### KEY PRINCIPLES OF PRACTICE

- 95% of the care people with Diabetes receive is self-care and all patients should have access to high quality structured education programmes eg. X-PERT, DESMOND, conversation maps.
- The ability to monitor their own glucose level gives people with Diabetes the feedback they need in order to learn how to manage their condition optimally.
- Monitoring should be based on the individual’s clinical needs and in the context of Diabetes education and self-management.
- People should receive appropriate training in the technique and the actioning of the results.
- The frequency of testing will be different for different people and will change with their circumstances. Any guidelines can only be used as a framework and then adapted to meet individual needs.
- People may move between different methods of monitoring dependent on their needs at that time.
- Equipment used for monitoring should be based on choice and agreed with patient.

### TYPE 2 DIABETES

- Routine self-monitoring of blood glucose is not usually required if patients are well controlled on therapy without the potential to cause hypoglycaemia (see the table).
- HbA1c is important in assessing the adequacy of blood glucose control and should be tested every 3-6 months.
- Structured education is essential for people with newly diagnosed and existing Diabetes.
- People with Type 2 Diabetes usually have more stable glycaemic control. In practice, the level of monitoring will vary according to the treatment regimen used and the target level of glycaemic control set for/with the patient.
- DVLA requirements for testing when driving apply to people with Type 2 Diabetes treated with insulin, Gliclazide, glimepiride, glibenclamide or another sulphonylurea, nateglinide or repaglinide.

### TYPE 1 DIABETES

- Approaches and targets should be individualised and agreed in consultation with patients, as part of the care planning process.
- In addition to self-monitoring, HbA1c should be measured every 3-6 months.
- People prescribed insulin should be taught how to adjust therapy in line with their blood glucose monitoring and recognise patterns in their test results. This facilitates adjustments to their medication to achieve targets for fasting and postprandial blood glucose, which both contribute to HbA1c values.
- All results should be recorded with the time and date to provide a cumulative record as a basis for day-to-day changes in therapy. Most meters will store this information and some will allow download to a computer or smart phone.

### DIABETES AND DRIVING

**People with Diabetes must inform the DVLA.**

- Those on insulin or oral hypoglycaemic agents which carry a risk of hypoglycaemia, such as sulphonylureas should monitor their blood glucose before driving.
- Must have awareness of hypoglycaemia. If there is a total loss of 'hypo' warning signs their license will be withdrawn.
- Must not have had more than one episode of hypoglycaemia requiring third party assistance within the preceding 12 months. If they have had more than one episode they must inform the DVLA and their licence will be withdrawn for one year following the first episode.

- **Patients with blood glucose levels <5 should not drive until they have eaten.**

### GROUP 2 ENTITLEMENT

**People with Diabetes on insulin can apply for any Group 2 licence providing the patient has:**

- Had no episodes of hypoglycaemia requiring third party assistance within the previous 12 months.
- Full awareness of hypoglycaemia and can demonstrate understanding of its risks.
- Meter recorded evidence of regular monitoring (twice a day and at times relevant to driving).
- Been reviewed annually by an independent consultant diabetologist.

Visit [www.dft.gov.uk/dvla/medical](http://www.dft.gov.uk/dvla/medical)
## ADULTS WITH TYPE 2 DIABETES

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Sulphonylureas 4 alone or in combination with other hypoglycaemic agents except insulin</th>
<th>Insulin for Type 2 Diabetes: basal, twice daily fixed regimens or mixed insulins For basal bolus regimens see table for Type 1 Diabetes overleaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
</tr>
<tr>
<td>Metformin</td>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
</tr>
<tr>
<td>Pioglitazone</td>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
</tr>
<tr>
<td>DPP-4 inhibitors</td>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
</tr>
<tr>
<td>SGLT-2 inhibitors</td>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
</tr>
<tr>
<td>GLP-1 analogues</td>
<td>Diet and exercise</td>
<td>Diet and exercise</td>
</tr>
</tbody>
</table>

**Usual monitoring**

- Not usually necessary (*except when initiating exenatide, liraglutide or lixisenatide in people taking a sulphonylurea – see next column)
- Do not offer a meter unless a clear action based on test results has been agreed and for short term use only, e.g. to allow patient to adjust lifestyle when newly diagnosed
- 4 tests per week, usually testing once week before each of the three daily meals and before bedtime
- See advice on Diabetes and driving on previous page.

