

BLOOD GLUCOSE TESTING, LANCETS AND INSULIN PEN NEEDLES

Contents	Page:
Introduction	2
Who should be testing?	3
Glucose testing for drivers	3
Category 1 meter table (T1 or T2DM on fixed dose insulin)	4
Category 2 meters table (variable insulin dose, pregnancy)	5
Category 3 meters (restricted use)	6
Ketone testing	6
Switching blood glucose meters	7
Lancets and insulin pen needles	8
Safety needles and safety lancets	9
Safe disposal links	9

Introduction:

These guidelines are intended to assist healthcare professionals in the selection of appropriate blood glucose meters and testing strips for patients to self-monitor their blood glucose levels.

The recommendations on choice of meter in this guideline reflect a multi-disciplinary review of several requirements including:

- Compliance with the new ISO standards (01.05.2016) for glucose testing meters
- Cost and expiry of test strips
- Clinical features of meters for example connectivity, suitability for particular patient groups, support for patient self-management, any known interference with prescribed medicines
- Compatibility with DVLA requirements

The need for a meter for newly diagnosed diabetics 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 diabetic 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. Prescribing of strips and lancets for patients who purchase a meter is not supported.

This guideline has divided meters into 2 broad categories.

The majority of patients with diabetes (including those using **fixed dose** insulin regimens) should be offered a meter from **category 1**, these are cost-effective and the table of key features enables informed decision making between clinician and patient. Practices should routinely stock these meters (available free of charge from the manufacturer) and offer them to patients who meet the criteria for [self-management of blood glucose](#)

Category 2/3 meters are mostly reserved for specific groups of patients with T1DM, they are usually initiated in secondary care or tier 2 diabetes services and strips continued in primary care. Accu-Chek Mobile is an exception to this, it may be used in patients with T2DM or on fixed dose insulin regimens who meet the other criteria outlined, and in such cases, initiation in primary care would be reasonable. Category 2/3 meters do not need to be routinely stocked in primary care but may be ordered ad hoc from manufacturers if patient meets criteria for use.

Patients prescribed these products who meet this criteria **should not be changed** by healthcare professionals in primary care, as they have been specifically selected for complex patients

Patients, who purchase a meter where an off-formulary strip is used, should expect to purchase the strips as well. Community pharmacists should not sell blood glucose meters to patients with diabetes without prior discussion and approval from the patient's diabetes healthcare professional. Practices should dispose of, not accept, or return, free samples of non-formulary meters from drug companies. All of the meters included in this guideline are available at no cost to the patient.

Glucose testing for drivers?¹

Treated with Insulin

- Group 2 Drivers (lorries/buses):
 - At least twice daily blood glucose monitoring including on days when not driving **and**
 - No more than 2 hours before the start of the first journey and every 2 hours after driving has started
 - A maximum of 2 hours should pass between the pre-driving glucose test and the first glucose check performed after driving has started. More frequent self-monitoring may be required with any greater risk of hypoglycaemia
 - Use glucose meter with non-deletable memory function sufficient to ensure 3 months of readings available
- Group 1 Drivers (cars/motorcycles):
 - Glucose testing no more than 2 hours before the start of the first journey and every 2 hours after driving has started (More frequent self-monitoring may be required with any greater risk of hypoglycaemia)
 - A maximum of 2 hours should pass between the pre-driving glucose test and the first glucose check performed after driving has started

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

- Group 2 Drivers (lorries/buses):
 - Should monitor blood glucose at least twice daily and at times relevant to driving
- Group 1 Drivers (cars/motorcycles):
 - The frequency of testing depends upon the clinical context, it may be appropriate to monitor blood glucose at times relevant to driving to enable the detection of hypoglycaemia
 - The greatest risk of hypoglycaemia with sulphonylureas is in the first three months of treatment therefore people who are just starting treatment, experiencing hypoglycaemia, or have reduced awareness are likely to need to test more frequently






Who should be testing?

- All patients with Type 1 diabetes
- All pregnant women with pre-existing or gestational diabetes
- All patients with Type 2 diabetes using **insulin**
- Non-insulin managed patients with T2DM who:
 - Are prescribed sulfonylureas or 'glinides, who also drive (see above)
 - Have been newly initiated or dose titrated with GLP analogue (e.g. exenatide) for short term only (<3 months)





Who Should Not Need to Test?

