WANDSWORTH

DIABETES GUIDELINES

Second edition, released August 2010

Recent updates

May 2009: Type 2 Diabetes - newer agents (partial update of CG66) Nice clinical guidelines CG87
June 2009: Change in HbA1c level reporting
March 2010: Nice clinical guidelines CG96. Neuropathic pain - The pharmacological management of neuropathic pain in adults in non-specialist settings
June 2010: Discontinuation of Mixtard 30
September 2010: South London Cardiac and Stroke Network – Combined lipid algorithm
October 2010 – Discontinuation of Rosiglitazone - Exenatide in dual and triple therapy – NPSA safety alert on safe insulin prescribing
March 2011 – Erectile dysfunction guidelines updated
November 2011 – NICE T2DM insulin regimes. September 2010 - CDSN contact details updated
November 2012 – Diagnosis using HbA1c

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1 Introduction

These guidelines are a collaborative initiative between primary care professionals and the local diabetes specialists. They are based upon recommendations from the National Institute for Clinical Excellence (NICE) and the latest research at the time of print.

Reference Documents

NICE Guidelines on the Management of People with Diabetes
National Service Framework: Standards (December 2001)

Cited documents are indicated throughout the text in parenthesis and correspond to the reference list at the end of each section where appropriate.

Every effort has been made to make this a user-friendly document for medical, nursing and allied health staff. These guidelines and the attachments are also available on the website – http://www.thewig.eu/.

Good Practice

These guidelines are not prescriptive. Individual care is paramount and there is still an important place for clinical judgment, experience and common sense. If decisions significantly depart from the recommended guidelines, it is advised that the reasons for this should be fully documented in the patient’s notes when they are made.

The treatment and targets should be based upon the latest clinical data available and tailored to the needs of the individual patient. They should be realistic, achievable and clearly discussed and agreed with the patient.

In December 2001, the Government published the ‘National Service Framework (NSF) for Diabetes: Standards’. This set out 12 minimum standards of care covering prevention, screening, management and treatment of diabetes and its long-term complications (see below for standards). It is intended to be ‘a vision of diabetes services’ which will:

- Lead to fewer people developing diabetes and better care for those who have it.
- Be centred around the needs of people with diabetes, developed in partnership with health care staff, equitable, integrated and focused on delivering the best outcomes for the person with diabetes.
- Offer care that is structured and pro-active providing people with the support they need to manage their own condition.
## 1.1 Diabetes National Service Framework Standards

| Prevention of Type 2 diabetes | **Standard 1**  
The NHS will develop, implement and monitor strategies to reduce the risk of developing Type 2 diabetes in the population as a whole and to reduce the inequalities in the risk of developing Type 2 diabetes. |
|-------------------------------|-------------------------------------------------|
| Identification of people with diabetes | **Standard 2**  
The NHS will develop, implement and monitor strategies to identify people who do not know they have diabetes. |
| Empowering people with diabetes | **Standard 3**  
All children, young people and adults with diabetes will receive a service, which encourages partnership in decision-making, supports them in managing their diabetes and helps them to adopt and maintain a healthy lifestyle. This will be reflected in an agreed and shared care plan in an appropriate format and language. Where appropriate, parents and carers should be fully engaged in this process. |
| Clinical care of adults with diabetes | **Standard 4**  
All adults with diabetes will receive high-quality care throughout their lifetime, including support to optimize the control of their blood glucose, blood pressure and other risk factors for developing the complication of diabetes. |
| Clinical care of children and young people with diabetes | **Standard 5**  
All children and young people with diabetes will receive consistently high-quality care and they, with their families and others involved in their day–to-day care will be supported to optimize the control of their blood glucose and their physical, psychological, intellectual, educational and social development. |
| Management of diabetic emergencies | **Standard 6**  
All young people with diabetes will experience a smooth transition of care from paediatric diabetes services to adult diabetes services, whether hospital or community based, either directly or via a young people’s clinic. The transition will be organised in partnership with each individual and at an age appropriate to and agreed with them. |
| Care of people with diabetes during admission to hospital | **Standard 7**  
The NHS will develop, implement and monitor agreed protocols for rapid and effective treatment of diabetic emergencies by appropriately trained health care professionals. Protocols will include the management of acute complications and procedures to minimize the risk of recurrence. |
| Diabetes and pregnancy | **Standard 8**  
All children, young people and adults with diabetes admitted to hospital, for whatever reason, will receive effective care of their diabetes. Wherever possible, they will continue to be involved in decisions concerning the management of their diabetes. |
| Detection and management of long term complications | **Standard 9**  
The NHS will develop, implement and monitor policies that seek to empower and support women with pre-existing diabetes and those who develop diabetes during pregnancy to optimize the outcomes of their pregnancy. |
| | **Standard 10**  
All young people and adults with diabetes will receive regular surveillance for the long–term complications of diabetes. |
| | **Standard 11**  
The NHS will develop, implement and monitor agreed protocols and systems of care to ensure that all people who develop long-term complications of diabetes receive timely, appropriate and effective investigation and treatment to reduce their risk of disability and premature death. |
| | **Standard 12**  
All people with diabetes requiring multi-agency support will receive integrated health and social care. |

2 Prevention and screening

There is an increase in risk of diabetes with age. It appears to peak at increased risk of 16% for men and 12% for women aged 75-84. It has been estimated by the year 2036, 20% of increase in diabetes will be related to the aging population in the UK. In view of people living longer than ever before, it is important to try and delay the onset of diabetes as much as possible as it may help reduce morbidity in old age.

Type 2 diabetes has long been regarded a disease of adult middle age, however current findings suggest an increase prevalence in childhood, due to the dramatic rise in childhood obesity.

It is likely that both genetic and environmental influences are important in the development of Type 2 diabetes. Preventing or managing excess weight gain and being physically active can reduce risk of developing type 2 diabetes.

2.1 People at High Risk of Developing Type 2 Diabetes

- Cardiovascular disease (CVD): ischaemic heart disease (IHD), cerebro-vascular disease, peripheral vascular disease (PVD)
- Hypertension
- White European people over 40 years and non-caucasian whites.
- High risk ethnic groups over 25 years with 1st degree relative. 40% lifetime risk if one increasing to 80% with two first degree relatives
- Body mass index (BMI) ≥ 30kg/m²
- Women who have had Gestational diabetes mellitus (GDM)
- Women with polycystic ovarian syndrome
- People with Schizophrenia on atypical anti-psychotic medications

2.2 Assessing risks from overweight and obesity:

<table>
<thead>
<tr>
<th>BMI classification</th>
<th>Waist circumference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Men &lt;94cm</td>
</tr>
<tr>
<td></td>
<td>Women &lt;80cm</td>
</tr>
<tr>
<td>Overweight</td>
<td>No increased risk</td>
</tr>
<tr>
<td>BMI&gt;25kg/m²</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>Increased risk</td>
</tr>
<tr>
<td>BMI&gt;30kg/m²</td>
<td></td>
</tr>
</tbody>
</table>

(Adapted from the NICE obesity guidelines 2006)

Weight reduction of between 5% and 10% of initial body weight reduces the health risks associated with obesity.

A 10kg reduction in body weight in an individual of initial weight of 100kg who has obesity related diseases can lead to the following health benefits. (June 1997)

<table>
<thead>
<tr>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 25% fall in total mortality</td>
</tr>
<tr>
<td>30 - 40% fall in diabetes related deaths</td>
</tr>
<tr>
<td>40 – 50% fall in obesity related cancer deaths</td>
</tr>
</tbody>
</table>
### Hypertension
- Fall of 10 mmHg systolic blood pressure
- Fall of 20mmHg diastolic blood pressure

### Angina
- Reduced symptoms by 91%
- 33% increase in exercise tolerance

### Lipids
- Fall by 10% in total cholesterol reduction
- Fall by 15% in low density lipoprotein cholesterol reduction
- Fall by 30% in triglycerides
- Increase by 8% in high density lipoprotein cholesterol

### Diabetes
- Reduces risk of developing diabetes by > 50%
- Fall of 30 – 50% in fasting glucose
- Fall of 15% in HbA1c

### 2.3 Key Healthy Eating Points
- Eat regular meals every day and do not skip meals
- Eat at least 5 portions of fruit and vegetables daily
- Include starchy foods at every meal
- Eat moderate servings of lean meat, fish and pulses
- Choose low and reduced fat dairy produce
- Limit fatty and sugary foods to cut down on calories
- Cut out or reduce the amount of salt used in cooking and at the table
- Keep alcohol within the recommended limits
- More details in section 3.5

### 2.4 Physical activity
- Regular physical activity has been shown to reduce the risk of type 2 diabetes.
- Recommendations are at least 30 minutes of at least moderate intensity physical activity on 5 or more days a week, in one session or several shorter ones lasting 10 minutes or more; 45-60 minutes may be needed to prevent obesity.
- Recommended levels should be built up to, using a managed approach with agreed goals.
- Recommended types of physical activity include activities that can be incorporated into everyday life, such as brisk walking, gardening or cycling, supervised exercise programmes and other activities such as swimming, walking a certain number of steps each day or stair climbing.
- The individual’s current physical fitness and ability should be taken into account.

References:

- Diabetic Medicine 20, 786-807
- Available at www.nice.org.uk

See WPCT weight management guidelines for further information
2.5 Screening

In most cases diabetes mellitus is diagnosed by testing fasting venous blood glucose or on a random test of HbA1c. In newly incident diabetes one test may become positive before the other and only one method of testing should be chosen for an individual. There are some circumstances where an early precise diagnosis in a situation where a person’s metabolism is rapidly changing or will be subject to stress, such as pregnancy, post-natally or pre-employment screening for certain occupations, and a fasting glucose tolerance test is used.

<table>
<thead>
<tr>
<th>2.5.1</th>
<th>Diagnosis of Diabetes Mellitus by fasting blood glucose (WHO 1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes symptoms (i.e. polyuria, polydipsia and unexplained weight loss) plus</td>
<td></td>
</tr>
<tr>
<td>A random venous plasma glucose concentration ≥ 11.1 mmol/l or</td>
<td></td>
</tr>
<tr>
<td>Fasting plasma glucose concentration ≥ 7.0 mmol/l (whole blood ≥ 6.1 mmol/l) or</td>
<td></td>
</tr>
<tr>
<td>In the absence of symptoms</td>
<td></td>
</tr>
<tr>
<td>Two fasting plasma glucose samples ≥ 7.0 mmol/l</td>
<td></td>
</tr>
<tr>
<td>Two random plasma glucose samples ≥ 11.1 mmol/l</td>
<td></td>
</tr>
<tr>
<td>Oral glucose tolerance test (OGTT)</td>
<td></td>
</tr>
<tr>
<td>Two hour plasma glucose concentration ≥ 11.1 mmol/l two hours after 75g anhydrous glucose</td>
<td></td>
</tr>
</tbody>
</table>

NB With no symptoms diagnosis should not be based on a single glucose determination but requires confirmatory plasma venous determination. If the fasting or random values are not diagnostic the two hour value should be used.

<table>
<thead>
<tr>
<th>2.5.2</th>
<th>Diagnosis of Diabetes Mellitus by HbA1c (WHO 2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following provides guidance for the use of HbA1c to diagnose diabetes.</td>
<td></td>
</tr>
<tr>
<td>HbA1c ≥ 6.5% (48 mmol/mol)</td>
<td></td>
</tr>
<tr>
<td>This level of HbA1c may be used to diagnose diabetes with the following provisos:</td>
<td></td>
</tr>
<tr>
<td>1. The test must be performed on an accredited analyser) not a point of care testing machine.</td>
<td></td>
</tr>
<tr>
<td>2. It must be confirmed on a repeat sample i.e. two tests ≥ 6.5% (48 mmol/mol) within 4 weeks unless a patient is symptomatic in which case a diagnosis can be made based on one result.</td>
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</tr>
<tr>
<td>3. If the second sample is &lt; 6.5% (48 mmol/mol), treat the patient as being at high risk of developing diabetes. The sample should be repeated after 6 months or before if the patient develops symptoms of diabetes.</td>
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</tr>
</tbody>
</table>

HbA1c ≥ 6% (42 mmol/mol) but < 6.5% (48 mmol/mol)

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This level suggests a high risk of diabetes in the future similar to those with a diagnosis of impaired glucose tolerance (IGT) or impaired fasting glucose (IFG).</td>
<td></td>
</tr>
<tr>
<td>2. If there is a high suspicion of diabetes (diabetes symptoms or multiple risk factors for developing diabetes) and HbA1c &lt; 6.5% an oral glucose tolerance test (OGTT) may be performed, although this should be considered exceptional.</td>
<td></td>
</tr>
</tbody>
</table>
**2.6 Classification and terms**

The terms Type 1 and Type 2 process should be used to describe the cause of insulin dependent and non-insulin dependent diabetes respectively. Both of these pathological processes will be clinically staged by the treatment that they need – from diet to insulin.

