Wakefield District Diabetes Network

Diabetes Care for Adults
A Guide to Good Working Practice

October 2012
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INTRODUCTION

Guidelines for diabetes care were originally produced in 1991 and have been revised a number of times the last being in March 2010. There have also been changes affecting the clinical management of patients with Type 2 diabetes, including the publication of the diabetes National Service Framework (NSF) delivery strategy and NICE guidelines, and also the development of local integrated care pathways. These guidelines should be read in conjunction with the latest clinical guideline 87 Type 2 Diabetes – the management of Type 2 diabetes (May 2009)

We hope that the revised guidelines will continue to deliver the essential foundation of good quality diabetes care. It is anticipated that these guidelines will be reviewed periodically.

WAKEFIELD DISTRICT DIABETES NETWORK – BOARD MEMBERS

<table>
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<tr>
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<tr>
<td>Co Chair</td>
<td>Dinesh Nagi</td>
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<tr>
<td>Clinical Lead (Pinderfields)</td>
<td>Tara Kadis, Ryan D’Costa</td>
</tr>
<tr>
<td>Clinical Lead (Pontefract)</td>
<td>Helen Dobson</td>
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<tr>
<td>Paediatric Lead</td>
<td>Alison Grove, Sheila Roberts</td>
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<tr>
<td>Co Chair and Network Manager</td>
<td>Janet Wilson</td>
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<tr>
<td>Network Co-ordinator</td>
<td>Kay Bellwood</td>
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<tr>
<td>Primary Care Clinical Lead</td>
<td>Som de Silva (GP), Lesley Newland (GP)</td>
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<tr>
<td>Primary Care Nurse Leads</td>
<td>Andrea Hazengerave, Meg Kinsey, Chris Lane, Sandra Little</td>
</tr>
<tr>
<td>Head of Public Health – Long Term Conditions (NHS Wakefield District)</td>
<td>Jo Hanlon</td>
</tr>
<tr>
<td>Patient Representative(s)</td>
<td>Grahame Platt</td>
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<tr>
<td>Diabetes UK Regional Manager</td>
<td>Linda Wood</td>
</tr>
<tr>
<td>Mid Yorkshire Hospitals NHS Trust – Service Manager Diabetes</td>
<td>Jackie Robinson</td>
</tr>
<tr>
<td>Network Education Lead</td>
<td>Gill Day</td>
</tr>
<tr>
<td>Medicines Management</td>
<td>Joanne Fitzpatrick</td>
</tr>
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CONTACT DETAILS OF DIABETES CENTRES

| Diabetes Centre Pontefract General Infirmary Friarwood Lane PONTEFRACT WF8 1PL Tel 01977 747930 Fax 01977 606949 | Diabetes Centre Pinderfields General Hospital Aberford Road WAKEFIELD WF1 4DG Tel 01924 213904 Fax 01924 214977 | Dewsbury and District Hospital Boothroyd Centre Halifax Road DEWSBURY WF13 4HS Tel 01924 816097 Fax 01924 816193 |
CORE GUIDELINES FOR DIABETES CARE

A firm foundation for good quality diabetes care would incorporate a commitment to the following:

1. **REGISTER**
   Have and maintain a register for all adults with diabetes.

2. **CALL AND RECALL**
   To ensure that systematic call and recall of patients is taking place, for regular surveillance for ongoing care and detection of complications.

3. **PERSON CENTRED/EMPOWERMENT**
   To empower the individual to adopt a healthy lifestyle and to manage their own diabetes, through education and support which recognises the importance of lifestyle, culture and religion, and which, where necessary, tackles the adverse impact of material disadvantage and social exclusion.

4. **STRUCTURED GROUP EDUCATION FOR PEOPLE WITH DIABETES**
   Ensure people with diabetes are referred to the appropriate structured education programme.
   - DESMOND (Diabetes Education and Self-Management for Ongoing and Newly Diagnosed – Type 2 diabetes) education programmes – newly diagnosed and foundation modules
   - DAFNE (Dose Adjustment for Normal Eating – Type 1 diabetes)

5. **ONE TO ONE EDUCATION FOR PEOPLE WITH DIABETES**
   To offer comparable one to one education for those people who are unable/unsuitable to attend group education sessions. To ensure that all patients receive appropriate structured continuing education, tailored to their needs. To ensure evaluation of learning and reinforcement of key points tailored to the individual is ongoing.

6. **REFERRAL POLICIES**
   Referral for eye care should be in accordance with the retinal screening programme. Referrals for foot care in accordance with the Diabetes Foot Care Integrated Care Pathway. Patients should be referred promptly and appropriately to the relevant agencies using, where issued, the appropriate referral guidelines.

7. **RECORD KEEPING**
   The maintenance of adequate records is recommended in order to monitor the performance and outcomes of the above procedures.

8. **AUDIT**
   To participate in DiabetesE – a web based, self-assessment, diabetes care performance tool that supports the NICE Quality Standard for Diabetes in Adults, the National Diabetes Audit and the yearly audit scheme in order to make appropriate changes to practice following suggested recommendations.
EARLY IDENTIFICATION OF PEOPLE WITH TYPE 2 DIABETES

Symptoms

- Polyuria, nocturia, excess thirst
- Fatigue
- Weight loss
- Neuropathic symptoms
- Recurrent infections especially thrush
- Changes in visual acuity
- Macrovascular disease (Ischaemic Heart Disease, Peripheral Vascular Disease, TIA/Stroke)
- All women with a history of a large baby (>4kg)
- History of diabetes in pregnancy

Risk Factors

The risk of diabetes is increased X 5 (if not already present) in

The Metabolic Syndrome

Of which the 2005 International Diabetes Federation definition is:

<table>
<thead>
<tr>
<th>Central Obesity</th>
<th>Plus any two of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist circumference</td>
<td>Triglyceride&gt;1.70mmol/L*</td>
</tr>
<tr>
<td>Female &gt;80cm (31.5 ins)</td>
<td>HDL-cholesterol&lt;0.9mmol/L (M)*</td>
</tr>
<tr>
<td></td>
<td>&lt;1.1mmol/L (F)*</td>
</tr>
<tr>
<td>Europid Male &gt;94cm (37 ins)</td>
<td>BP &gt;130 systolic or &gt;85 Diastolic*</td>
</tr>
<tr>
<td>South Asian Male &gt;90cm (35.5 ins)</td>
<td>Impaired fasting glycaemia or Type 2 diabetes</td>
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</table>

* or on treatment for these

When to Screen

Annual Screening

- Previous gestational diabetes
- Impaired fasting glycaemia
- Impaired glucose tolerance
- Metabolic syndrome

Targeted Opportunistic Screening

- Routine health checks
- Cardiovascular disease clinics
- Well women clinics
- Health related events in the community

Consider regular screening (every 1-3 years)

- Central obesity* (ensuring waist measurements)
- Macrovascular disease
- Hypertension*
- Hypertriglyceridaemia*
- Diabetes in a first degree relative
- Long term steroid use
- South Asian > 30 years old
- Over 65 years of age
- Use of certain antipsychotic drugs eg olanzapine

*features of metabolic syndrome

How to Test

If symptomatic/diabetes is suspected:
- If fasting – test Fasting Plasma Glucose
- If not fasting – test Random Plasma Glucose

For early identification of people who are aged 40 – 74 years who are asymptomatic:
- If fasting – test Fasting Plasma Glucose
- If not fasting – test HbA1c

FPG = ≥7mmol/l
RPG = ≥11.1mmol/l
HbA1c => 48 mmol/mol

Refer to the Newly Diagnosed Diabetes Integrated Care Pathway
**Presentation**
- GP
- Self
- NHS Direct/Walk In Centre
- Community Pharmacists
- Opticians
- Opportunistic Screening
- Hospital Outpatients/Inpatients

**Diagnostic Guidelines**
Symptoms eg thirst, polyuria, weight loss, fatigue, visual disturbances

**Diagnostic tests**
- Plasma Glucose (Laboratory Test) (mmol/l)
  - Random ≥ 11.1
  - Fasting ≥ 7.0
  - HbA1c > 48 mmol/mol

*If asymptomatic, confirm diagnosis with repeat test on another day*  
Test urine for ketones

**Clinical Examination**
Assessment of the person with newly diagnosed diabetes by a member of the Primary Care Team
- Physical examination to include BMI, waist measurement and BP
- Urine for microalbuminuria
- Take blood sample for glucose, HbA1c, U&E, LFTs, TFTs, Lipids and eGFR
- Examine feet (as per diabetes foot care ICP)

**Management**
- Negotiate and outline a self-management care plan to include:
  - Support and monitoring
  - Named contact
  - Recall advice
- Implementation of self-management care plan
  - Review according to individual needs
  - Consider earlier intervention with oral medication if symptoms and Type 2 diabetes
- To care pathway for Continuing Diabetes Care

**Education**
- Discuss diagnosis and immediate patient concerns
- Establish patients knowledge of illness and education needs
- Give initial dietary lifestyle advice, including physical activity
- Smoking cessation referral and advice if required

**Diagnosis**
Following Diagnostic Guidelines

**Type 1**
**Type 2**

**Same Day Referral**
by telephone call followed by a fax to the appropriate diabetes centre
- Acutely ill
- Symptomatic
- Ketonuria

**Admission**
- Acutely ill
- Dehydration required IV fluids
- Requiring intensive monitoring – ketotic
- Serious incurrent problem

**NEWLY DIAGNOSED DIABETES INTEGRATED CARE PATHWAY**

**To care pathway for Continuing Diabetes Care**
Initial Education and Management

- NICE guidelines (2009) recommend that structured patient education is made available to all patients with diabetes at the time of initial diagnosis and then as required on an ongoing basis, based on a formal, regular assessment of need.
- Initial education should include: lifestyle advice including healthy eating, physical activity, smoking cessation and alcohol.
- Refer newly diagnosed to DESMOND programme if appropriate
- Appropriate leaflets should be given to support the initial advice given eg. First steps and a healthy eating leaflet
- An explanation of targets, stressing that a multifactorial approach (eg. looking at BP and cholesterol alongside blood glucose control) is required when negotiating a self-management care plan with the patient.
- Test urine for microalbuminuria in Type 2 diabetes
- Ensure that the person with newly diagnosed diabetes is referred to the retinal screening programme.
- Review dates should be agreed according to each patient’s individual needs.
- Link to the single assessment process where appropriate when managing complex long term conditions.

Referral Guidelines

- Admission
  - Admit to hospital if the person is at risk of a hyperglycaemic emergency (vomiting, abdominal pain, reduced conscious level, heavy ketonuria, dehydration requiring IV fluids, hypotension, serious intercurrent problem)

- Same day referral
  - Refer to be seen on the same day if the patient is acutely ill, consider Type 1 Diabetes if ketonuria present, the patient is slim and has a short history of marked symptoms (weight loss, thirst, polyuria)

- Early Referral
  - Diabetes and pregnancy requires referral to the hospital diabetes team please see pregnancy guidelines

Refer to specialist dietitian if appropriate (see referral criteria in dietetic pathway in development)

Ensure that a foot assessment takes place and appropriate education is given according to risk classification (see Diabetes Foot Care – page 51)
**DIAGNOSIS OF DIABETES**

Diabetes is diagnosed on the basis of the following WHO criteria;

- Symptoms of hyperglycaemia (polyuria polydipsia, unexplained weight loss, visual blurring, genital thrush, lethargy) plus raised venous plasma glucose level detected once fasting: 7.0 mmol/L or higher or random 11.1 mmol/L or higher

  **OR**

- In the absence of symptoms 2 abnormal results are required for the diagnosis. A *random glucose* of 7 – 11 should be followed by *fasting blood glucose*. If the result of the second test is not diagnostic, an oral glucose tolerance test (OGTT) should be performed

- Impaired Glucose Tolerance (IGT) is a stage of impaired glucose regulation (Fasting plasma glucose less than 7.0 mmol/l and OGTT two hour value greater than or equal to 7.8 mmol/l but less than 11.1 mmol/l) should be followed by lifestyle advice, education and repeat fasting blood tests in one year.

- Impaired Fasting Glycaemia (IFG) has been introduced to classify individuals who have fasting glucose values above the normal range but below those diagnostic of diabetes. Impaired fasting glycaemia (fasting plasma glucose greater than or equal to 6.1 mmol/l but less than 6.9 mmol/l) should be followed by an OGTT to exclude a diagnosis of diabetes.

- It should be noted that children usually present with severe symptoms and diagnosis should then be based on a single raised blood glucose result, as above. Immediate referral to a Paediatric Diabetes Team should not be delayed.

IGT and IFG are not clinical entities in their own right but rather risk categories for cardiovascular disease (IGT) and/or future diabetes (IFG).

A diagnosis of diabetes has important legal and medical implications for the patient and it is therefore essential to be secure in the diagnosis.

Diabetes UK recommends that the diagnosis is confirmed by a glucose measurement performed in an accredited laboratory on a venous plasma sample. A diagnosis should never be made on the basis of glycosuria or a stick reading of finger prick blood glucose alone and should be confirmed by a venous sample, as per NICE guidelines.

**HbA1c for Diagnosis**

- A HbA1c of 48 mmol/mol is recommended as the cut off point for diagnosing diabetes. A value of < 48 mmol/mol does not exclude diabetes diagnosed using glucose tests.

- In patients without symptoms of diabetes, repeat the laboratory venous HbA1c. If the second sample is < 48 mmol/mol treat as high diabetes risk and repeat the test in 6 months or sooner if symptoms develop
Situations where HbA1c is not appropriate for Diagnosis of Diabetes

- ALL children and young people
- Patients of any age suspected of having Type 1 diabetes
- Patients with symptoms of diabetes for less than 2 months
- Patients at high diabetes risk who are acutely ill (eg those requiring hospital admission)
- Patients taking medication that may cause rapid glucose rise eg steroids, antipsychotics
- Patients with acute pancreatic damage, including pancreatic surgery
- In pregnancy

The following is recommended for those at high risk of developing diabetes:

- High diabetes risk HbA1c 42-47 mmol/mol
  - Provide intensive lifestyle advice
  - Warn patients to report symptoms of diabetes
  - Monitor HbA1c annually
- HbA1c under 42 mmol/mol
  - These patients may still have high diabetes risk
  - Review the patient’s personal risk and treat as “high diabetes risk” as clinically indicated
Confirmed diagnosis of impaired glucose tolerance or impaired fasting glucose – refer to newly diagnosed diabetes ICP for the WHO definition of the diagnosis of diabetes

OR

Previous gestational diabetes

1. Advice regarding lifestyle modification
   - Physical Activity
   - Healthy eating
   - Weight Management
   - No smoking

2. Cardiovascular risk factor assessment

Annual fasting blood glucose

Above or equal to 7.0 mmol/l x 2

Diabetes Mellitus
If there is a high suspicion of diabetes and fasting glucose not diagnostic carry out an OGTT. All people with impaired fasting glucose 6.1 – 6.9mmol/l should have an OGTT. Fasting plasma glucose less than 5.5mmol/l makes diagnosis of diabetes unlikely and no further action required.

## Patient Preparation

The patient should be aware of the following:

- The patient should be on a normal carbohydrate containing diet (at least 150g/day) for at least 3 days prior to the test.
- Fast from 10pm on the evening before the test with the exception of water and any drugs normally taken unless GP advises otherwise eg. glucocorticoids or thiazide diuretics.
- The patient will need to rest during the test and should not smoke, eat or drink except for small amounts of water.

- Measure fasting venous blood glucose.
- Give the patient 75g glucose by:
  - 113ml Polycal liquid (Nutricia Clinical) made up to a volume of 200ml in a beaker, with water. This should be shaken thoroughly and consumed over a 5 minute period followed by a further 100ml of plain water. *Note: This can cause abdominal discomfort if consumed too quickly.*
  - Take one further venous blood glucose sample at two hours.
  - The test is now complete and the patient may eat.

## Interpretation

Non-pregnant individuals
Results are interpreted in accordance with WHO criteria. These are as follows:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Fasting</th>
<th>2 Hours</th>
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<tbody>
<tr>
<td>Normal</td>
<td>≤6.1 mmol/l</td>
<td>and &lt;7.8 mmol/l</td>
</tr>
<tr>
<td>Impaired Fasting Glucose</td>
<td>6.1 mmol/l to 6.9 mmol/l</td>
<td>and &lt;7.8 mmol/l</td>
</tr>
<tr>
<td>Impaired Glucose Tolerance</td>
<td>&lt;7.0 mmol/l</td>
<td>and ≥7.8 mmol/l and &lt;11.0 mmol/l</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>≥7.0 mmol/l</td>
<td>or ≥11.1 mmol/l</td>
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Refer to the newly diagnosed diabetes pathway if diabetes diagnosed.

## Side Effects

The test is usually well tolerated. Rarely, some patients may feel nauseated and experience vaso-vagal symptoms during the test. The test is invalidated by vomiting.

## Postpone Test

- If the patient is febrile or acutely ill.
- If within 6 weeks of a myocardial infarction or major surgery.
- If on short-term treatment with drugs which interfere with glucose tolerance such as glucocorticoids or thiazide diuretics.
EDUCATION OF PEOPLE WITH DIABETES

The Diabetes National Service Framework (DH 2001) highlights structured education programmes as a key part of systematic care. It is recommended that structured patient education is made available to all people with diabetes at the time of initial diagnosis and then as required on an ongoing basis, based on a formal regular assessment of need.

NICE Clinical Guidelines 87 – Type 2 Diabetes (2009) recommends that structured education should be offered to every person and/or their carer at and around the time of diagnosis, with annual reinforcement and review. It also recommends that people with diabetes and their carers should be informed that it is an integral part of diabetes care.

The aim of education for people with diabetes is to improve their knowledge and skills, enabling them to take control of their own condition and to integrate self-management in their daily lives. The ultimate goal of education is improvement in the following areas:

- Control of vascular risk factors, including blood glucose, blood lipids and blood pressure
- Management of diabetes associated complications, if and when they develop
- Quality of life

Education should be provided by an appropriately trained multidisciplinary team to groups of people with diabetes, unless group work is considered unsuitable for an individual. All people who are newly diagnosed with diabetes should be referred into the DESMOND programme if they are willing to participate in group education.

The DESMOND Programme

DESMOND (Diabetes Education and Self-Management for Ongoing and Newly Diagnosed) is a structured education programme for people with Type 2 diabetes.

DESMOND provides six hours of structured group education over two half days no more than two weeks apart. Groups consist of 6 – 10 people newly diagnosed with Type 2 diabetes. The programme covers areas such as the patients’ story, an explanation of what diabetes is, main ways to manage diabetes, the risks and complications of diabetes, food choices and action planning.

