

A Whittington Hospital Clinical Management Guideline

Guidelines for the Management of Diabetes

Date:	April 2005
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 **The
Whittington
Hospital
Edition**

The Whittington Hospital

Guidelines for the Management of Diabetes

April 2005



Guidelines for the Management of Diabetes

- These guidelines are available on our website:
www.whittington.nhs.uk/diabetes
- They are intended to help teams manage diabetes.
- They were originally written as a joint initiative between the specialist hospital diabetes team and primary care providers in Islington and West Haringey, with targets and care aligned between The Whittington Hospital and University College London Hospital.
- These guidelines focus on the management of type 2 diabetes. In addition, there are sections relevant to the management of type 1 diabetes and local initiatives.
- The original Whittington Hospital and Islington PCT guidelines were reviewed by the President of the Royal College of Physicians:

*“Thank you again for letting me see your very good guidelines.”
Professor Sir George Alberti, PRCP (March 2001)*

Comments from all primary and secondary care providers are welcome. These guidelines will be updated regularly and your comments will be taken into account.

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**This edition of the guidelines has been updated and edited by
Dr Maria Barnard, April 2005**

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Guidelines for the Management of Diabetes 2005: Summary

Aim of treatment:

- To allow a full life; to control blood glucose, blood pressure and lipids; to prevent complications.

Detection and initial action:

- **Screen:** subjects with a family history of diabetes; Asian, Black Caribbean and Black African ethnic groups; subjects with other cardiovascular risk factors (e.g. hypertension); subjects with a history of gestational diabetes; and all those aged 45 years and over.
- Patients with new type 1 diabetes need urgent referral to the hospital diabetes team.
- Patients with type 2 diabetes who are unwell also require hospital referral for initial assessment.
- Group education sessions are available at the Whittington Hospital for all patients in its catchment area with new type 2 diabetes, whether the patients are managed at the hospital clinic or in general practise (contact the Diabetes Specialist Nurses, Whittington Hospital - 020 7288 3344). Sessions are also run in the community by the Islington Community Diabetes Team (contact Irene Mayer / Beth Wright / Denise Van Rensburg – 020 7527 1176 / 1198 / 1216).
- Diet is a mainstay of treatment.
- Exercise is a basic part of treatment for all patients with diabetes.

Tablet treatment:

Aim to reduce HbA1c < 7.0 %

- Institute treatment when weight loss and diet do not give adequate glycaemic control.
- Metformin is the drug of choice for overweight patients (BMI > 25 or BMI > 23 in Asian people).
- Sulphonylurea drugs are an option for first-line therapy for normal weight or thin patients (can increase weight).
- Gliclazide and glibenclamide are commonly used effective drugs.
- In all patients, stop chlorpropamide and substitute another sulphonylurea.
- In patients > 70 y, stop glibenclamide (hypoglycaemia risk) and substitute gliclazide or tolbutamide.

Insulin treatment:

Aim to reduce HbA1c < 7.0 %

- Patients with type 1 diabetes usually attend the hospital diabetes clinic, unless cared for by an experienced GP.
- Patients with type 1 diabetes usually start with premixed, twice a day insulin.
- Younger patients may require 4 injections a day to get good glycaemic control.
- Patients with type 2 diabetes, who are not controlled on tablets, may require additional insulin therapy. Patients usually start with once a day insulin (intermediate/long acting), at bedtime. Patients should be referred to the hospital diabetes clinic or GPs may liaise directly with the Diabetes Specialist Nurses.

Monitoring the patient:

- A register and recall system is required to ensure all patients with diabetes have an annual review.
- Division of care between GP and hospital depends on the skill of each provider. All GP's should be able to provide a good basic level of care to patients with type 2 diabetes.

Annual review:

Education:

- ♦ self monitoring
- ♦ diet
- ♦ foot care
- ♦ smoking
- ♦ exercise
- ♦ alcohol
- ♦ intercurrent illness
- ♦ contraception and pre-conception advice

Examination:

- ♦ weight (BMI)
- ♦ urine for protein
- ♦ blood pressure
- ♦ feet
- ♦ retinal screening

Tests:

- ♦ HbA1c
- ♦ lipid profile
- ♦ urea, electrolytes, creatinine
- ♦ estimate GFR (CrCl)
- ♦ thyroid function tests (TFTs)
- ♦ microalbuminuria/proteinuria



Cardiovascular risk factors:

➤ Smoking

- Stopping smoking will reduce all diabetic complications.
- Consider nicotine replacement therapy or patient referral to smoking cessation service.

➤ Aspirin

- Give aspirin if the patient has cardiovascular disease or is at risk of cardiovascular disease (almost all patients with diabetes over 40 years of age).

➤ Hypertension

Aim to lower BP <130/80

- Treat vigorously and treat systolic hypertension.
 - If renal disease present (including microalbuminuria), aim to lower BP < 125 / 75.
 - ACE inhibitors / Angiotensin-II receptor antagonists are indicated with microalbuminuria / proteinuria.
- ### ➤ Lipids
- Raised cholesterol should be treated aggressively.
 - Improve glycaemic control, start a low fat diet, reduce obesity, avoid alcohol, check TFTs.
 - Patients aged > 40 y with total cholesterol ≥ 3.5 mmol/l should commence statin therapy.
 - Patients aged < 40 y at increased cardiovascular risk, who do not achieve lipid targets, should start statin therapy.
 - Aim to achieve total cholesterol < 4.0 mmol/l, LDL-cholesterol < 2.0 mmol/l.

Complications

➤ Eyes

- Screen the eyes **every year** - screening prevents blindness.
- Patients can be enrolled onto the Camden, Islington & West Haringey Retinal Screening Programme via the retinal screening office (contact Shirley Burnett, Whittington Hospital, 020 7288 3173).
- Refer patient to the eye clinic if multiple large haemorrhages or cotton wool spots, new vessels, maculopathy, unexplained decrease in visual acuity or acuity < 6/12, significant cataracts.
- Patients in the screening programme will be referred to the eye clinic through the scheme.

➤ Feet

- Assess the feet **every year** - use the 'Focus on Feet' protocol.
- Detection and treatment of foot problems halves the risk of amputation.
- Refer to community podiatrist for nail-care, if needed by the patient, and management of callous.
- Refer to the hospital podiatry service if ulcer present or foot at risk of ulceration.

➤ Microalbuminuria / Proteinuria / Renal Impairment

- Screen for microalbuminuria or proteinuria **every year**.
- Estimate Glomerular Filtration Rate (eGFR) (Creatinine Clearance, CrCl) every year.
- If microalbuminuria present or GFR 30 – 60 ml / min consider referral to the hospital diabetes clinic.
- If proteinuria present or GFR < 30 ml / min refer to the renal clinic and hospital diabetes clinic.
- Aggressive management of BP and glycaemic control delays progression to renal failure.

➤ Sexual function

- Ask about sexual difficulties in men and women. Consider referral to the Andrology Clinic (Mr Barry Maraj), Department of Urology at the Whittington Hospital.

Shared care facilities for patients managed in primary care:

- Community eye screening - Camden, Islington and West Haringey Retinal Screening Programme.
- Prompted community diabetes care – available to patients in the catchment area of the Whittington Hospital. Patients receive 6 monthly prompts to attend GP for blood tests and review. Contact Maria Christofi, Whittington Hospital (020 7288 3173).



MANAGEMENT TARGETS FOR PEOPLE WITH DIABETES

- Targets should be tailored to the individual, taking account of what is possible and safe.
- Over ambitious targets can be counterproductive. For example, in those with a relatively short life expectancy, it may be inappropriate to impose strict management targets where this may impair quality of life.
- The impact of other cardiovascular disease or risk factors should be taken into account when agreeing targets.

TARGETS OF CARE

	Good	Borderline	Poor
HbA1c ^a [%]	< 7	7-8	>8
Capillary Blood Glucose [mmol/l]			
Fasting	4-7	7-8	> 8
Postprandial (2h after food)	5-8	8-10	>10
Urine glucose	-	-/+	+
Blood Pressure ^b [mmHg]	< 130/80	130/80 - 139/89	≥ 140/90
Total cholesterol (TC) [mmol/l]	< 4.0	4.0 – 4.9	≥ 5.0
LDL cholesterol [mmol/l]	< 2.0	2.0 – 2.5	≥ 2.6
HDL-cholesterol ^c [mmol/l]			
• Men	> 1.1		
• Women	> 1.3		
Fasting triglycerides ^d [mmol/l]	< 2.3	2.3 – 5.6	≥ 5.7
Smoking	Non-Smoker	Smoker	Smoker
Body Mass Index [kg/m ²] ^e	20-25	26-27	≥ 27
Exercise	Daily	Weekly	None
Aspirin (75 mg daily)	Daily	Intermittent	None

a HbA1c assays should all be DCCT aligned.

b Stricter targets may be necessary (e.g. in renal disease, BP target is < 125/75).

c HDL-cholesterol optimal levels: Men ≥ 1.6 mmol/l; Women ≥ 1.8 mmol/l.

d Fasting triglycerides optimal level: < 1.7 mmol/l.

e For Asian subjects, BMI < 23 kg/m² is a normal weight and good BMI.



WHITTINGTON TRUST DIABETES OUT-PATIENT SERVICES

OUTPATIENT DIABETES CLINIC TIMES

General Diabetes Clinics		<ul style="list-style-type: none"> • Tuesday • Wednesday • Wednesday • Thursday 	<ul style="list-style-type: none"> • Afternoon • Morning • Afternoon • Afternoon
Diabetes Renal Clinic	Dr Barnard & Dr Woolfson	<ul style="list-style-type: none"> • Wednesday 	<ul style="list-style-type: none"> • Morning
Young Adults Clinic	Dr Barnard	<ul style="list-style-type: none"> • Thursday 	<ul style="list-style-type: none"> • Afternoon
Adolescent Clinic	Dr Barnard, Dr Rossi & Dr Raine, Dr Broadhurst	<ul style="list-style-type: none"> • One Thursday every 3 months 	<ul style="list-style-type: none"> • 2 – 6 pm
Ante-natal Clinic	Dr Rossi & Miss Morgan	<ul style="list-style-type: none"> • Monday 	<ul style="list-style-type: none"> • Morning
Diabetes Eye Clinic	Miss Davey	<ul style="list-style-type: none"> • Tuesday 	<ul style="list-style-type: none"> • Morning & Afternoon
Paediatric Clinic	Dr Raine	<ul style="list-style-type: none"> • One Thursday of each month • One Friday of each month 	<ul style="list-style-type: none"> • Afternoon • Morning
Podiatry Clinics (for outpatients)	Jennifer Buchanan	<ul style="list-style-type: none"> • Monday am • Tuesday am/pm • Wednesday am/pm • Friday am 	<ul style="list-style-type: none"> • 9.00 – 12.30 am • 1.30 – 5.00 pm

Urgent telephone advice:	Diabetes Specialist Nurses (DSNs) 020 7288 3344 or 3490 Diabetes Specialist Registrar - Hospital Switchboard
Ante-natal advice:	Diabetes/High Care Midwifery Coordinator (Julie Logue) 020 7288 3531 DSN (Romilla Jones) 020 7288 3344 (Monday & Thursday)
Paediatric advice:	Paediatric Diabetes Specialist Nurse (Roma Romano-Morgan) 020 7288 3654 DSN (Jill Lankester) 020 7288 3490
Urgent appointments:	Diabetes Secretary Fax: 020 7288 5052
Routine appointments	Tel: 020 7288 3070 Fax: 020 7288 5930

CONTACT NUMBERS

Appointments:	020 7288 3070	Retinal screening:	020 7288 3173
Diabetes secretary:	020 7288 5218/9	Prompted shared care:	020 7288 3173
Dietetics:	020 7288 5553/2	Pathology Results:	020 7288 5900
Podiatry:	020 7288 5695	Haematology lab:	020 7288 5767
Diabetes specialist nurses:	020 7288 3344	Biochemistry lab:	020 7288 5775
Community diabetes liaison nurse:	020 7288 3490		



WHITTINGTON TRUST DIABETES RELATED STAFF

Diabetes Service Related Doctors

Dr Maria Barnard	Lead Consultant in Diabetes	<i>Speciality:</i> Diabetes and renal disease; diabetes in adolescent and young adult patients
Dr Michela Rossi	Consultant in Diabetes	<i>Speciality:</i> Diabetes in pregnancy; diabetic foot disease
Professor John Yudkin	Honorary Consultant in Diabetes	<i>Speciality:</i> Cardiovascular risk in diabetes
Dr Jigisha Patel	Part-time SpR	Outpatient diabetes care
Dr Leslie Isenberg	GP Clinical Assistant	Outpatient diabetes care
Dr Heskell Kateb	GP Clinical Assistant	Outpatient diabetes care
Specialist Registrar	Diabetes/Endocrine/GIM	Inpatient & outpatient care
SHO	Diabetes/Endocrine/GIM	Inpatient & outpatient care
House Physician	Diabetes/Endocrine/GIM	Inpatient diabetes care
Dr Robin Woolfson	Consultant in Nephrology	Renal disease in diabetes
Miss Heulwen Morgan	Consultant in Obstetrics	Ante-natal care in diabetes
Miss Clare Davey	Consultant Ophthalmologist	Eye disease in diabetes
Dr Joseph Raine	Consultant in Paediatrics	Diabetes in paediatric patients
Mr Alan Wilson	Consultant Surgeon	Peripheral vascular disease in diabetes

Specialist Nurses and Diabetes Specialist Nurses (DSN)

Jill Lankester	Lead DSN	<i>Speciality:</i> Diabetes in adolescent patients; Community care liaison; service development
Elly Baker	DSN	<i>Speciality:</i> Acute inpatient care of diabetes
Cathy Jenkins	DSN	<i>Speciality:</i> Diabetes in renal disease; patient self management and education
Caroline Cox	DSN	<i>Speciality:</i> Outpatient care of diabetes
Romilla Jones	DSN	<i>Speciality:</i> Diabetes in pregnancy; research
Roma Romano-Morgan	Paediatric DSN	<i>Speciality:</i> Diabetes in paediatric patients
Liz Denver	Hypertension Specialist Nurse	<i>Speciality:</i> Hypertension and cardiovascular risk management in diabetes; research

Community Diabetes Care Team

Shirley Burnett	Retinal Screening and Shared Care Project Manager; Whittington NSF Lead for Diabetes
Maria Christofi	Deputy Shared Care Co-ordinator; Diabetic Retinal Screening Practitioner
Gurmeh Lohia	Retinal Screening Programme Administrator; Diabetic Retinal Screening Practitioner

Podiatry

Jennifer Buchanan	Senior Podiatrist	<i>Speciality:</i> Foot ulcers and charcot arthropathy
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Diabetes Dietitian

Janice Mavroskoufis	Senior Diabetes Dietitian	<i>Speciality:</i> Diet and complex insulin regimes; weight management in diabetes
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Outpatient staff

Patsy Modeste	Diabetes Clinic Nurse; OGTT Co-ordinator; Diabetic Retinal Screening Practitioner
Carol Basdeo	Diabetes Clinic Nurse; Endocrine Nurse



EDUCATION & SERVICE INITIATIVES AVAILABLE AT THE WHITTINGTON HOSPITAL DIABETES DEPARTMENT

1. Group education sessions for people with newly diagnosed type 2 diabetes

These are open to all patients, whether referred to the hospital diabetes clinic or staying under the care of their GP.

➤ Contact the Diabetes Specialist Nurses on 020 7288 3344 or 3490

2. WINDFAL (Whittington INSulin Dosing For Active Living): group education for people with type 1 diabetes

This course is based on the Royal Bournemouth Hospital modified DAFNE programme, known as 'BERTIE' (Bournemouth Educational Resources for Training in Insulin and Eating). It provides education on adjusting insulin according to diet and lifestyle and starts in Autumn 2005.

➤ Contact Cathy Jenkins on 020 7288 3344 or Janice Mavroskoufis in 020 7288 5552

3. Advanced Diabetes Care Course for Practise Nurses

This scheme involves small group talks and one-on-one teaching with the hospital Diabetes Specialist Nurses. The aim is to expand the practical knowledge of the Practice Nurse in the day-to-day management of diabetes.

➤ Contact Jill Lankester on 020 7288 3490

4. Diabetic Foot Care Scheme for Accredited GPs

This scheme accredits primary care providers (GPs and Practice Nurses) in management of the diabetic foot. This allows them direct access to the Whittington Podiatry Department and related hospital foot care services.

➤ Contact Maria Christofi on 020 7288 3173

5. Clinical Observer in the Diabetes Renal Clinic

In this scheme, local GPs who provide a high level of diabetes care in their practice attend the joint diabetes renal clinic. They meet the diabetes consultant (Dr Maria Barnard), the renal consultant (Dr Robin Woolfson) and Diabetes and Hypertension Specialist Nurses. They observe the busy specialist clinic and have the opportunity to discuss management issues relating to the clinic patients and to their own practice.

➤ Contact Maria Christofi on 020 7288 3173

6. Camden, Islington and West Haringey Retinal Screening Programme

This scheme is available to patients with diabetes, including those cared for solely by their GP. It enables the patients to have their annual diabetic eye screening performed by Retinal Photographers and local Optometrists, who have been trained and accredited by The Whittington Hospital. Patients are referred to the eye clinic if required, according to established protocols.

➤ Contact Shirley Burnett, Maria Christofi or Gurmeh Lohia on 020 7288 3173

7. Prompted Community Diabetes Care Scheme

In this scheme, patients continue to receive their diabetes care from the primary care team. In addition, they are enrolled onto a database at the Whittington Hospital, which prompts the patient to have regular blood and urine tests, eye screening and to attend their GP for review. Patients can be referred to the hospital diabetes clinic via this scheme if their GP is concerned.

➤ Contact Maria Christofi on 020 7288 3173

8. Whittington Hospital Diabetes Service Website

➤ www.whittington.nhs.uk/diabetes



Chapter 1:
Screening, Diagnosis & Initial Action



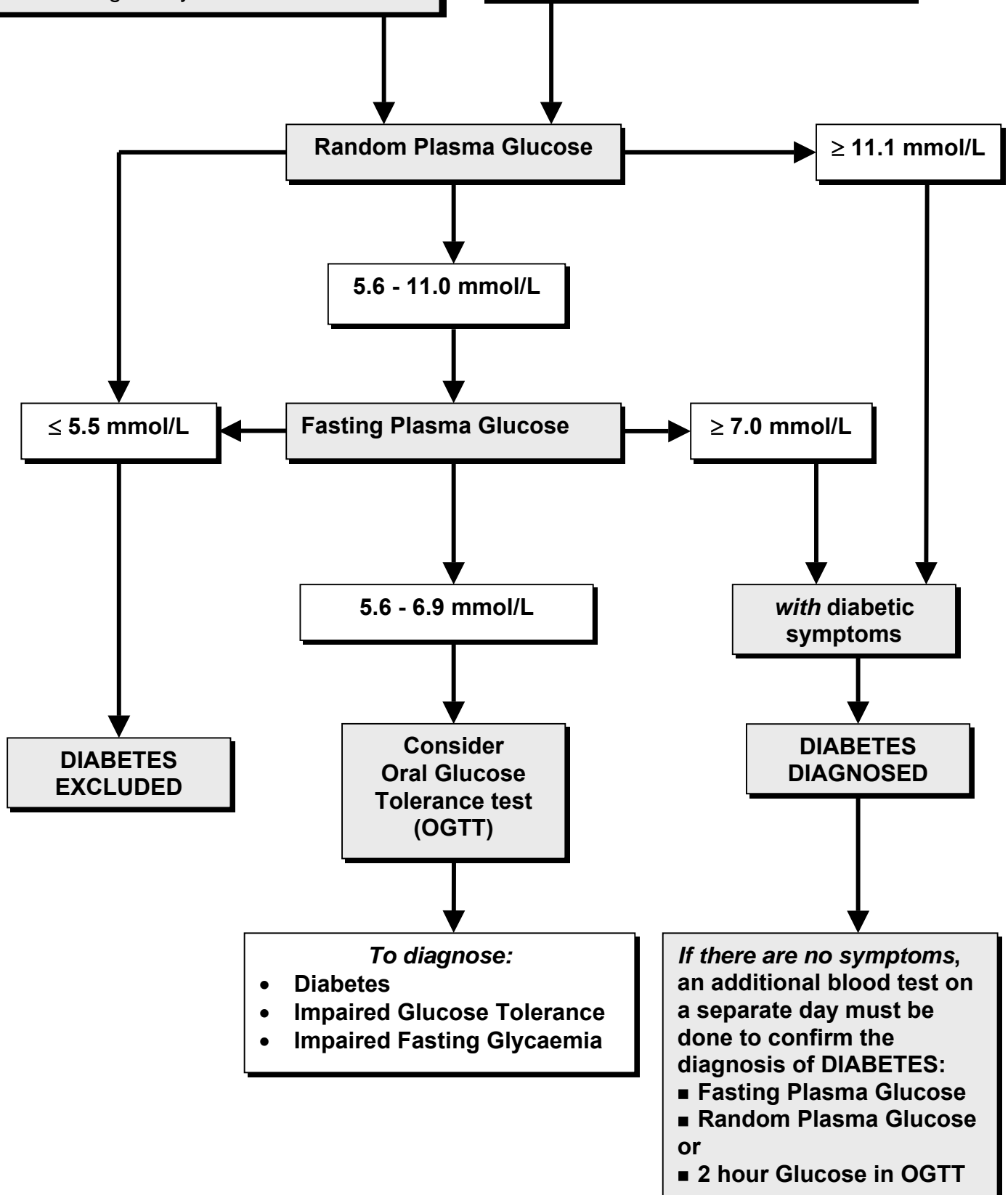
SCREENING AND DIAGNOSIS

Patients at risk

Glycosuria on routine screening
Age ≥ 45 , obesity, positive family history
Asian, Black African, Black Caribbean
History of gestational diabetes, foetal loss or large baby

Symptoms of Diabetes

Weight loss, thirst, polyuria, nocturia, lethargy, pruritus vulvae, balanitis, recurrent sepsis, blurred vision



SCREENING AND DIAGNOSIS

Oral Glucose Tolerance Test (OGTT)

Indications:

- Fasting Plasma Glucose 5.6 - 6.9 mmol/l
- Where the Fasting Plasma Glucose may be unreliable:
 - Elderly patients
 - Ethnic minority groups

Method:

- Patient fasts overnight
- Given 75 g anhydrous glucose (or 388 ml lucozade)
- Blood for plasma glucose at 0 min and 120 min

Fasting glucose
 ≤ 5.5 mmol/l
 2 hour glucose
 < 7.8 mmol/l

**DIABETES
EXCLUDED**

Fasting glucose
 5.6 - 6.9 mmol/l
 2 hour glucose
 < 7.8 mmol/l

IFG
*Impaired
Fasting Glycaemia*

Fasting glucose
 < 7.0 mmol/l
 2 hour glucose
 $\geq 7.8 - 11.0$ mmol/l

IGT
*Impaired
Glucose Tolerance*

Fasting glucose
 ≥ 7.0 mmol/l
 OR
 2 hour glucose
 ≥ 11.1 mmol/l

DIABETES

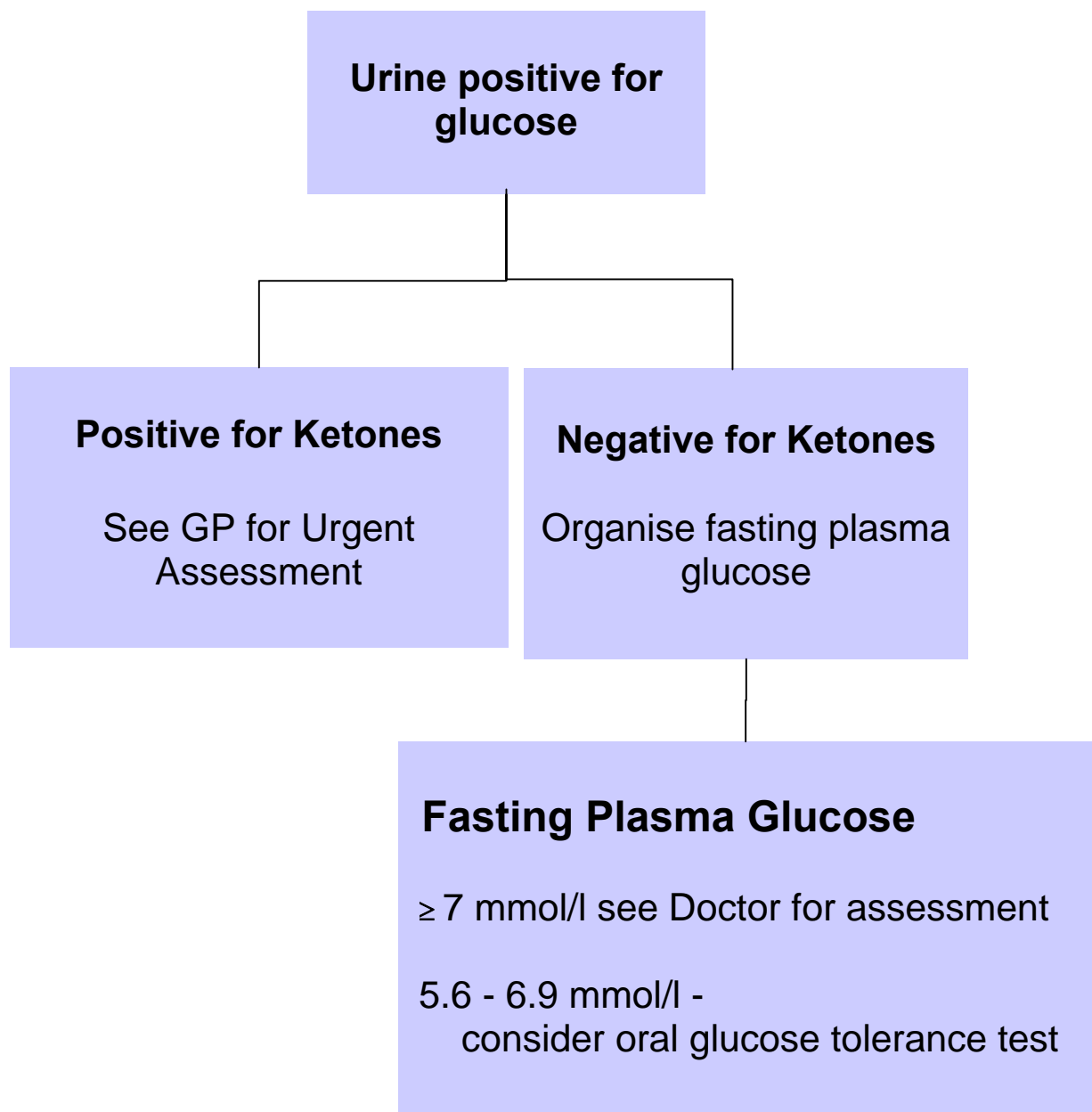
**Attention to cardiovascular risk factors
 Test fasting glucose annually**

TO BOOK OGTT:

1. Complete request form (must include GP code) and give to patient.
2. Patient phones to leave their details on answer phone (020 7288 5230).
3. Patsy Modeste (Diabetes Clinic Nurse) phones them back to arrange date for OGTT.
4. A capillary blood glucose is checked before and after the OGTT. If high, advice is sought from the Diabetes Specialist Nurse before proceeding with the OGTT or sending the patient home.



POSITIVE URINALYSIS FOR GLUCOSE



Remember: YOU CANNOT DIAGNOSE DIABETES FROM URINALYSIS




DIABETES DIAGNOSED – INITIAL ACTION AND REFERRAL

A) DOES THE PATIENT NEED INSULIN?

In a patient with newly diagnosed diabetes, one of the first points to consider is whether they need insulin. If insulin therapy is likely, refer them to the hospital diabetes team.

If there are 2 or more of the following:

- 
- Ketonuria ++ or more
 - Severe symptoms
 - Short history
 - Marked weight loss



**Likely to need insulin
Refer to hospital**

B) ALL OTHERS - START MANAGEMENT IN GENERAL PRACTICE

Patients with well controlled type 2 diabetes will normally be looked after by their GP, with easy access to the hospital diabetes clinic or other specialist clinics if problems arise.

C) ALL NEW PATIENTS [both Type 1 & Type 2 Diabetes]

Initial action points:

- Enter patient on practise diabetes register.
- Start health education and advise patient to join Diabetes UK (previously BDA).
- Give dietary advice and refer to dietitian in general practice or the community dietetic service or at the Whittington Hospital.
- Set targets of care.
- For patients with new type 2 diabetes, give details of education sessions at the Whittington Hospital, which are open to all patients in its catchment area.
- Enrol patient onto the Camden, Islington and West Haringey Retinal Screening Programme (patient recruitment forms available from the Retinal Screening Office at The Whittington Hospital 020 7288 3173 or the Retinal Screening website).
- See further details in *Chapter 10: 'Diabetes Review Formats & Continuing Care'*.