### 2.6.1 Type 1 Diabetes

This is due to lack of insulin production by beta cells in the pancreas; this may result from viral infection, auto-immune response and genetic factors. This leads to impairment of carbohydrate, protein and fat metabolism.

The incidence worldwide is estimated to be 218,000 people per year. The prevalence is estimated to be 5.3 million people.

The prognosis of increasing blood glucose levels in untreated type 1 diabetes can lead to ketoacidosis that may result in coma and death. People with type 1 diabetes may have fluctuating levels of insulin production, although insulin treatment is usually still required to prevent ketoacidosis.

Complications such as retinopathy, nephropathy diabetic foot disease and cardiovascular disease are issues that may arise long term in the presence of diabetes.

### 2.6.2 Type 2 Diabetes

This results from reduced insulin production and/or reduced tissue sensitivity to insulin. The incidence in the UK is estimated to be 1.7/1000 people per year. The prevalence in the UK is estimated to be 1/20 people over the age of 65 years and 1/5 over the age of 85 years.
The prognosis of increasing blood glucose levels if diabetes is left untreated may lead to ketoacidosis or non-ketotic hyperosmolar states that may lead to result in coma and death. It should be noted that non-ketotic hyperosmolar states occur more frequently than ketoacidosis.

Complications may arise from long-term presence of diabetes, such as retinopathy, nephropathy diabetic foot disease and cardiovascular disease.

### 2.6.3 Other Types of Diabetes

- **Maturity-onset diabetes of the young (MODY)** – Usually presents <25 years and is a sub-group of Type 2 diabetes. Specific monogenic defects of the β-cell have been identified as causing impaired insulin secretion. There is a strong diabetes hereditary link. Selective genetic testing can identify these patients and often prevent unnecessary trauma in mismanagement. Predictive testing can also be done on family members to identify those who may have inherited the mutated gene. Family counselling is available if the family wishes to have these done.


- **Endocrinopathies** – Thyrotoxicosis, acromegaly, Cushing’s syndrome, phaeochromocytoma, glucagonoma.

- **Drug-induced** – Glucocorticoid therapy (steroids)

- **Gestational**

### 2.6.4 Non diabetic hyperglycaemia

**Impaired Glucose Tolerance (IGT)** – A stage of impaired glucose regulation is associated with a 2-5% increased cardiovascular risk.

Fasting plasma glucose ≤ 7.0 mmol/l and OGTT two hour value ≥ 7.8mmol/l but ≤ 11.1 mmol/ l).

**Impaired Fasting Glycaemia (IFG)** – Individuals with fasting glucose values above the normal range but below those diagnostic of diabetes. Present in 5% of the population, increases with age and are at a greater risk of cardiovascular complications than the general population.

Fasting plasma glucose ≥ 6.1 mmol/l but ≤ 7.0 mmol/l

**NB** Diabetes UK recommends that all those with IFG should have an OGTT to exclude the diagnosis of diabetes, and are actively managed with lifestyle advice.

### 2.7 Complications at diagnosis

50% of newly presenting patients with Type 2 diabetes already have one or more complications at diagnosis, the management of which is very important and is discussed in section 9;

- Stroke 1%
- Circulation Problems 3%
- Kidney Problems 3%
- Foot Problems 13%
- Abnormal Cardiac Tracing 18%
- Eye Problems 21%
- High Blood Pressure 35%
Reference:

3 Empowering people with diabetes

The diabetes NSF standard 3 aims for people with diabetes to ‘receive a service which encourages partnership in decision making in managing their diabetes’. This will be reflected in an agreed and shared care plan.

Empowerment means dialogue between the healthcare professional (HCP) and the person with diabetes, which provides support, information and goal setting. HCP cannot empower their patients, as this is a process that takes place within an individual, but can create a climate whereby a patient is motivated to become (or chooses not to become) empowered. Although the HCP should be involved in the decision making process, it is the patient who lives with diabetes day to day and therefore makes the final decisions as to what they feel is best for them.

Funnel et al (2004) suggest a five-step goal setting process
- Steps 1 and 2 define the problem and discovers whether the patient has any beliefs thoughts or feelings, which may help or hinder their efforts
- Step 3 identifies long-term goals which the patient will work towards
- Step 4 enables the patient to choose and commit to behaviour which will achieve the set goals
- Step 5 enables the patient to evaluate what they have learned through this process

Wandsworth PCT is currently rolling out a programme using hand held records. These records provide information for people with diabetes on their condition and also their clinical parameters. These records facilitate goal setting with the HCP and can promote communication between HCPs. The person with diabetes ‘owns’ their hand held records. Maintaining the records is the responsibility of the person with diabetes and/or their carer, although they may require some support from their HCP.

3.1 Education

Education and information are the cornerstones for good self-management and each contact with a patient should be used as an opportunity to facilitate this. The diabetes NSF and NICE make it clear that structured education should be provided to all newly diagnosed people with type 2 diabetes and to those with type 1 diabetes.

Education in Primary Care

DESMOND is a structured education programme in WPCT for patients with newly diagnosed type 2 diabetes standing for Diabetes Education and Self Management for Ongoing and Newly Diagnosed. DESMOND is evidence based, undertaken in a group and provides 6 hours of education either as one session or divided into two sessions. DESMOND promotes self-management and empowerment by allowing people with diabetes to address the issues relevant to them. DESMOND ensures all people with diabetes receive the same high standard of structured education wherever they access the programme. Practices are provided with specific DESMOND referral forms and information leaflets, which are sent to the course coordinator at Suite 4 Queen Mary’s Hospital. Patients can access DESMOND education at 3 sites in Wandsworth PCT, Beta Cell Queen Mary’s Hospital, St John’s Health Centre and Tooting Health Centre.

For people with established type 2 diabetes, education using the Conversation Map® programme is available in group sessions run in practices by the CDSNs.

Education in the Diabetes Unit

The Dose-Adjustment for Normal Eating (DAFNE) and Bournemouth Type 1 Intensive Education (BERTIE) are programmes in operation in secondary care for people with Type 1 diabetes. DAFNE and BERTIE are ways of managing Type 1 diabetes and provide people with the skills necessary to estimate
the carbohydrate in each meal and to inject the right dose of insulin. Leaflets should always be given to patients to reinforce information.

DAFNE involves attending a 5-day training course plus a follow-up session around 8 weeks after the course and yearly half-day top-up sessions. The structured teaching programme is delivered to groups of 6-8 participants and covers topics including carbohydrate estimation, blood glucose monitoring, insulin regimens, hypos, illness and exercise.

The DAFNE course is about learning from experience. During the week the patient practices the skills of carbohydrate estimation and insulin adjustment under the supervision of DAFNE-trained nurses and dieticians. There are opportunities for each person to speak to a doctor, nurse or dietician individually. DAFNE allows people to fit diabetes into their lifestyle, rather than changing their lifestyle to fit in with their diabetes.

For patients to be considered for the DAFNE programme send a referral letter to the Thomas Addison Unit, St Georges Hospital or St Thomas’s Hospital Diabetes Unit.

BERTIE is a four day course covering the same topics based on a five day programme from Dusseldorf, Germany. The curriculum was adapted by the Bournemouth team to be delivered over a four week period, to provide participants with an opportunity to put new skills into practice as the programme progressed. People attending do need to have knowledge of carbohydrate counting. The programme uses a multi-disciplinary team and takes a proactive approach in enabling people to self manage their diabetes and maintain better control, which may in turn lead to fewer long term complications. BERTIE is run at Queen Mary’s Hospital.

DESMOND and DAFNE are evidence based national programmes and are peer reviewed, quality assured and audited nationally to develop a patient centred model of care. For people with diabetes who are not eligible for DESMOND, DAFNE or BERTIE please refer to your local diabetes unit for one to one education, or assessment for eligibility.

References
www.DAFNE.uk.com
www.DESMOND-project.org.uk

3.2 Blood glucose monitoring

Care of people with diabetes accounts for about 5% of total NHS and 10% of hospital in-patient resources. Studies have shown that improved diabetic control reduces many of the costly long-term complications of diabetes.

Self-monitoring of blood glucose (SMBG)

NICE guidelines for Type 2 diabetes states that ‘self monitoring of blood glucose should be offered to newly diagnosed people with Type 2 diabetes only as an integral part of self-management education’. Both Diabetes UK and the International Diabetes Federation support SMBG in all people with diabetes regardless of treatment. Healthcare professionals should work in partnership with individuals and provide information about SMBG to enable people with diabetes to self-manage and be cost effective. People with diabetes should receive education on SMBG so they know why they are testing, when to test and what to do with the results. They should be given lifestyle advice so they can make changes to improve their glycaemic control in relation to their SMBG results and therefore use resources effectively.
Recommended targets: 4-6 mmol/L fasting (pre-meal), 5-9 mmol/L post-prandially.

- In the elderly, a more flexible target may be negotiated to avoid hypoglycaemia.
- Targets for pregnancy: See Pregnancy Section.

3.2.1 Recommendations for testing times (DUK, IDF Guidelines and UK Consensus guidelines)

Optimal use of SMBG requires proper interpretation of the data. Patients should be taught how to use the data to adjust food intake, exercise, or treatment to achieve specific glycaemic goals, varying the time between fasting, pre-meal and 2 hour post-meal, to identify trends. The optimal frequency and timing of SMBG for patients with type 2 diabetes is not known, but is desirable in all patients not achieving goals (see algorithm on page 15 for suggestions).

NICE (2009) recommend SMBG should be available;
- To those on insulin treatment.
- To those on oral hypoglycaemic agents to provide information on hypoglycaemia
- To assess changes in glucose control resulting from medications and lifestyle changes.
- To monitor changes during intercurrent illness.
- To ensure safety during activities including driving.

Blood glucose profile varies day to day; therefore a staggered SMBG regimen (5-6 determinations of blood glucose in a single day) is more informative than sporadic fasting or random glucose. Several glucose tests over a period of a few weeks are better correlated to HbA1c. Urine testing for glucose is an unreliable method of monitoring blood glucose levels and is not recommended.

Accuracy of SMBG is instrument and user-dependent. NICE (2008) recommends annual review of:
- Self monitoring skills
- The quantity and appropriate frequency of testing
- The use of the results
- Impact on quality of life
- The continued benefit
- The equipment used

3.3 Haemoglobin A1c (HbA1c)

HbA1c provides an assessment of treatment efficacy and measures a patient’s average glycaemia over the preceding 2 - 3 months. Glycaemic control is best judged by the combination of the results of the patient’s SMBG testing and current HbA1c result.

From 1st June 2009 the HbA1c test will be changing from a percentage figure to a measurement in mmol/mol. To make the transition easier the new measurement will appear alongside the old measurement until 31st May 2011. The correlation between HbA1c level and mean plasma glucose levels is suggested below.

<table>
<thead>
<tr>
<th>New in mmol/mol</th>
<th>HbA1c in percentage</th>
<th>Suggested correlation to mean plasma glucose levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>6</td>
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<tr>
<td>75</td>
<td>9</td>
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</table>
Use of HbA1c testing

HbA1c should be routinely tested in all patients with diabetes, initially to document the degree of glycaemic control and then as a part of continuing care. It is recommended that HbA1c be performed 2-6 monthly. 6 monthly in people with stable therapy and stable glycaemic control.

Recommended targets: HbA1C < 6.5% or <48 mmol/mol - this is negotiable with the person as individual targets may need to be set.

There is some evidence that post-prandial glucose (PPG) levels are better correlated to HbA1c less than 8.4% (68 mmol/mol) so if a patient is achieving pre-prandial targets and still has a sub-optimal HbA1c then post-prandial testing may be beneficial to target changes in lifestyle or medication. There is increasing evidence that raised PPG contributes to cardiovascular risk. Therefore, if HbA1c levels remain above target levels, but pre-meal self-monitoring levels remain well controlled (<7.0 mmol/l), consider self-monitoring to detect postprandial hyperglycaemia (>8.5 mmol/l), and manage to below this level if detected (NICE, 2009).

3.4 Ketone testing

Ketone testing (urine or blood) is an important part of monitoring in type 1, diabetes in pregnancy with pre-existing diabetes, and in gestational diabetes. The presence of ketones may indicate impending or even established ketoacidosis.

Patients with type 1 diabetes should test for ketones during acute illness or stress or when blood sugars levels are consistently >13 mmol/L, during pregnancy, or when symptoms of ketoacidosis, such as nausea, vomiting, or abdominal pain are present. Ketones with hyperglycaemia indicate insulin deficiency. Prior to use check the expiry date of strips. It is important to replace the lid on the ketone test-strip container after use as once opened ketostix are only stable for 6 months and should not be used after that.