The philosophy underpinning DESMOND is essentially patient centred. Its aim is to support individuals to achieve their own goals for managing their diabetes. It is not about motivating people to do what health care professionals think they should do. Recognition that the person with diabetes is the expert in their own condition is therefore the driver for the programme and influences the style of how it is delivered.

The style of delivery is crucial to enable all information to be made personally relevant and to promote individual problem solving and action planning which is then dovetailed with clinical management.

The DESMOND newly diagnosed programme should be ideally offered to people within two to three months of diagnosis and no more than twelve months from diagnosis.

The DESMOND foundation programme should be offered to all people with Type 2 diabetes who have been diagnosed with diabetes for over 12 months and who have not previously undertaken the newly diagnosed programme.
The overall aim is to ensure that people with diabetes are empowered to enhance their personal control over the day-to-day management of their diabetes in a way that enables them to experience the best quality of life.

**Conversation Maps**

Conversation maps are a different method of structured group education for people with Type 2 diabetes. The session lasts for one and a half to two hours and can be delivered to up to eight people. This education programme may be more appropriate for people who are unable to commit to six hours. There are four different maps looking at: newly diagnosed, healthy lifestyle, long term complications and starting on insulin.

**Carbohydrate Awareness Group Education**

Carbohydrate awareness sessions are provided for people with Type 2 diabetes who are using insulin. Patients will benefit the most from a carbohydrate awareness after they have been on a DESMOND course. The group is run by both a Diabetes Specialist Nurse and a Specialist Dietitian and there are currently 6 group sessions planned a year. The aim of the session is to enable the patient to correctly identify carbohydrate foods appropriate portion sizes and how to distribute the carbohydrate intake to match the insulin they take. Supporting literature is given to the patients along with a follow up appointment with the dietitian.

**One to One Education with the Diabetes Specialist Dietitian**

As part of the diabetes re-design, a community based diabetes dietitian was appointed. The diabetes dietitian covers one to one clinics at various community based centres and GP surgeries aiming to offer a community based dietetic service close to home. The service accepts any person with Type 1 or Type 2 diabetes that is not under consultant or acute care for their diabetes management. The service supports surgeries up to level 4 in diabetes management which includes GLP-1 starts and management, insulin starts and management and stable Type 1 on insulin.

The main aim of dietetic intervention is to optimise glycaemic control and minimise cardio-vascular risk factors. This can be achieved by using a range of behaviour change techniques to improve food choices, manage weight and increase activity. It also includes carbohydrate awareness training which provides an in-depth knowledge in optimising the diet to improve glycaemic control. This is currently done on a one to one basis but is being rolled out as group sessions.

**The DAFNE (Dose Adjustment for Normal Eating) Programme**

DAFNE is a high quality skills-based structured education patient programme in intensive insulin therapy and self-management where people with Type 1 diabetes are taught to match their insulin dose to their chosen food intake on a meal by meal basis. DAFNE provides 35 hours of structured group education and is delivered by specially trained diabetes specialist nurses and dietitians, to groups of between 6 and 8 over a consecutive 5-day period on an outpatient basis.

DAFNE is an evidence-based, evaluated, professionally delivered, quality assured, peer reviewed and audited education package for Type 1 diabetes. DAFNE meets the 5 criteria required to fulfill the NICE requirements and aims to improve outcomes for people with Type 1 diabetes through high quality structured education which is embedded in the Health Service. The programme has been developed over more than 25 years of rigorous research and includes a randomised control trial in Northern Europe and a feasibility trial and economic analysis in the UK.
CARE PLANNING IN DIABETES

The principles of the Care Planning approach to consultations are:

- A partnership approach offers people active involvement in decision making. A partnership approach is more likely to lead to successful self-management strategies rather than a dictatorial one.
- A person-centred, holistic approach is more satisfying and effective in diabetes care consultations.
- Health Care Professionals and people with diabetes wish for optimal health and quality of life outcomes.
- Preparation for the care planning consultation including sharing both clinical and practical information about the process, leads to realistic expectations and outcomes.

The key components of the diabetes care planning model:

Prior to care planning review

Invitation and explanation of care planning sent to the person with diabetes.

Information gathering

Biomedical and other screening tests, and check re date of foot/retinal screening assessments.

The care planning consultation

The care planning consultation is a protected consultation time between the patient and the health care professional for diabetes and/or the GP. Ideally people with diabetes have their results for this protected consultation with their reflections and questions.

Components of the care planning consultation

- Gather and share stories
- Explore and discuss
- Goal setting
- Action planning
- Arrange review

Recording the consultation

Provide written details of the agreed shared care plan (goals and actions) for patients to take away from the consultation. Record the agreed shared care plan (goals and actions) on the clinical system.

Reviews

Undertake an initial care planning review with all patients on your diabetic register, with a further follow up six months later to review and record their progress against goals.
DIETARY MANAGEMENT OF DIABETES

Diet remains the foundation of diabetes management. Everyone with diabetes should receive dietary information and support. State registered dietitians will provide specific, individual dietary advice that takes patient’s lifestyles and cultural preferences into account.

Aims

- Abolish primary symptoms
- Minimise fluctuations in blood glucose concentrations and improving glycaemic control
- Improve blood lipid profiles, minimising the long term macrovascular and microvascular complications
- Maintain a desirable body weight (BMI 20-25)
- Achieve weight loss where appropriate

Dietary Management of Type 1 Diabetes

Dietary management of Type 1 diabetes focuses primarily on improvement of overall glycaemic control. Daily carbohydrate distribution, carbohydrate counting and glycaemic index may be discussed.

Dietary Management of Type 2 Diabetes

Dietary management of Type 2 diabetes focuses on glycaemic control, cardio protection and weight management.

CARBOHYDRATES

Sugary Food

These foods are digested very quickly and cause a rapid rise in the blood sugar levels. Diets should be low in sugar, but do not need to be sugar free. Some sugary foods can be eaten in moderation. Education should be given around appropriate portions and overall carbohydrate content in a meal to reduce the degree of daily fluctuations in blood glucose levels.

Sugary foods are also the first line treatment in the dietary management of hypoglycaemia, where rapidly available glucose is required to raise plasma glucose levels. This should be followed with a complex (starchy) carbohydrate to maintain the correct blood glucose level and prevent a rebound hypoglycaemic episode.

Starches

Starchy foods tend to have a lower glycaemic index; however the amount of carbohydrate you eat in total will determine how high your blood glucose levels will go after a meal. It is recommended to have a starchy carbohydrate at each meal.

Patients on sulfonylureas and insulins may require more specific dietary advice and should then be referred to a specialist dietitian.

If the patient increases their intake of dietary fibre (e.g. cereal fibre such as wholemeal bread, wholewheat pasta, high fibre breakfast cereals, brown rice) they should be reminded to drink plenty of fluids – at least 6-8 cups per day.
Carbohydrate Portion sizes (Glycaemic Load)
Understanding carbohydrate portion sizes can help to maintain blood glucose control

Glycaemic Index
Glycaemic index (GI) is a concept that predicts the speed that causes a rise in blood glucose levels.

Foods are given a 'score' and then ranked as low, medium or high glycaemic index.
LOW glycaemic index foods release glucose slowly
HIGH glycaemic index foods release glucose RAPIDLY

Fats
Reviewing the type and amount of dietary fat is an essential part of dietary advice for cardio protection and weight management
There are four types of dietary fats:-

Omega 3 fatty acids
Benefits of Omega 3 fatty acids include:
• Enhancing a regular heart beat
• Reduces the stickiness of the red blood cells
• Reduces the risk of thrombosis and inflammation

The best source of Omega 3 is oily fish: e.g. mackerel, sardines, salmon, trout and fresh tuna.

Monounsaturated Fats
Foods high in monounsaturated fat can lower less beneficial types of cholesterol (LDL) but maintain "good cholesterol" (HDL).
Sources of monounsaturated fat include olive oil rapeseed and groundnut oil.

Polyunsaturated Fats
Can change chemically (oxidation) and contribute to atherosclerosis. Polyunsaturated fat lowers LDL but also lowers HDL
Sources of polyunsaturated fat include sunflower oil and corn oil

Saturated Fats
Increase atherogenic LDL cholesterol.
Saturated fats are found in butter, lard, ghee, the visible fat on meat and in dairy products such as cheese and cream.
**Fruit and Vegetables**

Patients should aim for at least five portions of fruit or vegetables daily.

They are excellent sources of soluble fibre and antioxidant vitamins which have beneficial effects on glycaemic control and lipid lowering.

**Protein**

Sources include: meat, poultry, fish, eggs, nuts, beans and pulses, cheese, milk.

Patients should limit their intake of meat products such as sausage rolls, meat pies, tinned meats and meat spreads. These are very high in fat. Patients should eat moderate amounts and choose lower fat versions whenever possible. They should avoid cooking with added fats. Remove visible fats from meats and skin from poultry.

Patients should be encouraged to try low fat cooking methods including, grilling, baking, microwaving, steaming and poaching.

**Alcohol**

**Maximum daily intake**

- **Men** 3 - 4 units
- **Women** 2 - 3 units

1 unit equals

-half pint of beer or lager (ordinary strength)
- 1 glass of wine (125 ml 9% alcohol) this will increase as the % alcohol in the wine increases
- 1 glass of sherry
- 1 pub measure of spirit

- Distribute alcohol throughout the week (eg 2 units a day aim for at least 2 alcohol free days).
- Never drink on an empty stomach. Ensure regular CHO intake.
- Alcohol may increase risk of hypoglycaemia.
- Alcohol is high in calories. Consider weight management.
- Advisable to avoid high alcohol content beers, lagers and alcopops above 5% volume.

(Department of Heath 2007)

**Diabetes Food Products**

These are not recommended. Often these foods are sweetened with sugar alcohols, which will act as a laxative and induce diarrhoea. Sugar alcohols, as sugar, contain 4kcal/g and therefore such diabetes food products may be high in calories. This may promote weight gain or inhibit weight reduction.
Weight

Weight reduction, where appropriate, will improve glycaemic control, lipid profiles and blood pressure. It will decrease insulin resistance. Body Mass Index (BMI) can be used to assess the degree of obesity; however waist circumference is a more reliable clinical indicator of insulin resistance and, therefore cardiovascular risk.

Weight loss expectations should be realistic, considering an individual’s ability to exercise and present medical history.
Physical activity is important in the management plan of Type 2 diabetes as it not only improves short and long term glycaemic control, but has beneficial effects on blood pressure and dyslipidaemia. In addition, regular physical activity helps to lose and maintain weight, improves physical and psychological well-being and may enhance quality of life; it may also help to reduce long term mortality.

Despite these potential benefits, compliance with physical activity remains discouragingly poor. At present there is little evidence to suggest how the exercise habits and barriers to physical activity are assessed in patients with Type 2 diabetes. To reap the multiple benefits of physical activity in patients with Type 2 diabetes, we need to educate our patients regarding the benefits of a healthy lifestyle and being physically active. The brief guidelines which follow will help health professionals to understand the role of physical activity in the management of diabetes.

There is evidence, that regular physical activity benefits most patients with Type 2 diabetes and metabolic syndrome and the benefits generally far outweigh the risk associated with it. However, due to potentially detrimental effects of exercise on macro and micro vascular complications, careful selection of patients through a proper clinical evaluation and individualisation of exercise programmes is needed in those who wish to increase physical activity.

**Benefits of Physical Activity**

- Lowers blood glucose during and after exercise
- Increases insulin sensitivity
- Lowers basal and post prandial insulin levels
- Lower glycated haemoglobin (HbA1c) over long term
- Cardiovascular conditioning
- Lowers systolic and diastolic blood pressures
- Lower triglyceride, lower LDL cholesterol, higher HDL cholesterol
- Beneficial effects on LDL density?

Other benefits

- Improves strength
- Improves sense of well-being (physical and psychological)
- Better quality of life

But remember

- The best time to motivate your patients is around the time of diagnosis
- Physical activity is much more likely to be beneficial during early years of Type 2 diabetes

**What is the Best Type of Activity?**

The best type of activity for the prevention and management of diabetes is stamina based such as walking, swimming, dancing or cycling. However it is also important to include activities which develop strength – walking up hill, carrying shopping or climbing stairs and flexibility e.g. swimming, dancing or yoga to get the best health benefits.
How Much Activity is Recommended?

The latest guidance builds upon previous advice but reflects the growing body of knowledge about physical activity levels and the links to reducing the risk of serious diseases like heart disease, stroke and diabetes.

Key new elements are:

- Adults should aim to be active daily. Over a week, activity should add up to at least 150 minutes (2½ hours) of moderate intensity activity in bouts of 10 minutes or more – one way to approach this is to do 30 minutes on at least 5 days a week.

- Alternatively, comparable benefits can be achieved through 75 minutes of vigorous intensity activity spread across the week or combinations of moderate and vigorous intensity activity.

- Adults should also undertake physical activity to improve muscle strength on at least two days per week

- All adults should minimise the amount of time spent sedentary for extended periods

- Advice is also available for older people (DH 2011)

Risks of Physical Activity

The risks of physical activity need to be considered carefully as newly diagnosed subjects with Type 2 diabetes frequently have micro and macro vascular complications.

All people with newly diagnosed Type 2 diabetes:

- should routinely be assessed for their leisure time and occupational activity as is the current practice for dietary assessment
- target those who currently take no or little exercise
- develop and disseminate information leaflets to highlight the health benefits of exercise to people with Type 2 diabetes
- screen for complications of diabetes prior to the initiation of any formal exercise programme
- give individualised advice to those who are ready for action about the kind of activities they can choose
- encourage patients to keep a log book of their activities, as a willingness to do so is associated with better compliance
- education regarding exercise needs to be reinforced and should form an essential part of any ongoing educational programmes

- Minor musculo-skeletal injuries are common and depend upon the intensity and duration. Wearing proper fitting shoes and exercising in a proper environment can minimise these risks.

- Those treated with sulfonylureas or insulin are at risk of hypoglycaemia during and up to 24 hrs after exercise

- Exercise may also cause transient or prolonged hyperglycaemia after strenuous exercise in those who are insulin deficient

- Education on methods to prevent exercise induced hypoglycaemia should be provided, as well as information on hyperglycaemia and foot care.
Effects on Specific Complications of Type 2 Diabetes

Chronic complications of diabetes or other physical disabilities may be an impediment for exercise. However, none of these are absolute contraindications for mild or moderate intensity exercise.

- Sudden death is rare with an incidence of 0-2/1000,000 hours of exercise
- Precipitation of pre-existing CHD or unmasking of angina is another concern. But, patients should be carefully screened including a thorough history, a physical examination and a resting ECG should be considered. Follow safe tips for initiation of physical activity

Microvascular Complications

Retinopathy: Moderate intensity physical activity has a no detrimental effect on non-proliferative retinopathy and the risk in those with proliferative retinopathy is low.

- In those who have new vessel formation or vitreous haemorrhages, it is prudent to avoid vigorous physical activities
- These include activities such as pounding, repeated jarring, weight lifting, high impact aerobics, and activities involving valsalva manoeuvre.

Nephratophy: Exercise increases albumin excretion during and immediately after exercise although the long term implications on the natural history of diabetic nephropathy are unclear.

Neuropathy: Patients with neuropathy and insensitive feet are more prone to foot ulceration and fractures. Therefore

- screen for peripheral neuropathy, foot deformity or degenerative joint disease
- limit or avoid weight bearing exercises such as step aerobics, prolonged jogging or walking
- adequate advice about self-management of foot care should be provided to all
- patients with autonomic neuropathy may have decreased exercise capacity. These patients may be more prone to episodes of extreme hypo or hypertension following vigorous exercise

Advice for People who wish to become more Active

- Always begin slowly and build up to a comfortable pace
- Check feet after activity, always change socks and wear comfortable appropriate footwear.
- Stop if feeling unwell
- Monitor blood glucose levels before and activity if taking sulfonylureas or insulin and take necessary steps to prevent hypoglycaemia e.g. carry fast acting carbohydrate
- Drink water during and after activity sessions
- Avoid strenuous activity if eye problems or high blood pressure

Adjustments to insulin/diabetes tablet treatment or eating extra carbohydrate may be required depending on:

- How often exercise takes place
- Time of day in relation to meal times
- The intensity and duration of the activity.

Locally exercise on referral is available:
to order get active leaflets you can ring 01924 307811 or email activators@wakefield.gov.uk
MANAGING DEPRESSION IN DIABETES

Depression is approximately two to three times more common in people with a chronic physical health problem such as cancer, heart disease or diabetes than in people with good physical health. A chronic physical health problem can both cause and exacerbate depression, and treating depression in these patients has the potential to increase their quality of life expectancy.

The presence of a physical illness can complicate the recognition and assessment of depression, because some symptoms are common to both mental and physical disorders. Symptoms below the threshold for a diagnosis of depression can be distressing and disabling, especially in patients with a physical health problem.

People with diabetes with psychological and/or depressive disorders should be identified through routine QOF screening for depression, by continual professional awareness, and managed in accordance with current national guidelines.

**QOF Depression screening questions:**

- During the last month, have you been bothered by feeling down, depressed or hopeless?
- During the last month, have you often been bothered by having little interest or pleasure in doing things?

Yes

Refer to GP for a further assessment of other symptoms such as tiredness, guilt, poor concentration, change in sleep pattern and appetite and suicidal ideation to confirm a diagnosis of depression. The assessment should be informed by using a questionnaire such as:

- PHQ-9
- HADS
- BDI

Reference: NICE CG91, Depression with a chronic physical health problem
DIABETES AND SMOKING

Tobacco is harmful to health and is of particular danger to people with diabetes. All late complications of diabetes such as cardiovascular disease, foot problems, kidney and eye disease are worsened by smoking. In diabetes care, smoking cessation is of the utmost importance in order to facilitate the effective control of blood glucose, and to limit the development of diabetes complications.

The Wakefield Stop Smoking Service offers a variety of support options and pharmaceutical aids to assist patients through their quit attempts. Patients can access: - flexible drop-in clinics, weekly supports sessions and one to one appointments with specialist stop smoking advisors.

To access the services or self-refer please call 01977 465449
MANAGEMENT OF LONG TERM COMPLICATIONS

Management of Cardiovascular Risk

Introduction

Patients with diabetes are generally a very high risk group for Cardiovascular Disease (CVD) and its clinical manifestations. The risk of CVD in patients with Type 2 diabetes is higher than patients without diabetes who already have Ischaemic Heart Disease (IHD).

