Management of type 2 diabetes

Retinopathy – screening and early management
This guideline is a part of the Inherited Clinical Guidelines work programme. It was commissioned by the Department of Health before the Institute was formed in April 1999. It has followed closely the development brief that was agreed at the time of commissioning. The developers have worked with the Institute to ensure, in the time available, that the guideline has been subjected to validation and to consultation with stakeholders. However it has not been possible to subject it to the full guideline development process that the Institute has now adopted.
1. Evidence

1.1 Evidence levels
The definitions of the type of evidence used in this guideline (Table 1) originate from the US Agency for Health Care Policy and Research.

Table 1 Levels of evidence

<table>
<thead>
<tr>
<th>Level</th>
<th>Type of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>evidence from meta-analysis of randomised controlled trials</td>
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<tr>
<td>Ib</td>
<td>evidence from at least one randomised controlled trial</td>
</tr>
<tr>
<td>IIA</td>
<td>evidence from at least one controlled study without randomisation</td>
</tr>
<tr>
<td>IIB</td>
<td>evidence from at least one other type of quasi-experimental study</td>
</tr>
<tr>
<td>III</td>
<td>evidence from non-experimental descriptive studies, such as comparative studies, correlation studies and case–control studies</td>
</tr>
<tr>
<td>IV</td>
<td>evidence from expert committee reports or opinions and/or clinical experience of respected authorities</td>
</tr>
</tbody>
</table>

1.2 Derivation and grading of recommendations
The grading scheme used in this guideline (Table 2) is from Eccles M et al. (1998).

Table 2 Grading of recommendations

<table>
<thead>
<tr>
<th>Grade</th>
<th>Evidence (see Table 1):</th>
</tr>
</thead>
<tbody>
<tr>
<td>✅</td>
<td>directly based on category I evidence</td>
</tr>
<tr>
<td>⭐</td>
<td>directly based on category II evidence, or extrapolated recommendation from category I evidence</td>
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<tr>
<td>⭐⭐</td>
<td>directly based on category III evidence, or extrapolated recommendation from category I or II evidence</td>
</tr>
<tr>
<td>⭐⭐⭐</td>
<td>directly based on category IV evidence, or extrapolated recommendation from category I, II or III evidence</td>
</tr>
</tbody>
</table>

2. Guidance

2.1 Introduction

2.1.1 Diabetes

Type 2 diabetes is affecting increasing numbers of people in the UK and the burden of serious complications and their sequelae can be considerable both for the individual concerned and the health service in general. Many aspects of these complications can be limited, even prevented in some instances, with good early management of the condition. The aim of these guidelines is to provide guidance about managing type 2 diabetes for people with diabetes and the whole range of clinical staff who work in primary and secondary care, in order to maximise the potential for reducing complications and improving the quality of life of people with the disease.

This guideline is one of a series of five guidelines on type 2 diabetes. Other guidelines in the series, due to be published in Spring 2002, cover the management of renal disease, dyslipidaemia and blood pressure, and blood glucose. A guideline on foot care has been published by the Royal College of General Practitioners.

2.1.2 Diabetic retinopathy

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 onset of diabetes, more than 60% of people with type 2 diabetes will have diabetic retinopathy. In people with type 2 diabetes, maculopathy is the major cause of visual loss.

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 preventive treatment.

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.

2.2 Eye care for all people with diabetes

- Maintain good blood pressure control (at or below 140/80 mmHg).
- Maintain good blood glucose levels (preferably below HbA1c 6.5–7.5%, according to the individual’s target).
- Check visual acuity, corrected with glasses or pinhole.
- Refer for specialist opinion if cataracts are interfering with vision or the retina is obscured.
- Classify eye care as: routine care required; early review required; or referral required (see next page).

2.2.1 Screening for diabetic retinopathy

- Examine the eyes of people with type 2 diabetes at the time of diagnosis and at least annually thereafter (including those registered blind and partially sighted).
• Perform an appropriate and acceptable retinopathy screening test.

• Use tests that have been demonstrated to achieve: sensitivity of 80% or higher; specificity of 95% or higher; and technical failure rate of 5% or lower.
  – Retinal photography, which is currently the most practical method, when conducted and evaluated by trained personnel, or slit-lamp indirect ophthalmoscopy, which is effective in trained hands.