References


Driving and Diabetes. Diabetes UK May 2005


NICE 2008 Type 2 Diabetes National clinical guideline for management in primary and secondary care (update) www.nice.org

NICE 2009 Type 2 Diabetes The Management of type 2 diabetes, NICE clinical guidelines 87, www.nice.org

Suggestions For Self-Monitoring of Blood Glucose (BG) in Type 2 Diabetes

**Type 2 Diabetes**

- Diet alone
  - Self monitoring of blood glucose is non-essential.
  - HbA1c twice yearly minimum

- Diet and oral medication
  - Good control
    - BG not essential
    - Recommended if:
      - Any unexplained symptoms
      - Unwell
      - Hypoglycaemia symptoms
      - BG profile 1 week and contact GPPN for review
      - HbA1c twice yearly minimum

  - Poor Control
    - Measure BG 2-3 times per day (pre-meal and 2 hours post-prandial), 2-3 days per week.
    - Profile for 1-2 weeks
    - Contact GPPN for review
    - Titrate medication as required
    - HbA1c quarterly

- Diet, oral medication and insulin
  - Good control
    - Measure BG 2-4 times daily, pre-meal and 2 hours post-prandially 2-4 days a week
    - HbA1c twice yearly (minimum)

**Type 2 diabetes on basal bolus insulin therapy**
- Recommendations as type 1 diabetes

Good control defined as HbA1c >6.5 to 7.5% depending upon individual patient

Frequency and timing should be tailored to the individual patient's needs and targets.
Extra blood glucose monitoring required to cover:

- Change of dose/therapy
- Illness
- Pregnancy
- Meal variance
- Exercise
- Driving
- Traveling
- Alcohol
- Suspected hypo- or hypergly

Education on how and why to test and what to do with results is fundamental to HDMG

NHS LONDON & PRIMARY CARE
*Consents recommendation of self monitoring of BG, Appendix 2.
3.5 Dietary management of diabetes

- Eat regular meals that contain some starchy foods. Having regular meals is recommended to help control blood glucose levels and will help prevent over eating. Small, between meal snacks may be indicated for those on certain types of medication (sulphonylureas and some insulin). Starchy (carbohydrate) foods such as bread, pasta, rice, potatoes, chapattis or breakfast cereals should be included at each meal. Wholegrain starchy foods may help to control blood glucose levels. These have a lower Glycaemic Index (GI) which helps you to feel full longer, reduce rapid rises and falls in blood glucose and so should be chosen more often. Examples of low GI foods include wholegrain bread, porridge oats, pulses, most fruit and low fat yogurt.

- Try to eat at least five portions of fruit and vegetables each day. Eating more fruits and vegetables lowers the risk of heart disease, strokes and some cancers. All types of fruits and vegetables can be eaten, however, fruit should be spread out throughout the day. Fruit also makes an ideal snack. Examples of a portion of fruit are below:
  
  One piece of ordinary sized fruit e.g. apple, orange, banana
  
  Two small fruits e.g. plums or Satsuma’s
  
  A handful of grapes or a slice of large fruit e.g. melon
  
  ½ -1 tablespoon of dried fruit e.g. sultanas
  
  A small glass of pure fruit juice

- Include oily fish. It is recommended that people with type 2 diabetes eat 2 portions of oily fish each week. The omega 3 fats found in oily fish may have several health benefits but in particular for heart health. Examples of oily fish include mackerel, sardines, salmon, trout and herring.

- Modify fat intake. Saturated fats, such as those found in fatty meat, butter, ghee and other full fat dairy foods are linked to heart disease and so should be reduced. Monounsaturated fats are more likely to have a beneficial effect on triglycerides and HDL cholesterol; these fats are found in rapeseed oil, olive oil, pure vegetable oil and spreads made from these. As fat is the greatest source of calories from food, eating less fat and fatty foods will help with weight reduction.

- Eat less sugar and sugary foods. People with diabetes do not need to follow a sugar free diet, nor would it be possible to although a reduction in sugary foods such as sweets, chocolate, cakes and biscuits should be encouraged as these foods are also high in saturated fat. Drinks should be ‘sugar free’ or ‘no added sugar’ as far as possible. Special ‘diabetic’ foods are not recommended, as they offer no special benefits.

- Reduce salt intake. Particularly if suffering from hypertension. This includes salt added to cooking and at the table. Many seasonings are high in salt as are many canned, dried packets and ready meals. Encourage more herbs, spices and pepper.

- Drink alcohol in moderation only. The recommendations are the same as for the general population. That’s no more than 14 units (2-3 units a day) per week for women and 21 units (3-4 units a day) for men. Encourage 2 alcohol free days per week. One unit equals ½ pint of beer (3.5% ABV), 1 ‘pub’ measure of spirits and 125ml glass of 9% alcohol wine. Many drinks now have a higher percentage of alcohol than these, which should be taken into account. To reduce the risk of hypoglycaemia, alcohol should not be taken on an empty stomach, especially if on hypoglycaemic medication as food slows the rate of alcohol absorption. Moderate alcohol (2-3 units) before, during or soon after meals should not affect short term glycaemic control. Serious hypoglycaemia can occur with large quantities of alcohol, particularly in insulin treated patients. Delayed hypoglycaemia may occur up to 16 hours after drinking.

For further information see the 1st line diet sheet available for Western, South Asian and African Caribbean diets available from the dietician.
3.5.1 Carbohydrate counting

Patients who are on Basal Bolus Insulin regimens are suitable for carbohydrate counting to allow the individual to adjust their insulin according to what they choose to eat. The emphasis is on dietary freedom and empowerment for the patient. Both group and individual sessions are being run at the Thomas Addison Unit and at Queen Mary’s Hospital.

Patients on the DAFNE/BERTIE waiting list can be referred for Carbohydrate Counting pre DAFNE/BERTIE.

3.5.2 Diet for Insulin Pump therapy

All patients who are to go onto a PUMP must complete the DAFNE course or Carbohydrate Counting first, to allow accurate counting of carbohydrate and to allow accurate adjustment of insulin. PUMP therapy will be considered on an individual basis.

3.5.3 Diet and Insulin therapy

**OD/ BD Long Acting Insulin**

Patients on OD/ BD long acting insulin should ensure:

- Regular meals at regular times as part of a general diet to help to balance blood glucose levels
- Regular intake of Carbohydrate and similar portion sizes
- May need a pre-bed snack

**Biphasic BD Insulin**

All patients on biphasic BD insulin should ensure the following:

- Regular meals at regular times
- Regular intake of Carbohydrate/ similar portion sizes
- Lighter Lunch- smaller portion of Carbohydrate
- May need a snack at bed time/ between meals

**Basal Bolus**

Basal bolus allows flexibility with dosage adjustments to take into account variability in dietary intake, meal times and other lifestyle factors. People on basal bolus can also benefit from carbohydrate counting if motivated to learn how to adjust insulin dosage to carbohydrate content of meals

People on a Basal Bolus:

- Do not usually require snacks in between meals/ fixed meal times and fixed carbohydrate portions.
- Can choose to eat what they want when they want and have much more flexibility with food and drink.

Exercise and alcohol guidelines can also be discussed to allow adjustments in insulin and dietary intake to optimise blood glucose control, patients to be referred to a specialist Diabetes Dietitian for such advice.

Specific foods and appropriate quantities can be agreed in discussion with the dietician.

3.5.4 Anti-obesity drugs

- Orlistat is a lipase inhibitor that reduces the absorption of dietary fat.
- It may be used as an adjunct to other lifestyle measures to manage obesity in patients with diabetes and a BMI of 28 kg/m2 or greater.
• The dose in adults over 18 years is 120mg taken immediately before, during or up to one hour after each main meal. The dose should be omitted if a meal contains no fat.
• Treatment should only be continued after 12 weeks if a weight loss of greater than 5% is achieved.
• Patients should be reviewed every 6 months to ensure weight loss is maintained.
• Treatment should only be continued beyond 12 months after discussing potential benefits and risks with patient.
• Common side effects are gastrointestinal in nature such as flatulence, oily stools, abdominal pain.
• Orlistat may impair absorption of fat-soluble vitamins therefore any supplements containing these should be taken at least 2 hours after orlistat dose.

3.6 Physical activity recommendations for people with diabetes

• Recommended levels of physical activity are the same as for the general population (see section 1).
• Individuals with existing complications of diabetes should seek medical review before embarking on exercise programmes.
• Education on methods to prevent exercise induced hypoglycaemia should be provided, as well as information on hyperglycaemia and foot care (see clinical care section).
• When initiating physical activity, the amount and intensity of activity should be increased gradually on an individual basis.

3.7 Stop smoking

Giving up smoking is the most positive thing a person with diabetes can do for general. Smoking roughly doubles the risk of heart disease and increases the risk of stroke.

There are effective treatments available to help people quitting the addiction. Some of the services include:

• Nicotine replacement therapy
• Prescribing of Varenicline
• Advice and consultation

Most GP surgeries provide smoking cessation consultations which patients can book into directly or alternatively the PCT run a Wandsworth wide stop smoking service.

This service is FREE of charge. To register or simply find out more about giving up smoking, call Wandsworth Stop Smoking Service on 0800 389 7921 or email stopsmokingclinic@stgeorges.nhs.uk.

<table>
<thead>
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<th>Area</th>
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<tr>
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<tr>
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<td>Queen Mary’s Hospital</td>
</tr>
<tr>
<td>Battersea</td>
<td>John Morris House Community Centre</td>
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<tr>
<td>Battersea</td>
<td>Doddington Health Centre</td>
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4 CLINICAL CARE

Structured care is essential to provide good diabetes care. It requires each practice to:

- Have their own diabetes protocol, which will identify a care-pathway for people with diabetes.
- Maintain an up-to-date diabetes register.
- Have an active recall system for the review and follow up of these patients.

The majority of people with diabetes can be managed well in Primary Care. Research shows that most patients prefer to have their care in a Primary Care setting (National Service Frameworks). Professionals must ensure that they have the necessary knowledge and skills to provide such care. Each practice is ultimately responsible for the care of every patient on its register. Care can be either ‘shared care’ with the hospital diabetes team or solely GP care.

4.1 Management of Newly Diagnosed Type 1 Diabetes – Secondary Care

Confirmation of diagnosis of Type 1 diabetes must be done by the GP or practice nurse. Urgent referrals to the Specialist Diabetes Unit, to be seen the same day or within 24 hours, especially if urine ketones are present, must be discussed with a specialist nurse or doctor by telephone. An appointment will be given for the patient to come to the unit. Patients may bring a friend, partner or relative for support.

Provide as much clinical information as possible e.g. ketonuria/weight loss, history of any other symptoms and results of any recent blood test (especially important if the practice uses another hospital for laboratory tests) or use the referral proforma (See Appendix) Please include the patient’s telephone contact/mobile phone on the referral form and indicate if an interpreter is required. For all urgent referrals out of hours contact the on-call Medical Registrar via the Accident and Emergency Department.

4.2 Previously Diagnosed Type 1 Diabetes – Secondary Care

All people with type 1 patients are referred to the specialist team for their care (NICE 2004).

*In the presence of ketone or poor control, refer as URGENT.*

Follow up

The specialist nurse will start patients with Type 1 diabetes on insulin and will follow them up until their diabetes is stabilised and the patient confident in managing their diabetes. A follow up appointment will be made for the doctor’s New Patient review clinic and/or retinal photography within the year. The patient is given contact details for the specialist nurses should any problems arise. All prescription renewals should be provided by the GP.

Annual Review

An annual review in the diabetes unit will be arranged following the doctor’s appointment, and the need for a specialist review. The Community Specialist Diabetes Specialist Nurse (CDSN) is also available to supervise the management of patients in primary care (See attachment on referral criteria).

4.3 Management of Newly Diagnosed Type 2 Diabetes

Most patients with type 2 diabetes are initially managed in primary care, however we recommend that the following patients be referred and/or discussed with the diabetes specialist team:

Within 24 Hours

- Very symptomatic with weight loss/ketonuria
- Severe hyperglycaemia
• Foot lesions that require specialist podiatric care

Within 1 - 2 weeks
• Gestational diabetes and all women with known diabetes considering pregnancy.

Following annual review or with new complications
• Some of the complications of diabetes are often best managed in secondary care or with the assistance of the CDSNs. The guide on secondary care and CDSN referrals in the attachments will help with deciding in these cases but this will also depend on the experience of the primary care team and the patient’s circumstances.

• Referrals made to the Unit are reviewed by the Consultants and prioritised according to urgency. Any patients needing to be seen urgently or soon are referred to the specialist nurses. If unsure of management plan, please refer for advice.