- Those with Type 2 DM controlled by diet and exercise alone
- Patients with Type 2 diabetes controlled by any of the following oral agents (alone or in combination with one another): metformin, pioglitazone, acarbose, a gliptin or an SGLT2 inhibitor

Category 1: For T1DM or T2DM patients on fixed dose insulin regimens (or non-insulin managed T2DM if meet [criteria](#))

		1 st line meters			2 nd line meters (1 st line where double tick ✓✓ in table)	
		GlucoRx Q	Palmdoc 2	Contour	Tee2	Accu-Chek Performa
Product photo (and approx. size and weight)						
Memory	450 tests	900 tests	480 tests	1000 tests	500 tests	
Compatible test strips	Glucorx Q	Palmdoc	Contour Plus	Tee2	Accu-Chek Performa	
50 strips (£)	£5.45	£5.90	£5.95	£7.75	£7.50	
Expiry after opening	2 x 25 pots, each 6 months	2 x 25 pots, each 6 months	1 x 50 pot, 24 months from manufacture	1 x 50 pot, 12 months		
Lancets	Use lancets <£3/100, not necessarily the ones supplied with the meter. Refer to Cost effective lancet table					Fastclix Lancet drums (£5.90/204)
Contra-indications	No known interference with medication/drugs in normal ranges	Drugs that contain/metabolise to maltose or galactose e.g. peritoneal dialysis, immunoglobulins, abatacept	No known interference with medication/drugs in normal ranges	No known interference with medication/drugs in normal ranges	TBC	
Preferred meter (✓), alternative choice (✓)	T2DM (tablets)	✓✓	✓✓	✓✓	✓	✓
	T1/T2 fixed dose insulin	✓✓	✓✓	✓✓	✓	✓
	Group 2 driver	✓ (testing up-to 5 x /day)	✓✓ (testing up-to 10 x / day)	✓ (testing up-to 5 x /day)	✓ (testing up-to 11 x /day)	✓ (testing up-to 5 x /day)
	Other cohorts		✓ Partially sighted (if able to insert strip & take sample; meter has speaking function)			✓✓ Paediatrics (non-carb counting)
Additional considerations on choice of meter	<ul style="list-style-type: none"> Four alarms Discreet testing Fulfils DVLA requirements PC link for results download Free replacement batteries from patient helpline 	<ul style="list-style-type: none"> Speaking function in 5 languages Drivers, (esp Gp 2) who require large test memory for DVLA (900 tests sufficient for testing 10 times daily) 	<ul style="list-style-type: none"> Test reminder alarms Data cables available free from customer support GLUCOFACETS DELUXE diabetes management software 	<ul style="list-style-type: none"> Suitable for group 2 (lorry/bus) drivers that require insulin and test up to 11 times per day Bluetooth connectivity Compatible with Smart Log diabetes management APP 	<ul style="list-style-type: none"> Data transfer via infrared cable to PC If clinically need Fast-Clix lancing device but does require or meet criteria for Accu-Chek Mobile 	
Contact to order FREE meters	Lewis Bailey Tel: 07880 031031 Email: lewis@glucorx.co.uk	Joanna Jackson Phone: 07951 941319 E-mail: Jo@palmdoc.co.uk	Helen Moore: 07774 121307 Helen.Moore@Ascensia.com	TBC	Josephine Smith Mobile: +44 (0)7885473013 josephine.smith.js2@roche.com	
Patient helpline details	01483 755133 / 0800 0075892 Email: info@glucorx.co.uk	0800 994 9995 (Freephone) 8am – 6pm. Or contact Jo Jackson (07951 941319)	Mon–Fri, 8am - 8pm 0345 600 6030 www.diabetes.ascensia.co.uk	TBC	Mon to Fri 8am - 6pm (excluding bank holidays): 0800 701 000	

Category 2: Meters reserved for specific cohorts of patients (not to be changed in primary care for patients with these indications)