Smoking, hypertension, dyslipidaemia and physical inactivity are major modifiable risk factors for IHD in diabetes.

Nephropathy manifested as microalbuminuria and retinopathy are strong predictions of CVD and total mortality.

What Are We Trying To Achieve?

People with diabetes (Type 1 or Type 2) are now all considered to be at high risk and therefore formal cardiovascular risk assessment is not required. The absolute risk can be effectively lowered by tackling multiple risk factors ie stopping smoking, treating hypertension adequately and lowering cholesterol levels.

The Management of Hypertension in Diabetes

Targets for Blood Pressure Management

The results of the UKPDS showed that aggressive management of blood pressure is more important than that of hyperglycaemia.

Secondly, it was clear that for good blood pressure control most patients required two or more hypertensive agents.

Target BP.

No end organ damage aim for < 140/80 mm of Hg.
End organ damage aim for < 130/80 mm of Hg

The individual clinical situation may determine positioning

The treatment of hypertension is as important as good glycaemic control and all patients, irrespective of age, should have their blood pressure measured annually (hypertension, particularly systolic hypertension may be present from an early age).

"At risk" patients, those with macro/microalbuminuria, established vascular disease, dyslipidaemia or smokers should be monitored at every clinic visit.

In the case of proteinuria or microalbuminuria, it is reasonable to aim for a blood pressure of 130/80 mmHg. (NICE 2008)

A diagnosis of hypertension is made if the blood pressure exceeds the criteria for that individual on three separate occasions.
When treatment is initiated depends on the individual patient and the presence or absence of proteinuria/microalbuminuria, vascular disease or other risk factors.

Repeat Blood Pressure 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 eye, kidney or cerebrovascular disease

Confirming the diagnosis of hypertension
- If the clinic blood pressure is 140/90 mmHg or higher, offer ABPM to confirm the diagnosis of hypertension. (NICE CG127 2011)

Treatment

Non-pharmacological therapy: advice should be given, as appropriate, about smoking, diet, exercise, weight reduction, alcohol and salt intake and in those with borderline or mild hypertension this may be sufficient.

Drug therapy: there are several classes of anti-hypertensive agents available. The choice of agent would depend upon the presence or absence of albuminuria or microalbuminuria for these patients consider the use of ACE-inhibitors (angiotensin-converting enzyme) (or ARB - angiotensin II receptor antagonists if not tolerated) as the first choice irrespective of blood pressure (MEREC 2006).

Some degree of patient profiling is necessary depending upon co-existing cardiac complications such as angina, due to ischaemic heart disease or cardiac failure.
ANTIHYPERTENSIVE TREATMENT GUIDELINE

Advice on lifestyle measures

STEP ONE
For people < than 55 years ACE inhibitor (titrate dose) or a low cost ARB (do not combine an ACE inhibitor with an ARB to treat hypertension)

For people > 55 years or people of African-Caribbean descent, offer ACE inhibitor and calcium channel blocker (CCB) If CCB not suitable offer a thiazide like diuretic such as chlorthalidone 12.5 – 25.0mg once daily or indapamide 1.5mg MR or 2.5mg once daily

STEP TWO
Add CCB with either ACE or ARB If CCB not suitable offer a thiazide –like diuretic

For people of African-Caribbean descent, consider an ARB rather than an ACE inhibitor in combination with a CCB

STEP THREE
Review medication to ensure step 2 treatment is at optimal or best tolerated doses
Combination of ACE inhibitor or ARB , CCB and thiazide –like diuretic should be used

STEP FOUR
Consider further diuretic therapy with low dose spironolactone (25mg once daily) or a higher dose thiazide like diuretic if potassium level is higher than 4.5mmol/l
Consider seeking specialist advice

Use a potassium sparing diuretic with caution if already taking ACE Inhibitor or ARB. If there is a possibility of becoming pregnant refer to NICE CG 107 - Hypertension in pregnancy (2010)

Refer to the management of renal disease in people with diabetes re ACE inhibitors and ARB

Targets for Blood Pressure Management

The results of the UKPDS showed that aggressive management of blood pressure is more important than that of hyperglycaemia. Secondly, it was clear that for good blood pressure control most patients required two or more hypertensive agents.

Target BP:
No end organ damage aim for <140/80 mm of Hg
End organ damage aim for <130/80 mm of Hg
Detection and Management of Blood Lipids

How to Screen

Ideally all adults with diabetes should have their lipids checked at the time of diagnosis and, every year thereafter.

Caution:

Do not forget secondary causes of hyperlipidaemia in patients with diabetes ie

- Hypothyroidism
- Primary biliary cirrhosis
- Alcohol excess
- Nephrotic syndrome
- Chronic renal failure
- Drugs

When to Treat

All patients with Type 2 diabetes should have a statin over the age of 40 years unless there is a compelling reason for them not to. Each patient should be clinically assessed and their individual risk should be discussed.

In people with diabetes statin therapy is recommended for:

- All those who are aged 40 years or over with Type 2 diabetes. Initiate therapy with generic simvastatin (to 40mg) or a statin of similar efficacy and cost unless the cardiovascular risk from non hyperglycaemia related factors is low.

- For people who are aged 18 – 39 years with Type 2 diabetes and who have at least one of the following:
  - Retinopathy (pre-proliferative, proliferative, maculopathy)
  - Nephropathy, including persistent microalbuminuria
  - Poor glycaemic control (HbA1c 75 mmol/mol)
  - Elevated blood pressure requiring antihypertensive therapy
  - Raised total blood cholesterol (>6.0 mmol/l)
  - Features of metabolic syndrome (central obesity and fasting triglyceride >1.7 mmol/l [non-fasting >2.0 mmol/l] and/or HDL cholesterol <1.0 mmol/l in men or <1.2 mmol/l in women)
  - Family history of premature cardiovascular disease in a first degree relative.

Other classes of lipid lowering drugs (fibrates, bile acid sequestrants, cholesterol absorption inhibitors, nicotinic acid) should be considered in addition to a statin if the total and LDL cholesterol targets have not been achieved

Once a patient has been started on cholesterol lowering therapy, assess his or her lipid profile (together with other modifiable risk factors and any new diagnosis of cardiovascular disease) one to three months after starting treatment, and annually thereafter. In those not on cholesterol lowering therapy; reassess cardiovascular risk annually and consider initiating a statin
Treatment

First line: Simvastatin 40mg daily OR

Second Line: Simvastatin 20mg or pravastatin 40mg (if simvastatin 40mg contraindicated/not tolerated)

ACS: Offer patients higher intensity statin e.g. atorvastatin 80mg OD for up to 3 months then change to simvastatin 40mg daily

Monitoring

Measure ALT at 3 months, and again at 12 months and NOT again unless clinically indicated.

Measure lipid profile annually

- If ALT > 3 times the upper limit or other abnormality – stop or reduce dose of statin (recheck full LFT within 4-6 weeks)
- If patient reports unexplained muscle pain check creatinine kinase (CK) – consider statin – drug interactions.

Treatment Follow Up

If either total or LDL cholesterol are below 4mmol/L or 2mmol/L respectively there is no need to increase dose.

If both total and LDL cholesterol are above 4mmol/L AND 2mmol/L respectively consider increasing dose of simvastatin to 80mg or switching to atorvastatin 40mg with a potential to increase to 80 mg if necessary.

Check compliance/concordance first

Note: less than half of the treatment population will achieve a total cholesterol less than 4mmol/L or LDL less than 2mmol/L even when prescribed atorvastatin.

If there is a possibility of a woman becoming pregnant, do not use statins unless the issues have been discussed with the woman and agreement has been reached.

Anti-thrombotic Therapy (Aspirin and Clopidogrel)

NICE (May 2009) recommends aspirin 75mg daily for all people with Type 2 diabetes who are aged 50 years or older, and selectively in younger people with one of the following criteria: people who have had the disease for more than 10 years, who are already receiving treatment for hypertension and who have target end organ damage in the form of retinopathy or nephropathy

However recent evidence from randomised controlled trials has cast doubt on the use of aspirin in the primary prevention of cardiovascular disease in diabetes. While awaiting the updated NICE guidelines on aspirin treatment the following local consensus has been agreed:

- Patients with diabetes and existing cardiovascular disease (stroke, TIA, heart disease, peripheral vascular disease), will continue to require lifelong aspirin therapy.
- Patients with diabetes and who have one or more of the following cardiovascular risk factors (hypertension, smokers, hyperlipidaemia, positive family history of premature CHD, South Asian), are at high risk of CVD and may benefit from aspirin therapy. The decision to treat would be following a discussion with the patient regarding the risks and benefits of aspirin therapy.

- Patients with diabetes and who have one or more complications of diabetes (nephropathy, retinopathy) are at high risk of CVD and may benefit from aspirin therapy. The decision to treat would be following a discussion with the patient regarding the risks and benefits of aspirin therapy.

- Patients with diabetes already taking aspirin should be individually reviewed. The decision to treat would be following a discussion with the patient regarding the risks and benefits of aspirin therapy.

Ensure the risk of gastrointestinal bleeding is discussed fully with each patient to assist them in coming to an informed choice. Before starting treatment ensure that blood pressure has been reduced to 145/90 mmHg or below and maintain while taking aspirin. If aspirin is contraindicated as per NICE which defines aspirin intolerance as:

- proven hypersensitivity to aspirin-containing medicines
- history of severe dyspepsia induced by low-dose aspirin

then clopidogrel 75mg could be considered as an alternative (NICE 2008)
Lifestyle and risk factor targets

- Discontinue smoking
- Make healthier food choices
- Reduce alcohol intake
- Increase physical activity
- Achieve optimal weight and weight distribution

Lifestyle advice should be offered initially and then periodically throughout the patient journey

**Lipids:** target total cholesterol - <4.0mmol/l, low density lipoprotein (LDL) <2.0mmol/l and high density lipoprotein (HDL) >1.4mmol/l

**Blood Pressure:** target – 140/80
130/80 may be more appropriate in selected people with chronic renal failure or established cardiovascular disease

**When to screen**
All people with diabetes should have their lipids checked at the time of diagnosis and yearly thereafter

**When to screen**
The treatment of hypertension is as important as good glycaemic control and all patients irrespective of age should have their blood pressure measured annually

**When to treat**
- All those who are 40 years or over with Type 1 or Type 2 diabetes
- For people who are 18 – 39 with either Type 1 or Type 2 and have at least one of the following
  - Retinopathy
  - Nephropathy including persistent microalbuminuria
  - Poor glycaemic control HbA1c >75 mmol/mol
  - Elevated blood pressure requiring therapy
  - Features of metabolic syndrome
  - Family history of premature cardiovascular disease in first degree relative

Refer to treatment page 27

Refer to Hypertension oral medication guideline page 26

NICE CG 127 – Hypertension clinical management of primary hypertension in adults (2011)
Oral Medication for Type 2 Diabetes

Oral anti-diabetic drugs should usually be prescribed when diet and lifestyle change has proved inadequate in controlling plasma glucose, usually after at least one month’s trial. The tablets should be used to supplement diet and not to replace it. Occasionally, oral medication may be used at an early stage for symptom control.

The list of oral medication below is not exhaustive and further up to date information can be accessed in a current BNF and summaries of product characteristics (SPC) www.emc.medicines.org.uk

Metformin

Metformin should be used as first line oral medication after lifestyle intervention in all patients, on the basis of evidence of beneficial clinical outcomes and cost effectiveness. It is particularly beneficial in overweight patients as it tends to facilitate weight reduction.

Gastrointestinal symptoms, nausea, abdominal pain and diarrhoea are relatively common but can be minimised if taken at mealtimes and doses are initially low and increased in stages. Side effects tend to be dose dependent so where a higher dose causes symptoms, a lower dose may be tolerated. Consider a trial of extended absorption metformin tablets where GI tolerability prevents continuation of metformin therapy NICE 87 (2009): Guidelines for Type 2 diabetes (update) of NICE clinical guideline 66: national clinical guidelines for the management in primary and secondary care

Metformin has an excellent safety record but caution must be used in patients with renal, hepatic or cardiac impairment or those who are severely dehydrated because of the small risk of lactic acidosis. NICE (2009) recommends that the dose should be reviewed if eGFR is less than 45 mL/minute/1.73 m² and to avoid if eGFR less than 30 mL/minute/1.73 m².

Sulfonylureas

Sulfonylureas lower blood glucose by stimulating insulin release and therefore tend to encourage weight gain and hypoglycaemia. NICE (2009) recommends their use as second line to metformin, as first line for patients who are intolerant of metformin, not overweight with a BMI of less than or as first line in a person newly diagnosed with Type 2 diabetes who has severe osmotic symptoms.

Caution is advised in the elderly and in those with hepatic or renal insufficiency because of the risks of hypoglycaemia. Side effects apart from hypoglycaemia are generally mild and infrequent and include gastrointestinal disturbances and headaches.

Patients should be educated around the risk of hypoglycaemia, particularly if renally impaired.

The sulfonylurea preferred by the specialist diabetes team is gliclazide. NICE does not recommend the use of glibenclamide. When drug concordance is a problem offer a once daily long acting sulfonylurea.

You may wish to consider glimepiride when drug concordance is a problem.
HYPOGLYCAEMIC WARNING

All patients prescribed sulfonylureas must be given advice regarding hypoglycaemic symptoms and management. Treatment should be adjusted if hypoglycaemia is experienced. Advice should be given regarding taking sulfonylureas, driving and hypoglycaemia.

Acarbose

Acarbose is an inhibitor of intestinal alpha glucosidases and delays the absorption of simple sugars. It has a small but significant effect in lowering blood glucose, alone or in combination with other anti-diabetic agents. Flatulence is a frequent and troublesome side effect making it unpopular with most patients who have tried it.

DPP- 4 Inhibitors

DPP – 4 inhibitors improve glycaemic control by inhibiting dipeptidyl peptidase – 4 to increase insulin secretion and lower glycogen secretion.

NICE (2009) recommends considering their use as second line to metformin as alternative to sulfonylureas if there is a significant risk of hypoglycaemia or its consequences or a sulfonylurea is contraindicated or not tolerated. DPP – 4 can be used as monotherapy if metformin or sulfonylurea is contraindicated,

DPP – 4 can be considered as second line therapy to first line sulfonylurea when control of blood remains or becomes inadequate and when insulin is unacceptable or inappropriate. DPP-4 can be used as monotherapy when metformin or sulfonylurea is not tolerated or is unacceptable.

Sitagliptin

Sitagliptin can be used as add on to insulin (with or without metformin) when diet and exercise plus stable does of insulin do not provide adequate glycaemic control.

No dose adjustment is required for mild to moderate hepatic impairment.

Patients with moderate or severe renal impairment should not be treated with sitagliptin (creatinine clearance <60ml/min)

Linagliptin

Linagliptin can be used in combination with metformin and sulfonylurea. Linagliptin does not have a license with insulin. No dose adjustment is required for patients with renal impairment.

Only continue DPP – 4 Inhibitor therapy if the person has had a beneficial metabolic response (a reduction of at least 10mmol/mol in HbA1c in 6 months)

Thiazolidinediones (Pioglitazone)

Pioglitazone reduces peripheral insulin resistance, leading to a reduction in blood glucose but takes two to three months for maximum effect. Liver function tests (LFTs) should be performed on all patients prior to commencing a pioglitazone and periodically thereafter.
Pioglitazone may be considered as second line treatment as an alternative to sulfonylurea if there is a risk of serious hypoglycaemia or its consequences or if a sulfonylurea is contraindicated or not tolerated (NICE 2009). Pioglitazone can be used as second line therapy to first line sulfonylurea when control of blood glucose remains or becomes inadequate if the person does not tolerate metformin or metformin is contraindicated. Pioglitazone should not be used in patients with heart failure or with a history of heart failure; the instance of heart failure is increased when combined with insulin. Pioglitazone can be used in combination with insulin (risk of heart failure see above). The risk of fractures should be considered in the long term care of patients treated with pioglitazone.

Prescribers are advised not to use these medicines in patients with current or a history of bladder cancer or in patients with uninvestigated macroscopic haematuria. Risk factors for bladder cancer should be assessed before initiating pioglitazone treatment. In light of age-related risks, the balance of benefits and risks should be considered carefully both before initiating and during treatment in the elderly.

The combination with metformin is preferred particularly in obese patients. The long term benefits of glitazones have not been demonstrated.

Pioglitazone may be preferable to a DPP-4 inhibitor if:

- the person has marked insulin sensitivity
- a DPP-4 inhibitor is contraindicated
- the person has previously had a poor response to or did not tolerate a DPP-4 inhibitor

**GLP-1 Mimetics**

Exenatide and liraglutide both bind to, and activate, the GLP-1 (Glucagon – like peptide – 1) receptor to increase insulin secretion, suppress glucagons secretion, and slow gastric emptying. Treatment with exenatide and liraglutide is associated with the prevention of weight gain and possible promotion of weight loss which can be beneficial in overweight patients. They are both given by subcutaneous injection for the treatment of Type 2 diabetes.

NICE (2009) recommends considering adding GLP-1 to metformin and sulfonylurea if BMI is greater than 35 or BMI less than 35 if insulin is unacceptable to the patient or if weight loss would benefit other co-morbidities. Only continue GLP-1 mimetic therapy if the person has had a beneficial metabolic response (a reduction of at least 10mmol/mol in HbA1c and a weight loss of at least 3% of initial body weight at six months).

**Exenatide**

Exenatide is given twice daily by subcutaneous injection up to one hour before food. Commence treatment with 5 micrograms twice daily increasing to 10 micrograms twice daily after one month.

Exenatide can also be given by a once weekly injection (Bydureon®) on the same day each week. However, the day of weekly administration can be changed if necessary as long as the next dose is administered at least one day (24 hours) later. Bydureon® can be administered at any time of day, with or without meals. If a dose is missed, it should be administered as soon as practical. Thereafter, patients can resume their once weekly dosing schedule. Two injections should not be given on the same day. The use of Bydureon® does not require additional self-monitoring. Blood glucose self-monitoring may be necessary to adjust the dose of sulfonylurea.
Liraglutide

NICE (2010) recommends that liraglutide in triple therapy regimens (in combination with metformin and a sulfonylurea, or metformin and a thiazolidinedione) for the treatment of Type 2 diabetes, only when glycaemic control is inadequate and the patient has:

- a body mass index of 35kg/m or over and is of European descent with appropriate adjustment for other ethnic groups and weight related psychological or medical problems
- a body mass index of less than 35kg/m, and insulin would be unacceptable for occupational reasons or weight loss would benefit other significant obesity related comorbidities

Treatment with liraglutide in a triple therapy regimen should be continued only if HbA1c concentration is reduced by at least 10mmol/mol and a weight loss of at least 3% is achieved within 6 months of starting treatment. Liraglutide in dual therapy regimens (in combination with metformin or a sulfonylurea) is recommended only if:

- treatment with metformin or a sulfonylurea is contra-indicated or not tolerated, and
- Treatment with thiazolidinediones and dipeptidylpeptidase-4 inhibitors is contra-indicated or not tolerated.