Help from the CDSN team
• The CDSNs work closely with practices and see patients in the surgery, at home and will also hold clinics in the proposed polyclinics. Contact details and referral details are given in the attachments.

The aims of the Wandsworth Community Diabetes Specialist Nurse team are to:
  o Provide integrated care between primary and secondary care
  o Work towards the standards set by the Diabetes NSF
  o Support, educate and help manage patients with diabetes in Wandsworth
  o Support and develop the skills of GPs, Practice Nurses, and District Nurse teams in Wandsworth, in the management of patients with diabetes by providing:-
    o Interventions for individuals to optimise glycaemic control
    o Transfer to insulin for people with type 2 diabetes

They provide
  o Joint clinics with GPs and Practice Nurses
  o Joint visits with District Nurses
  o Joint clinics/regular liaison with secondary care diabetes teams
  o Telephone advice for healthcare professionals and patients
  o Insulin Start Groups for patients with T2DM
  o Education for newly diagnosed patients with T2DM – (DESMOND)
  o Education for patients with existing T2DM – (Conversation Map Education)
  o Education for healthcare professionals: –
    o Wandsworth Insulin Management Programme
    o Blood Glucose Monitoring training for Community teams
  o Diabetes study days for Community teams, Nursing/Residential homes/Wandsworth Prison

Discharge of type 2 patients referred to secondary care
Once the presenting problem has been addressed the patient will usually be referred back to primary care, often the CDSNs will supervise the management of such patients.

Annual Review
This will be arranged if the patient is to be followed up by the hospital. If the patient is transferred back to Primary Care for follow up, a management plan will be discussed with the patient and a copy sent to the GP.

Education and further support in secondary care
As well as giving the patient relevant information on their diabetic care a referral will be made to DESMOND (see Section 3.1). Dietetic, community podiatry and retinal screening referrals will also be initiated.
4.4 Drug Management

- All people with type 1 diabetes are managed with insulin.
- When diet and lifestyle measures have failed to control type 2 diabetes drug therapy will be required.
- Note: with respect to newer diabetic agents ("glitazones", "gliptins", "GLP-1 mimetics") long-term benefit has not be demonstrated in terms of morbidity and mortality.
- Pregnancy is considered in Section 8.
- Consult BNF (www.bnf.org) and product information (www.emc.medicines.org.uk) for full information on dosing, cautions, adverse effects, interactions.

4.4.1 Algorithm of Drug Management of Type 2 Diabetes

HbA1c > 6.5% after trial of lifestyle interventions. Ketone negative.

Metformin

HbA1c > 6.5%

HbA1c < 6.5% monitor for deterioration

Metformin + Sulfonylurea

HbA1c > 7.5%

HbA1c < 7.5% monitor for deterioration

Add pioglitazone or insulin

HbA1c > 7.5%

HbA1c < 7.5% monitor for deterioration

Insulin + metformin + sulphonylurea

Ketone positive requires urgent referral for insulin therapy

Consider sulfonylurea here if:
- Not overweight (tailor the assessment of body-weight-associated risk according to ethnic group)
- Metformin is not tolerated or is contraindicated
- A rapid therapeutic response is required because of hyperglycemic symptoms

Consider a rapid-acting insulin secretagogue for people with erratic lifestyles
- Offer a once-daily sulfonylurea if concordance is a problem
- Consider substituting pioglitazone for the sulfonylurea here only if hypoglycaemia on sulfonylurea is potential problem
- Consider substituting pioglitazone for the metformin if metformin is not tolerated
- GLP-1 mimetic or Gliptin may be considered if patient is unsuitable for pioglitazone and fulfils criteria
- See text below on each drug class for full details on place in therapy and criteria

- If human insulin likely to be unacceptable or ineffective (because of employment, social, recreational or other personal issues, or obesity/metabolic syndrome)
  ⇒ Consider pioglitazone
  ⇒ Consider GLP-1 mimetic if patient is overweight and fulfils criteria
  ⇒ Consider a gliptin if a patient is unsuitable for pioglitazone or is already on a thiazolidinedione
4.4.2 Metformin
Metformin is the only biguanide. It works by decreasing gluconeogenesis and increasing peripheral utilisation of glucose. Some residual functioning pancreatic islet cells are required to be effective.
- Metformin is a first line oral hypoglycaemic drug and is the drug of choice in overweight patients.
- When metformin fails to achieve adequate control it can be used in combination with other oral hypoglycaemic drugs and insulin.
- Gastrointestinal side effects such as nausea, abdominal pain are common, especially initially and titrating dose slowly may minimise this (start patients on 500mg with breakfast for at least one week, then increase to 500mg with breakfast and evening meal for at least one week, then 500mg with breakfast, lunch and evening meal). Hypoglycaemia is rare.
- Lactic acidosis is rare but patients with renal impairment are at increased risk. NICE recommends that the dose be reviewed if estimated glomerular filtration rate (eGFR) is less than 45mL/min and to avoid if eGFR is less than 30mL/min.
- Metformin is also contraindicated in cardiac failure (NYHA classification III or IV) and liver failure.
- Metformin is available as 500mg and 850mg tablets, as well as a modified release 500mg tablet taken once a day in the evening. The modified-release preparation should be reserved for patients where compliance is a problem and gastrointestinal side effects are intolerable.
- Metformin is licensed for up to 3 grams per day but in practice the maximum is usually 2 grams per day in divided doses due to tolerance.

4.4.3 Sulphonylureas
Sulphonylureas act mainly by augmenting insulin secretion and are consequently effective when residual pancreatic beta-cell activity is present.
- Can be considered first line therapy as monotherapy in patients that are not overweight or if metformin is contraindicated or not tolerated.
- It can also be used in combination with other oral hypoglycaemic drugs and insulin to achieve glucose control.
- Sulphonylureas may cause weight gain and hypoglycaemia.
- Available sulphonylureas; gliclazide, tolbutamine, glibenclamide and glipizide.
- Gliclazide is the sulphonylurea of choice.
- Glibenclamide and glipizide are long-acting and associated with a greater risk of hypoglycaemia (both non-formulary at St George’s Hospital).
- Gliclazide is available as a modified-release formulation taken once-a-day. This should be reserved for patients where compliance is a problem and who have some renal or hepatic impairment.

4.4.4 Rapid Acting Secretagogues
Rapid acting insulin secretagogues are not routinely used. These drugs need to be taken three times a day and are expensive. However they may be helpful in highly motivated patients who wish to tailor their therapy closely to meal times. In these few occasions, repaglinide is the rapid acting secretagogue used within St George’s Hospital.

4.4.5 Thiazolidinediones (Glitazones)
Thiazolidinediones reduce peripheral insulin resistance resulting in reduced blood-glucose concentration.
- There are currently only one glitazone licensed in the UK; pioglitazone (formulary St George’s Hospital).
• Rosiglitazone had license suspended due to increased cardiovascular risk (September 2010).
• NICE recommends a glitazone can be used as second line therapy together with either metformin or a sulphonylurea if one of these two drugs is not tolerated or contra-indicated, or as third line therapy together with metformin and a sulphonylurea if insulin therapy is not acceptable.
• Treatment should only be continued if HbA1c is reduced by at least 0.5% within 6 months of initiation.
• Liver dysfunction reported rarely. Monitor liver function before treatment then every 2 months for the first 12 months and annually thereafter.
• Thiazolidinediones can cause fluid retention therefore oedema and weight gain should be acted upon accordingly.
• Pioglitazone and rosiglitazone are contra-indicated in patients with cardiac failure or a history of cardiac failure (NYHA class I to IV), hepatic impairment and those at increased risk of fracture.
• Rosiglitazone is associated with increased cardiovascular risk compared with both placebo and with pioglitazone. Rosiglitazone is also contra-indicated in patients with acute coronary syndrome (unstable angina, NSTEMI and STEMI).

4.4.6 Acarbose
Acarbose may have a role in type 2 diabetes inadequately controlled by diet alone. The high incidence of gastro-intestinal side effects such as flatulence, diarrhoea and abdominal pain limit its use and it is usually reserved where other oral hypoglycaemics are contra-indicated or not tolerated.

4.4.7 Dipeptidylpeptidase-4 (DPP-4) Inhibitors (Gliptins)
Incretin hormones, such as glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP), are involved in regulation of glucose homeostasis in response to a meal. DPP-4 inhibitors are compounds that prevent the degradation of endogenous GLP-1 by inhibiting the activity of the DPP-4 enzyme hence preserving the glucoregulatory actions of GLP-1 for a longer time.
• There are currently three gliptins licensed in the UK; sitagliptin (formulary at St George’s Hospital), vildagliptin (non-formulary St George’s Hospital) and saxagliptin (non-formulary St George’s Hospital and not assessed by NICE therefore advice given below does not pertain to it).
• NICE recommends a gliptin can be used as second line therapy together with either metformin or a sulphonylurea if one of these two drugs is not tolerated or contra-indicated, or sitagliptin as third line therapy together with metformin and a sulphonylurea if insulin therapy is not acceptable. That is, it may be considered in place of a glitazone if they are contra-indicated or not tolerated.
• Treatment should only be continued if HbA1c is reduced by at least 0.5% within 6 months of initiation.
• Gliptins are considered weight neutral.
• Nausea is commonly reported but this is usually transient. Headache is also common. Upper respiratory tract infection, stuffy or runny nose and sore throat are side effects reported commonly for sitagliptin and rarely for vildagliptin.
• Gliptins are contra-indicated in patients with an eGFR less than 50 mL/min.
• Liver dysfunction reported rarely with vildagliptin. Monitor liver function before treatment then every 3 months for the first 12 months and annually thereafter.
• Vildagliptin should not be used in patients with cardiac failure or a history of cardiac failure (NYHA class I to IV).

4.4.8 Glucagon-like peptide-1 (GLP-1) mimetics (or receptor agonists)
GLP-1 mimetics (or receptor agonists) stimulate glucose dependent insulin secretion and suppress glucagon secretion in response to food. They also delay gastric emptying.
• They are given by subcutaneous injection.
• There are currently two GLP-1 mimetics licensed in the UK; exenatide and liraglutide (both formulary at St George’s Hospital).
Exenatide should be considered as third line therapy for type 2 diabetes when control of blood glucose remains or becomes inadequate (HbA1c ≥ 7.5% or 59 mmol/mol) after full titration of metformin and a sulphonylurea and only in patients with a BMI over 35 kg/m² where glitazones are unacceptable or for those with a BMI less than 35 kg/m² if glitazones and insulin therapy are not acceptable.

Exenatide can be used in a dual therapy regimen with metformin, a sulphonylurea or pioglitazone, or a triple therapy regimen with metformin and either a sulphonylurea or pioglitazone. It should not be used with insulin. If used with a sulphonylurea the dose of the sulphonylurea may need to be reduced due to an increased risk of hypoglycaemia.

It is recommended that it is initiated in secondary care by diabetologists and transferred to primary care after 3 months if well tolerated and if patient is stable.

Initiation in primary care by GPs experienced in the management of diabetes is approved in-line with a protocol, which is included in the attachments.

Treatment should only be continued if HbA1c is reduced by at least 1% and a weight loss of at least 3% of initial body weight is achieved within 6 months of initiation and this continues to be maintained (monitor at a minimum of 6 monthly intervals).

Nausea is common as are other gastrointestinal side effects although this is usually seen to improve by about 8 weeks. Headache is also common.

Pancreatitis has been reported rarely. Patients with unexplained persistent abdominal pain, nausea, vomiting should seek prompt medical care and exenatide discontinued.

Exenatide should not be used in patients with an eGFR less than 30 mL/min, severe gastrointestinal disease e.g. gastroparesis, type 1 diabetes or type 2 diabetes with beta cell failure.

Liraglutide has only been approved for initiation only by the secondary care trust in patients who unable to tolerate exenatide due to side effects or refusal of twice daily injections. Prescribing may be transferred to primary care after 3 months if well tolerated and if patient is stable.

NICE guidance on liraglutide will be forthcoming shortly.

Additional information for liraglutide; should not be used in patients with hepatic impairment and heart failure (NYHA class III and IV).

Liraglutide is administered once a day by subcutaneous injection compared to twice a day for exenatide.

4.5 Management of Insulin Therapy

Insulin is the therapy of choice in patients who have absolute or relative deficiencies in insulin secretion.

People with Type 1 diabetes need insulin urgently. Most type 2 patients are initially managed on other agents but most will require insulin within 5-10 years when other methods have failed to achieve good control.

Aims of treatment
• To maintain normoglycaemia in as far as is possible.
• Maintain the safety of the patient by reducing the risk of hypoglycaemia.
• Alleviate / reduce the symptoms of hyperglycaemia.
• Maintain ideal body weight.

