

Prescribing guidance in the self-monitoring of blood glucose (SMBG)

December 2015

DOCUMENT CONTROL

Document Location

Copies of this document can be obtained from:

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Revision History

The latest and master version of this document is held on the Medicines Management SharePoint:

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01/07/2015	J Cheung	Initial draft for review by North East sector specialist diabetes group (NESSDG)	0.1
06/08/2015	J Cheung	Second draft as per suggested changes by NESSDG	0.2
26/09/2015	J Cheung	Amendments following 4 weeks GM wide consultation	0.3
20/11/2015	J Cheung	Update reference of NICE type 2 diabetes guidance. Add communication template letter/leaflet – <i>Appendix 2</i> Healthcare professional letter. <i>Appendix 3</i> Patient Information Leaflet	0.4

Approvals

This document must be approved by the following before distribution:

NAME	TITLE	DATE OF ISSUE	VERSION
GMMM	Prescribing guidance in the self-monitoring of blood glucose (SMBG)	Nov 2015	0.3
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Distribution

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NAME	TITLE	DATE OF ISSUE	VERSION
GM CCGs and GMSS	Prescribing guidance in the self-monitoring of blood glucose (SMBG)	25/8/2015	0.2
GMMM	Prescribing guidance in the self-monitoring of blood glucose (SMBG)	Nov 2015	0.3
GMMM	Prescribing guidance in the self-monitoring of blood glucose (SMBG)	Dec 2015	1.0

Summary of recommendations

1. Self-monitoring blood glucose (SMBG) should only be initiated if the need/purpose is clear and agreed with the patient (and/or their care-givers). All agreements/ recommendations should be clearly documented in their medical records.
2. The continued need for SMBG should be assessed at least annually or more frequently according to need.
3. Patient should receive education relevant to appropriate SMBG, understanding when to test and what to do with the result.
4. Any face to face changes or structured follow-up assessment in SMBG is an opportunity to identify any SMBG practice, explore patient's beliefs and motivation for using SMBG and allow patients to set goals in line with their care plans.
5. In addition to SMBG, all patients should have their glycaemic control measured by HbA1c (glycated haemoglobin).
6. Regular HbA1c testing remains the gold-standard test and is recommended every 3 months in children/ young people and every 3-6 months in adults (tailored to individual needs).
7. NICE guidelines recommend that SMBG is indicated for all patients with type 1 diabetes (T1D).
8. There should be no restriction on the supply of blood glucose testing strips (BGTS) in T1D. Concerns about over usage should be referred to the specialist diabetes team.
9. NICE do not recommend the routine use of SMBG in type 2 diabetes (T2D). NICE recommends to only offer SMBG in adults with T2D if:
 - 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/ planning to become pregnant.
10. NICE recommends considering short-term SMBG in T2D if:
 - the person is starting with oral or intravenous corticosteroids or
 - the person has suspected hypoglycaemia.
11. The recommended number of BGTS in the guidance is only a guide and some patients may require more or less depending on need.
12. Be aware that there are increased risks of blood glucose variation in some patients and they may require increased testing frequency during:
 - acute inter-current illness
 - pregnancy/pre-conception
 - changes in therapy that may alter blood glucose results
 - changes in lifestyle/routine or
 - at any times where erratic results may be dangerous.
13. Offer locally approved, quality assured and international standard (ISO) compliant blood glucose monitoring devices.
14. Ensure the same blood glucose monitoring device and testing strips is used and do not offer differing devices e.g. for home, work and car.
15. Some patients will require SMBG devices chosen by their specialist care team. Where an alternative meter is chosen, the healthcare professional should specify the reason of their preferred choice to reduce the risk of subsequent change in primary care.
16. Expiry dates of BGTS should be taken into account and patients should be encouraged to help reduce waste by using strips before ordering more.

1. Introduction

Self-Monitoring Blood Glucose (SMBG) is an integral part of the management of some patients with diabetes and is particularly useful in people on medicines that require dose adjustments (such as insulin), have erratic control of blood glucose or increased risk of hypoglycaemia.

This guideline aims to provide robust guidance to support the optimal use of SMBG testing systems.