Liraglutide 1.8mg daily is not recommended for the treatment of people with Type 2 diabetes.

Liraglutide, in combination with metformin or a sulfonylurea should be continued only if HbA1c concentration is reduced by at least 10 mmol/mol within 6 months of starting treatment.

Obesity Agents : Orlistat

Orlistat, a lipase inhibitor, reduces the absorption of dietary fat. It may be considered as an aid to weight reduction in conjunction with a hypo caloric diet in patients with Type 2 diabetes and a body mass index (BMI) of greater than 28. Treatment with orlistat should be discontinued after 12 weeks if patients have been unable to lose at least 5% of the body weight as measured at the start of drug therapy (NICE 2006).

Cautions and Contraindications for OAD Treatments in Type 2 Diabetes Patients

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<td>Moderate 15-30</td>
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<tr>
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<td>No</td>
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<td>Yes</td>
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<tr>
<td>Sitagliptin</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes but dose adjustment</td>
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<tr>
<td>Saxagliptin</td>
<td>Yes</td>
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<td>Yes – with caution and dose adjustment</td>
</tr>
<tr>
<td>Vildagliptin</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Exenatide</td>
<td>Yes</td>
<td>Yes</td>
<td>Use with caution</td>
</tr>
<tr>
<td>Liraglutide</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Pioglitazone</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Metformin</td>
<td>Yes</td>
<td>Adjust dose with care</td>
<td>No</td>
</tr>
<tr>
<td>Sulfonylureas</td>
<td>Yes</td>
<td>Adjust dose with care</td>
<td>No</td>
</tr>
</tbody>
</table>
**STEPWISE APPROACH TO THE TREATMENT AND MANAGEMENT OF TYPE 2 DIABETES**

**Confirmed diagnosis of Type 2 diabetes**
**Target HbA1c between 48 and 59 mmol/mol**

### STEP ONE
- Refer to DESMOND structured education programme
- Refer to Retinal Screening programme
- Lifestyle changes - healthy eating, physical activity, weight control and smoking cessation
- Consider early use of oral hypoglycaemic agent if symptomatic and a rapid therapeutic response is required because of hyperglycaemic symptoms or long term complication already present at diagnosis
- Review in 3 months

---

If HbA1c ≥ 48mmol/mol

After three months add metformin (active dose titration)

Consider sulfonylurea if not overweight or metformin not tolerated

---

### SECOND LINE THERAPY

<table>
<thead>
<tr>
<th>Add Sulfonylurea</th>
<th>Add DPP-4 Inhibitor</th>
<th>Add Thiazolidinediones (TZD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider alternatives where hypoglycaemia or weight gain are potential problems</td>
<td>When hypoglycaemia is a concern</td>
<td>When hypoglycaemia is a concern</td>
</tr>
<tr>
<td></td>
<td>When weight gain is a particular therapeutic concern</td>
<td>Consider in people with significant hallmarks of metabolic syndrome</td>
</tr>
<tr>
<td></td>
<td>As an alternative to TZD if fractures or CHF are prime concerns</td>
<td></td>
</tr>
</tbody>
</table>

---

If HbA1c is ≥ 59 mmol/mol

---

### THIRD LINE THERAPY

**Oral Administration**

<table>
<thead>
<tr>
<th>Add DPP4 Inhibitor</th>
<th>Add TZD</th>
</tr>
</thead>
<tbody>
<tr>
<td>When risk of hypoglycaemia is a concern</td>
<td>When risk of hypoglycaemia is a concern</td>
</tr>
<tr>
<td>When weight gain is a particular therapeutic concern</td>
<td>When a subcutaneous agent is not acceptable</td>
</tr>
<tr>
<td>As an alternative to TZD if fractures are prime concerns</td>
<td>Consider in people with significant hallmarks of metabolic syndrome</td>
</tr>
<tr>
<td>When a subcutaneous agent is not acceptable</td>
<td></td>
</tr>
</tbody>
</table>

**Subcutaneous Administration**

<table>
<thead>
<tr>
<th>Add GLP-1</th>
<th>Add insulin</th>
</tr>
</thead>
<tbody>
<tr>
<td>When high body weight causes particular concern</td>
<td>When there has been clear progression of the disorder and insulin therefore the therapy most likely to enable achievement of the individual’s glycaemic target.</td>
</tr>
<tr>
<td>As an alternative to insulin if the expected HbA1C reduction will enable the patient to reach his or her target</td>
<td>Refer to insulin initiation guidelines</td>
</tr>
<tr>
<td>Base decision to continue GLP-1 therapy on individual HbA1c response and weight loss</td>
<td></td>
</tr>
</tbody>
</table>

---

Ensure compliance / concordance with lifestyle issues and oral therapy throughout the patient journey.

Consider reassessment of patient’s blood glucose control at appropriate intervals throughout the patient’s journey.

Consider the need for the addition of agents specifically licensed for weight reduction.

Consider possible drug interactions and contraindications.

Aim to keep within the target HbA1c of 48-59 mmol/mol increasing/titrating medication as required.
Drug Acquisition Costs for GLP-1 Analogues

<table>
<thead>
<tr>
<th></th>
<th>Exenatide 5-10 mcg per day</th>
<th>Liraglutide 1.2 mg per day</th>
<th>Liraglutide 1.8 mg per day</th>
<th>Bydureon 2 mgs once week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per 30 days</td>
<td>£68.24</td>
<td>£78.48</td>
<td>£177.72</td>
<td>£73.36</td>
</tr>
</tbody>
</table>

*Prices correct as at October Drug Tariff
**Insulin Initiation Pathway for People with Type 2 Diabetes**

### When to initiate insulin
- The aim of the treatment is to improve glycaemic control and quality of life.
- Oral hypoglycaemic agent (OHA) or GLP-1 prescription is to the maximum tolerated dose and desired HbA1c not achieved (< 59 mmol/mol)
- OHA not tolerated/contra-indicated
- Check concordance of medication OHA or GLP-1
- Symptoms related to poor glycaemic control
- Patient agrees to and understands the benefits of insulin therapy

### Before insulin therapy
- Reinforce dietary advice and discuss lifestyle issues and employment i.e. smoking and physical activity
- Check ability to administer own insulin / carers district nurse involvement
- Patients should be taught home blood glucose monitoring advice to monitor blood glucose at different times.
- Refer to specialist diabetes dietitian if appropriate
- Assess for diabetes related complications

### Different regimens which may be considered when initiating insulin therapy in people with Type 2 diabetes

<table>
<thead>
<tr>
<th>Basal Insulin with oral hypoglycaemic agents</th>
<th>Two to three times daily pre-mixed insulin with oral hypoglycaemic agents</th>
<th>Basal Bolus (QDS) consider referral to Diabetes specialist nurse to initiate this regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Overweight BMI &gt;26</td>
<td>➢ Regular lifestyles</td>
<td>➢ On daily/ bd insulin regimens without optimal control</td>
</tr>
<tr>
<td>➢ Reluctance to start insulin</td>
<td>➢ Eat similar amounts at similar times of the day</td>
<td>➢ Requiring flexibility due to an erratic lifestyle</td>
</tr>
<tr>
<td>➢ Unable to inject themselves</td>
<td>➢ OHAs are no longer stimulating efficient insulin production leading to post prandial high blood glucose level</td>
<td>➢ Shift work</td>
</tr>
<tr>
<td>➢ The older person with no complications but where hypoglycaemia is unacceptable</td>
<td>➢ Symptomatic</td>
<td>➢ Regular travel across time zones</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Regular sport</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ To optimise blood glucose control because of complications</td>
</tr>
</tbody>
</table>
Levels of Control

Generally the target HbA1C is < 59 mmol/mol or < 53 mmol/mol if there are complications present however each person should be assessed on an individual basis and targets set accordingly.

Who may not benefit from insulin therapy

The target of 59mmol/mol may not be appropriate for all and the risk of hypoglycaemia must be balanced against the target. HbA1c is not always relevant if life expectancy is limited

Some obese people may not benefit from insulin therapy because insulin can lead to further weight gain with little or no improvement in HbA1c. Could lifestyle issues such as change in their diet, more exercise, or the use weight reducing agent like orlistat be explored?

People whose oral hypoglycaemic therapy regimen could be improved and titrated to the maximum doses

Reasons for Resisting Commencing Insulin Therapy

The decision when to start insulin therapy must be made in partnership with the patient keeping the Hba1c results in mind.

Lifestyle and employment issues must be discussed (HGV drivers may not wish or delay transfer to insulin as they will lose their HGV licence

Needle phobia accurate information may help people with needle phobia for example people may think that they need to find a vein to inject into or that the needle may be large. A demonstration of the pen device is therefore useful

People generally over estimate the risk of hypoglycaemia or be basing their ideas on stories on outdated treatments or equipment

Some people may believe that if they have no symptoms their diabetes is well controlled and that they are not at risk of complications

Training and Competencies

Prior to initiating insulin in Primary Care it is essential that Providers have:

- A health care professional who has already completed ENB 928 or the Diabetes Diploma.
- Undertaken Insulin initiation training either at The Crow Trees Centre, Idle, Bradford or by accessing locally developed training with support from the Diabetes Specialist Nurses.

Nurses involved in the initiation of insulin in primary care will be required to commit to attending at least one update session per year.

The training for insulin initiation will take three months to complete with a case study forum to finish. A forum to discuss case studies will be held six monthly to enable nurses to have regular updates particularly around new pen devices and insulin regimens and to share any problems they may be encountering in practice.

The training will be linked to the Skills for Health Diabetes competencies which in turn is linked to the knowledge and skills framework

Patients should be encouraged to take responsibility for their own care as far as possible. A good understanding of their own condition and how to treat it increases the chances of effective control of blood glucose levels, which will minimize the risk of complications. Educating people with diabetes, their carers, partners and families is therefore vitally important part of the nurse’s role

Different Regimens

There is no one ‘right’ choice and one regimen is not necessarily forever. If it unsuitable it should be changed. Negotiate with each individual the most appropriate form of treatment taking into consideration lifestyle and individual needs. Metformin should always be continued with all three regimens unless it is not tolerated or the patient has renal impairment and the serum creatinine is outside the normal range. Sulfonylurea should be discontinued after a period of six weeks when the dose of insulin has been titrated when using basal insulin. Pioglitazone is licensed in combination with insulin and it may be appropriate to be continued when insulin is commenced but the increased risk of fluid retention and heart failure should be taken into consideration.
Fasting blood glucose

<table>
<thead>
<tr>
<th>Action</th>
<th>3 - 5</th>
<th>5 - 7</th>
<th>&lt; 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10</td>
<td>Increase by 4 units</td>
<td>Increase by 2 units</td>
<td>No change</td>
</tr>
<tr>
<td>&lt;10</td>
<td>No change</td>
<td>Reduce by 2 units</td>
<td>Reduce by 4 units</td>
</tr>
<tr>
<td>5 - 7</td>
<td>No change</td>
<td>Reduce by 2 units</td>
<td>Reduce by 4 units</td>
</tr>
</tbody>
</table>

Once fasting targets achieved monitor hypoglycaemia and pre-meal values (target 6 mmol/l)
Recheck HbA1c in 3 months

At three months check – HbA1c remains out of target or an improvement of 10 mmol/mol has not been reached continue titration and recheck in a further three months

Criteria to define basal insulin failure

Those who require assistance from a carer or health care professional to administer their insulin injections
Those who would otherwise need twice daily human NPH insulin plus oral hypoglycaemic drugs to control their diabetes

Those with problematic hypoglycaemia
Those who cannot use the device to inject human NPH insulin

If at any time you wish advice on insulin initiation or adjustment contact the Diabetes Nurse Specialist (via e-consultation when available)

Consider adding in a rapid acting analogue to the basal insulin with the main meal or switching to a twice daily regimen - with support from the diabetes specialist nurse
Commence 10 units of a pre-mixed human biphasic insulin before breakfast and before evening meal (Humulin M3®, Insuman Comb 15®, Insuman Comb 25®, Insuman Comb 50®)

- Continue to take metformin if tolerated
- Stop sulfonylureas

Review on a regular basis 2 – 4 weeks to ensure patient understands and feels confident with the titration process

**Titration Process**

- Increase insulin every three - five days and review until individual targets are achieved
- Morning dose titrated against pre-lunch, pre evening meal blood glucose
- Evening dose titrated against pre bed and pre breakfast blood glucose
- Suggest 2 units increment increase up to 20 units, then consider 4 unit increments
- Target glucose 5 - 8 mmol/l before lunch/evening meal
- Target glucose 6 – 8mmol/l pre bed / 5.5 – 6mmol/l pre breakfast

Stop titrating when either the target is reached or the patient is experiencing hypoglycaemia
Consider using an insulin analogue mix if:

- Regular hypoglycaemic episodes are occurring
- Raised post prandial blood glucose levels

If at any time you wish advice on insulin initiation or adjustment contact the Diabetes Nurse Specialist (via e-consultation when available)

Review in three months if HbA1c remains out of target consider referral to Diabetes Nurse Specialists for further advice

Review on a regular basis 2-4 weeks to ensure patient understands and feels confident with the titration process
<table>
<thead>
<tr>
<th></th>
<th>INSULIN INITIATION CHECKLIST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tick Complete</td>
</tr>
<tr>
<td>1</td>
<td>Aims of treatment</td>
</tr>
<tr>
<td>2</td>
<td>Oral medication</td>
</tr>
<tr>
<td>3</td>
<td>Choice/use of pen</td>
</tr>
<tr>
<td>4</td>
<td>Name and type of insulin</td>
</tr>
<tr>
<td>5</td>
<td>Action of insulin</td>
</tr>
<tr>
<td>6</td>
<td>Timing of injections</td>
</tr>
<tr>
<td>7</td>
<td>Injection technique</td>
</tr>
<tr>
<td>8</td>
<td>Site rotation</td>
</tr>
<tr>
<td>9</td>
<td>Safe disposal of sharps</td>
</tr>
<tr>
<td>10</td>
<td>Storage of insulin</td>
</tr>
<tr>
<td>11</td>
<td>Self-adjustment of insulin</td>
</tr>
<tr>
<td>12</td>
<td>Hypoglycaemia – cause/symptoms/treatment</td>
</tr>
<tr>
<td>13</td>
<td>Hyperglycaemia – cause/symptoms/treatment</td>
</tr>
<tr>
<td>14</td>
<td>Ketone testing</td>
</tr>
<tr>
<td>15</td>
<td>Sick day rules</td>
</tr>
<tr>
<td>16</td>
<td>Meter used</td>
</tr>
<tr>
<td>17</td>
<td>Timing/frequency</td>
</tr>
<tr>
<td>18</td>
<td>Recording results</td>
</tr>
<tr>
<td>19</td>
<td>Interpreting results</td>
</tr>
<tr>
<td>20</td>
<td>Basic dietary advice</td>
</tr>
<tr>
<td>21</td>
<td>Alcohol</td>
</tr>
<tr>
<td>22</td>
<td>Dietitian referral</td>
</tr>
<tr>
<td>23</td>
<td>Physical activity</td>
</tr>
<tr>
<td>24</td>
<td>Smoking</td>
</tr>
<tr>
<td>25</td>
<td>Driving – DVLA/insurance/hypoglycaemia</td>
</tr>
<tr>
<td>26</td>
<td>Employment</td>
</tr>
<tr>
<td>27</td>
<td>Prescription exemption</td>
</tr>
<tr>
<td>28</td>
<td>Foot care/podiatry referral</td>
</tr>
<tr>
<td>29</td>
<td>Contraception/pregnancy/pre-pregnancy counseling</td>
</tr>
<tr>
<td>30</td>
<td>Holidays/travel</td>
</tr>
<tr>
<td>31</td>
<td>Insulin Passport information leaflet and insulin passport/ID card</td>
</tr>
<tr>
<td>32</td>
<td>Local support groups</td>
</tr>
</tbody>
</table>
Once Daily Basal Insulin

Human NPH (isophane) insulin is the preferred first choice insulin recommended by NICE for Type 2 diabetes. For most people with Type 2 diabetes long acting insulin analogues offer no significant advantage over NPH insulin.

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Insulin</th>
<th>Device</th>
<th>Needles</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once daily</td>
<td>Humulin I</td>
<td>Luxura (3ml cartridges)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humulin I Kwikpen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once daily</td>
<td>Insulatard</td>
<td>Innolet, Novopen 4</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Once daily</td>
<td>Insuman Basal</td>
<td>Solostar (pre-filled disposable)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Once daily</td>
<td>*Lantus (Glargine)</td>
<td>Solostar (Disposable)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Once daily</td>
<td>*Levemir (Detemir)</td>
<td>Flexpen, Novopen 4</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
</tbody>
</table>

Twice Daily Pre-mixed Insulin

Short acting insulin analogue mixtures are available such as Novomix 30 or Humalog 25 and MIX 50 they have advantages for the patients because they don’t need to wait before eating and control post prandial glucose.

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Insulin Biphasic Mixture</th>
<th>Device</th>
<th>Needles</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twice daily</td>
<td>Insuman Comb 15</td>
<td>ClikSTAR pen device (3ml cartridge)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Twice daily</td>
<td>Insuman Comb 25</td>
<td>Solostar pen device(pre-filled disposable)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Twice daily</td>
<td>Insuman Comb 50</td>
<td>ClikSTAR pen device (3ml cartridge)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Twice daily</td>
<td>Humulin M3</td>
<td>Kwikpen 3ml cartridge – Luxura</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Twice daily</td>
<td>*Humalog Mix 25</td>
<td>Humapen Luxura (3ml cartridges)</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Twice daily</td>
<td>*Humalog Mix 50</td>
<td>Humalog Mix 50 Kwik pen</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Twice daily</td>
<td>*Novomix 30</td>
<td>Flexpen Novopen 4</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
</tbody>
</table>

* Analogue insulins

Multiple Daily Injection Regimen (Basal Bolus)

Most often used in patients with Type 1 diabetes but is also used in patients with Type 2 diabetes. Short acting insulin or rapid acting analogues before each meal and basal insulin; either once or twice daily isophane or long acting analogue Lantus (glargine) or Levemir (detemir).

