



NHS Forth Valley Management Programme for Diabetes Mellitus

**Produced by NHS Forth Valley Diabetes Managed Clinical
Network and updated 2009**

This management plan is only a guideline and is not intended to serve as a standard of medical care or be applicable in every situation. Decisions regarding the treatment of individual patients must be made by the clinician in light of that patient's presenting clinical condition and with reference to current good medical practice.

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Change Record:	

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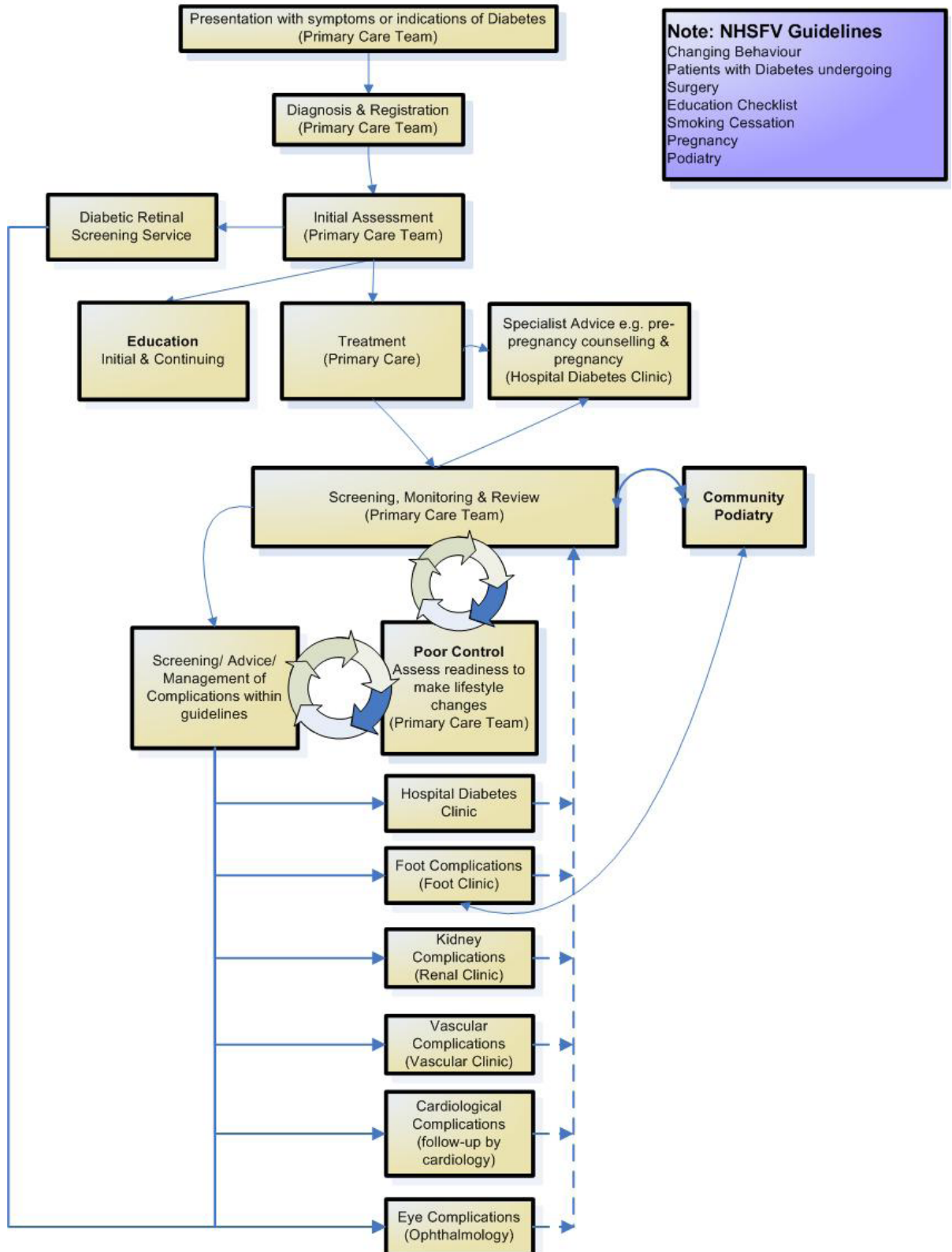
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Pathway of care for Type 2 diabetes

NHSFV Pathway for the Diagnosis, Assessment, Treatment and Monitoring of Type 2 Diabetes



Purpose of this document:

- To set out the mechanisms by which diabetes care should be accessed and delivered in Forth Valley
- To refer care providers to local and national clinical guidance where available.

Links to relevant SIGN guidelines:

- SIGN 116 (Management of Diabetes)
(www.sign.ac.uk/pdf/sign116.pdf)
- SIGN 103 (Diagnosis and Management of Chronic Kidney Disease)
www.sign.ac.uk/guidelines/fulltext/103/index.html

Links to associated documents:

- Diabetes UK's 2005 recommendations for provision of services in primary care to people with diabetes:
www.diabetes.org.uk/Documents/Professionals/primary_recs.pdf
- Reports of the annual Scottish Diabetes Survey:
www.diabetesinscotland.org.uk
- NICE guidance on managing Type 2 diabetes, including education strategies:
www.nice.org.uk/CG066
- The Scottish Diabetes Framework, produced by the Scottish Executive in 2002, www.scotland.gov.uk/Publications/2002/04/14452/1980 and the Diabetes Action Plan (2006) <http://www.scotland.gov.uk/Resource/Doc/129328/0030795.pdf>.
Look out for the next update which is due later in 2009.

Your secondary care diabetes team

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Clinical Psychologist

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Diabetes Retinal Screening Manager

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All are happy to be contacted to discuss management or provide advice

1.0 Diagnosing diabetes

1.1 Diagnostic tests (WHO guidelines)

In a patient with classical symptoms e.g. polyuria, polydipsia or unexplained weight loss, **one** of the following is diagnostic:

- Random plasma venous glucose concentration ≥ 11.1 mmol/l **or**
- Fasting plasma venous glucose concentration ≥ 7.0 mmol/l **or**
- Plasma venous glucose concentration ≥ 11.1 mmol/l (2 hour sample in OGTT)

If asymptomatic, diagnosis should **not** be based on a single venous plasma glucose measurement, a **second** sample (fasting, random or 2 hours-post glucose load) is required to make the diagnosis.

1.2 Interpreting the 75g Oral Glucose Tolerance Test

*Fasting plasma glucose	< 6.0	6.1-6.9	< 7.0	≥ 7.0
2 hour plasma glucose	< 7.8	< 7.8	7.8 – 11.0	≥ 11.1
Diagnosis and Management	Normal No follow up required	Impaired Fasting Glucose Annual fasting plasma glucose	Impaired Glucose Tolerance Annual fasting plasma glucose	Diabetes

*If fasting glucose 6.1 – 6.9 mmol/L, consider 75g oral glucose tolerance test.

1.3 Pre-diabetes

Patients with Impaired Fasting Glucose and Impaired Glucose Tolerance have increased risk of future diabetes. Lifestyle modification has been shown to reduce this. Therefore:

- Advise on healthy eating to obtain 5% total weight reduction
- Regular Exercise; 5 x 30 minimum exercise per week
- Check Fasting Plasma Glucose annually
- Treat co-existing coronary risk factors aggressively, as are at increased risk of developing cardiovascular disease

1.4 Determining Diabetes Type

Type 1 diabetes is a condition of absolute insulin deficiency. If it is not identified promptly and insulin administered it can be fatal.

Most typically we think of younger adults, with abrupt onset of profound thirst and weight loss. However, it can occur at any age. Consider it probable in any patient who presents with severe osmotic symptoms or weight loss.

Type 2 diabetes is becoming more prevalent in younger patients; age is no longer a good discriminator of diabetes type.

Patients with pancreatic pathology (cystic fibrosis, haemochromatosis, chronic pancreatitis, previous pancreatic resection) can become insulin deficient.

If in doubt, contact SRI switchboard 01786 434000 and speak to the Adult Diabetes Consultant of the Week, page number 623, or Consultant Paediatrician.

1.5 Where and how to refer

New Type 1 patient

Refer by telephone immediately to:

- SRI Diabetes Centre 01786 434472 /01786 434169
- FDRI Diabetes Day Centre 01324 616041

New diagnosis of diabetes in a child or adolescent

Refer by telephone immediately to Paediatric Diabetes Nurses 01786 433667
OR
Paediatrics Registrar on-call via SRI switchboard 01786 434000
OR
at ward 17 01786 434417

If the patient is unwell, is vomiting, or has heavy ketonuria contact the bed manager via SRI switch board 01786 434000 for urgent assessment at CAU.

Refer newly pregnant diabetic women by telephone

- SRI 01786 434472/ 01786 434169
- FDRI 01324 616041

Referring for non-urgent hospital care

The secondary care diabetes service is best skilled to provide:

- on-going care for people with Type 1 diabetes
- care of women with diabetes considering pregnancy.
- care of children or adolescents with diabetes.
- advice on the management of people with complications of diabetes
- help for people struggling to achieve satisfactory glycaemic control

Refer these groups through SCI-Gateway.

Patients whose care will generally remain in primary care

Most patients with newly-diagnosed Type 2 diabetes, or whose Type 2 diabetes is stable, will remain under the care of their GP and Practice Nurse.

