Guidelines for Home Glucose Monitoring for Patients with Type 1 & 2 Diabetes Including Guidance on Choice of Meters, Strips, Needles & Lancets

These guidelines have been written in accordance with the Ipswich and East Suffolk Diabetes Services, North East Essex Diabetes Service (NEEDS), West Suffolk Diabetes Services, NHS England's publication Commissioning recommendations following the national assessment of blood glucose and ketone meters, testing strips and lancets and NICE guidelines.

Background

The NICE guidelines recommend that people should have access to home blood glucose monitoring based on individual clinical need, informed consent and not on ability to pay. Home monitoring is essential in the context of diabetes education for self-management, to enable the person to make appropriate treatment and/or lifestyle choices. Clinicians should ensure that patients monitoring their blood glucose levels are clear about the purpose of the monitoring, how results should be interpreted, and what action to take in response to results.

The purpose of monitoring blood glucose levels is to act on the results to provide the best possible care and outcomes.
These guidelines are also intended to assist healthcare professionals in the selection of appropriate blood glucose meters, testing strips, and lancets for patients to self-monitor their blood glucose levels. The need for a meter will be assessed by a healthcare professional and if required, a suitable meter will be supplied to the patient. These meters will be provided free of charge from GP surgeries or diabetes clinics. There should be no need for a patient to purchase a meter and patients should be dissuaded from doing so without consulting their specialist first. Patients who purchase a meter for use outside the recommendations made in these guidelines should **not** be prescribed strips and lancets in primary care.

People with diabetes will receive support to optimise their blood glucose control, minimising the risk of long-term vascular complications in partnership with the health care provider. For people with type 2 diabetes, testing should only be used within the context of medication and a care package supported by structured education with regular reviews.

Quality Control

To ensure that the readings patients present to you are accurate and a reasonable reflection of their glycaemic control when using their own meter:

The patient:

- Must be educated on quality control of their meter.
- Should Quality Control (QC) their meter as recommended by the meter company and record results (preferably on the meter) for reference. It is the responsibility of the patient to ensure that the meter they are using is working correctly.
- Should be aware that the QC solutions can be obtained free of charge from the company's customer care line.

Patients who are self-monitoring their blood glucose levels should have a structured review annually. This review should include reviewing their meter and replacing if damaged, dropped, or requires upgrading (greater than 2 years old) or is non-compliant with the local meter formulary.

Recording results

Patients are to be advised to use their meter memory to store results and bring the meter along to their appointments for review. This is important for all patients holding a driver's licence, as up to three months' readings are required at review.

Driving

Detailed information can be found on the DVLA website.

Drivers Using Insulin
Group 1 Drivers (cars/motorcycles) treated with insulin are advised to test their blood glucose levels no more than 2 hours before the start of the first journey and every 2 hours during the journey. More frequent self-monitoring may be required with any greater risk of hypoglycaemia (physical activity, altered meal routine). Drivers can now choose to use flash and continuous glucose monitoring devices to take glucose readings before they drive, or during breaks in driving. If using an interstitial fluid continuous glucose monitoring system (Flash GM or RT-CGM), the blood glucose level must be confirmed with a finger prick blood glucose reading in the following circumstances; when the glucose level is ≤4.0 mmol/L, when symptoms of hypoglycaemia are being experienced, when the glucose monitoring system gives a reading that is not consistent with the symptoms being experienced.
Group 2 Drivers (lorries/buses) treated with insulin are advised to have regular blood glucose testing – at least twice daily including on days when not driving and to test their blood glucose levels no more than 2 hours before the start of the first journey and every 2 hours during the journey. More frequent self-monitoring may be required with any greater risk of hypoglycaemia (physical activity, altered meal routine), in which case a bus or lorry driver may be licensed if they use a glucose meter with memory functions to ensure 3 months of readings will be available for assessment. Flash GM and RT-CGM interstitial fluid glucose monitoring systems are not permitted for the purposes of Group 2 driving and licensing. Group 2 drivers who use these devices must continue to monitor finger prick capillary blood glucose levels with the regularity defined below.

Drivers Using sulfonylureas and glinides
Group 1 drivers. The DVLA advises that it is appropriate to monitor blood glucose regularly and at times relevant to driving to enable the detection of hypoglycaemia.
Group 2 Drivers treated with sulfonylureas and glinides are advised to have regular self-monitoring of blood glucose – 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.

Drivers 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 their diabetes healthcare professional.

Driving and Hypoglycaemia

The initiating clinician should discuss hypoglycaemia awareness, severe hypoglycaemia and licence withdrawal, length of time to full recovery following a mild hypo before driving (45 minutes), and the threshold for safe driving (>5 mmol/l). Please see the DVLA Hypoglycaemia and driving guidance for full information.