**Intensive monitoring**

- Before meals and 2 hours after evening meal

  *Intensive monitoring is essential during initiation of exenatide, liraglutide or lixisenatide for people already on sulphonylureas until stabilised

- See advice on driving

### Prescribing

- Prescribe the minimum appropriate number of strips on acute
- Prescribe on repeat
- Additional supplies may be necessary for driving and intensive monitoring

### Intensive monitoring may be required in any of these situations

- During intercurrent illness
- Intermittent steroid therapy
- Osmotic symptoms
- Postprandial hyperglycaemia
- Terminal care/end of life

To prevent development of acute complications

- Pre-conception and pregnancy
- Increased or regular intensive exercise
- When HbA1c testing is unavailable
- Impaired awareness of hypoglycaemia

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1. Linagliptin, saxagliptin, sitagliptin, vildagliptin,
2. Dapagliflozin, canagliflozin
3. Exenatide, liraglutide, lixisenatide
4. Gliclazide, glibenclamide glimepiride, glipizide, tolbutamide, nateglinide or repaglinide

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**ADULTS WITH TYPE 1 DIABETES**

- Insulin: basal bolus or delivered by a pump
- Usually 4 to 8 tests daily.
- Test before meals and at bedtime as a minimum
- Include two hour post meal testing to check correct carbohydrate ratios
- Additional testing may be required to enable people with Type 1 Diabetes to drive safely
- Additional post prandial tests may be required to optimise the dose of the rapid acting insulin; include testing before meals and 1-2 hours after the largest meals
- During periods of intensive monitoring additional supplies of strips may be required
- Prescribe on repeat.
- Restricting access to strips may destabilise control and adversely affect people’s quality of life
PRINCIPLES

Patients and health care professionals should be clear about what they hope to achieve by self-monitoring blood glucose because monitoring in itself does not improve control. It is the interpretation of the result and the action taken that makes the difference.

Assessment of monitoring at least once a year is desirable and should include:
- Self-monitoring skills
- The quality and frequency of testing
- The use made of the results obtained
- The continued benefit
- The impact on quality of life
- The equipment used

If the patient does not benefit from monitoring or if it is adversely affecting their quality of life, then it should be stopped.

Self-monitoring of blood glucose does not replace HbA1c testing, which should be carried out at suitable intervals as part of regular care.

Remember other health education (healthy diet, regular physical activity, maintaining a normal body weight, avoiding tobacco) to help people reduce their risk of Diabetes-related complications.

Provide Diabetes lifestyle leaflets and actively promote structured education.

CHOOSING A BLOOD GLUCOSE METER

A wide variety of blood glucose meters are available for patient use. These guidelines aim to rationalise the choice where possible to a smaller number of meters which have been assessed for technical specification and accuracy, patient acceptability and cost effectiveness.

The advantages of this are expected to be
- health professionals only need to be familiar with a limited number of meters which will facilitate better teaching of testing to patients
- patients will understand testing better and test more effectively
- reduced acquisition costs
- reduction in unnecessary testing and increase in necessary testing (optimisation)

The blood glucose testing meters referred to in these guidelines meet the needs of the majority of people with Type 2 Diabetes. However, meters with specialist functions will still be required, mainly for people with Type 1 Diabetes, people with Type 2 on a basal bolus insulin regime and patients with complicated needs. These are usually chosen and provided by secondary care, but GPs will be requested to continue to prescribe strips.

The decision to change meters should be used as an opportunity to review the purpose of testing and the interpretation of results as well as provide basic lifestyle advice and leaflet.

When 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. Repeats of current strips should be stopped and a new meter demonstrated and supplied from the preferred list and strips put onto repeat.

The majority of test strips expire within 90 days of opening. If usage is low enough that one pot of strips lasts longer than 90 days, review of the need for blood glucose monitoring is recommended.

Patients should be reminded to use control solutions/calibrate machines in line with the manufacturer’s recommendations.

Each meter is supplied with a lancer and a few lancets. Lancers (the finger pricking devices) are not available on prescription and replacement lancing devices are available from companies (usually free of charge). Lancets are for single use only and should be prescribed in quantities which correspond to the expected frequency of testing.
CWHHE GLUCOSE TEST STRIPS FORMULARY

BLOOD GLUCOSE TEST STRIPS

These guidelines aim to rationalise the choice where possible to a smaller number of meters which have been assessed for technical specification and accuracy, patient acceptability and cost effectiveness.