Hospital clinic appointments

To cut down DNA rates patients receive reminder letters and in some cases a request to have blood taken before the clinic. (When GP practices are able to help with the latter it is very useful and very much appreciated). If, despite this, a patient fails to attend 2 consecutive appointments we do not routinely re-appoint; GP and patient are notified if this is the case.

A number of diabetes specialist practitioners from non-medical disciplines have undergone training in broader aspects of diabetes management in order to conduct review clinic consultations. The outcomes of these are discussed with the supervising Consultant. The survey of patient satisfaction with consultations with these extended-scope practitioners was very favourable.

2.0 Looking after the patient with newly diagnosed diabetes

2.1 Registration in SCI-DC (Diabetes Database)

SCI DC Network is a nationally promoted clinical information system and register of patients with diabetes. It takes information from multiple resources including Primary and Secondary Care IT systems, Podiatry clinics and the Retinal Screening Service. While the system is national, patient information access is restricted at a practice or hospital clinic level.

Entering a Reid code for diabetes in Primary Care Patient Management System (GPASS, EMISS etc) should automatically result in the patient being registered in SCI-DC Network and subsequently in the National Retinal Screening system Soarian. However, completing a patient registration form directly in SCI-DC Network is the most reliable means of ensuring a patient is in the Forth Valley Diabetes Register and they will automatically receive Retinal Screening appointments.

All data, relevant to a patient's diabetes care, and medications entered on to the Primary Care system are automatically uploaded to the patient's record in SCI-DC Network each evening. All notes / letters and results from all hospital diabetes consultations which are recorded in the hospital diabetes patient management system SCI-DC Clinical are also uploaded into the patients SCI-DC network record. Many community podiatrists enter results of their examination directly into SCI-DC Network. Retinal screening results and photographs are uploaded into the patient's SCI-DC record after grading has been completed. The patient's summary in SCI-DC Network should contain the most up to date information from all the possible sources and can be an extremely useful resource during a consultation with a patient with diabetes. Anonymised data held in SCI-DC Network is used to provide summary statistics annually for the Scottish Diabetes Survey. SCI-DC Network is also a reasonably reliable source for obtaining accurate practice QUAF statistics for diabetes automatically and identifying individuals who require some action to achieve targets.

As well as clinical data SCI-DC Network is a source of educational materials for patients and information on most areas of diabetes management.

2.2 Education

Self-management education is essential to a good diabetes service. It is central to understanding the recommendation for care when diabetes is first diagnosed, and valuable in supporting good self-management decisions throughout the years that follow.

The Long Term Conditions Alliance, www.ltcas.org.uk which aims to bring together voluntary and other groups working alongside people with long term conditions, aims for:

- People to have more access to high quality information about their condition and its impact on their life.

Healthcare providers are referred to the joint policy document produced by the Long Term Conditions Alliance and the Scottish Government in 2008, “Gaun Yersel: the self management strategy for people with long term conditions”.

<http://www.ltcas.org.uk/documents/SelfManagementStrategydocument-GaunYersel.pdf>

NICE recommends (CG66) that all patients newly diagnosed with Type 2 diabetes are offered the opportunity to participate in a structured group education programme, to acquire knowledge about the condition and develop coping skills to deal with it. Their criteria for a structured education programme are that it:

- has a structured, written curriculum, which is evidence-based, patient-centred and grounded in learning theory
- is delivered by trained educators
- is quality-controlled
- has its outcomes audited.

The 2005 paper produced by Diabetes UK giving its recommendations for the provision of services in primary care for people with diabetes (www.diabetes.org.uk/Documents/Professionals/primary_recs.pdf) includes a list of topics which should be included in a structured education programme. These are under 4 broad headings: the nature of diabetes; day-to-day management of diabetes which is very much the practicalities of testing and treatment; specific issues, which includes hypoglycaemia, intercurrent illness, and pre-conception care; and living with diabetes, which includes driving, holidays and employment issues.

There are 2 commercially available programmes which meet the NICE criteria for structured education, address the topics recommended by Diabetes UK and also include opportunities to encourage patients to begin making positive lifestyle changes. Both come with detailed lesson plans, patient and educator materials and integrated mechanisms for quality control.

The first of these is DESMOND, (www.desmond-project.org.uk) which operates in other areas in Scotland and offers two 3-hour sessions of group education for patients within 12 months of diagnosis.

The second is X-PERT patient: <http://www.xperthealth.org.uk/> This is a programme delivered in six 2 ½ hour sessions, and is suitable for patients irrespective of length of time they've had diabetes. Most of their centres are in the other parts of the UK but there is some Scottish representation.

Both programmes use a variety of visual aids to illustrate the physiology of diabetes, discuss short and long-term problems caused by diabetes, and cover pharmacological and lifestyle aspects of treatment. Being based on adult learning theories such as self-efficacy theory and techniques such as mastery and vicarious learning, participants are encouraged to learn through discussion, rather than as passive attendees at a lecture!

Both encourage personalised goal setting with specific actions being planned, and techniques for overcoming problems identified at the outset, thereby, encouraging behaviour modification as well as enhancing knowledge.

The Education sub-group of the Diabetes MCN is working towards ensuring a programme which meets the NICE criteria is available to patients in Forth Valley. At present, education is delivered on a one-to-one basis within primary care. Written material to support this education is widely available.

In addition, community dietitians are piloting group sessions in some GP practices, and some members of staff have undergone training in the use of conversation maps as a tool to facilitating group sessions for people learning self management skills in diabetes.

The Dietetic department has also produced a high quality series of leaflets to support education on healthy food choices. The range is entitled "Eating well with diabetes" and can be ordered from HIRS (Health Promotion Dept):
www.nhsforthvalley.com/home/Services/healthpromotion/hp_intro.html

The Health Promotion Dept also offer training for staff in delivering health promotion strategies, such as facilitating behaviour change in patients. One alternative source of such training, delivered in various locations nationwide by the Skills Development Service, www.skillsdevelopment.co.uk . Some of those in secondary care involved in group education found the seminars by Anne Marie McKay on "Working with groups" very useful – she is freelance, for enquiries email:
areemckay@ambm.freeserve.co.uk.

The Diabetes Education Network, www.diabetes-education.net although originally a group set up to support education programmes for people with Type 1 diabetes, is extending its scope, and in the future should be a useful resource for groups developing education programmes for Type 2 diabetes too.

2.3 Lifestyle issues

2.3.1 Dietary Management and Nutrition

Dietary advice, especially for people with Type 2 diabetes should focus on the need for weight management and minimising cardiovascular risk.

➔ Dietary Advice – getting the balance right

Current advice for diabetes is based on a healthy balanced diet. The picture below illustrates what individuals should be aiming to eat on a day-to-day basis. Patients should be reminded that they will continue to enjoy a wide variety of foods. A food diary can be very helpful – encourage patients to write down what they eat and drink over a few days [including a weekend] and then compare it to the **eatwell plate**. Most find it easier to make and maintain changes that they have identified themselves.



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➔ **Recommendations**

Eat regular meals based on starchy carbohydrate foods. Skipping meals should be discouraged. Between meals snacks are not always required but depend on individual requirements/treatment regimens e.g. individuals on sulphonylureas and conventional insulin therapies may need snacks to avoid hypos. Newer hypoglycaemic agents, analogue insulins and insulin therapies make snacks less vital. If snacks are taken healthy options should be encouraged.

Be fat aware, aim to reduce and modify fat intake. As a high overall fat intake, especially a high saturated fat and trans/hydrogenated fat intake, is linked with raised blood cholesterol levels and heart disease. Encourage low fat foods and the use of small amounts of fats rich in monounsaturated fat e.g. olive or rapeseed [canola] oil for spreading and cooking. Eating less fat and fewer fatty foods will help with weight management

eatwell plate	DAILY PORTIONS	COMMENTS
Bread, rice, potatoes, pasta and other starchy foods [carbohydrates]	7 - 14	<ul style="list-style-type: none"> Encourage complex carbohydrates, especially those rich in soluble fibre and wholegrains. Promote carbohydrates with a low glycaemic load.
Fruit and vegetables	5 - 9	<ul style="list-style-type: none"> There are no fruits that should be avoided. Encourage a good variety of colourful fruit and vegetables. Include some fruit and vegetables with every meal.
Meat, fish, eggs, beans and other non-dairy sources of protein	2 - 3	<ul style="list-style-type: none"> Choose low fat varieties and cooking methods. Include fish, beans and pulses regularly. Include foods rich in omega-3 fats twice weekly, oily fish is the best source. OTC omega-3 supplements can be taken by those who do not eat oily fish and/or other omega-3 rich foods as advised, manufacturer's recommended doses must not be exceeded.
Milk and dairy foods	3	<ul style="list-style-type: none"> Switch to low fat versions.
Foods and drinks high in fat and/or sugar	0 - 3	<ul style="list-style-type: none"> Limit these foods – all are high in calories. This does not mean a sugar-free diet, emphasis is a reduction of added sugars. Have sugary foods as a treat and always with, rather than between, meals.

Reduce salt intake to below 6g/day. About 75% of current intake is from salt already added to foods. Advise reducing salt intake by cutting back on processed and pre-prepared foods – choose fresh foods. Use a little salt in cooking, flavour food with herbs and spices and try not to add any salt after cooking or at the table. This goes for salt substitutes as well – use them sparingly.