CRITERIA FOR SPECIALIST REFERRAL

1) Urgent Referral [by phone, within 24hrs]

- **Child with new diabetes** [via paediatricians]
- **Most new type 1 diabetics** [look for ketonuria, short history of severe symptoms and marked weight loss, usually in a patient under 40 years of age]
- **Moderate or heavy ketonuria**
- **Acutely infected or ischaemic foot**
- **Women with diabetes who are pregnant**
- **Women with gestational diabetes**
- **Protracted vomiting in patient with diabetes** [emergency referral and consider admission]

2) Routine Referral

- **If pregnancy planned**
- **Problems with diabetes management and persistently poor HbA1c (> 8 %)**
- **If insulin therapy is necessary**
- **If hypertension or hyperlipidaemia is difficult to manage**
- **Patient with complications**

3) Who Should Patients Be Referred To?

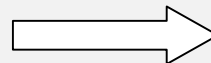
- Persistent microalbuminuria [if management targets are not reached]
- *Persistent proteinuria [PCR > 0.1 g/mM]
- Creatinine clearance 30 – 60 ml / min
- *Creatinine clearance < 30 ml / min
- *Raised serum creatinine [> 150 µmol/l]
- Troublesome neuropathy, mononeuropathy, amyotrophy
- Deterioration of feet
- Difficult to control hypertension or hyperlipidaemia



**Diabetic
Clinic**

*These patients will be referred on to the renal clinic. Some experienced GPs, providing a high level of diabetes care, may wish to continue to manage the patient's diabetes. In such cases, the GP may refer these patients directly to the renal clinic. Referral to the hospital diabetic clinic would also be indicated if tight control of blood glucose, blood pressure and lipids are not being achieved in primary care (targets in *Chapter 16: 'Kidney Disease: Screening & Management'*).

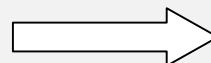
- Retinopathy *
- Unexplained deterioration of vision



Ophthalmology

* See referral criteria to Ophthalmology in *Chapter 14: 'Retinal Screening'*

- Psychological problems complicating diabetes*



Diabetes clinic*

* Patients may be referred on to the Psychology Department

4) Referral Letter To The Hospital – Please Include:

- NHS number and language spoken
- In a newly diagnosed patient: plasma glucose and presence or absence of ketones at diagnosis, symptoms, length of history, change in weight, family history



Chapter 2:
Education In Type 2 Diabetes



EDUCATION IN DIABETES

Type 2 Diabetes Group Education Sessions

All patients with newly diagnosed type 2 diabetes should attend a group education session. These are run twice a month at the Whittington Hospital. Each session lasts about 2 hours and is led by a Diabetes Specialist Nurse, a Dietitian and a Podiatrist. There is no need to book patients onto these sessions. The patient can just turn up and bring their partner with them, if so wished. Dates are circulated to local practices at the beginning of each year. For further information or for a list of dates, contact the Diabetes Specialist Nurses at the Whittington Hospital on 020 7288 3344. Some sessions are also run in the community by the Islington Community Diabetes Team (contact Irene Mayer / Beth Wright / Denise Van Rensburg – 020 7527 1176 / 1198 / 1216).

Where it is not possible for the patient to attend or when it is not appropriate (patient deaf or does not speak English) these education points should be covered at the general practice.

Content of Group Education Session

1. Explanation of type 2 diabetes:

- Possible symptoms at presentation
- Simple physiology
- Genetic and ethnic group links
- Association with obesity and hypertension

2. Treatment

- Aims of treatment: symptom control and prevention of complications
- Diet as the mainstay of treatment - discussed in detail with slides and plenty of opportunity for questions
- Tablets for blood sugar control - what they do and how to take them
- Insulin as a possible later treatment is mentioned
- Tablet treatment for cardiovascular risk prevention
- Role of exercise in cardiovascular risk prevention and blood sugar control

3. Self management in diabetes

- How to achieve good blood sugar control to prevent microvascular complications
- How to minimise cardiovascular risk through weight management, exercise, smoking cessation and blood pressure control
- Foot care - explanation of diabetic foot problems, how to prevent them with good personal foot care and how to access podiatry services

4. Importance of yearly medical review

- Includes brief explanation of diabetic eye and kidney disease and these are screened for in General Practice and Hospital clinics

5. Self monitoring of diabetes

- We teach urine testing with Diastix and give a bottle of sticks
- Explain significance of glycosuria in relation to normal renal threshold
- Blood sugar testing is mentioned as a more suitable alternate for some people but not taught at these sessions



6. Literature given

- Diabetes UK booklets: *Diabetes: Diet and Tablets* & *Diabetes: What Care to Expect*
- Healthy eating guidelines
- Footcare leaflet

Continuing Diabetes Education In General Practice

Much of the on-going care for people with diabetes consists of education and encouraging self-management of diabetes.

The points covered in the group education session need to be developed and re-emphasised at a pace suitable for the individual patient.

It is important that the Practice Nurse has enough time allocated in her consultation to enable her to give education and support to the patient's self management, as well as carrying out tests and recording data.

Useful Reference Book

'Providing Diabetes Care in General Practice: A Practical Guide to Integrated Care'

by Mary MacKinnon

This is an excellent and practical guide for all members of the Primary Care Team.



EDUCATION OF PEOPLE WITH TYPE 2 DIABETES

A CHECKLIST

1. Nature of Diabetes

- Significance and implications of diabetes ☐
- Aims and different types of treatment ☐
- Relationship between blood glucose, dietary intake and physical activity ☐
- Short and long term consequences of poorly controlled diabetes ☐
- Association between cardiovascular risk and diabetes ☐
- Nature and prevention of long term complications ☐
- Importance of annual review, including screening for eye disease ☐

2. Day-to-day Management of Diabetes

- Importance of healthy lifestyle, exercise and not smoking ☐
- Importance of self management and empowerment ☐
- Food and diabetes ☐
- Self monitoring either home glucose monitoring or urine testing ☐
- Interpretation and action following self monitoring ☐
- Importance of foot care, choice of footwear, foot hygiene and the role of the Podiatrist ☐

3. Special Problems

- Hypoglycaemia - warning signs, role of alcohol and associated risk situations (e.g. driving, diving, working at a height or working with dangerous machinery) ☐
- Intercurrent illness - how to manage diabetes ☐
- Preconception advice - the importance of good glucose control ☐

4. Living with Diabetes

- Personal identification ☐
- Driving - notification of the DVLA and insurance company ☐
- Implications of diabetes on employment, life insurance and travel insurance ☐
- Making best use of healthcare services - free eye checks and free prescription charges ☐
- Advise on annual influenza vaccination ('flu jab') and pneumovax ☐

5. Contacts and Help lines

- Diabetes UK (Central Office): Tel no. 020 7424 1000 or www.diabetes.org.uk ☐



Chapter 3:

Dietary Advice

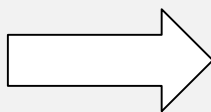


DIETARY ADVICE FOR PEOPLE WITH DIABETES

➤ Eat Less Sugar

STOP:-

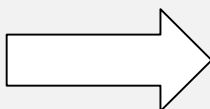
Sugary drinks:
including 'unsweetened', 'natural'
fruit juice and all Lucozade unless
'low calorie'



START:-

Try unsweetened drinks, water, low
calorie or diet drinks.
Artificial sweeteners can be used in
tea or coffee.

Sugary foods

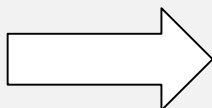


Try low sugar or reduced sugar
snacks e.g. scones, currant buns,
tea-cakes, cereal bars, rich tea
biscuits or fruit.

AVOID FRUIT JUICE – even 'unsweetened', 'natural' or 'freshly squeezed' juice contains a large amount of sugar. Take no more than one small glass per day with food.

➤ Eat Less Fat

Cut down on fat/oil



Less fried foods
Less full fat dairy products
Less fatty meats/sausages
Less fatty sauces and oily dressings
Less pies and pastries
Less fatty snacks e.g. crisps, nuts,
biscuits, cakes

For cooking or salad dressings, a small amount of mono or poly-unsaturated oil is OK
e.g. Olive oil, Sunflower oil, Soya oil, Corn Oil, Rapeseed oil.

Take care with "VEGETABLE OIL" – this may contain coconut or palm oil, which is high in saturated fatty acids and should be avoided.

➤ Eat Less Salt

- Use less salty processed foods and snacks e.g. less cheese, ham, bacon, sausages, tinned, packet and bottled soups, vegetables and sauces, crisps and salted nuts.
- Use more unprocessed and fresh or frozen foods, e.g. vegetables.

➤ Eat More Starchy Foods – these should be the main part of each meal or snack

- Breads
- Breakfast cereals (not sugar or honey coated)
- Potatoes, starchy vegetables and fruits e.g. sweet potato, yam, cassava, dasheen, plantain, green banana
- Rice
- Pasta, macaroni,ourgouri
- Beans, peas and lentils



➤ **Eat More Vegetables and Fruit – Aim for at least 5 portions a day**

- Preferably eat more vegetables than fruit.
- Eat no more than 4 portions of fruit in a day, and no more than one portion at a time.
- Starchy vegetables like potatoes count as starch, not as a fruit or vegetable intake.

What is a portion?

One portion of fruit =

- 1 apple or 1 pear or 1 orange or 1 banana
- 2 plums or 2 satsumas
- 1 slice of melon
- 1/3 of a mango
- 10 grapes or 10 cherries
- a bowl of strawberries, raspberries, blackcurrants or gooseberries

Alternatives:

- Tinned fruit in natural juice or water is acceptable.
- Dried fruit is acceptable when used in baking or to sweeten breakfast cereals or in desserts – but do not eat as a snack.
- Legumes, peas, beans, lentils and corn are good and also fast to use when tinned or frozen.

➤ **Special Considerations - Ethnic Groups**

Look out specifically for the following dietary issues:

Black-Caribbean Sugary drinks, condensed/evaporated milk, malt drinks or high energy glucose drinks (e.g. Lucozade), palm oil, meat portions, fatty meat, added salt

Indo-Asians Type/amount of fat added to curries, chapattis, fried snacks

Greek/Turkish Amount of oil used, syrup pastries, olives, full fat Greek yoghurt

South East Asians Amount of white rice, deep fried foods, salted foods, soya sauce

➤ **Meal Pattern**

Regular small meals and snacks will keep blood sugar more stable than occasional large meals. Aim for 3 small meals or snacks each day.

DIET AND LIFESTYLE SUMMARY

1. If overweight, aim to lose weight – even a 3 kg weight loss will be beneficial.
2. Increase exercise – aim for 30 min aerobic exercise, 5 times a week.
3. Moderate alcohol – men < 2-3 units/day; women < 1-2 units/day.
4. Stop smoking – a major risk factor for cardiovascular disease.
5. Eat regular meals and snacks – at least 3 per day.
6. Cut out very sugary drinks and foods.
7. Cut down on fried and fatty foods.
8. Eat less salty, processed foods and snacks.
9. Eat more starchy foods.
10. Eat more vegetables and fruit (fresh or frozen).



FIRST AID DIET ADVICE FOR THE PATIENT WITH DIABETES

Diet is critical in managing and coping with your diabetes. If there is a problem with your diabetes always THINK ABOUT YOUR FOOD. Improving your diet will help to control your blood sugar levels, control your weight and lower your risk of heart disease.

1. **Eat regular meals, based on starchy foods.** These foods should be part of every meal or snack and include bread, pasta, chapattis, potatoes, rice, cereals, beans, peas and lentils.
2. **Eat more high fibre foods** - like wholemeal bread and wholemeal cereals.
3. **Cut down on the amount of fat you eat**, particularly animal fats. Use less butter, margarine, cheese and fatty meats. Change to semi-skimmed or skimmed milk. Grill, steam or oven bake rather than fry. For oil, use olive oil, sunflower oil, soya oil, corn oil or rapeseed oil - but not “vegetable oil” which contains coconut or palm oil. Eat less pies, pastries, crisps, nuts, biscuits and cakes.
4. **Eat at least 5 portions of fruit and vegetables** throughout the day, every day:
1 portion of fruit = 1 apple or 1 pear or 1 orange or 1 banana
or 2 plums, 2 satsumas or 1 slice of melon
or 1/3 of a mango
or a handful of grapes or cherries
or a bowl full of strawberries, raspberries, blackcurrants or gooseberries
5. **Avoid Fruit Juice**, even ‘unsweetened’ or ‘natural’ fruit juice contains a lot of sugar. Take no more than one small glass per day, preferably with food.
6. **Avoid sugary drinks**, including fizzy drinks, lucozade and squash - choose low calorie / sugar free / diet drinks instead or water.
7. **Use artificial sweeteners** in place of sugar.
8. **Use less salt** - try flavouring with herbs and spices instead.
9. **If you drink alcohol, limit your intake** – men less than 2 - 3 units a day, women less than 1 – 2 units a day. Alcohol can affect your diabetes, causing high or low blood sugars.
10. **Do not buy special diabetic foods.**



HOW TO GET DIETARY ADVICE FOR PEOPLE WITH DIABETES

All people with newly diagnosed diabetes (type 1 and type 2 diabetes) need dietary advice, ideally within 4 weeks.

All Patients with newly diagnosed Type 2 Diabetes

Send patients from Islington and West Haringey to one of the regular education sessions at the Whittington Hospital, run twice monthly. The programme includes dietary advice given by the Diabetes Dietitian. Session dates are sent out annually. Call the Diabetes Specialist Nurses for further details on 020 7288 3344. Patients can also access the community-led education sessions at Finsbury Health Centre (contact Irene Mayer / Beth Wright / Denise Van Rensburg – 020 7527 1176 / 1198 / 1216).

Some Patients will need direct referral for dietary advice:

- Patients with type 2 diabetes with language or hearing problems
- All patients with type 1 diabetes
- Specific management issues

Refer them directly to the Primary Care & Community Dietitians (details and referral forms given below) or Diabetes Clinical Nutrition Therapist at the Whittington Hospital:

Islington Primary Care	Haringey Primary Care	The Whittington Hospital
Primary Care & Community Dietitians Nutrition and Dietetics 1 st Floor, North East Building St Pancras Hospital 4 St Pancras Way London NW1 0PE Tel: 020 7530 3551 Fax: 020 7530 3982	Primary Care & Community Dietitians Holbrook House Cockfosters Road Barnet Herts EN4 0DR Tel: 020 8272 5500 Fax: 020 8272 5513	Janice Mavroskoufis Diabetes Clinical Nutrition Therapists Department of Nutrition & Dietetics The Whittington Hospital Highgate Hill London N19 5NF Tel: 020 7288 5552 or 5553

Annual Review

At the yearly diabetes review, all people with diabetes should have a diet review, ideally by a dietitian. However, this can be done by a GP, Practice Nurse, Hospital Doctor specialising in Diabetes or Diabetes Specialist Nurse.

If a diet problem is highlighted, patients should be offered an appointment to see a dietitian.

Written information for patients on healthy eating and diabetes

Starter sheets with basic information are available from the Diabetes Dietitians at the Whittington Hospital. Diabetes UK (formerly the British Diabetic Association) produce a lot of information on healthy eating and cooking, including a free leaflet 'Eating Well with Diabetes' which is also available on the Diabetes UK website www.diabetes.org.uk

For the Diabetes UK catalogue contact:

Diabetes UK Distribution Department, P.O. Box 1, Portishead, Bristol BS20 8DJ

Tel: 0800 585058



For Office Use Only
Ref No:

REFERRAL TO DIETICIAN – ISLINGTON PCT

Please complete all relevant sections clearly
If sections are left incomplete, it may be returned for more information

Mr ☐ Mrs ☐ Miss ☐ Ms ☐

Surname _____

First name _____

Address _____

Postcode _____ Tel. _____

D.O.B. _____

Does the client need an interpreter? Yes ☐ No ☐

Language _____

GP's name: _____

GP's address: _____

GP's Tel: _____

Relevant Medical History with dates: _____

Relevant Information / Biochemical results with dates:	
Weight _____ Date _____	Total cholesterol _____ Date _____
Height _____ Date _____	LDL _____ Date _____
BMI _____ Date _____	HDL _____ Date _____
HbA1C _____ Date _____	Triglycerides _____ Date _____
Random BS _____ Date _____	Other eg iron/calcium _____
Fasting BS _____ Date _____	Date _____
Medication _____ Date _____	

Reason for Dietetic Referral: _____

Social history / useful information (eg visual / hearing difficulty): _____

A GP's signature is required to confirm diagnosis:

GP's Signature: _____

Name and title: _____ Date _____

Return to the address overleaf - PLEASE TURN OVER FOR LIST OF CLINICS



Return form to:**NUTRITION AND DIETETICS**1st Floor, North East Building

St Pancras Hospital

4 St Pancras Way

London NW1 0PE

Non-patient line: Tel.020 7530 3551 / Fax: 020 7530 3982

CLINICS WITHIN THE ISLINGTON AREA

Please indicate the patient's preferred venue. On receipt of this referral, a letter will be posted to the patient requesting the department to make a suitable appointment. Appointments are made at a time and venue to suit the patient. If a patient is able to travel they may be offered an appointment at a venue with a shorter waiting list.

Isledon Road Medical Centre Monday 9.15 – 12.30pm	115 Isledon Road N7 7JJ	<input type="checkbox"/>
Mildmay Medical Practice Monday 2.30 – 5pm	2a Green Lanes N16 9NF	<input type="checkbox"/>
Goodinge Health Centre Thursday 2.15 – 5pm	Goodinge Close, North Road N7 9EW	<input type="checkbox"/>
Tufnell Park Road Surgery Friday 9.15 – 12.30pm	244 Tufnell Park Road N19 5EW	<input type="checkbox"/>
St John's Way Medical Centre Friday 2.15 – 5pm	96 St John's Way N19 3RN	<input type="checkbox"/>
Elizabeth Avenue Group Practice 1 st Monday of every month	2 Elizabeth Avenue N1 3BS	<input type="checkbox"/>
St Peter's Street Medical Centre Every Tuesday 9.15 – 12.15pm	16½ St Peter's Street N1 8JG	<input type="checkbox"/>
Amwell Practice Alternate Tuesdays 2 – 4.45pm	4 Naoroji Street WC1X 0GB	<input type="checkbox"/>
Killick Street Health Centre Alternate Wednesdays 9.15 – 12.15pm	75 Killick Street N1 9RH	<input type="checkbox"/>
Doctors Group Practice Alternate Thursdays 9.15 – 12.15pm	34 Ritchie Street N1 0DG	<input type="checkbox"/>
City Road Medical Centre Alternate Thursdays 9.15 – 12.15pm	190-196 City Road EC1V 2QH	<input type="checkbox"/>
The Group Practice Alternate Thursdays 1.45 – 4.45pm	River Place, Essex Road N1 2DE	<input type="checkbox"/>
St Paul's Road Medical Centre Alternate Fridays 2.15 – 4.30pm	248 St Paul's Road N1 2LJ	<input type="checkbox"/>
Clerkenwell Medical Centre Alternate Fridays 9.15 – 12.15pm	Finsbury Health Centre, Pine Street EC1R 0JH	<input type="checkbox"/>



Primary Care & Community Dietitians Working across Enfield & Haringey
Based at Holbrook House, Cockfosters Road, Barnet, Herts, EN4 0DR

Telephone Nos. for Primary Care Dietitians and Community Dietitian - Enfield are:
 0208-272-5500 (main switchboard). All the following extension numbers can be converted to direct line numbers.
 Fax no: 0208 272 5513

WHO ARE WE?

DIETITIAN	CONTACT NO.	GP CLINICS IN HARINGEY	No. clinics per month
Fiona Yung Head of Primary Care & Community Dietetics	Extn: 5532	Bridge House H.C. N4	4
Valerie Hainsworth Chief Dietitian for Primary Care	Extn: 5542	Clocktower Practice N8 Bounds Green G.P N11	4 7
Stavroulla Petrides Primary Care	Extn: 5535		
Susan Bowyer Primary Care	Extn: 5572	Morris House Surgery N17 Somerset Gardens N17 Dr Suri N17	5 6 1
Alison Vale Primary Care	Extn: 5536	Highgate Group Practice N6 Crouch End H.C. N8 Christchurch Hall Surgery N8 Dukes Avenue, N10 Ferme Park Road H.C. N8 Rutland House Surgery N10 Tynemouth Road H.C. N15 Westbury Avenue N22	4 2 1 3 1 1 3 2
Franica Yovich Primary Care	Extn: 5568	Crouch Hall Road N8 Dr El-Kinani, Turnpike Lane N8 Dr Caplan, 114 High Rd, N15 Lawrence House Surgery N15 Dr Siva & Thiru N15 Dr Jeyrajah, 1 Lansdowne Rd N17	3 1 2 4 2 4
Rukiye Shafique Primary Care	Extn: 5635	Dr Afghan, N15 Bruce Grove M.C. N17 Castle View Surgery N17 Charlton House M.C N17 Dr Dave, Stuart Crescent H.C. N22 Dr Greenbury N8 Morum House N22 Dr Paun & Patel N22 Dr Ramnani & Nubi N4 Dr Das-Gupta	1 1 1 2 1 4 4 2 2 1
Bank Dietitian	Extn: 5571	Dr Ansari Havergal Villas Dr Samarasinghe & Jurangpathy	2 2 2
Anne Masters-Thomas Primary Care Bank	Extn: 5571	Dr Ikwueke N15 Dr Karunaratne N10 Queens Avenue N10 Dr Sivananthan N22	1 1 1 1
Debbie Wilkins Community Dietitian – Haringey	0208 442 6225 St. Ann's Hospital	Broadwater Farm H.C. N17	2
Gill Sargent / Fiona Jeffers Secretaries	Extn: 5571		



- Send patients from West Haringey with newly diagnosed type 2 diabetes to the patient education sessions at the Whittington Hospital.
- Make a clinical referral in writing to the dietitian at your own surgery.
- Make a clinical referral in writing to the Dietetic Department at the Whittington Hospital, at North Middlesex Hospital, at Barnet & Chase Farm Hospital or at St. Ann's Hospital. Referrals are accepted from Nurse Practitioners, Practice Nurses, Community Nurses, Dentists, Health Visitors and District Nurses with approval from the GP.

Other Requests, Queries, Assistance

- For talks, presentations and tailor-made training, please contact by phone, in writing or in person initially to any of the contacts given below:

Rukiye Shafique
Turkish Speaking Primary Care Dietitian (Enfield & Haringey)
Tel: 020 8272 5571

Debbie Wilkins
Community Dietitian in Haringey
Tel: 020 8442 6225

Fiona Yung
Head of Service
Tel: 020 8272 5532



Chapter 4:

Weight Management



WEIGHT MANAGEMENT IN PEOPLE WITH DIABETES

If the patient is overweight, weight-loss will be beneficial.

Targets for weight loss: Use BMI (Body Mass Index) = $\frac{\text{Weight (in kg)}}{\text{Height}^2 \text{ (in metres}^2\text{)}}$

BMI values	Caucasian People		Asian People	
• Healthy range	18.5 - 25	kg/m ²	18.5 - 23	kg/m ²
• Overweight	25.1 - 30	kg/m ²	23 – 27.5	kg/m ²
• Obese	30.1 - 40	kg/m ²	27.5 – 32.5	kg/m ²
• Morbidly obese	> 40	kg/m ²	32.5 – 37.5	kg/m ²

- Long term target should be for the patient to get to the next category down, e.g. from obese to overweight, or overweight to healthy range.
- Any weight reduction will be beneficial.
- Make the initial target to lose 3kg - when achieved, review the target again.
- **Asian subjects:** the overweight range starts at a lower BMI. This relates to differences in body composition/fat distribution and a high risk from diabetes and cardiovascular disease in this ethnic group. The WHO has suggested 4 new BMI values for action among Asians.
- Anti-obesity drugs may be considered when supervised diet, exercise and behaviour modification fails to achieve a realistic reduction in weight. These agents can be used at a lower BMI in patients with diabetes.
- Orlistat (Xenical) – used if BMI ≥ 30 kg/m² or if BMI ≥ 28 kg/m² in patients with diabetes or other risk factors (e.g. hypertension, hypercholesterolaemia).
- Sibutramine (Reductil) - used if BMI ≥ 30 kg/m² or BMI ≥ 27 kg/m² in patients with diabetes or other risk factors.
- If patients are successful in weight loss, remember to assess changes in their glycaemic control as their oral antidiabetic drugs or insulin may need adjusting.



GUIDANCE FOR USE OF ORLISTAT IN DIABETES

Orlistat is a lipase inhibitor. It can reduce the absorption of dietary fat. Weight loss may also result from patients reducing their intake of fat in order to avoid severe gastrointestinal effects, including steatorrhoea.

SELECT A PATIENT

- BMI 28.0 kg/m² or more in a patient with diabetes, aged between 18 – 75 years
- **Exclusions:**
 - Chronic malabsorption syndrome
 - Cholestasis
 - Pregnancy and lactation

AGREE CONTRACT – The patient must be referred to a dietitian to:

- Advise on a low fat diet
- Focus patient on achieving a weight loss of 2.5 kg over the next month by diet and exercise
- Provide patient information leaflets and direct patient to sources of support

INITIATE THERAPY – The dietitian will advise the patient regarding:

- Dietary measures to maintain a low fat, reduced calorie diet
- Increasing physical activity each day
- If the patient has lost ≥ 2.5 kg in weight over the preceding month, Orlistat (Xenical) may be commenced, taking 120 mg three times a day with meals
- If there is concern about deficiency of fat soluble vitamins, vitamin supplementation may be considered, taken at least 2 hours after Orlistat or at bedtime

MONITOR RESPONSE TO ORLISTAT – AT 3 MONTHS

- If weight loss > 5 % of initial body weight: reinforce and continue
- If weight loss < 5 % of initial body weight: stop Orlistat

MONITOR RESPONSE TO ORLISTAT – AT 6 MONTHS

- If weight loss > 10 % of initial body weight: reinforce and continue
- If weight loss < 10 % of initial body weight: stop Orlistat

AT 12 MONTHS – CONSIDER STOPPING ORLISTAT

- Treatment will usually be stopped at 12 months or if patient has reached their target weight

AT 24 MONTHS STOP ORLISTAT



GUIDANCE FOR USE OF SIBUTRAMINE IN DIABETES

Sibutramine is a re-uptake inhibitor of noradrenaline (NA), serotonin (5-HT) and dopamine. It enhances central NA and 5-HT function and promotes a feeling of having eaten enough.

SELECT A PATIENT

- **BMI 27.0 kg/m² or more in a patient with diabetes, aged between 18 – 65 years**
- **Exclusions:**
 - Blood pressure (BP) > 145/90 mmHg
 - Coronary artery disease or Congestive cardiac failure
 - Arrhythmia or tachycardia
 - Peripheral vascular disease or Cerebrovascular disease
 - Psychiatric illness or History of eating disorder
 - History of drug, medication or alcohol abuse
 - Hyperthyroidism
 - Phaeochromocytoma
 - Severe hepatic or renal impairment
 - Benign prostatic hyperplasia with urinary retention
 - Narrow angle glaucoma
 - Pregnancy and lactation

AGREE CONTRACT – The patient must be referred to a dietitian to:

- Focus patient on a 5 – 10 % weight loss goal
- Agree patient input
- Provide patient information leaflets and direct patient to sources of support

INITIATE THERAPY – The dietitian will advise the patient regarding:

- Dietary measures to reduce daily calorie intake
- Increasing physical activity each day
- Sibutramine (Reductil) 10 mg od may be commenced

MONITOR RESPONSE TO SIBUTRAMINE

- BP and pulse rate must be measured every 2 weeks for the first 3 months
- Stop Sibutramine if BP rises above 145/90 mmHg or by more than 10 mmHg
- Stop Sibutramine if resting pulse rises by more than 10 beats per minute

AT 1 MONTH REVIEW

- If weight loss > 2 kg: reinforce and continue
- If weight loss < 2 kg: stop Sibutramine or consider increasing dose to 15 mg od

AT 2 MONTH REVIEW

- If weight loss < 2 kg on increased 15 mg dose, stop Sibutramine

AT 3 MONTH REVIEW

- If weight loss < 5 % of initial body weight, stop Sibutramine
- If weight loss > 5 % of initial body weight, reinforce and continue

AT 12 MONTHS STOP SIBUTRAMINE



Chapter 5:

Physical Activity



PHYSICAL ACTIVITY AND DIABETES

Why Exercise?

Physical activity is important for people with diabetes as it promotes good health, improves diabetic outcomes, reduces cardiovascular disease risk factors and helps weight management. It can benefit self-esteem, stress levels and mental health.

Encouraging people to become more active is not easy. The challenge is to increase the level of activity in people who do not view it as part of their normal routine. Physical activity need not involve a formal exercise regime. Informal activity can be the most successful way to accumulate the recommended amount of exercise.

Local Exercise Programmes

- In Islington, patients can be referred to the 'Prescription for Exercise'. This scheme at local leisure centres includes individual assessment and goal setting, exercise sessions (including Gym sessions, Tai-chi, Ease-into-exercise classes and Water aerobics) and personal reassessment after 20 sessions. For information and to register as a referrer to the programme, contact:

Prescription for Exercise Team, Aquaterra Leisure, Health Projects Section
Sobell Leisure Centre, Hornsey Road, London N7 7NY
Tel: 020 7686 8814 Fax: 020 7686 5593

- In Haringey, patients can be referred to a 'Fit for Life' course. The course lasts for 16 weeks. The first 8 weeks include group based physical activity with a British Association of Cardiac Rehabilitation (BACR) instructor and one hour of health/lifestyle discussion. The final 8 weeks are spent using the facilities at a local leisure centre. A member of the Fit for Life team is on hand to provide encouragement and advice. For information, see details below or contact Dinah Thompson on 020 8442 6878.
- In Camden, patients can be referred to the Camden Active Health Team which runs daytime community physical activity programmes throughout Camden:

Camden Active Health Team, Crowndale Court, 218 Eversholt Street, London NW1 1BD
Tel: 020 7974 1542 Fax: 020 7974 1590

Starting Up: What To Do?