2. Guidance in the SMBG

- 2.1 SMBG should be used only when individuals with diabetes (and/or their carer-givers) have the knowledge, skills and willingness to incorporate SMBG monitoring and therapy adjustments into their diabetes care plan in order to attain agreed treatment goals.
- 2.2 On initiation all patients performing SMBG should receive adequate instructions from appropriately trained and competent healthcare professionals with a structured follow-up assessment at least annually, or more.
- 2.3 The assessment should include:
 - the person's self-monitoring skills,
 - the equipment used and conformity to international standards (ISO 15197: 2013),
 - the quality and frequency of testing,
 - 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 and
 - the continued benefit to the person.
- 2.4 NICE guidelines recommends that SMBG is indicated for all persons with type 1 diabetes (T1D)¹.
- 2.5 NICE do not recommend the routine use of SMBG in type 2 diabetes (T2D)² and to only offer SMBG in adults if:
 - 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/operating machinery or
 - the person is pregnant, or is planning to become pregnant or
 - the person is starting treatment with oral or intravenous corticosteroids.
- 2.6 NICE recommends considering short-term SMBG for adults with T2D (and review if necessary) if:
 - the person is starting treatment with oral or intravenous corticosteroids
 - to confirm suspected hypoglycaemia
- 2.7 Patients should be advised when to seek advice. Be aware that there are increased risks of blood glucose variation in some patients and they may require increased testing frequency during:
 - acute inter-current illness,
 - pregnancy/pre-conception,
 - any changes in therapy that may alter blood glucose results,
 - changes in lifestyle/routine or
 - at any times where erratic results may be dangerous e.g. driving.
- 2.8 Healthcare professionals offering SMBG to patients who drive and are at risk of hypoglycaemia must consult the mandatory Driver and Vehicle Licensing Agency (DVLA)³ - [At a glance guide to the current medical standards of fitness to drive](#). This is particularly important and a legal requirement for the DVLA Group 2 drivers of large goods vehicle (LGV) or passenger carrying vehicle (PCV).

- 2.9 Diabetes in pregnancy is associated with risks to the woman and to the developing foetus. All pre-conception and pregnant women with pre-existing diabetes or gestational diabetes should be offered SMBG⁴. See *Appendix 1* and [NICE guideline on diabetes in pregnancy](#) for further advice.
- 2.10 NICE recommends offering all children and young people with T1D and their family members or carers (as appropriate) a choice of equipment for SMBG so that they can optimise their blood glucose control in response to adjustment of insulin, diet and exercise⁵. It does not recommend the routine use of SMBG in children and young people with T2D unless considered by healthcare professionals as necessary depending on overall diabetes control and management plan. See *Appendix 1* and [NICE guideline in children and young people with diabetes](#) for further advice.

Prescribing guidelines in the SMBG

All patients using SMBG should be encouraged to use the minimum number of tests required to improve control. The recommended number of testing strips below is only a GUIDE, some patients may require more or less depending on their individual needs.

Typical SMBG testing regimes		Blood glucose targets (mmol/L)		
N	SMBG considered not necessary and glycaemic control monitored by HbA1c	Fasting on waking	5-7 (4-7 in children/young people)	<i>Encourage patients to achieve targets and maintain under jointly agreed individual care plans.</i>
		Pre-prandial	4-7	
A	Once daily at various times (<i>Week Profile</i>)	Post-prandial	5-9	
B	Two tests daily twice a week	Bedtime	5-10	
C	Four tests at different times on one day (<i>Day Profile</i>)	Driving ³	At least 5	
D	<i>Day Profile</i> twice a week		See mandatory DVLA At a glance guide to the current medical standards of fitness to drive	
E	Before meals and at bedtime each day	Pregnancy ⁴	Pre-conception 5-7 (fasting on waking) and 4-7 (before meals at other times of the day)	<i>Review annually and modify target taking into account changes in the patient's wishes, circumstances, any resulting adverse effects (including hypoglycaemia), or their efforts to achieve target impair their quality of life.</i>
F	Before meals, snacks, driving and bedtime		During pregnancy Below 5.3 (fasting) and below 7.8 (1hr after meals) or 6.4 (2hrs after meals)	