4.5.1 Clinical Indications for Insulin

a) Newly diagnosed Type 1 diabetes – These patients need insulin urgently and should be referred to the Diabetes Specialist team.
b) **Type 2 diabetes** –

- Pregnancy or planning pregnancy
- Persistent hyperglycaemia on optimal OHAs and diet management with HbA1c > 7.5% or 58 mmol/mol (In elderly patients a target of <7.5% may be inappropriate but an assessment must be made on the individual patient).
- Oral hypoglycaemic treatments not tolerated / contraindicated.
- Persistent weight loss and deteriorating BG control.
- Weight loss without dieting in someone of low or normal weight.
- Ketonuria with or without the above.
- Intercurrent illness / infection / poor healing / pre- and post- surgery.
- Post Myocardial Infarction depending on BG levels.
- Foot ulceration and infection if control is poor, to optimise control in order to aid healing (may come off insulin after healing is complete).
- Painful neuropathy if control is poor.
- Presence of and deterioration of complications with HbA1c > 7% - 7.5% (53-58 mmol/mol)

**4.5.2 Starting Insulin in Primary Care**

The professional’s role is to explain the reasons for this choice to the patient providing all the pros and cons. The final choice is made by the patient.

To undertake this role of starting insulin in primary care you need to understand:

- How insulin works
- Why insulin is needed
- The principles of normal insulin production
- Types of insulin available
- The benefits and disadvantages of the various delivery devices
- Common insulin regimens

To refer patients with Type 2 diabetes for insulin initiation, please see attached referral criteria and referral pathway, and refer to Community DSN.

**Managing insulin in Primary Care**

The 2 day Wandsworth Insulin Management Programme is available for GPs and Practice Nurses to develop skills and confidence with insulin, and help support patients in their self-management of insulin therapy. Please contact the CDSN team to find out more about the Wandsworth Insulin Management Programme.

**4.5.3 Three major forms of insulin**

1. **Short Acting insulin**

   This is injected with food and is meant to cover the rise in blood sugar that occurs with eating.

   There are 2 categories of Short Acting insulin;

   **Soluble Insulin** (either animal or human, also known as neutral) – this is injected 15-30 minutes before meals. The onset of action is 30-60 minutes with the peak action between 2-4 hours and the duration of action up to 8 hours.
Soluble insulins available are:
- Human (Actrapid, Humulin S, Insuman Rapid)
- Bovine (Hypurin Bovine Neutral)
- Porcine (Hypurin Porcine Neutral)

Rapid Acting analogues – these have a faster onset (working within 15 minutes and peaking at 30-60 minutes) and a shorter duration of action (2-5 hours) than soluble insulin.

These insulins are injected just before a meal. They can be helpful in reducing postprandial blood glucose. They are reported to have a reduced risk of hypoglycaemia.

Rapid Acting analogues are:
- Insulin Lispro (Humalog)
- Insulin Aspart (NovoRapid)
- Insulin Glulisine (Apidra)

2. Intermediate and Long Acting insulin

Intermediate insulin - This insulin is given once or twice a day as basal (background) insulin. The onset of action is 1-2 hours, the peak action is 5-8 hours and the duration of action is 12-18 hours. The insulin is cloudy and therefore needs to be mixed before injection.

Intermediate Insulins are:
- Isophane Insulin
  - Human (Insulatard, Humulin I, Insuman Basal)
  - Animal (Hypurin Bovine Isophane, Hypurin Porcine Isophane)

Long Acting Analogues – These have a longer duration of action of up to 35 hours with a fairly flat profile. They are reported to have a better record of reducing the risk of hypoglycaemia. They are usually administered once daily but can be used twice daily.

Long Acting analogues are:
- Insulin Glargine (Lantus) – should be given within an hour of the same time each day. It is usually only given once daily. Duration of action 24hours.
- Insulin Detemir (Levemir) – can be given once or twice daily. Duration of action 18-24hours.
- Insulin Zinc Suspension (Hypurin Bovine Lente)
- Protamine Zinc Insulin (Hypurin Bovine Protamine Zinc)

3. Biphasic (mixed) insulins

Biphasic insulins are combinations of short acting and intermediate or long acting insulin available to improve management, usually in a 30/70 mix (30% short acting and 70% longer acting insulin). The short acting component covers the rise in the blood glucose following the ingestion of food and the longer acting component will control the blood glucose between meals and at night.

They are usually given twice a day but can be given three times a day. Time of administration is determined by the short-acting insulin in the biphasic combination; 15-30 minutes before a meal for soluble insulin and 5-15 minutes before a meal for rapid acting analogues (aspart or lispro).

Biphasic insulins can sometimes be responsible for hypoglycaemia at night or between meals hence patients on this regimen are often asked to snack in between meals and at bedtime to prevent this occurring.

Biphasic Insulins available are:
• Biphasic Isophane Insulin: combination of soluble insulin (short acting) and isophane insulin (intermediate). Injected 15-30 minutes before a meal.
  o 30% soluble and 70% isophane (human – *Mixtard 30*, Humulin M3, animal – Hypurin Porcine 30/70 Mix)

(NovoNordisk has announced the withdrawal of insulin Mixtard 30 and stock will cease to be available after 31 December 2010. Patients prescribed Mixtard 30 will be need to be reviewed and switched to an alternative. To help manage transfer there is a helpline (0845 600 5055) and Diabetes UK issued a list of alternative insulins on their Website. Local information will be available from the CDSNs and TA unit)
  o Other % combinations of soluble and isophane are 15 and 85, 25 and 25, and 50 and 50, although these are not commonly used (Isuman Comb 15, 25 and 50)
• Biphasic Insulin Aspart
  o 30% insulin aspart and 70% insulin aspart protamine (NovoMix 30)
• Biphasic Insulin Lispro
  o 25% insulin lispro and 75% insulin lispro protamine (Humalog Mix25)
  o 50% insulin lispro and 50% insulin lispro protamine (Humalog Mix50)

4.5.4 Insulin regimens for Type 1 Diabetes

• On diagnosis, depending on the patient’s ability to cope with injections the patient will be offered the choice of biphasic insulin twice a day or the basal-bolus regimen.

**Basal-bolus Regimen**

• The basal-bolus regimen consists of short acting insulin with meals (bolus) and once or twice daily background insulin (basal).
• Approximately 50% of insulin is the basal and 50% is bolus divided up between the meals, adjusted to amount of carbohydrate eaten.
• An intermediate insulin (isophane) or insulin detemir (Levemir) is usually used as the twice a day basal.
• Insulin glargine (Lantus) is usually used as the once a day basal. It is given at the same time each day, either in the morning or at night depending on patient choice.
• Basal bolus offers more flexibility for the patient as compared with the biphasic insulin twice a day regimen although it does not necessarily give better control.
• The basal-bolus regimen should ideally be used in conjunction with carbohydrate counting (referral to Specialist Dietician) and the patient put on the DAFNE waiting list or similar structured education course e.g. BERTIE (See Section 3.1 Education).
• This empowers the patient to make maximum use of this regimen by learning to adjust insulin according to the carbohydrate portion of the meal and the BG result and adapt to the individual’s lifestyle e.g. alcohol intake / exercise / weight management / times of meal / food type.
• Patients are also taught to do corrective doses, to look for patterns before increasing doses, to adjust ratio of insulin to carbohydrate portions, to treat hypoglycaemia correctly and manage BG levels during illness.

**Biphasic insulin twice a day Regimen**

• Biphasic insulins available are outlined above.
• Approximately two-thirds of dose is given in morning and one-third in the evening.
• This regimen has requires fewer injections than the basal-bolus and may be more convenient for patients with a stable lifestyle.
4.5.5 Insulin Regimens for Type 2 Diabetes

Starting insulin in Type 2 patients is dependent on various factors, prior to commencing the following should be considered:

- Is there a clear need for insulin?
- Check compliance with diet and medication.
- Have the pros and cons of insulin therapy been discussed with the patient?
- Have they agreed to start insulin? Discuss any fears e.g. hypoglycaemia / fear of injections.
- If patient is asymptomatic they may not feel the need for insulin and prefer to live with the complications ('live for today', 'God’s will' etc.)
- Do they live on their own? Who will inject? Is the patient able to self-inject? Check manual dexterity and visual ability.
- Agree insulin regimen and device to be used.
- Discuss potential weight gain. Weight gain in Type 2 diabetic patients on insulin is an undesirable but often inevitable effect. On average, this can be > 4kgs within 6 months. Weight management control is important. Refer to dietitian to review diet and offer support/advice to minimise weight gain.
- Lifestyle: discuss exercise / alcohol intake.
- Occupation: does the patient hold a vocational driving licence? People using insulin cannot hold a LGV or PCV licence. If applying for a C1 licence to drive vehicles between 3.5 and 7.5 tonnes they will need to undergo a medical assessment.
- Check commitment to self-management and discuss support needed for successful implementation of chosen regimen.

There must always be a clear rationale for choosing a particular regimen for the individual.

Regimens:

- Continue on oral hyperglycaemic agents (OHAs) (metformin and /or sulphonylurea) and add in basal insulin.
  - First line: Human NPH (Neutral Protamine Hagedorn) / Isophane Insulin at bedtime or twice-daily (available brands are Insulatard, Humulin I and Insuman Basal).
  - Alternative: Long-acting insulin analogue (insulin detemir, insulin glargine) should only be used if,
    - The person needs assistance from a carer or healthcare professional to inject insulin, and use of a long-acting insulin analogue would reduce the frequency of injections from twice to once daily, or
    - The person’s lifestyle is restricted by recurrent symptomatic hypoglycaemic episodes, or
    - The person would otherwise need twice-daily NPH insulin injections in combination with oral glucose-lowering drugs, or
    - The person cannot use the device to inject NPH insulin

- Depending on control patients may need to start or progress onto biphasic insulin or a basal bolus regimen. Metformin is usually continued and sulphonylureas stopped. Metformin may be stopped if there is renal function impairment (see information on metformin). Pioglitazone is licensed with insulin but this decision must be made by a Diabetologist.

**Basal + OHAs may be a good option for people:**

- Who are overweight and insulin resistant.
- Who are reluctant to start insulin.
- Who are unable to self-inject (District Nurse intervention needed).
• Who just need a little basal insulin to improve control significantly.
• For whom optimising control is not vital but hypoglycaemia is unacceptable.

Twice daily pre-mixed insulin would be suitable for people:
• With fairly regular lifestyles, who eat similar amounts at the same time each day.
• Who are becoming insulin deficient, with high BGs as OHAs not effective anymore.

Basal-Bolus (multiple injections)
• May be a treatment choice for people needing insulin with a flexible regimen, e.g. erratic lifestyle, shift work, regular traveller across time zones, regular exercise.
• People who need to optimise control due to complications, illness or wound healing.
• Those where all previous regimens have failed to improve control.

(Ref. Royal College of Nursing ‘Starting Insulin Treatment in Type 2 Diabetes 2004).

4.5.6 Insulin Dosage
The dose is usually calculated according to body weight, most commonly 0.3 to 0.5 units of insulin per Kg of body weight. The term ‘units’ should be used in all contexts and abbreviations, such as ‘U’ or ‘IU’ must not be used.

• Bisphasic Insulin – usually two thirds of the calculated dose is administered in the morning and one third in the evening, e.g. for a patient weighing 60kgs the calculated initial starting dose will be a total daily dose of 20 units with 12 units with breakfast and 8 units with the evening meal.

• Basal Bolus – usually 50% of the calculated dose is the basal and 50% is the bolus divided up between the meals, e.g. for a patient weighing 60kgs you would usually start on 20 units a day with 10 units given as the basal and the remaining 10 units is for the bolus doses with the meals (e.g. 4 units with breakfast, 2 units at lunch and 4 units with the evening meal).

• Once daily insulin with maximum OHAs – usually the patient is started on 6 to 10 units of insulin at bedtime depending on their Fasting BG level.

(Please contact your local Community Diabetes Nurse team for the PCT guidelines on titration).

4.5.7 Insulin administration
Insulin is inactivated by gastro-intestinal enzymes therefore administration is by subcutaneous injection into upper arms, thighs, buttocks or abdomen. Rotation of injection sites is recommended as fat hypertrophy does occur rarely.

All regular and single insulin (bolus) doses must be measured and administered using an insulin syringe or commercial insulin pen device. Intravenous syringes must never be used for insulin administration.

Insulin delivery devices:
• Various are available depending on the type of insulin prescribed, such as ‘pens and cartridges’, prefilled ‘pens’, vials, along with respective needles or syringes required. Each brand has a registered name for their device.
• Counsel patient on use prior to commencing insulin, ensuring they are comfortable and familiar with the device.
• Patients should be advised on the safe disposal of syringes, needles.
### Storage of insulin:
- Check individual manufacturer’s storage recommendations. Usually;
- Unused/unopened insulin should be stored in a refrigerator (2–8°C);
- After opening and during use, insulin can be kept for 4 weeks at room temperature.

