minimum of 2 to 3 boxes per month (pack size 50). Maximum of 5 boxes per month (pack size 50) *but may need more.
Type 2 diabetes	Insulin therapy, or hypoglycaemic episodes or taking a sulfonylurea or glinide	<p>Consider self- monitoring frequency of 2 - 4 times daily. This may be reduced to once daily or less if glycaemic control is considered to be stable, in agreement with the patient. Testing frequency may increase in some circumstances e.g.</p> <ul style="list-style-type: none"> During periods of illness, instability, or use of corticosteroids. There is a legal requirement to do so (such as driving, in line with the DVLA) Any significant lifestyle changes. <p>Assess patients' understanding and use of results to adjust diet, lifestyle and treatment.</p>	100 strips; 2 boxes (pack size 50)	1 to 3 boxes per month (pack size 50) depending on number of tests required per day
	Diet and physical activity alone. Metformin alone. Combination therapies which do not include sulfonylureas or insulin.	<p>Glycaemic control can be monitored through HBA1c to agreed individual targets. Patients should not routinely need to perform self- glucose monitoring. Short term SMBG (with review) may be appropriate in some circumstances, e.g.</p> <ul style="list-style-type: none"> To assess changes in glucose control resulting from medication and lifestyle changes or when newly diagnosed (if considered appropriate by the patient's healthcare professional, and as part of clinical plan) When starting treatment with oral or intravenous corticosteroids During acute inter current illness To confirm suspected hypoglycaemia 	50 strips (1 pack) to facilitate monitoring agreed	No repeat. Issue 50 strips (1 box of 50) on request, ONLY where appropriate

Appendix 2: References

1. NICE Guideline [NG17] Type 1 diabetes in adults: diagnosis and management. August 2015. <https://www.nice.org.uk/guidance/ng17>
2. NICE Guideline [NG28] Type 2 diabetes in adults: management <https://www.nice.org.uk/guidance/ng28>
3. COMPASS Therapeutic Notes on the Management of Type 2 Diabetes Mellitus. September 2016
4. Swale Clinical Commissioning group/Medway Clinical Commissioning Group: Guidelines on self-monitoring of Blood Glucose (SMBG) in Adults with Diabetes. (Published February 2016)
5. NICE guideline [NG3] Diabetes in Pregnancy management from preconception to the postnatal period. August 2015. <https://www.nice.org.uk/guidance/ng3>