Blood Glucose Meters and Test Strip Options

Blood glucose monitoring requires the use of appropriate equipment. The aim of this guidance is to rationalise the number of different blood glucose testing equipment across the locality whilst ensuring appropriate use of NHS resources. Advantages of compliance with the guidance include consistency of approach, reduced risk of errors due to unfamiliarity with equipment, a reduction in unnecessary prescribing, and improved cost effectiveness.

- Blood glucose testing should be used as part of a care plan for the management of Diabetes following structured patient education which includes the purpose of testing. Testing is not required for all diabetic patients.
- The decision to change meters should be used as an opportunity to review the purpose of testing and the interpretation of results.
- If a change in prescribed test strips is required, patients should be encouraged to use their current supply of test strips first as long as the strips have not reached their expiry date and the current meter is in working order.
- The majority of test strips expire within 90 days of opening. If one container usage is over a longer period than this, review of blood glucose monitoring needs is recommended.
- Patients should be reminded to use control solutions/calibrate machines in line with manufacturer recommendations.

The blood glucose testing meters referred to in this document are recommended in the North of Tyne and Gateshead areas at the time of publication and meet the needs of the majority of patients whilst complying with ISO standards. The list is neither exhaustive nor exclusive and is subject to change due to product updates/changes.

Driving

- The main issue in relation to driving and the law is the risk of hypoglycaemia.
- It is important that any patient who is using treatment that can cause hypoglycaemia (insulin / sulphonylurea) has the means to test their blood glucose.
- The current DVLA guidance separates insulin-treated diabetes and diabetes managed by tablets carrying hypoglycaemia risk (including sulphonylureas and glinides) and provides different recommendations for each.
- People with insulin-treated diabetes are recommended to test their blood glucose prior to driving, and every 2 hours during long journeys (compulsory for Group 2 licences/taxi drivers). Following hypoglycaemia treatment the blood glucose must be in the normal range for 45 mins prior to resuming driving. There must be full hypo awareness at every episode (refer to DVLA website for further information).
- For people with diabetes managed by tablets carrying hypoglycaemia risk, blood glucose monitoring is not routinely required (except for Group 2 licences/taxi drivers), but should be used if needed to avoid or detect hypoglycaemia in people at high risk.
- For Group 2 and vocational licences evidence is required of twice daily blood glucose testing and at times related to driving (no more than 30mins before the start of the first journey and at two hourly intervals while driving). A blood glucose meter with the facility to store a minimum of 3 months of results is required and has to be reviewed annually by an appropriate medical professional. A meter with the facility to download results is recommended. All meters in use must be reviewed.
- The DVLA require to be notified if there is one episode of unrecognised hypoglycaemia where assistance is required in previous 12 months.
**Type 1 Diabetes Mellitus**

Self-monitoring of glycaemic control should only be performed if it has a clear purpose for the patient and healthcare professional. It should not be viewed as a stand-alone intervention, but should be incorporated into structured patient education (NICE-clinical guideline 15). Approaches and targets should be individualised and agreed in consultation with patients, as part of the care planning process.

Test frequency will depend on the patient and their insulin regimen. A frequency of up to eight times daily is possible. More testing is required to meet driving requirements:

- All results must be recorded with time and date to provide a cumulative record as a basis for day-to-day changes in therapy
- People prescribed insulin should be taught how to adjust therapy in line with their blood glucose monitoring.

### Frequency of Testing

- **Increase in BGM may be required during period of:**
  - Illness
  - Use of steroids
  - Lifestyle changes
  - Changes to insulin dosage
  - Pre conception
  - Impaired hypo awareness
  - Frequent hypos
  - Exercise
  - Driving
  - Terminal care/end of life patients as part of a care plan

- **Test at night if unrecognised hypos are suspected**

- **Routinely pre meals and pre bed (MDI):**
  - One or two multi-point profiles a week at different times of day (BD premixed)

- **HbA1c should be measured every three to six months.**

**Type 2 Diabetes Mellitus**

Routine self monitoring of blood glucose is not required if patients are well controlled on non-insulin therapy (including oral treatment, diet, and exercise control). Patient education should clearly identify potential situation where hypo and hyperglycaemia may arise. Examples of these include:

- Any non-minor illness
- Concomitant systemic steroid therapy
- Initiation of a sulphonylurea/Insulin

People with Type 2 diabetes usually have more stable glycaemic control and therefore advice on the frequency of testing will reflect this in line with the treatment they are on. In practice, the level of monitoring will vary according to the treatment regime in use and the target level of glycaemic control set for the patient, and for driving requirements.

NB: Urine glucose monitoring test strips (Diastix) are used as part of structured Type 2 education i.e. DESMOND.

### Frequency of Testing

- **HbA1c is the real outcome measure for these patients.**
  - Blood glucose monitoring should not be required routinely, but may be required:
    - During illness
    - When therapy is changed
    - If steroids are co-prescribed (midday, before evening meal and 2 hours after evening meal)
    - When regular HbA1c testing is not available
    - Patients with postprandial hyperglycaemia
    - Pre-conception care and pregnancy
    - Terminal care/end of life patients

- **The main purpose is to detect and avoid hypoglycaemia**

- **Also may be required for driving in people at high risk of hypoglycaemia**

- **Fasting Glucose can be used to titrate basal insulin and results at other times to identify trends of hyper and hypoglycaemia**

- **Test at various times to include pre-prandial and pre-bed**

### Alternative Site Testing (ASL)

These results **must be used with caution** in the following circumstances:

- When making frequent insulin dose adjustment decisions eg following new diagnosis
- During illness management
- Following exercise
- For hypoglycaemia management especially if poor warning symptoms

