NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINE

GUIDELINES FOR THE SELF MONITORING OF BLOOD GLUCOSE IN DIABETES MELLITUS

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Treatment Group	Self Monitoring of Blood Glucose (SMBG) Monitoring Guide	Reasonable test strip requirement (NB: 1 box = 50 strips)
All children and adults with Type 1 diabetes	• SMBG is integral in the treatment of all people with Type 1 diabetes. • SMBG four times a day or more (*pump patients may routinely check 6-8 times a day)* will be required to gain optimum control, avoid hypoglycaemia, and avoid metabolic emergencies such as diabetic ketoacidosis. • Less frequent testing may be appropriate in patients with good control and good hypoglycaemia awareness.	• Should be prescribed as a repeat prescription – quantities depend on frequency of use. • Guide requirement = 2-4 boxes per month.
All pregnant women with diabetes	• All pregnant women with Type 1, Type 2 or gestational diabetes controlled with insulin, tablets or diet alone should SMBG four to seven times a day (fasting and postprandial) in order to achieve tight diabetic control.	• Supply according to agreed management plan. • Guide requirement = 2-4 boxes per month during pregnancy.
Insulin therapy with Type 2 diabetes	• 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. • As per DVLA guidance below.	• Guide requirement = 1-2 boxes per month. • Additional test strips will be necessary for those who require monitoring for DVLA licensing requirement.
Sulfonylurea/glinide	• Patients on sulfonylureas/glinide should not need to routinely self monitor blood glucose. • SMBG may be considered: - at initiation of therapy (up to 3 months) - if oral steroids are used - if evidence of hypoglycaemia or risk of hypoglycaemia due to renal impairment or high alcohol intake - in those with certain occupations (see DVLA guidance) • Self monitoring regime should be agreed as part of a management plan.	• Guide requirement = 1-2 boxes per year. • More strips may be required for occupational monitoring – assess on individual basis.
Patients with diabetes controlled with Metformin, Pioglitazone, SGLT2 inhibitor, gliptin or GLP-1 mimetic	• SMBG not routinely recommended, unless evidence of hypoglycaemia. • Glycaemic control is best monitored through HbA1c testing. • Regular long term testing is unnecessary.	• Testing unnecessary. • If evidence of hypoglycaemia: Guide requirement = 1-2 boxes per year. • Test strips should not routinely be put on repeat for these patients.
Patients with diabetes controlled with diet and exercise	• SMBG not routinely recommended. • Glycaemic control is best monitored through HbA1c testing.	• Testing unnecessary.

DVLA Guidance

Insulin treatment

- Group 1 Drivers (cars/motorcycles) on insulin should monitor blood glucose at least twice daily and at times relevant to driving (no more than 2 hours before the start of the first journey and every 2 hours while driving).
- Group 2 Drivers (lorries/buses) should monitor blood glucose at least twice daily and at times relevant to driving (no more than 2 hours before the start of the first journey and every 2 hours while driving). They must also use a blood glucose meter with a memory function **with no delete facility** which records blood glucose levels as they will be required to have three months of blood glucose readings available for inspection at an annual examination by a consultant diabetologist.

Treated with tablets which carry a risk of hypoglycaemia (Sulfonylureas* and Glinides^)

- Group 1 Drivers (cars/motorcycles) are advised that it **may** (see below) be appropriate to monitor blood glucose regularly and at times relevant to driving to enable the detection of hypoglycaemia.
    - ABCD/DUK guidance: “The greatest risk of hypoglycaemia is in the first three months of sulphonylurea treatment, so it would seem sensible to maintain current practice and only encourage extra testing in those people who are starting treatment, experiencing hypoglycaemia, or with reduced awareness. A medication review should also take place, to reduce the risk. For Group 1 drivers (car/motorcycle) the diabetes panel has advised that the frequency of blood glucose monitoring should depend on the clinical context.”
- Group 2 Drivers (lorries/buses) should monitor blood glucose at least twice daily and at times relevant to driving.

* Sulphonylureas e.g. gliclazide, glibenclamide.
^ Glinides e.g. repaglinide, nateglinide.

Please refer to the GGC Formulary for information on the Blood Glucose Monitoring meters & test strips of choice

Additional Information

Training

Most meters have the same basic functions and the process to obtain a blood glucose reading is similar. However it is important that all patients are trained on how to use their meter and know:

- the purpose of testing
- how to interpret the blood glucose results and what action to take
- how often and when to test
- how to use the meter and the lancing device to achieve an accurate result
- when to seek advice from their healthcare professional

NICE recommend that patients with type 1 & type 2 diabetes who are self-monitoring their blood glucose levels, have a structured assessment at least annually to include self monitoring skills. In addition to this the assessment should take account of the impact of monitoring on the person's quality of life & the continued benefit of monitoring.

Good Practice in Self Testing & Safe Storage of Blood Glucose Testing Strips

Information for Patients

Specific information is included in product leaflets for meters & strips.

SELF TESTING

- Ensure hands are washed with soap and thoroughly dried (with a clean towel) prior to testing. Contaminants on the skin or excess moisture can affect the accuracy of the reading.
- Ensure sufficient blood sample size is applied to the test strip. Do not add more blood after the first drop has been applied.
- Apply fresh blood drop to test strip immediately after blood drop obtained. Not testing promptly can lead to evaporation of blood drop which can affect accuracy of the reading.
- Do not test with a smeared or spread blood drop as this can introduce contaminants. Also, do not wipe or smear the blood drop onto the test strip, simply touch the test strip and blood drop together without excess pressure.

STORAGE

- Store strips in accordance with manufacturer's instructions. Heat, cold, humidity and moisture can all affect how the strips work which in turn affects the accuracy of the reading.
- Keep strips in their original sealed container only. Ensure container lid is closed properly after each use.
- Check expiry dates of test strips and control solutions. Do not use if out of date. Most strip packaging allows the opening or expiry date once opened to be written on the label
- Store the meter and test strips at room temperature. Keep away from direct sunlight & heat. Do not freeze.
- Do not leave test strips in vehicles for extended periods of time as may be subject to temperature extremes.
- Do not bend, cut or alter test strip in any way.

A Control Solution, available free from meter companies, contains a known amount of glucose and is used to ensure the meter and strips are working correctly. It is advised to routinely use the control solution to test the meter and if there are situations where the blood glucose test results are not as expected.