• Use tropicamide (to achieve mydriasis) unless contraindicated.

• Opportunistic screening is not an adequate substitute for participation in a formal screening programme. It is an option only if formal screening is not possible.

2.2.2 Routine care

• Review annually if:
  – no retinopathy present
  – minimal or mild background retinopathy

2.2.3 Early review

• Review every 3 to 6 months if:
  – lesions have occurred or worsened since last examination
  – there are scattered exudates more than 1 disc diameter from the fovea
  – the person is at high risk of progression (rapid improvement in blood glucose control, presence of hypertension or renal disease).

2.2.4 Referral

Refer to an ophthalmology specialist if:

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<th>**</th>
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<tbody>
<tr>
<td>****</td>
<td>there is sudden loss of vision</td>
<td></td>
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<td></td>
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<tr>
<td>****</td>
<td>there is evidence of retinal detachment</td>
<td></td>
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<tr>
<td>***</td>
<td>there is new vessel formation</td>
<td></td>
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<tr>
<td>***</td>
<td>there is evidence of preretinal and/or vitreous haemorrhage</td>
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<tr>
<td>***</td>
<td>rubeosis iridis is present</td>
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<tr>
<td>**</td>
<td>there is an unexplained drop in visual acuity</td>
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<tr>
<td>**</td>
<td>there are hard exudates within 1 disc diameter of the fovea</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>**</td>
<td>there is macular oedema</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>**</td>
<td>there are unexplained retinal findings</td>
<td></td>
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</tr>
<tr>
<td>**</td>
<td>pre-proliferative or more advanced (severe) retinopathy is present.</td>
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</table>

*a Mild non-proliferative diabetic retinopathy is described in the Royal College of Ophthalmology’s Guidelines for Diabetic Retinopathy (1997).
Key to referral timings

Arrangements should be made to so that the patient:

<table>
<thead>
<tr>
<th>**</th>
<th>Is seen by a specialist <strong>immediately</strong>¹</th>
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<tbody>
<tr>
<td>***</td>
<td>Is seen by a specialist <strong>urgently</strong>²</td>
</tr>
<tr>
<td>**</td>
<td>Is seen by an ophthalmology specialist <strong>soon</strong>³</td>
</tr>
</tbody>
</table>

1  Within a day

2/3  Health authorities, trust and primary care organisations should work to local definitions of maximum waiting times in each of these categories. The Guideline Development Group considered a maximum waiting time of 1 week to be appropriate for the urgent category and 4 weeks for the soon category.

3.1 These recommendations are derived from the guideline entitled *Diabetic Retinopathy: Early Management and Screening* commissioned from a collaboration between the Royal College of General Practitioners, the Royal College of Physicians, the Royal College of Nursing and Diabetes UK. This guideline is one of a series of five guidelines on type 2 diabetes. Other guidelines in the series, due to be published in Spring 2002, cover the management of renal disease, dyslipidaemia and blood pressure, and blood glucose. A guideline on foot care has been published by the Royal College of General Practitioners. *Diabetic Retinopathy: Early Management and Screening* is available on the NICE website, [www.nice.org.uk](http://www.nice.org.uk), and on the National Electronic Library for Health's website, [www.nelh.nhs.uk](http://www.nelh.nhs.uk). The guideline developers are listed in Appendix A.

3.2 The five guidelines were commissioned by the Department of Health before the National Institute for Clinical Excellence (NICE or ‘the Institute’) was formed in April 1999. The developers have followed closely the development brief that was agreed at the time of commissioning. The developers have worked with the Institute to ensure, in the time available, that the guideline has been the subject of validation and consultation with stakeholders. However, it has not been possible to subject it to the full guideline development process that the Institute has now adopted.

4.1 This component of the national guideline for type 2 diabetes is aimed primarily at all healthcare professionals providing retinopathy care to people with diagnosed type 2 diabetes in primary and secondary care, irrespective of location. Depending on the type, stage and severity of the clinical problem, the guideline may also be valuable to those who work in diabetes care in the tertiary sector.

4.2 This guideline has been developed to advise on the care of adults with type 2 diabetes, but it may also help inform the care of those with type 1 diabetes.