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Insulin Analogue</th>
<th>Device</th>
<th>Needles</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analogue</td>
<td>*Humalog</td>
<td>Luxura (3ml cartridge) Kwikpen</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
<tr>
<td>Rapid Acting</td>
<td>*Novorapid</td>
<td>Flexpen Novopen 4</td>
<td>BD microfine</td>
<td>4mm/5mm</td>
</tr>
</tbody>
</table>

Needle clipping device (BD safe clip)
A clipper which will remove needles from their hubs and a container from which cut-off needles cannot be retrieved.

Sharps disposal
A 1 litre sharps bin is available on a prescription FP10
To arrange sharps disposal contact: Wakefield 0845 8506506
**Injection Sites**

The most common injection sites are the abdomen (or stomach) and thighs. The back of the upper arms, and the upper buttocks, and the outer side of the thighs are also used. These sites are the best to inject into for two reasons:

- They have a layer of fat just below the skin to absorb the insulin, but not many nerves - which means that injecting there will be more comfortable than injecting in other parts of their body.

- They make it easier to inject into the subcutaneous tissue, where insulin injection is recommended.

Depending on the body type, certain injection sites work better than others.

- There is some debate regarding use of upper-arms – use 5mm needles
- Use 5mm needles where pinching up half an inch is difficult due to lack of body fat
- Advise to consistently use the same part of the body for each of the daily injections, e.g. abdomen for thigh for morning injections and abdomen for evening injections.
- Advise to rotate the insulin injection sites within the area to avoid developing lipo hypertrophy
- Advise to change needles for each injection
- Advise to monitor blood glucose levels closely when changing injection sites

**Note:** Hot and cold weather, a hot bath or shower, other sources of heat affect absorption rates as well as exercise.
Driving

The role of the Drivers Medical Group at the Driver and Vehicle Licensing Agency (DVLA) is to promote road safety by establishing whether drivers who have medical conditions can satisfy the medical standards required for safe driving.

Drivers do not need to tell DVLA if their diabetes is treated by tablets, diet or both and they are free of the complications listed below.

Some people with diabetes develop associated problems that may affect their driving.

What should the patient inform DVLA about?

By law we must be informed if any of the following apply:

- treatment with insulin
- more than one episode of disabling hypoglycaemia requiring the assistance of another person in the preceding 12 months.
- laser treatment to both eyes, or in the remaining eye if there is sight in one eye only
- problems with vision in both eyes, or in the remaining eye if there is sight in one eye only. (By law, the patient must be able to read, with glasses or contact lenses if necessary, a car number plate in good light at 20.5 metres (67 feet) or 20 metres (65 feet) where narrower characters (50mm wide) are displayed)
- problems with the circulation, or sensation in the legs or feet which makes it necessary to drive certain types of vehicles only, for example, automatic vehicles or vehicles with a hand operated accelerator or brake. This should be shown on the persons driving licence
- impaired awareness of hypoglycaemia
- disabling hypoglycaemia at the wheel
- an existing medical condition gets worse development of any other condition that may affect safe driving

Treatment with GLP-1 or Gliptins

GLP-1’s have been licensed as a treatment for use in type 2 diabetes, in combination with metformin and or sulfonylureas/pioglitazone. Trials published to date show a small but significant risk of hypoglycaemia when exenatide is used in conjunction with a sulfonylurea. It would also appear that when the gliptins (DPP4 inhibitors) or liraglutide are used with sulfonylureas, the hypoglycaemia risk is similarly raised.

The increased risk of hypoglycaemia from exenatide, liraglutide or gliptins when used in combination with sulfonylureas is such that these are felt to be a potentially high risk treatment for drivers holding Group 2 (LGV or PCV) licences and that individual assessment will be required.

Group 2 drivers are required to notify DVLA if they have diabetes treated with tablets. If they are then started on exenatide, liraglutide or a gliptin they are only required to notify DVLA if this is in combination with a sulfonylurea.

The use of exenatide, liraglutide or gliptins currently carries no specific driving restrictions for Group 1 (car or motorcycle) licences. [DVLA website](http://www.dft.gov.uk/dvla/)
Motor Insurance

Since the Disability Discrimination Act (1995) came into effect at the end of 1996, insurers can only refuse cover or charge more for cover if they have evidence of increased risk. Most of the evidence available about drivers with diabetes indicates that they are at no higher risk than any other driver. As a result of this many insurance companies no longer ask about diabetes when applying for insurance.

When applying for motor insurance, diabetes must be declared. Insurance companies should also be informed if there are any changes to the condition or its treatment. Failure to do so can invalidate cover in the event of a claim. Failure to notify the DVLA/DVA can also invalidate cover.


Advise to patients using sulfonylureas/insulin regarding driving and hypoglycaemia:

➢ Always test blood glucose before driving
➢ If you feel you are going hypo, pull over and stop the car, as soon as it is safe to do so
➢ Remove the keys from the ignition
➢ Leave the driving seat and treat the hypo in the usual way
➢ Do not attempt to start driving again until you are certain your blood glucose level has risen again
TREATING HYPOGLYCAEMIA

At first warning of episode of hypoglycaemia:

Immediately treat with a 15-20g of a short-acting carbohydrate such as:

- 100-120 mls of Lucozade
- 200mls of non-diet drink
- 4-5 glucose tablets
  - jelly babies
- 200mls of fruit juice

If the hypo is more severe, and the patient cannot treat themselves:

- applying Glucogel (or treacle, jam or honey) on the inside of cheeks and gently massaging the outside of cheeks.
- if unconscious, Glucagon can be injected if the person treating has been trained to use it. Otherwise call an ambulance immediately

Important:

If unable to swallow or unconscious, do not give anything by mouth (including Glucogel, treacle, jam or honey). Make sure family and friends are aware of this. If unconscious, place patient in the recovery position (on side with head tilted back) so that tongue does not block throat.

Follow-on treatment:

To prevent blood glucose levels dropping again, follow sugary foods with 10-20g of a longer-acting carbohydrate such as:

- half a sandwich
- fruit
- a small bowl of cereal
- biscuits and milk
- the next meal if due

Patients experiencing regular episodes of hypoglycaemia require prompt review by the diabetes team.

Severe episodes of hypoglycaemia require urgent review by the diabetes team.
**RETINOPATHY – SCREENING AND EARLY MANAGEMENT**

**Introduction**

Diabetic retinopathy is the leading cause of blindness in people under the age of 60 in industrialised countries. It is also a major cause of blindness in older people.

Many people will be asymptomatic until the disease is very advanced. After 20 years from the onset of diabetes, almost all people with Type 1 diabetes and more than 60% of people with Type 2 diabetes will have diabetic retinopathy. Nearly one if five people with Type 2 diabetes will have a significant degree of diabetic retinopathy at the time when diabetes is diagnosed.

The risk of visual impairment and blindness is substantially reduced by a care programme that combines methods for early detection with effective treatment of diabetic retinopathy. The key issue in screening for diabetic retinopathy is to identify those people with sight-threatening retinopathy who may require treatment to prevent visual loss. In 2001 the policy for screening for diabetic retinopathy was clearly set out in the National Service Framework for Diabetes with the introduction of a national screening programme. Within the local area retinal screening has been commissioned by the Wakefield and Kirklees PCTs to provide comprehensive coverage to the area served by the Diabetes Network.

Screening and treatment for diabetic retinopathy will not eliminate all cases of sight loss, but can play an important part in minimising the numbers of patients with sight loss due to retinopathy.

**Referral and Screening**

All people with diabetes aged 12 years and over should be referred into the screening programme using the appropriate referral form. These forms are available electronically on request to the programme administrators. However, in a small number of circumstances, it may be appropriate to decide that a patient is not suitable for screening. This should only be done after careful assessment of the person and their circumstances (see guidance notes). In all cases where patients are excluded from screening their details should still be provided to the retinal screening programme for reporting purposes with an indication of whether the exclusion is permanent or temporary. In all other circumstances, people with diabetes will be sent an annual invitation for screening and given the opportunity to make their own informed choice about whether to accept on each and every occasion that screening is offered.

All screening is carried out by digital photography unless patients are referred by the screening programme into the biomicroscopy clinic where retinal examination is undertaken with a slit lamp.

Screening takes place at fixed sites throughout the district by accredited retinal screeners. Patients are invited to attend the most convenient site to their registered General Practice.

All screening results are sent to the patients GPs which assists in their diabetes management when disease is detected.
Patients registered within the retinal screening programme follow the pathway of care outlined below by the National Screening Committee (NSC).

This links with the NSC and NICE guidelines for the early treatment of diabetic retinopathy from the identification of the presence of diabetes through to referral into a screening programme, grading and referral for treatment or back into the screening programme.

### RETINAL SCREENING PATHWAY OF CARE

<table>
<thead>
<tr>
<th>On Diagnosis of Type 1 or Type 2 diabetes, examine eyes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Record best corrected visual acuity, with spectacles or pinhole as appropriate</td>
</tr>
<tr>
<td>➢ Dilate pupils with Tropicamide</td>
</tr>
<tr>
<td>➢ Examine for diabetic retinopathy using 2-field digital photography</td>
</tr>
</tbody>
</table>

| ➢ Optimise diabetes control |
| ➢ Manage retinopathy according to severity: |
| ➢ Routine diabetes care |
| ➢ Maintain good blood glucose control |
| ➢ Maintain good blood pressure control |
| ➢ Annual screening |

### Background Retinopathy

| ➢ Microaneurysm |
| ➢ Retinal haemorrhage (s) |

<table>
<thead>
<tr>
<th>R1</th>
<th>Routine diabetes Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arrange annual screening</td>
</tr>
</tbody>
</table>

### Pre-proliferative retinopathy

| ➢ Venous beading, venous loop or reduplication |
| ➢ Intraretinal microvascular abnormality (IRMA) |
| ➢ Multiple deep, round or blot haemorrhages |
| (CWS – careful search for above features) |

<table>
<thead>
<tr>
<th>R2</th>
<th>Achievable standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% seen by ophthalmologist in &lt;13 weeks</td>
</tr>
<tr>
<td></td>
<td>Minimum Standard</td>
</tr>
<tr>
<td></td>
<td>70% seen by ophthalmologist in &lt;13 weeks</td>
</tr>
</tbody>
</table>

### Maculopathy

| ➢ Exudates within 1 disc diameter (DD) of the centre of the fovea |
| ➢ Circinate or group of exudates within the macula |
| ➢ Retinal thickening within 1DD of the centre of the fovea (if stereo available) |
| ➢ Any microaneurysm of haemorrhage within 1DD of the fovea only if associated with a best VA of ≤ 6/12 (if no stereo) |

<table>
<thead>
<tr>
<th>M1</th>
<th>Achievable standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% seen by ophthalmologist in &lt;13 weeks</td>
</tr>
<tr>
<td></td>
<td>Minimum Standard</td>
</tr>
<tr>
<td></td>
<td>70% seen by ophthalmologist in &lt;13 weeks</td>
</tr>
</tbody>
</table>

### Proliferative retinopathy / rubeosis iridis

| ➢ New vessels on disc (NVD) |
| ➢ New vessels elsewhere (NVE) |
| ➢ Pre-retinal or vitreous haemorrhage |
| ➢ Pre-retinal fibrosis ± tractional retinal detachment |

<table>
<thead>
<tr>
<th>R3</th>
<th>Achievable Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% seen by Ophthalmologist in &lt; 2 weeks</td>
</tr>
<tr>
<td></td>
<td>Minimum Standard</td>
</tr>
<tr>
<td></td>
<td>70% seen by ophthalmologist in &lt; 2 weeks</td>
</tr>
</tbody>
</table>

### Very Urgent

| ➢ Sudden loss of vision |
| ➢ Retinal detachment |

|    | Emergency referral to ophthalmologist (same day) |
Ungradable Images

In a small minority of patients attending for retinal photography, it may not be possible to obtain clear images of their eyes and these patients are categorised as “technical failures”. Reasons may include inadequate dilation, dense cataract etc. In such cases patients will be referred into the dedicated biomicroscopy clinic where examination with a slit lamp will be carried out by an experienced member of the retinal screening team.

Feedback

Full disease grading is carried out by the dedicated team of retinal screener/graders overseen by internal and external quality assurance. Patients and health care providers should expect to receive written feedback within approximately two weeks of attendance.

Medical Treatment

Blood pressure

Tight blood pressure control is particularly important in retarding the development and progression of eye disease and the prevention of visual impairment. **The minimum target for blood pressure should be <140/80 mm/Hg but ideally <130/75 mm/Hg.**

Glycaemic control

Tight glycaemic control also has a beneficial effect on the development and progression of eye disease and the prevention of visual impairment. **The minimum target for HbA1c should be <59mmol/mol or ideally <53mmol/mol.** It is important to note that in patients with severe background or significant retinopathy rapid tightening of glycaemic control can lead to rapid progression to high risk proliferative retinopathy.

- In a patient with unknown retinopathy status and poor glycaemic control, retinal screening should be performed before tightening up glycaemic control.
- As it takes years for the complications of diabetes to occur, it would seem prudent for glycaemic control to be improved gradually over 6-12 months in such at risk patients.

Laser treatment

Laser treatment is an effective treatment for proliferative retinopathy and will prevent the majority of people developing significant visual impairment.

However the outcome of laser treatment is dependent upon the severity of retinopathy and its impact on vision. For example if people enter into laser treatment with poor vision the likelihood of visual improvement is greatly reduced.
### Retinal Screening Referral Form

<table>
<thead>
<tr>
<th><strong>Name</strong> (attach demographic printout if available)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr / Mrs / Ms / Master / Miss / Dr</td>
<td>--</td>
</tr>
<tr>
<td><strong>D.O.B</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>Postcode</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>Telephone number</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>NHS Number</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>Registered GP/ Practice</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>Diabetes Type / Diagnosed</strong></td>
<td>Type 1 □ Type 2 □ Date Diagnosed: …………</td>
</tr>
<tr>
<td><strong>Suitable for retinal photography (see exclusion notes)</strong></td>
<td>YES □ NO □</td>
</tr>
</tbody>
</table>
| If NO state reason: ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………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SCREENING / REFERRAL CRITERIA

WHO : All people with diabetes aged 12 years and over

WHEN : Refer at diagnosis
Screening will be performed at least annually

PATIENTS REQUIRING SPECIAL CONSIDERATION

In a small number of circumstances it may be appropriate to decide that a patient is not suitable for diabetic retinopathy screening. This should only be done after a careful assessment of the person and their circumstances.

<table>
<thead>
<tr>
<th>Patients receiving specialist eye care</th>
<th>Physical disabilities</th>
<th>Learning and mental disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>These patients may be exempt from screening once it has been established that they are attending ophthalmology and it has been identified that retinal examination has been carried out there. In such cases these patients should be identified to the screening programme as under ophthalmology care and the responsibility will fall with the screening programme to liaise with ophthalmology regarding continuing care.</td>
<td>Some patients with physical disabilities may prevent them from achieving a position where a diagnostic image of the eye can be obtained. This may include medical conditions which prevent the head from being steady for sufficiently long to assess the eyes properly. In these circumstances the situation should be explained to the patient and should only be excluded if their disabilities are unlikely to improve.</td>
<td>Every effort should be made with the carers and relatives to facilitate the explanation of the procedure. However, some patients may become distressed when the procedure is attempted. In these circumstances the screening activity will cease and the GP informed and the situation reconsidered at the next screening interval. Mental disability may be a temporary condition and this should be taken into account when considering exempting the patient.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminal illness</th>
<th>Informed choice</th>
<th>Note of caution!</th>
</tr>
</thead>
</table>
| Patients should be referred and invited for as long as they are able to participate in screening. Discretion should be exercised by the GP/Practice Nurse referring the patient as to not cause undue distress. | If a patient requests to be withdrawn from the screening programme permanently, the healthcare professional receiving this information should ensure the patient has had sufficient information to make informed choice. That person should inform the programme of their decision in writing. Consider asking whether the patient would want to be invited in future. | Screening outside the NHS programme

Patients who have their eyes screened outside the NHS should not be excluded from the programme. Patients will continue to receive an invitation for screening at the routine interval so they can decide whether or not to attend.

For reporting purposes, where patients fall into any of the above categories, their details should still be provided to the retinal screening programme on a referral form with the reason for exclusion clearly stated.
FOOT CARE IN DIABETES

Patients should have foot screening at a frequency and by a healthcare professional appropriate to their needs. Routine foot screening will be provided by appropriate health care professionals in Primary Care with referral on to podiatrists and Specialist Care guided by specific and explicit triggers. In this way, patients with simple needs will not need to routinely see podiatrists, and patients with complex needs will be managed by a specialist multidisciplinary foot team.

Principles

- All patients will have regular reviews of their feet
- Foot review will be carried out by appropriately trained staff
- Footcare education will be provided to individuals according to their clinical and personal needs
- Patients will be regularly screened for their risk of foot ulceration and be classed as GREEN, AMBER, RED or ULCERATED

Process

- Annual Review of feet for all patients with diabetes from diagnosis
- Standard simple annual review examination
- Colour-coded risk stratification of patients according to findings
- Subsequent management dependant on risk group

Routine foot assessment

Examination of a patient previously classified as GREEN risk or of a patient with newly-diagnosed Type 2 diabetes mellitus should include:

- Inspection for any abnormality
- 10g monofilament sensation
- Palpation of foot pulses
- Examination of footwear

Based on this assessment the patient will be allocated to a risk group using Table 1.

Clinical management for each risk group will be as outlined in Table 2.
Table 1: **Risk Stratification of patients with diabetes mellitus**

Patients will be categorised into one of 4 risk groups based on the foot assessment.