Continuous Glucose Monitoring Technology

SNEE ICB has adapted the NICE guidelines for continuous glucose monitoring (CGM). The device can be initiated by the specialists and by the primary care team who have been upskilled. Please ensure a maximum of 26 sensors / year are prescribed and ensure prompt discontinuation when advised by the specialist or as per primary care guidance. Patients who are prescribed or self-purchasing Flash Glucose Technology **will be prescribed a decreased quantity of test strips and lancets quantities appropriate to their needs.**

Recommendations for Home Blood Glucose Monitoring

Diabetes Type	Treatment Group	Monitoring Regime
Type 1	All people with type 1 diabetes	CGM and both blood glucose and ketone tests strips and lancets according to their needs
Diabetes in pregnancy	All women with diabetes in pregnancy and those planning pregnancy	•Blood glucose monitoring essential. •The number of tests as recommended by the joint diabetes/antenatal team. •CGM as per pathway in suitable patients
Type 2	Intensive insulin therapy/ titration of insulin/insulin + oral th	• As with type 1 diabetes, monitoring should be according to the individual need of the patient to optimise control and prevent acute complications.
Type 2	Diet & exercise/ Metformin (+/- Glitazones)/ Incretins SGLT-2 (Gliflozins)	• Blood glucose monitoring is not required.
Type 2	Sulfonylurea alone or in combination with other oral hypoglycaemic agents	• Routine testing is not required unless patient is a driver. • Patients with evidence of hypoglycaemic episodes should be taught how to monitor blood glucose using the most appropriate meter, interpretation of results and routinely test at least 3 times per week to assess medication or lifestyle change. • Testing should be undertaken at different times of the day to ensure hypoglycaemia is identified.
Special circumstances	Driving Illness Changes of treatment Steroid therapy	• Patients on treatment (insulin and some oral medication) must be made aware of the regulations of the DVLA. • Patients should be made aware of the "sick day rule" guidelines and be aware that they should test frequently. • Various tests should be performed until stabilisation of glycaemia. Patients should be advised to increase the amount of testing during the day to adjust diabetic treatment.

Final

Choice of meter

The aim of this policy is to support the use of the most cost-effective method of blood glucose monitoring whilst meeting differing patient needs using NHS England Commissioning recommendations for blood glucose and ketone meters, testing strips and lancets. Patients using CGM are expected to be prescribed a reduced number of glucose test strips and lancets.

Type 1 Diabetes:

Meter should be chosen depending on the need and used to optimise control. Patients currently prescribed continuous Glucose Monitoring should be prescribed testing strips on repeat according to their individual circumstances. Patients using CGM should be encouraged to always keep a full in date pack of test strips. Where more than one meter is suitable the one with the lowest acquisition cost should be chosen. *Paediatrics include children less than 16 years of age.

If no special features are required, patients should be offered a basic meter from the list of Type 2 (Table 2).

Table 1: Meters suitable for type 1 diabetes and type 2 who are ketosis prone

Meter	Manufacturer	Testing Strips	Drug Tariff cost for 50 strips Feb 24	Memory	Special Situations	Other features
CareSens® Dual	Spirit Healthcare LTD	**CareSens® Pro blood Glucose** **KetoSens® blood Ketone**	£9.95 £9.95 x 10	1000	Ketosis prone T2DM	Bluetooth functionality – share reporting via mobile app Tagging of pre, post meal & fasting levels (90 day averages) Reminder to test ketones Records diet, exercise & medication Ketone testing
GlucoFix Tech GK	A.Menarini Diagnostics	**GlucoFix Tech Sensors Test Strips** **GlucoFix Tech B-Ketone Sensors Test Strips**	£5.95 £9.95	730	Paediatrics* Learning difficulties Ketosis prone T2DM	Hypo/Hyper alert up to six settable acoustic alarms (3 Glucose Alarms & 3 Ketone Alarms) Ketone testing Visually impaired Dexterity
GlucoRx HCT	GlucoRx LTD	**GlucoRx HCT Glucose Test Strips** **GlucoRx HCT ketone Test Strips**	£8.95 £9.95	1000	Pregnancy Ketosis prone T2DM Dialysis	Suitable for women with GDM and for dialysis patients due to haematocrit range (0-70%) Ketosis prone T2DM Dialysis

Type 2 Diabetes:

Meter should be chosen depending on the need and used to optimise control. Patients currently prescribed Continuous Glucose Monitoring (CGM) will only require 50 test strips per month or when required. Patients using CGM should be encouraged to always keep an unopen bottle of test strips. Where more than one meter is suitable the one with the lowest acquisition cost should be chosen.