4.3 The scope of the guideline covers:

- the primary detection of retinopathy in type 2 diabetes
- the early management of retinopathy.

4.4 Matters outside the scope of the guideline are listed below:

- This guideline does not provide detailed advice about the management of risk factors such as raised blood glucose levels, smoking, raised blood lipids or raised blood pressure (which will be covered by other guidelines in this series).
- This guideline covers only the screening and early management of diabetic retinopathy; it does not cover laser or surgical management after referral.
• The guideline does not address the identification of undiagnosed diabetes or general management of people with diabetes.

• This guideline does not address questions about the organisation and delivery of population-based or service-wide responses to the needs of people with diabetes.

This guideline is published as part of a range of clinical resources to support the Diabetes National Service Framework. Its implementation should take place as part of the health improvement plans for each local health community.

5. Implementation in the NHS

5.1 Local health communities will need to review existing service provision against this guidance. This review should result in a strategy that identifies the resources required to implement fully the recommendations set out in Section 2 of the guidance, the people and processes involved and the timeline over which full implementation is envisaged.

5.2 Relevant local clinical guidelines and protocols should be reviewed in the light of this guidance and revised accordingly.

5.3 To enable clinicians to audit their own compliance with this guideline it is recommended that, if not already in place, management plans are recorded for each patient. This information should be incorporated into local clinical audit data recording systems and consideration given (if not already in place) to the establishment of appropriate categories in electronic record systems.

5.4 Prospective clinical audit programmes should record the proportion of patients whose care adheres to the guidance. Such programmes are likely to be more effective in improving patient care when they form part of the organisation’s formal clinical governance arrangements and where they are linked to specific post-graduate activities.

5.5 Selected audit review criteria are shown in the box below. These can be used as the basis for local audit criteria, at the discretion of those in practice.

<table>
<thead>
<tr>
<th>Selected audit review criteria</th>
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<tbody>
<tr>
<td>• The percentage of people with diabetes* who have had their eyes examined in the previous 12 months. *These include those who are registered blind or partially sighted.</td>
</tr>
<tr>
<td>• For those with lesions that have occurred since the preceding examination, the percentage who have had their eyes examined in the previous 3–6 months.</td>
</tr>
<tr>
<td>• For those at high risk of progression, the percentage of people who have had their eyes examined in the previous 3–6 months. (A high risk of progression is associated with a rapid improvement in blood glucose control, or presence of raised blood pressure, or renal disease.)</td>
</tr>
<tr>
<td>• For those with severe (sight-threatening) retinopathy on examination, the percentage of people who have been referred for specialist opinion within 4 weeks of the finding.</td>
</tr>
<tr>
<td>• For those with new vessels found on examination, the percentage of people who have been referred to an ophthalmologist within 1 week.</td>
</tr>
</tbody>
</table>
In the course of developing the recommendations, the guideline developers considered some areas to be inadequately addressed by the available literature. In view of this, they made the following recommendations.

- Research studies are needed that address effective implementation methods to support the decision-making process or, at least, to monitor the effectiveness of any programme, once established.

- Well-designed screening studies are required to determine whether new tests of screening/early detection (such as digital camera retinal photography) meet the standards of 80% sensitivity and 95% specificity.

- Studies are needed to determine the appropriate interval for formal screening, which is currently unclear. This would have a major impact on the additional costs and benefits of formal screening.

Guidelines on the management of type 1 diabetes are being developed by the Institute and will be available in late 2003/early 2004.

This guideline is one of a series of five guidelines on type 2 diabetes. Others in the series cover the management of renal disease, dyslipidaemia and blood pressure, and blood glucose; these are due for publication in Spring 2002. A guideline on foot care has already been published by the Royal College of General Practitioners.

The Institute has published the following guidance on the use of rosiglitazone and pioglitazone in the treatment of type 2 diabetes mellitus. Both items are available from the NICE website www.nice.org.uk, and paper copies can be ordered from the NHS response line, phone: 08701 555 455.


The Institute’s Guidance Executive will consider changes in the evidence base for this guideline in March 2005. A decision will be made as to the need for and the extent of any update.
Appendix A

Guideline Development Group and Recommendations Panel

Retinopathy Guideline Development Group
The Guideline Development Group is a multiprofessional team brought together on a project basis to consider the evidence of clinical and cost effectiveness and develop the guideline. The members of the Retinopathy Guideline Development Group are listed below.