#### 4.5.8 Adjusting insulin

Before adjusting insulin check the following:
- Compliance – is the patient giving the injection?
- Dosage – is the patient “dialling” up the correct amount?
- Concordance with diet / eating patterns / low sugar fluids
- Any activity / exercise
- Alcohol intake
- Injection sites – check for lipodystrophy / lipohypertrophy
- Injection technique, needle size, injection site
- Timing of injections in relation to meals
- Insulin dose distribution
- Storage of insulin correctly
- BG profile – identify periods of the day where the problem is and any patterns

Adjustments to insulin are usually made by either increasing or decreasing the dose by 10-20% depending on whether the problem is hyperglycaemia or hypoglycaemia.

**Adjustment of insulin during illness** needs careful titration, which needs to be discussed with a Diabetes Specialist. If the patient has done the DAFNE/BERTIE course and feels confident to adjust insulin as per DAFNE principles they should be encouraged to do so.

#### 4.5.9 Changing Insulin Regimens

This should only be considered if the present regimen is not achieving optimal control.
- Discuss alternative insulin and regimen options with the patient. Check if they are coping with the present regimen.
- Provide information on potential benefits / risks and differences.
- If there is a history of hypoglycaemia reduce total daily dose by 10-20%.
- Advise more frequent blood glucose monitoring whilst adjusting regimen.
- Blood tests in the early morning (3am) may help to identify nocturnal hypoglycaemia.
- Introduce and teach new delivery device if appropriate.
- Review injection sites / technique / change of needle / size of needle.
- Snacks / meal times may need to be reviewed.
- Allow sufficient time for education and arrange follow up to ensure that the patient is coping well and BG levels stable.

For education when starting a patient on insulin see Section 3 on patient empowerment.

**DO NOT STOP INSULIN WITHOUT SPECIALIST ADVICE.**

## 5 The Paediatric Services
A multidisciplinary team approach is provided for the care of children and adolescents with all types of diabetes within the Wandsworth locality.

- St George's Hospital
- Guy's and St Thomas’ Hospital
- Kingston Hospital

Young people under the age of 16 years receive regular input from team members, who are all based at the above hospitals. A dedicated Paediatric diabetes clinic is held 3 times a month in the Children’s out-patient department. Between 16 – 18 years, integration into the adult services occurs, and the transition clinic (adolescent to adult) is also held. Ongoing support and education is provided according to the individual and family needs and usually takes place in the home. The Paediatric diabetes nurse specialist offers school and nursery visits for staff education.

5.1 Newly diagnosed paediatric diabetic patients and urgent referrals

Please contact the specialist paediatric team as soon a diagnosis has been confirmed (elevated blood glucose reading and urine positive to glucose and ketone; positive or negative) or if advice is required regarding any acute or chronic aspect of the child’s condition.

If you are seriously concerned, please refer to an A & E Department, but also tell the paediatric team of the referral so they can assess the child as soon as possible. This often gives time for the child to return home on treatment that day and avoids a distressing overnight stay.

Children often present with the following symptoms:

- Polyuria and polydipsia
- Glycosuria and ketonuria
- Elevated blood glucose values (frequently well above 11.1 mmol/L at random testing)
- Weight loss & lethargy
- Abdo pain, urine infection, nausea and vomiting

Depending on the medical condition and social situation, every attempt is made to prevent a newly diagnosed child from hospitalisation. Intense support and education is provided during the first few weeks following diagnosis to offer reassurance and guidance.

A very small proportion of children and adolescents may present with mild symptoms without ketonuria and blood glucose levels not seriously elevated (Mature Onset Diabetes of the Young (MODY) or type 2). These may be less urgent. Contact the Paediatric Specialist Team for advice concerning referral.

5.2 Common problems in paediatric diabetes

Whilst children with diabetes are cared for by the hospital paediatric teams the common problems are discussed here for your information to enable support and education to be given to parents and the child. Please ensure the paediatric teams are made aware of any continuing problems.

Regular hypoglycaemic (hypo) episodes

Factors to review/check:

- Review dietary intake. Ensure adequate diet is being offered and eaten, including 3 main meals containing carbohydrate, and 3 snacks during the day if required. BIPHASIC INSULIN Consider if levels of diet/carbohydrate are exceeding requirements. UNDER DOSING OF CARBS
• Consider levels of exercise as increased levels of activity e.g. physical activity lessons or starting a new sport will require increased dietary intake. OR REDUCED INSULIN INPUT
• Check for signs of illness or infection. GENERALLY INCREASES BLOOD SUGAR
• Review insulin doses. If the afternoon blood glucose levels are low, then the morning insulin dose will need reducing. BIPHASIC INSULIN OR INTERMEDIATE INSULIN
• If the child is going through a growth phase dietary and insulin requirements may need to be increased. WILL TEND TOWARDS LEADING TO HIGH BLOOD GLUCOSE
• Monitor for urinary ketones. During episodes of hyperglycaemia, monitor urinary OR BLOOD ketones for early detection of diabetic ketoacidosis; the presence of ketones indicates the need for increasing insulin doses.

Any dose adjustment to the child's insulin must only be 10% of their normal dose. This may only be 1 or 2 units but will be sufficient to have an effect on the overall glycaemic control.

Confirm with parents the treatment of a hypoglycaemic episode:
(Also see hypo guidelines in Section 6.1)

Mild hypo: Offer a full sugar drink (½ cup, e.g. Lucozade), 3-5 dextrose tablets or suitable alternative followed by carbohydrate snack once recovered e.g. biscuit, crisps or bread. OR USUAL MEAL IF READY.

Moderate hypo: If the child has become too drowsy to give oral fluids/food but has a swallowing reflex administer Glucogel (½ a tube) to be squeezed into the side of the mouth, between the cheek and gums, and allowed to be absorbed. The second half may need to be administered if there is a poor response to the initial dose, and must be followed up with a carbohydrate-based snack. SMALLER CHILDREN MAY USE A PEA SIZED AMOUNT OF GLUCOGEL MASSAGED INTO BOTH CHEEKS

Severe hypo: If unconsciousness, do not give anything by mouth. Glucogel is no longer recommended for use in these situations. Ensure the child is placed in a recovery position and emergency medical help is called for (999). If within the surgery, a subcutaneous injection of glucagon can be administered.

Dose:
• Child over 8 years (>25 kg): 1 mg
• Child under 8 years (<25 kg): 0.5 mg

6 Diabetic Emergencies

6.1 Management of Hypoglycaemia

Hypoglycaemia or ‘hypo’ is when the blood glucose level drops too low. This is a blood glucose level of less than 4 mmol/litre.

Hypos can occur with insulin or certain tablets for the treatment of diabetes. Hypos are unlikely to occur with metformin alone or if diabetes is treated with diet only.

If diabetes is well controlled hypos may occur on occasions but if hypos are frequent then the insulin, diabetes tablets or eating pattern may need adjusting. If this is the case contact the diabetes team.
Signs and symptoms

- Feeling dizzy or shaky
- Sweating
- Hunger
- Anxiety
- Mood change
- Blurred vision
- Lack of concentration
- Tingling lips

The symptoms can be different for everyone but the person with diabetes will get to recognise their own signs. Encourage patient to check their blood glucose level if they are unsure whether they are having a hypo. Sometimes the symptoms of a hypo can occur if blood glucose levels have been running low for some time.

The most common reasons:

- Missed or delayed meal
- Too much insulin or oral hypoglycaemic agents
- Not injecting in the right place with the correct injection technique
- Lipodystrophy (lumpy injections sites)
- Increased activity
- Meals or snacks do not contain enough carbohydrate foods (bread, potatoes, pasta, cereals, rice, biscuits, fruit, crackers) or if the gap between meals or snacks is too long
- Drinking alcohol
- Hot weather
- Having a hot shower or bath between taking insulin and eating.
- Stress (although this causes raised blood glucose in some people)

Treatment

TREATMENT GUIDE - HYPOGLYCAEMIA: PRIMARY CARE

Hypoglycaemia is a blood glucose level of less than 4 mmol/l
Wherever possible, check blood glucose level prior to treatment. If asymptomatic, treat but repeat test.

<table>
<thead>
<tr>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient conscious and able to swallow. Symptoms may include: Trembling, sweating, hungry, tingling, headache, anxiety, palpitations, nausea, forgetfulness.</td>
<td>Patient conscious and able to swallow, but in need of assistance. Difficulty concentrating, confusion, weakness, giddiness, drowsiness, unsteady, headache, dizziness, difficulty focusing and speaking.</td>
<td>Patient unconscious and unable to swallow. Fitting</td>
</tr>
</tbody>
</table>

**STEP 1**

- Give 10-20 g of glucose orally (see Appendix – suitable food/ fluid )
- Ensure gag reflex is present Give 10-20 g of liquid glucose orally (see Appendix – suitable food/ fluid )
- Consider use of Glucose Gel
- Call for emergency assistance 999
- Check airway
- Place patient in recovery position
- Patient will require IM Glucagon or IV Dextrose

**STEP 2**

- Once patient is conscious, give sips of Glucose gel or Lucozade.
- Recheck glucose level every 15 minutes to ensure increase to at least 4 mmol/L.

- Once glucose level is over 4mmol/l, **ALWAYS FOLLOW UP WITH A SNACK** to help prevent recurrence.
- (Snack eg: bread, biscuits, glass of milk, banana, small carton of fruit juice.)
- Review cause of hypoglycaemia to help prevent recurrence, or seek advice from Diabetes Specialist Teams.
- NOTE: If Insulin is due, it should NOT be omitted following hypoglycaemia – ensure blood glucose is over 4mmol/l and the person is able to eat before administering the insulin.
6.2 Diabetic Ketoacidosis

Blood glucose usually > 25 mmol/L, but may be lower.
Diabetic ketoacidosis (DKA) is a medical emergency and can develop rapidly in people with type 1 diabetes who:

- Are newly presenting.
- Have missed one or more insulin injections.
- Have an infection intercurrent illness such as urinary tract infection, gastroenteritis or upper respiratory tract infections.

Treatment should be commenced promptly and advice on management sought from the Diabetes Specialist Team.

In the UK, DKA remains the main cause of death in young people with diabetes. The mortality rate ranges between 4.7% - 10.4% but importantly many cases are avoidable.

Presentation

Symptoms vary depending on severity but often include:

- Polyuria/ nocturia
- Polydipsia
- Rapid onset weight loss
- Blurred vision
- Lethargy/ drowsiness/ confusion, disturbance of consciousness
- Abdominal pain/ cramps
- Nausea/ vomiting
- Patient may present in coma

Clinical features include:

- Tachycardia
- Shortness of breath (‘Kussmaul’ breathing)
- Hypotension
- Ketotic breath (‘pear drops’ smell)
- Dehydration

Referral advice for primary care

Patients with diabetic ketoacidosis should be transferred to hospital immediately. If transfer is delayed, it may be appropriate to start IV fluid replacement (e.g. with sodium chloride 0.9%) and to
give insulin. This should only be done after discussion with the hospital Medical or Paediatric Team.

Don’t delay treatment of a life-threatening precipitating cause if it can be identified.

**Investigations – Secondary Care**

- Record capillary blood glucose and urinalysis (could be inaccurate if high level of ketones is present).
- Bloods for urea, creatinine, electrolytes, glucose and full blood count, bicarbonate and osmolarity, amylase and creatinine kinase.
- Arterial blood gases
- Chest X-ray
- ECG
- Blood and urine cultures (swab any obvious sites of infection)
- CT scan/lumbar puncture if meningitis suspected
- Pregnancy test if female

**Diagnosis is confirmed by the following test results:**

- Urinary ketones: ++ or more
- Blood glucose: > 12 mmol/L
- pH: < 7.35
- Bicarbonate: < 15 mmol/L

**Management**

**The main aims of treatment are to:**

- Correct acidosis with insulin and fluid replacement.
- Restore electrolyte balance.
- Treat any infection or precipitating factors.
- Closely monitor critically ill patients with low level of consciousness or coma on an intensive care or high dependency unit.
- Manage less severely ill patients on a general medical ward.

Cerebral oedema is a serious complication of DKA. It is more common in children and young people and carries a high risk of permanent neurological damage and death

**Recovery period**

Once blood glucose levels are stable and patient is able to eat normally, transfer to subcutaneous insulin injections. Intravenous insulin should not be withdrawn until after first subcutaneous injection is given.

**Education**

Education of the person with diabetes/carers/relatives and healthcare professionals is essential to prevent DKA. Identifying the underlying cause of the development of DKA is vital to ensure that this situation is prevented from recurring. Post-recovery, the main focus of education is on sick day rules and self-management skills (adjustment of insulin doses).