Drink alcohol responsibly and stick to recommended levels. Advise two consecutive alcohol free days weekly. Avoid sweet alcohols and always use sugar-free mixers. Alcohol lowers blood glucose therefore minimise risk of hypoglycaemia in vulnerable patients [those on sulphonylureas or insulin] by advising never drinking alcohol on an empty stomach and always having some starchy carbohydrates with or shortly after alcohol.

Do not include ‘diabetic’ foods and drinks. They are of no benefit for anyone with diabetes. They are expensive, often high in calories, can still cause blood glucose levels to rise and may cause stomach upsets.

→ Dietary Resources

The following resources should be used by all health professionals as a basis for dietary assessment and advice thus ensuring consistency. All are available from the Health Information Resource Service [HIRS] at the Health Promotion Department [HIRS codes in brackets]:

www.show.scot.nhs.uk/nhsfv/fvhealthpromotion/hirs/hirs.htm then click on ‘Health Promotion Resources [HIRS]’.

At diagnosis all patients should be issued with:

- **Eating Well with Diabetes – Getting the Balance Right** [ILL 07/L]

NHS Forth Valley **Getting the Balance Right** explains diabetes and the aims of dietary advice. It includes practical information and advice on eating a healthy balanced diet for diabetes in the form of 8 top tips. The emphasis is on eating regular meals based on starchy/complex carbohydrates, being fat aware [reducing and modifying fat intake/increasing consumption of oily fish], increasing fruit and vegetable intake, reducing added sugars, reducing salt intake, keeping to recommended alcohol levels, weight management, ‘diabetic’ foods and drinks and reading food labels.

Additional supporting literature:

NHS Forth Valley **Eating Well with Diabetes** series of leaflets which compliment and expand the information given in **Getting the Balance Right**:

- **Facts about Fat** [ILL 05/L]
- **Know your Carbs!** (Includes information on glycaemic index) [ILL 06/L]
- **Fibre Providers** [ILL 04/L]
- **Alcohol** [ILL 03/L]

NHS Forth Valley **Just what you've been 'weighting'** for series of leaflets with advice on weight management:

- **Take some simple steps to lose weight and keep it off** [NUT 78/L]
- **Your personal step by step guide to losing weight** [NUT 80/L]

NHS Forth Valley guidance on portion sizes with weights and handy measure for everyday foods:

- **Are You Getting The Balance Right? What is a Portion?** [NUT 76/L]

Diabetes UK: <http://www.diabetes.org.uk/>

- **Understanding diabetes** [ILL 08/L]
- **Eating well with diabetes** [ILL 01/L]

Additional useful approved supporting literature is available from the following:

- The British Dietetic Association Food Fact Sheets.
www.bda.uk.com then click on 'Food Facts'.
- The Weight Wise website gives impartial, practical advice and information on weight management. Included is 'work' specific advice e.g. advice for shift working, packed lunched etc and information aimed at teenagers.
www.bdaweightwise.com
- Food Standards Agency and **Healthier Scotland** [Scottish Government] produce a variety of resources including information on healthy eating, weight management, alcohol and exercise:
www.takelifeon.co.uk
www.eatwell.gov.uk
<http://www.salt.gov.uk/>
<http://www.actiononsalt.org.uk/index.htm>
- British Heart Foundation leaflets:
http://www.bhf.org.uk/keeping_your_heart_healthy/healthy_eating.aspx

➔ **Weight Management**

- It is important that goals for weight management are realistic and practical and are set in partnership with the patient. Between individuals there will be variable rates of weight loss depending on a variety of factors including the patient's motivation, ethnicity, age, gender and previous weight loss.
- Maintained weight loss of 5%-10% results in significant improvements in health.
- Maintained weight loss of more than 10% provides further health benefits but is less commonly achieved.
- For many weight maintenance is a more realistic achievement. Distribution of body fat as well as BMI should be considered. Abdominal or 'belly' fat is associated with insulin resistance as well as an atherogenic profile.

Other useful resources/tools when discussing weight management also available from HIRS:

- **Weight management record card.**
A patient held record card. [NUT08/L]
- **Small Changes Big Benefits.**
An A5 foldout leaflet with advice and practical suggestions on how to reduce fat intake. [NUT 71/L]
- **Worried about gaining weight when you stop smoking?**
An 8 page A5 booklet with advice for those concerned that they may gain weight when they stop smoking. [SMO 03/L]
- **Food - using traffic lights to make healthier choices.**
A small booklet explaining the traffic light system of food labelling. [NUT 09/L]

➔ **Anti-obesity Medication**

Drug treatment should only be considered for those patients with a BMI ≥ 28 , who are committed to and exhibit the ability to make and maintain long term dietary and lifestyle changes. There is currently one agent licensed for pharmacotherapy for obese and overweight patients within Forth Valley: orlistat [Xenical®]. All patients should first be entered into a practice based structured weight management programme for a minimum of 3 months which should include counselling and advice on diet and lifestyle. **Ideally patients should be referred to the dietitian for assessment prior to, or immediately when anti-obesity medication is prescribed.** It should be noted that there is no requirement for pre-prescription weight loss for orlistat.

➔ **Referral to the Dietitian**

Type 1 diabetes:

- All newly diagnosed patients will be seen by the Diabetes Dietitian at the hospital as part of their initial education – a separate referral to the dietetic service is not required.

Type 2 diabetes:

- Diabetes UK continues to recommend that patients newly diagnosed with Type 2 diabetes should be referred to a Registered Dietitian. **It should be noted that within Forth Valley the majority of newly diagnosed patients will be managed within the practice.** Patients who meet the following criteria can be referred to the dietitian:
 - Prior to insulin conversion and education on commencement of insulin.
 - Prior to, or immediately when anti-obesity medication is prescribed, or prior to referral for bariatric surgery.
 - With evidence of nephropathy – as per Forth Valley Guidelines/CKD Stage 3 [eGFR 30-59mL/min].
 - On maximum therapy and have problems managing weight, HbA1c, blood pressure or lipids.
 - Requests dietetic assessment and advice.

➔ **Intervention**

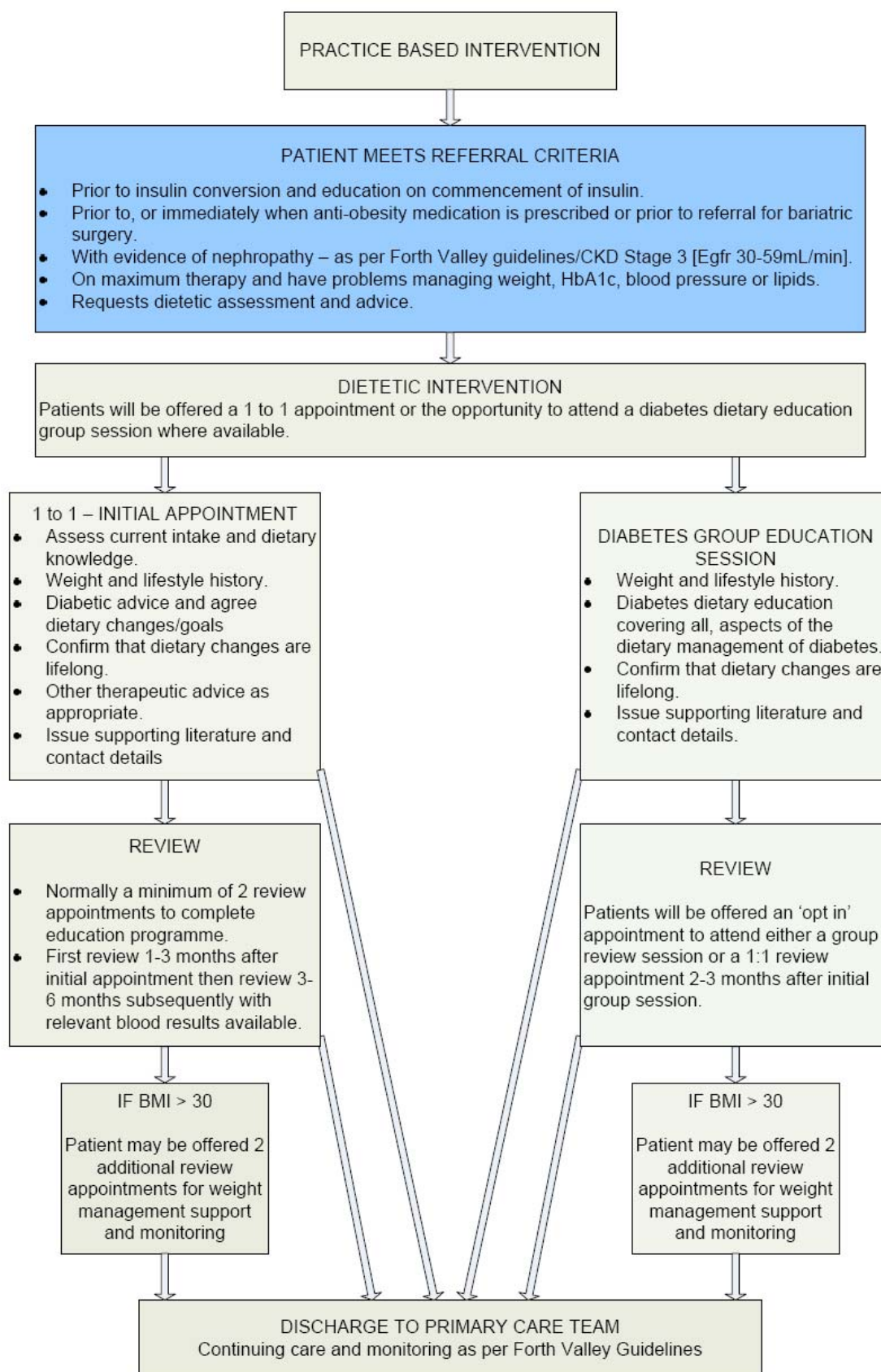
Type 1 diabetes – will have ongoing dietetic review and monitoring [minimum every 6 months] at the Department of Diabetes.