Cohort	Carb Counting T1DM with SMART phone (APP supports dosing) – for example T1DM patients who have completed DAFNE or BERTIE course		Paediatrics OR needle phobia OR dexterity OR vision problems	Diabetes in Pregnancy
Name of Meter	MyLife Unio	Nipro Sure Smart Duo	Accu-Chek Mobile	Agamatrix Wavesense Jazz or Jazz Wireless
Product photo				
Memory	1000 tests	1000 tests	2000 tests	1865 (Jazz) Unlimited in APP (wireless)
Compatible test strips	MyLife Unio	4SURE	Accu-Chek Mobile test cassette	Wavesense Jazz or Wavesense Jazz Duo
50 strips (£)	£9.50	£8.99	£9.99	£8.74
Expiry after opening	18 months (50 strip pack)	24 months	3 months (50 test drum)	6 months per pot (available as 1 x 50 or 2 x 25)
Ketone testing	Supply either GlucoRx HCT OR Nipro SureSmart Duo (for ketone testing function)	Yes, requires coding with new pack of strips (18 month expiry)	NA	NA
Lancets	Use the most cost effective lancets (<£3/100), these are not necessarily the ones supplied with the meter. Refer to Cost effective lancet table on page 7		Fastclix Lancet drums (£5.90/204)	Use the most cost effective lancets (<£3/100). Refer to Cost effective lancet table on page 7
Contra-indications/interference with result accuracy	No known interference with medication/drugs in normal ranges	No known interference with medication/drugs in normal ranges	Note: no known interference with medication/drugs in normal ranges	Patients with abnormally high ascorbic acid concentrations. Patients receiving oxygen therapy. No other known interference with medication/drugs in normal ranges.
Additional considerations on choice of meter	<ul style="list-style-type: none"> Mini USB – plug and play diabetes software. Dosing calculator on MyLife app. Connects with diasend Compatible strips for those on Ypsomed insulin pump 	Patients using the 4SURE devices get full free access to the company's bolus calculator App Bluetooth connectivity Blood glucose and ketone dual meter		Free download AgaMetric Diabetes Manager APP. Results can also be downloaded to PC – contact patient helpline for cable. Connects with diasend
Contact to order FREE meters	TBC	Ryan Wilkes 07990 013907; ryan.wilkes@nipro-group.com Hannah Dixie 02380 604 307 Hannah.dixie@nipro-group.com	Josephine Smith Mobile: +44 (0)7885473013 josephine.smith.js2@roche.com	Sharon Fernando 07733 458927 sfernando@agamatrix.com
Patient helpline details	TBC	Bayer Diabetes Support 0845 600 6030	Mon to Fri 8am - 6pm (excluding bank holidays): 0800 701 000	08.00 – 18.30 Mon - Fri and OOH Answerphone

Category 3 – RESTRICTED USE meters for special circumstances only - initiation by diabetes specialists:

Name of Meter	Accu-Chek Aviva Expert (meter now discontinued)	Contour Next One	Freestyle Libre and Libre2 (FSL)
Test strip and cost	Accu-chek Aviva: £16.21 / 50	Contour Next One £15.16 /50	Freestyle Libre and Freestyle Libre 2 sensors £35/kit
RESTRICTED TO:	<ul style="list-style-type: none"> • Carb Counting T1DM unable to use SMART phone for dose calculation • Patients with NHS funding approval for, and using the Insight insulin pump (STRIPS only - meter not required) 	Patients with NHS funding approval for, and using the Medtronic insulin pump	Following assessment by specialist diabetes team only against agreed criteria
Additional considerations on choice of meter	<ul style="list-style-type: none"> • No other meter offers in device dose calculation, other meters supported to do this through compatible smart phone APP • Accu-chek Aviva Expert meters restricted to children of primary school age who require dose calculation technology but are unable to use a Smart phone in school • Carb counting type 1s who DO have access to a smart phone should be reviewed by the diabetes team at their next review for consideration of switch to a category 2 meter (preserving remaining strip supply for patients unable to use a smart phone for dose calculation) 	Only for users of compatible insulin pump	<ul style="list-style-type: none"> • For patients who fulfill criteria, the device and initial supply of sensors will be issued by the specialist diabetes team. A notification form will be sent to the GP requesting transfer of prescribing. Continue until next review with diabetes team. GPs should not be assessing patient suitability NOR initiating Freestyle Libre • Any category 1 meter is a suitable back up for Libre patients. Freestyle Optum strips are NON-FORMULARY and should not be prescribed.
Local rep details:	Josephine Smith +44 (0)7885473013 josephine.smith.js2@roche.com	Helen Moore: 07774 121307 Helen.Moore@Ascensia.com	TBC
Patient helpline details	Mon to Fri 8am - 6pm (excluding bank holidays): 0800 701 000	Mon – Fri, 8.00am - 8.00pm 0345 600 6030 www.diabetes.ascensia.co.uk	