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk</th>
<th>Definition</th>
<th>Management on page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>Normal</td>
<td>Normal 10g monofilament (MF) sensation AND Normal foot pulses</td>
<td>53</td>
</tr>
<tr>
<td>AMBER</td>
<td>Increased</td>
<td>Decreased 10g MF sensation or absent foot pulse No callous deformity or redness</td>
<td>54</td>
</tr>
<tr>
<td>RED</td>
<td>High</td>
<td>As for AMBER PLUS at least one of: Deformity Persisting redness of a pressure area Callus OR previous foot ulcer</td>
<td>56</td>
</tr>
<tr>
<td>ULCERATED</td>
<td>Proven</td>
<td>Presence of an active foot ulcer</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 2: **Overview of foot screening and risk identification**

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Risk Level</th>
<th>Assessment Frequency</th>
<th>Assessor</th>
<th>Information Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>Normal</td>
<td>Annual</td>
<td>Usual Diabetes Care Provider*</td>
<td>Green</td>
</tr>
<tr>
<td>AMBER</td>
<td>Increased</td>
<td>3-6 monthly</td>
<td>Usual Diabetes Care Provider*</td>
<td>Amber</td>
</tr>
<tr>
<td>RED</td>
<td>High</td>
<td>1-3 monthly</td>
<td>Podiatrist</td>
<td>Red</td>
</tr>
<tr>
<td>ULCERATED</td>
<td>High</td>
<td>1-2 weekly</td>
<td>Specialist Foot Team</td>
<td>Ulcerated</td>
</tr>
</tbody>
</table>

* Please note that these patients do not need to see a podiatrist.
Primary Care Team
Assessment to include:
- Testing of foot sensation
- Palpation of foot pulses
- Inspection for deformity
- Inspection of footwear

Normal sensation and pulses

Low risk GREEN
Management by primary care team
Agree management plan including foot care education
Arrange call and recall
Annual review

Absent pulse or sensation. No callus deformity or redness
Increased risk AMBER
Management by primary care team
3-6 monthly reviews
Enhanced foot care education

If previous ulcer or as amber plus deformity
High risk RED
Management and frequent review by podiatrist 1-3 monthly
Enhanced foot care education
Refer to podiatry clinic

Foot ulcer present
Refer promptly to foot clinic/diabetes centre within 24 hours if a new ulcer

Absent foot pulses
Symptomatic eg intermittent claudication or rest pain
Yes
Start secondary prevention i.e. statin and aspirin
No
Vascular surgery referral
The Normal Risk Foot (GREEN)

What is the normal risk foot?

A normal risk foot has normal pulses, normal monofilament sensation, no history of ulceration and no significant deformity.

Annual review of the normal risk foot

Examination of a patient previously classified as GREEN risk or in a patient with newly diagnosed Type 2 diabetes mellitus should include:

- Inspection for abnormality
- 10g monofilament sensation
- Palpation of foot pulses
- Examination of footwear

Who should assess the normal risk foot?

A health care professional trained to examine foot pulses and monofilament sensation should carry out the annual assessment. There is no need for a patient with a normal risk foot to routinely see a podiatrist.

What should be done if deformity is found in a normal risk foot?

Foot deformity may not need any action but if it is severe and interferes with the function of the foot or the ability to obtain appropriate footwear then the patient may be referred. This should initially be to a community podiatrist for advice.

Non-diabetic foot problems

If there is foot pathology unrelated to diabetes, for example nail conditions, corns or callous then these people should be offered referral to podiatry services for treatment but remain within the GP recall system for annual review.

Education

Foot care education of the GREEN risk patient should cover:

- Nail care
- Emollient use
- Footwear
- The need for daily self-examination of the feet
- What to do and who to contact if foot problems develop
- The GREEN Normal Risk Foot Information sheet should be given to the patient
The Increased Risk Foot (AMBER)

What is the AMBER risk foot?

An increased (AMBER) risk foot has either a reduction in monofilament sensation or the loss of at least one foot pulse. There must be no history of ulceration and no significant deformity.

3-6 monthly review of the increased (AMBER) risk foot

Examination of a patient previously classified as AMBER risk should include:

- Inspection for abnormality
- 10g monofilament sensation
- Palpation of foot pulses
- Examination of footwear

Who should assess the AMBER risk foot?

A health care professional trained to examine foot pulses and monofilament sensation should carry out the annual assessment. There is no need for a patient with an AMBER risk foot to see a podiatrist routinely.

What should be done if deformity is found in an AMBER risk foot?

The finding of deformity in an AMBER risk foot indicates that the foot is at greater risk and should be classified as RED (High Risk). A referral to the podiatrist should be made. If accommodating footwear is required then refer to orthotics.

Non-diabetic foot problems

If there is foot pathology unrelated to diabetes, for example nail conditions, corns or callous then these people should be offered referral to podiatry services for treatment but remain within the GP recall system for annual review.

Education

Foot care education of the AMBER risk patient should cover:

- Nail care
- Emollient use
- Footwear
- Checking bath temperature
- Checking footwear and hosiery before putting them on
- Not walking in bare feet
- “Breaking shoes” in gradually
- Avoidance of home remedies e.g. corn plasters
- The need for daily self-examination of the feet
- What to do and who to contact if foot problems develop
- The AMBER (Increased Risk) Foot Information sheet should be given to the patient
The High Risk Foot (RED)

What is the RED risk foot?

A high (RED) risk foot has deformity plus either a reduction in monofilament sensation or the loss of at least one foot pulse. If there is a history of ulceration then the foot is RED risk automatically.

1-3 monthly review of the high (RED) risk foot

Examination of a patient classified as RED risk should include:

- Inspection for abnormality
- 10g monofilament sensation
- Palpation of foot pulses
- Examination of footwear

Who should assess the RED risk foot?

A community podiatrist should review the RED risk foot every 1-3 months. There is no routine need for other healthcare staff to examine the feet unless a new problem develops.

What actions should follow from the foot review?

If ulceration is present then refer within 24 hours to the multidisciplinary secondary care foot clinic – see Referral Information for list of contacts). Otherwise, review educational needs of the patient.

What should be done for deformity in the RED risk foot?

The community podiatrist will perform a thorough examination of the foot to document deformity.

Education

Foot care education of the RED risk patient should cover:

- Nail care
- Emollient use
- Footwear
- Checking bath temperature
- Checking footwear and hosiery before putting them on
- Not walking in bare feet
- “Breaking shoes” in gradually
- Avoidance of home remedies e.g. corn plasters
- Avoidance of constrictive hosiery e.g. garters
- The need for daily self-examination of the feet
- What to do and who to contact if foot problems develop
- Importance of good glucose control
- Highlight that a break in the skin is potentially serious
- The RED (High Risk) Foot Information sheet should be given to the patient
The Ulcerated Foot

Immediate management in primary care of the newly-diagnosed ulcer

- **REFERRAL:** All ulcerated feet should be referred to the Foot Clinic **urgently** by telephone or fax (see Referral Information for contact details). Patients will be seen within 24 hours or on the next working day.

- If there are clinical signs of infection, **start antibiotics immediately** (see Antibiotic Guidance for Primary Care).

- If there are clinical signs of severe infection then the patient should be admitted urgently for parenteral treatment.

- Once a foot ulcer has occurred the patient will remain in the High Risk (Red) category subsequently.

Subsequent management by the multi disciplinary team

To optimise the chances of ulcer healing, treatment will be directed at the following areas:

- Control of infection
- Regular weekly wound care by a podiatrist
- Multidisciplinary management
- Vascular status
- Off-loading
- Footwear
- Glycaemic control
- Education
- Ulcer secondary prevention
- Vascular secondary prevention

Monofilament Testing

Screening for significant sensory neuropathy uses nylon monofilaments which provide an easy and reliable method to identify those patients at increased risk of developing foot ulceration.

Monofilaments consist of a plastic handle connected to a nylon monofilament which will buckle at a force of 10g when applied perpendicular to the foot. If a patient cannot feel this pressure then protective sensation has been lost.

*How to test?*

- The examination should take place in a quiet and relaxed setting.
- Lay the patient flat.
- Ask the patient to close their eyes.
- Do not apply to any site where a callus or ulceration is present
The four testing sites are (see Figure 1)

- the plantar aspect of the great toe
- the plantar aspect of the middle toe
- the plantar aspect of the little toe
- the plantar aspect of the first metatarsal head

- Additional optional sites are the surface of the heel and the dorsum of the foot
- Apply the monofilament perpendicular to the surface of the skin until it buckles and record the patient’s response (See Figures 2)
- If negative repeat the procedure twice more at the same point
- Failure to feel the filament at any tested site indicates significant sensory loss

Figure 1

Figure 2

Diagram A

Diagram B
Caution: Studies of the performance of commercially available products have revealed variability in accuracy, reliability and sensitivity of monofilaments. The best monofilaments in the tests were those made by either Bailey Instruments or Owen Mumford, and it is recommended that only these are used (Booth et al 2000). The purchase of several filaments is recommended.

Suppliers of Monofilaments

Owen Mumford
Brookhill
Woodstock
Oxfordshire
OX20 1TU
01993812021

Bailey Instruments
527 Wilbraham Rd
Chorlton cum Hardy
Manchester
M21 OUF
01618605849

Reference

Booth J, Young MJ: Differences in the performance of commercially available 10g monofilaments. Diabetes Care 23(7):984-988, 2000

Foot Pulses

Palpation of the pulses forms an important part of the assessment of the arterial blood supply of the lower limb. There are two main foot pulses which need to be tested.

Dorsalis Pedis: Place your fingers half way down the dorsum of the foot on the bony area in the line between the first and second toes. The bones you can feel are the dorsal aspect of the navicular and the intermediate cuniform bones. The dorsalis pulse is palpated where the dorsalis pedis artery passes over this area.

Posterior Tibial: Locate the medial malleolus, 2-3cm below and behind it you should find the posterior tibial pulse. The pulse is palpated using the pulps of the index and middle fingers. The artery is slightly deeper placed than the dorsalis pedis and therefore more concentration is often required to feel its pulsations.
Antibiotic Guidance for Primary Care

<table>
<thead>
<tr>
<th>Illness</th>
<th>Comments</th>
<th>Drug</th>
<th>Dose</th>
<th>Duration of TX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetic Foot Ulcer Infection</td>
<td>All non healing ulcers/acute limb threatening ulcerations should be referred to the specialist diabetes foot clinics for multidisciplinary care. Wound samples should not be taken routinely but cleaning of the wound followed by a thorough swabbing of the wound bed is deemed practicable in the community.</td>
<td>Non-limb threatening Flucloxacillin +/- Amoxicillin (Clindamycin if penicillin allergic) Deep infections including osteomyelitis Clindamycin and Ciprofloxacin</td>
<td>500mg QDS PO 500mg TDS PO 300mg QDS PO 300mg QDS PO 500mg BD PO</td>
<td>1 – 2 weeks 2 – 4 weeks (4 -6 weeks if Osteomyelitis)</td>
</tr>
</tbody>
</table>

Modify antibiotic treatment on the basis of sensitivities and/or clinical response

Note: Doses are oral and for adults. Please refer to the BNF for further information

Reference

Antimicrobial Guidelines for Primary Care – for use in NHS Calderdale, NHS Kirklees and NHS Wakefield District
February 2008

Dressings Policy

Choosing the correct dressing to facilitate effective wound management requires both an understanding of the process of tissue repair, knowledge of the properties of the dressings available and an understanding of the complications of diabetes and mechanics of the foot.

61
The principle reasons for applying a dressing are as follows:

- To produce rapid and cosmetically acceptable healing
- To remove or contain odour
- To reduce pain
- To prevent or combat infection
- To contain exudates
- To cause minimal distress or disturbance to the patient

For guidance on the appropriate dressings to use in the treatment of ulcers please refer to the district-wide “Trust Wound Management Formulary”.

Referral Information

<table>
<thead>
<tr>
<th>NHS Wakefield District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community podiatry</strong></td>
</tr>
<tr>
<td>Podiatry Department</td>
</tr>
<tr>
<td>Castleford, Normanton and District Hospital</td>
</tr>
<tr>
<td>Lumley Street</td>
</tr>
<tr>
<td>Hightown</td>
</tr>
<tr>
<td>Castleford WF10 5LT</td>
</tr>
<tr>
<td>Tel 01977 605535</td>
</tr>
<tr>
<td>Fax 01977 605501</td>
</tr>
<tr>
<td><strong>Vascular surgery</strong></td>
</tr>
<tr>
<td>Vascular Surgery Department</td>
</tr>
<tr>
<td>Pinderfields General Hospital</td>
</tr>
<tr>
<td>Aberford Road</td>
</tr>
<tr>
<td>Wakefield WF1 4DG</td>
</tr>
<tr>
<td>Tel 01924 213848</td>
</tr>
<tr>
<td><strong>Microbiology</strong></td>
</tr>
<tr>
<td>Mid Yorkshire Hospitals NHS Trust – 0844 8118110</td>
</tr>
<tr>
<td>Consultant Microbiologists</td>
</tr>
<tr>
<td>Pinderfields General Hospital – Dr Aneel Sohal – ext 57048, Dr Viv Peiris – ext 57051, Dr Adekola Adegeji – ext 57049</td>
</tr>
<tr>
<td>Microbiology Laboratory – ext 57144</td>
</tr>
<tr>
<td><strong>Orthotics</strong></td>
</tr>
<tr>
<td>Orthotics Department</td>
</tr>
<tr>
<td>Pontefract General Infirmary</td>
</tr>
<tr>
<td>Southgate</td>
</tr>
<tr>
<td>Pontefract WF8 1PL</td>
</tr>
<tr>
<td>Tel 01977 747915</td>
</tr>
<tr>
<td>Fax 01977 747921</td>
</tr>
<tr>
<td><strong>Foot clinic</strong></td>
</tr>
<tr>
<td>Diabetes Centre</td>
</tr>
<tr>
<td>Pinderfields General Hospital</td>
</tr>
<tr>
<td>Aberford Road</td>
</tr>
<tr>
<td>Wakefield WF1 4DG</td>
</tr>
<tr>
<td>Tel 01924 213904</td>
</tr>
<tr>
<td>Fax 01924 214977</td>
</tr>
<tr>
<td>Diabetes Centre</td>
</tr>
<tr>
<td>Pontefract General Infirmary</td>
</tr>
<tr>
<td>Grove Road</td>
</tr>
<tr>
<td>Pontefract WF8 1PL</td>
</tr>
<tr>
<td>Tel 01977 747930</td>
</tr>
<tr>
<td>Fax 01977 747921</td>
</tr>
</tbody>
</table>
Footwear

Introduction

Preliminary evidence suggests that the provision of custom-made shoes reduces the risk of further ulceration in those patients with previous ulceration. For the remaining population, however, it is not cost effective and patients should be encouraged to provide their own good-fitting footwear.

Footwear can be divided into four categories:

- Sensible high street shoes
- Ready made off-the-shelf extra-depth footwear
- Custom made or bespoke footwear
- Temporary offloading footwear for the ulcerated foot

Sensible high street shoes (For GREEN and AMBER feet)

<table>
<thead>
<tr>
<th>The sensible high street shoe should:</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Have a long, broad and deep toe box, which fits well and doesn’t rub the toes</td>
</tr>
<tr>
<td>➢ Fastening should be adjustable (lace, strap or Velcro) and come high up the foot</td>
</tr>
<tr>
<td>➢ The shoe should conform to the shape of the foot</td>
</tr>
<tr>
<td>➢ Heel height should be less than four centimeters</td>
</tr>
<tr>
<td>➢ The inner linings should be smooth with no rough seams or stitching</td>
</tr>
</tbody>
</table>

Ready made off the shelf shoes (for feet with deformity, such as RED feet)

| ➢ Available in the district from the Mid Yorkshire Hospitals NHS Trust Appliances Department and prescribed through the GP appliance referral |
| ➢ Ready-made, off the shelf extra-depth shoes contain cushioning insoles which are flat non-moulded insoles of microcellular rubber |
| ➢ Moulded inlays can be requested through the Appliance Department or from the community podiatry department |
| ➢ Deformities of the foot include any loss of fatty tissue, toe or joint abnormality, amputation and any finding suggestive of excessive pressure points or callus formation. |

Customised or bespoke shoes required in cases of gross deformity (for Charcot feet or previously ulcerated feet i.e. some RED feet).

| ➢ These shoes accommodate the shape of the foot and can house cradled (moulded) inlays to redistribute weight-bearing from vulnerable pressure areas. |
| ➢ They will be provided to all those attending the multidisciplinary foot clinic, if required, following resolution of a foot ulcer. |
| ➢ Once a patient enters this category, custom shoes should be a life-long provision and will need monitoring by the community podiatrist and primary care team. |

Temporary ready made shoes (for ulcerated feet)

| ➢ Provided by the multidisciplinary foot clinic as needed |
| ➢ Polyurethane, velcro-fastening shoes which may or may not provide forefoot or rear foot offloading |
| ➢ Designed to accommodate bulky wound dressings |
Patient Information Sheets

Specific patient information sheets are available for each of the GREEN, AMBER AND RED risk groups and these should be given to the patient to support the education process.

The information sheets are enclosed on the following pages which can be referred to or photocopied as needed. The information sheets may be ordered from the health promotion unit at Fieldhead.

GREEN RISK INFORMATION SHEET

Diabetes is a lifelong disease, which can cause foot problems. These usually occur because of damage to nerves (affecting feeling) and blood vessels (affecting circulation).

Keeping good control of your diabetes and having an annual foot examination can help to prevent damage. The following advice will help you.

ADVICE TO HELP PREVENT PROBLEMS:

- Shoes are a common cause of damage to feet because you may not feel if they are ‘rubbing’. Always wear well-fitting shoes with soft uppers and no hard or bulky seams. Lace ups are good because they hold your feet firmly in place.

- Have your feet measured before you buy. Buy shoes that are the correct length, width and depth.

- Socks should be made from cotton or wool, be free from bulky seams and have non-elasticated tops. Before putting on socks and shoes check inside them for anything that may rub (stones, bulky seams, etc). Wearing socks inside out helps to prevent the seams rubbing the skin.

- Dry skin can be treated with a moisturising cream such as Diprobase or E45 (available at the chemist, supermarket or on prescription). Avoid using it between the toes, as this can make the skin too moist and prone to infection.

- Examine your feet daily to detect any problems which may develop.

- Any minor cut or blister should be covered by a sterile plaster until healed. If these are slow to heal seek advice from your GP.

- Do not use home remedies, such as corn plasters or verruca treatments without advice from your Diabetes Team.

- It is not necessary for you to see a podiatrist regularly just because you have diabetes. Your routine foot checks should be done by your Practice Nurse or GP and a referral can be made to a Podiatrist if needed.

- If you notice any signs of infection, swelling, heat, redness or pain contact your GP or Practice Nurse at the surgery URGENTLY. The contact numbers for these people can be found on the reverse of this leaflet. Remember, problems, which are left alone, do not get better.
AMBER RISK INFORMATION SHEET

Diabetes is a lifelong disease, which can cause foot problems. These usually occur because of damage to nerves (affecting feeling) and blood vessels (affecting circulation). You have been given this leaflet because examination has shown that either the nerves to your feet have been affected (you could not feel the filament) or the blood vessels have been affected (at least one of your foot pulses was absent).

Once sensation is lost it means that you may develop blisters and ulcers without being aware that your feet are being damaged.