Dr Bill Alexander
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Edinburgh

Professor Richard Baker (Chair)
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Clinical Governance Research & Development Unit
University of Leicester

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Diabetes Care Adviser
Diabetes UK
London

Professor John Forrester
Head of the Department of Ophthalmology
University of Aberdeen
Aberdeen

Dr Richard Greenwood
Consultant
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Norfolk and Norwich Hospital
Norwich

Dr Gill Grimshaw
Senior Research Fellow
Centre for Health Services Studies
University of Warwick
Coventry

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Consultant in Public Health
Avon Health Authority
Bristol

Dr Kamlesh Khunti
Clinical Lecturer
University of Leicester
Leicester

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Senior Research Fellow and Programme Manager
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ScHARR
University of Sheffield
Sheffield

Mr Colin O’Keeffe
Research Associate
Section of Public Health
ScHARR
University of Sheffield
Sheffield

Dr Jean Peters
Senior Lecturer
Section of Public Health
ScHARR
University of Sheffield
Sheffield

Dr Andrew Wilson
Senior Lecturer
Department of General Practice & Primary Health Care
University of Leicester
Leicester

Professor Geoff Woodward
Head of Department of General Optometry and Visual Science
The City University
London

Recommendations Panel
The production of the guidelines for type 2 diabetes is overseen by a Recommendations Panel, which has ultimate responsibility for ensuring that a valid, relevant rigorous national clinical guideline is produced as the result of the guideline development process. The Panel is also responsible for the final grading of recommendations. Membership details of the Recommendations Panel are listed in the full guideline.
Management of type 2 diabetes

Retinopathy – screening and early management
Algorithm for the early management of diabetic retinopathy in type 2 diabetes

On diagnosis of type 2 diabetes, examine eyes:
• Check visual acuity, corrected with spectacles or pinhole – if problem, including cataract, seek ophthalmologic opinion
• Examine for diabetic retinopathy following dilation of pupils with tropicamide

Is retinopathy present?  No  Yes

No

Manage retinopathy according to severity, as follows:
• Sudden loss of vision
• Retinal detachment

Yes

Maintain good blood glucose control (below 6.5–7.5% HbA1c, according to individual’s target) and good blood pressure control (at or below 140/80 mmHg)

Routine care
Arrange recall and annual review

Emergency referral to ophthalmology specialist
Same day referral

Urgent referral to ophthalmology specialist
Arrange referral within 1 week

Referral
Arrange referral for specialist opinion within 4 weeks

Early review
Arrange recall and review every 3–6 months

• Sudden loss of vision
• Retinal detachment

• New vessels
• Preretinal and/or vitreous haemorrhage
• Rubeosis iridis

• Unexplained drop in visual acuity (which may indicate macular oedema)
• Hard exudates within 1 disc diameter of fovea
• Macular oedema
• Unexplained retinal findings
• Pre-proliferative or severe retinopathy

• Occurrence or worsening of lesions since previous examination
• Scattered exudates more than 1 disc diameter from fovea
• People at high risk of progression

• Minimal or mild background retinopathy
• Low risk background retinopathy

Ref

aUse screening tests that achieve at least 80% sensitivity and 95% specificity
bThose at high risk of progression are those with rapid improvement in blood glucose control, presence of raised blood pressure or renal disease
cThe developers consider these maximum waiting times to be appropriate, though health authorities, trusts and primary care organisations should work to the locally defined waiting time for appointments to see a specialist soon or urgently.
Management of type 2 diabetes
Retinotherapy – screening and early management

The algorithm overleaf forms part of the guideline referenced above. The algorithm draws directly on the evidence presented in the guideline and should be read in conjunction with the guideline on type 2 diabetes. Copies of the guideline can be obtained free of charge from the Institute’s website (www.nice.org.uk). The algorithm overleaf forms part of the guideline referenced above. The algorithm drawing on the evidence presented in the guideline and should be read in conjunction with the guideline on type 2 diabetes. Copies of the guideline can be obtained free of charge from the Institute’s website (www.nice.org.uk).