Prescribing of Blood Ketone Testing Strips in patients with Type 1 diabetes

Ketone testing may be indicated for people with type 1 diabetes mellitus. Patients required to self-test for ketones will be identified by the diabetes specialist service and provided with the initial supply of ketone testing strips and compatible meter by the specialist service. It may be necessary for primary care to repeat prescribe such strips. The use must be carefully monitored and it is not expected that this will exceed more than one pack (10 strips) per year, with the exception of insulin pump patients.

Ketone test strips which are available on the MSE formulary are: **4SURE** and **Glucorx HCT** (can use compatible glucose test strips if patient prefers a single device even though not listed above – or any other glucose testing meter suitable for patient needs from formulary)

Switching blood glucose meters:

It is recommended that all patients with Type 2 diabetes or Type 1 diabetes on fixed dose insulin regimens (unless in one of the exempted cohorts as described in the category tables above); and who are prescribed strips **costing more than £6 per 50 test strips** are reviewed and that the category 1 table is used, in consultation with the patient, to select a suitable alternative. **Remember that if a meter is to be switched for the purpose of cost saving, any existing supply of strips the patient has for the old meter should be used up first.**

Patients who fall into the cohorts of category 2 meters should not be switched unless on the advice of a diabetes specialist.

In all cases, when undertaking a switch to an alternative meter, practitioners should be assured that the patient has been educated and is competent to use the new meter and interpret the results.

The prescribing of alternative test strips not listed in this guideline and which are priced at less than £6 / 50 strips would not be challenged; however, healthcare professionals who recommend or prescribe meters not included in this guideline are accepting responsibility for ensuring compliance of the meter with ISO and DVLA requirements and suitability for the individual patient need.

Lancets:

- Use cost-effective lancets (which may not be the ones provided with the meter). There are a range of different sized lancets available on prescription at a cost of **≤£3 / 100** and any of these are considered suitable for use.
- The higher the gauge (G) of a lancet; the smaller the diameter of the needle. A low gauge needle (28G) may be quite uncomfortable for the patient while a higher gauge (33G) may not provide sufficient blood for testing. Generally 30G lancets are suitable for most patients
- Lancets are designed to fit into proprietary finger-pricking devices but from local experience most appear to be a universal fit for all. Finger pricking devices are not prescribable but are supplied with the blood glucose monitoring meter.
- Lancets are for single use only, ensure patients are educated about safe disposal via sharps bin
- Multi-device lancets (**e.g. Fastclix drum** £5.90/204), which contain a preloaded lancet drum are the preferred choice for those with dexterity problems, needle phobia or visual impairment. They are also suitable for patients who are supported with glucose testing by a carer or for paediatric patients

Insulin Pen needles:

- For adults, there is no clinical reason for recommending needles longer than 8mm, most adults of average body weight should use needles of 6mm or less.
- For children and adolescents, there is no clinical reason for using needles longer than 6mm. Needles of shorter length (e.g. 4mm) help prevent accidental IM injection.
- 4, 5, 6 and 8mm needles are the recommended sizes locally.
- All needles are for single use only.