Patients with Type 1 Diabetes or those with Type 2 who may be prone to episodes of ketosis require access to ketone strips

<table>
<thead>
<tr>
<th>TYPE 2 DIABETES</th>
<th>CENTRAL LONDON, WEST LONDON, HAMMERSMITH AND FULHAM, HOUNSLOW</th>
<th>EALING</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlucoRx Nexus</td>
<td>GlucoMen GM</td>
<td></td>
</tr>
<tr>
<td>Neon GlucoLab</td>
<td>Neon GlucoLab</td>
<td></td>
</tr>
<tr>
<td>Wavesense Jazz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supercheck 2&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Supercheck 2&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>GlucoRx Nexus Voice&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accu-check mobile&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> For visually impaired  
<sup>2</sup> For patients with problems with manual dexterity

<table>
<thead>
<tr>
<th>TYPE 1 DIABETES AND GESTATIONAL DIABETES (SPECIALIST INITIATION)</th>
<th>CENTRAL LONDON, WEST LONDON, HAMMERSMITH AND FULHAM, HOUNSLOW</th>
<th>EALING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freestyle Optium / Optium Neo&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Freestyle Optium / Optium Neo&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>GlucoMen LX Plus&lt;sup&gt;3&lt;/sup&gt;</td>
<td>GlucoMen LX Plus&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Accucheck Expert&lt;sup&gt;4&lt;/sup&gt;/ Performa Nano&lt;sup&gt;6&lt;/sup&gt;</td>
<td>Accucheck Expert&lt;sup&gt;4&lt;/sup&gt;</td>
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</tr>
<tr>
<td>Freestyle Insulinx&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Freestyle Insulinx&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Contour Next Link&lt;sup&gt;5&lt;/sup&gt;</td>
<td>Accucheck Combo&lt;sup&gt;5&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<sup>3</sup> Measure ketones  
<sup>4</sup> Insulin dose advisor  
<sup>5</sup> For patients on pumps  
<sup>6</sup> Antenatal

TEST STRIP REQUIREMENTS

<table>
<thead>
<tr>
<th>STRIPS</th>
<th>PACKS/FREQUENCY</th>
<th>TESTS PER DAY</th>
<th>PACKS/FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>8 /yr</td>
<td>1</td>
<td>2 x 200 or 4 x 100 /yr</td>
</tr>
<tr>
<td>56</td>
<td>1 /mth, 14 /yr</td>
<td>2</td>
<td>4 x 200 or 8 x 100 /yr</td>
</tr>
<tr>
<td>112</td>
<td>2-3 /mth, 14 /yr</td>
<td>4</td>
<td>8 x 200 or 15 x 100 /yr</td>
</tr>
<tr>
<td>168</td>
<td>6</td>
<td>6</td>
<td>11 x 200 or 22 x 100 /yr</td>
</tr>
<tr>
<td>224</td>
<td>8</td>
<td>8</td>
<td>15 x 200 or 30 x 100 /yr</td>
</tr>
</tbody>
</table>

LANCET REQUIREMENTS

<table>
<thead>
<tr>
<th>PATIENTS SHOULDN'T USE A FRESH LANCET FOR EACH TEST. PACK SIZE VARY BETWEEN 100 AND 200 FOR DIFFERENT BRANDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE CHEAPEST BRANDS OF NEEDLES ARE CURRENTLY GLUCORX, AND MYLIFE PENFINE CLASSIC. THESE TWO BRANDS COVER MOST NEEDLE SIZES AND ARE COMPATIBLE WITH ALL DEVICES.</td>
</tr>
<tr>
<td>NEEDLES COME IN PACKS OF 100.</td>
</tr>
</tbody>
</table>

NEEDLE REQUIREMENTS

<table>
<thead>
<tr>
<th>INJECTIONS PER DAY</th>
<th>PATIENTS PER DAY</th>
<th>PACKS/FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>4 x 100 /yr</td>
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<td>56</td>
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<tr>
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<td>11 x 100 /yr</td>
</tr>
<tr>
<td>4</td>
<td>112</td>
<td>15 x 100 /yr</td>
</tr>
</tbody>
</table>

V1.2 Date of preparation: May 2015. For review: May 2016

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