Type 2 diabetes – will have ongoing practice based review and monitoring; any dietetic intervention will be time limited and aims to make the patient confident and able to self manage.

➔ **Dietetic Departments Contact numbers**

Community Dietitians, Euro House, Stirling	01786 431155
Falkirk Royal Infirmary Dietitians	01324 616097
Stirling Royal Infirmary Dietitians	01786 434046
Diabetes Specialist Dietitians (for SRI and FDRI)	01786 434169

Process of care for adults with type 2 diabetes referred to the dietitian



2.3.2 Alcohol

Recommendations about safe alcohol intake for the rest of the population also apply to people with diabetes.

Additional considerations:

- Alcohol makes hypoglycaemia more likely to occur in those who are treated with insulin or oral hypoglycaemic agents.
- Serious hypoglycaemia can occur if a large quantity of alcohol is taken. The person should have a snack before going to bed. Suitable snacks are toast, breakfast cereal or sandwiches. However, chips or a pizza on the way home is maybe more practical.
- Hypoglycaemia can occur up to 16 hours after finishing drinking.
- People may be less aware of their symptoms of hypoglycaemia than usual when they have been drinking, therefore, symptoms and treatment should be explained to friends and identification should always be carried. The symptoms of hypoglycaemia often mimic drunken-ness.

2.3.3 Exercise

Many older, overweight people with diabetes are physically inactive and may require extra encouragement, but could benefit greatly from the results.

NHS Health Scotland recommends a 2-stage approach to physical activity:

- Encourage sedentary people to increase activity to moderate levels (e.g. daily walking) for 30 minutes most days of the week.
- Encourage those who are motivated, interested and achieving moderate levels of activity to engage in more rigorous activity at least 3 days a week.

Vigorous activity may lower blood glucose and can do so several hours after exercise. Those who are very physically active may need to monitor blood glucose during and after exercise sessions, carry refined carbohydrate whilst exercising and consider eating a carbohydrate-containing meal to replenish glycogen stores after exercise.

2.3.4 Smoking cessation

Any diabetic patient who smokes should be encouraged and helped to stop. Information about smoking cessation services throughout Forth Valley is available on:

www.nhsforthvalley.com/home/Services/healthpromotion/teams/smoking_cessation/sc_clinics.html

Patients can be referred to the excellent self-help website, www.canstopsmoking.com, which also includes information about smoking cessation clinics and the Smokeline phone number.

Recommendations for prescribing to assist smoking cessation are in the FV Formulary pages 140 and 141:
www.communitypharmacy.scot.nhs.uk/documents/nhs_boards/forth_valley/FV_formulary2008_final_16Jul.pdf

2.4 Treating blood glucose

2.4.1 Target Blood Glucose levels

Target blood glucose levels should be individualised.

Textbook values would be 4-7 mmols fasting, 7-8 mmols pre-meals and less than 9 mmols post-prandially. However, whilst we recognise an HbA1c < 6.5mmol/L greatly reduces the risk of microvascular complications, it increases the risk of hypoglycaemia. Those with a short life expectancy, impaired awareness of hypoglycaemia, mobility or visual problems may benefit from a higher target blood glucose range. Furthermore introduction of very tight glycaemic control may increase morbidity and mortality in those at risk of ischemic heart disease. Regular HbA1c testing can be used as the sole means of assessing glycaemic control.

Alternatively in some cases patients will benefit from self-monitoring.

2.4.2 Glucose Monitoring

Urine testing

Urine testing is unreliable in gauging glycaemic control as it depends on the renal threshold for glycosuria in the individual. Results reflect average blood glucose levels for the period the bladder filled. A negative test cannot distinguish between hypoglycaemia and normoglycaemia.

Blood glucose monitoring

Who should monitor and when should they monitor?

Some patients who manage their diabetes with diet or on metformin and are therefore not at risk of hypoglycaemia, will nonetheless find it helpful to be able to test their blood glucose periodically, e.g. to confirm a stable level of glycaemic control or during a period of ill-health. Those who periodically are treated with steroids may find it useful to be able to test at these times – some patients use sulphonylureas or even insulin during a course of prednisolone, reverting to diet alone afterwards.

Patients on sulphonylurea medication are at risk of hypoglycaemia and should be able to monitor blood glucose to identify this.

Patients who initiate nocturnal insulin will need to test fasting blood glucose in order to dose-titrate. Those on insulin should also test before driving and during long journeys. Further information under section 2.4.3 below.

If there is a suspicion that a patient with Type 2 diabetes is likely to become insulin-requiring it is prudent to ensure they are able to blood glucose monitor.

All patients with Type 1 diabetes need to be able to self-monitor blood glucose – the extent to which they do this will reflect how useful they find the information it provides.

How should they monitor?

Recommended meters are listed on the FV formulary:

http://www.communitypharmacy.scot.nhs.uk/documents/nhs_boards/forth_valley/FV_formulary2008_final_16Jul.pdf (page 197)

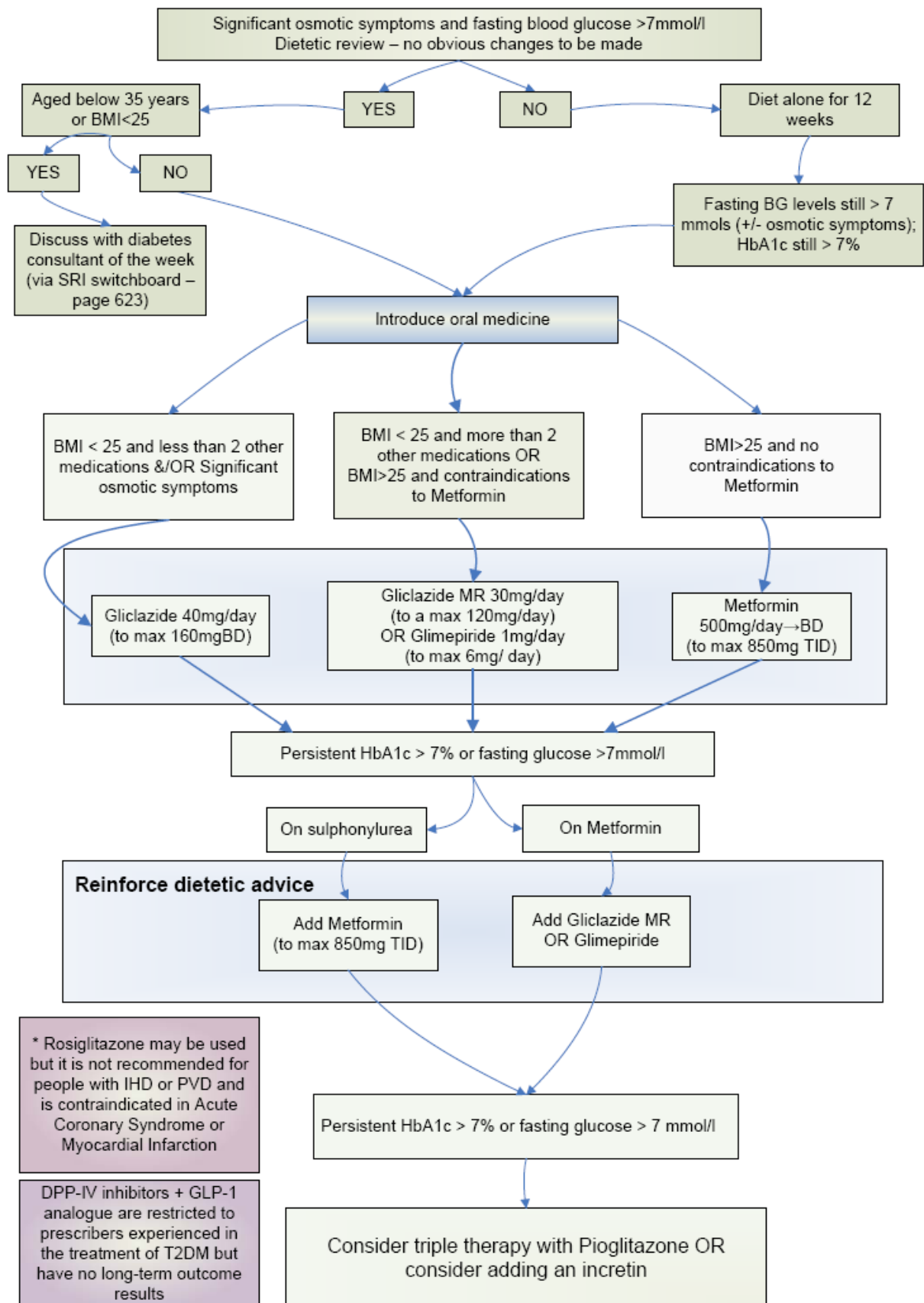
2.4.3 Drivers with insulin treated diabetes

- Do not drive if you feel hypoglycaemic or if your blood glucose is less than 5.0 mmol/l.
- If hypoglycaemia develops while driving stop the vehicle as soon as possible in a safe location, switch off the engine, remove the keys from the ignition and move from the driver's seat.
- Do not resume driving until 45 minutes after blood glucose has returned to normal. It takes up to 45 minutes for the brain to fully recover.
- Always keep an emergency supply of fast-acting carbohydrate such as glucose tablets or sweets within easy reach in the vehicle.
- Carry your glucose meter and blood glucose strips with you. Check blood glucose before driving (even on short journeys) and test regularly (every 2 hours) on long journeys. If blood glucose is 5.0mmol/l or less, take a snack before driving.
- Carry personal identification indicating that you have diabetes in case of injury in a road traffic accident.
- Particular care should be taken during changes of insulin regimens, changes of lifestyle, exercise, travel and pregnancy.