Keeping good control of your diabetes and having a regular (every three to six months) foot examination by your health care professional can help to prevent damage. You will also need to take extra care of your feet to prevent future problems. The following advice will help you.

<table>
<thead>
<tr>
<th>It is not necessary for you to see a podiatrist regularly just because you have diabetes. Your routine foot checks should be done by your health care professional and a referral can be made to a podiatrist if needed</th>
</tr>
</thead>
</table>

ADVICE TO HELP PREVENT PROBLEMS:

- Shoes are a common cause of damage to feet because you may not feel if they are ‘rubbing’. Check your feet for any signs of damage when you take your shoes and socks off for any signs of redness. If you have poor eyesight ask a friend or relative to do this for you daily if possible (at least weekly).

- Always wear well fitting shoes with soft uppers and no hard or bulky seams.

- Have your feet measured before you buy – remember you cannot ‘feel’ if they fit. Buy shoes that are the correct length, width and depth. Lace ups are good because they hold your feet firmly in place.

- Socks should be made from cotton or wool, be free from bulky seams and have non-elasticated tops. Before putting on socks and shoes check inside them for anything which may rub (stones, bulky seams etc.) Wearing socks inside out helps prevent the seams rubbing the skin.

- Do not to walk barefoot.

- Keep your feet clean by washing them every day. Dry them carefully with a soft towel, pay particular attention to drying between the toes this helps to prevent problems. Do not soak your feet for too long.

- Dry skin can be treated with a moisturising cream such as aqueous cream.

- Do not use cream between the toes, as this can make the skin too moist and prone to infection.

- Wash any minor cut or blister and cover with a sterile plaster until healed. If these are slow to heal seek advice from your GP.
➢ Do not use home remedies, such as corn plasters or verruca treatments.

➢ You may not be able to feel heat or cold so be very careful when bathing. Test the water with your elbow, in case the nerves in your hands are also affected, or alternatively ask someone to test the temperature for you.

➢ Do not use hot water bottles.

➢ Do not sit close to fires and heaters; they can burn your skin without you noticing.

➢ Your health care professional will advise how to care for your toenails. Avoid trimming hard skin from your feet yourself, if it is necessary a Podiatrist will do this for you.

➢ It is not necessary for you to see a podiatrist regularly just because you have diabetes. Your routine foot checks should be done by your Practice Nurse or GP and a referral can be made to a Podiatrist if needed.

➢ If you notice any signs of infection, swelling, heat, redness or pain contact your GP or Practice Nurse at the surgery URGENTLY. The contact numbers for these people can be found on the reverse of this leaflet. Remember, problems, which are left alone, do not get better.
RED RISK INFORMATION SHEET

Diabetes is a lifelong disease, which can cause foot problems. These usually occur because of damage to nerves (affecting feeling) and blood vessels (affecting circulation). You have been given this leaflet because examination has shown that either the nerves to your feet have been affected (you could not feel the filament) or the blood vessels have been affected (at least one of your foot pulses was absent). In addition, you have a change in the shape of your feet and are more likely to develop blisters and ulcers.

Keeping good control of your diabetes and having a regular (every one to three months) foot examination by a podiatrist can help to prevent damage. You may need to wear special shoes to keep your feet safe. You will also need to take extra care of your feet to prevent future problems. The following advice will help you.

If you notice any signs of infection, swelling, heat, redness or pain TREAT AS AN EMERGENCY and contact the Podiatrist, GP or Practice Nurse at the surgery URGENTLY. The contact numbers for these people can be found on the reverse of this leaflet. Remember, problems, which are left alone, do not get better.

Advice to help prevent problems:

- Shoes are a common cause of damage to the feet. You will not feel if they are ‘rubbing’ and the shape of your feet will make it hard to buy suitable shoes
- Check your feet for any signs of damage when you take your shoes and socks off. If you have poor eyesight or cannot reach down to look at your feet ask a friend or relative to do this for you daily
- If you do buy shoes have your feet measured before you buy – remember you cannot ‘feel’ if they fit. Buy shoes that are the correct length, width and depth with soft uppers and no hard seams
- If you have difficulty finding shoes to fit, you may need special shoes, there are available by referral from your Consultant or GP
- If you are given special shoes they are to protect your feet and should be the only ones you wear, even at home. You will need more than one pair in order to keep them in good repair and they should be renewed when necessary
- Socks should be made from cotton or wool, be free from bulky seams and have non-elasticated tops
- Every time you put on socks and shoes check inside them for anything which may rub (stones, bulky seams etc). Wearing socks inside out helps prevent the seams rubbing the skin
- Do not to walk barefoot and risk damaging your feet
- Do not use hot water bottles
- Keep your feet clean by washing them every day. Dry them carefully with a soft towel, pay particular attention to drying between the toes, this helps to prevent problems. Do not soak your feet for long periods.

- Dry skin can be treated with a moisturising cream such as aqueous cream. Your Podiatrist will instruct you how often this should be applied.

- Do not use cream between the toes as this can make skin too moist and prone to infection.

- Wash any minor cut or blister cover with a sterile plaster and contact podiatry services.

- Do not use home remedies, such as corn plasters or verruca treatments.

- You cannot feel heat or cold so be very careful when bathing. Test the water with your elbow in case the nerves in your hands are also affected or alternatively ask someone to test the temperature for you.

- Do not sit close to fires and heaters; they can burn your skin without you noticing.

- Your Podiatrist will decide who should care for your toenails and advise you accordingly. Do not trim hard skin from your feet yourself, if it is necessary your Podiatrist will do this for you.
What is Neuropathic Pain (NeP)?

- “Pain initiated or caused by a primary lesion or dysfunction in the nervous system” (IASP 1997).
- NeP is very different from nociceptive (inflammatory pain). While nociceptive pain is due to tissue destruction, NeP is due to abnormally functioning nerves due to numerous causes.

How common is Neuropathic Pain?

- It is thought to affect 2-4% of the general population (1-2 million patients suffering from neuropathic pain in the UK).
- It can affect up to 20-25% of diabetic patients and 30-40% of patients with cancer.
- The average GP may have 35-70 patients suffering with neuropathic pain.

Neuropathic Symptoms

- **Primary – Pain**
  - Can be spontaneous or evoked, continuous or intermittent
  - Trigger words to aid diagnosis “burning, shooting, stabbing”

- **Secondary – Co-morbidity**
  - Sleep interference, lack energy, drowsiness, concentration/memory difficulties, mood swings, depression, anxiety

Neuropathic Symptoms

- Allodynia: pain produced by an innocuous stimulus e.g. touch, pressure
- Hyperaesthesia: increased sensitivity to touch
- Hyperalgesia: increased response to stimulus which is normally painful
- Dysaesthesia: an unpleasant abnormal sensation
PATHWAY FOR MANAGING NEUROPATHIC PAIN IN PRIMARY CARE

➢ This is a new guideline with resources for both patient and clinician to manage this type of pain well

➢ It presents a treatment plan for use before considering referral

➢ If complex regional pain syndrome is suspected, refer early

➢ The DN4 tool is useful to aid diagnosis and for detecting change in pain after treatment. (see patient clinical resources)

➢ All of the drugs in the guideline can cause significant adverse effects in some patients. If this occurs, try an alternative from the same therapeutic group. For example, with tricyclic antidepressants (TCA) try nortriptylline or imipramine instead of amitriptylline
ALGORITHM FOR PHARMACOLOGICAL MANAGEMENT OF NEUROPATHIC PAIN

**Peripheral Neuropathic Pain including diabetic neuropathic pain**

**Contra-indication to TCAs?**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

**Duloxetine** – 4 wk trial

**1st Line: Antidepressants**
1. *Amitriptyline* – If adverse side effects consider:
2. *Nortriptyline* (for 6–8 weeks)
   If no response to trial of 2 different TCAs, consider:
3. *Duloxetine & reduce TCAs over 4 weeks*

**2nd line: Anti-epileptics**
1. *Gabapentin* (increase the dose to a point where the patient reports good clinical effect – 8 week trial period)
   If not tolerated consider:
2. *Pregabalin: 4-6 week trial*

**3rd Line – Opioid Drugs in use order:**
1. *Codeine/Dihydrocodeine/Tramadol* (full daily dose paracetamol 4g is of benefit)
2. *Oral Morphine* (see strong opioids guidance for long term pain).
3. *Opiate patches should only be considered for those patients who cannot take oral medicines, or who have severe renal impairment.*

**Other Management Options:**
- Encourage self management skills; use Pain Toolkit and resources above
- Refer to local self management programmes: Kirklees Active Leisure PALS Revive
- BEEP scheme, Expert Patient Programme
- Multidisciplinary assessment to assess health needs via Step 2 Pain pathway

**Patient resources:**
- Neuropathic pain resources
- Self help resources
- Pain Toolkit
- Neuro Pain toolkit
- BPS Patient Advice
- Opioids
- British Pain Society Opioid Guidelines for clinicians, 2010

**Clinician resources:**
- Drug & dose guide
  - Drug dose guide.doc
- Drug Cost Comparison Charts
  - Drug cost charts
- Clinical review resources
  - Clinical Review oct 10.doc
- Pain Clinical Audit Template
  - Pain Clin Audit Template
- British Pain Society Opioid Guidelines for clinicians 2010
  - BPSopioidguidefull January2010
  - BPSopioidsummary June2010

**Treatment review**
At each patient review, assess the effect of the treatment on pain relief using the visual analogue pain scale in patient resources.

**Stop the drug** where a patient derives minimal or no clinical benefit from the drug at an appropriate dose and trial period. Then try next drug in the pathway.

(Note: Reduce Tricyclic Antidepressants(TCA) over 4 weeks)

**Treatment ineffective**
- Stop antidepressant
  - Start antiepileptic

**Treatment sub-optimal**
- Add

**Treatment ineffective**
- Stop antiepileptic
  - Start Opioid
AUTONOMIC NEUROPATHY

There are many manifestations of autonomic neuropathy as a complication of long-term hyperglycaemia. These include gastroparesis, diarrhoea, faecal incontinence, erectile dysfunction, bladder disturbance, orthostatic hypotension, gustatory and other sweating disorders, dry feet and unexplained ankle oedema. These complications can offer diagnostic and management problems, and on occasions can be very disabling.

Alternatively symptoms may be vague and may present insidiously without realisation that they are diabetes-related, while nerve damage can be also found in asymptomatic people. A mixed presentation is common, may be exacerbated by other drug therapy (e.g. tricyclic drugs), and may give troublesome hypoglycaemia. People with advanced autonomic neuropathy may also have advanced retinopathy, nephropathy, and somatic neuropathy.

Gastroparesis can be one of the more devastating complications of autonomic neuropathy. While it can present as bloating, nausea and fullness on eating, severe intermittent hypoglycaemia can be a major problem for people on glucose-lowering therapy, while vomiting may be intermittent and sudden or occasionally severe and protracted.

Any patients with symptoms of autonomic neuropathy should be referred to the specialist diabetes team for further investigation and management.

<table>
<thead>
<tr>
<th>Gastroparesis</th>
<th>Action</th>
<th>Further Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider gastroparesis in an adult with:</td>
<td>Consider a trial of metoclopramide domperidone for an adult with gastroparesis</td>
<td>Consider referral to specialist services if:</td>
</tr>
<tr>
<td>- Erratic blood glucose control, or</td>
<td></td>
<td>- Differential diagnosis is in doubt, or</td>
</tr>
<tr>
<td>- Unexplained gastric bloating or vomiting</td>
<td></td>
<td>- Persistent or severe vomiting occurs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Erectile Dysfunction</th>
<th>Action</th>
<th>Further Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review with men annually</td>
<td>Provide assessment and education for a man with erectile dysfunction to address contributory factors and treatment options. If no contraindications, offer a phosphodiesterase-5 inhibitor.</td>
<td>If phosphodiesterase-5 inhibitor is ineffective, discuss next step and refer as appropriate for:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Medical treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Surgery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Psychological support</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foot Problems</th>
<th>Action</th>
<th>Further Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to diabetes foot care pathway</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Background:
- Erectile dysfunction (ED) is common in diabetes and is associated with increasing age and poor glycaemic control.
- Studies suggest a prevalence of 50% in men >50 years and 75% >60 years.
- Approximately 1/3rd of men with Type 2 diabetes have hypogonadism.
- Review the issue of erectile dysfunction with men annually.

### Assessment: is this psychogenic or organic?
- **Suggest psychogenic**
  - Sudden onset
  - Early collapse of erection
  - Good quality or better spontaneous self stimulated or waking erections
  - Premature ejaculation or inability to ejaculate
  - Problems or changes in relationship
  - Major life events
  - Psychological problems

- **Suggest organic**
  - Gradual onset
  - Lack of tumescence
  - Normal ejaculation
  - Normal libido (except hypogonadal men risk factor in medical history, operations, radiotherapy or trauma to pelvis or scrotum
  - Current drug recognised as associated with ED
  - Smoking, high alcohol consumption
  - Use of recreational or body building drugs

### Examination and Tests:
- Review cardiovascular risk factors including HbA1c and BP.
- Review medication (see box).
- Measure LH, FSH, Testosterone (9am), SHBG and prolactin.

### Treatment Options:
- **PDE5 inhibitor** – long acting/short acting Maximum use: 1 in 24 hours.
- Sildenafil – short acting – take 30 to 60 minutes before anticipated sexual activity.
- Tadalafil – longer acting – take up to 36 hours before anticipated sexual activity.

- Avoid concomitant use with nitrates. Caution is required when used with an a-blocker. Avoid if systolic BP < 90 mmHg.

### Drugs Associated with ED
- **Antihypertensives**
  - β-blockers, hydralazine
  - Diuretics
  - Thiazide diuretics
  - Potassium sparing diuretics
  - Carbonic anhydrase inhibitor
- **Antidepressants**
  - SSRIs
  - Tricyclics
  - Monoamine oxidase inhibitors
- **Antipsychotics**
  - Phenothiazines
  - Risperidone
- **Hormonal agents**
  - Cyproterone acetate
  - LH-releasing hormone analogues
  - Oestrogens
- **Phenothiazine antihistamines**
  - e.g., Promethazine
- **Phenothiazine antiemetics**
  - e.g., Prochlorperazine
- **H2 antagonists**
  - e.g., Ranitidine
- **AntiParkinson’s drugs**
  - Levodopa
- **Anticonvulsants**
  - Phenytoin, carbamazepine
- **Miscellaneous**
  - Allopurinol
  - Indomethacin
  - Disulfiram

### Consider referral to secondary care ED service if response to PDE5 inadequate. Refer to Endocrinology if 9.00 am testosterone low. Alternative treatments for ED are: MUSE® - urethral application of alprostadil, Apomorphine (Uprima), Intracavernosal injections, Vacu.

### What does NICE say? (Diabetes Guidelines 2009)
- R123 Review the issue of erectile dysfunction with men annually.
- R124 Provide assessment and education for men with ED to address contributory factors and treatment options.
- R125 Offer a phosphodiesterase-5 inhibitor in the absence of contraindications, if ED is a problem.
- R126 Following discussion, refer to a service offering other medical, surgical or psychological management of ED if phosphodiesterase-5 inhibitors have been unsuccessful.
Test urine for microalbuminuria annually
- Screen for microalbuminuria by measuring the albumin/creatinine ratio on overnight first void samples type
- If positive, confirm by demonstrating at least 2 positive of 3 tests in 1 month.
- Exclude other causes i.e. urinary tract infections, other kidney disease etc.

Is microalbuminuria present? No → Routine care
Arrange recall and annual review
Yes →
- Document it and identify the patient as high cardiovascular risk
- Aim for a blood pressure of 130/80 mmHg (accepting that many patients are unable to achieve this target) by using aggressive blood pressure lowering medication - ACE-inhibitors (or angiotensin II receptor antagonists if not tolerated) as the first choice irrespective of blood pressure
- Tighten glycaemic control (below 53mmol/mol) HbA1c according to individual’s target
- Stop metformin if creatinine > 150 mmol/l (eGFR < 30)
- Intensive management of cardiovascular risks smoking cessation, weight management, dyslipidaemia and physical inactivity

If targets are not reached
- Intensify treatment
- Consider insulin therapy if HbA1c >59mmol/mol and rising
- Reassess in 3 – 6 months

Following reassessment
- Blood pressure targets not achieved
- Glycaemic control remains poor
- Creatinine levels are elevated and rising

Diabetic Nephropathy with one of the following
- eGFR < 30 or rapidly falling
- Plasma creatinine >200 mmol/l or plasma urea>20 mmol/l
- Plasma potassium>6 mmol/l on a non-haemolysed (hospital ) sample
- Heavy proteinuria (1g in 24 hours)
- Uncontrollable hypertension (>150/90 on 3 agents)
- Suspected non-diabetic renal disease
- Suspected renal artery stenosis

Refer to Nephrologists
Consider Referral to a Diabetes Specialist Centre

It is important in this group of people especially at the first detection of any diabetic nephropathy, that any risk factors should be addressed ie:
- Glycaemic control (HbA1c<53 mmol/mol)
- Control of hypertension (<130/80 mmHg)
- Lipid assessment
- Total Cholesterol <4, LDL <2
- Smoking cessation (advised)
Definitions

Diabetic Renal Disease
The presence of raised urine albumin levels or raised serum creatinine in Type 2 diabetes indicates an increased risk of premature cardiovascular events and, to a lesser extent, end stage renal disease. If the person has also signs of retinopathy, it is likely that the raised urine albumin and raised serum creatinine is resulting from diabetes-related renal disease. If retinopathy is not present, the probability of another renal disease increases.

Lower-risk urine albumin excretion
People who have levels of microalbuminuria and/or proteinuria lower than those indicated below.

Higher-risk urine albumin excretion
Microalbuminuria – albumin:creatinine ratio greater than or equal to 2.5mg/mmol (men) or 3.5mg/mmol (women), or albumin concentration greater than or equal to 20mg/l and/or

Proteinuria – albumin; creatinine ratio greater than or equal to 30mg/mmol or albumin concentration greater than or equal to 200mg/l.

Screening for Nephropathy

- Screen when free of acute, intercurrent illness
- Collect an early morning urine sample
- Check for protein using a dipstick
  - Check for urinary tract infection
  - Obtain a laboratory urine albumin : creatinine ratio (ACR)

If dipstick negative
- Check for microalbuminuria using laboratory urine albumin : creatinine ratio (ACR)
- If positive, confirm by demonstrating at 2 positive of 3 tests in 1 month

Calculating Glomerular Filtration Rate


\[
eGFR = 186 \times (\frac{Pcr}{88}) - 1.154 \times (\text{age}) - 0.203 \times (0.742 \text{ if female}) \times (1.210 \text{ if black})
\]

This equation uses serum creatinine in combination with age, sex and race to estimate GFR and therefore improves upon several of the limitations with the use of serum creatinine.