### Lancers and Lancets

- Each meter is supplied with a lancer and will require lancets on prescription
- Lancers (the finger pricking devices) are not available individually on prescription.
- Replacement Lancing devices (Lancers) available from companies (usually free of charge)
- Lancets are for single use only
- Disposal of lancets (refer to Sharps policy)

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<table>
<thead>
<tr>
<th>Driving (see page 1 for more detail)</th>
<th>Alternative Site Testing (ASL)</th>
<th>Lancers and Lancets</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
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North of Tyne, Gateshead and North Cumbria Blood Glucose Monitoring Guidelines

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## FIRST LINE - meets the needs of majority of patients:

<table>
<thead>
<tr>
<th>Test Strips</th>
<th>Meter name</th>
<th>Benefits</th>
<th>Lancets</th>
<th>Cost (strip 50)</th>
<th>Manufacturer</th>
</tr>
</thead>
</table>
| Finetest Lite | Finetest Lite | • 0.5µl blood volume  
• Large display  
• Auto-coding  
• Alternative site testing  
• Data download | Greenlan | £5.95 (50) | Neon |

### Alternative recommendations for patient groups who may be excluded from using a first line meter:

<table>
<thead>
<tr>
<th>Patient groups</th>
<th>Test Strips</th>
<th>Cost (strips)</th>
<th>Meter name</th>
<th>Company</th>
</tr>
</thead>
</table>
| Type 1 diabetes with requirement for blood ketone monitoring (for use in CSII therapy; diagnosis of DKA; CAPD; pregnant women) | GlucoMen Areo ketone sensors  
GlucoMen Areo sensors  
FreeStyle Optium β-Ketone  
FreeStyle Optium | £9.95 (10)  
£9.95 (50)  
£21.71 (10)  
£16.12 (50) | GlucoMen Areo 2K  
FreeStyle Optium Neo | Menarini  
Abbott |
| Visual impairment (supplied lancet not easy to use for visual impairment) | GlucoRx Nexus Test Strips | £8.95 (50) | GlucoRx Nexus Voice Meter | GlucoRx |
| Impaired manual dexterity | Performa | £7.50 (50) | Accu-Chek Performa Nano (with Fastclix lancing device) | Roche |
| Bus/taxi drivers on insulin/sulphonylureas (to dispose of sharps safely whilst working; use standard meter at home) | Mobile  
Performa | £9.99 (50)  
£7.50 (50) | Accu-Chek Mobile cassette  
Accu-Chek Performa Nano (with Fastclix lancing device) | Roche  
Roche  
Abbott |
| Adult patients who require bolus dose advice on meter or smartphone app | MyLife Unio  
Mobile  
Aviva  
FreeStyle Lite | £9.50 (50)  
£9.99 (50)  
£16.21 (50)  
£16.41 (50) | MyLife Unio Neva (app)  
Accu-Chek Mobile (app)  
Accu-Chek Aviva Expert (meter)  
FreeStyle Insulinx (meter) | Ypsomed  
Roche  
Roche  
Abbott |
| Patients on insulin pumps | Contour Next  
FreeStyle Lite  
Aviva  
MyLife Unio | £15.16 (50)  
£16.41 (50)  
£16.21 (50)  
£9.50 (50) | Contour Link (Medtronic)  
FreeStyle Lite (Omnipod)  
Accu-Chek Combo/Insight (Roche)  
MyLife YpsoPump | Ascensia  
Abbott  
Roche  
Ypsomed |
| Patients being remotely managed via Telehealth | GlucoMen Areo sensor (gestational diabetes) | £9.95 (50) | GlucoMen Areo | Menarini |
| Patients who have difficulties using the first line meter – consider alternatives where test strips cost less than £9.99/50 strips | Element  
GlucoLab  
Contour  
Performa | £9.89 (50)  
£9.89 (50)  
£9.99 (50)  
£7.50 (50) | Element  
GlucoLab  
Contour  
Accu-Chek Performa Nano | Neon  
Neon  
Ascensia  
Roche |

Meter choice should be guided on the advice of specialist team for:
- Renal dialysis patients
- Children and young people under 19 years old – seek advice from paediatric specialists before changing meter
- Antenatal and post-natal patients – meter choice guided by hospital to ensure compatibility with service software
- Any patients for whom the GP practice has received instructions from secondary care to keep the patient on a specific meter.
**Cost effective lancet choices for self-use by patients**

- Use the least costly lancets that are suitable for the individual patient - these may not be the one provided with the meter. There are a number of cost effective lancets available on prescription priced at less than £3 per 100 lancets.
- Lancets are designed to fit into proprietary finger-pricking devices however most single use lancets can fit several devices.
- Finger pricking devices are not prescribable as they are not listed as appliances under Part IXA of the Drug Tariff. Finger pricking devices are supplied with the blood glucose monitoring meter.
- Multi-device lancets which contain a preloaded lancet drum (e.g. Fastclix), should be restricted to those with clinical need, e.g. those with dexterity problems or children/adults where disposal of sharps may be impractical or difficult.
- Safety lancets are designed so that the sharp retracts after use. These are primarily for the benefit of healthcare workers to avoid needle stick injury, not to be used by patients self-monitoring blood glucose, therefore they should not routinely be prescribed by GPs on prescription.
- Ensure that quantities on prescription are appropriate and in line with frequency of testing (i.e. should match quantities and frequency of ordering of blood glucose test strips).
- Lancets are for single use only, patients should be provided with suitable containers for the collection of used lancets. Arrangements should be available for the suitable disposal of these containers.
- Lancets for self-use must not be used by healthcare workers to take samples from more than one patient.