Take regular meals, snacks and rest periods on long journeys. Always avoid alcohol.

2.4.4 Prescribing hypoglycaemic medication

Initiating hypoglycaemic agents in Type 2 diabetes



Hypoglycaemic agents available for managing Type 2 diabetes

Class	Action	Comments
Sulphonylurea	Stimulates pancreatic insulin secretion.	Can cause hypoglycaemia.
Biguanide (metformin)	Decreases hepatic gluconeogenesis and increases peripheral glucose uptake.	Don't use if at risk of lactic acidosis i.e. unstable or severe heart failure, eGFR <30, critical limb ischaemia, hypoxia. Omit during intercurrent illness which might cause dehydration eg gastroenteritis
Alpha-glucosidase inhibitor (acarbose)	Delays digestion of starch and sucrose, limiting post-prandial glucose excursions.	Acceptability significantly limited by flatulence.
Thiazolidinedione	Enhances insulin sensitivity.	Can cause significant fluid retention and may worsen heart failure. Rosiglitazone not to be used in patients at risk of ischaemic heart disease. Association with fractures of metacarpals and metatarsals.
Prandial glucose regulator	Stimulates pancreatic insulin production at mealtimes.	Limited efficacy.
DPPIV inhibitor	Inhibits degradation of endogenous incretin hormones, thus enhancing pancreatic insulin production.	Weight neutral.
GLP-1 analogue	Enhances pancreatic insulin production, slows gastric emptying and acts centrally to promote satiety.	Sub-cut injection. Can help weight loss. High rate of nausea, vomiting and bloating. Reports of pancreatitis.

For further information see FV formulary page 31:

http://www.communitypharmacy.scot.nhs.uk/documents/nhs_boards/forth_valley/FV_formulary2008_final_16Jul.pdf

or

the relevant chapter of the BNF:

<http://bnf.org/bnf/bnf/current/alphaindex.htm>

2.4.5 Combining hypoglycaemic agents

Diabetes is a progressive condition and often increasing doses and multiple agents will be required to meet HbA1c targets. All prescribed medications work best in conjunction with appropriate lifestyle choices.

Metformin, an insulin sensitiser, is generally first choice in patients whose BMI is >25. Further drugs may be added - sulphonylureas, thiazolidinediones (though not rosiglitazone if patient at risk of ischaemic heart disease), or in some cases both. Oral incretins can be used as a second agent with metformin, sulphonylurea or thiazolidinedione if the other classes of drugs are contraindicated. They can also be added 3rd line to metformin + sulphonylurea. Insulin can be added to therapy with metformin, metformin + sulphonylurea, or metformin + pioglitazone, although the risk of oedema with the last combination is appreciable and clinicians should be alert to it.

Pancreatic failure can occur in patients with long standing Type 2 diabetes and this should be suspected in patients with deteriorating glycaemic control, weight loss and osmotic symptoms. They should convert to insulin treatment.

2.4.6 Initiating Insulin for those with Type 2 diabetes and BMI >30

Diabetes Specialist Nurses are keen to advise and support primary care staff initiating insulin. See page 8 for contact details.

Nocturnal isophane insulin

This supplements daytime use of oral hypoglycaemic agents. It is licensed in combination with metformin, sulphonylureas and pioglitazone. Dose is adjusted until optimal fasting glucose values are obtained (or episodes of overnight hypoglycaemia limit further dose increases).

- Use either Insulatard (using a Novopen 4 and 3ml penfills, or Innolet disposable device) or Humulin I (using a Humapen Luxura and 3ml cartridges, or 3ml pre-filled disposable device) , all available on prescription.
- Begin with 10 units, preferably to be given before supper
- If fasting blood glucose currently above 10, target should be 7 – 9mmol/L. Once this target is achieved aim for fasting blood glucose 4 - 7mmol/L.
- Increase dose by 2 units every 3 days if fasting glucose above target range. Once dose >30 units increase in steps of 4 units.

Doses in excess of 1unit/kg are often needed.

Once-daily Glargine (Lantus)

- The Scottish Medicines Consortium recommend use of Lantus in Type 2 diabetes is restricted to patients who would benefit from once-daily insulin but who will require assistance from a District Nurse/carer to administer the injection.
- Supply insulin glargine with Solostar 3ml disposable pen or Autopen 24 and 3ml cartridges, or in a 10ml vial for use with insulin syringes.
- Start with 10 units, given at a convenient time (try to keep time of injection about the same every day)

- Increase in 2 unit steps towards target fasting blood glucose values, and in 4 unit steps once dose exceeds 30 units.

3.0 On-going care for people with Type 2 diabetes

3.1 Conducting a Diabetes Review

This will be most effective when patient-led, however below is given a structure which some might adapt. * indicates this should happen at least once a year.

Ask		
<i>Symptoms of hyper- or hypo-glycaemia</i>		
<i>Diabetic control</i>	HbA1c and self monitoring	*
<i>Perception and understanding of condition</i>		
<i>Psychological Well-being</i>	Including sexual health	
<i>Review of medication</i>	Check for appropriate dose and timing, side-effects, interactions.	
<i>Diet history</i>		
<i>Physical activity</i>		
<i>Smoking</i>		
<i>Alcohol</i>		
Examination		
<i>Height and weight</i>	For calculation of body mass index	*
<i>Blood Pressure</i>	Compare with personalised target	*
<i>Foot inspection</i>	- encourage patient self-examination - establish categories of risk and offer appropriate management	*
Review recent results with patient		
<i>Renal function</i>	U& E's, eGFR and albumin:creatinine ratio	*
<i>Lipids/random total cholesterol</i>	once diabetes stabilised	*

As with all chronic disease management the patient's ability to choose health-promoting behaviours is crucial. See Appendix 1 for a brief summary of approaches to people who would benefit from changing behaviours.

Screening for and Treating Complications

3.2 Cardiovascular risk management

3.2.1 Hypertension

Target blood pressure levels:	uncomplicated diabetes	< 140/80 mmHg.
	Type 2 with microalbuminuria	<130/80 mmHg
	Type 1 with nephropathy	<120/70 mmHg

In cases where ambulatory blood pressure measurements have been made, these should be adjusted upwards by 10/5 mmHg before deciding on need for treatment / additional agents.

Choice of drug

- ACE-inhibitors are first-line in patients with diabetes. Dose should be titrated according to prescription guidance e.g. Ramipril 10mg.
- A rise from baseline creatinine of 20% at 2 weeks, or fall in eGFR of 10% at 2 weeks is acceptable as long as there is no further deterioration.
- Serum potassium levels up to 6mmol/L are acceptable as long as they are stable – consider offering dietary advice and/or adding a loop diuretic prior to reducing the dose of ACE-inhibitor.
- Discuss with one of the Diabetes Consultants if you have any concerns – contact details page 8.

In patients with a cough an Angiotensin Receptor Blocker should be substituted. Patients prescribed ACE-inhibitors or ARBs should be reminded to temporarily discontinue in the event of an intercurrent illness which could cause dehydration eg gastroenteritis.

Blood pressure targets are tight and in many cases several drugs will be required – see Forth Valley hypertension guidelines:

http://www.nhsforthvalley.com/web/FILES/CE_Guideline_Hypertension/HypertensionGuidelineV42008FINAL.pdf

If secondary hypertension due to endocrine or renovascular disease is suspected please refer via SCI-gateway to the diabetes clinic where it can be investigated.

3.2.2 Lipid management

All patients with Type 2 diabetes should be treated with lipid-lowering medication, irrespective of baseline cholesterol levels. The option of treatment will also be discussed with all patients with Type 1 diabetes over the age of 40.

Once on treatment, target levels: total cholesterol < 4mmol/L
LDL cholesterol < 2mmol/L

Choice of lipid-lowering medication: see FV lipid management guidelines:

http://www.nhsforthvalley.com/web/FILES/CE_Guideline_Cardiovascular/FVLipidLoweringGuidelines.pdf

3.2.3 Anti-platelet medication

Until recently aspirin was recommended as primary prevention in all patients with Type 2 diabetes. Evidence from the Popadad trial (BMJ 2008; 337: A1840) suggested the risks of this treatment might outweigh any benefit. Therefore, it is no longer routinely prescribed for patients with Type 2 diabetes who do not have existing vascular disease.