- ❖ For anyone who is currently inactive, starting even moderate, regular physical activity may be difficult. The daily physical activity target should be built up in small activity portions (10-15 minutes) over time. The rate of progression will be dependent on several factors including age, functional capacity, medical status, personal preferences and goals. They should begin with small increases compared to current activity and build up gradually.

Frequency And Intensity: How often? How Hard?

- ❖ **To benefit health, adults should aim to build up to 30 minutes of moderate intensity physical activity on five or more days of the week.**
- ❖ Moderate activity means breathing faster than normal and feeling warm, while still being able to talk.
- ❖ Intensity should not produce adverse reactions either at the time of exercise or afterwards.



Time: How Long?

- ❖ Thirty minutes a day is the target.
- ❖ They should build up to the 30 minutes gradually. For example, they could try starting with 3 x 10 minute walks spread throughout the day and work towards 15 minute walks and then 30 minute continuous walks. A goal could be to increase activity by 2 minutes each day.
- ❖ Whatever the chosen activity, the person must start gently and gradually increase over 5-10 minutes until they reach the intensity level they wish to maintain. At the end of the activity, they should slowly decrease their level of activity over 5-10 minutes to cool down.

Type: What Sort?

- ❖ People with diabetes, who have been assessed by their GP or diabetes team, can participate in most types of activity without restrictions (see table for specific recommendations).
- ❖ Walking and other home based activities, such as housework and gardening are useful to increase strength and mobility and cardiovascular fitness in the sedentary. They require little expense or skill and can easily be incorporated into a daily routine.
- ❖ Fun sociable activities will increase the person's commitment to a healthy lifestyle.

Exclusion Criteria

There are certain individuals with whom exercise is contraindicated. These are patients with:

- ❖ Unstable angina
- ❖ Resting Systolic BP >180 mmHg / Diastolic BP >100 mmHg
- ❖ Significant drop in BP during exercise
- ❖ Uncontrolled tachycardia >100 beats per minute
- ❖ Unstable or acute heart failure
- ❖ Febrile illness
- ❖ Severely uncontrolled type 1 diabetes

NB. With angina, hypertension and heart failure, exercise is indicated to improve cardiovascular fitness, lower blood pressure and reduce weight. The exclusion criteria only apply to patients with an acutely severe or unstable condition. Physical activity may be possible if the patient has been reviewed by a relevant health professional and been given appropriate advice.

How to recruit to an exercise programme

When assessing a patient for an exercise programme, the healthcare professional should:

- ❖ Assess the readiness of the individual to participate
- ❖ Consider their diabetes history and discuss any contraindications/precautions (see table)
- ❖ Ensure that patient has none of the above exclusion criteria
- ❖ Take blood pressure: if resting SBP >180 mmHg / DBP >100 mmHg exercise should not be started until BP treated and reduced
- ❖ Discuss how to manage hypoglycaemia and hyperglycaemia
- ❖ Discuss how to manage diet, insulin and sulphonylurea medications during physical activity
- ❖ Ensure the person is aware of appropriate foot care, foot wear and importance of hydration
- ❖ Ensure the person knows how much activity is necessary to obtain desired goals
- ❖ Provide information on local schemes and complete recruitment form

Resources and information

British Heart Foundation www.bhf.org.uk (including leaflet: 'Physical activity and your heart')

Diabetes UK – www.diabetes.org.uk

BBC Online Health – www.bbc.co.uk/health/heart



Hypoglycaemia

During and after physical activity, insulin requirements may decrease because of increased insulin sensitivity and increased glucose uptake into the muscles and liver. Delayed hypoglycaemia can occur up to 36 hours after intense activity, as the muscles and liver use carbohydrates to restore pre-exercise levels of stored glucose (glycogen). Factors contributing to hypoglycaemia include:

- intensity, duration and type of activity;
- insulin status (timing and size of last dose);
- time of day (early morning activity prior to pre-breakfast insulin dose is less likely to cause hypoglycaemia; activity later in day may lead to delayed or night-time hypoglycaemia);
- conditions (hot conditions can increase absorption of insulin from subcutaneous sites).

Guidance To Avoid Exercise Induced Hypoglycaemia

This is a possible problem in people on insulin or sulphonylurea medication / insulin secretagogues. It can be avoided by blood glucose monitoring and either increasing carbohydrate intake or reducing insulin doses. Everyone is very different and individuals will need to do a certain amount of experimenting to see what they need to do with their intake or insulin for different activities. Blood glucose tests are essential to see if they have made correct adjustments.

- 1) Blood glucose levels should be monitored before and after activity. If the physical activity lasts for one hour or more, blood glucose levels should also be monitored during exercise.
- 2) Increasing carbohydrate intake: If the person will be exercising shortly after a meal, they can have extra starchy carbohydrate with the meal (e.g. bread, pasta, rice, potatoes, cereal). If they cannot eat more at that meal or if the exercise is one to two hours after the last meal, they will probably need to take a snack containing carbohydrate before the exercise (e.g. cereal bar, small chocolate bar, biscuits).

If participating in vigorous physical activity, the person will probably need a top up of glucose during the activity. As they may be thirsty and hydration is important, it is usually convenient to take this top up as a glucose drink, sports drink or fruit juice. If exercising for a long period of time (e.g. cycle ride or long walk) fast acting carbohydrate food or drink should be taken along to allow snacks to be taken regularly during the activity.

- 3) Reducing insulin: This is possible if the activity is planned. Adjustments are a matter of trying out various strategies, as these will vary with different individuals, doing different activities (varying in intensity and duration) at different times of the day (when there is more or less insulin circulating). Liaison with the person's diabetes team will be necessary.
- 4) Insulin injection sites should be away from the areas used during exercise.
- 5) Fast-acting carbohydrate snacks or drinks should be immediately available to hand while the person is being active (e.g. Lucozade or glucose sweets).
- 6) Delayed hypoglycaemia can occur up to 36 hours after exercise as the muscles refuel. Meal adjustments and bedtime snacks are advisable after vigorous activity.

Hyperglycaemia

If a person has a higher blood glucose level than usual before activity, there may not be enough circulating insulin to mobilise glucose for muscular work and they must check for ketones. If a person's blood glucose levels are > 15 mmol/l and ketones are present in the urine, they should take extra insulin and postpone their physical activity until their urine is ketone free and blood sugar levels start to reduce to a safe range.



Exercise Recommendations for Specific Complications in Diabetes (taken from Diabetes UK, March 2003)

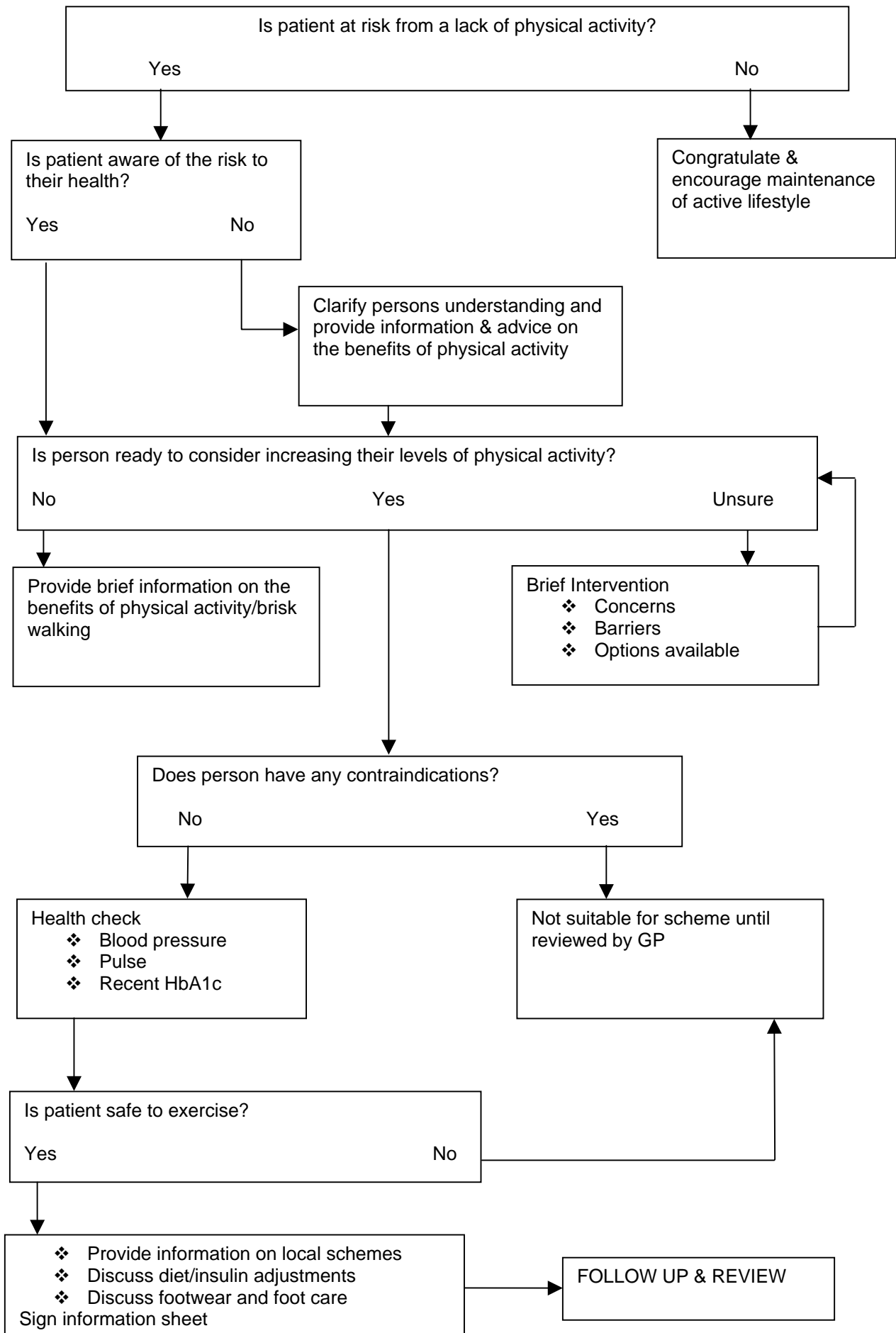
All people with complications of diabetes should:

- Incorporate a 5-10 minute warm-up and a 5-10 minute cool down into the activity session
- Avoid hypertensive activities such as breath holding, heavy weight lifting, high intensity sports
- Avoid exercising in excessive temperatures (hot or cold) and maintain good hydration
- Maintain good glycaemic control
- Check footwear and feet before and after activity

Complication	Recommendations	Contraindicated activities or circumstances	Precautions
Cardiovascular Disease (risk or presence)	Low impact aerobic activities, such as walking, cycling, swimming. Supervised sessions to increase confidence in safe levels of exercise	Recent MI < 6 weeks Hypertensive activities such as heavy weight lifting, high intensity	Increase heart rate gradually
Hypertension	Low impact aerobic activities, such as walking, cycling, swimming.	SBP should not exceed 170 Isometric or heavy weights exercises	Use Borg's revised Rate of Perceived exertion (RPE) as medications may suppress heart rate's reaction to effort
Proliferative Retinopathy	Low impact or seated aerobic activities, such as walking, cycling, swimming, rowing machines	Do not exercise immediately after photocoagulation treatment or surgery. Avoid all hypertensive activities plus head stands, bending at the hips and contact sports	Gradual increases in intensity Use RPE Avoid SBP >170
Peripheral Neuropathy	Low impact or seated aerobic activities, such as cycling, swimming, rowing machines	Avoid step-based activities, high impact and high intensity	Full pre-exercise screening for sensitivity Cushioned shoes
Nephropathy	Weight bearing, low intensity aerobic activities	Maintain BP control, follow hypertensive restrictions given for retinopathy	Particular emphasis on hydration
Autonomic Neuropathy	Low impact and low intensity aerobic activities, such as stationary cycling or water-based activities	High intensity Rapid changes in body position	Imperative to maintain BP to avoid postural hypotension Note that temperature control may be difficult as there is sometimes excessive sweating of the upper body (hyperhidrosis) and/or absence of lower body sweating (anhidrosis)
Peripheral Vascular Disease i.e. intermittent claudication	Low-impact aerobic activity such as walking, cycling, or swimming	No anaerobic activity as increasing muscle bulk tends to worsen symptoms.	Rest when painful
Charcot's Syndrome (CS)	Low-impact aerobic activity such as walking, cycling, or swimming	While CS is active: put in non- weight bearing cast (plaster or Aircast)	While CS active, ensure any exercise is total non-weight bearing
Mobility	Activities that promote strength, range of movement and maintain function		
Obesity/Insulin Resistance	Low impact aerobic activities, such as walking, cycling, swimming.		The very overweight may be breathless on quite moderate effort: gradual increases, reassurances and support will give confidence to continue



How To Prescribe Increased Physical Activity And Exercise





Haringey **NHS**
Teaching Primary Care Trust

Fit for Life

The Fit for Life course provides a safe way for people who have been inactive to become more physically active. The course lasts for 8 weeks and provides exercise and advice on how to maintain a healthy lifestyle. In 2004/05 we will provide four courses for people with diabetes and other chronic disease (1 in Turkish) and two for patients with a weight problem

For more information on Fit for Life Courses, venues and participation criteria please call Dinah Thompson on 020 8442 6878

Haringey Leisure Centres

Tottenham Green

1 Philip Lane, N15 Tel: 020 8489 5322

Multi facility indoor leisure centre with 3 pools, squash courts, health & fitness suite with fitness room.

Park Road Pools

Park Road

N8 Tel: 020 8341 3567

3 indoor pools, outdoor pool, children's pool and exercise room

New River Sports Centre

White Hart Lane, N22 Tel: 020 8881 2323

Athletics Track, gym and fitness classes.

Finsbury Park

Hornsey Gate, Endymion Road, N4 Tel: 020 8802 9139

Athletics track and gym



DOCTOR SECTION:

To be completed if person has answered
Yes to any of the questions on 'Health'.

Are you happy for the patient to take
part in the 'Fit for Life' programme?

YES/NO.

Doctor's signature:

Practice Stamp:

Once completed: Please return form to:
Lynne Nalbantoglu,
Health Improvement,
Block A1, St. Ann's Hospital,
St. Ann's Road,
N15 3TH



'FIT FOR LIFE' FOR PEOPLE WITH DIABETES



ABOUT YOU.

Name:.....

.....

Address:.....

.....

Post Code:.....

Age:.....Sex:.....D:O:B:.....

Do you need an interpreter: Yes ☐ No ☐

Language spoken

ABOUT YOUR HEALTH.HAVE YOU SUFFERED FROM THE
FOLLOWING IN THE LAST 3 MONTHS.

(please tick Y=Yes or N=No)

High blood pressure?	Y	N
Heart attack?	Y	N
Angina?	Y	N
Dizzy spells/Blackouts/fainting?	Y	N
Recent major surgery such as heart bypass?	Y	N
Palpitations (fast heart beat, feels as if jumping out the chest?),	Y	N
Is your diabetes treated with: diet/ tablets/ Insulin/ both tablets and insulin? (Please circle response)		

Hypoglycaemia (low blood
sugars < than 3.5 mmol/l)

Y

N

If patient circles **Yes**, their GP will need to
sign the form to authorise participation.**PHYSICAL EXAMINATION.**

Blood pressure	
Pulse	
Height	
Weight	
BMI	
Recent HbA1c	
Does this patient have any complications of diabetes? (Y/N)	
If yes, please specify	
Unstable angina? (Y/N)	
Unstable or acute heart failure (Y/N)	
Uncontrolled glycaemia (Y/N)	

To be completed by the practice nurse and signed by
the nurse:

.....

ABOUT YOUR LIFESTYLE.**SMOKING:**

Do you smoke? Y/N.

If yes, how many in a typical
day?.....**Have** you be given support/advice to stop?
Y/N**ALCOHOL.**Do you drink alcohol on a regular basis?
Y/N.If yes, how many drinks would you have in
a day?
.....**DIETARY INTAKE.**Do you eat regular meals, i.e. breakfast,
lunch, evening meal? Y/N.If No, when in the day do you eat?
.....
.....Thank you for answering these few
questions. They are important to provide us
with information which will benefit your
participation in the 'Fit for Life

Chapter 6:

Home Monitoring



SELF MONITORING IN DIABETES CARE

- Motivating people with diabetes to monitor their own health is an important part of education for self-management.
- They should be encouraged to monitor their general health and well-being, symptoms, diabetes control, weight, feet and eyesight.
- Monitoring diabetes control, by urine or blood tests, enables people to see the results of their diabetes self management and to make alterations in their lifestyle or medications doses, or to seek professional health and so reduce the risk of complications.

Urine Glucose Testing

This is useful in people with type 2 diabetes that is well controlled and stable on diet or diet and metformin or glitazone therapy.

1. Equipment

- Diastix (Bayer) is recommended.
- Urine testing uses the concept of the renal threshold. In most people, the threshold at which glucose starts to appear in the urine is when the blood glucose is above 10 mmol/l.
- Urine testing will not detect hypoglycaemia.

2. Frequency & Timing

- Urine should be tested before breakfast (following early morning voiding) and 2 hours after the main meal. This reflects the times when the blood glucose is likely to be at its lowest and highest levels.
- Patients should initially test every day. When tests become negative, testing on 1 or 2 days a week is sufficient.

3. Aim

- Negative urine tests should be the aim, as the blood glucose will then be below 10 mmol/l.
- When a patient is newly diagnosed there may be glycosuria. As lifestyle and/or medication take effect the tests should become negative.
- If sugar starts showing in the urine when it has previously been absent, the patient should consider possible causes, including dietary changes, weight gain, reduction in exercise or intercurrent illness. If glycosuria persists, despite attention to these causes, the medication may need reviewing and the patient may need to seek advice.

Blood Glucose Monitoring

Measurement of HbA1c provides an overall indication of ambient blood glucose levels over the previous 6-8 weeks. It does not reflect the variability that can occur in day-to-day blood glucose concentrations or the effect of specific activities, such as exercise. Assessment of glycaemic control therefore requires both HbA1c and information from home blood glucose monitoring profiles.

Home blood glucose monitoring must always been seen as a part of the self-management programme and not as a stand-alone activity. It provides people with diabetes and their clinicians with a tool by which to measure and understand the quality and stability of their glycaemic control. It allows them to make any necessary changes in their lifestyle and /or treatments.



Teaching Blood Glucose Monitoring

The reasons for and benefits of self-monitoring, as an aid to self-management, should be discussed and agreed with the patient.

Accurate and useful blood testing requires careful assessment and education of the patient by the care team. There are 3 stages:

1. Assessment of the Patient

- Vision, manual dexterity, ability to record results accurately
- Understanding of rationale for testing, ability to act on results, literacy, attitude, culture
- Some people may not be able to learn this skill or understand the value and meaning of self-monitoring

2. Teaching the Patient

- Tell patient how to obtain a blood glucose testing meter (information about availability and costs of meters can be obtained from local pharmacies or from pharmaceutical representatives)
- All meters now come with finger pricking devices
- Demonstrate the meter using quality control solution that comes in the pack and then get patient to try out the meter by doing a test on themselves
- Teach when to test and how to record test results. Record books can be obtained from pharmaceutical companies
- Advise the patient on the aims of blood glucose control and what their targets are
- Advise the patient when and how to request advice
- Advise the patient that testing will help to answer the following questions:
 - Is my diabetes well controlled?
 - Is my diabetes control stable?
 - If it is not, when is my blood glucose too high or too low?
 - How do illness, exercise and food affect my glucose control?
 - Can any lifestyle changes be made to improve my control?
 - Can medication doses be adjusted to improve my control?
 - Should I contact my Practice Nurse or Doctor for advice?

3. Evaluation

- Discussion of recorded results and action taken or that might be taken
- Checking of testing technique periodically

The risk of microvascular complications is reduced if blood glucose is less than 8 – 9 mmol/l most of the time. Where this degree of glycaemic control is appropriate and practical, this should be the patient's aim.

Blood Glucose Testing Frequency And Timing

The cost of blood glucose testing strips is a legitimate concern to health care providers. It is important to ensure that patients are testing at appropriate times and frequency and are taught and encouraged to act on the results. The following are recommended guidelines. These may need to be negotiated with individual patients. Additional testing will be required: before driving and at 2 hourly intervals throughout a journey; during illness; in work context; if the patient has unawareness of hypoglycaemia; before, during and after exercise.



Blood Glucose Testing Frequency And Timing

Diabetes Type	Treatment Group	Home Blood Glucose Monitoring (HBGM) Regimen (packs usually contain 50 glucose test strips)
Type 1 diabetes	All patients with type 1 diabetes	<ul style="list-style-type: none"> Blood glucose monitoring should be seen as an integral part of treating type 1 diabetes. People with type 1 diabetes should be taught to monitor blood glucose and alter treatment accordingly. Most people with type 1 diabetes are liable to instability in their blood glucose levels. They should therefore monitor their blood glucose 4 or more times a day, including pre- & 2 hours post-prandially, to prevent hypoglycaemia and treat hyperglycaemia. 3 packs of strips a month will be needed for this level of testing.
Gestational diabetes	All women with gestational diabetes	<ul style="list-style-type: none"> Women treated with diet only: 2 tests a day, including fasting & 1 hour post-prandially. Women treated with insulin: 2 or more tests a day, including fasting & 1 hour post-prandially. 1-2 packs of strips a month are needed.
Type 2 diabetes	Intensive insulin therapy (basal/bolus)	<ul style="list-style-type: none"> As with type 1 diabetes. However, if control is stable, twice a day is sufficient to include a variety of pre- & 2 hour post-prandial tests. 1-3 packs of strips a month are needed.
Type 2 diabetes	Twice daily biphasic or isophane insulin	<ul style="list-style-type: none"> Many people with type 2 diabetes have more stable glycaemic control than those with type 1 diabetes. If control is stable, this group should monitor once or twice daily at varying times, including fasting and pre- & 2 hours post-prandially. District nurses monitoring for these patients may only be able to monitor once or twice a week. Varying times continue to be important. If glycaemic control is suboptimal or unstable, frequency must be increased, until control is improved. 1-2 packs of strips a month are needed.
Type 2 diabetes	Once daily insulin	<ul style="list-style-type: none"> If control is stable this group should monitor once daily at varying times to include fasting and pre- & 2 hour post-prandially. District nurses monitoring for these patients may only be able to monitor once or twice a week. Varying times continue to be important. If glycaemic control is sub-optimal or unstable, frequency must be increased, until control is improved. 2 packs of strips every 3 months are needed.
Type 2 diabetes	Combined insulin and oral antidiabetic therapy	<ul style="list-style-type: none"> Fasting glucose should be tested daily during insulin titration. In addition, 2-4 tests per week pre- & 2 hour post-prandially will indicate hypoglycaemia and the effect of diet, exercise and oral agent on blood glucose. When control is stable, they should monitor once daily at varying times to include fasting and pre- & 2 hour post-prandially. 2 packs of strips every 3 months are needed.
Type 2 diabetes	Oral antidiabetic medication or diet and exercise only	<ul style="list-style-type: none"> HbA1c is the main outcome measure in this group. Blood glucose monitoring may not be required routinely. Urine testing, aiming for no glycosuria, will indicate continued satisfactory control in those with a normal renal threshold. Blood glucose testing is recommended: <ul style="list-style-type: none"> For those showing glycosuria on maximum oral medication; For those with an abnormal renal threshold; For those who choose this method and have been taught how and when to test – it can be very instructive for the patient and can greatly stimulate motivation. Test 1-4 times a week, depending on stability and quality of control, pre- & 2 hour post-prandially. 1 pack of strips every 3 – 9 months will be needed.



Urine Ketone Testing

- Patients with type 1 diabetes should test their urine for ketones during intercurrent illness or during periods of poor glycaemic control. Ketostix (Bayer) may be used. If ketonuria is detected, this suggests worsening glycaemic control and the possibility of insipient ketoacidosis and patients should therefore seek urgent medical advice.
- People with type 1 diabetes must always have some ketone testing strips available

References

National Diabetes Support Team (2003). Glucose self-monitoring in diabetes: Fact sheet no 1. NHS modernisation Agency Clinical Governance Support Team

Owens D, Barnett A, Pickup J et al (2004). Blood glucose self-monitoring in type 1 and type 2 diabetes: reaching a multidisciplinary consensus. *Diabetes and Primary Care* 6 (1)



GUIDELINES FOR MONITORING HOUSEBOUND PATIENTS WITH DIABETES

Housebound Patients Controlled With Diet Or Tablets

Background

If housebound patients were able to get to their GP's surgery for their diabetes care, they would have a yearly review for surveillance for complications. If their diabetes were stable, they would usually be seen 6-monthly to monitor their diabetic and blood pressure control. The diabetic control would be assessed with an HbA1c test or sometimes with a fasting blood glucose.

In patients who are diet or tablet controlled, the fasting blood glucose level is a good reflection of the blood glucose throughout most of the 24 hours. The post-prandial blood glucose can be high 1 or 2 hours after eating and a blood glucose test done at this time can be of little help in monitoring overall diabetic control. Ideally, these patients would be taught to monitor their own diabetes with blood or urine testing.

Guidelines

With this information in mind, monitoring of frail elderly patients with diabetes treated with diet or tablets by District Nurses might usefully consist of:

- A HbA1c or laboratory fasting blood glucose every 3-6 months:
Satisfactory control in this group would be freedom from symptoms of hyper or hypoglycaemia and HbA1c of 7 to 8.5% or fasting blood sugar between 5 and 9 mmol/l.
- Teaching the patient or their carer urine or blood sugar testing if possible:
A fasting urine sample tested with Diastix should normally be negative or 1/10% - 1/4%. Patients should be advised to contact you if they become symptomatic or their home urine testing persistently falls outside this range.
- If the patient or carer cannot self-monitor, it is reasonable to expect a District Nurse to visit monthly to assess the patient's well-being and perform a pre-prandial capillary blood glucose test. (Ideal range in this group 5-9 mmol/l or sometimes below 11 mmol/l).
- Each time you visit: review diet, ensure medication is being taken correctly and that someone is checking the patient's feet weekly.

In younger housebound patients, where prevention of microvascular complications is aimed for, you should aim for HbA1c of 6.5% - 7.5% or fasting blood sugar of 4-7 mmol/l.

If the patient has symptoms of hyper- or hypoglycaemia or if monitoring results fall outside the recommendations above, the diabetes will need closer attention e.g. more frequent monitoring, review of diet, medication or intercurrent illness.



Patients Controlled With Insulin

Background

These patients will normally be reviewed every 6 months in a hospital diabetes clinic, though some may receive this care from their GP. If they are self-caring, they will be taught to monitor their control by home blood glucose testing before different meals and bed. The frequency is decided individually, but patients usually test from alternate days to once or twice daily.

When diabetes is controlled with insulin, blood glucose levels are much less likely to be consistent throughout the 24 hours. The purpose of home blood testing is to examine the action of each insulin injection and look at the patterns and trends of control that emerge e.g. tests before lunch and dinner give information about the morning insulin; those before bed and breakfast give information about the evening insulin.

People on insulin have post-prandial peaks of blood sugar 1 to 2 hours after a meal. Blood glucose tests taken routinely at this time can be of limited help in monitoring overall diabetic control.

Guidelines

With this information in mind monitoring of frail elderly patients with diabetes on insulin by District Nurses might usefully consist of:

- A HbA1c every 3-6 months if the patient is not attending a diabetic clinic:
Satisfactory control in this group would be freedom from symptoms of hyper- or hypoglycaemia and HbA1c of 7.5% to 8.5%.
- Teaching the patient or their carer to test blood sugar if possible.
- If the patient cannot self-monitor and if the diabetes control is satisfactory, blood glucose tests taken before different meals and before bed about 4 times a month are helpful e.g. sometimes fasting, sometimes before lunch, sometimes late afternoon. They may be done weekly if this suits your nursing care schedule for the patient or concentrated over a few days once a month if the patient is otherwise self-caring. The results must be recorded and the patient reminded to take them to clinic appointments.
- Pre-prandial results mainly in the 7-9 mmol/l range or sometimes below 11 mmol/l indicate satisfactory control in this group. Freedom from symptoms of hyper- or hypoglycaemia is just as important and must always be asked about.
- Each time you visit: review diet, injection technique and sites and that someone is checking the patient's feet weekly.

In younger housebound patients, where prevention of microvascular complications is aimed for, you should aim for HbA1c of 7% - 8% or pre-prandial blood sugars of 4-7 mmol/l.