Recommended regime(s)		Typical <u>weekly</u> BGTS usage	Typical <u>annual</u> BGTS usage
Type 2 diabetes	N	Newly diagnosed T2D + Diet controlled only	0
		<ul style="list-style-type: none"> ✓ Do not routinely offer SMBG in T2D unless as specified by NICE T2D guidelines ✓ SMBG may not be necessary if glycaemic control is acceptable (e.g. HbA1c to target) ✓ Healthcare professionals should assess and advise when SMBG becomes necessary depending on overall diabetes control and management plan 	- Nil in those where SMBG is considered not necessary and glycaemic control adequately monitored by HbA1c
	N, A, B	T2D prescribed non-insulin therapy Abbreviation: DPP4i - Dipeptidyl peptidase-4 inhibitor, SGLT2 – Sodium glucose co-transporter 2 inhibitor, GLP-1 - Glucagon-like peptide-1	0-7
	<ul style="list-style-type: none"> ✓ Do not routinely offer SMBG in T2D unless as specified by NICE T2D guidelines ✓ Well managed stable patients with metformin, pioglitazone, DDP4i, SGLT2 or GLP-1 analogues may not require routine SMBG ✓ If SMBG is necessary the healthcare professional should tailor monitoring regime to individual patient need depending on diabetes control and management plan ✓ Particular focus maybe required for those patients on single or any combined non-insulin therapies that carry a risk of inducing hypoglycaemia e.g. regimes that include insulin secretagogues (sulfonylureas and/or glinides) 	- (4-8) x50 strips for patients on non-insulin therapy that carry a risk of inducing hypoglycaemia	
A, C, D	T2D prescribed insulin	4-28	
	<ul style="list-style-type: none"> ✓ SMBG is recommended in all cases with daily testing on initiation of insulin. ✓ SMBG should be tailored to individual patient need depending on diabetes control and treatment plan ✓ Once patient is stable, frequency of testing can be reduced to profiles on one or two days a week or daily at varying times (week profile). ✓ Stable patients are those whose blood glucose varies little from day to day and who are not having intensive changes of treatment. 	- (4-30) x50 strips for patients on insulin	

Type 1 diabetes	E, F	T1D prescribed insulin	28-70	(29-70) x50 strips [3-6 boxes of 50 strips per month]
		<ul style="list-style-type: none"> ✓ NICE recommends SMBG in all cases of T1D. ✓ Testing should be at least 4 times a day in adults and at least 5 times a day in children/young people; including before each meal and before bed. ✓ SMBG should be used to adjust insulin dose before meals where this is appropriate. ✓ There should be no restriction on BGTS in T1D. Concerns about over usage should be referred to local specialist team. ✓ NICE guideline in adults recommends to test at least 4 times day and up to 10 times a day may be required if any of the following apply: <ul style="list-style-type: none"> • target HbA1c is not achieved • increase in hypoglycaemic episodes • legal requirement to do so (e.g. such as before driving) • during periods of illness • before, during and after sport • during pregnancy, pre-conception and while breastfeeding • the need to know more than 4 times a day is required (e.g. loss/impaired hypoglycaemia awareness, high risk activities, alcohol consumption, dependency of others in providing diabetic care) 		
High risk patients	F	High risk patients with T1D or T2D	No restriction	Any concerns about over usage should be referred to local specialist team for review.
		<ul style="list-style-type: none"> ✓ Some high risk patients may require intensive SMBG testing i.e. more than 10 times a day, due to certain lifestyle characteristics or impaired awareness of hypoglycaemia. ✓ Examples of intensive monitoring (but not exhaustive) may include: Patients on DAFNE or other intensive insulin program, insulin pump, pregnancy, lifestyle (e.g. driving for long period of times, undertaking high-risk activity or occupation) or impaired awareness of hypoglycaemia. 		