**7 Care of people with diabetes in hospital**

People with diabetes are admitted to hospital twice as often and stay twice as long as those without diabetes, and occupy 1:10 acute hospital beds. All children and adults should wherever possible be
involved in decisions concerning the management of their diabetes.

Timely liaison with the Diabetes Specialist team can both prevent the need for diabetes-related hospital admissions, and where admission is unavoidable prevent complications during admission and delayed discharge.

**Aim:** To ensure that good quality consistent care is provided for people with diabetes whenever they are admitted to hospital.

### 7.1 Follow up: in-patients

Diabetes specialist nurses have dedicated time to review in-patients with diabetes. They provide support, education and training to patients and ward staff and enable early discharge of patients and release of bed space. Patients needing follow up by the Diabetes Specialist Team are referred internally for follow up and review. If a dietary review is required, patients are seen by the ward dieticians prior to discharge.

### 7.2 Follow up: post-discharge

Many people newly diagnosed with diabetes in hospital with no diabetic complications can be managed effectively by their Primary Care team. Initial education and referral to a dietician will be done as an in-patient. Written information should be given and the patient informed about what care to expect, e.g. annual review and retinal eye screening arranged.

> It is the responsibility of the patient and the GP to ensure that a structured care programme is agreed to review the diabetes management.

### 8 Diabetes and pregnancy

Diabetes is the most common pre-existing medical disorder complicating pregnancy in the UK and approximately 1:250 pregnant women has pre-existing diabetes. This is associated with increased risks to both mother and baby (National Service Frameworks 2003).

Tight blood glucose control is essential:
- Before and during pregnancy in women with pre-existing diabetes to reduce congenital malformation and perinatal mortality.
- In the third trimester to reduce the risk of macrosomia and its associated consequences.
- During labour to reduce the risk of neonatal hypoglycaemia.

#### 8.1 Pre-pregnancy care

Pregnancy should be planned with good contraceptive advice and pre-pregnancy care. NHS Wandsworth has advice leaflets and poster for planning pregnancy in women with diabetes which should be displayed in the practice. Please contact your community diabetes specialist nurse if you have not received these. Effective contraception is vital to provide time to plan the pregnancy. Pre-pregnancy care should be provided by a multi-disciplinary team and will involve taking the medical, obstetric and gynaecological history, as well as advice on optimising glycaemic control (target HbA1c < 7% or 53 mmol/mol prior to conception). Screening for pre-existing complications as well as retinal screening should be done, and referral made to specialist diabetes dietician.
Folic acid supplements (5mg daily) should be prescribed up to 12 weeks’ gestation. Refer to the Joint Diabetes and Obstetric Clinic in secondary care.

8.2 New Diabetes in Pregnancy: Gestational Diabetes (GDM)

Type 1 or type 2 diabetes can manifest prior to or during pregnancy and must be identified as early as possible. Prompt action must be taken to normalise blood glucose levels to minimise risk of complications. These patients will need insulin.

Patients with GDM should receive intensive management with diet and/or insulin if macrosomia is suspected or if blood glucose levels are > 7 mmol/L.

8.3 Screening for Gestational Diabetes

Routine blood tests at Booking

- Random blood glucose for all women. If the results is > 8mmol/L refer woman to diabetic screening clinic, where an oral glucose tolerance test (OGTT) will be performed.

Random blood glucose at 28 weeks of the following woman

- All women of Asian ethnicity and women of Afro-Caribbean origin
- All women with a family of diabetes
- All women with booking body mass index (BMI) >30kg/m\(^2\). This is calculated automatically on the maternity computer system.
- Glycosuria on more than one occasion – refer to Diabetic Screening Clinic even if Random Blood Sugar was normal.
- Previous stillbirth
- Suspected Polyhydramnios
- Measuring large for dates – in terms of fundal height (upper edge of pubic bone to top of uterus or fundus)
- Previous gestational diabetes identified by combined entries in previous notes
- All women whose previous babies > 4.5kg

When to refer for diabetic screening

- Glycosuria on more than one occasion – refer to Diabetic Screening Clinic even if Random Blood Sugar was normal.
- Women with previous gestational diabetes

8.4 Management of Insulin-treated patients during pregnancy

Type 1 Diabetes

- These patients are generally on or changed to a basal bolus regimen (see targets below).
- Glucagon Hypo kit given to all patients on insulin.
- Blood glucose monitoring is encouraged pre-meals and 1 hour post-prandial.
• Patients are seen every 4 weeks up to 28 weeks gestation, every 2 weeks up to 34 weeks gestation, then weekly till delivery.
• Regular telephone contact is maintained in between appointments.

**Type 2 Diabetes**

• Commenced on insulin to optimise control.
• Oral sulphonylureas and glitazones are stopped. Metformin is often continued at the discretion of the Consultant Diabetologist to avoid excessive weight gain.
• Blood glucose monitoring is encouraged pre-meals and one hour post-meals.
• Optimisation of blood glucose:
  - Target HbA1c: < 7% (53 mmol/mol)
  - BG Pre-meals: < 5 mmol/L
  - BG 1 hour post-meal: < 7 mmol/L
• Retinal Photography to screen for retinopathy should be done in each trimester. Women with retinopathy should be referred to the ophthalmologist.
• Target BP is 130/80 mmHg. Optimisation of blood pressure is achieved using methyldopa and/or nifedipine. The use of ACE inhibitors is not recommended in pregnancy.

**8.5 Post-natal follow-up**

**Type 1 and Type 2 patients**

These patients are seen in the Joint Obstetric and Diabetes clinic between 6 – 8 weeks.

**People with gestational diabetes**

These patients are at high-risk for developing type 2 diabetes. An OGGT is done at the 6 weeks post-natal check. The results are discussed with them at a follow up appointment.

If they are euglycaemic, they are advised to continue with the life-style advice given and to get checked by their GP annually for diabetes as they are in the high-risk category.

**9 Complications of Diabetes**

The chronic hyperglycaemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels. These complications of diabetes may be present at the time of diagnosis or at any time after diagnosis.

Diabetes management requires a holistic approach to the prevention, reduction and treatment of complications.

Rigorous control of blood pressure, lipids and glucose is essential to prevent/delay the onset of complications. The evidence suggests that controlling blood glucose alone or in preference to other strategies will not achieve anything like the reduction in risk that can be achieved by controlling other modifiable risk factors such as blood pressure.

<table>
<thead>
<tr>
<th>Complications include:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Macrovascular disease</td>
<td>• Atherosclerotic cardiovascular disease</td>
</tr>
</tbody>
</table>
9.1 Cardiovascular disease (CVD) and diabetes

Consensus Statement on Coronary Disease Prevention in Diabetes Mellitus: Thomas Addison Unit at St George's Hospital.

It is universally accepted that patients with diabetes have an absolute increased risk of morbidity and mortality associated with coronary disease. Statements from a variety of national and international bodies involved in diabetes care have approximated this risk to that of a non-diabetic (of similar age, sex, etc) having already suffered a myocardial infarct. This has given rise to the concept that patients with diabetes should be considered for 'secondary prevention'. As a result, for all adult patients with diabetes, due consideration should be given to the routine prophylactic use of lifestyle changes and drug therapies to reduce this cardiac risk.

<table>
<thead>
<tr>
<th>Modifiable risk-factors</th>
<th>Non-Modifiable risk-factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>Ethnicity</td>
</tr>
<tr>
<td>Hyperglycaemia</td>
<td>Family history</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Increasing age</td>
</tr>
<tr>
<td>Dyslipidaemia</td>
<td>Gender</td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
</tr>
<tr>
<td>Physical inactivity</td>
<td></td>
</tr>
</tbody>
</table>

Diabetes increases the risk heart attack or stroke by two to three times more when compared to a non-diabetic person. Evidence has shown that by keeping tight control of your blood sugars, cholesterol level and blood pressure you can reduce this risk by up to 40%.

9.2 Hypertension

Measure blood pressure (BP) at least annually in a person without previously diagnosed hypertension or renal disease.

For a person on antihypertensive therapy at diagnosis of diabetes, review control of BP and medications used, and make changes only where there is poor control or where current medications are not appropriate because of microvascular complications or metabolic problems.

Lifestyle advice should be offered and reinforced at all stages. This includes advice on diet, exercise, stopping smoking and reducing alcohol, caffeine and salt intake.

The target BP to aim for in people with type 2 diabetes is less than 130/80mmHg if they have end-organ damage or less than 140/80mmHg if they don't have such damage.
Repeat BP measurements within:
- 1 month if BP is higher than 150/90 mmHg
- 2 months if BP is higher than 140/80 mmHg
- 2 months if BP is higher than 130/80 mmHg and there is kidney, eye or cerebrovascular damage.

Once target is achieved monitor BP every 4-6 months.

Treatment (see algorithm below):
First-line blood-pressure-lowering therapy should be a once-daily, generic angiotensin-converting enzyme (ACE) inhibitor due to renal benefits. Exceptions to this are people of African-Caribbean descent or women for whom there is a possibility of becoming pregnant.

First-line blood-pressure-lowering therapy for a person of African-Caribbean descent should be an ACE inhibitor plus either a diuretic or a generic calcium-channel antagonist (calcium-channel blocker). A calcium-channel blocker should be the first-line blood-pressure-lowering therapy for a woman for whom, after an informed discussion, it is agreed there is a possibility of her becoming pregnant. For people who are truly intolerant of ACE inhibitors due to cough, an angiotensin-2 receptor antagonist (A2RA) is an alternative.
Hypertension Management

 Measure BP annually if not hypertensive or renal disease
 If >140/80 mmHg confirm consistently raised

 Trial lifestyle measures alone unless >150/90 mmHg

 Maintain lifestyle measures
 Start ACEI (and titrate dose)
 (if African-Caribbean plus diuretic or plus CCB)

 Add CCB or bendroflumethiazide

 Add bendroflumethiazide or CCB

 Add α-blocker, β-blocker, or potassium-sparing diuretic

 Add α-blocker, β-blocker, or potassium-sparing diuretic, or refer to specialist

 **Targets**
 People with retinopathy or cerebrovascular disease or with microalbuminuria
 Follow algorithm with target <130/80 mmHg
 Others
 Follow algorithm with target <140/80 mmHg

 **Women with possibility of pregnancy**
 Avoid use of ACEI or A2RB drugs
 Begin with CCB.
 In people with continuing intolerance to an ACE inhibitor (other than renal deterioration or hyperkalaemia)
 substitute the ACE inhibitor with an A2RB drug.

 **People with microalbuminuria**
 Will already be on full dose ACEI or alternative
 Then follow algorithm with target <130/80 mmHg

 **Scheme for the management of blood pressure for people with type 2 diabetes**

 *ACEI*: angiotensin converting enzyme inhibitor,
 *A2RB*: angiotensin 2 receptor blocker (sartan),
 *CCB*: calcium channel blocker
9.3 Dislipidaemia

Damage to the heart and blood circulation is caused by a build up of cholesterol (fatty deposits) on the lining of the blood vessels. This restricts the flow of blood around the body which can result in a heart attack. Cholesterol-lowering therapy reduces cardiovascular morbidity and mortality.

Statins remain the lipid-lowering agent of choice in patients with type 2 diabetes, with generic simvastatin 40mg the first line choice. Statin therapy should be considered for all people with diabetes who are at high risk of a major cardiovascular event, irrespective of their initial cholesterol concentrations.

A statin is recommended for people:
- Aged 40+ years and normal to high CV risk for someone with type 2 diabetes
- Aged 40+ years and low CV risk for someone with type 2 diabetes but CV risk >20%/10 years when assessed using a cardiovascular risk estimation method
- Aged under 40 years and poor CV risk factor profile

Monitor lipid profile 1–3 months after initiation, then a minimum of annually thereafter.

Consider intensifying therapy in patients whose total cholesterol is greater than 4mmol/L and also whose LDL cholesterol remains greater than 2mmol/L.
9.4 Anti-thrombotic therapy

The Medicines and Healthcare products Regulatory Authority (MHRA) Drug Safety Update (Volume 3, Issue 3, October 2009) advises that “aspirin is not licensed for the primary prevention of vascular events. If aspirin is used in primary prevention, the balance of benefits and risks should be considered for each individual, particularly the presence of risk factors for vascular disease (including conditions such as diabetes) and the risk of gastrointestinal bleeding”.

- Offer low-dose aspirin for secondary prevention in people with type 2 diabetes and existing CV disease.
- Consider aspirin for primary prevention on an individualised basis once BP is controlled.

9.5 Kidney Disease

Kidney disease is a preventable problem in patients with diabetes.