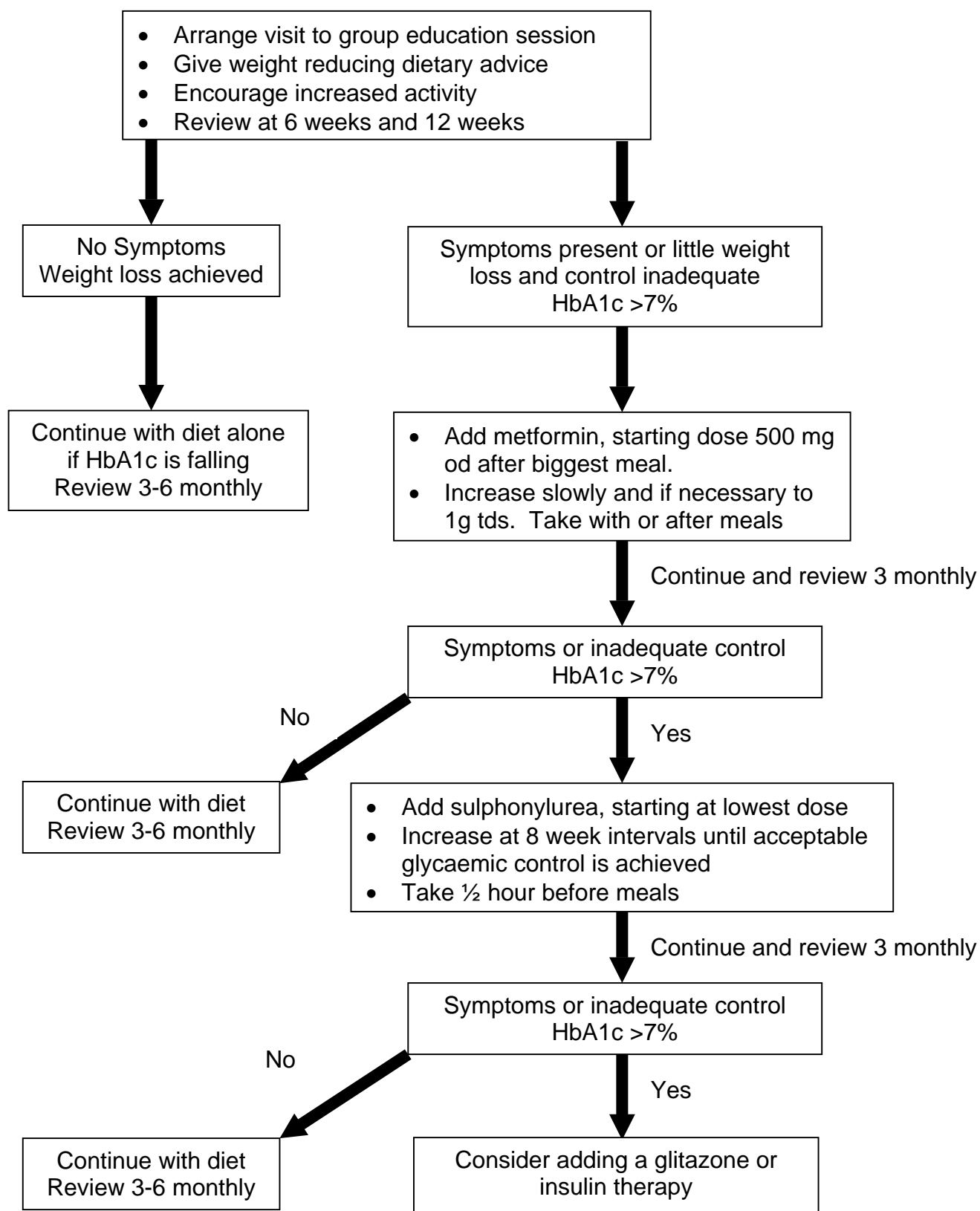
If the patient has symptoms of hyper- or hypoglycaemia or monitoring results fall outside the recommendations above, the diabetes will need closer attention e.g. more frequent monitoring, review of diet, medication doses or intercurrent illness.



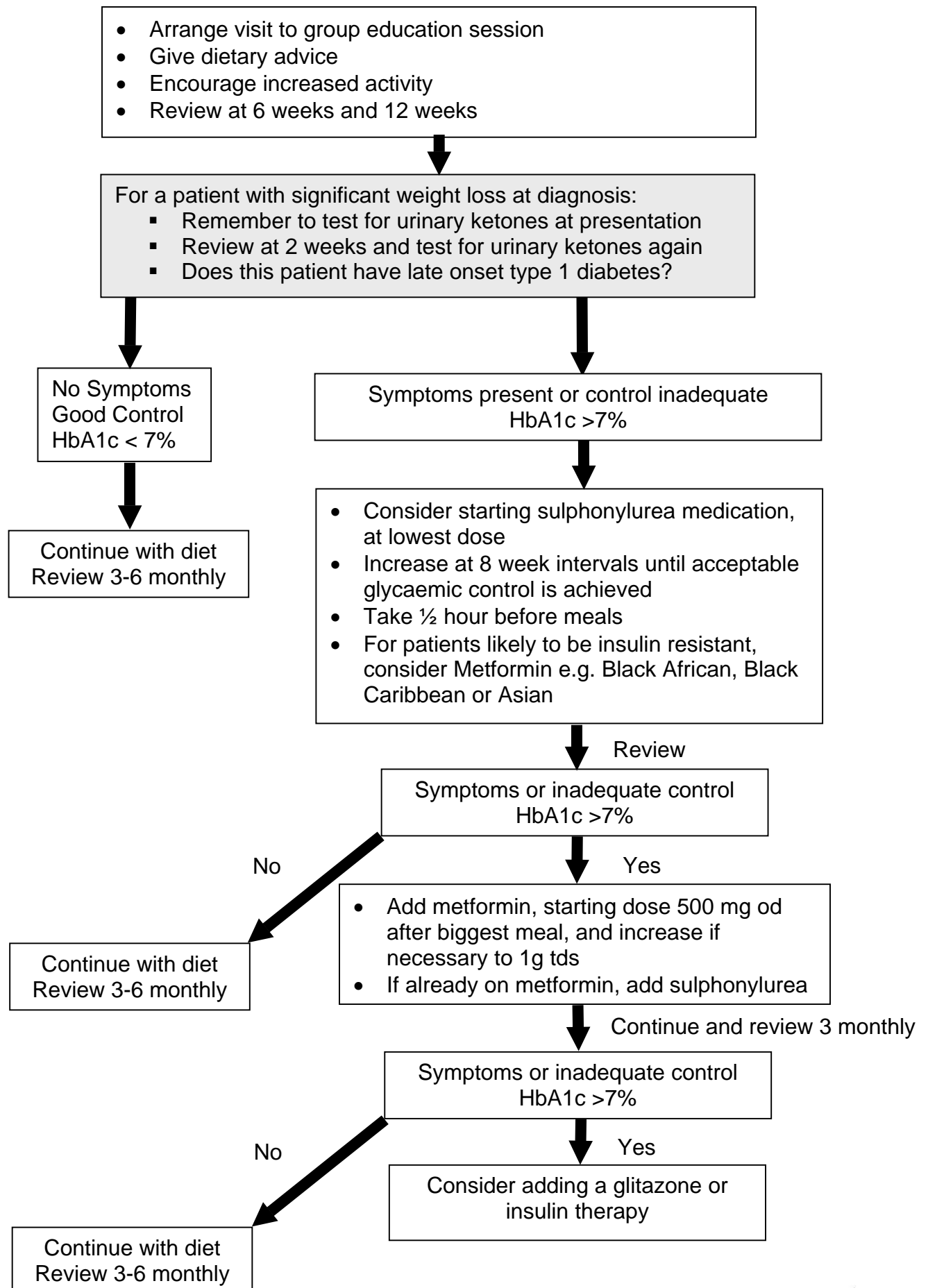
Chapter 7:
**Treatment Of Type 2 Diabetes &
Oral Antidiabetic Drugs**



TREATMENT FOR OVERWEIGHT SUBJECTS WITH TYPE 2 DIABETES (BMI > 25)



TREATMENT SCHEME FOR NORMAL WEIGHT SUBJECTS WITH TYPE 2 DIABETES (BMI ≤ 25)



ORAL ANTIDIABETIC DRUGS

(A) Biguanides - Metformin

Drug of choice in overweight patients or insulin resistant patients.

Action

- Decreases gluconeogenesis.
- Increases glucose uptake into peripheral tissues.
- May also inhibit appetite.

Side Effects

- Very low risk of hypoglycaemia.
- Gastro-intestinal side effects are initially common.
- High incidence of abdominal wind, diarrhoea and nausea.
- Metformin is renally excreted and may provoke lactic acidosis.
- The risk of lactic acidosis is increased if renal or hepatic function is significantly impaired or if tissue hypoxia is present.
- Avoid starting if plasma creatinine is $> 130 \text{ umol/l}$. NICE recommends stopping metformin if plasma creatinine is $> 130 \text{ umol/l}$. However, the hospital diabetes clinic may supervise the use of metformin at higher plasma creatinine levels. The hospital diabetes team are happy to advise on patient management with raised plasma creatinine (and see below).
- Take care in the very elderly, when there may be renal impairment.
- Withdraw if tissue hypoxia likely (e.g. acute sepsis, acute cardiac failure, acute respiratory failure, acute myocardial infarction).
- Iodine-containing X-ray contrast media can lead to acute deterioration of renal function, which can impair the excretion of metformin and precipitate lactic acidosis. In patients in whom such studies are planned, metformin should be discontinued at the time of the procedure and for the subsequent 48 hours. Metformin should only be reinstated when renal function has been re-evaluated and found to be normal.

Instructions for use

- Start with small doses e.g. 500 mg after the biggest meal. **Take after food and increase the dose gradually** (e.g. increase to 500 mg bd after one month). This helps prevent GI side effects. Maximum dose is 1g tds.

Estimated Glomerular Filtration Rate (eGFR) (Calculated Creatinine Clearance)

The plasma creatinine value is dependent on muscle mass and can therefore give a falsely reassuring result. For example, an elderly frail patient with *significantly* impaired renal function may have only a *slightly* elevated plasma creatinine, because they have a low muscle bulk.

There are various equations available for estimating glomerular filtration rate (creatinine clearance) taking account of plasma creatinine, age, gender and body weight or race. These calculations can be usefully applied under various circumstances (e.g. monitoring renal function over time). Making this calculation can help to determine whether the use of metformin is safe. There are not yet specific international guidelines, but we suggest the following:

- eGFR 30 - 60 ml / min - Use metformin with extreme caution and consider reducing the dose of metformin used.
- eGFR $< 30 \text{ ml / min}$ - STOP metformin.

For Glomerular Filtration Rate Calculators, see:

Cockcroft-Gault Calculator (includes weight)

www.nephron.com/cgi-bin/CGSIdefault.cgi

MDRD GFR Calculator (includes race)

www.nephron.com/cgi-bin/MDRD_NKF.cgi



(B) Sulphonylureas

A reasonable choice for patients who are not overweight or used second line in obese patients.

Action

- Stimulate beta cell to secrete insulin.

Side Effects

- Increased appetite and weight gain.
- Hypoglycaemia, particularly with glibenclamide used in the elderly or with renal impairment.

Instructions for use

- Introduce slowly and titrate dose according to HbA1c.
- Take 30 minutes **before meals**.
- Can combine metformin with sulphonylureas as an alternative to commencing insulin.
- **Chlorpropamide is not recommended.**
- If renal impairment or elderly patient, use gliclazide or tolbutamide (short acting and metabolised in the liver).

Commonly Used Sulphonylureas

(1) Gliclazide

Initially 40-80 mg daily before main meal, maximum 160 mg twice daily. Shorter acting and inactivated in the liver. Safer in the presence of renal impairment or in the elderly.

(2) Glibenclamide

Initially 2.5-5 mg daily before breakfast, maximum 15 mg daily. Long acting and increased risk of hypoglycaemia. Avoid in those over 70 years or if renal impairment.

(3) Glimepiride

Initially 1 mg shortly before first main meal, maximum 6 mg once daily. Low risk of hypoglycaemia. Weight neutral and may be associated with a small reduction in body weight in the obese patient on a diabetic diet.

(4) Tolbutamide

Initially 500 mg daily before main meal, maximum 1gm twice daily. Shortest acting but weakest action. Low risk of hypoglycaemia. Useful in the elderly if aiming only for symptom relief.

(5) Glipizide

Initially 2.5-5 mg daily before breakfast, maximum 40 mg daily in divided doses.

(6) Chlorpropamide Has more side effects, very long duration of action, may cause facial flushing after drinking alcohol and may enhance antidiuretic hormone secretion (causing hyponatraemia). Not recommended.



(C) Glitazones/Thiazolidinediones - Rosiglitazone, Pioglitazone

For use in combination with metformin or sulphonylurea if failing to achieve blood glucose targets.

Indication

- Intolerance to metformin or sulphonylurea medication.
- Patients whose blood glucose remains high despite metformin and sulphonylurea combination. therapy may be offered a trial of a glitazone as an alternative to insulin.

Action

- Selective agonist of PPAR γ (peroxisome proliferator-activated receptor- γ).
- Decrease insulin resistance.
- Increase capacity for glucose storage and disposal.
- Decrease lipolysis and free fatty acid availability with reduced hepatic glucose output.

Side effects

- Severe liver toxicity reported with troglitazone and license for use withdrawn in the UK.
- No indication as yet that rosiglitazone or pioglitazone are associated with hepatotoxicity.
- Can cause weight gain, fluid retention/oedema, anaemia.

Instructions for use

- These drugs take approximately 2 months to give maximum effect.
- NICE guidance currently recommends that these agents are indicated if there is inadequate blood glucose control on monotherapy:
 - In a patient on metformin, glitazone may be added if the patient is intolerant of sulphonylureas or if sulphonylureas are contraindicated.
 - In a patient on a sulphonylurea, glitazone may be added if the patient is intolerant of metformin or if metformin is contraindicated.
- Patients whose blood glucose remains high despite metformin and sulphonylurea combination therapy may also be offered a trial of a glitazone as an alternative to insulin. Rosiglitazone is now licensed for this triple combination therapy.
- Dosage: Rosiglitazone 4 - 8 mg od; Pioglitazone 15 - 30 mg od; timing of dose not critical.
- Liver function tests (LFTs) must be checked before commencing. Glitazones should not be used if alanine transaminase is more than 2.5 times the upper limit of normal.
- Glitazones should not be used if patient has cardiac failure (cause fluid retention).
- Glitazones can be used if patient has mild to moderate renal failure.



(D) Meglitinidines - Repaglinide, Nateglinide

Repaglinide can be used as a first line monotherapy if diet fails, or with metformin.
Nateglinide can be used in combination with metformin.

Action

- Stimulate insulin release
- Rapid onset of action and short duration of activity

Side effects

- Weight gain
- Hypoglycaemia
- Abdominal pain

Instructions for use

- Repaglinide - Start with 500 ug taken within 30 minutes before the main meals (tds). Titrate dose slowly according to HbA1c up to maximum dose of 4 mg qds before meals.
- Nateglinide - Start with 60 mg taken within 1 to 30 minutes before the main meals (tds). Titrate dose slowly according to HbA1c up to a maximum dose of 180 mg tds before meals.
- The dose is omitted if the meal is missed. This may be of advantage if the patient's diet is erratic with missed meals.
- Nateglinide is particularly quick acting and short acting. The risk of hypoglycaemia and weight gain is therefore low with nateglinide and this agent may be particularly useful in patients with a very erratic lifestyle or dietary intake.

(E) Acarbose

Can be used as a first line monotherapy if diet fails, or with another agent, or insulin.

Action

- Inhibits intestinal alpha-glucosidases, delays absorption of starch and sucrose and hence alters the rise of blood glucose levels following a meal containing carbohydrate.

Side effects

- Gastro-intestinal side effects common. High incidence of abdominal wind and diarrhoea.
- As it interferes with sucrose absorption, treat hypoglycaemia caused by co-existing medication with glucose, not sucrose.

Instructions for use

- Start slowly because of side effects, e.g. 50 mg daily, then bd and then tds, increasing at two-week intervals, aiming for 100 mg tds for the maximal effect.
- Metformin/Acarbose combination can be useful in overweight people.
- Swallow whole immediately before food or chew with the first mouthful of food

(F) Fail To Control Glucose On Diet & Oral Therapy - Needs Insulin?



SUMMARY	METFORMIN	SULPHONYLUREAS	GLITAZONES	MEGLITINIDES	ACARBOSE
Primary Indications	<ul style="list-style-type: none"> • Patient overweight or • Insulin resistance 	<ul style="list-style-type: none"> • Normal weight patients 	<ul style="list-style-type: none"> • Any patient (in combination therapy) 	<ul style="list-style-type: none"> • If food intake erratic 	<ul style="list-style-type: none"> • Overweight patients
Action	<ul style="list-style-type: none"> • Decrease gluconeogenesis • Increases glucose uptake into peripheral tissues • May reduce appetite 	<ul style="list-style-type: none"> • Stimulates insulin secretion 	<ul style="list-style-type: none"> • Decrease insulin resistance 	<ul style="list-style-type: none"> • Stimulates insulin release 	<ul style="list-style-type: none"> • Inhibits intestinal glucosidases • Delays absorption of starch/sucrose
Side Effects	<ul style="list-style-type: none"> • GI effects common • Abdominal pain, nausea • Wind, diarrhoea 	<ul style="list-style-type: none"> • Increased appetite • Weight gain • Hypoglycaemia 	<ul style="list-style-type: none"> • Fluid retention • Liver impairment • Anaemia 	<ul style="list-style-type: none"> • Weight gain • Hypoglycaemia • Abdominal pain 	<ul style="list-style-type: none"> • GI effects common • Wind, diarrhoea
Contra-Indications	<ul style="list-style-type: none"> • Poorly controlled heart failure • Liver or renal failure • Reduced creatinine clearance (plasma creatinine > 130 umol/l) • Pregnancy 	<ul style="list-style-type: none"> • Caution in liver & renal disease • Avoid glibenclamide in the elderly or renal failure – use gliclazide or tolbutamide • Avoid chlorpropamide • Pregnancy 	<ul style="list-style-type: none"> • Severe renal impairment • Hepatic impairment (do not give if ALT > 2.5 ULN) • Cardiac failure • Pregnancy 	<ul style="list-style-type: none"> • Severe renal or hepatic impairment • Pregnancy 	<ul style="list-style-type: none"> • Pregnancy
Dose	Metformin <ul style="list-style-type: none"> • Start at 500 mg per day after the largest meal • Increase gradually • Maximum dose 1g tds 	<ul style="list-style-type: none"> • Gliclazide 40 mg od – 160 mg bd • Glibenclamide 2.5 mg od – 15 mg od • Glimepiride 1 mg od – 6 mg od • Tolbutamide 500 mg od – 1 g bd 	Rosiglitazone <ul style="list-style-type: none"> • 4mg od – 8mg od Pioglitazone <ul style="list-style-type: none"> • 15 – 30 mg od ➤ Use in combination with metformin or sulphonylurea ➤ Measure LFTs before use 	Repaglinide <ul style="list-style-type: none"> • Start at 500 ug before the main meal • Maximum dose 4 mg qds, before meals Nateglinide <ul style="list-style-type: none"> • Start at 60 mg before the main meal • Maximum dose 180 mg tds, before meals 	Acarbose <ul style="list-style-type: none"> • Start at 50 mg od • Increase gradually • Maximum dose 100mg tds
Timing	<ul style="list-style-type: none"> • Take after meal 	<ul style="list-style-type: none"> • Take 30 min before meal 	<ul style="list-style-type: none"> • At any time 	<ul style="list-style-type: none"> • Within 30 min before a meal • Miss meal=omit dose 	<ul style="list-style-type: none"> • Immediately before food or chew with first mouthful



Chapter 8:

Insulin



INSULIN

COMMONLY USED INSULINS			
Name	Type	Action	Commonly Used Regimens
<i>Rapid acting</i>			
<ul style="list-style-type: none"> • NOVORAPID • HUMALOG 	Insulin Aspart (Insulin analogue) Insulin Lispro (Insulin analogue)	Rapid acting Peak action 1 - 2 h Lasts up to 4 - 5 h	Given <i>immediately</i> before meals, as part of basal - bolus regimen
<i>Short acting</i>			
<ul style="list-style-type: none"> • ACTRAPID • HUMULIN S 	Soluble	Short acting Peak action 2 - 3 h Lasts up to 8 h	Given 20 - 30 min before meals, as part of basal - bolus regimen
<i>Intermediate acting</i>			
<ul style="list-style-type: none"> • INSULATARD • HUMULIN I 	Isophane	Intermediate acting Peak action 6 - 8 h Lasts 12 - 18 h	<ol style="list-style-type: none"> 1. Given before bed, as basal part of basal - bolus regimen 2. Given before bed, in combination with tablets, in overweight patients 3. Given once daily before breakfast, in the elderly 4. Given twice a day, instead of pre-mixed insulin, in Type 2 diabetes
<i>Biphasic action</i>			
<ul style="list-style-type: none"> • NOVOMIX30 • HUMALOG MIX25 	30 % Insulin Aspart 70 % Insulin Aspart Protamine 25 % Insulin Lispro 75 % Insulin Lispro Protamine	Biphasic action: Combination of rapid and intermediate action	Given <i>immediately</i> before breakfast and evening meal, as a twice a day regimen
<ul style="list-style-type: none"> • MIXTARD 30 • HUMULIN M3 	30 % soluble 70 % isophane	Biphasic action: Combination of short and intermediate action	Given 20 - 30 min before breakfast and evening meal, as a twice a day regimen
<i>Long acting insulin analogue</i>			
<ul style="list-style-type: none"> • LANTUS • LEVEMIR 	Insulin Glargine Insulin Detemir	Long acting - up to 24 hours Flatter absorption	Can be considered: - In type 1 diabetes, when problems with nocturnal or recurrent hypoglycaemia - In type 2 diabetes, in combination with tablets, when bedtime insulatard not giving adequate 24 h control



COMMON INSULIN REGIMENS

Patients on complex insulin regimens are usually managed by the hospital diabetes clinic.

TYPE 1 DIABETES

1) Twice Daily Regimen

- Insulin is given twice daily, 20 - 30 min before breakfast and the evening meal.
- Pre-mixed insulins are used (e.g. Mixtard 30, Humulin M3) which are a combination of short acting and intermediate acting insulin (soluble and isophane).
- Injection before breakfast covers breakfast (short acting component) and lunch (intermediate acting component); injection before evening meal covers dinner (short acting component) and the night-time (intermediate acting component).

Subjects:

- Starting regimen for patients with newly diagnosed type 1 diabetes
- Usual regimen for children
- Common regimen for adults with a regular lifestyle

2) Twice Daily Regimen, with Insulin Analogues

- As above, but using Novomix 30 or Humalog Mix25 (a mixture of rapid and intermediate acting insulin analogue).
- Insulin analogue is given immediately before breakfast and the evening meal.

Subjects:

- Starting regimen for patients with newly diagnosed type 1 diabetes
- Consider if patient cannot co-ordinate giving insulin 20 - 30 min before meals
- Can reduce pre-lunch and nocturnal hypoglycaemia

3) Basal - Bolus Regimen

- 'Bolus': short acting insulin (e.g. Actrapid, Humulin S) given 20 - 30 min before each meal.
- 'Basal': intermediate acting insulin (e.g. Insulatard, Humulin I) given before bed.

Subjects:

- Used when patients have an irregular lifestyle or require a more flexible regimen, e.g. adolescents, young adults, adults
- Usual regimen for pregnant women requiring very tight glycaemic control

4) Basal - Bolus Regimen, With Rapid Acting Insulin Analogues

- As above, but using Novorapid or Humalog immediately before each meal
- Rapid, short action can reduce the need for snacks and reduce hypoglycaemic episodes

Subjects:

- Used when patients require a very flexible regimen

5) Basal - Bolus Regimen, With Long Acting Insulin Analogues

- As above, but using Glargine insulin (Lantus) or Detemir insulin (Levemir) as basal insulin, usually at bedtime.

Subjects:

- Used when patients require a very flexible regimen
- Used for patients who have nocturnal and/or recurrent symptomatic hypoglycaemia



TYPE 2 DIABETES

Patients with type 2 diabetes starting on insulin generally continue to take metformin tablets.

1) Bedtime Insulin (Once Daily Regimen):

- Patient takes oral antidiabetic drugs in the day.
- Insulin is taken once daily at bedtime, to control blood glucose overnight.
- Intermediate acting insulins are used (e.g. Insulatard, Humulin I).
- If daytime sugars remain sub-optimal, patients may need to take intermediate acting insulin twice a day (see below) or consider changing to once daily long acting insulin analogue such as Glargine insulin or Detemir insulin.

Subjects:

- Starting regimen for patients with type 2 diabetes and with poor glycaemic control on tablets
- Common regimen for overweight patients with type 2 diabetes needing insulin and tablets

2) Twice Daily Regimen

- Using intermediate acting insulin (e.g. Insulatard, Humulin I) given twice a day.
- As for type 1 diabetes using pre-mixed biphasic insulin or insulin analogues (see above).

Subjects:

- Used when glycaemic control is inadequate with bedtime insulin and tablets
- May be first line treatment for patients with type 2 diabetes who are thin and have hyperglycaemic symptoms (using pre-mixed insulin)

ELDERLY PATIENTS WITH DIABETES

Any of the above regimens can be used in the elderly. In addition:

1) Breakfast Insulin (Once Daily Regimen):

- Insulin is given once daily, before breakfast.
- Intermediate acting insulin is used (e.g. Insulatard, Humulin I).
- A long acting insulin analogue (e.g. Glargine insulin, Detemir insulin) can be considered if insulin is to be administered by a carer.

Subjects:

- Used when tight glycaemic control is inappropriate or dangerous (risk of hypoglycaemia)
- Useful if insulin administration dependent on a third party (e.g. district nurse)

USING HUMAN vs ANIMAL INSULIN

- Controversy surrounds the reported lack of hypoglycaemic awareness on human insulin.
- Our policy is to start patients on human insulin or human insulin analogues unless they request otherwise.
- **For patients already on insulin - if they wish to have animal insulin or stay on animal insulin, there should be no objection to this.**

PRESCRIBING INSULIN PENS AND NEEDLES

- All insulin syringes, pens, injection devices and needles are freely available on NHS prescription in the community and in hospital. Different injection devices will suit different patients and some will prefer to continue using syringes.



Chapter 9:
Diabetic Emergencies



MANAGEMENT OF THE SICK PATIENT WITH DIABETES

A) SICK-DAY RULES

ALWAYS REMEMBER

- The aim of treatment is to keep patients safe and out of hospital.
 - **NEVER STOP INSULIN - PATIENTS MAY NEED MORE**
 - Test more frequently and increase medication if blood or urine glucose is high
 - Seek **URGENT** advice if a high glucose concentration does not respond to an increased dose of insulin, or if there is more than a trace of ketonuria
- **If the patient is unconscious**, they may be hyperglycaemic or hypoglycaemic. If you have no means of testing blood glucose - **give intravenous glucose (25 - 50 ml of intravenous 20 - 50 % glucose solution)**. If the patient is hypoglycaemic - they will wake up. If the patient is hyperglycaemic, this bolus of glucose will not significantly affect management or outcome. Never be afraid to give glucose.



PATIENTS WITH TYPE 1 DIABETES

At times of sickness, the stress associated with illness increases insulin requirements. The decision to admit a patient to hospital or not depends whether there is evidence of diabetic ketoacidosis (DKA - ADMIT) or whether instead the patient has hyperglycaemia and mild ketonuria which can be managed at home.

Does The Patient Need Admitting To Hospital? - Type 1 Diabetes

1) Assess the patient

Remember to take an overview of the situation and generally assess whether the patient is safe to stay at home. Patients will need someone (a friend or relative) to look after them; if they are on their own, they may need admission to hospital.

a) Are there signs of acidosis?

- Vomiting - if *repeated* vomiting or unable to take oral fluids ADMIT
- Hyperventilation or ketones on the breath ADMIT
- Any disturbance of conscious level ADMIT

b) Are there signs of severe dehydration?

- Tachycardia or hypotension ADMIT

2) Test urine for ketones using a ketostix

- *Persistent* ketonuria of more than a trace ADMIT

3) Test capillary blood for glucose level

- Blood glucose not responding to increased insulin ADMIT

Blood glucose is usually > 20 mmol/l in DKA

Blood glucose < 10 mmol/l, excludes DKA

(NB. This means blood glucose can be as low as 15 mmol/l in DKA)

4) Consider the underlying cause of sickness - does this require admission?

- May need admission
 - Infection - remember to check uncommon sites (perianal abscess, foot infection)
 - Myocardial Infarction - cardiac ischaemia can be silent/painless in people with diabetes

DKA CAN DETERIORATE VERY QUICKLY - IF IN DOUBT, ADMIT.



Managing The Sick Patient At Home - Type 1 Diabetes

1) Test blood glucose

- Patients should monitor at least every 2 - 4 hours.

2) Increase insulin

- If blood glucose < 13 mmol/l (or urine glucose negative), continue normal insulin.
- If blood glucose 13 - 22 mmol/l, give an extra 4 units* of short / rapid acting insulin before each meal and bedtime, even if the patient is not eating. Use intermediate acting insulin or pre-mixed insulin if this is all that is available, in same dose.
- If blood glucose > 22 mmol/l, give an extra 6 units* of short / rapid acting insulin before each meal and bedtime, even if the patient is not eating. Use intermediate acting insulin or pre-mixed insulin if this is all that is available, in same dose.
- If blood glucose persistently > 22 mmol/l, despite increased insulin therapy, patient may need hospital admission.