Important note:

SMBG does not replace regular HbA1c testing. NICE recommends^{1,2,4,5} measuring HbA1c:

- every 3-6 monthly intervals in adults (tailored to individual needs)
- every 3 months in children/young people
- every month in women with diabetes who are planning to become pregnant
- at the start, and in the second and third trimesters of pregnancy in all women with pre-existing diabetes
- at the time of diagnosis of gestational diabetes in all women

Target HbA1c level = 48mmol/mol (6.5%)
Or level agreed with diabetes team

3. Choice of SMBG devices

- 3.1 Different blood glucose meters on the market have a variety of different features, but the principle underlying the use of these devices is the requirement for an accurate blood glucose reading. This should be considered prior to any other features.
- 3.2 A robust process has been taken to identify those products with published independent accuracy of the latest International Standards (ISO 15197: 2013). This ensures that those meters recommended have the most robust evidence possible and in the interests of patient safety, use of the products listed within the Greater Manchester Medicines Management Group (GMMMG) guidance⁶ is recommended.

Please see: [GMMMG Blood Glucose Test Strip \(BGTS\) evaluation protocol and results](#) and any local formulary/specialist approved blood glucose monitoring device(s).

- 3.3 Other features were considered as part of the protocol to enable flexibility of choice and pricing, but the overriding concern has to be in delivering accurate and reproducible results for patients with minimal variation. This work will continue to be updated as new evidence presents itself.

4. Local decision of approved SMBG devices

- 4.1 The Clinical Commissioning Group (CCG) and local diabetes team have endorsed and approved the following meters and their associated test strips in patients that are required to SMBG:

INSERT LOCAL DECISIONS

- 4.2 The majority of patients will be suitable to change to the locally approved and quality assured, ISO compliant blood glucose meter. However there are some patient groups that may require additional support and /or an alternative meter. Please see *Appendix 1* for special considerations.
- 4.3 Where an alternative meter is chosen, the prescriber should specify the reason to reduce the risk of subsequent change.
- 4.4 *Appendix 2 and 3* can be adopted locally to support any implementation of decisions or guidance made in SMBG.

5. References

1. National Institute for Health and Care Excellence (NICE) Clinical guideline NG17 – Type 1 diabetes in adults: diagnosis and management. August 2015. Accessed August 2015.
2. National Institute for Health and Care Excellence (NICE) Clinical guideline NG28 – Type 2 diabetes in adults: management. December 2015. Accessed December 2015.
3. Drivers Medical Group. Driver & Vehicle Licensing Agency (DVLA) For medical practitioners – At a glance guide to the current medical standards of fitness to drive. November 2014.
4. National Institute for Health and Care Excellence (NICE) Clinical guideline NG3 –Diabetes in pregnancy: management from preconception to the postnatal period. February 2015. Accessed October 2015.
5. National Institute for Health and Care Excellence (NICE) Clinical guideline NG18 –Diabetes (type 1and type 2) in children and young people: diagnosis and management. August 2015. Accessed October 2015.
6. Greater Manchester Medicines Management Group (GMMMG) Blood Glucose Test Strip (BGTS) evaluation protocol & results. May 2015. Accessed July 2015.
7. Schleis TG, Interference of maltose, icodextrin, galactose, or xylose with some blood glucose monitoring systems, *Pharmacotherapy*, 2007;27(9):1313–21.
8. Greater Manchester Shared Services (medicines optimisation team). Medicines information response by all approved blood glucose testing device. Replies received October/November 2015. Accessed 9 November 2015 and available at email - gmcsu.medsman@nhs.net.
9. Tang Z, Louie RF, Lee JH, et al (2001). Oxygen effects on glucose meter measurements with glucose dehydrogenase- and oxidase-based test strips for point-of-care testing. *Crit Care Med*. 29(5): 1062–70.

6. Acknowledgements

Greater Manchester North East Sector specialist diabetes team.
 Pan Mersey Medicines Management Group guideline – Blood Glucose Self-Monitoring. June 2013.
 Bedfordshire, Salford, South Manchester and Trafford CCGs Medicines Optimisation team – local prescribing guidelines.

