

Good Practice in Self-Blood Glucose Monitoring (SBGM) Type 1 and Type 2 Diabetes

Guidance for Health Care Professionals

This guidance describes best practice. It is recognised that not all patients are willing or able to test their own blood glucose. Where patients refuse to monitor against advice or are unable to monitor this should be documented.

This guidance does not cover SBGM in gestational diabetes or in children aged <16years

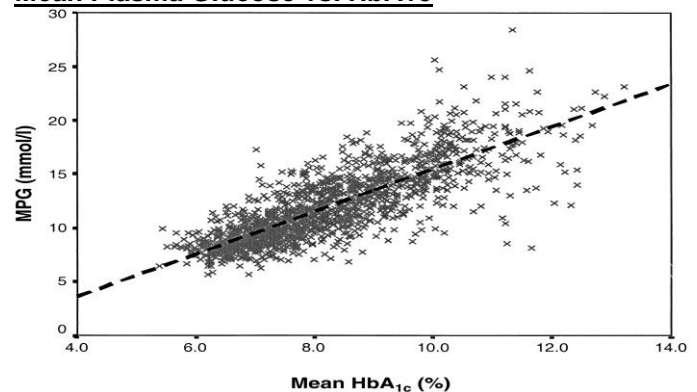
General Principles

1. The focus for SBGM should be to improve the quality and stability of glycaemic control AND the avoidance of hypoglycaemia.
2. All patients at potential risk of hypoglycaemia due to their prescribed diabetes treatment should be taught SBGM. These treatments are insulin and any drug from the sulphonylurea or insulin secretagogue classes.
3. All patients who drive and are on insulin should be educated about DVLA guidance on driving, SBGM and hypoglycaemia (**SEE LAST PAGE**). (Please ensure patient is given a copy of the DVLA guidance and retain a signed copy for your records.)
4. SBGM should be taught **with education** to enable people to understand its purpose. This will empower them to make use of the information SBGM gives, in order to make safe and effective changes in their diabetes management.
5. All people with type 1 diabetes should have access to SBGM at least four times per day as required.
6. The risk / frequency of hypoglycaemia increase the tighter the glycaemic control in people on treatments with potential to cause hypoglycaemia.
7. Hypoglycaemia in this context is defined as any blood glucose reading below 4 whether or not accompanied by symptoms.

Relationship between SBGM and HbA1c:

- Individual's glycosylate haemoglobin at different rates. This means that the relationship between mean plasma glucose and HbA1c value for populations is not the same at an individual level. This is illustrated by:
- HbA1c 7.0% - the patient mean plasma glucose could be anywhere from 6-12mmol/L
- Mean plasma glucose 10mmol/L – the HbA1c could be anywhere from 6.5% to 9.5%.

Mean Plasma Glucose vs. HbA1c



Graph courtesy of Prof E. Kilpatrick.

Author – Owens. D. et al Diabetes and Primary Care (Volume 7 No1 2005:9-21)

METHOD OF GLYCAEMIC CONTROL

Type 2 diabetes on treatment with no hypoglycaemia risk

The following treatments for type 2 diabetes used as a single agent or in combination with each other do not cause clinically significant hypoglycaemia.

Diet and exercise
Metformin
Pioglitazone
Gliptins
SGLT-2 (gliflozins)
GLP-1 injectable agents
SBGM is not routinely advised in patients on such medication. HbA1c is the preferred measure of control.

SBGM may be used on an individual basis to answer a specific clinical question in which case it should only be necessary temporarily. Examples of specific queries are:

1. Symptoms of hyperglycaemia in someone whose HbA1c suggests good control.
2. During intercurrent illness especially if progress to insulin likely, e.g. high-dose steroid treatment.
3. If there is diagnostic uncertainty about type 1 or type 2 diabetes and close observation required to pick up need for insulin.

Type 2 diabetes on treatment with hypoglycaemia risk – oral agents

The following treatments for type 2 diabetes and any other agents from the same drug class **can** all cause hypoglycaemia. Combining these agents with an agent that does not cause hypoglycaemia **does not** minimise the hypo risk.

Sulphonylureas
Repaglinide
Nateglinide
Sulphonylurea induced hypoglycaemia can be severe, prolonged and potentially life-threatening.

1. SBGM should be taught along with education about hypoglycaemia.
2. Patients taught to test if possible hypo symptoms and then treat if hypo confirmed (glucose < 4)
3. Frequency and timing of testing will vary according to individual circumstances and glucose control targets.
4. Testing should be more frequent at times of medication change, intercurrent illness, and reduced food intake.
5. Driving – Patients who are new to sulphonylurea therapy should be advised to test glucose before driving in the first 3 months or longer if they experience regular hypo events.

A case example would be to commence testing 3 times a day pre-meals when Gliclazide treatment started. If no hypo problems emerge after 1-2 weeks, reduce testing to around 3 tests a week. If the dose of Gliclazide needs to be increased then test 3 times per day again until satisfied there are no hypo concerns.

Insulin treated patients – Type 1 and Type 2

Type 1

All people with type 1 diabetes should have access to SBGM at least four times daily.

Type 2

The frequency of testing should vary from 1-4 tests a day depending on insulin regimen, patient lifestyle and specific clinical circumstances. Some patients with very stable control may be safe to test just once every other day. All patients are likely to have some periods when more frequent testing is indicated.

Advise all patients on sulphonylureas, glinides and insulin to test their BG's prior to driving and only drive if BG > 5

DVLA

<https://www.gov.uk/guidance/diabetes-mellitus-assessing-fitness-to-drive>

DIABETES UK

<https://www.diabetes.org.uk/guide-to-diabetes/life-with-diabetes/driving>

DVLA guidance for driving and blood glucose monitoring

Diabetes treatment	Group 1	Group 2
Diet alone	–	–
Treatment by tablets or injections with no hypoglycaemia risk	–	–
Tablets carrying a risk of hypoglycaemia (sulphonylureas and glinides)	If needed, detection of hypoglycaemia is by appropriate BGM at times relevant to driving and clinical factors including frequency of driving. It is appropriate to offer SMBG at times relevant to driving to enable the detection of hypoglycaemia	Regular SMBG – at least twice daily and at times relevant to driving (e.g. no more than 2 hours before the start of the first journey and every 2 hours while driving)
Insulin	Test blood glucose no more than 2 hours before the start of the first journey. Test every 2 hours while driving. More frequent SMBG may be required with any greater risk of hypoglycaemia (e.g. physical activity, altered meal routine)	Must use a meter with sufficient memory to store 3 months of readings. Carry out regular BGM at least twice daily on days when not driving. Test no more than 2 hours before the start of the first journey and every 2 hours while driving. More frequent monitoring may be required with any greater risk of hypoglycaemia (e.g. physical activity, altered meal routine)
Continuous glucose monitoring systems: Because these systems measure interstitial glucose, drivers must also monitor blood glucose levels as outlined above		
Adapted from: <i>Diabetes mellitus: Assessing fitness to drive</i> (DVLA, 2016).		

See separated trendUK leaflets

- Blood Glucose Guideline
- Diabetes: Safe driving and the DVLA

On HERPC webpage <https://www.hey.nhs.uk/herpc/prescribing-guidelines/>
 trendUK webpage <https://trend-uk.org/resources/>
 or request them to ukdiabetes@merck.com