*These units should be doubled if the patient is on > 50 units of insulin per day.

3) Check for ketonuria

- Check the urine for ketones at least two times a day.
- If ketonuria is persistent or is heavy (ketones > 3 +), assess for signs of acidosis and consider admitting the patient.

4) Treat the underlying condition

- Give antibiotics if evidence of bacterial infection.

5) Maintain fluid and food intake

- If the patient cannot maintain solid food intake, advise them to replace with alternatives - sip Lucozade or other sugary drinks, milk, soup, ice-cream, fruit juice, Complan, honey, jam or suck boiled sweets or glucose tablets.
- The patient's fluid intake should be maintained, drinking 2.5 - 3 litres (5 - 6 pints) of unsweetened fluid per day.



PATIENTS WITH TYPE 2 DIABETES

DKA: Patients with type 2 diabetes rarely get ketoacidosis. However, at times of severe intercurrent illness and in younger patients from ethnic groups, DKA can occur. The rules of assessment are therefore similar to above.

HONK: In addition, hyperosmolar non-ketotic hyperglycaemia (HONK) may occur in patients with type 2 diabetes. It tends to affect elderly and Black Caribbean patients. In this condition, very high blood glucose levels occur (> 30 mmol/l) with severe dehydration and drowsiness. Ketones are absent from the urine or are present in low levels (trace or 1+). When associated with altered conscious level, this condition has a high mortality, with secondary thrombotic events.

Does The Patient Need Admitting To Hospital? - Type 2 Diabetes

If there is a high blood glucose concentration (> 30 mmol/l) with *either* severe dehydration *or* any disturbance in conscious level, the patient should be ADMITTED.

1) Assess the patient

Remember to take an overview of the situation and generally assess whether the patient is safe to stay at home. Patients will need someone (a friend or relative) to look after them; if they are on their own, they may need admission to hospital.

a) Are there signs of acidosis?

- | | |
|--|-------|
| • Vomiting - if <i>repeated</i> vomiting or unable to take oral fluids | ADMIT |
| • Hyperventilation or ketones on the breath | ADMIT |
| • Any disturbance of conscious level | ADMIT |

b) Are there signs of severe dehydration?

- | | |
|------------------------------|-------|
| • Tachycardia or hypotension | ADMIT |
|------------------------------|-------|

2) Test urine for ketones using a ketostix:

- | | |
|--|-------|
| • <i>Persistent</i> ketonuria of more than a trace | ADMIT |
|--|-------|

3) Test capillary blood for glucose level

- | | |
|--|-------|
| • Blood glucose not responding to increased therapy | ADMIT |
| • Blood glucose > 30 mmol/l + severe dehydration or disturbance in conscious level | ADMIT |

4) Consider the underlying cause of sickness - does this require admission?

- May need admission
 - Infection - remember to check uncommon sites (perianal abscess, foot infection)
 - Myocardial Infarction - cardiac ischaemia can be silent/painless in people with diabetes

**DKA CAN DETERIORATE VERY QUICKLY AND HONK CAN KILL:
IF IN DOUBT, ADMIT.**



Managing The Sick Patient At Home - Type 2 Diabetes

1a) Test blood glucose

- Patients should monitor at least every 2 - 4 hours, if they have blood glucose testing equipment.

1b) Test urine glucose

- Patients should monitor at least 4 times a day, if they only have urine testing equipment; if they have no home monitoring equipment, urine testing is very easy to learn.

2) Medication

At times of sickness, the stress associated with illness can increase blood glucose levels in type 2 diabetes, just as in type 1 diabetes.

2a) Patients on tablets

- The patient should continue to take their oral antidiabetic drugs.
- Patients must be able to keep their medication down.
- If they are nauseated or vomiting, this may be difficult, particularly with metformin.
- If blood glucose < 13 mmol/l or urine glucose negative, continue normal medication.
- If blood glucose or urine glucose is higher than usual for the patient, give extra oral antidiabetic drugs, even if the patient is not eating. If the patient is already on the maximum drug dose or is vomiting up oral medication, consider short-term insulin therapy (using the regimen given below).
- If blood glucose persistently > 30 mmol/l or urine glucose persistently > 2 %, despite increased medication, patient may need admission to hospital.

2b) Patients on insulin

- Some patients with type 2 diabetes are on insulin or on both insulin and tablets.
- The patient should continue to take their insulin and/or oral antidiabetic drugs.
- If they are nauseated or vomiting, this may be difficult, particularly with metformin.
- If blood glucose < 13 mmol/l, continue normal insulin.
- If blood glucose 13 - 22 mmol/l, give an extra 4 units* of short / rapid acting insulin before each meal and bedtime, even if the patient is not eating. Use intermediate acting insulin or pre-mixed insulin if this is all that is available, in same dose.
- If blood glucose > 22 mmol/l, give an extra 6 units* of short / rapid acting insulin before each meal and bedtime, even if the patient is not eating. Use intermediate acting insulin or pre-mixed insulin if this is all that is available, in same dose.
- If blood glucose persistently > 30 mmol/l, despite increased insulin therapy, patient may need hospital admission.

*These units should be doubled if the patient is on > 50 units of insulin per day.



3) Check for ketonuria

- If the blood glucose is > 15 mmol/l or if there is > 2 % glycosuria, check the urine for ketones at least two times a day.
- If ketonuria is *persistent* or is *heavy* (ketones > 3 +), assess for signs of acidosis and consider admitting the patient.

4) Treat the underlying condition

- Give antibiotics if evidence of bacterial infection.

5) Maintain fluid and food intake

- If the patient cannot maintain solid food intake, advise them to replace with alternatives - sip Lucozade or other sugary drinks, milk, soup, ice-cream, fruit juice, Complan, honey, jam or suck boiled sweets or glucose tablets.
- The patient's fluid intake should be maintained, drinking 2.5 - 3 litres (5 - 6 pints) of unsweetened fluid per day.



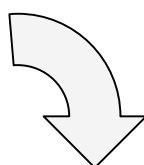
B) HYPOGLYCAEMIA

- Most commonly occurs with patients on insulin, but can also happen with sulphonylureas or other insulin secretagogues (e.g. meglitinides: repaglinide and nateglinide).
- The blood glucose level at which hypoglycaemic symptoms occurs can vary between different individuals with different levels of overall glycaemic control.
- Generally, patients have autonomic symptoms when blood glucose ≤ 3.5 mmol/l:
e.g. sweating, hunger, paraesthesia, anxiety, shaking / tremor, pounding heart / palpitations / tachycardia, pallor, increased blood pressure.
- Generally, patients have neuroglycopenic symptoms when blood glucose ≤ 2.5 mmol/l:
e.g. confusion, drowsiness, difficulty in thinking, altered speech, altered behaviour / aggression / emotional lability, incoordination, focal neurological deficit such as double vision / diplopia or hemiparesis, seizures, coma.

MANAGEMENT

If the patient is:

- **confused**
- **drowsy**
- **unconscious**
- **fitting**



CHECK THE BLOOD GLUCOSE FOR HYPOGLYCAEMIA.

WHEN IN DOUBT, e.g. no blood glucose testing equipment available,
ALWAYS GIVE GLUCOSE.

1) IF THE PATIENT IS DROWSY, UNCONSCIOUS OR FITTING, GIVE:

25 - 50 ml of glucose intravenous solution, into a large vein
(e.g. 50 ml of 20 % glucose solution or 25 ml of 50 % glucose solution)
OR
1 mg glucagon, given im / iv / sc

GLUCAGON:

LOOK IN THE PATIENT'S FRIDGE - IT IS PRESCRIBED TO SOME PATIENTS

- Glucagon can wake patients up sufficiently for them to take oral glucose.
- Glucagon can therefore be used if venous access is difficult or not available (e.g. nurse witnessed hypoglycaemia).
- Glucagon can also be issued for relatives to administer to patients with diabetes if bad hypoglycaemic attacks are occurring at home.
- If not effective in 10 min, give intravenous glucose.



2) IF THE PATIENT IS CONFUSED BUT ALERT:

Use the 15:15 rule:

Give 15 g of fast acting carbohydrate every 15 minutes until blood glucose level is normal.

- Eating foods containing fast acting sugars / carbohydrate will correct hypoglycaemia.
- The 15:15 rule can help the patient manage and recover from an episode of hypoglycaemia.
- When the patient suspects hypoglycaemia, if possible they should first check their blood glucose (usually < 4 mmol/l when hypoglycaemic).
- If hypoglycaemia is confirmed, the patient eats or drinks 15 g of fast acting sugars.
- They wait 15 minutes and then test their blood glucose level again.
- If the blood glucose is still < 4 mmol/l, they eat another 15 g portion and wait another 15 minutes. They then test their blood glucose again.
- If the blood glucose is still too low, they treat again with 15 g of fast acting sugars and contact a member of their healthcare team.

15 g of fast acting sugars are available from:

Food / Drink	Practical estimate	Volume / weight
▪ Lucozade®	$\frac{1}{3}$ cup	85 ml
▪ Sugar	3 teaspoons	15 ml
▪ Sugar lumps	4 – 5 lumps	15 g
▪ Dextrose tablets (‘Dextrosol’ or ‘Dextro Energy’)	5 tablets	5 tablets (3 g per tablet)
▪ Coca-Cola®	$\frac{1}{2}$ cup	135 ml
▪ Ribena® Original	$1\frac{1}{2}$ tablespoons diluted	23 ml
▪ Milk	$1\frac{1}{4}$ cups	300 ml

NB. One cup ~ 240 ml or $\frac{1}{2}$ pint

OR

Administer a tube of ‘Hypo-stop’ - a gel (containing 10 g glucose per tube) that is squeezed into the cheek pouch: the glucose is absorbed across the mouth mucous membranes.

**LOOK IN THE PATIENT’S FRIDGE -
IT IS PRESCRIBED TO SOME PATIENTS.**

3) PATIENT SHOULD EAT AFTER HYPOGLYCAEMIA

If the patient is not expected to have a meal within 30 minutes of a low blood glucose, they must have a snack containing starchy carbohydrate (e.g. sandwich or biscuits) after the initial resuscitation to prevent further hypoglycaemia.

4) RECHECK THE BLOOD GLUCOSE AFTER 15 MIN AND 30 MIN



5) CONSIDER THE POSSIBLE CAUSES OF HYPOGLYCAEMIA

- Excess insulin
- Decreased food intake
- Exercise
- Alcoholic binge
- Sulphonylureas - commonly long acting sulphonylureas:
glibenclamide and chlorpropamide, especially in the elderly or with renal impairment
- Liver disease
- Sepsis
- Salicylate poisoning

5) ADVISE PATIENTS APPROPRIATELY

- Elderly patients are particularly prone to hypoglycaemia when long acting sulphonylureas are used.
- Sulphonylureas which are long acting or are renally excreted can also cause hypoglycaemia if there is pre-existing renal impairment.
- Change elderly patients (>70 y) or patients with renal impairment from long acting sulphonylureas (**stop glibenclamide or chlorpropamide**) onto short acting sulphonylureas or those metabolised in the liver (**start gliclazide or tolbutamide**).

6) IF HYPOGLYCAEMIA RECURS OR IS LIKELY TO RECUR:

(e.g. liver disease, sepsis, sulphonylurea excess)

- Consider admission to hospital for intravenous 10 % dextrose infusion.
- Monitor blood glucose frequently (every 1 - 2 h).
- Sulphonylurea excess will require close blood glucose monitoring for 3 - 7 days.



Chapter 10:
Diabetes Review Formats & Continuing Care



TYPE 2 DIABETES - INITIAL ASSESSMENT

Initial Discussion

- History of illness, including enquiry about possible underlying causes of diabetes
- Simple explanation of diabetes
- Lifestyle in relation to diabetes - including advice to stop smoking
- Explanation of diabetes care and how this will be organised
- Information regarding patient support association e.g. Diabetes UK (formerly BDA)
- Send patient to new diabetes group education session at the Whittington Hospital if Islington or West Haringey resident

Examination

- Weight, height and BMI (weight in kg / height in m²)
- Blood pressure
- Foot examination
- Full clinical examination to exclude underlying causes of diabetes
- Enrol onto Camden, Islington and West Haringey Retinal Screening Programme (for yearly eye examination)

Investigations

- **Urine dipstix for glucose, ketones, protein and blood**
 - 0, Trace or 1+ proteinuria detected, test urine for microalbuminuria
 - 2+, 3+ or 4+ proteinuria detected, send MSU
 - if urine infected, treat with antibiotics
 - if no infection, do laboratory test for proteinuria
- **Blood tests (baseline investigations)**
 - plasma glucose
 - HbA1c
 - lipid profile (cholesterol, LDL, HDL, total cholesterol:HDL ratio, triglycerides)
 - urea, electrolytes and creatinine
 - thyroid function tests
 - liver function tests
 - Fbc
- Further investigations as required (e.g. ECG)

Final discussion

- Initial dietary assessment and advice
- Discussion and agreement of initial management plan and individual targets
- Date of next appointment
- Referral to Podiatrist, Ophthalmologist or Specialist in Diabetes if specific indications
- Record patient and review findings on practice diabetes register



TYPE 2 DIABETES - ROUTINE REVIEW

All patients should be seen at least twice a year and more if their diabetes control is not satisfactory.

Initial Discussion

- General well being and overview of life with diabetes, including driving
- Glycaemic control
 - self monitoring results
 - symptoms of hypoglycaemia or hyperglycaemia
- Knowledge of diabetes and diabetes self management
- Education requiring importance of good metabolic control and healthy lifestyle
- Lifestyle and diet enquiry (alcohol, smoking, physical activity and food)

Examination

- Weight, height and BMI (weight in kg / height in m²)
- Blood pressure
- Other clinical examination as required

Investigations

- **Urine dipstix for protein, glucose, ketones and blood**
 - 2 +, 3+ or 4+ proteinuria detected, send MSU
- **Blood tests**
 - HbA1c
- Further investigations as indicated

Final Discussion

- Glycaemic control
 - dietary management
 - change in treatment
 - reinforce diet and physical activity
- Management of identified cardiovascular risk factors
- Management of identified long-term complications
- Set individual management targets for HbA1c, cholesterol, weight and blood pressure
- Agree future management plan
- Date of next appointment
- Record review findings on practice diabetes register



TYPE 2 DIABETES - ANNUAL REVIEW 1

Initial Discussion

- Explain reason for this visit and need for annual review
- General well being and overview of life with diabetes, including driving
- Glycaemic control
 - self monitoring results
 - symptoms of hypoglycaemia or hyperglycaemia
- Knowledge of diabetes and diabetes self management
- Education regarding importance of good metabolic control and healthy lifestyle
- Review patient compliance with medication
- Lifestyle and diet enquiry (alcohol, smoking, physical activity and food)
- Specific inquiry about diabetic complications
 - problems with vision
 - chest pain and shortness of breath
 - intermittent claudication
 - symptoms of neuropathy, including erectile dysfunction and diarrhoea
 - foot problems

Examination

- Weight, height and BMI (weight in kg / height in m²)
- Blood pressure
- Foot examination
 - Footwear and general condition of skin and nails
 - Deformity and ulceration
 - Peripheral pulses
 - Peripheral neuropathy (ankle jerks, monofilament)
- Eye examination - check patient attending review in the Retinal Screening Programme or a hospital eye clinic
- Other clinical examination as required



TYPE 2 DIABETES - ANNUAL REVIEW 2

Investigations

- **Urine dipstix for protein, glucose, ketones and blood**
 - 0, Trace or 1+ proteinuria detected, test urine for microalbuminuria
 - 2 +, 3+ or 4+ proteinuria detected, send MSU
 - if urine infected, treat with antibiotics
 - if no infection, do laboratory test for proteinuria
- **Blood tests**
 - plasma glucose
 - HbA1c
 - lipid profile (cholesterol, LDL, HDL, total cholesterol:HDL ratio, triglycerides)
 - urea, electrolytes and creatinine
 - estimate Glomerular Filtration Rate (eGFR) (Creatinine Clearance, CrCl)
 - thyroid function tests
 - liver function tests
- Further investigations as indicated

Final Discussion

- Glycaemic control
 - dietary management
 - change in treatment
 - reinforce diet and physical activity
 - management during concurrent illness
- Management of identified cardiovascular risk factors
- Management of identified long-term complications
- Set individual targets for HbA1c, cholesterol, weight and blood pressure
- Reinforce importance of patient compliance with medication
- Agree future management plan
- Date of next appointment
- Review results of eye examination from Retinal Screening Programme or eye clinic
- Record review findings on practice diabetes register



ARRANGEMENTS FOR SHARED CARE

Well-controlled patients with type 2 diabetes will normally be looked after by their GP with easy access to the hospital clinic if new problems arise.

For many patients, care is shared between the hospital and the GP practice. The balance between the two will vary depending on the GP practice and the clinical condition of the patient.

We envisage four categories of shared care:

1. Practices who provide interim BP checks, weight checks, HbA1c, cholesterol and repeat prescriptions but do not feel able to carry out full annual review checks.
2. Practices who carry out diabetic reviews including annual review as part of Prompted Shared Care (see following page).
3. Practices who are more experienced and are happy to look after patients with well-controlled type 2 diabetes including annual reviews, but not type 1 diabetes.
4. Practices who are experienced in running diabetic clinics and who will look after all but the most difficult cases.

This information will be made available to hospital clinic doctors, so that they can make informed decisions regarding discharge of patients back to primary care. The Whittington Hospital Diabetes Service holds a list of local GPs, with information that the practice has given us regarding the level of diabetes care that they provide. This is regularly updated and available to the clinic doctors.

Patients who will receive predominately hospital-based care

- Children and adolescents
- Pregnant women
- Patients with type 1 diabetes
- Patients with poorly controlled type 2 diabetes
- Patients with serious complications including:
 - microalbuminuria
 - vascular disease
 - renal disease
 - diabetic retinopathy
 - foot ulcers

Diabetic problems suitable for specialist consultation but not necessarily long term hospital follow-up

- Poor glycaemic control +/- symptoms
- Assessment for insulin treatment
- Painful neuropathy
- Diabetic erectile dysfunction



PROMPTED COMMUNITY DIABETES CARE SCHEME FOR PATIENTS WITH TYPE 2 DIABETES

Summary

- Patients in this scheme receive their diabetic care from their **GP and primary care team**
- These patients are **not** seen in the hospital diabetic clinic.
- This service is available for patients in the catchment area of the Whittington Hospital which runs the scheme (Islington and West Haringey).
- In this scheme, patients are prompted:
 1. To have blood and urine tests done every 6 months;
 2. To attend their GP for review or full annual diabetic review;
 3. To attend for annual retinal screening.
- If the patient's GP is concerned, they can refer the patient directly to the hospital diabetes clinic via the forms used in this scheme.
- Patients can be recruited onto Prompted Community Diabetes Care by their GP or by the hospital doctor at discharge of the patient from diabetes clinic.
- **Contact Maria Christofi or Shirley Burnett (020 7288 3173)**

How Does The Prompted Community Diabetes Care Scheme Work?

Patients will be prompted to see their GP for a review of their diabetes every 6 months. They will make an appointment at the surgery about 10 days after a blood and urine test. If the surgery does not run a designated diabetic clinic then the patient will be asked to book a double appointment. The results of the blood and urine tests will be entered on a diabetic record that the patient brings to the surgery. The records will contain relevant details about the diabetic history.

Investigations

Twice a year patients will be sent request forms and will be asked to attend either the GP surgery or the Whittington Hospital laboratory:

- to have blood tests - for random blood glucose, HbA1c & lipids;
- to have an MSU - to be checked for infection, proteinuria & microalbumin screen.

The result of these tests will be sent back to the patients on a medical record that they will bring to the surgery.

Clinical Review In General Practice

The medical records consist of either a **regular review form** or an **annual review form**. They are designed to provide a basic structure to the diabetic consultation. GPs are asked to record clinical information on the middle third of the form. After completion, the back copy should be returned in the pre-paid envelope to the Whittington Hospital Community Diabetes Care Scheme and the top copy should be filed in the GP notes.



Retinal Screening

Once a year, patients will be asked to attend for eye screening as part of the Camden, Islington and West Haringey Retinal Screening Programme. They will be sent a record that will be completed by the Retinal Screener. A copy of this report will be sent to the patient's GP to be filed as part of the diabetic record. The scheme allows for direct referral of patients to a hospital ophthalmologist when indicated, in which case the GP will be informed. Any patient already attending a hospital eye clinic will **not** be recruited into the retinal screening programme, unless they are discharged from the clinic.

Non-Compliance

If a patient does not attend for either blood & urine tests, GP diabetic review or retinal screening, the GP will be notified.

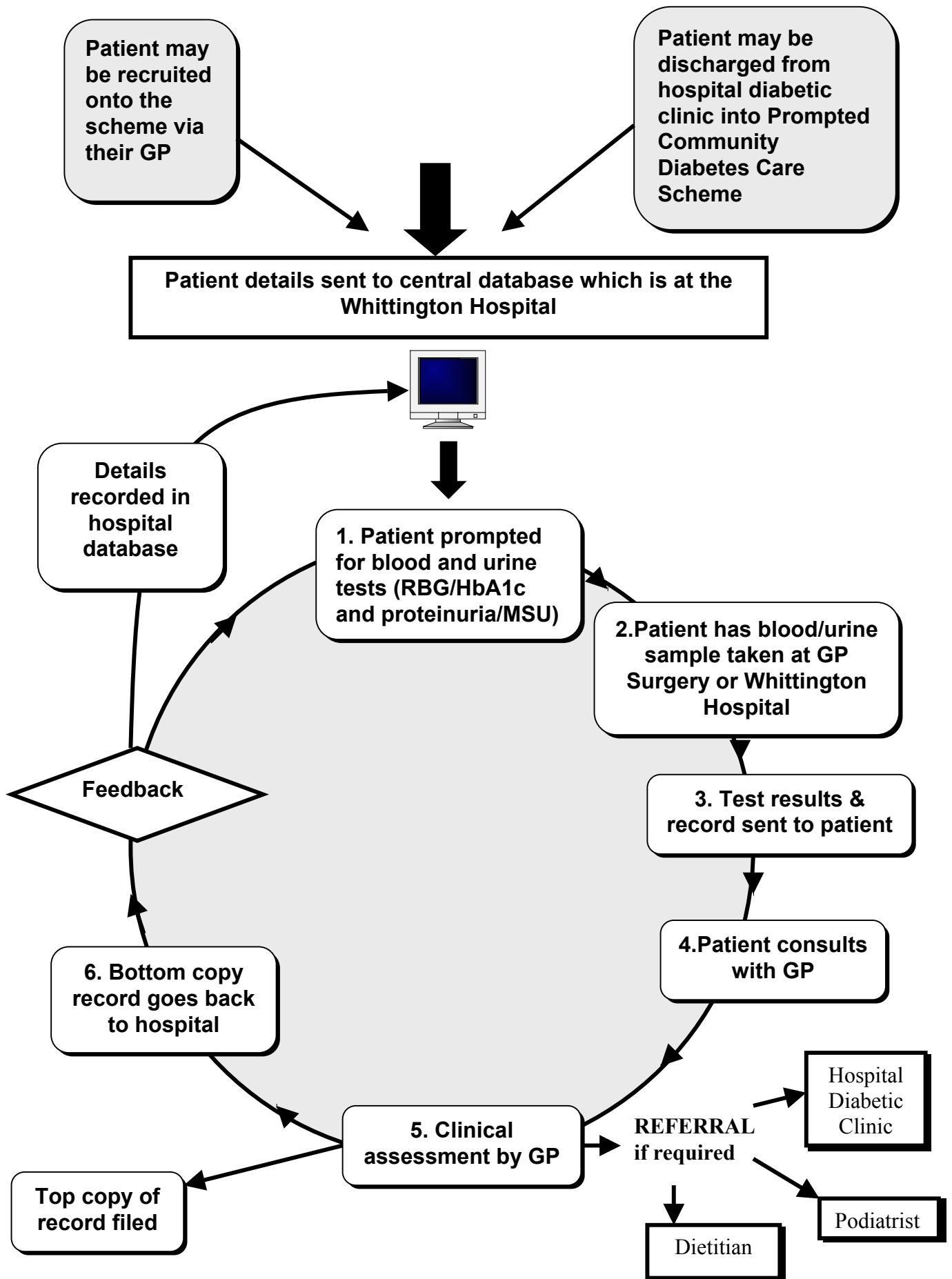
For advice regarding these schemes, please contact:

Maria Christofi or Shirley Burnett, The Whittington Hospital

Tel: 020 7288 3173



PROMPTED COMMUNITY DIABETES CARE SCHEME (FOR PATIENTS WITH TYPE 2 DIABETES)



Chapter 11:
Cardiovascular Risk And Aspirin In Diabetes



REDUCING CORONARY HEART DISEASE IN DIABETES

- All patients with diabetes mellitus are at high risk of developing coronary heart disease.
- In general over 70% of patients with diabetes die from macrovascular disease (mainly CHD). CHD mortality in diabetes is 2 - 4 times higher than in people who do not have diabetes.
- Managing hypertension and dyslipidaemia aggressively prevents macrovascular disease.
- Encourage smoking cessation, physical activity and weight reduction.
- Use Metformin as first line treatment in obese patients with type 2 diabetes.
- Sulphonylureas and insulin are safe and not associated with increased cardiovascular risk.

Primary Prevention In Patients With Diabetes

- Assess all patients for cardiovascular disease and microalbuminuria / proteinuria. The vascular risk is increased approximately two fold in patients with microalbuminuria, and more so with proteinuria. Premenopausal women with diabetes lose their cardiovascular protection.
- In type 2 diabetes, glycaemic control has a greater impact on microvascular disease. Macrovascular disease will be reduced by attention to the other risk factors.
- The patient's global risk can be determined using the Joint British Societies Coronary Risk Prediction Charts or, if microalbuminuria is present, by the risk charts modified by Diabetes UK.
- As a general guide, an absolute risk of 15% or greater of developing CHD over the next ten years is sufficiently high to justify drug treatment.
- Risk factor management should be undertaken as for secondary prevention.

Secondary Prevention In Patients With Diabetes

- The prognosis of coronary heart disease (CHD) is worse in patients with diabetes.
- Following acute myocardial infarction (MI), patients with diabetes are given infusions of insulin and glucose. This may be followed by 3 months treatment with subcutaneous insulin.
- After MI, patients with diabetes should be prescribed aspirin, β -blockers, ACE inhibitors, and statins, as for patients who do not have diabetes.
- Treat hypertension with ACE inhibitor or β -blocker in the first instance (see targets).
- Statins should be considered for all patients with diabetes and cardiovascular disease. In view of the strong association between diabetes and macrovascular disease, all patients with CHD should be screened for diabetes.



ASPIRIN THERAPY IN DIABETES

(Recommendations taken from American Diabetes Association)

Large scale studies have shown that aspirin therapy in diabetes:

- has an equivalent effect in patients with diabetes as patients without diabetes
- reduces vascular events, whether there is a pre-existing history of vascular disease (secondary prevention) or no history of vascular disease (primary prevention)

Secondary Prevention

If the patient has a history of:

MI

Angina

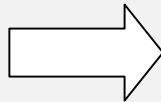
Vascular Surgery

CVA (non haemorrhagic)

TIA

PVD

Claudication



GIVE ASPIRIN

To reduce the risk of any vascular event by 25%

Primary Prevention

If patient at high-risk of cardiovascular disease:

Patient aged > 40 years

OR

Family history of cardiovascular disease

Cigarette smoking

Hypertension

Albuminuria (micro or macro)

Raised lipids



GIVE ASPIRIN

To reduce the risk of MI by 60 %

POSSIBLE EXCEPTIONS to aspirin use in primary prevention

Patients with diabetes < 30 years of age without cardiovascular risk factors

CONTRAINDICATIONS

Aspirin allergy, bleeding tendency, anticoagulant therapy, recent GI bleed, clinically active hepatic disease

Aspirin dose: 75 mg daily

(150 mg/daily for one month post acute MI, then 75 mg / day)

Clopidogrel dose: 75 mg daily - Can be considered if Aspirin intolerant

Combined Aspirin & Clopidogrel therapy should be considered in very high-risk patients



Chapter 12:

Hypertension



BLOOD PRESSURE

Hypertension and diabetes are very commonly associated. Hypertension increases the risk of cardiovascular disease and progression of diabetic retinopathy and renal disease.

Tight blood pressure (BP) control in diabetics has been shown to:

- reduce the risk of death from the complications of diabetes by 30 %;
- reduce the risk of strokes by 44 %;
- reduce the risk of serious deterioration of vision by 47 %.

Treating hypertension in diabetes shows early beneficial effects and reduces cardiovascular disease more than tight glucose control.

Even a small reduction in BP will significantly reduce the risk of complications.

Measuring Blood Pressure

- Use a validated device, calibrated and maintained once a year.
- Measure the BP with the patient sitting: remove tight clothing, support arm at heart level, ensure the hand is relaxed and avoid talking during the measurement.
- Use a cuff of appropriate size (see below).
- If using a mercury sphygmomanometer, lower the mercury column slowly (2 mm/sec) and measure diastolic pressure at the disappearance of sound (phase V).
- Measurement of lying and standing blood pressure is useful in the elderly and other patients with diabetes if postural hypotension is suspected.
- **Frequency:** The BP should be measured at least once every 6 months. If hypertension is detected, this should be confirmed by 3 separate measurements to confirm the diagnosis.