Produced: J. Cheung (Medicines optimisation pharmacist – Greater Manchester Shared Services)

7. Appendices

Appendix 1 – Points to consider for at risk patient groups

	SPECIAL CONSIDERATIONS <i>Note: see GMMMG BGTS evaluation report and results. Locally and specialist approved blood glucose monitoring devices should be considered first line.</i>
Visual impairment	<ul style="list-style-type: none"> - May be better suited to an easy-read display and/or talking meter. - Seek specialist advice on the appropriately approved meter if required.
Manual dexterity issues e.g. neuropathy	<ul style="list-style-type: none"> - May require a specific meter due the strip presentation or lancet device. - If the patients are unable to use them, alternatives may need to be sought by the specialist team.
Continuous Ambulatory Peritoneal Dialysis (CAPD)⁷	<ul style="list-style-type: none"> - Following queries with the manufacturers⁸, it is recommended that patients undergoing CAPD can use any of the following SMBG enzyme technology (see GMMMG BGTS evaluation results for details): <ul style="list-style-type: none"> • glucose oxidase (GoX), • mutant-quinone protein glucose dehydrogenase (Mut. Q-GDH), • glucose dehydrogenase-flavine adenine dinucleotide (GDH-FAD) OR • glucose dehydrogenase-nicotinamide adenine dinucleotide (GDH-NAD). - The above enzyme systems do not interfere with non-glucose sugars e.g. icodextrin in peritoneal dialysis solution, and consequently does not falsely elevate blood glucose results. - See GMMMG BGTS evaluation report and results of the appropriately approved meter if required.
Significant variation in oxygen tension⁹	<ul style="list-style-type: none"> - In a glucose oxidase (GoX) enzyme SMBG system, oxygen can act as a competing interference. - This may produce falsely under- or over-estimate blood glucose results in patients with high or low partial pressure of oxygen (pO₂) respectively. - The exact risk is uncertain as under international standards (ISO15197: 2013) accuracy is demonstrated under <u>appropriate</u> concentrations. - SMBG testing at extreme pO₂ were not evaluated but may be seen in the critically ill, neonates, patients receiving oxygen therapy, those undergoing surgery and even healthy individuals staying at high altitudes e.g. flying - Following queries with the manufacturers⁸, it is recommended that patients with significant varying oxygen tension do not use a glucose oxidase (GoX) enzyme SMBG system. - Seek specialist advice on the appropriately approved meter if required.
Neonates	<ul style="list-style-type: none"> - This is a highly specialist area and the infants will usually be in hospital rather than in the community. - See above around potential risks of oxygen tension in neonates. - Seek specialist advice on the appropriately approved meter if required.
Children and adolescents	<ul style="list-style-type: none"> - See NICE NG18 recommends to advise family/carers of children and young people with T1D to: <ul style="list-style-type: none"> • Test blood glucose levels five times a day and • Offer blood ketone testing strips and meter to test ketonaemia if they are ill or have hyperglycaemia - NICE NG18 does not recommend the routine use of SMBG in children and young people with T2D unless considered by healthcare professionals as necessary depending on overall diabetes control and management plan. - Patients in this group are frequently not engaged with SMBG and their diabetes management, therefore it is important that they have a meter of their choice that encourages appropriate testing.