Review date: March 2005
Appendix B

Guidelines Advisory Committee

The Guidelines Advisory Committee (GAC) is a standing committee of the Institute. It has responsibility for agreeing the scope and commissioning brief for clinical guidelines and for monitoring progress and methodological soundness. The GAC considers responses from stakeholders and advises the Institute on the acceptability of the guidelines it has commissioned. The members of the GAC are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
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</thead>
<tbody>
<tr>
<td>Professor Stephanie A Amiel</td>
<td>RD Lawrence Professor of Diabetic Medicine Kings College</td>
</tr>
<tr>
<td>(resigned 31/3/01)</td>
<td></td>
</tr>
<tr>
<td>Mr Charles Collins</td>
<td>Chairman, Clinical Effectiveness Committee Royal College of Surgeons</td>
</tr>
<tr>
<td>Mrs Joyce Cormie</td>
<td>Consumer Representative</td>
</tr>
<tr>
<td>Professor Mike Drummond</td>
<td>Director, Centre for Health Economics (CHE) University of York</td>
</tr>
<tr>
<td>Professor Martin Eccles (Chair)</td>
<td>Professor of Clinical Effectiveness University of Newcastle upon Tyne</td>
</tr>
<tr>
<td>Mr David Edwards</td>
<td>Chief Executive Cardiff and Vale NHS Trust</td>
</tr>
<tr>
<td>Professor Gene Feder (Vice-Chair)</td>
<td>Professor of Primary Care Research and Development Barts and The London Queen Mary’s School of Medicine and Dentistry</td>
</tr>
<tr>
<td>Professor Jeremy Grimshaw</td>
<td>Professor of Health Services Research and Programme Director in the Health Services Research Unit University of Aberdeen (resigned 30/5/01)</td>
</tr>
<tr>
<td>Dr Gill Harvey</td>
<td>Director Quality Improvement Programme Royal College of Nursing Institute</td>
</tr>
<tr>
<td>Dr Bernard Higgins</td>
<td>Consultant Chest Physician Newcastle upon Tyne</td>
</tr>
<tr>
<td>Professor Allen Hutchinson</td>
<td>Professor of Public Health University of Sheffield</td>
</tr>
<tr>
<td>Dr Marcia Kelson</td>
<td>Director National Guidelines and Audit Patient Involvement Unit c/o College of Health London</td>
</tr>
<tr>
<td>Dr Fergus Macbeth</td>
<td>Consultant Oncologist Velindre Hospital, Cardiff</td>
</tr>
<tr>
<td>Professor James Mason</td>
<td>Professor of Health Economics National Guidelines Support and Research Unit University of Newcastle upon Tyne</td>
</tr>
<tr>
<td>Mrs Judy Mead</td>
<td>Head of Clinical Effectiveness Chartered Society of Physiotherapy</td>
</tr>
<tr>
<td>Ms Juliet Miller</td>
<td>Director Scottish Intercollegiate Guidelines Network</td>
</tr>
<tr>
<td>Dr Chaand Nagpaul</td>
<td>General Practitioner Stanmore</td>
</tr>
<tr>
<td>Professor Robert Shaw</td>
<td>Postgraduate Dean Postgraduate Medical and Dental Education</td>
</tr>
<tr>
<td>Miss Helen Spiby</td>
<td>Senior Lecturer (Evidence Based Practice in Midwifery) Mother and Infant Research Unit University of Leeds</td>
</tr>
<tr>
<td>Dr Jennifer Tyrrell</td>
<td>Consultant Paediatrician Royal United Hospital Bath</td>
</tr>
<tr>
<td>Mrs Amanda Wilde</td>
<td>Clinical Manager Medical Devices Industry</td>
</tr>
<tr>
<td>Mrs Fiona Wise</td>
<td>Chief Executive (interim) Stoke Mandeville Hospital NHS Trust</td>
</tr>
<tr>
<td>Dr John Young</td>
<td>Medical Director MSD</td>
</tr>
<tr>
<td>Ms Carol Youngs</td>
<td>Assistant Director Contact a Family</td>
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</tbody>
</table>
Appendix C

Screening for and early management of eye problems (diabetic retinopathy) – a guide for adults with type 2 diabetes, and carers

The patient information in this appendix has been designed to support the production of your own information leaflets. You can download it from our website at www.nice.org.uk where it is available in English and Welsh. If you would like printed copies of the leaflets please ring the NHS Response Line on 0870 1555 455 and quote reference number N0059 for the English patient leaflet and N0060 for the bi-lingual patient leaflet.