Blood Pressure Cuff Size:

Arm circumference (cm)	Bladder width x length (cm)	Indication
< 23	12 x 18	Small adult / child
< 33	12 x 26	Standard adult
< 50	12 x 40	Large adult
< 53	20 x 42	Adult thigh cuff

Targets in Patients with Diabetes

General	Isolated Systolic Hypertension	Renal Disease
BP < 130 / 80	BP < 130 / 80	< 125 / 75

- These are targets - they may require multiple drugs and still may not be achieved.
- The very elderly are a very high-risk group for cardiovascular disease but targets may be limited by the side effects of medication (postural hypotension).



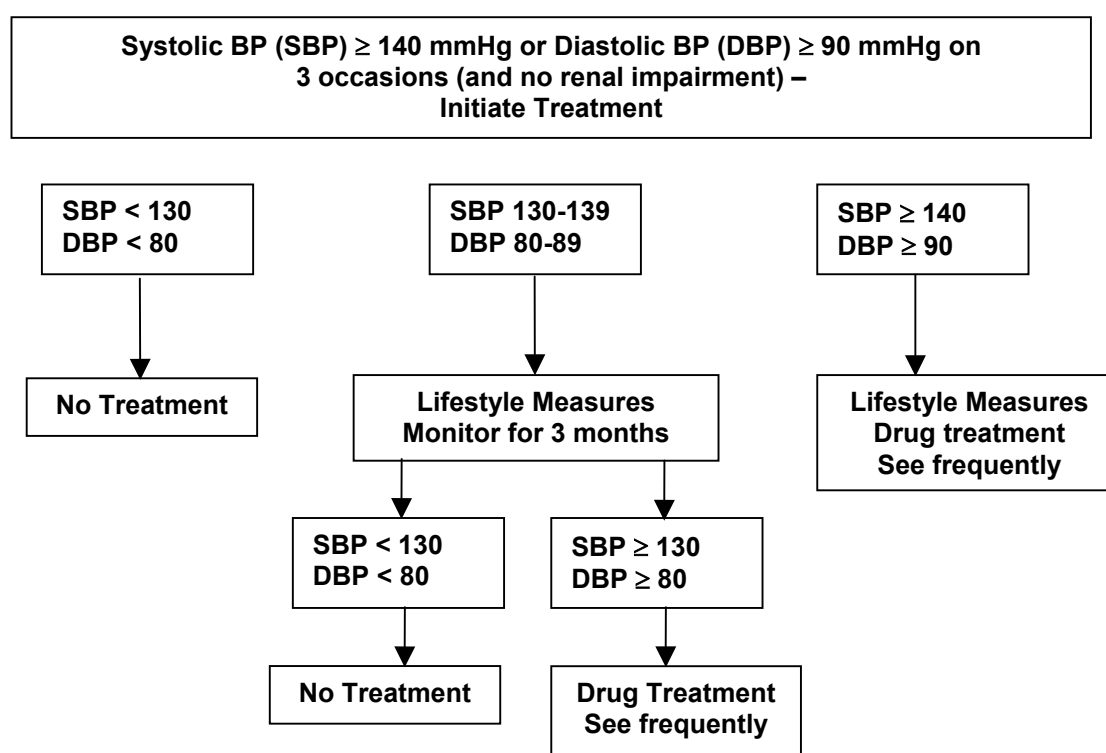
24 hour Ambulatory Blood Pressure Monitoring

- Ambulatory blood pressure monitoring (ABPM) is available through secondary care if not accessible in the community.
- GPs accredited by Cardiology can request monitoring directly from the Department of Cardiac Investigations, The Whittington Hospital.
- Ambulatory BP monitoring in patients with diabetes is also available via referral to Dr Barnard (Diabetes Consultant, The Whittington Hospital).
- GP Practices may also consider purchasing monitors for their own use. Advice on these systems is available from Liz Denver, Hypertension in Diabetes Specialist Nurse at The Whittington Hospital (020 7288 5307).

Consider requesting ambulatory BP monitoring if:

- office / white coat hypertension is suspected
 - unusual variability of BP over several visits
 - hypertension is resistant to drug treatments
 - symptoms suggestive of hypotensive episodes
- ABPM values are usually lower than clinic measurements and thresholds and targets should be adjusted downwards (e.g. by 10 / 5 mmHg).

HYPERTENSION TREATMENT



If goal BP achieved ($<$ 130 / 80)

- see 3 monthly
- monitor BP and risk factors
- reinforce lifestyle measures

If no significant BP reduction in 6 months

- consider hospital referral



Lifestyle measures

- Stop smoking: a major risk factor for cardiovascular disease
- Reduce weight: reduce weight by at least 5 kg and ideally attain normal BMI
- Moderate alcohol: men < 2 - 3 units / day; women < 1 - 2 units per day
- Increase exercise: commence moderate, regular aerobic exercise (e.g. brisk walk or swim, for 30 - 45 min, 5 times a week)
- Reduce salt: reduce salt to < 6 g / day or sodium < 2.4 g / day (< 100 mmol)

Do not add salt to food and use only a small amount in cooking (i.e. a pinch of salt)

Foods to Avoid:

- tinned and salted meat
- bacon, ham and sausage
- tinned, salted and smoked fish
- cheese (except cottage and cream cheese)
- tinned and packet soups
- crisps, salted nuts and salted biscuits
- dried pre-packed food (e.g. pot noodle)
- oxo, bovril, marmite

Reduced salt foods can be substituted but may still contain significant sodium salt
Potassium salt substitutes need to be used with caution in renal disease

Selecting drug treatment for hypertension in diabetes

- Angiotensin-Converting Enzyme (ACE) inhibitors are the first line treatment, because of their reno-protective and cardiovascular protective effects.
- ACE inhibitors can be switched to Angiotensin II receptor antagonists if patients have a side effect of cough or if there is a poor blood pressure lowering response to the ACE inhibitor.
- The next step is to add a Thiazide diuretic and/or Calcium Channel Blocker.
- The critical point is to lower blood pressure and the most effective agents for an individual should be used.
- Most people with type 2 diabetes will require 2 or more antihypertensive agents to achieve the target blood pressure.
- Information on the drug treatment pathways that we use for patients with hypertension can be obtained from Liz Denver, Hypertension in Diabetes Specialist Nurse at The Whittington Hospital (020 7288 5307)



Guidelines for Selecting Drug Treatment - Summary

Class of drug	Example	Dose range	Indications	Strong Contra-indications	Possible Contra-indications	Side Effects
ACE inhibitors	Ramipril Perindopril Lisinopril Enalapril	1.25 - 10 mg od 2 - 8 mg od 2.5 - 40 mg od 2.5 - 40 mg od	. Diabetic nephropathy . Heart failure . Left ventricular dysfunction . After MI	. Pregnancy . Hyperkalaemia . Bilateral renal artery stenosis	. <i>Black patients - less effective</i>	. Cough
	Check creatinine and U & E's before starting, after 4 – 7 days treatment, then 3 – 6 monthly (monthly if unstable)					
Angiotensin-II receptor antagonists	Valsartan Irbesartan Candesartan	40 - 160 mg od 75 - 300 mg od 2 - 16 mg od	. ACE inhibitor causes cough . Heart failure . <i>Black patients</i>	. Pregnancy . Hyperkalaemia . Bilateral renal artery stenosis		.
Diuretics (low dose)	Bendroflumethazide Hydrochlorothiazide Indapamide Indapamide SR	2.5 mg od 25 mg od 2.5 mg od 1.5 mg od	. Systolic hypertension . Heart failure . <i>Elderly patients</i> . <i>Black patients</i>	. Gout		. High dose causes low potassium, raised lipids and glucose . Impotence
Calcium-channel blocker	Amlodipine Nifedipine LA Diltiazem MR Verapamil	5 - 10 mg od 30 - 90 mg od see preparation 240 - 480 mg bd/tds	. Systolic hypertension . Angina . <i>Elderly patients</i>	. Verapamil with a B-blocker . With verapamil and diltiazem - AV heart block	.	. Cardiac failure with verapamil and diltiazem . Ankle oedema
B-blockers (cardioselective)	Atenolol Bisoprolol Metoprolol	50 mg od 5 - 20 mg od 100 - 400 mg od/bd	. Angina . After MI . Tachyarrhythmias . ?Heart failure . Pregnancy	. Asthma . COPD . AV Heart block	. Peripheral vascular disease . <i>Black patients - less effective</i>	. Impotence
α - blockers	Doxazosin Doxazosin MR	1 - 16 mg od 4 – 8 mg od	. Prostatic hypertrophy			. Postural hypotension

Effective drug combinations:

Use drugs from different classes that work together or synergistically, to lower BP without increasing drug side effects. These include:

- ACE inhibitor / angiotensin II receptor antagonist + diuretic; • ACE inhibitor / angiotensin II receptor antagonist + calcium-channel blocker;
- B-blocker + calcium-channel blocker: • α-blocker + B-blocker.



Chapter 13:

Lipids



LIPIDS IN DIABETES

Aggressive management of lipids in diabetes is very important.

- Cardiovascular disease (CVD) is a major cause of death in patients with diabetes.
- Patient with type 1 diabetes and proteinuria most commonly die of cardiovascular disease.
- Patients with type 2 diabetes have a greatly increased risk of coronary heart disease (CHD), the same risk as a non-diabetic patient who has already had a myocardial infarction (MI).

Measuring lipids

- Measure lipids once a year.
- Use a non-fasting blood sample for cholesterol, HDL-cholesterol [HDL] and triglycerides [TG] (non-fasted TG are ~ 20 % higher than fasted samples).
- A fasted blood sample (12 h) is necessary for fully accurate LDL-cholesterol [LDL] or triglyceride estimation.

Glycaemic control

- Poor glycaemic control raises lipids. If considering lipid lowering drugs because of raised lipid levels, patients should have the best glycaemic control possible before finally deciding whether to treat. However, in some patients with diabetes, good glycaemic control can never be achieved.

Secondary Hyperlipidaemia

- Raised cholesterol or triglycerides may be secondary to an underlying condition: hypothyroidism, nephrotic syndrome, alcohol abuse, liver disease and pancreatitis.
- Cholesterol can be high (>9 mmol/l) and variable (varying by 2 fold in months).
- Before starting lipid lowering therapy, secondary hyperlipidaemia should be excluded and managed.
- If detected, the patient should be either treated (hypothyroidism), counselled for life style change (reduce alcohol), investigated (nephrotic syndrome) or considered for referral to specialist clinic (liver disease, pancreatitis).



Targets For Lipids In Diabetes

**Patients with diabetes aged > 40 years with a total cholesterol ≥ 3.5 mmol/l, without overt cardiovascular disease, should start statin therapy regardless of baseline lipid levels, to achieve an LDL reduction of 30 %.
(Use Simvastatin 40 mg od or Atorvastatin 10 mg od)**

Patients with diabetes aged < 40 years without overt cardiovascular disease, but at increased risk (due to other cardiovascular risk factors or long duration of diabetes), who do not achieve lipid targets, should start statin therapy.

Targets

Total cholesterol < 4.0 mmol/l or a 25 % reduction

LDL cholesterol < 2.0 mmol/l or a 30 % reduction

Patients with overt cardiovascular disease:

LDL cholesterol < 1.8 mmol/l

Fasting triglycerides < 2.3 mmol/l (and ideally < 1.7 mmol/l)

HDL cholesterol:

Men > 1.1 mmol/l (and ideally ≥ 1.6 mmol/l)

Women > 1.3 mmol/l (and ideally ≥ 1.8 mmol/l)

Absolute Risk Reduction

- An alternative approach is to look at absolute risk of CHD.
- There are various tools available to calculate risk, which take a multifactorial approach. In addition to diabetes, these take account of patient gender, age, systolic and diastolic blood pressure, smoking status, total cholesterol, HDL cholesterol and ECG left ventricular hypertrophy.
- These tools are available as pictorial graphs*. These can be useful as an educational aid, to show to a patient how improved blood pressure control or lipid levels will reduce CHD risk.
- These tools are also available as a simple computer programme*.

- **Aim to reduce absolute risk of CHD to < 15 % over 10 years.**

* The graphs are available in the BNF (British National Formulary). Both the graphs and the computer programme are available via the 'Joint British recommendations on prevention of coronary heart disease in clinical practice' published in Heart 1998; 80 (supplement 2):S1-S29



Management Of Hyperlipidaemia In Patients With Diabetes

Raised lipids

Cholesterol ≥ 4 mmol/l
or
LDL ratio ≥ 2 mmol/l
or
Fasting triglycerides ≥ 2.3 mmol/l

► Optimise glycaemic control

► Exclude secondary hyperlipidaemia
*Measure: thyroid, liver & renal function
and urine dipstick analysis for protein*

► Follow lifestyle advice for 3-6 months

- Reduce total fat intake, particularly saturated fat
- Increase intake of fruit, vegetables and complex carbohydrates (oats, beans, pulses) and increase plant stanol/sterol ester intake
- If overweight, reduce weight
- Moderate alcohol intake
- Stop smoking
- Increase exercise

► Repeat lipids and treat as indicated

Raised total cholesterol Low triglycerides	Raised total cholesterol Raised triglycerides	Low total cholesterol Raised triglycerides or low HDL
Total cholesterol ≥ 4 mmol/l or LDL cholesterol ≥ 2 mmol/l and Fasting triglycerides < 2.3 mmol/l	Total cholesterol ≥ 4 mmol/l or LDL cholesterol ≥ 2 mmol/l and Fasting triglycerides ≥ 2.3 mmol/l	Total cholesterol < 4 mmol/l and LDL cholesterol < 2 mmol/l and Fasting triglycerides ≥ 2.3 mmol/l or HDL cholesterol Man < 1.1 mmol/l Woman < 1.3 mmol/l
Start Statin: Simvastatin 20 - 80 mg od Atorvastatin 10 - 80 mg od	Start Statin: Atorvastatin 10 - 80 mg od	Start Fibrate: Fenofibrate MR 160 mg od Bezafibrate MR 400 mg od Gemfibrozil 600 mg bd
	If fasting triglycerides remain ≥ 2.3 mmol/l Consider + Fibrate: Fenofibrate MR 160 mg od	



Lipid Regulating Drugs

Statins: Simvastatin, Atorvastatin, Fluvastatin, Pravastatin, Rosuvastatin

Action

- Inhibit the rate limiting enzyme in cholesterol synthesis (3-hydroxy-3-methylglutaryl coenzyme A reductase - HMG CoA reductase).
- Effective at lowering LDL cholesterol.
- May also produce slight increases in HDL cholesterol and lower triglycerides.

Side effects

- Uncommon.
- Muscle effects: Myalgia, myositis and myopathy rarely occur and are reversible. If the creatine kinase is markedly elevated (> 5 times upper limit of normal), the statin should be discontinued. The risk of muscle side effects is increased in those with renal impairment, possibly those with hypothyroidism and if statins are given in addition to fibrates, nicotinic acid or immunosuppressants (cyclosporin).
- Altered liver function with raised liver enzymes.
- Minor gastrointestinal disturbances (abdominal pain, nausea, vomiting) and headache.

Contraindications

- Active liver disease.
- Pregnancy and breast feeding.

Instructions for use

- Check liver function tests before starting treatment. Statins can be given with mild pre-existing liver enzyme abnormalities, but these will need to be very carefully monitored on commencing the statin.
- Start at low dose and titrate the dose up according to response.
- Advise patients to report promptly any unexplained muscle pain, tenderness or weakness and if this occurs, check the creatine kinase level.
- Check lipids at 3 - 6 month intervals until desired levels achieved, then test annually.
- Liver enzymes should be checked before and within 1 - 3 months of starting treatments and thereafter at intervals of 6 months for 1 year. Treatment should be stopped if serum transaminases rise to and persist at 3 times the upper limit of normal.
- In women of child-bearing age, ensure adequate contraception before commencing treatment and for one month after treatment stopped.



Fibrates: Fenofibrate, Bezafibrate, Gemfibrozil, Ciprofibrate

Action

- Decrease triglycerides.
- Tend to raise HDL cholesterol and reduce LDL cholesterol.

Side effects

- Can cause a myositis-like syndrome, especially in patients with renal impairment and when fibrate combined with statin therapy.
- Predispose to gall stones.
- Gastrointestinal disturbance (anorexia, nausea, abdominal pain), headache and itching.

Contra-indications

- Severe renal or hepatic impairment.
- Nephrotic syndrome.
- Hypoalbuminaemia.
- Primary biliary cirrhosis.
- Gall bladder disease.
- Pregnancy and breast feeding.

Instructions for use

- Start at low dose and titrate the dose up according to response.
- Advise patients to report promptly any unexplained muscle pain, tenderness or weakness and if this occurs, check the creatine kinase level.
- Check lipids at 3 - 6 month intervals until desired levels achieved, then test annually.
- Special care is needed in patients with renal disease. Progressive increases in serum creatinine over time, associated with progressive renal failure, may result in myotoxicity.
- Risk of muscle effects when combining statin and fibrate therapy is reduced with Fenofibrate.
- In women of child-bearing age, ensure adequate contraception before commencing treatment and for one month after treatment stopped.

Ezetimibe

Action

- Inhibits the intestinal absorption of cholesterol.
- Mainly used in combination with statin therapy.
- When used with statin therapy, reduces total cholesterol, LDL cholesterol and triglycerides and increases HDL cholesterol.

Side effects

- Diarrhoea, abdominal pain.
- Headache.
- Angioedema, rash.

Contra-indications

- Moderate or severe liver impairment.
- Breast feeding.

Instructions for use

- 10 mg od.
- When administered concurrently with a statin, requires usual statin monitoring protocols.



Anion-exchange resins: Colestyramine, Colestipol

Action

- Bind bile acids in the gastrointestinal tract, preventing their reabsorption. This promotes hepatic conversion of cholesterol into bile acids.
- Lower LDL but can aggravate hypertriglyceridaemia.

Side effects

- Gastrointestinal effects: constipation, diarrhoea, nausea, vomiting, abdominal pain.
- Interfere with absorption of fat soluble vitamins A, D and K.
- Increased bleeding tendency (hypoprothrombinaemia associated with Vit K deficiency).

Contra-indications

- Complete biliary obstruction - unlikely to be effective.
- Use with caution if pregnant or breast feeding.

Instructions for use

- Check lipids at 3 - 6 month intervals until desired levels achieved, then test annually.
- Other drugs should be taken at least 1 hour before or 4 - 6 hours after this treatment, to avoid possible interference with absorption.

Fish oils: Omacor, Maxepa

Action

- Reduces severe hypertriglyceridaemia.
- Adjunct in treatment of patients with severe hypertriglyceridaemia judged to be at special risk of pancreatitis or ischaemic heart disease.

Side effects

- Nausea, belching.
- Diarrhoea, constipation.
- Eczema and acne reported.

Contra-indications

- Haemorrhagic disorders.
- Anticoagulant treatment.

Instructions for use

- Omacor: For hypertriglyceridaemia 4 capsules daily in 1-2 divided doses with food; for secondary prevention after myocardial infarction 1 capsule daily with food.
- Maxepa: For hypertriglyceridaemia 5 capsules or 5 ml twice daily with food.



Nicotinic Acid Group: Nicotinic Acid, Nicotinic Acid MR (Niaspan)

Action

- Lowers total cholesterol and triglycerides by inhibiting synthesis.
- Increases HDL cholesterol.

Side effects

- *Vasodilatation / flushing - main limitation to its use.
- *Dizziness, headache, palpitations, pruritus.
- Nausea, vomiting, rarely impaired liver function.

Contra-indications

- Pregnancy and breast feeding.

Instructions for use

- *Prostaglandin-mediated side effects can be reduced by low initial doses taken with meals or by taking aspirin 75 mg 30 minutes before the dose.
- Standard-release: 100 - 200 mg tds, gradually increased over 2 - 4 weeks to 1 - 2 g tds.
- Modified release: 375 mg daily at night for 1 week, then 500 mg daily at night for 1 week, then 750 mg daily at night for one week, then 1 g daily at night for 4 weeks, increased if necessary at steps of 500 mg at intervals of at least 4 weeks to maximum of 2 g daily at night.



Chapter 14:
Diabetic Retinal Screening



Camden, Islington and West Haringey Retinal Screening Programme at The Whittington Hospital

- **This scheme covers people with diabetes resident in Camden, Islington and West Haringey.**
- **The retinal screening office is at The Whittington Hospital.**

How Often Should Patients With Diabetes Have Their Eyes Examined?

- Patients with diabetes (aged ≥ 12 years) must have their eyes checked for retinopathy yearly.
- Their eyes should be examined urgently if there is a sudden deterioration in vision.
- Pregnant women with diabetes must have their eyes checked for retinopathy once every 3 months during the pregnancy and urgently if there is a sudden deterioration in vision.

Who Is Eligible For The Retinal Screening Programme?

- Patients are eligible if their diabetes is managed by their GP.
- Patients are not eligible if they are attending a hospital eye clinic.

How Are Patients Recruited?

- Patients are recruited by their GP practice completing a recruitment form. Patients should sign this form to give their consent for their demographic details to be kept on the Diabetes Retinal Screening Register. Forms are available on the website and should be returned to:

Shirley Burnett, Retinal Screening Manager, Room 21, First Floor, Jenner Building, The Whittington Hospital, Highgate Hill, London N19 5NF

- Patients may also be recruited by participating Optometrists or on discharge from the hospital diabetic clinic or hospital eye clinic (copy clinic letter to Retinal Screening Manager).

Who Does The Eye Examination?

- The scheme currently uses local accredited Optometrists. With the planned expansion of the scheme and change to digital retinal photography, screening will also become available at the Whittington Hospital. Optometrists and Retinal Photographers are accredited by attending and successfully completing a course on diabetic eye disease run at the Whittington Hospital. Once accredited, the Optometrist's name is included on a list from which patients can choose where to go for their eye examination.

How Does The Retinal Screening Programme Work?

- Once enrolled, patients are invited to attend for an annual screening test at one of the available sites. This screening invitation is generated automatically by the Whittington Hospital computerised database.
- The results of the eye examination are sent back to the screening office, where they are recorded on the database. The results are also sent to the patient's GP.
- Referral to Ophthalmology, when indicated, is organised automatically through the scheme.

How Is The Scheme Monitored?

- Quality audit of the scheme has been performed regularly. Future quality assurance will be carried out by a regional office according to the National Screening Committee requirements.
- The scheme complies with the recommendations of the National Screening Committee.

For Advice And Information:

- **Contact Shirley Burnett, Maria Christofi or Gurmeh Lohia (020 7288 3173)**
- **Or www.whittington.nhs.uk/diabetes then pick - *diabetic eye screening service***



RETINAL SCREENING PROTOCOL FOLLOW UP AND REFERRAL CRITERIA

Findings	Grade	Action
No diabetic retinopathy	R0	Screening review in 1 year
Background retinopathy <ul style="list-style-type: none"> • Microaneurysm(s) • Retinal haemorrhage(s) and/or any exudate 	R1	Screening review in 1 year
Pre-proliferative Retinopathy <ul style="list-style-type: none"> • Venous beading • Intra-retinal microvascular abnormalities (IRMA) • Multiple deep, round or blot haemorrhages • If cotton wool spots (CWS) present, search carefully for the above features 	R2	Refer to ophthalmologist EARLY
Proliferative Retinopathy <ul style="list-style-type: none"> • New vessels on the optic disc (NVD) • New vessels elsewhere (NVE) • Preretinal or vitreous haemorrhage • Preretinal fibrous and/or traction retinal detachment 	R3	Refer to ophthalmologist URGENTLY
Maculopathy <ul style="list-style-type: none"> • Exudate within 1 disc diameter (DD) of centre of fovea • Circinate or group of exudates within the macula • Retinal thickening within 1DD of centre of fovea (if stereo available) • Any microaneurysm or haemorrhage within 1DD of centre of fovea only if associated with a best VA equal to or less than 6/12 (if no stereoscopic views) 	M	Refer to ophthalmologist EARLY
Photocoagulation <ul style="list-style-type: none"> • Focal/grid to macular • Peripheral scatter (PRPC) 	P	
Unclassifiable <ul style="list-style-type: none"> • Upgradeable/unobtainable 	U	Refer to ophthalmologist for retinal screening ROUTINELY

Other findings noted or recorded:

View of fundus: Good view, poor view, no view	If no view: Refer to ophthalmologist routinely
Cataract: Cortical (C1), nuclear sclerosis (NS), posterior sub-capsular (PSC) None, early, medium, advanced, removed	If cataract impairs vision: Refer to ophthalmologist as usual practice
Raised intraocular pressure	Refer to ophthalmologist as usual practice
Macular degeneration and other non-diabetic retinal findings	Refer to ophthalmologist as usual practice

Referrals to the eye clinic are organised automatically through the scheme



Chapter 15:
Footcare in Diabetes



DIABETIC FOOT DISEASE

The risk factors for amputation in diabetes are:

- loss of protective sensation (peripheral neuropathy);
- reduced blood supply (peripheral vascular disease - PVD);
- deformity of any part of the foot and callus formation;
- history of previous foot ulcer;
- infection.

People with diabetes are over 15 times more likely to undergo lower limb amputations than people without diabetes

BUT

Good foot care by the patient and the care providers can prevent infection, ulceration and amputation.

PREVENTION OF DIABETIC FOOT DISEASE

1. **Educate the patient with diabetes in foot care** - Patient education can reduce below knee amputation rates by 85 % (by one-to-one or group teaching, educational leaflets, videos).
2. **Assess the foot risk category** - This will allow appropriate podiatry treatment, footwear advice and medical review.
3. **Control blood glucose** - This is important to prevent peripheral neuropathy and maintain normal joint mobility.
4. **Control blood pressure** - A patient with diabetes with hypertension has an x 5 risk of developing PVD.
5. **Stop the patient smoking** - Lifetime cigarette quantity smoked is predictive of amputation.
6. **Assess plasma lipids** - Lipid abnormalities are associated with PVD in diabetic patients.
7. **Consider social, economic and educational factors**
Poorly educated, lower social class patients with foot problems may not appreciate they need medical intervention or may experience delays in obtaining it. Patients who cannot examine or care for their own feet are at increased risk of amputation.
This includes:
 - elderly;
 - physically disabled or immobile;
 - those living alone or with no social support;
 - partially sighted;
8. **Aspirin** - give aspirin if peripheral vascular disease is present.



WHEN TO REFER TO HOSPITAL

1. ULCER Podiatry Department, Whittington Hospital

A patient with diabetes who develops a foot ulcer should be referred URGENTLY to The Whittington Hospital Podiatry Department. They will be referred on to the Diabetic Foot Clinic for Podiatrist and Consultant Diabetologist review (Dr Michela Rossi).

There are three methods for obtaining urgent review in The Whittington Podiatry Department:

1. If the patient is known to the Podiatry Department, the patient or GP can phone to request urgent review.
2. If the patient's GP is accredited by the Whittington Hospital in Diabetic Foot Care, the GP has direct access to the hospital Podiatry Department and can phone to request urgent review. This will include access to additional investigations (microbiology, radiology) and additional services (plaster casting, bespoke footwear).
3. For other patients with diabetes, these can only be seen urgently in Podiatry if they are currently under a Whittington Hospital Diabetes Consultant. If they are, their GP can phone to request urgent review in Podiatry. If they are not, their GP must refer the patient to the Whittington Hospital Diabetic Clinic. Once the ulcer is healed, they may be referred back to the community.

NB. Some patients will be well known to the Vascular Surgery team and, if so, referral back to that team may be more appropriate.

2. Patients with 'At Risk' feet require intensive podiatry, prescribed footwear and foot-care education.

Footwear: If the patient's GP is accredited by the Whittington Hospital in Diabetic Foot Care, they can access the Whittington Hospital bespoke footwear services via the Podiatry Department. All other patients need to be under a Whittington Hospital Diabetes Consultant to access footwear services.

Alternatively, if the patient is not under a Whittington Hospital Diabetes Consultant but they live in Islington, they can be referred for a Biomechanical Examination via the Podiatry Central Booking Office (the usual route for all Islington Podiatry services). If appropriate, they will be supplied with insoles to redistribute pressure. These must be worn with appropriate footwear to be of benefit.

Diabetes management: If the patient's glycaemic control or other cardiovascular risk factors are poorly controlled, refer to the Whittington Hospital Diabetic Clinic.

3. Patients with ischaemia will need referral to the vascular surgeons if:

- there are significant symptoms of claudication;
- if ischaemia is preventing an ulcer healing;
- **urgent referral** is vital if there is any gangrene or infection with gas forming organisms.