It should be prescribed for any patient who does have existing vascular disease. Those with GI symptoms due to aspirin should receive it in conjunction with a PPI. Those who have an absolute contraindication to aspirin should be prescribed clopidogrel.

The option of treatment with aspirin will be discussed with patients with Type 1 diabetes over the age of 40.

3.2.4 Symptoms of ischaemic heart disease

Ischaemic heart disease is common in diabetes and symptoms may be disproportionately mild.

Patients with a presentation suspicious of new onset angina, or whose angina has become less stable, should be reviewed in the light of the local guidance on chest pain:

http://www.nhsforthvalley.com/web/FILES/CE_Guideline_Cardiology/CA19ChestPain.pdf and referral to the Rapid Access Chest Pain Clinic (telephone 01786 434 166) should be considered.

3.3 Screening and Treating Renal Complications

3.3.1 Screening Microalbuminuria

All patients should be screened for the presence of microalbuminuria with a spot urine sample for albumin: creatinine ratio (ACR). Ideally an early morning sample will be sent, but a sample produced later in the day can still be analysed: false positives are more likely in a day-time sample.

Normal ranges: <2.5mg/micromol in men, <3.5 mg/micromol in women.

If the ACR is elevated this should be repeated in **2 more samples** to confirm it as a true result.

The significance of microalbuminuria in Type 2 diabetes

In a patient who also has retinopathy, this may indicate the development of diabetic nephropathy. In the absence of retinopathy, it is more likely to reflect alternative renal pathology. In either case, it correlates well with cardiovascular risk.

Investigation of microalbuminuria

Microalbuminuria (ACR>2.5 in men, >3.5 in women): exclude infection and consider imaging renal tract if atypical features (short duration diabetes, resistant hypertension, renal impairment)

Proteinuria (ACR >30): exclude myeloma, autoimmune renal disease and renal artery stenosis (ultrasound then MRA if >1.5cm discrepancy between kidney sizes)

Assuming investigations do not reveal a non-diabetic/vascular cause, management consists of:

- blockade of the renin-angiotensin system with ARB or ACE-I in optimal dose
- target BP < 130/80 mmHg
- optimise cardiovascular risk factor management (lipids, anti-platelets, smoking cessation)
- optimise glycaemic control

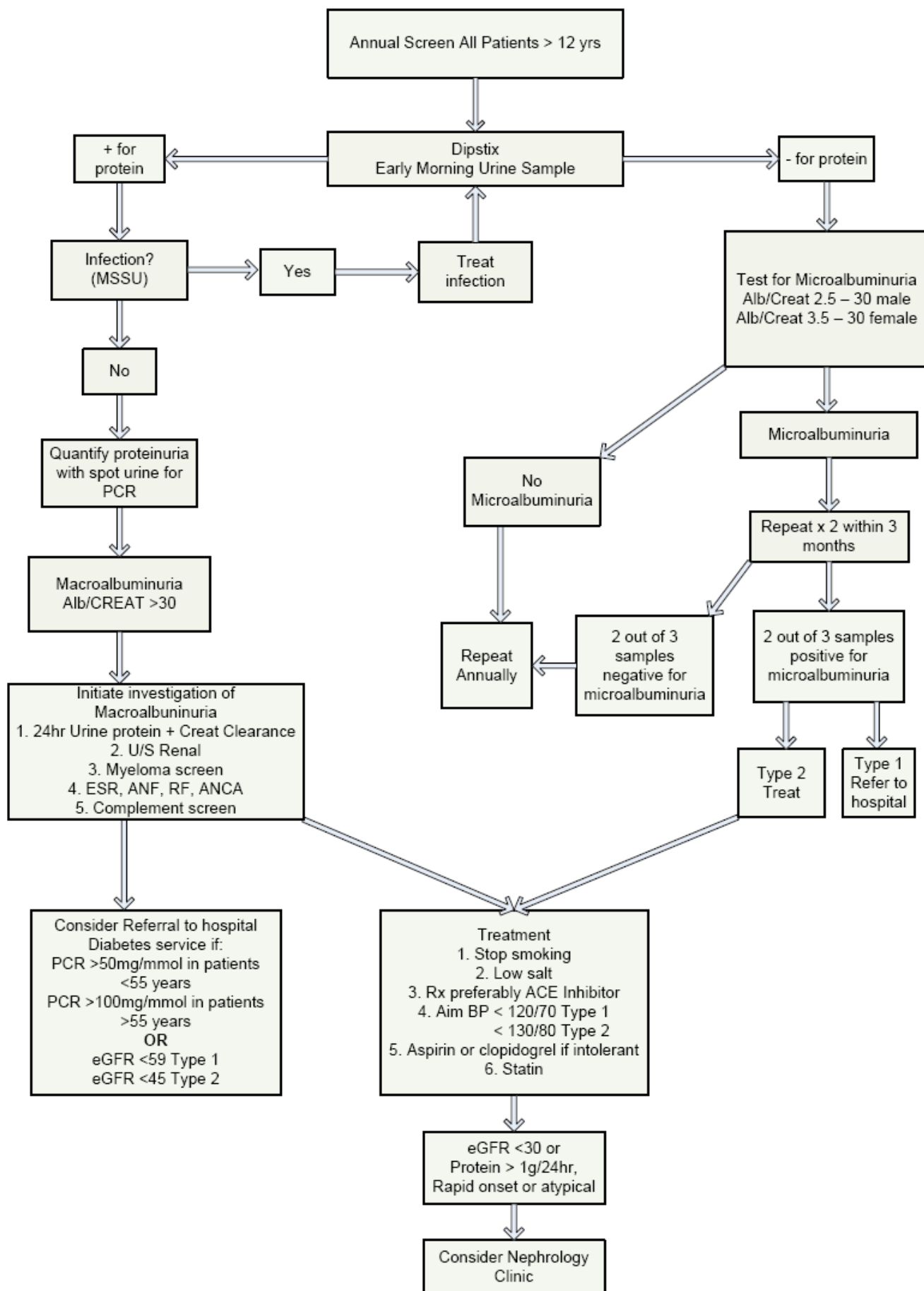
Refer the following patients to Hospital Diabetic Clinic if not already attending:

- patients with type 1 diabetes and persisting microalbuminuria OR proteinuria OR eGFR <59 on 2 consecutive occasions
- patients with type 2 diabetes and proteinuria OR eGFR <45 (CKD stage 3b)

Consider Referral to Nephrology Clinic if:

- eGFR <30 ml/min
- progressive fall in eGFR or rise in Creatinine
- eGFR < 45 and unexplained anaemia (Hb<110 g/l) or abnormal Potassium, Calcium or Phosphate
- Persisting heavy proteinuria > 1g/24hr
- Atypical proteinuria, i.e. No retinopathy, rapid onset
- Suspected renovascular disease

Screening for Microalbuminuria and Management Algorithm



3.3.2 Managing abnormal eGFR (<60ml/min)

In patients with chronic kidney disease (eGFR <60ml/min) assess:

The rate of deterioration

- review previous creatinine results and repeat serum creatinine measurement within 5 days to exclude rapid progression, if new finding.

The cause

- Review medication, particularly recent additions e.g. non-steroidal anti-inflammatory drugs (NSAIDs), antibiotics, mesalazine, diuretics, ACEIs/ARBs.
- Dipstick test urine for haematuria and proteinuria. If clear send for microalbumin/creatinine ratio. If protein present send for urine protein creatinine ratio and urine culture.
- Assess clinically: for urinary symptoms, palpable bladder, BP, sepsis, heart failure, hypovolaemia.

The targets for management

- Blockade of renin-angiotensin system with ACE-I or ARB:
 - Check creatinine/ potassium – before starting, 2 weeks after start and after each dose change
 - If creatinine increases by >20% or GFR falls by >15% (compared with previous sample) repeat with potassium and seek advice (Diabetes consultant can be paged on 623 via SRI switchboard)
 - If potassium > 6mmol/L. Exclude haemolysis. Advise avoiding potassium-rich foods and against use of Lo-salt. Review prescriptions
 - stop potassium-retaining diuretics. Only stop ACE/ARB if hyperkalaemia persists.
- BP < 130/80 in most or < 125/75 if Type 1 diabetes or PCR >100mg/mmol – see FV Hypertension management guidelines
- Total Cholesterol < 4mmol/L (see FV lipid guidelines)

CKD Stage 3: additional management

- Renal ultrasound if lower urinary tract symptoms
- Immunise against influenza and pneumococcus
- Serum for Hb, potassium, calcium and phosphate every 6 months
- In the absence of retinopathy exclude non diabetic causes
 - Myeloma screen (ESR, Serum + Urine protein electrophoresis)
 - Autoantibody screen (ANF, RF, Complement screen) and ANCA if microscopic haematuria

3.3.3 Referral Guidance for patients with impaired renal function

eGFR	Action
eGFR <15 ml/min	<ul style="list-style-type: none"> • urgent referral to renal unit • arrange repeat eGFR as soon as possible • check BP & urinalysis
eGFR 15-29 ml/min	<ul style="list-style-type: none"> • repeat eGFR within 1 month to confirm CKD Stage 4 • dipstick urinalysis: if positive, check random urine protein:creatinine ratio (PCR) & urine culture • check BP • if CKD 4 confirmed, or if PCR above threshold*, refer to renal unit
eGFR 30-59 ml/min	<ul style="list-style-type: none"> • repeat eGFR within 1 month to confirm CKD 3 • check urinalysis: If negative send for albumin:creatinine ratio (ACR). If positive send random urine protein:creatinine ratio (PCR) & urine culture • check BP • if PCR above threshold*, consider referral to renal unit • If ACR above threshold but PCR below threshold* manage as per FV microalbuminuria guideline • If urinalysis negative repeat eGFR & urinalysis/PCR in 6 months & 12 months: consider referral to renal unit if eGFR falls by >10 ml/min per year or if PCR rises above threshold

*PCR threshold – >100mg for all in patients >55 years
>50mg for all in patients <44 years

Useful links:

SIGN 103 Chronic Kidney Disease www.sign.ac.uk/guidelines/fulltext/103/index.html

www.renal.org/eGFR which gives extensive background information about each stage of chronic kidney disease and includes an eGFR calculator

3.4 Diabetic Foot Problems

3.4.1 Screening and referring for at-risk feet

Education on self-care of feet should be provided at diagnosis and refreshed annually.