Plasma creatinine levels may rise by more than 30% after a meat-containing meal. To use the creatinine level for one of these calculations a sample after a 10 hour fast is recommended.

CLASSIFICATION OF CKD ACCORDING TO eGFR

<table>
<thead>
<tr>
<th>Stage</th>
<th>eGFR (ml/min)</th>
<th>Description</th>
<th>Minimum testing</th>
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<tr>
<td>1*</td>
<td>&gt;90</td>
<td>Normal GFR*</td>
<td>Annually</td>
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<tr>
<td>2*</td>
<td>60-89</td>
<td>Mild impairment*</td>
<td>6 monthly</td>
</tr>
<tr>
<td>3a</td>
<td>45-59</td>
<td>Moderate impairment</td>
<td>3 monthly</td>
</tr>
<tr>
<td>3b</td>
<td>30-44</td>
<td></td>
<td>6 weekly</td>
</tr>
<tr>
<td>4</td>
<td>15-29</td>
<td>Severe impairment</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>&lt;15</td>
<td>Established renal failure</td>
<td></td>
</tr>
</tbody>
</table>

* The terms stage 1 and stage 2 chronic kidney disease (CKD) can ONLY be applied when there is evidence of structural abnormality, as determined by renal ultrasound (e.g. polycystic kidney disease) or functional abnormality (e.g. persistent asymptomatic proteinuria or microscopic haematuria). If there is no such abnormality, a GFR of 60-89 is NOT regarded as abnormal

Management of diabetic renal disease

Lifestyle, tight control of blood sugar and blood pressure, and regular monitoring of kidney function are key management approaches that aim to minimise the progression of diabetic renal disease. Most recommendations are covered by existing guidance, particularly the Diabetes NSF and NICE guidance.
PATHWAY FOR THE PRE-CONCEPTUAL CARE OF WOMEN WITH DIABETES

All women of child bearing age with Type 1 and Type 2 diabetes and women who have had previous gestational diabetes

Annual review either in Primary or Specialist care
- Discuss pre-conception, contraception and the importance of planning a pregnancy at each contact

Planning a pregnancy

No/not yet
- Give first line initial advice whether planning a pregnancy or not including contraception advice
- Unplanned Pregnancy
  If unplanned pregnancies refer direct to diabetes specialist team as soon as pregnancy confirmed either by Fax or telephone referral

Family complete

Yes

Refer to specialist diabetes pre-conception clinic
One to one consultation

Ensure good glycaemic control for at least 3 months prior to becoming pregnant
- Medication review – stop all statins and ace inhibitor therapy
- Ensure dietetic review
- Optimisation of HbA1c of < 42mmol/mol through intensive insulin therapy and the agreement of monthly monitoring
- Optimisation of blood pressure <130/80mmHg
- Lifestyle advice including: smoking cessation, alcohol and substance misuse
- Check rubella status
- Prescribe folic acid 5mgs during pre-conception and continue until after the first trimester
- Intensive education including the management of hypoglycaemia –DAFNE for people with Type 1 diabetes
- Screen for diabetic complications
  - Retinal screening if not carried out within the previous 6 months
  - Renal assessment
- Ketone monitoring for those with Type 1 diabetes

On becoming pregnant - Refer to Diabetes Specialist team directly either by Fax or telephone referral as soon as pregnancy is confirmed
Principles of management

- Women who are treated with lifestyle intervention alone should be asked to switch to home blood glucose monitoring as soon as they know they are pregnant. HbA1c to be checked at that time.
- Women who are taking oral hypoglycaemic agents may require the addition of insulin therapy in order to achieve good control.

Type 1 diabetes

Direct self referral via DSN, Diabetic specialist midwife or antenatal clinic should be made for attendance at Joint Antenatal clinic.

Type 2 diabetes

Women with Type 2 diabetes who are on insulin should be managed in accordance with women with Type 1 diabetes see above.

All patients with diabetes are seen in specialist combined clinics staffed by Consultants in diabetes and obstetrics, diabetes specialist nurse, specialist midwife and a dietitian.

Pre-pregnancy

All women with diabetes and of childbearing age should be made aware of the importance of planning a pregnancy. These women should be referred to a diabetes pre-conception clinic. Once seen in the clinic, the diabetes care plan should include;

- Advice re the benefits of stopping smoking and referral to smoking cessation if necessary
- Advice regarding alcohol and substance misuse
- Dietary advice, including advice and support to maintain or lose weight where indicated
- Advice about appropriate types of physical activity
- Folic acid supplementation: women with diabetes should be prescribed the higher dose of 5mg folic acid per day
- Assessment of the presence of any long term conditions, particularly eye and renal complications
- Standard pre-pregnancy assessments as for women who do not have diabetes including rubella status
- Review of all medication: the risks and benefits of continuing each medication should be carefully considered.
- Offered a meter for the self-monitoring of blood glucose and advised to test frequently including a mixture of fasting and pre and post prandial
- Discuss the importance of blood glucose control pre conceptually and during pregnancy to reduce risks to mother and baby
- Discuss the potential risks to mother and baby.

Contact details

<table>
<thead>
<tr>
<th>Diabetes Centre, Pinderfields General Hospital</th>
<th>Diabetes Centre, Pontefract General Infirmary</th>
<th>Dewsbury and District Hospital Boothroyd Centre</th>
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<tr>
<td>Aberford Road</td>
<td>Pontefract</td>
<td>Halifax Road</td>
</tr>
<tr>
<td>Wakefield</td>
<td>WF8 1PL</td>
<td>Dewsbury</td>
</tr>
<tr>
<td>WF1 4DG</td>
<td>Tel: 01977 747930</td>
<td>WF13 4HS</td>
</tr>
<tr>
<td>Tel: 01924 213904</td>
<td>Fax: 01977 747921</td>
<td>Tel: 01924 816097</td>
</tr>
<tr>
<td>Fax: 01924 214977</td>
<td></td>
<td>Fax: 01924 816193</td>
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Type 2 Diabetes

The Freemantle study (Davis et al 2006) concluded that either blood glucose monitoring or its frequency was associated with glycaemic benefit in Type 2 diabetes regardless of treatment. A better approach is to consider monitoring as one component of self-management education. If the patient has been properly educated in how to use the information they obtain from their meter, then he or she are much more likely to derive benefit from monitoring.

NICE Clinical Guideline 87 (2008) states that self monitoring of glucose levels should be available:

- to those on insulin treatment
- to those on oral glucose lowering medications to provide information on hypoglycaemia
- to assess changes in glucose control resulting from medications and lifestyle change
- to monitor changes during inter-current illness
- to ensure safety during activities, including driving

Self monitoring of glucose should only be offered to a person newly diagnosed with diabetes as an integral part of self-management education.

For self monitoring to be useful, patients should be given adequate training in self-monitoring techniques and calibration of meters. They should be educated to enable them to reflect on their results and take appropriate action.

One of the most important outcome measurements to assess overall diabetes management is: Glycated Haemoglobin (HbA1c) monitoring, HbA1c gives an indication of blood glucose control over the previous 12 weeks. The targets should reflect individual needs but HbA1c levels of between 48mmol/mol – 59mmol/mol are generally recommended.
<table>
<thead>
<tr>
<th>Treatment Pathway</th>
<th>HbA1c Frequency</th>
<th>Frequency of Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet and physical activity</td>
<td>Six monthly</td>
<td>No need to self monitor if good control unless destabilised by other factors</td>
</tr>
<tr>
<td>Metformin and other oral antidiabetic drugs (except sulfonylureas, see below)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfonlureas alone or in combination with other oral antidiabetic drugs. Sulfonlureas and GLP-1 analogues (exenatide and liraglutide)</td>
<td>Six monthly for overall control Three – Six monthly</td>
<td>There may be a need to self monitor blood glucose to reveal any problems with hypoglycaemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Driving – patients who are new to sulfonylureas should be advised to test glucose before driving in the first three months or longer if they experience regular hypoglycaemic events. Patients should also be advised to test prior to a long drive (DVLA)</td>
</tr>
<tr>
<td>Oral antidiabetic drugs in combination with once daily insulin</td>
<td>Three monthly for overall control</td>
<td>On initiation and titration of insulin:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Test fasting blood glucose daily until target level reached and remains fixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Test at other times of the day if feeling unwell</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ People who have unstable glycaemic control may require more frequent testing, varying the time of testing between fasting, pre-meal and post-meal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Check HbA1c and continue with monitoring if target HbA1c not reached</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Established and stable insulin therapy an oral medication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ People with Type 2 diabetes who have stable control should self monitor blood glucose two or three times per week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ The frequency of monitoring can be reduced (but not abandoned) when blood sugars and HbA1c targets are reached</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Driving – blood glucose should be monitored regularly and at times relevant to driving to enable the detection of hypoglycaemia (DVLA 2011)</td>
</tr>
<tr>
<td>Twice daily and basal bolus insulin therapy</td>
<td>Three monthly for overall control</td>
<td>➢ Testing twice a day for those requiring twice daily insulins varying the time between fasting, pre-meal and post-meal to identify trends</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ People who are using multiple daily insulin regimens should self monitor their blood glucose levels up to four times daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Those with unstable HbA1c of self monitoring blood glucose should test more frequently in order to inform treatment decisions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Driving – blood glucose should be monitored regularly and at times relevant to driving to enable the detection of hypoglycaemia (DVLA 2011)</td>
</tr>
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Supported Blood Glucose Meters

The GlucoRx Nexus is the recommended meter for people with Type 2 diabetes when starting self monitoring of blood glucose in primary care, it is also the recommended meter when an original meter requires replacing.

<table>
<thead>
<tr>
<th>Company</th>
<th>DiME</th>
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<tbody>
<tr>
<td>Customer Care Line</td>
<td>01483 755133</td>
</tr>
<tr>
<td>GlucoRx Nexus</td>
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<table>
<thead>
<tr>
<th>Meter Name</th>
<th>GlucoRx Nexus 50</th>
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</thead>
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<tr>
<td>Testing Strips</td>
<td>GlucoRx Nexus 50</td>
</tr>
<tr>
<td>Blood Glucose</td>
<td>50 strip pack £9.95</td>
</tr>
<tr>
<td>Sensitivity Range</td>
<td>1.1 – 33.3mol/l</td>
</tr>
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</table>

Clever-check talking blood glucose meters are available, free of charge, from:

RNIB Customer Services on 0303 123 9999 Product Code : DH274
Type 1 Diabetes

Blood glucose monitoring should be seen as an integral part of treatment for people with Type 1 diabetes to enable self management. Blood glucose monitoring should be performed prior to driving to ensure that driving is safe and hazard-free avoiding the risk of hypoglycaemia.

Ketostix or blood ketone testing strips are also required for episodes of illness and high blood glucose readings where these patients will need to test for ketones in their urine. It is unlikely that this group will need testing strips for glycosuria.

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Self monitoring of Blood Glucose</th>
<th>Urine Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>New transfer to insulin</td>
<td>Testing as appropriate to enable self management</td>
<td>Ketostix to test urine for ketones when necessary</td>
</tr>
<tr>
<td>Basal Bolus Regimen</td>
<td>Prior to driving to avoid the risk of hypoglycaemia</td>
<td>Blood ketones available with Abbott exceed meter</td>
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<td>Insulin Pump users</td>
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<td>Twice Daily</td>
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<td>Pregnancy</td>
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<td>All Children</td>
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References

- Diabetes and Primary Care: The continuing debate on self-monitoring of blood glucose in diabetes Owens et al. 2005
- Diabetes guidelines: South Cambridgeshire Diabetes Network (2006)
- Position statements: Home monitoring of blood glucose levels Diabetes UK (2003)
- Drug Update Self-monitoring of Blood Glucose Regional Drug and Therapeutic Centre (2007)
- Davis WA, Bruce DG, Davis TME: Is self monitoring of blood glucose appropriate for all Type 2 diabetic patients? The Freemantle Diabetes Study. Diabetes Care 29: 1764 -1770, 2006
- Driver and Vehicle Licensing Agency: Treatment with Exenatide or Gliptins www.dvla.gov.uk
- NICE Clinical Guidelines 87 (2008)
SUGGESTIONS REGARDING FURTHER INFORMATION FOR INDIVIDUALS WITH DIABETES

The provision of background reading and information are important aids in reinforcing verbal advice and increasing patient awareness. Below are some suggestions of resources that are currently available.

LITERATURE

Balance for Beginners

- Type 2 diabetes
- Type 1 diabetes

Available from Diabetes UK - currently at a charge of £3.00

Balance Magazine

Bi-monthly "news and views" publication by Diabetes UK to subscribing members.

Diabetes UK also produce a vast selection of leaflets and information which are listed in their catalogue and order form booklet. Can be ordered and purchased at Newsagents.

Books

<table>
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<tr>
<th>Title</th>
<th>Authors</th>
<th>Publishers</th>
<th>Cover</th>
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<tbody>
<tr>
<td>Living with diabetes for those treated with insulin</td>
<td>Dr JL Day, Susan Benchley, Suzanne Redmond</td>
<td>Medicos 1992 British Diabetic Association</td>
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<td>Living with diabetes for those treated with diet and tablets</td>
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<tr>
<td>Diabetes at your fingertips</td>
<td>Peter Sonksen, Charles Fox, Sue Judd</td>
<td>Class Publishing Ltd 1991 Cost £10.00 approximately</td>
<td><img src="Diabetes_at_your_fingertips.png" alt="Cover" /></td>
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<tr>
<td>Diabetes in the real world</td>
<td>Charles Fox, Anthony Pickering</td>
<td>Class Publishing</td>
<td><img src="Diabetes_in_the_real_world.png" alt="Cover" /></td>
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### Support Groups

**Diabetes UK**  
10 Parkway  
LONDON NW1 7AA

Telephone: 020 7323 1531

- Local branches of Diabetes UK are active in Wakefield. Further details are available from the Diabetes Centres in Wakefield.

- Local Support Groups currently running in:
  - Pontefract
  - Hemsworth
  - Castleford

### Diabetes Patient Focus Group

Ensuring that NHS Wakefield District is influenced by the needs and views of people with diabetes by providing those people, or those who care for them, with the opportunity to have a significant impact on the provision of diabetes services locally.

Meetings are currently held every six weeks in Castleford – for further information contact Kay Bellwood on 01924 315790 or kay.bellwood@wdpct.nhs.uk
REFERENCES

UK Prospective Diabetes Study Group (1998) Intensive blood-glucose control with sulfonylurea or insulin compared with conventional treatment and risk of complications in patients with Type 2 diabetes (UKPDS 33) The Lancet 352 837-851

UK Prospective Diabetes Study Group (1998) tight blood pressure control and risk of macrovascular and microvascular complications in Type 2 diabetes (UKPDS 38) British Medical Journal 317 703-713

Diabetes National Service Framework Delivery Strategy 2002 Department of Health

Joint British Societies’ Guidelines on Prevention of Cardiovascular Disease in Clinical Practice (2005) Heart British Cardiac Society 91 supplement V

The National Service Framework for Renal Services 2005 Part two: Chronic Renal Failure and End of Life Care Department of Health


Type 2 Diabetes Prevention and Management of Foot Problems Clinical Guideline 10 (2004) NICE

ASCOT - Study and implications for practice, Anglo Scandinavian Cardiac Outcomes trial (2003)

Type 1 Diabetes: Diagnosis and Management of Type 1 Diabetes in Children, Young People and Adults Clinical Guideline 15 (2004) NICE


Management of Type 2 Diabetes: Management of Blood Pressure and Blood Lipids Clinical Guideline H (2002) NICE

Type 1 Diabetes: Diagnosis and Management of Type 1 Diabetes in Adults Clinical Guideline 15 (2004) NICE


Guidance on Rosiglitazone for Type 2 Diabetes Mellitus: TAG – No. 9 (2000) NICE


Recommendations of the St Vincent Task Force for the Management of Diabetes Pregnancies – 1996 (September 1999)

International Diabetes Federation; new worldwide definition of metabolic syndrome (April 2005)


Type 2 Diabetes – The management of Type 2 diabetes Clinical guideline 87 (2009) NICE
**ACKNOWLEDGEMENTS**

Thanks are extended to those individuals who supported the development and completion of these guidelines as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
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<tbody>
<tr>
<td>Kay Bellwood</td>
<td>Diabetes Network Co-ordinator</td>
</tr>
<tr>
<td>Twane Celliers</td>
<td>Specialist Diabetes Dietitian</td>
</tr>
<tr>
<td>Lyndsey Clayton</td>
<td>Chief Technician Medicines Management</td>
</tr>
<tr>
<td>Dr Ryan D’Costa</td>
<td>Consultant Diabetologist, PGH</td>
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<tr>
<td>Gill Day</td>
<td>Public Health Manager (LTC)</td>
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<tr>
<td>Paul Dewhirst</td>
<td>General Practitioner</td>
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<tr>
<td>Jane Diggle</td>
<td>Practice Nurse</td>
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<tr>
<td>Fiona Fearnley</td>
<td>Specialist Diabetes Podiatrist</td>
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<tr>
<td>Joanne Fitzpatrick</td>
<td>Head of Medicines Management</td>
</tr>
<tr>
<td>Amanda Hammond</td>
<td>Retinal Screening Service Manager</td>
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<tr>
<td>Andrea Hezelgrave</td>
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<tr>
<td>Donna Howard</td>
<td>Practice Nurse</td>
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<tr>
<td>Tara Kadis</td>
<td>Lead Diabetes Specialist Nurse</td>
</tr>
<tr>
<td>Meg Kinsey</td>
<td>Practice Nurse</td>
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<td>Practice Pharmacist – Medicines Management</td>
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<td>Nicola Murphy</td>
<td>Specialist Diabetes Podiatrist</td>
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<tr>
<td>Dr Dinesh Nagi</td>
<td>Consultant Diabetologist, PGH</td>
</tr>
<tr>
<td>Lesley Newland</td>
<td>General Practitioner</td>
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<tr>
<td>Stop Smoking Team</td>
<td>Stop Smoking Service</td>
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Version Control Sheet

Document Title: Wakefield District Diabetes Network
Diabetes Care for Adults – A guide to good working practice

Version:
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<td>October 2012</td>
<td>Wakefield Diabetes Network Board (NSF Group 3)</td>
<td>Working document</td>
<td>Inclusion of GLP1 and DPP4 guidance</td>
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<td></td>
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<td></td>
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