For information regarding the Whittington Hospital Diabetic Foot Care Scheme for Accredited GPs, contact Maria Christofi on 020 7288 3173



THE DIABETIC FOOT ASSESSMENT - SUMMARY

1) Symptoms / Assess risk

Does the patient have:

- Pain (ischaemia, neuropathy)
- Previous ulcers
- Poor vision
- Poor mobility

2) Inspection

Look for:

- Deformity / Amputation
- Callus / Hard Skin
- Damage / Ulceration
- General Hygiene
- Nail Care
- Skin Colour
- Swelling
- Signs of Pressure

3) Examination

- Look between each toe and all over the foot and heel
- Check skin temperature (cold, heat)
- Look for swelling or oedema
- Feel for Pulses (dorsalis pedis, posterior tibialis)
- Test sensation (10g monofilament)

4) Assign Foot Risk Category



THE DIABETIC FOOT ASSESSMENT

(Taken from 'Focus on Feet'*)

Assessment must be done once a year:

- ask about symptoms
- look at the feet
- examine the feet
- determine which foot risk category the patient falls into

1) DIABETIC FOOT HISTORY

The history should assess whether there is evidence of ischaemia or neuropathy and whether the patient can look after their feet. The following is a suggested approach.

a) 'Have you got any problems with your feet?'

This is a useful general question.

b) 'Do you get any pain in your legs or feet?'

Pain can be caused by ischaemia or neuropathy:

i) Ischaemia?

Claudication

Cramping pain in the legs brought on by exercise and relieved by rest.

Severe critical ischaemic rest pain

Severe cramp in the lower leg occurring at rest; Eased by hanging the legs out of bed.

Ischaemia can lead to foot ulceration, can prevent ulcer healing and with critical ischaemic rest pain, can lead to gangrene and amputation.

ii) Neuropathy?

- Burning, tingling, pins and needles in the feet;
- Worse in bed and can be severe enough to disturb sleep;
- Eased by standing, walking around.

NB: Neuropathy can be symptomless.

Neuropathy can cause pain that is so severe that patients become anorexic or depressed. The associated numbness can lead to ulceration, because of the loss of protective sensation.

c) 'Have you had any previous foot ulcers or amputations?'

Patients with a history of foot ulceration or amputation are at high risk of recurrent ulceration.

d) 'Can you see to do your feet?'

Many patients with diabetes have poor eyesight. They may not be able to see to cut their toenails.

e) 'Do you have problems reaching down to your feet?'

Many patients with diabetes have limited mobility or flexibility. They may not be able to reach down to cut their toenails or check their feet for problems.

*Focus on Feet - Diabetic Foot Assessment Guidelines (approved by the British Diabetic Association, the Royal College of Nursing and the Society of Chiropractors and Podiatrists).



2) DIABETIC FOOT INSPECTION

Remove all the shoes, socks, tights, support stockings, dressings and look at both feet.

- A) Deformity/amputation** - Look for any deformity in the general shape of the foot, any previous amputation and any bunions or clawed toes. These can cause abnormal pressures in the foot or pressure points, leading to callus formation and ulceration.
- B) Callus/hard skin** - occurs at pressure points and is a forerunner of ulceration.
- C) Damage/ulceration** - have problems already developed?
- D) General hygiene:** gives an indication of the patient's ability to look after their feet.
- E) Nail care:** do they need podiatry for adequate nail care?
- F) Skin colour:** dusky blue with critical ischaemia; reddened with infection.
- G) Swelling of any part:** may indicate infection.
- H) Signs of pressure from shoes or socks:** reddened areas or pressure lines.

3) DIABETIC FOOT EXAMINATION

- A) LOOK** - Separate and look between each toe, look at the top of the foot, look underneath the foot and look at the heel:

- Any breaks in the skin?
- Any fungal infections?

- B) Check the skin temperature:**

Place the back of the hand on the lower part of the leg just above the ankle. Move the hand down towards the toes slowly, noting any change in temperature.

Cold - may indicate ischaemia; Heat - may indicate infection or inflammation.

- C) If you suspect swelling, check for oedema:**

Apply gentle pressure with a finger for 30 seconds - a pit will form if oedema is present.

- D) Feel for pulses:**

If the pulses cannot be felt, the foot may be ischaemic.

Dorsalis pedis pulse: in the groove between the first and second metatarsal bones.

Posterior tibialis pulse: running behind the medial malleolus (the inside ankle bone).

- E) Test sensation:**

There are different methods for checking sensation (e.g. vibration, pinprick). A simple, reproducible and clinically relevant method is to use a 10 g monofilament.

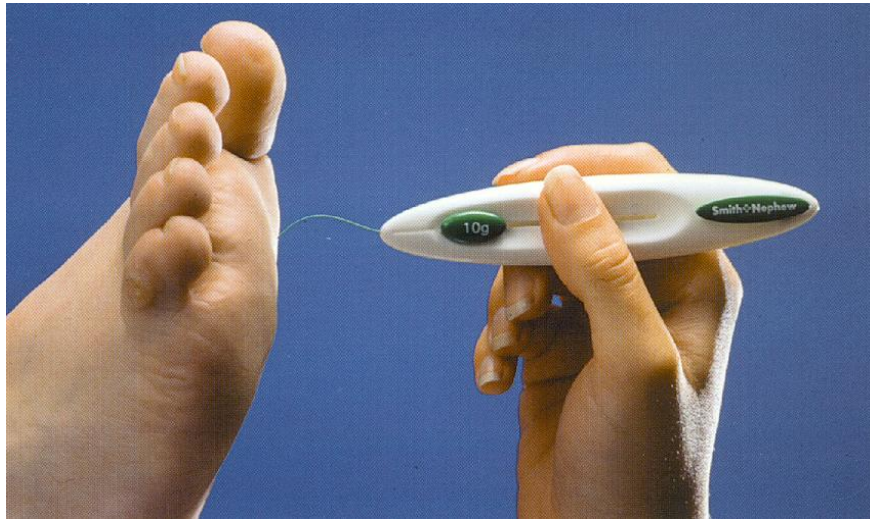
- i) Demonstrate on the patient's forearm, so they know what the sensation feels like;
- ii) Place the tip of the monofilament on the skin and apply pressure till it bows;
- iii) Then use the monofilament to examine all the test sites on the feet - ask the patient to close their eyes and say 'yes' when they feel the filament;
- iv) Do not test over callus - sensation will be reduced;
- v) Neuropathy is present if sensation is lost at any site.

4) RISK CATEGORY

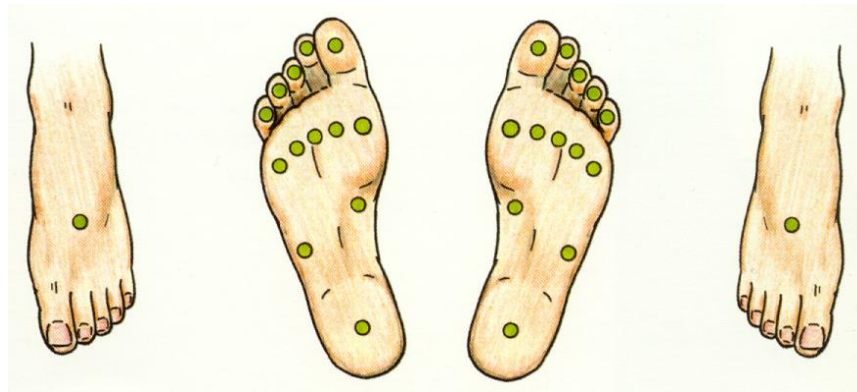
Determine the patient's risk category and implement appropriate education and intervention.



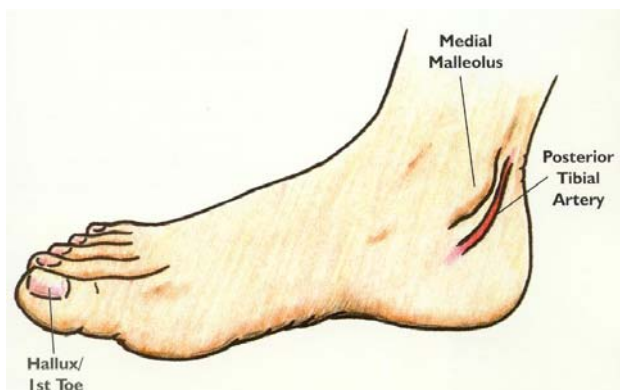
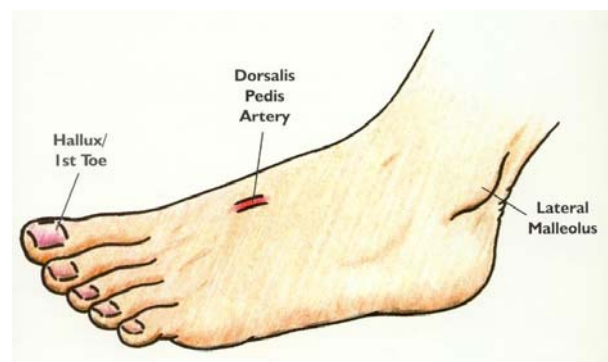
Correct use of 10g monofilament



Test sites for monofilament on the feet



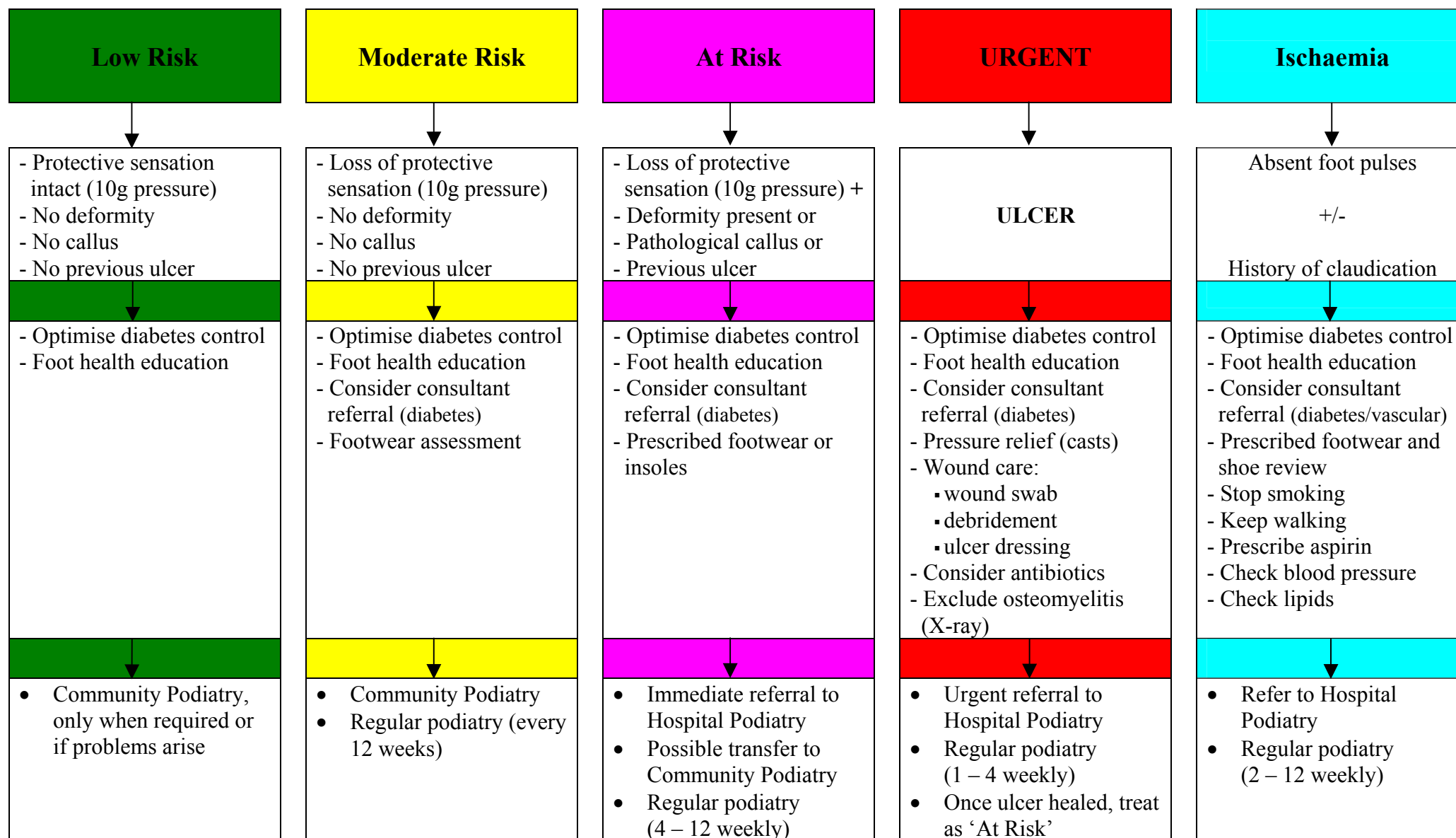
Palpation of Dorsalis Pedis Pulse



Palpation of Posterior Tibial Pulse



THE WHITTINGTON HOSPITAL DIABETIC FOOT ASSESSMENT – RISK CATEGORIES



Fungal skin infections are best treated (use an imidazole cream e.g. clotrimazole, econazole or miconazole)

Podiatry Department, Whittington Hospital: Tel: 020 7288 5965;

Fax: 020 7288 5173; e-mail: jennifer.buchanan@whittington.nhs.uk



BASIC FOOTCARE ADVICE FOR PEOPLE WITH DIABETES

People with diabetes must know how to look after their feet.

A) NUMB FEET: Diabetes can damage the nerves in the feet. This means that your feet may be numb and you can injure your feet without feeling it or noticing it.

B) POOR CIRCULATION: Diabetes can damage the blood circulation to the feet. This means injuries or infections may not heal quickly.

C) FOOT CARE: All serious problems can be avoided if **YOU LOOK AFTER YOUR FEET**

- 1) **Examine your feet every day:** Look for cuts, cracks, corns or anything unusual. Cracked skin between the toes can be a fungal infection (athlete's foot). This must be treated - see your GP about it.
- 2) **Do not use corn plasters:** These can damage the skin.
- 3) **Consult a podiatrist if you develop any concerns about your feet:** Podiatry is free for people with diabetes, whether for emergency treatment or nail-care.
- 4) **Wash your feet daily:** Use unscented soap.
- 5) **Check the temperature of bath water, before putting your feet in:** Use your elbow or a thermometer (it should be $< 40^{\circ}\text{C}$ / 104°F).
- 6) **Remove the hot water bottle from the bed before getting in.**
- 7) **Cut your toe nails straight across and file down the sharp edges. Do not cut or poke down the side of the nail.**
- 8) **Apply moisturising cream to your feet every day (but not between the toes):** It stops the skin cracking.
- 9) **Do not wear socks or tights with holes in them:** It can damage the skin.
- 10) **Check the insides of your shoes every time before you put them on:** Make sure nothing has dropped inside which could damage the skin.
- 11) **Wear good fitting shoes, with leather uppers and non-slip soles:** Try and have your feet measured by a qualified shoe fitter when you buy new shoes.
- 12) **Do not walk barefoot:** Not even on a tropical island holiday beach.
- 13) **Remember, your GENERAL HEALTH is IMPORTANT: Stop smoking, keep walking, keep your blood sugar and blood pressure well controlled.**

Get emergency professional advice if you notice any:

- **Colour Change**
- **Discharge**
- **Unusual Swelling**
- **Pain In Your Feet**

This advice may be copied for distribution to patients as required.

A detailed version is available from the Whittington Hospital Podiatry Department



DIABETIC NEUROPATHY

‘Diabetic neuropathy’ covers a spectrum of symptoms, signs and clinical syndromes.

• **Distal symmetrical sensorimotor neuropathy - Classical diabetic peripheral neuropathy**

Symptoms

- feet affected, hands rarely affected
- symptomless (feet at risk from loss of sensation)
- altered sensation
 - numbness
 - parasthesia
 - contact sensitivity (allodynia)
- pain
 - burning
 - electric-shock like

Signs

- none
- loss of sensation
 - touch / pressure (10 g monofilament)
 - vibration sense
- muscle weakness and wasting (rare)
- complications (ULCER)

• **Acute diffuse painful peripheral neuropathy**

- associated with sudden weight loss
- associated with sudden fluxes in blood glucose e.g. starting insulin (‘insulin neuritis’)
- improves with weight gain or stabilisation of blood glucose

• **Mononeuropathy**

- single nerve root affected
- femoral neuropathy, third or sixth cranial nerve palsy, truncal radiculopathy
- recovery, over months, is usual

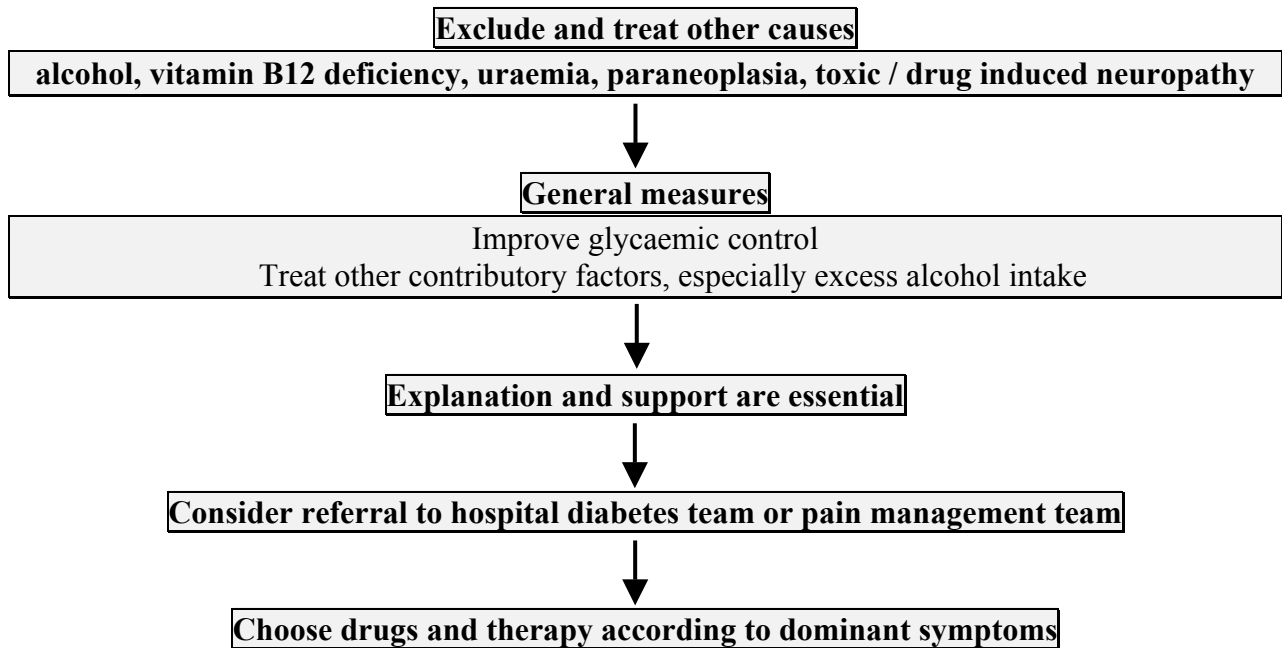
• **Pressure palsy**

- median nerve compression / Carpel Tunnel Syndrome
- ulnar nerve compression (elbow)
- lateral popliteal nerve / foot drop

• **Autonomic neuropathy**



MANAGEMENT OF DIABETIC PERIPHERAL NEUROPATHY



Pain:

- **Tricyclic drugs (burning pains - first choice)**
 - Amitriptyline 25 - 100 mg nocte, start at low dose (10 mg in the elderly)
 - Imipramine 25 - 150 mg nocte, start at low dose (10 mg in the elderly)
- **Gabapentin**
 - titrate up to pain relieving dose, up to 300 mg - 600 mg tds
- **Pregabalin**
 - titrate up to pain relieving dose, from 75 mg bd up to 300 mg bd
- **Capsaicin 0.075 % cream**
 - apply 3 - 4 times daily
 - warn the patient this may produce a burning sensation when first applied
- **Anticonvulsant drugs (lancinating, shooting electric-shock – first choice)**
 - Carbamazepine 100 mg 1 - 2 times daily
 - Phenytoin 150 - 300 mg daily, as single dose or in 2 divided doses
- **Mexiletine (only for lancinating pains)**
 - 450 mg once daily

Contact discomfort: Bed cradle; apply a protective film to the legs (Opsite®, Cling film®)

Restless legs: Clonazepam

Painful cramps: Quinine sulphate

Other Non - Pharmacological Therapies:

Acupuncture; TENS (transcutaneous nerve stimulation); Spinal cord stimulation



Chapter 16:
Kidney Disease: Screening & Management



MICROALBUMINURIA / PROTEINURIA SCREENING

Microalbuminuria is the presence of very small amounts of albumin in the urine.

Microalbuminuria:

- is a marker of early renal disease in type 1 and type 2 diabetes;
- may progress to frank proteinuria, a precursor of renal failure;
- is associated with a significantly increased risk of cardiovascular disease.

Microalbuminuria and proteinuria are so closely related to diabetic retinopathy, that if retinopathy is absent, a non-diabetic cause of renal damage should be investigated.

Screening

HOW?

- There are different methods for screening for microalbuminuria.
- Measurement of the urine Albumin to Creatinine Ratio (ACR) on a spot urine sample, preferably an early morning urine sample (EMU), is recommended.
- This measurement is done in the laboratory.
 - Microalbuminuria is not detected on a standard urine dipstix. There are urinalysis sticks available which detect microalbuminuria (e.g. Micral-Test II, Microbumintest) but this should be confirmed in the laboratory because false positive results are common.
 - Urine infection can cause proteinuria.
 - If the urine dipstix shows $\geq 2+$ proteinuria:
 1. the patient should be investigated with an MSU, to exclude infection
 2. if the MSU is negative, with no infection, a laboratory test should be done looking for proteinuria (urinary Protein to Creatinine Ratio [PCR], timed overnight urine collection or 24 hour urine collection).

FREQUENCY? Once a year.

CLINIC REFERRAL CRITERIA

Refer Patient To The Hospital Diabetes Clinic If:

- Microalbuminuria/Proteinuria is detected
- OR
- Glomerular Filtration Rate / Creatinine Clearance 30 - 60 ml / min
- AND
- Treatment targets are not being achieved (including tight control of blood glucose, blood pressure and lipids)

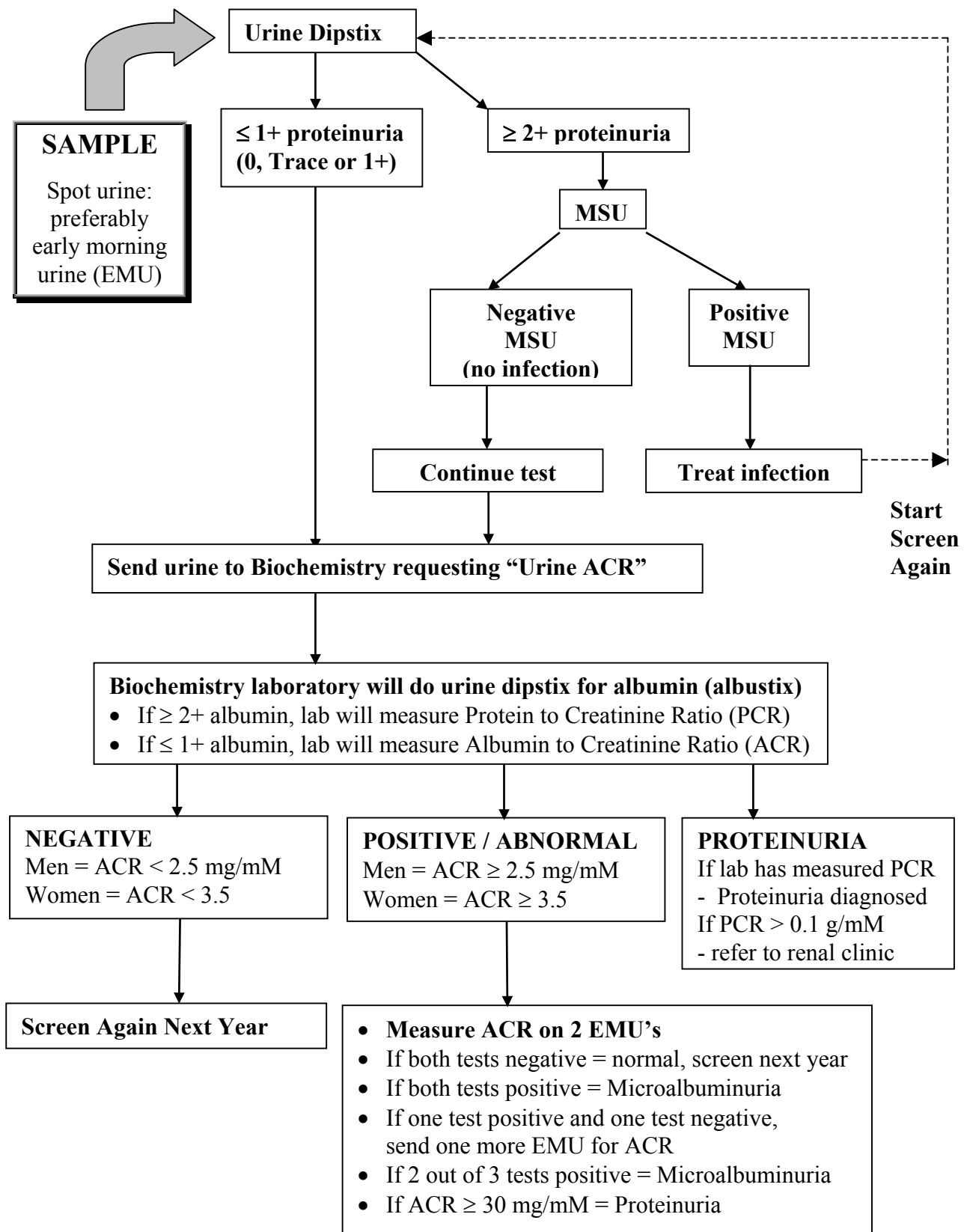
Refer Patient To Both Renal Clinic And Hospital Diabetes Clinic If:

- Urinary Protein-to-Creatinine-Ratio (PCR) > 0.1 g/mM
- 24 hour Urinary Proteinuria > 1 g
- Creatinine > 150 $\mu\text{mol/l}$
- Creatinine Clearance < 30 ml / min
- Resistant hypertension
- Possible non-diabetic renal disease:
 - no diabetic retinopathy
 - microscopic or macroscopic haematuria present
 - autoantibodies (ANF, RhF) or other evidence of vasculitis present



SCREENING PROTOCOL – DO A SCREENING TEST ONCE A YEAR

1) Screening Using Spot Urine Samples

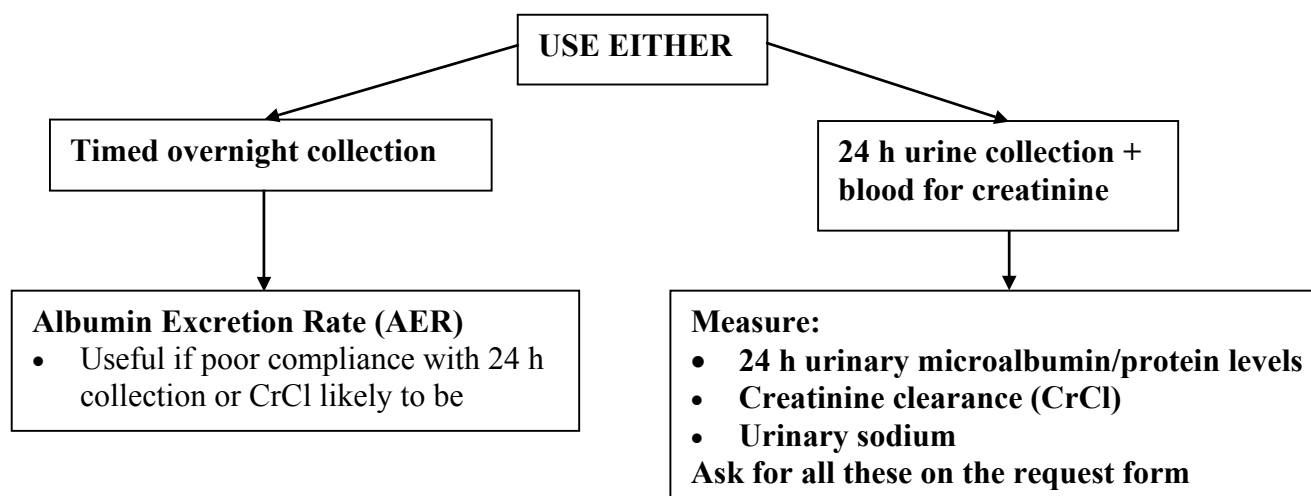


NB: The precise organisation of this may vary: for example, some practices ask patients to bring up both a spot urine and a MSU, for both these to be sent off for analysis.



2) Screening Using Timed Collections

- In the hospital clinic we have mainly stopped using timed urine collections.
- However, these investigations may be useful and can be used in situations where patients do provide a complete urine collection.