This booklet:

• is for adults with type 2 diabetes and their relatives and carers

• describes the advice, treatment and care you should receive for the prevention and management of eye problems (diabetic retinopathy)

• is based on national evidence-based clinical guidelines on eye care for people with type 2 diabetes.

About clinical guidelines

Clinical guidelines exist to help healthcare teams and patients make the best decisions about healthcare. They are developed by teams of healthcare professionals, patients and researchers who look at the best evidence about care for a particular condition.

Guidelines are recommendations for good practice. They are not intended to be a complete description of a medical condition or disorder. They are not a substitute for patient preference or clinical judgement. There may be good reasons why your treatment may differ from the recommendations in this booklet.

What is diabetes?

Diabetes or, to give it its full name, diabetes mellitus is a common condition in which the amount of glucose (sugar) in the blood is too high because the body is unable to use it properly. Normally, a person’s pancreas (an organ in the body) produces a natural hormone called insulin, which controls the levels of glucose in the blood. Diabetes occurs when the body does not produce enough insulin, or produces insulin but cannot use it properly. There are two types of diabetes.

Type 1 diabetes (also called insulin-dependent diabetes) occurs when there is a severe lack of insulin in the body because most or all of the cells in the pancreas that produce it have been destroyed. This type of diabetes usually appears in people under the age of 40, often in childhood, and is treated by insulin injections and diet.

Type 2 diabetes (also called non-insulin-dependent diabetes) develops when the body can still make some insulin, but not enough for its needs, or when the insulin that is produced does not work properly (known as insulin resistance). This type of diabetes usually appears in people over the age of 40, though it can appear in younger people.

Diabetes can cause a number of problems, which may affect:

• blood glucose (sugar) levels

• blood pressure levels

• the feet
• the eyes (diabetic retinopathy)

• the levels of certain substances in the blood (for example, lipids such as cholesterol)

• the kidneys (kidney problems are sometimes called nephropathy or renal disease).

This booklet describes the advice, treatment and care that adults with type 2 diabetes should receive for the prevention and management of eye problems (diabetic retinopathy).

Other booklets in the series will be published in Spring 2002, and will cover:

• the prevention and management of kidney (renal) problems

• the control of blood glucose (sugar)

• blood pressure management and lipid management (for example, control of cholesterol levels).

One of the effects of type 1 and type 2 diabetes is that small blood vessels in the body may become damaged.

If changes to the blood vessels occur in the inner layer of the eye (called the retina), it can cause a condition called diabetic retinopathy. The retina is the layer at the back of the eye. To see, light must be able to pass to the retina. Diabetic retinopathy may lead to bleeding or scarring in the centre of the retina, making the light unable to reach parts of it. This can affect your sight and, in severe cases, cause blindness. The effects of retinopathy may be different in each eye.

Research shows that people with diabetes can reduce the risk of developing these complications by:

• controlling blood pressure and blood glucose levels (your healthcare professional will advise you on the levels you should be aiming to maintain)

• managing your weight (your healthcare professional can advise you on an appropriate weight for your height)

• maintaining good levels of physical activity (your health professional can advise you on appropriate exercise or fitness plans).

You are at increased risk of having complications the longer you have had diabetes and if you:

• have high blood glucose (sugar) levels**

• have high blood pressure levels**

• are older

• have high levels of certain lipids, such as cholesterol

• are a man (but the other risk factors still apply to women)

• smoke

• have a family history of kidney problems
• are South Asian or African-Caribbean

• have high levels of protein in your urine.

** High blood glucose or blood pressure levels for one person may be normal for another.

To help prevent health problems associated with diabetes, including eye problems, it is important to monitor and manage your blood pressure and blood glucose (sugar) levels. If you have type 2 diabetes, you should expect to have your health reviewed every year. A specially trained member of your healthcare team will look for any health problems or signs of problems or complications. The check-up may include:

• examining your eyes

• carrying out tests to find out how well your kidneys are working,

• advice on your diet, exercise, weight reduction, stopping smoking, and to help you manage your blood pressure and blood glucose (sugar) levels yourself

• advice on the need for any medicine or referral to a specialist.