<p>Pregnancy⁴</p>	<ul style="list-style-type: none"> - See NICE NG3 recommendations in diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. - Offer women with diabetes who are planning to become pregnant a meter for SMBG. - If a woman with diabetes who is planning to become pregnant needs intensification of blood glucose lowering therapy, advise her to increase the frequency of SMBG to include fasting levels and a mixture of pre-meal and post-meal levels. - Offer women with T1D who are planning to become pregnant blood ketone testing strips and a meter, and advise them to test for ketonaemia if they become hyperglycaemic or unwell. - Seek specialist advice on the appropriately approved meter if required.
<p>Insulin pumps – T1D</p>	<ul style="list-style-type: none"> - Insulin pumps have a meter which communicates with the pump. - Patients will require the corresponding meter. Seek specialist advice on the appropriate meter.
<p>Patients with T1D who require Continuous Glucose Monitoring (CGM)¹</p>	<ul style="list-style-type: none"> - CGMs are not blood glucose monitors but sensors that measure glucose in the interstitial fluid. - CGM may be considered in those using a pump or injections for their insulin delivery. - It is recommended to not routinely offer real-time CGM to adults with T1D. - Only consider CGM for adults with T1D who are willing to commit to using it at least 70% of the time and to calibrate it as needed, and who have any of the specified problems despite optimised use of insulin therapy and conventional blood glucose monitoring: <ul style="list-style-type: none"> • more than one episode a year of severe hypoglycaemia with no obviously preventable precipitating cause • complete loss of awareness of hypoglycaemia • frequent (more than two episodes a week) asymptomatic hypoglycaemia that is causing problems with daily activities • extreme fear of hypoglycaemia • hyperglycaemia (HbA1c level of 75 mmol/mol (9%) or higher) that persists despite testing at least 10 times a day. Continue CGM only if HbA1c can be sustained at or below 53 mmol/mol (7%) and/or there has been a fall in HbA1c of 27 mmol/mol (2.5%) or more - CGM should be provided by a centre with expertise in its use, as part of strategies to optimise a person's HbA1c levels and reduce the frequency of hyperglycaemic episodes.
<p>Patients with T1D who test blood ketones^{1,5}</p>	<ul style="list-style-type: none"> - See NICE NG17 and NG18. NICE recommends: <ul style="list-style-type: none"> • to consider ketone monitoring (blood or urine) as part of 'sick-day rules' for adults with T1D, to facilitate self-management of an episode of hyperglycaemia • in adults with T1D presenting to emergency services, consider blood ketone testing if DKA is suspected or the person has uncontrolled diabetes with a period of illness, and urine ketone testing is positive • to consider blood ketone testing for inpatient management of DKA in adults with T1D that is incorporated into a formal protocol • to offer ketone testing in children/young people to test ketonaemia if they are ill or have hyperglycaemia - Patients on a basal bolus regimen are trained to give correction doses according to their blood ketones. Testing blood ketones does not give false results due to drug interactions and measures the most important ketone in the blood. - Consider the frequency of blood ketone testing and the implications for the patient if they have to carry two meters or are unable to test blood ketones and act accordingly with the results. - Seek specialist advice on the appropriately approved meter and use if required.
<p>Patients with T1D with carbohydrate counting meters</p>	<ul style="list-style-type: none"> - T1D patients on the basal bolus regimen calculate insulin doses based on the insulin to carbohydrate ratio. - The carbohydrate counting meters calculate the units of insulin required and correction doses which may eliminate the risk of errors in dosing. - Seek specialist advice on the appropriately approved meter and use if required.

Note: This is not an exhaustive list and other individuals may require specialist assessment/advice to select a device and regimen that best meets their needs

<<GP Practice/Pharmacy Name>>
<<House number and street name>>
<<Town>>
<<Postcode>>
<<Date>>

FAO – <<GP Practice/Pharmacy>>

Dear colleague

Re: Preferred Blood Glucose Testing Strip (BGTS)

Further to the publication of the *Greater Manchester Medicines Management Group (GMMMGM) BGTS evaluation report* ([add link](#)), your Clinical Commissioning Group (CCG) and local specialist diabetes team have endorsed and approved the following meters and their associated test strips in patients that are required to self-monitor blood glucose levels:

Insert locally selected meters

The CCG medicines optimisation team will be planning a program to offer appropriate patients an approved meter. This will ensure standardisation to quality assured systems within our local area and will promote the cost effective prescribing of test strips. We envisage the majority of patients will be suitable to change to the preferred meter however there are some patient groups that may require an alternative as directed by their specialist diabetes team.

Where an alternative meter is required, the prescriber should specify the reason, and annotate on patient record, to reduce the risk of subsequent change.

Historically some companies have offered GP practices, pharmacies and patients new blood glucose testing meters followed by asking the GP to prescribe the associated testing strips. This is no longer appropriate unless it is an approved meter.

We currently recommend that you do not stock non-approved meters in [practices/ pharmacies](#) (delete as required) unless advised to do so by the medicines optimisation team.

GPs are advised to refuse to issue any new requests for non-formulary testing strips and patients should also be informed that strips will not be supplied for meters acquired, which are neither clinically necessary nor an approved meter.

It is recognised that careful consideration would be required when prescribing approved BGTS and greater support in the implementation of the project is available from the *GMMMGM Prescribing guidance in the self-monitoring of blood glucose* ([add link](#)).

Should you have any queries please do not hesitate to contact us.

Yours faithfully

[\(Add name\)](#) CCG Medicines Optimisation Team

Appendix 3 - Template Patient Information Leaflet

A guide to self-monitoring blood glucose and preferred devices in diabetes

HOW IS DIABETES BEST MONITORED?