DEFINITIONS AND ACTION

	<i>Normal</i>	<i>Microalbuminuria</i>	<i>Proteinuria</i>
ACR (mg/mM)	Men < 2.5 Women < 3.5	Men ≥ 2.5 Women ≥ 3.5	≥ 30
24 h urinary albumin (mg)	< 30	30-300	> 300
AER (ug/min) (timed collection)	< 20	20-200	> 200
CrCl (ml/min)	60-120	60-120 or increased	60-120 or reduced

*Urinary Sodium > 200 mmol/l indicates poor compliance with low salt diet

TARGETS

<u>Normal</u>	<u>Microalbuminuria</u>	<u>Proteinuria</u>
<ul style="list-style-type: none"> • Screen Again Next Year 	<ul style="list-style-type: none"> • Tighten BP (<125/75) • Use ACE inhibitor or Angiotensin II receptor antagonist • Tighten glycaemic control (HbA1c < 7.0 %) • Tighten lipids (Cholesterol < 4 mmol/l, LDL < 2 mmol/l) • Start Aspirin 75 mg od • Patient stopped smoking • Refer to hospital diabetes clinic if targets not achieved 	<ul style="list-style-type: none"> • Tighten BP (<125/75) • Use ACE inhibitor and/or Angiotensin II receptor antagonist • Tighten glycaemic control (HbA1c < 7.0 %) • Tighten lipids (Cholesterol < 4 mmol/l, LDL < 2 mmol/l) • Start Aspirin 75 mg od • Patient stopped smoking • Refer to hospital: Renal +/- diabetes clinic



Estimated Glomerular Filtration Rate (eGFR) (Calculated Creatinine Clearance)

The plasma creatinine value is dependent on muscle mass and can therefore give a falsely reassuring result. For example, an elderly frail patient with *significantly* impaired renal function may have only a *slightly* elevated plasma creatinine, because they have a low muscle bulk.

There are various equations available for estimating glomerular filtration rate (creatinine clearance) taking account of plasma creatinine, age, gender and body weight or race. These calculations can be usefully applied:

- Annual estimation of eGFR will allow you to monitor renal function and detect early renal impairment;
- It will guide you in referring the patient to the diabetes clinic and/or renal clinic;
- It will help to determine whether the use of metformin is safe.

Clinic Referral

- eGFR 30 - 60 ml / min - Refer to hospital diabetes clinic
- eGFR < 30 ml / min - Refer to renal clinic and hospital diabetes clinic

Metformin

There are not yet specific international guidelines, but we suggest the following:

- eGFR 30 - 60 ml / min - Use metformin with extreme caution and consider reducing the dose of metformin used
- eGFR < 30 ml / min - STOP metformin

For Glomerular Filtration Rate Calculators, see:

Cockcroft-Gault Calculator (includes weight)

www.nephron.com/cgi-bin/CGSIdefault.cgi

MDRD GFR Calculator (includes race)

www.nephron.com/cgi-bin/MDRD_NKF.cgi



Timed Collections - Organising And Instructions

- Timed urine collections can be organised by the GP Surgery (practises may have their own system in place)

OR

- A request form can be given to the diabetic patient to bring to the Whittington Hospital Diabetes Clinic (Clinic 3B), where the outpatient clinic nurses will organise the urine collection and instruct the patient.

- The patients need clear instructions as to how to collect the urine.
- They need a container for the urine.
- If the creatinine clearance is being measured, the patient will need to have a blood sample taken for serum creatinine when they return the urine collection.
- The results will be sent to the GP surgery.
- If patients are coming up to the Whittington Hospital Diabetes Clinic for help and organisation of this test, they should ask to speak to Patsy Modeste (in clinic 3B or 3A) or Carol Basdeo (in clinic 3B). This facility is available for GP managed patients on Monday-Thursday from 8.30am – 4pm.

The pathology form must be very specific:

- For creatinine clearance, ask for a blood sample for serum creatinine as well as the 24 hour urine collection.
- For a 24 hour urinary albumin level, specify this.
- For a urinary sodium level, specify this.
- For an albumin excretion rate (AER), specify this and record the collection start and finish times.

a) 24 hour urine collection:

- On the day of the collection, the patient gets up, empties his bladder into the toilet and records the time. This is the start time.
- All the urine for the next 24 hours is collected into the container.
- The collection is completed at the same time the next morning. At this time, the patient must squeeze out the last urine from his bladder into the container. The collection is then finished.

b) Timed overnight collection (for AER):

- The patient empties his bladder into the toilet before going to bed and records the time.
- When the patient wakes up the next morning, he empties his bladder into the container and records this time. The collection is then finished.
- If the patient has to get up during the night to pass urine, this is also collected in the container but these times need not be recorded.

$$AER(\mu\text{g} / \text{min}) = \frac{\text{Urine Albumin Concentration} \times \text{Urine Volume}}{\text{Urine Collection Time (Finish - Start time)}}$$



24 Hour Urine Collection - Instructions For Patients

- a) Collect a request form from your GP or practise nurse.
- b) The nurse will also give you:
 - a container for the urine to take home
 - instructions on how to do the test
- c) Some patients are told to bring the form to the Whittington Hospital Diabetes Clinic instead. One of the nurses there will provide a urine container and will go through the instructions. If you are one of these patients, please go to Clinic 3B on a Monday to Thursday, between 8.30am and 4pm. Ask to speak to a clinic nurse, either Patsy Modeste or Carol Basdeo.
- d) Write the date you start the collection here: _____
- e) On the day of the collection, discard the first urine that you pass in the morning when you get up – but look at the time and make a note to record this time. Write this time here: _____
- f) Then collect every drop of urine passed in the next 24 hours into the container.
- g) You finish the collection at the same time the next morning. At that time, you must make an effort to squeeze any urine left in your bladder into the container. Write this time down here: _____
(It should be the same time as in (f))
- h) Bring the urine collection back to your GP surgery straight away and remember to bring the request form. You may need to wait to have a blood test done, so please ask and wait for this test if needed.
- i) This is the end of the test. The laboratory analyses the results, which are sent back to your GP.
- j) If you are one of the patients doing the urine collection at the Whittington Hospital Diabetes Clinic, please bring the urine collection back to Clinic 3B straight away, to either Patsy or Carol, and remember to bring the request form. The opening times are the same as above.
- k) You may need to wait to have a blood test done, and Patsy or Carol will do this for you.
- l) The test result is sent directly to your GP.



Chapter 17:
Sexual Health & Women's Health



ERECTILE DYSFUNCTION (ED)

- Erectile dysfunction affects up to 50% of male patients with diabetes.
- Patients are most likely to mention this to their General Practitioner.
- The Andrology Clinic general pathway for management of ED is given overleaf.

History - important points:

- Duration of problem and onset (sudden vs. gradual)
- Effect of ED on partner and relationship
- Other possible contributing life events
- Presence of other complications of diabetes makes diabetes the likely culprit

Examination

Examine genitalia to exclude any local causes

Investigations

Check Prolactin & Testosterone (and LH/FSH if testosterone low)
If symptoms of bladder outflow obstruction, check PR and PSA

Treatment

1st Line

SILDENAFIL (Viagra) 50 mg, increasing to 100 mg as required
VARDENAFIL (Levitra) 10 mg, increasing to 20 mg as required
TADAFIL (Cialis) 10 mg, increasing to 20 mg as required

Contraindications:

Therapy with Nitrates, severe ischaemic heart disease, unstable angina, recent MI or CVA, BP <90/50, severe hepatic impairment

If on nitrates:

APOMORPHINE (Uprima) 2 mg sublingual, increased to 3 mg as required

If failure on oral and sublingual therapy: refer to Andrology Clinic

2nd Line

INTRA-URETHRAL ALPROSTADIL

MUSE® 250 - 1000 ug (usual range)

Demonstrate the technique and check competence

3rd Line

INTRA-CAVERNOSAL PROSTAGLANDINS

CAVERJECT® 5 - 20 ug (usual range)

VIRIDAL DUO® 5 - 20 ug (usual range)

Demonstrate the technique and check competence

4th Line

Consider for penile implant

A vacuum pump device is an alternative to pharmaceutical therapy.

Consider referral to The Whittington Hospital Andrology Clinic, (Mr Barry Maraj, Consultant in Urologist, Department of Urology) if:

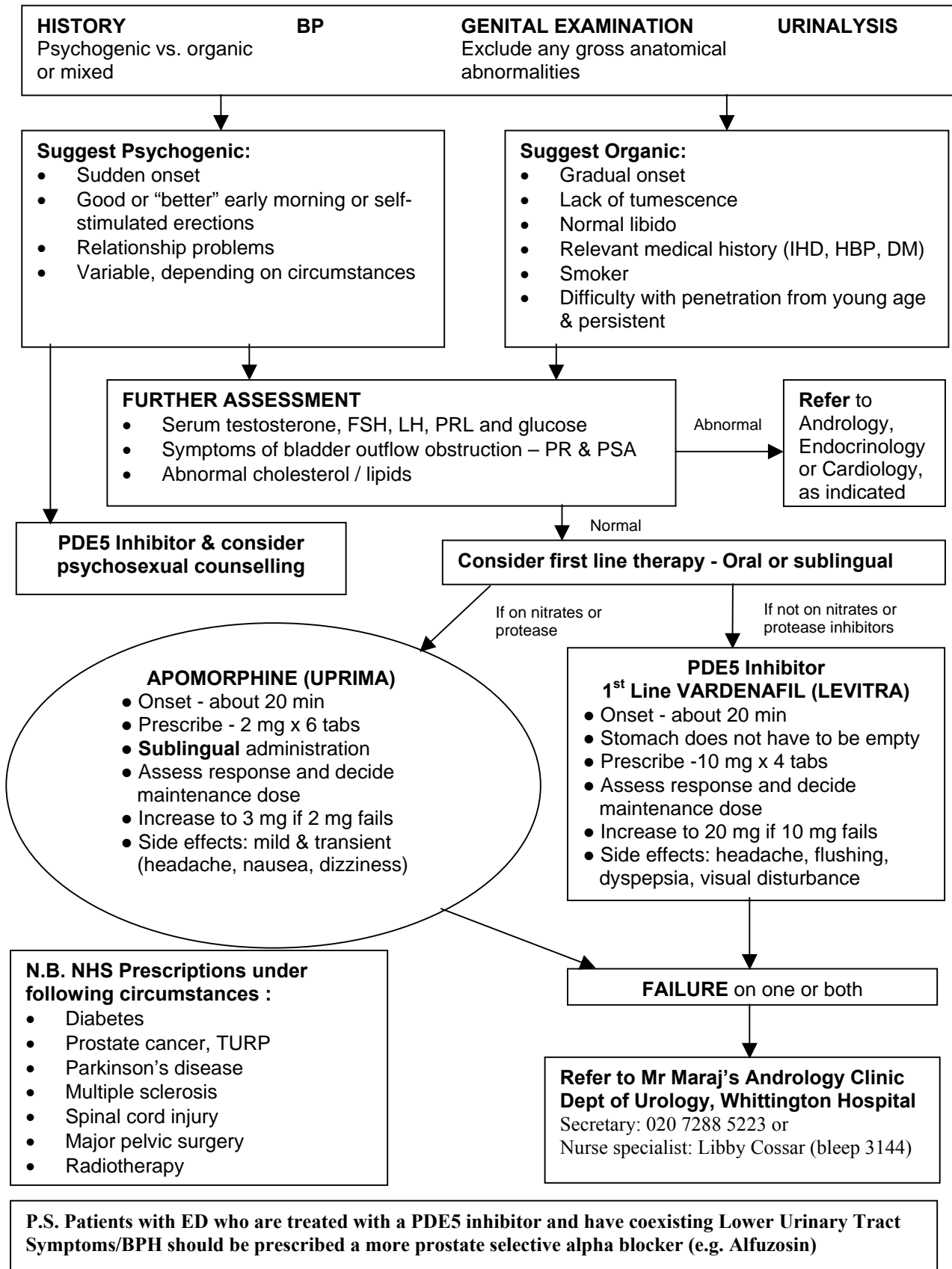
- There is a complex medical history, which may affect treatment;
- Oral or sublingual therapy fails;
- GP or Practice Nurse has no training in advising patients on intra-urethral/cavernosal therapy.

Advice for patients: Sexual Dysfunction Association: 0870 7743571 or www.sda.uk.net



GUIDELINES FOR PRIMARY CARE MANAGEMENT OF ERECTILE DYSFUNCTION

- Contact Mr Barry Maraj's Andrology Clinic for further information
- Tel: 020 7288 5223; Fax: 020 7288 5538



HORMONE REPLACEMENT THERAPY IN DIABETES

Hormone replacement therapy (HRT) is not contraindicated in diabetes.

Benefits

- Relief of menopausal symptoms (e.g. vasomotor instability, vaginal atrophy)
- Prevention/treatment of osteoporosis

Increased risks

- Breast cancer
- Venous thromboembolism (VTE) - DVT, PE
- Stroke
- Endometrial hyperplasia/cancer

Additional risk with HRT compared to pre-existing risk in women not using HRT

	Risk per 1000 women not on HRT	Extra cases per 1000 women on HRT for 5 years	
		Oestrogen-only HRT	Combined HRT (oestrogen & progestogen)
Breast cancer: In women aged 50-64 years	14 cases over 5 years	+ 1.5	+ 6
Breast cancer: In women aged 50-79 years	31 cases over 5 years	-	+ 4
Venous TE: In women aged 50-59 years	10 cases over 5 years	+ 1	+ 4
Venous TE: In women aged 60-69 years	20 cases over 5 years	+ 4	+ 9
Stroke: In women aged 50-59 years	3 cases over 5 years	+ 2	+ 1
Stroke: In women aged 60-69 years	26 cases over 5 years	+ 6	+ 4
Endometrial cancer: In women aged 50-69 years	3 cases over 5 years	+ 5	-
Ovarian cancer: In women aged 50-69 years	3 cases over 5 years	+ 1	Unknown

Risks estimated by Committee on Safety of Medicine, taken from British National Formulary 49



Considerations Relating To Risk

- **Risk of breast cancer** —→ **emphasise breast awareness and regular mammograms**
 - Risk of breast cancer is increased within 1 - 2 years of initiating treatment. Increased risk is related to the duration of HRT use. Excess risk disappears within about 5 years of stopping.
- **Risk of thromboembolism**
 - Review the need for HRT if the woman has predisposing factors for DVT or PE: Personal or family history of DVT/PE, severe varicose veins, obesity, recent surgery or trauma, bed rest.
- **Premature menopause**
 - The balance of risk to benefit is different in this situation. Prematurely menopausal women are often significantly compromised by their symptoms and are at much higher osteoporotic risk for the future. Their potential benefit in terms of quality of life gain and disease prevention is greater. For women with early natural or surgical menopause (before age 45 years), HRT may be given until the approximate age of the natural menopause (age 50 years).

Suggested HRT Regimens

Women can continue to use HRT for symptom relief and quality of life gain, provided an informed decision is made.

**For women with diabetes,
use natural oestrogens and less androgenic progestogens
(for optimal effect on the metabolic profile).**

For example:

Women with uterus in situ

- Transdermal oestradiol
- Dydrogesterone
(10 mg od, on days 15 - 28 of each cycle)

Women with hysterectomy

- Transdermal oestradiol

The HRT regimen will also depend on choice and convenience. The treatment should suit the individual profile and use the lowest dose to provide relief of symptoms.

REMEMBER:
HRT does not provide contraception.
A woman is potentially fertile for 2 years after her last menstrual period if she is under 50 years and for 1 year if she is over 50 years.



CONTRACEPTION IN DIABETES

Adequate contraception is essential in sexually active women with diabetes.

It should be checked for at all diabetic reviews.

REMEMBER: Pregnancy needs to be *planned* in women with diabetes.

The COMBINED ORAL CONTRACEPTIVE PILL is NOT contraindicated in young women with diabetes and no cardiovascular risk factors.

Avoid:

- 1. High oestrogen dose pills;**
- 2. Combined pills containing the progestogens desogestrel or gestodene, as these may carry an increased risk of venous thromboembolism.**

The PROGESTOGEN-ONLY CONTRACEPTIVE PILL (mini- pill) is appropriate for older women or women with diabetic complications or cardiovascular risk factors (e.g. smoking, hypertension, hyperlipidaemia).

All other contraceptive methods can be used in women with diabetes, including intrauterine devices (IUDs).

Take account of:

- 1. Patient preference;**
- 2. Effectiveness of method - pregnancy needs to be planned in women with diabetes.**



PRE-CONCEPTION CARE IN WOMEN WITH DIABETES

- Women (pre-menopausal) with diabetes must be aware of the potential effects of diabetes on pregnancy, both for them self and the foetus.
- They must understand the need for tight diabetes control before and during pregnancy.
- Pregnancy needs to be planned in diabetes.
- Any woman planning a pregnancy should be offered advice on contraception, optimising diabetes control and general pregnancy advice to ensure the best outcome for mother and baby.
- Patients can be referral to the Whittington Hospital Diabetes Clinic for preconception counselling and care.
- Women with diabetes who become pregnant should be referred immediately to the Whittington Hospital Joint Obstetric and Diabetes Ante-natal Clinic.

CHECKLIST - Pre-conception care

Before conception, the woman should aim for HbA1c < 6.5% and should be on Folic acid

Education:	Diabetes and pregnancy	<input type="checkbox"/>
	Need for glucose control before conception	<input type="checkbox"/>
	Risks of pregnancy	
	maternal	<input type="checkbox"/>
	foetal	<input type="checkbox"/>
	Screening for congenital abnormalities	<input type="checkbox"/>
	Importance of blood glucose monitoring	<input type="checkbox"/>
	Smoking	<input type="checkbox"/>
	Alcohol	<input type="checkbox"/>

Folic acid 5 mg od ☐

Rubella status ☐

Review glucose control:

Is dietetic advice needed?	
Referral to Dietitian	<input type="checkbox"/>
Is diabetic advice and education needed?	
Referral to Diabetic clinic and/or	
Diabetes Specialist Nurses	<input type="checkbox"/>



SCREENING FOR GESTATIONAL DIABETES THE WHITTINGTON HOSPITAL

Diagnosis

Any plasma glucose that is	≥ 11.1 mmol/l	=	Diabetes
Any fasting plasma glucose that is	≥ 7.0 mmol/l	=	Diabetes

Screening

All pregnant women who are not known to have diabetes are screened for diabetes and gestational glucose intolerance when attending the Ante-natal Clinic. This protocol is continuing at present, pending future evidence, because of the increased risk of our local population.

- **Urine is tested for glucose each visit**
- **One hour oral glucose load (50 g glucose)**
 - All women have an oral glucose load at booking.
 - The woman does not need to fast: she is given 50 g glucose and blood is taken 1 hour later.
 - If this test is normal, no further glucose tolerance tests are done during the pregnancy.
 - If the plasma glucose is > 8 mmol/l, a 2 hour oral glucose tolerance test (OGTT) will be done after an overnight fast (see below).
- **Two hour oral glucose tolerance test (75 g glucose)**
 - If the results of the first OGTT are normal and gestation is less than 26 weeks, a second OGTT will be done at 28 weeks.
 - If the results of the first OGTT are abnormal (2 hour plasma glucose is > 8 mmol/l), the woman will be considered for home blood glucose monitoring.
- **Women at high risk of glucose intolerance**
 - Women in this category have one or more of the following characteristics:
 - Non-European ethnic origin
 - Glucose intolerance in a previous pregnancy
 - Obesity (Body Mass Index > 30 kg / m²)
 - Previous babies who were large for gestational age
 - Previous unexplained still birth
 - Diabetes mellitus in a first degree relative and age > 30 y
 - Consideration is being given to including women with Polycystic Ovarian Syndrome
 - These women will have a 50g oral glucose load at booking and a full 2 hour OGTT at 20 weeks and at 28 weeks.

Multidisciplinary Team for Diabetes in Pregnancy

Dr Michela Rossi	Consultant in Diabetes
Miss Heulwen Morgan	Consultant in Obstetrics
Romilla Jones	Diabetes Specialist Nurse
Julie Logue	Diabetes / High Care Midwifery Coordinator

- Patients with diabetes in pregnancy are seen by a multi-disciplinary team in the ante-natal clinic every 2 weeks from diagnosis until the third trimester and then weekly until the birth.
- HbA1c is tested on a 4 weekly basis and patients should achieve normal levels.
- All patients with gestational diabetes have a repeat OGTT at 6 - 12 weeks after delivery and receive the results and education regarding future pregnancies at their post-natal hospital check.



AFTER GESTATIONAL DIABETES A GUIDE FOR PATIENTS

What is GESTATIONAL DIABETES?

This means that your blood sugar was higher than in other people during your pregnancy.

How is it caused?

It is not fully known why this happens. It may be related to increased demands of the foetus and the response of your own body to the placenta.

What happens after I have my baby?

It is likely that your diabetes will go away as soon as you have your baby. You will have a glucose tolerance test performed at six weeks which will tell us if you still have diabetes.

Does it matter?

Yes.

1. You may develop diabetes in future pregnancies.

2. You may develop diabetes in later life.

- Your doctor should measure your blood sugar in the fasting state once a year.
- You should ask your doctor to measure your blood sugar if you develop any of these symptoms, as they can occur if you develop diabetes:
 - losing weight
 - passing more urine or increasing thirst
 - genital irritation
 - blurred vision

3. You can help prevent yourself from developing diabetes.

- You must watch your weight. Try and lose some if you are overweight.
- Try and live a healthy lifestyle and take regular exercise.
- Cut down on the fatty foods in your diet.
- Stop smoking.



Chapter 18:
Travel & Diabetes



TRAVELLING WITH YOUR DIABETES - Patients on Insulin

BEFORE YOU TRAVEL:

1. Check your travel and health insurance cover. Healthcare is available in other European Community Countries, although outside the EU you could face heavy medical bills.
2. Check the vaccinations required for the area you are visiting.
3. Check the facilities available at your holiday destination, i.e. medical clinics and Pharmacies.
4. Check the types and preparations of insulin available.
5. Discuss your insulin regime for travelling with your healthcare team.
6. Obtain a letter from your Diabetes Care team, explaining the need for insulin and needles.

TRAVELLING:

1. Ensure you have enough insulin for your journey.
2. Ideally keep two completely separate supplies of insulin and syringes or pens. This will be useful if one of your bags is mislaid.
3. Keep the insulin on the plane, not in the hold, as you may not be able to access your baggage and insulin may freeze in the hold.
4. Take extra snacks such as cereal bars and biscuits - in case you are delayed.

AT YOUR DESTINATION:

1. Ensure that you take sensible precautions to avoid any infectious diseases e.g. don't drink the water - only bottled.
2. If you become unwell, then be sure to drink plenty of safe "bottled" water.
3. Don't EVER stop your insulin.
4. Always keep your insulin cool. However, insulin cartridges in pens are stable in normal temperatures for up to four weeks.
5. If you are very hot, you will absorb insulin more quickly and should reduce your dose.
6. If it is very cold - you may need to increase your insulin dose.
7. Check your glucose before any exercise, particularly swimming. Aim for above 8mmol/l.
8. Wear sandals or shoes on the beach.
9. Alcohol may lead to high and then low blood glucose levels.
10. Learn "I am a diabetic, please give me something sweet to drink" in the local language.
11. Travel guides & information on local food is available from Diabetes UK.



TRAVEL CHECKLIST

Tickets and passport	<input type="checkbox"/>
Adequate supply of insulin, syringes or pen and needles (2 supplies carried separately)	<input type="checkbox"/>
Blood glucose monitor and test strips	<input type="checkbox"/>
Long-acting carbohydrate for delayed flights	<input type="checkbox"/>
Dextrose tablets and Glucagon	<input type="checkbox"/>
Identification bracelet or card	<input type="checkbox"/>
"I am a diabetic, please give me something sweet to drink" in native language	<input type="checkbox"/>
Medical insurance and documentation	<input type="checkbox"/>
Letter of travel from healthcare team	<input type="checkbox"/>
Spare pen and needles	<input type="checkbox"/>

TRAVELLING – SAMPLE LETTER

Practice Address

Date

To whom it may concern

Re: Mr/Ms X

Mr/Ms X has diabetes mellitus treated with insulin. It is essential for him/her to carry syringes, needles, insulin and blood glucose monitoring equipment at all times.

If you require further information please contact me at the above address.

Yours Sincerely

Dr β. Cell



Chapter 19:
**Impaired Glucose Tolerance &
Impaired Fasting Glycaemia**



IMPAIRED GLUCOSE TOLERANCE AND IMPAIRED FASTING GLYCAEMIA

Impaired Glucose Tolerance (IGT)	Fasting Plasma Glucose	< 7.0 mmol/l
	2 h Plasma Glucose (on OGTT)	≥ 7.8 - 11.0 mmol/l
Impaired Fasting Glycaemia (IFG)	Fasting Plasma Glucose	5.6 - 6.9 mmol/l
	2 h Plasma Glucose (on OGTT)	< 7.8 mmol/l

Patients diagnosed as having Impaired Glucose Tolerance or Impaired Fasting Glycaemia are at increased risk of:

- **Diabetes**
- **Hypertension**
- **Cardiovascular Disease**

They should have an ANNUAL check of:

- **Weight and Body Mass Index (BMI)**
- **Fasting Glucose**
- **Fasting Lipids**
- **Blood Pressure**

Some local GP practices are setting up specific clinics for annual monitoring of patients with IGT and IFG. This allows for detection of diabetes / hypertension / hyperlipidaemia, treatment as required and ongoing patient education in self-management.



PATIENT INFORMATION: IMPAIRED GLUCOSE TOLERANCE & IMPAIRED FASTING GLYCAEMIA

What are “Impaired Glucose Tolerance” and “Impaired Fasting Glycaemia”?

This means that your blood sugar is higher than in most other people, but it is not as high as someone with diabetes.

Is it the same as diabetes?

No.

You do not have diabetes. However, 50 % of people with Impaired Glucose Tolerance go on to develop diabetes over a 10 year period. Also, 25 % of people with Impaired Fasting Glycaemia go on to develop diabetes over a 10 year period.

Does it matter?

Yes.

1. You may develop diabetes.

- Your doctor should measure your blood sugar in the fasting state once a year.
- You should also ask your doctor to measure your blood sugar if you develop any of these symptoms, as they can occur if you develop diabetes:
 - losing weight
 - passing more urine or increasing thirst
 - genital irritation
 - blurred vision

2. You may develop heart problems - this can be prevented.

People with Impaired Glucose Tolerance or Impaired Fasting Glycaemia have an increased risk of developing hardening of the arteries. This can cause heart attacks and strokes. With good management of your weight, your blood pressure and your cholesterol levels, this risk can be reduced.

- You must watch your weight. Try and lose some if you are overweight.
- Try and live a healthy lifestyle and take regular exercise.
- Cut down on the fatty foods in your diet.
- Stop smoking.
- Your doctor should check your blood pressure and measure your blood cholesterol at least once a year. You may need to take tablets to control your blood pressure or cholesterol or if high.



USEFUL WEBSITES: FOR PATIENTS AND HEALTHCARE PROFESSIONALS

www.diabetes.org

American Diabetes Association: Contains extensive information for people with diabetes and health care professionals, including clinical practice recommendations.

www.bbc.co.uk/health

BBC Health: Useful patient focused information about health, including diabetes (www.bbc.co.uk/health/diabetes) and the heart (www.bbc.co.uk/health/heart).

www.bpassoc.org.uk

Blood Pressure Association: Extensive information for patients and health care professionals, including validated home blood pressure machines.

www.bhf.org.uk

British Heart Foundation: Information for patients and health care professionals.

www.bhs.org

British Hypertension Society: Information for patients and health care professionals.

www.diabetes.org.uk

Diabetes UK: Contains extensive information for people with diabetes and health care professionals, including standards of care.

www.dafne.uk.com

Dose Adjustment for Normal Eating Website: Information on the DAFNE course for people with type 1 diabetes.

www.easd.org

European Association for the Study of Diabetes: Contains information on meetings and membership.

www.idf.org

International Diabetes Federation: International health issues relating to diabetes with links to other sites.

www.isn-online.org

International Society of Nephrology: Global organisation for physicians and renal scientists, with news and dates of international meetings.

www.ispad.org

International Society for Pediatric and Adolescent Diabetes: Contains guidelines for diabetes management and extensive links to other diabetes sites.

www.jdrf.org.uk

Juvenile Diabetes Research Foundation: Excellent information for children with diabetes and their family.



www.nhlbi.nih.gov/about/ncep

National Cholesterol Education Programme: American clinical practice guidelines on cholesterol management, including links to quick desk reference.

www.kidney.org

National Kidney Association: American organisation with extensive patient information and links to health care professional sites and clinical practise guidelines (www.kidney.org/professionals/kdoqi).

www.kidney.org.uk

National Kidney Federation: UK charity for kidney patients with extensive information for patients and their relatives and carers.

www.nscrtinopathy.org.uk

National Screening Committee for Retinopathy: All the details on the National Screening Programme for Retinopathy, including requirements, quality assurance, training and accreditation.

www.nephron.com

Nephron Information Center: Extensive up-to-date information on nephrology, with links to GFR calculators and guidelines.

www.nice.org.uk

National Institute for Health and Clinical Excellence: National guidelines on various aspects of diabetes care.

www.renal.org

Renal Association: Professional association of nephrologists and renal scientists in the UK, including standards of care.

www.runsweet.com

Runsweet.com: Useful site for people with diabetes, with information on general diabetes management and on diabetes and sport.

www.sda.uk.net

Sexual Dysfunction Association: Patient focused website for male and female sexual dysfunction.

www.whittington.nhs.uk/diabetes

Whittington Diabetes Service Website: Details of our staff, care provided, further information and links to other websites and clinical care guidelines.



REFERENCES

These guidelines are a combination of our own person clinical experience and international guidelines relating to diabetes management. Our aim is to advise optimal care for patients while recognising the practicalities and challenges of providing diabetes care. These are some of the references we have used.

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