- The locally approved insulin pen needles are shown below. All of these cost less than £5/100 needles and are compatible with all insulin pen devices. All are 31 or 32G (gauge)
- Use the most cost-effective pen needles suitable for the patient (table presents brands in ascending order of price per 100 needles, beginning with the left-hand column)

Insulin needle	Cost/100	Insulin needle	Cost/100
Carefine (4mm, 5mm, 6mm, 8mm)	£2.75	Tri Care (4mm, 5mm, 6mm, 8mm)	£3.95
GlucoRx CarePoint (4mm, 5mm, 6mm, 8mm)	£2.75	Omnican Fine (4mm, 5mm, 6mm)	£3.95
Mylife Penfine Classic (4mm, 5mm, 6mm, 8mm)	£3.55	4SURE (31G: 4mm, 5mm, 6mm, 8mm); (32G: 4mm, 5mm, 6mm)	£3.95
PROfine (4mm, 5mm, 6mm, 8mm)	£3.80		
BD Viva (4mm, 5mm, 8mm)	£3.94	Neon Verifine (4mm, 5mm, 6mm, 8mm)	£4.50

Safety needles and safety lancets – Do NOT prescribe on FP10 for healthcare workers use

- Safety needles and lancets, have a needle that retracts after use.
- These are primarily for the benefit of healthcare workers to avoid needle stick injury, not for the benefit of the patient
- They should not be prescribed by GPs on FP10s.
- **They may be ordered as a stock item by healthcare providers who require them to ensure the safety of their staff**
- For paediatric patients who require support during school hours to test their blood glucose,
 - **Fastclix** lancet drum may be prescribed if the patient has the compatible lancing device (the device itself is not prescribable on FP10, it is available in the starter kits of Performa and Mobile meters, or may be self-purchased by patients).
- Paediatric patients requiring support with administering insulin during school hours from school staff may be supplied with a supply of safety needles sufficient for the doses that will be given during school hours only.
 - GlucoRx Safety Pen Needles 5mm are recommended for prescribing in this situation.

Safe disposal of sharps

District councils provide a domestic clinical waste collection service. Patients should refer to the following websites to complete the relevant forms for regular clinical waste collections. Some of the forms are to be completed by the GP/HCP, this will be indicated on the website.

Mid Essex	South East Essex	South West Essex
Maldon district council: https://www.maldon.gov.uk/info/20000/waste_and_recycling/9331/clinical_waste_collections	Southend-on-Sea Borough Council: https://www.southend.gov.uk/recycling-waste/hazardous-household-waste/2	Brentwood Borough Council: https://www.brentwood.gov.uk/-/household-waste#clinical-waste
Chelmsford city council: https://www.chelmsford.gov.uk/bins-and-recycling/special-collections/clinical-waste-collections/	Castle Point Borough Council: https://www.castlepoint.gov.uk/clinicalwaste/	Basildon Borough Council: www.basildon.gov.uk/article/4816/Clinical-and-Hazardous-Waste
Braintree district council: https://www.braintree.gov.uk/bins-waste-recycling/dispose-clinical-waste	Rochford District Council: https://www.rochford.gov.uk/environment/recycling/wast-hat-goes-where	Thurrock Council: www.thurrock.gov.uk/clinical-waste/disposing-of-clinical-waste

References	<ul style="list-style-type: none"> • NHS Clinical Commissioners’ “Items which should not routinely be prescribed in primary care” Version 2, June 2019 https://www.england.nhs.uk/publication/items-which-should-not-be-routinely-prescribed-in-primary-care-guidance-for-ccgs/ • ISO standard (15197:2013 last updated 2018) “In vitro diagnostic test systems — Requirements for blood-glucose monitoring systems for self-testing in managing diabetes mellitus” https://www.iso.org/standard/54976.html • Driver and Vehicle Licensing Agency “Assessing fitness to drive – a guide for medical professionals” Sept 2019 https://www.gov.uk/guidance/assessing-fitness-to-drive-a-guide-for-medical-professionals [Accessed 31/8/21] • NHS Mid Essex CCG “Blood Glucose Meters, Test Strips and Lancets Guidelines Nov 2019 https://midessexccg.nhs.uk/medicines-optimisation/clinical-pathways-and-medication-guidelines/chapter-6-endocrine-system-2/1605-diabetes-blood-glucose-meters-test-strips-lancets-guidelines-nov-19/file [Accessed 31/8/21]
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