

**SUMMARY: SELF MONITORING OF BLOOD GLUCOSE (SMBG): REGIONAL GUIDELINES FOR PEOPLE WITH TYPE 2 DIABETES**

1. People with type 2 diabetes who use **insulin** should monitor blood glucose levels as part of their *self-management programme*.
2. SMBG *with appropriate education* should be available to those receiving other drugs with the potential to cause hypoglycaemia (**sulphonylureas, meglitinides, or incretin mimetics\***) to assess glucose control and identify hypoglycaemic episodes. \*Incretin Mimetics: primarily during initiation and then dependent on concomitant therapy
3. *Only where there is an agreed purpose or goal to testing* should SMBG be provided *routinely* to people with type 2 diabetes who are **not** treated with sulphonylureas, insulin or incretin mimetics. SMBG should be used only within a plan of care which incorporates *appropriate education* on how results can be used to reinforce lifestyle changes, adjust therapy or alert healthcare professionals. This should include regular reviews to identify and support those who find it useful, while discouraging those who gain no clinical benefit from continuing to SMBG. Those who are motivated by SMBG activity and use the information to maximise the effect of lifestyle and medication, should be encouraged to continue to monitor.
4. Targets, frequency, timing and duration of monitoring, should be agreed with the individual patient following discussion with a healthcare professional and documented within the clinical record.
5. On a yearly basis, individuals should be assessed by a healthcare professional on their SMBG activity. This review should incorporate:
  - Self-monitoring skills
  - The quality and frequency of testing
  - The use made of the results obtained
  - The impact on quality of life
  - The continued benefit
  - The equipment used

**TABLE 1: SUGGESTED APPROACHES FOR SMBG**

Monitoring Mode Treatment Type		Intensive	Conventional
		<p><b>No monitoring is necessary and should <u>not</u> be provided routinely; but, where used, there must be an agreed purpose or goal to testing:</b></p>	
Diet +/- Exercise	No medication	eg when newly diagnosed and individual wants to monitor to gain information and understanding about how food / activity interact and the effect on diabetes management	<i>Could test once a week before breakfast and once a week 2 hours after an evening meal</i>
		<i>Could test daily before breakfast and 2 hours after evening meal</i>	
Oral drugs/non-insulin	<b>Sulphonylureas*, Meglitinides</b> (alone or in combination with other non-insulin anti-diabetic agents)	eg when need to change dose to cover situations such as intercurrent illness, steroid therapy, or if very symptomatic <i>Before meals and 2 hours after evening meal as guide to dose reductions or persisting hyperglycaemia</i> + Specific guidance for problem solving tests (PTO)	<i>Once weekly before breakfast and once weekly after an evening meal</i>
	<b>Other oral agents</b> (eg metformin, pioglitazone, gliptins) (alone or in combination with each other)	<i>Not necessary - as for "lifestyle only" above</i>	<i>Not necessary - as for "lifestyle only" above</i>
	<b>Incretin Mimetics</b> (eg exenatide, liraglutide)	eg when initiating treatment / before stabilised – NB concomitant sulphonylurea <i>As for Sulphonylureas above</i>	<i>Dependent on concomitant antidiabetic agent</i>
Insulin	<b>Once daily basal insulin</b> (eg NPH, Glargine, Detemir) ± oral hypoglycaemic agents (OHAs)	<i>Before breakfast tests</i> are essential to implement the agreed titration scheme to achieve target fasting blood glucose. Test 2 hours after food if fasting blood glucose is on target but HbA1c is not + Specific guidance for problem solving tests (PTO)	<i>Fasting blood glucose daily</i>
	<b>Insulin regimens (twice daily fixed, mixtures)</b>	<i>Before meals and 2 hours after evening meal</i> to establish the best match of dose to requirements throughout the day + Specific guidance for problem solving tests (PTO)	<i>Test daily pre each injection</i>
	<b>Basal bolus insulin regimen</b>	<i>Before meals and before bed tests</i> will establish the best match of dose to requirements throughout the day. To optimise the dose of the rapid acting analogue some post-prandial tests may be needed + Specific guidance for problem solving tests (PTO)	<i>Test daily pre meals and bedtime</i>

Most patients will move between **intensive** and **conventional testing modes** according to their individual needs and circumstances. Some will always monitor in the intensive mode e.g. those with an active lifestyle who may wish to exploit fully the flexibility of the analogue multiple insulin regime (particularly those counting carbohydrate and adjusting their insulin dose with each meal). It is recommended that patients on insulin monitor in the intensive mode for one week prior to attending their clinic appointment.

**Pregnancy (Type 1, Type 2 and Gestational Diabetes Mellitus):** SMBG should be done at least 4 (and sometimes up to 8) times per day.

**Driving:** All patients on insulin should test prior to driving, and every 2 hours on long journeys; SMBG may be of benefit to those on other drugs which potentially cause hypoglycaemia. Up to date DVA advice is available at: <http://www.dft.gov.uk/dvla/medical/ata glance.aspx>

**\*NOTE:** NICE and NHS Diabetes Working Group specifically mention the important role of SMBG in detecting hypoglycaemia in those treated with sulphonylurea

## Problem solving tests

These are used in specific circumstances, and include such questions as:

- “My HbA1c is above target – at what times of the day is my sugar too high?”
- “I feel funny. Is my blood sugar OK?”
- “I’m about to drive my car. Am I safe to do so?”
- “Is my blood sugar too low in the night?”
- “Am I experiencing nocturnal hypo’s?”
- “I have to eat more to prevent hypo’s.”
- “My weight is increasing despite efforts to lose /maintain weight.”
- Shift patterns / change in normal routine / exercise.
- Intensive monitoring one week pre clinic.
- Illness.

## Post-prandial monitoring

- **For conventional short-acting insulin:** not necessary – the dose of short-acting insulin is likely to be limited by the blood glucose trough before the next due meal.
- **For short-acting analogue insulin:** peak action of insulin is 30 mins - 3 hours after injection. During optimisation of treatment, monitoring 2 hours after meals will enable individuals to adjust treatment to improve post-prandial blood glucose control with minimum risk of hypoglycaemia.