Your blood glucose will be tested at your regular diabetes check-up. A blood test called 'HbA1c' provides information about your blood glucose control over a 2-3 month period and is much more helpful. Your specialist diabetes team will discuss your result with you and support if you need it, to help reach and stay at your HbA1c target.

Some patients may only require HbA1c test to monitor their diabetes.

SELF-MONITORING BLOOD GLUCOSE

Self-monitoring show what blood glucose levels you are at that **moment** and maybe necessary for you if you take certain types of medications, your occupation and lifestyle (in particularly if you operate machinery or drive), and/or any times where poorly controlled blood glucose results may be dangerous.

You will be recommended to self-monitor blood glucose levels if you:

- have type 1 diabetes or
- have type 2 diabetes and are treated with certain medicines that put you at risk of hypo (hypoglycaemia- low blood glucose).

Short term use of self-monitoring may also be advised. For example:

- when you are first diagnosed with diabetes,
- if you suspect or have symptoms of hypo,
- if you are prescribed steroid tablets or injections,
- if you have diabetes and planning a pregnancy,
- if you are pregnant and have diabetes during pregnancy (gestational diabetes) or,
- if your blood glucose levels are affected by any changes in medication, lifestyle or daily routine e.g. illness, changes in diet, how active you are.

Discuss with your diabetes healthcare team if you are required to self-monitor blood glucose.

SELF-MONITORING ADVICE

Your diabetes healthcare team will discuss and agree with you **when, how often** to test, **who to report** your results to and **what actions** to take. It may not be necessary to check your blood glucose level every day.

TREATMENT WITH NON-INSULIN MEDICINES

If you are treated with non-insulin medicines for diabetes, you may not need to test your glucose levels; or depending on the type of medicines you are taking and your individual circumstances, you may be asked to check it occasionally.

The benefit of self-monitoring blood glucose in non-insulin treated type 2 diabetes is unclear. It is recognised that regular self-monitoring may not lead to better control of your diabetes, compared to having HbA1c test checked regularly. In addition, there is evidence that patients who regularly test can have greater stress and feel worse about themselves than people who do not test regularly.

As a result your diabetes healthcare team may not recommend such testing and will advise you on what is appropriate for you.

TREATMENT WITH INSULIN

You will be asked to self-monitor your blood glucose levels more regularly when you first start on insulin. If the results are within your agreed target range then you may be able to reduce the number of tests.

You will be provided with appropriate advice to suit your own circumstances when you see your healthcare professional. If your blood glucose levels are not to target you may need to adjust your insulin.

Always contact your diabetes healthcare team for advice if necessary.

TARGET BLOOD GLUCOSE READINGS

You should discuss and agree your personal blood glucose targets with your diabetes healthcare team; but as a guide:

- 4-7mmol/L - first things in the morning and before meals
- 5-10mmol/L – two hours after meals and before bed

Discuss with your diabetes healthcare team what to do if results fall outside your blood glucose targets.

WHY HAS MY BLOOD GLUCOSE METER CHANGED?

Your local diabetes team and clinical commissioning group have agreed certain meter choices for reasons of ease of use, accuracy to international standards, cost and offer consistency locally. As a result of these arrangements, there are local guidelines outlining which meter and strips should be available to people depending on their testing needs.

REMEMBER

- **Self-monitor blood glucose only if you have been advised to by your healthcare professional.**
- **Testing more frequently than advised does not necessarily give more meaningful results and can cause greater stress and worry. It is important that you know when, how often to test and what to do with the results.**
- **Make sure you speak to your GP or practice nurse before you accept or consider buying a blood glucose testing meter.**
- **Your GP will only prescribe approved blood glucose test strips and the appropriate quantity of strips suitable for you to manage your diabetes.**
- **Make sure you know how to use your blood glucose testing machine; your GP or practice nurse can help if needed.**
- **Reduce waste and risk of using expired blood glucose test strips by ordering only the amount of strips you need.**
- **Record the expiry date of your blood glucose test strips if this is different when the pot opened. Expiry dates can significantly vary dependent on the brand supplied.**
- **Further information and legal requirement about blood glucose testing and driving can be found on the DVLA website or from your healthcare professional.**