Basic foot care advice	
DO	DO NOT
Examine feet daily, including between toes and around heels (contact podiatrist in emergency)	Wear ill-fitting shoes
Check footwear for small objects or rough seams	Burst blisters
Wash feet daily and dry thoroughly	Sit too near heaters or fires or use hot water bottles to heat feet up quickly
Check water temperature with elbow before bathing feet	Poke down edges of nails with scissors to cure ingrown toenails
Switch off electric blankets and remove hot water bottles before going to bed	Use razor blades, pumice stones or corn remedies
Ask for feet to be measured when buying shoes	Wear sandals if there is any loss of sensation in the feet
<i>Follow this advice and have feet checked regularly</i>	Go barefoot

Assess risk category using the structured foot examination in the patient's record on SCI-DC or refer to the protocol provided on the following page:

EXAMPLE PROTOCOL FOR THE ASSESSMENT OF RISK OF THE DIABETIC FOOT
ADAPTED FROM THE TAYSIDE FOOT RISK ASSESSMENT PROTOCOL

Patients with diabetes should be assessed annually by a diabetologist, GP, chiropodist, diabetes nurse specialist, or practice nurse with training in diabetes to look for presence of neuropathy, ischaemia or deformity.

Patients should be categorised according to the presence of the following symptoms/signs

Normal sensation AND good pulses AND no previous ulcer AND no foot deformity AND normal vision	Loss of sensation OR absent pulses (or previous vascular surgery) OR significant visual impairment OR physical disability (e.g. stroke, gross obesity)	Previous ulcer due to neuropathy/ischaemia OR Absent pulses and neuropathy OR Callus with risk factor (neuropathy, absent pulse, foot deformity) OR Previous amputation	Active foot ulceration, painful neuropathy which is difficult to control.
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LOW RISK	MODERATE RISK	HIGH RISK	ACTIVE FOOT DISEASE
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<ul style="list-style-type: none"> No specific regular chiropody input needed (except in exceptional circumstances) Patients can undertake their own nail care after appropriate education. Annual foot check 	<p>Regular (4-12 weekly) general chiropody input advised. For patients with visual impairment or physical disability, who would otherwise fit into the low risk category, input from trained Foot Care Assistants can be substituted (where available).</p>	<ul style="list-style-type: none"> Chiropodist with interest and expertise in diabetes either at diabetes unit or in community centre Chiropodist may want to consider orthotic referral. 	<p>Suggest making contact with local specialist diabetes team (hospital based).</p>
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In addition, patients with any of the following signs of **ischaemia** or **infection** should be considered for emergency referral to the hospital surgical receiving service or diabetic foot clinic, where appropriate:

<p>CRITICAL ISCHAEMIA</p> <ul style="list-style-type: none"> rest or night pain pale/mottled feet dependent rubor ischaemic ulceration gangrene 	<p>SEVERE INFECTION</p> <ul style="list-style-type: none"> abscess cellulitis
---	--

*SIGN 55, Management of Diabetes, 2001

Routes of referral:

For active foot ulceration:

- Refer to Podiatry for appointment within 48 hours, Tel: 01786 431133 **or** if signs of infection / critical ischaemia / generally a worrying-looking foot call bed manager on 01786 434000 and admit under Physicians

For high risk feet or Moderate risk feet:

- refer to Community Podiatrist using standard paper forms

For low risk feet:

- Continue to monitor annually in Primary care

3.4.2 Treating Diabetic Foot problems

Foot Ulcer

- Refer to hospital podiatry (Tel 01786 431 133) – should be seen within 48 – 72 hours, when further assessment and debridement will take place
- Advise on pressure relief – avoid standing and walking as much as possible, dress with semi-compressible felt/ Poron around the area of ulceration
- Treat infection (see below)
- Optimise glycaemic control

Foot Infections

- Refer to podiatry as above
- Initiate antibiotics in accordance with NHS Forth Valley Acute Empirical Management of Infection Guidance:
http://www.nhsforthvalley.com/web/FILES/CE_Guideline_AcuteMedicine/EmpiricalAntibioticGuidelines.pdf
- Signs of spreading infection or systemic sepsis – phone bed manager on 01786 434 000 and admit under Physicians.

Cellulitis

- Flucloxacillin and Benzylpenicillin oral or IV, or Clindamycin oral or IV
- If significant ischaemia or features suggestive of anaerobic infection consider adding Metronidazole 400mg 4 times a day by mouth (admit SRI under Physicians as above).

Charcot foot

Clinical diagnosis based on unilateral red, swollen, oedematous and possibly painful foot in the absence of infection. (However, ulcer may also be present). Other features - bounding foot pulses; differences between feet due to active Charcot's process creating deformity or fracture; impaired perception of monofilament.

- Refer to hospital podiatry urgently (Tel 01786 431133)
- Pressure off-loading – total contact casting may be offered by the hospital podiatrist, advise patients not to weight bear on the affected foot until seen
- Treat any ulceration or infection as above.

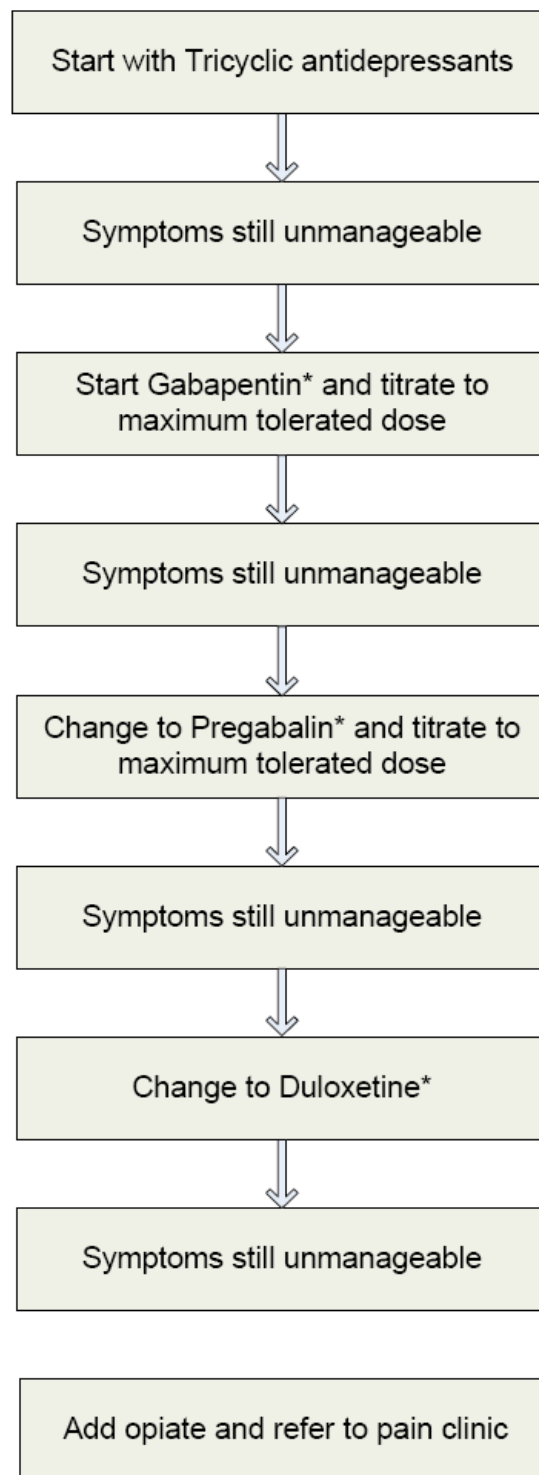
3.4.3 Antibiotic recommendations from the NHS Forth Valley Acute Empirical Management of Infection Guidance

	First choice	Penicillin Allergic	Comments
Diabetic foot ulcers – without systemic sepsis	Co-amoxiclav 625mg tds oral	Discuss with microbiology/ check recent microbiology results	Advise on pressure relief. Arrange review by Diabetes Consultant/ Specialist Podiatrist within 48 hours
Diabetic foot ulcers – if evidence of systemic sepsis	Piperacillin 4g/Tazobactam 500mg tds IV +/- Gentamicin IV as per protocol	Vancomycin IV + Gentamicin IV as per protocol + Metronidazole 400 mg tds oral	Advise on pressure relief. Admit under Diabetes Team and ensure review by Diabetic Consultant/ Specialist Podiatrist within 24 hours

Notes on duration of treatment

Duration 5-7 days (mild/moderate) to 10-14 days (severe) and then review need for longer treatment. If osteomyelitis present treat for at least 4-6 weeks and then review the need for longer treatment. IV antibiotics may be switched to oral preparations after an appropriate interval.

