

Guidelines on Self Monitoring of Blood Glucose (SMBG)

Developed in conjunction with Cumbria Diabetes

August 2014



Type 1 Diabetes

Self Monitoring of Blood Glucose (SMBG) is an integral part of treatment of type 1 diabetes. SMBG should be carried out four or more times a day to help manage diabetes appropriately (control hyperglycaemia and prevent hypoglycaemia). There should be no restriction on testing strips in Type 1 diabetes. Concerns about over usage should be referred to Cumbria Diabetes.

Type 2 Diabetes

SMBG should be offered to a person who is newly diagnosed with type 2 diabetes **only** as an integral part of his/her self-management education. The purpose of SMBG should be discussed, agreement reached on how results should be interpreted and what action should be taken. The patient's care plan should include frequency of testing.

At least annually, the patient should be assessed for:

- Self monitoring skills
- The quality and appropriate frequency of testing
- The use made of the results obtained
- The impact on quality of life
- The continued benefit
- The equipment used

No Routine Testing

People with type 2 diabetes with good control do not need to use **routine** SMBG if they are managed with

- diet and physical activity alone
- metformin, glitazones, gliptins or GLP-1analogues (once stabilised) or any combination of these treatments, **without** a sulfonylurea or rapid acting insulin secretagogue (glinide)

Patients who do not need routine SMBG testing should have their glycaemic control monitored through HbA1c testing every three to six months.

Routine testing

SMBG should be available to people with Type 2 diabetes;

- On insulin (with or without oral antidiabetic medication). SMBG will need to be considered up to four times a day. This may be reduced if glycaemic control is stable, and increased during periods of instability or illness.
- On a sulfonylurea or rapid acting insulin secretagogue (glinide) and in whom any one of the following circumstances apply:
 - Suspected hypoglycaemia
 - Hypoglycaemia unawareness
 - Greater risk of hypoglycaemia (pregnancy, underlying renal impairment, alcohol abuse, physical activity)
 - Where hypoglycaemia has particular safety concerns (e.g. HGV, PCV license holders –see DVLA guidance see appendix 1)

If none of the above circumstances apply, routine testing may not be required.

SMBG should also be made available **but not routinely**;

- To those on oral glucose-lowering medications to provide information on hypoglycaemia
 - To assess changes in glucose control resulting from medications and lifestyle changes
 - To monitor changes during intercurrent illness
- These patients should only be prescribed blood glucose testing strips acutely.

The continued benefit of SMBG should be assessed regularly to identify and support those who find it useful while discouraging those who gain no clinical benefit from continuing to test.

In August 2014, Cumbria Area Prescribing Committee approved a formulary range of SMBG meters, strips, lancets and needles for supply on FP10 prescription.

The approved devices are:

Element test strips -Element meter (Neon Diagnostics)

Glucolab test strips - Glucolab meter (Neon Diagnostics)

GlucoRx Nexus Test strips - Nexus, Nexus Mini, Nexus Voice meters– (GlucoRx)

Greenlan Needle lancets

GlucoRx lancets

GlucoRx fine point needles

BBraun Omnican fine needles

Community pharmacists should advise patients who wish to purchase meters not on the Area Prescribing Committee approved list that testing strips will only be available on prescription for approved meters.

For DVLA blood glucose monitoring requirements see Appendix 1

Diabetes Type	Treatment Group	Monitoring Guide	Reasonable test strip requirement (NB: 1 box = 50 strips)
Type 1 Diabetes	All children and adults with Type 1 diabetes	<ul style="list-style-type: none"> SMBG is integral in the treatment of all people with Type 1 diabetes. All people with Type 1 diabetes should be educated in SMBG and offered structured education to ensure they have the skills and knowledge to adjust insulin according to carbohydrate intake and make corrective doses. SMBG four times a day or more will be required to gain optimum control, avoid hypoglycaemia, and avoid metabolic emergencies such as diabetic ketoacidosis (although less frequent testing may be appropriate in patients with good control and good hypoglycaemia awareness). 	Regular testing required. Should be prescribed as a repeat prescription – quantities depend on patient’s monitoring frequency (Guide requirement = 2-3 boxes per month)
Type 1 and Type 2 diabetes in pregnant women & gestational diabetes	All pregnant women with diabetes	<ul style="list-style-type: none"> All pregnant women with Type 1, Type 2 or gestational diabetes controlled with insulin, tablets or diet alone should SMBG four times a day or more in order to achieve tight diabetic control. Testing should include both fasting and postprandial blood glucose measurements. 	Regular testing required. Supply according to agreed management plan (Guide requirement = 2-3 boxes per month during pregnancy)
Type 2 Diabetes	Insulin therapy with or without hypoglycaemic agents	<ul style="list-style-type: none"> On initiation regular monitoring 2 to 4 times a day is required to achieve optimum glycaemic control. For stable patients where glycaemic control is achieved, testing may be reduced to 2 or 3 times a week. Increase testing during periods of illness, instability or use of oral steroids, and following changes in insulin dosage. Regular testing is required for patients who adjust their insulin dose according to SMBG. Assess patients understanding and use of results to adjust diet, lifestyle and treatment. Provide extra training/education if required. 	(Guide requirement = 1-2 boxes per month). Additional test strips will be necessary for those who require monitoring for DVLA vocational licensing requirement – assess on an individual basis. (A meter with a memory function will be required by these patients too).
Type 2 Diabetes	Sulfonylurea/glinide alone or in conjunction with other therapies	<ul style="list-style-type: none"> Patients on sulfonylureas/glinide should not need to routinely self monitor blood glucose, but SMBG may be considered if there is asymptomatic hypoglycaemia, suspected asymptomatic hypoglycaemia, use of oral steroids, risk of hypoglycaemia due to renal impairment or high alcohol intake, plus in those with certain occupations (see DVLA guidance Appendix 1) Self monitoring regime should be agreed as part of a management plan. 	(Guide requirement = 1-2 boxes per year) (Test strips should not routinely be put on repeat for these patients). More strips may be required for occupational monitoring – assess on individual basis.
Type 2 Diabetes	Diabetic patients controlled with Metformin, Pioglitazone, gliptin or GLP-1mimetic (once stabilised)	<ul style="list-style-type: none"> SMBG not routinely recommended. Glycaemic control is best monitored through HbA1c testing. On diagnosis and treatment initiation, motivated patients may wish to monitor effects of changes in diet and physical activity. SMBG should only be offered as part of a structured plan with education on how to interpret the results. Regular long term testing is unnecessary 	(Guide requirement = 1-2 boxes per year) (Test strips should not routinely be put on repeat for these patients)
Type 2 Diabetes	Diabetic patients controlled with diet and exercise	<ul style="list-style-type: none"> SMBG not routinely recommended. Glycaemic control is best monitored through HbA1c testing 	Testing unnecessary