Monitor the following in all patients annually, regardless of presence of nephropathy;
- Albumin:creatinine ratio (ACR): first-pass urine specimen (or spot sample if necessary) sent for laboratory estimation. If proteinuria or urinary tract infection (UTI) prevents analysis request sample on subsequent visit
- Serum creatinine
- Estimate glomerular filtration rate (eGFR)

If ACR is abnormal (> 2.5 mg/mmol for men, > 3.5 mg/mmol for women);
- Repeat ACR test at next two clinic visits but within 3-4 months
- Microalbuminuria is confirmed if at least one out of two of these subsequent tests is also abnormal

Suspect renal disease other than diabetic nephropathy and consider further investigation or referral if ACR is raised and any of the following any of the following apply;
- there is no significant or progressive retinopathy
- BP is particularly high or resistant to treatment
- previously had a documented normal ACR and develops heavy proteinuria (ACR > 100 mg/mmol)
- significant haematuria is present
- GFR has worsened rapidly
- the person is systemically ill

If diabetic nephropathy is confirmed;
- Start an ACE inhibitor with the usual precautions and titrate to maximum dose in all individuals
- An A2RB can be substituted where ACE inhibitor is not tolerated
- If pregnancy is a possibility see Section 9.2 on hypertension
- See algorithm below

(NICE 2008)
Perform Urinalysis with a dipstick (clinstick/multi-stick) and note if MSU performed in the last week.

- **Negative trace/ 1+ protein**
  - Screen for micro-albuminuria (check ACR)

- **+2 protein and MSU in the last week negative**
  - Spot Urine Total Protein : Creatinine (*100 = mg/24hrs)
    - ≥50mg/mmol = Clinical Proteinuria
    - 15 - 50mg/mmol = micro-albuminuria (see protocol on next page)

- **≥+2 protein and no recent MSU**
  - Send MSU
    - -ve
      - Retinopathy
        - Yes
          - Refer to Vascular Endocrine Clinic
        - No
          - Refer to renal team for investigation
    - +ve
      - Renal U/S
      - Infected ➔ Treat infection
Managing Confirmed Microalbuminuria and Monitoring Renal Function

Confirmed Micro-albuminuria

- Treat HbA1c to target
- Start low dose ACE-I/ARB
- Treat Lipids to Target

Repeat urea, Creatinine and Electrolytes within 7 - 14 days

Has the serum creatinine risen by 20% or is K>5.5mmol?

- Yes
  - Refer to Vascular Endocrine Clinic
  - Add additional anti-hypertensive agents according to guidelines
- No
  - Is BP to target - <120/70 mm Hg and ACR < 3
    - NO
      - Titrates ACE-I +/-ARB to maximum dose
      - Is BP to target - <120/70 mm Hg and ACR < 3
        - NO
          - Continue with current treatment and review ACR and BP every 4/12
        - yes
          - yes
9.6 Diabetic Retinopathy and Retinal Screening

Annual structured eye surveillance in patient with diabetes has been implemented in Wandsworth in a shared programme between Wandsworth and Richmond and Twickenham PCTs.

Arrange retinal eye screening at or around the time of diagnosis. Subsequent reviews at least annually depending on findings will be arranged by the screening programme.

Although all newly diagnosed people with diabetes will be identified and sent invitations through monthly emis web downloads of GPs registers it is best to also make a paper referral to the retinal screening team to alert them.

A referral form is provided as a separate attachment.

Emergency review by an ophthalmologist for:
- Sudden loss of vision
- Rubeosis iridis
- Pre-retinal or vitreous haemorrhage
- Retinal detachment.
9.7 Management of the Diabetic foot

Diabetic foot problems are a common complication of diabetes. There is an increased risk of peripheral vascular disease (PVD), especially when associated risk-factors are present e.g. smoking, hypertension, hypercholesterolaemia and hyperglycaemia. Amputation rates are higher among people with diabetes than non-diabetic patients.

Education
All people with diabetes at diagnosis must receive education about foot care as part of a comprehensive education programme. A multi-disciplinary professional approach is important so that the person with diabetes accepts a holistic approach to the management of their diabetes. Every facet of risk-management impacts on foot health and the importance of life-style modification must be reinforced, with glycaemic, blood pressure and lipid control optimised. Foot-screening is essential and should be done at least annually.

Risk Factors for diabetic foot ulceration:
- Peripheral Vascular Disease
- Peripheral neuropathy
- Previous amputation
- Previous ulceration
- Presence of callus
- Joint deformity
- Visual/mobility problems
- Male gender

Factors influencing management of the diabetic foot:
When examining the diabetic foot, always take into account risk-factors, which may influence your management.
- Social deprivation/isolation (living alone)
- Poor vision
- Systemic complications (coronary heart disease, kidney complications, stroke)
- Duration of diabetes
- Poor glycaemic control
- Individual’s awareness of potential problems
- Smoking and alcohol history

Assessment:
- Low Risk
  o No complications of diabetes detected: normal palpable foot pulses, no peripheral sensory neuropathy = normal sensation with a 128 Hz tuning fork or 10 g monofilament. No podiatry complications e.g. callus, marked deformity or problematic nails, and none of the above risk-factors.
  o Management: No podiatry input necessary, self-care with verbal advice and written information. Routine annual review by GP/practice nurse/district nurse.
- Medium Risk
  o Sensory neuropathy present = negative response on one or more sites tested with 128 Hz tuning fork or with 10 g monofilament. Poor circulation indicated by weakened or absent foot pulses. Presence of podiatry complications e.g. callus, hard skin, problematic nails or a combination of any of the above risk-factors.
- **Management**: Refer to local podiatry services for assessment, treatment and advice and offer individualised education for patient/carer regarding foot inspection and warning advice. Provide written information.

- **High Risk**
  - Any symptomatic signs of poor circulation = absent pulses with cramp/claudication. Profound neuropathy with a history of ulceration, amputation or deformity or a combination of any of the above risk-factors
  - **Management**: Contact hospital specialist diabetes Foot Clinic for advice. Offer individualised education for patient/carer on foot care and how to rapidly access services if foot condition deteriorates. Consider regular review by team GP/practice nurse/district nurse and local/specialist podiatry services.

(See Algorithm: Urgent Referral of Acute Foot Problems)
9.8 Diabetic Neuropathy

The latest update to the nice guidelines has stressed the usefulness of Duloxetine in Diabetic Neuropathy and provided an updated care pathway. This is copied below.

Nice guidelines, March 2010, CG96

Neuropathic pain - The pharmacological management of neuropathic pain in adults in non-specialist settings

Care pathway
Third-line treatment
- Refer the person to a specialist pain service and/or a condition-specific service.
- While waiting for referral:
  - consider oral tramadol instead of or in combination with second line treatment (see box A for dosages)
  - consider topical lidocaine for treatment of localised pain for people who are unable to take oral medication because of medical conditions and/or disability.

Other treatments
- Do not start treatment with opioids (such as morphine or oxycodone) other than tramadol without an assessment by a specialist pain service or a condition-specific service.
- Other pharmacological treatments that are started by a specialist pain service or a condition-specific service may continue to be prescribed in non-specialist settings, with a multidisciplinary care plan, local shared care agreements and careful management of adverse effects.

Box A Drug dosages
- Start at a low dose, as indicated in the table.
- Titrate upwards to an effective dose or the person’s maximum tolerated dose (no higher than the maximum dose listed in the table).

<table>
<thead>
<tr>
<th>Drug</th>
<th>Starting dose</th>
<th>Maximum dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline*</td>
<td>10 mg/day</td>
<td>75 mg/day</td>
</tr>
<tr>
<td>Pregabalin</td>
<td>150 mg/day</td>
<td>600 mg/day</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>60 mg day ³</td>
<td>120 mg/day</td>
</tr>
<tr>
<td>Tramadol²</td>
<td>50-100 mg not more often than every 4 hours</td>
<td>400 mg/day</td>
</tr>
</tbody>
</table>

* Higher doses could be considered in consultation with a specialist pain service.
³ A lower starting dose may be appropriate for some people.
⁴ As monotherapy. More conservative titration may be required if used as combination therapy.

Box B Early clinical review
After starting or changing a treatment, perform an early clinical review of dosage titration, tolerability and adverse effects to assess suitability of chosen treatment.

Box C Regular clinical reviews
Perform regular clinical reviews to assess and monitor effectiveness of chosen treatment. Include assessment of:
- pain reduction
- adverse effects
- daily activities and participation (such as ability to work and drive)
- mood (in particular, possible depression and/or anxiety)
- quality of sleep
- overall improvement as reported by the person.
9.9  Erectile Dysfunction

- Review the issue of erectile dysfunction with men annually.
- Provide assessment and education for men with erectile dysfunction to address contributory factors and treatment options.
- Offer a phosphodiesterase-5 (PDE-5) inhibitor (choosing the drug with the lowest acquisition cost), in the absence of contraindications, if erectile dysfunction is a problem.
- If PDE-5 inhibitor ineffective, consider specialist referral.

* Sildenafil must be taken on an empty stomach.
* If patient develops angina, do not take GTN but ➔ A & E if pain lasts > 15 mins.
9.10 Other Neuropathic Complications

**Gastroparesis**
- Gastroparesis may be a possible cause for erratic blood glucose control or unexplained gastric bloating or vomiting in an adult.
- A trial of metoclopramide, domperidone or erythromycin could be considered for the management of symptoms.
- Consider referral to specialist services if;
  - The differential diagnosis is in doubt, or
  - Persistent or severe vomiting occurs.

**Other Signs of possible autonomic neuropathy**
- Loss of the warning signs of hypoglycaemia ⇒ consider contributory sympathetic nervous system
- Unexplained diarrhoea, particularly at night ⇒ consider the possibility of autonomic neuropathy affecting the gut
- Unexplained bladder-emptying problems ⇒ consider the possibility of autonomic neuropathy affecting the bladder
  ⇒ For all signs/symptoms experienced by patients investigate further and offer specific interventions

- When using tricyclic drugs and antihypertensive medications in people with autonomic neuropathy be aware of the increased likelihood of side effects such as orthostatic hypotension.
10 Contacts

10.1 Thomas Addison Unit, St George’s Hospital
Telephone - reception 020 8725 1429 or 020 8725 0232
Fax 020 8725 3572

Diabetes Specialist Nurses Through reception
Community DSN 020 8725 0928
Specialist Dietitians 020 8725 1434
Retinal Screening 020 8725 1145
Podiatrist 020 8725 1859
Consultants secretaries 020 8725 3902/ 1027/ 1968

10.2 Beta-Cell Team, Queen Mary’s Hospital
Reception/appointments 020 8487 6449
Diabetes Specialist Nurses 020 8487 6447/8
Psychologist – Kate Bewsey via secretary 020 8487 6441/6987
Diabetic Dietitian 020 8487 6446
Consultant –
Dr Matt Oldfield via secretary 020 8 487 6441/6987 Fax 020 8487 6535

Desmond Coordinators 020 8487 6441/6987 Fax 020 8487 6535
Retinal Screening 020 8487 6444
Central booking no: 020 8725 0935/0932
Podiatry - 020 8487 6426

10.3 St Thomas’ Hospital
Main reception 020 7188 1988 Fax 020 7188 1991
Diabetes Specialist Nurses admin 020 8188 1993
Specialist Dietitian 020 7188 1993
Retinal Screening 020 7188 1979
Podiatrist 020 7188 1983
Endocrine Nurse 020 7188 1973

Consultants secretaries 020 7188 1981/ 1987

10.4 Wandsworth Diabetes Intermediate Team (The CDSNs)
Team administrator: chris.gumble@stgeorges.nhs.uk

Putney, Roehampton & Central Wandsworth
Yvonne Bornemann 020 8789 5511 Fax 020 8789 5477
Kippy Mahdi-Rogers 020 8789 5511

Wandsworth South
Judith Nelson 20 8812 5065 020 8812 5477
Maggie Dixon 020 8812 5065

Battersea
Lucy Chadder (Team Leader) 020 8812 4049 020 8812 4051
David Gammon 020 8812 4049
11 Appendices and attachments

Referral forms and information leaflets and other items which are updated frequently will be listed here as they are made available. The latest versions of these as well as the latest downloadable version of these guidelines are available on the Web at http://www.thewig.eu/pageID_3486387.html.

1. Community DSN referral form
2. Function of the CDSN team
3. Retinal screening referral form
4. Desmond referral form
5. Beta cell referral form
6. Exclusion from the retinal screening programme
8. Exenatide Protocol
9. Food and Drink for Hypos - illustrated
10. Insulin Start Groups - referral pathway
11. Insulin Start Groups - referral criteria
12. Referral Criteria - Thomas Addison Unit
13. NHS Vascular Health Check - diabetes filter
14. Preconception clinic referral form
15. Hypoglycaemia info (picture) (text)
16. Information on IFG
17. Podiatry referral form
18. Frequently asked questions on the Retinal Screening Programme
19. Diabetes in Pregnancy
20. Advice on HbA1c