Table 2

Meter	Manufacturer	Testing Strips	Drug Tariff cost for 50 strips Feb 24	Memory	Special Situations	Comments
CareSens S Fit BT	Spirit Healthcare	**CareSens S test strips**	£5.45	1000		Bluetooth functionality Personal 'Normal range' & hypoglycaemia & hyperglycaemia indicator Tagging of pre, post meal & fasting levels (90 day averages)
Contour® Plus Blue	Ascensia	**Contour® Plus Test Strips**	£5.95	800	Pregnancy Dialysis	Alternate site testing Meal markers (fasting, pre and post meal) Second Chance Sampling Suitable for use with renal dialysis Suitable for gestational women due wide haematocrit range (0%-70%)
GlucoRx Nexus Blue	GlucoRx LTD	**GlucoRx Nexus**	£8.95	1000	Dialysis Cognitive Impairment Dexterity Learning Difficulties Paediatrics*	Suitable for dialysis patients Ketone warnings when readings ≥ 15mmol/L Alternative site testing Four alarms and discreet testing Carbohydrate counting
WaveSense JAZZ	AgaMatrix	**WaveSense JAZZ Test Strips**	£8.74	1865	Pregnancy	Suitable for gestational women
On Call Extra Voice	Connect 2 Pharma	**On Call Extra Test Strips**	£5.20	900	Paediatrics* Visually impaired	For visually impaired adult and paediatric T1 & 2 patients

Choice of lancets and lancing devices

Lancets & lancing devices supplied with the meters may not be supported by SNEE CCG. Lancets with a higher gauge are generally less painful but may not provide enough blood for testing. Please ensure the quantities of the lancets are in line with the frequency of testing and match quantities with blood glucose test strips. Please use ICB recommended lancet brand and supply a universal lancing device where required. The ICB supports lancing devices that are <£3/100

ICB recommended lancets

Remind patients it is not essential to have the same lancets as that provided with their meter.					
Patients testing <4 X daily					
Manufacturer	**Lancet**	**Size**	**Pack size**	**Cost Feb 24**	**Compatible**
AgaMatrix	AgaMatrix Comfort Twist	0.32mm/30G	100	£2.69	Universal fit
Nipro Diagnostics	4SURE	0.32mm/30 G	100	£2.90	
		0.195mm/30 G			
Trividia	TRUEplus	0.36mm/30G	100	£2.90	
		0.32mm/30G			
		0.195mm/33G			
Spirit Healthcare LTD	CareSens Lancets	0.31mm/30 G	100	£2.95	
		0.36mm/28 G			
Patients testing ≥4 X daily					
GlucoRx	GlucoRX	0.31mm/30G	200	£4.50	Universal fit
AgaMatrix	AgaMatrix Ultra-thin	0.2mm/33G	200	£5.43	
		0.35mm/28G			
Patients with dexterity problems ONLY					
Neon Diagnostics	Neon Verifine safety	1.8mm/28G	100	£2.99	Universal fit
		1.8mm/ 30G			
GlucoRx	GlucoRx Safety*	1.6mm/30G 1.8mm/28G 1.8mm/26 G 2.2mm/23 G	200	£5.50	
Safety Lancets* *Safety Lancets are for the benefit of the healthcare worker and should not be routinely prescribed on FP10s but provided by the employer.* Safety lancets should only be prescribed on FP10 for use by people who are not health and social care professionals and are not employees in the health and social care sectors but are finger pricking a patient and there is a risk of disease transmission (e.g., HIV and *hepatitis).*					

Choice of Needles

Please use ICB recommended pen needles brand. NHS England and the ICB supports the use of pen needles <£5/100

Recommended Pen Needles

Best practice guidance in pen needle choice:
The Forum for Injection Technique (FIT) UK considers the 4mm needle to be the safest pen needle for adults and children, regardless of age, gender and body mass index (BMI).

Using shorter length needles helps prevent intramuscular injection of insulin. (IM injection of insulin can result in unpredictable blood glucose levels.) Therefore, the most cost-effective 4mm needle should be chosen.
For patients currently using longer pen needle lengths (8mm, 12mm), changing to a shorter length (6mm or less) is advised, but only after discussion with a healthcare professional to ensure they receive advice on the correct injection technique.)

Remind patients it is not essential to have the same pen needles as that provided with their meter.				
Manufacturer	**Pen Needle**	**Size**	**Pack size**	**Cost Feb 24**
GlucoRx Ltd	GlucoRx Carepoint®	4mm/31G	100	£2.75
BD	BD Viva	4 mm/31G; 4 mm/32G	100	£3.59

Safety Pen Needles

Safety pen needles are for the benefit of the heathcare worker and should not be routinely prescribed on FP10s but provided by the employer. Safety pen needles should only be prescribed on FP10 for use by people who are not health and social care professionals and are not employees in the health and social care sectors but are injecting to a patient and there is a risk of disease transmission (e.g., HIV and *hepatitis).*

Supplier Contact Details

Supplier	Contact Details
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