Appendix 1

DVLA requirements for blood glucose monitoring

Blood glucose monitoring requirements for people with insulin-treated diabetes driving buses or lorries.

People in this category should regularly monitor their blood glucose at least twice daily and at times relevant to driving, using a glucose meter with a memory function to measure and record blood glucose levels. At the annual examination by an independent Consultant Diabetologist, three months of blood glucose readings must be available. Three months of readings must also be available before people in this category can submit their application.

Guidance given by DVLA to all insulin-treated diabetic drivers (whether they have a group 1 or group 2 vehicle driving licence):

- You must always carry your glucose meter and blood glucose strips with you. You must check your blood glucose before driving and every two hours whilst you are driving.
- In each case if your blood glucose is 5.0mmol/l or less, take a snack. If it is less than 4.0mmol/l or you feel hypoglycaemic, do not drive.
- If hypoglycaemia develops while driving, stop the vehicle as soon as possible.
- You must switch off the engine, remove the keys from the ignition and move from the driver's seat.
- You must not start driving until 45 minutes after blood glucose has returned to normal. It takes up to 45 minutes for the brain to recover fully.
- Always keep an emergency supply of fast-acting carbohydrate such as glucose tablets or sweets within easy reach in the vehicle.
- You should carry personal identification to show that you have diabetes in case of injury in a road traffic accident.
- Particular care should be taken during changes of insulin regimens, changes of lifestyle, exercise, travel and pregnancy.
- You must take regular meals, snacks and rest periods on long journeys. Always avoid alcohol.

Blood glucose monitoring requirements for people with insulin-treated diabetes driving cars or motorcycles.

There is no requirement for people with insulin-treated diabetes who hold a group 1 vehicle driving licence to drive cars or motorcycles, to monitor their blood glucose with a meter with a memory function, as for group 2 drivers.

However, there is a requirement that there must be appropriate blood glucose monitoring.

No definition of appropriate monitoring is given by the DVLA however drivers with insulin-treated diabetes are advised to take precautions, including the following:

- You must always carry your glucose meter and blood glucose strips with you. You must check your blood glucose before driving and every two hours whilst you are driving.
- In each case if your blood glucose is **5.0mmol/l or less, take a snack. If it is less than 4.0mmol/l or you feel hypoglycaemic, do not drive.**

Blood glucose monitoring requirements for people with non-insulin treated diabetes driving buses or lorries.

For group 2 drivers with diabetes who are managed by tablets which carry a risk of inducing hypoglycaemia i.e. sulfonylureas and glinides, there is a requirement that they regularly monitor their blood glucose at least twice daily and at times relevant to driving. The DVLA state that evidence will be required to demonstrate adequate control of the condition by regular blood glucose monitoring (at least twice daily and at times relevant to driving).

There is no requirement to use a glucose meter with a memory function to measure and record blood glucose levels, as there is for insulin-treated group 2 drivers, although the DVLA have stated in correspondence that this would be advised. The evidence of adequate control would normally take the form of a report from the driver's doctor.

For group 2 drivers with diabetes who are managed by other tablets (e.g. metformin or gliptins) or by non-insulin injectables (exenatide or liraglutide), there is no requirement to monitor blood glucose. However, there is advice from the DVLA to monitor blood glucose regularly and at times relevant to driving.

Blood glucose monitoring requirements for people with non-insulin treated diabetes driving cars or motorcycles.

For group 1 drivers with diabetes who are managed by tablets which carry a risk of inducing hypoglycaemia i.e. sulfonylureas and glinides, the DVLA have stated in correspondence that there is a requirement for appropriate blood glucose monitoring. For example, if the driver is advised by their doctor to monitor blood glucose, this would be a requirement. DVLA state in the 'At a Glance Guide', that it may be appropriate to monitor blood glucose regularly and at times relevant to driving to enable the detection of hypoglycaemia.

For group 1 drivers with diabetes who are managed by other tablets (e.g. metformin or gliptins) or by non-insulin injectables (exenatide or liraglutide), there is no requirement or advice to monitor blood glucose from the DVLA, although the DVLA have stated in correspondence that drivers should take advice from their doctor in this regard.

Further information can be found at

(<http://www.direct.gov.uk/en/Motoring/DriverLicensing/MedicalRulesForDrivers/MedicalAZ/index.htm>)

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