This annual check-up is an opportunity for you to discuss any concerns or questions you may have. Not all the investigations will necessarily be carried out at the same time (for example, if you have recently undergone some of the tests between annual check-ups, these will probably not be carried out again at your annual check).

Examinations and tests

The examinations and tests to check your eyes may include the following.

• Testing your eyesight to check:
  – how clear your vision is
  – if cataracts are affecting your vision
  – how well the retina (the back of the eye) can be seen.

• Examining your eyes to check each retina, which may involve:
  – dilating the pupils with eye drops called tropicamide to allow a fuller examination of the eye
  – shining light into your eyes
  – taking photographs of the retina.

Your doctor, or a member of your diabetes care team, should agree a plan of care with you that covers:

• how to manage your blood pressure and blood glucose (sugar) levels

• any further monitoring, management or treatment that you need.

The need for further monitoring, management, treatment and follow-up appointments will depend on the results of the tests performed at your check-up.
Summary of what to expect at your annual check-up

If you have type 2 diabetes a member of your healthcare team should:

- arrange an appointment to check your health annually
- measure your blood pressure
- take blood and urine samples to check your:
  - blood lipid levels
  - blood glucose levels
  - kidney function
- offer treatment to make sure healthy levels are maintained
- if you smoke, help you to stop
- discuss ways in which you can reduce the risk of developing heart problems, such as:
  - changing your diet, in particular, reducing the amount of salt you eat
  - taking more exercise (exercise can reduce your blood pressure)
  - losing weight if you are overweight
  - reducing the amount of alcohol you drink
Monitoring and management of eye problems

The number of times you will be asked to attend for appointments to monitor your eyes will depend on the results of the tests carried out when you are first diagnosed with diabetes or at your annual health check.

<table>
<thead>
<tr>
<th>If:</th>
<th>A member of your healthcare team should:</th>
</tr>
</thead>
<tbody>
<tr>
<td>You have no damage or only mild signs of retinopathy</td>
<td>Continue to check your eyes annually and monitor your plan of care with you, discussing with you the significance of early changes and look at blood pressure and blood glucose control</td>
</tr>
<tr>
<td>You have retinopathy which has recently appeared or has worsened since your last examination or Your blood pressure or blood glucose levels are not being successfully controlled or You have kidney problems</td>
<td>Arrange to examine your eyes every 3 to 6 months</td>
</tr>
<tr>
<td>Your sight suddenly gets worse or Signs of retinopathy become more severe</td>
<td>Consider referring you to an eye specialist within 4 weeks</td>
</tr>
</tbody>
</table>

**Eye care emergency**

You should be referred to an eye specialist **urgently** if tests show:

- blood vessels growing in the wrong places within the eye
- blood vessels bleeding into the eye

You should be seen by an eye specialist **immediately** if:

- tests show that your retina has become ‘detached’
- you suddenly cannot see in one or both eyes
- you see flashing lights or black spots
Further information

You have the right to be fully informed and to share in decision-making about your healthcare. If you need further information about any aspects of your diabetes or treatment, please ask your GP or a relevant member of your healthcare team. You can discuss this guideline with them if you wish.

For further information about the National Institute for Clinical Excellence (NICE), the Clinical Guidelines Programme or other versions of this guideline (including the sources of evidence used to inform the recommendations for treatment and care), you can visit the NICE website at www.nice.org.uk.

Ordering information

Copies of the Guideline can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting ref. N0058. Further copies of the patient information can also be obtained by quoting ref. N0059.

This patient information is also available in Welsh, ref. N0060.

Mae’r daflen hon hefyd ar gael yn Gymraeg, rhif N0060.

The advice in this patient information is adapted from Clinical Guidelines for Type 2 Diabetes. Diabetic Retinopathy: Early Management and Screening. Sheffield: Effective Clinical Practice Unit, Royal College of General Practitioners, 2002, which has been produced by a collaboration between the Royal College of General Practitioners, the Royal College of Physicians, the Royal College of Nursing and Diabetes UK, on behalf of the National Institute for Clinical Excellence (NICE).