3.4.4 Treating Painful Diabetic Neuropathy



*** Recommended dose:**

Duloxetine	60mg/day
Gabapentin	900mg – 3600mg/day
Pregabalin	75mg bd – 600mg/day

3.5 Screening for retinopathy

The National Diabetic Retinal Screening Programme offers the opportunity of annual retinal screening to the diabetic population over the age of 12 years.

Patients are coded as diabetic on a GP system and populated with SCI-DC Network filter through to the Soarian (DRS) system and are automatically called for screening.

Trained screeners take digital images of the patient's eyes which are also available to view via SCI-DC Network. An Optometrist grades the images and a result a letter is sent indicating the condition of the patient's eyes to the patient and GP within 20 working days of the screening appointment.

Should significant retinopathy be identified, the patient will be referred for Specialist opinion and treatment at an eye clinic will be arranged if necessary.

A patient can be suspended from the screening programme by their GP, temporarily or permanently if the GP believes it is in their best interest to do so. For a copy of the current suspensions policy please click on the link below:

<http://www.ndrs.scot.nhs.uk/Manual/Docs/Suspensions%20Policy.pdf>

If you have any concerns regarding a patient's screening status please contact Mrs Lorraine Fowler (Diabetic Retinal Screening Administrator) on 01786 434169 or email lorraine.fowler@nhs.net

3.6 Psychological morbidity

Screening

Use Hospital Anxiety and Depression Scale (HADS).

Scores (for both anxiety and depression):

0 – 7 Minimal 8 – 10 Mild 11 – 15 Moderate 16 – 21 Severe

Stepped Care Model

Psychological Therapies are organised around a stepped care model. Step 1 includes Moodjuice and book prescription; step 2 is Beating the Blues, step 3 is Psychotherapy (including adult clinical psychology) and step 4 is Specialist services.

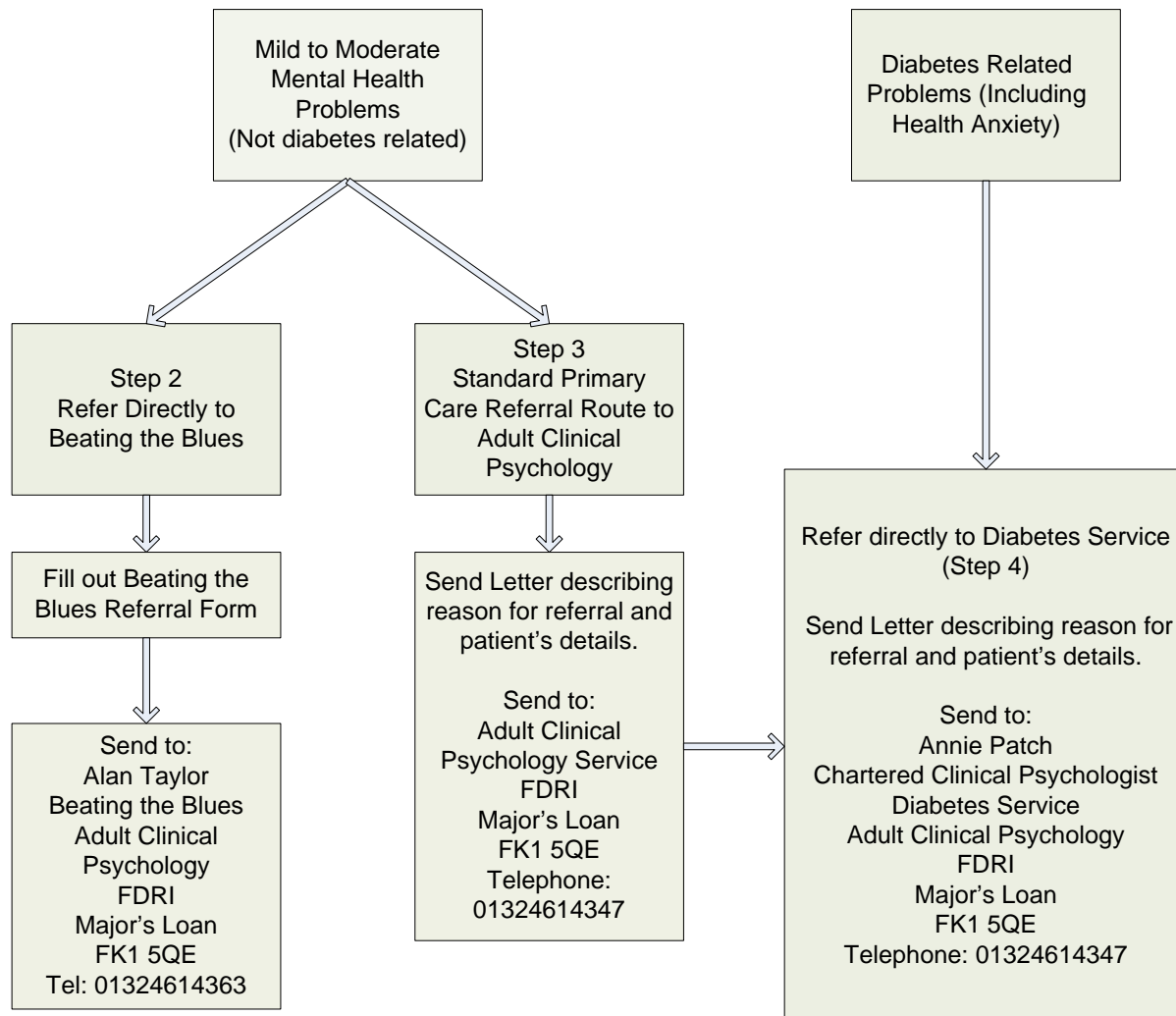
Step 1 relates to community well-being and milder mental health problems:

Refer patient to Moodjuice website - www.moodjuice.scot.nhs.uk

Book Prescription – Prescribe recommended books, available in local libraries for specific problems

- Go to Moodjuice Website
- Click on 'moodjuice professional'
- Menu on left hand side Click on 'Bk Prescription'
- Complete required fields (further directions given on website)

Psychology Referral Routes



4.0 Reproductive Health

4.1 Assessing and managing impotence

This affects 55% diabetic men >60 years and is often multifactorial.

→ Assessment

History

- define problem
- differentiate predominantly physical from psychological causes
- ascertain expectations of patient and partner

Examination

- For evidence of vascular disease, neuropathy and hypogonadism if suspected

Investigations

- HbA1c
- If hypogonadism suspected, morning testosterone. If low, repeat (testosterone, LH, FSH, Prolactin) and if hypogonadism confirmed refer to endocrine clinic.

→ Management

General

- Optimise glycaemia, limit alcohol, withdraw causative drugs

Pharmacological

- Oral PDE5 inhibitors (Sildenafil FV Formulary choice)
- Contra-indicated in men using nitrates or nicorandil and those with severe hepatic dysfunction or hereditary retinal disorders.
- Diabetic men may need 100mg dose; it should be used on 5 or 6 occasions with appropriate sexual stimulation before condemning it as ineffective.
- Intracavernosal alprostadil – refer urology

Mechanical

- Vacuum devices – in erectile dysfunction resistant to all pharmacological treatments these may still provide a useful erection and are acceptable to some. The devices and rings can be prescribed; cost £100 – £200.

→ Prescribing restrictions

- GPs are not restricted in their prescription of drugs for erectile dysfunction to men who have diabetes.
- Community pharmacists are unable to dispense prescriptions that do not contain the endorsement SLS.
- The Dept of Health considers that one treatment a week is reasonable but if the GP feels that more is necessary this can be prescribed.

4.2 Women considering pregnancy

Pregnancies in diabetic mothers have a 2-3 fold increased risk of major congenital malformation, miscarriage and stillbirth. This should be reduced by optimal pre-conception care. Good contraception and pre-pregnancy planning are thus essential.

Contraception

Individualised approach required.

As for general population, but with caveats:

- Favour Progesterone-Only Pill over combined Oral Contraceptive Pill (OCP) in women with complications, risk factors for vascular disease or over 35 years of age.
- Women using the intrauterine contraceptive device may be at increased risk of infection.
- Balance the risk of complications with the need to avoid pregnancy in women with complications or vascular risk - the levonorgestrel-releasing intrauterine device (Mirena coil) may be particularly suited as it is as effective as sterilisation and produces low circulating hormone levels

Pre-Pregnancy Care

- If possible refer Diabetes Specialist Nurse for pre-pregnancy care
- Ensure rubella immunity and normal thyroid function (aim for TSH <3 mmol/L)
- Review medications and **stop** ACE I, ARBs, statins and OHAs other than metformin
- Prescribe alternative antihypertensive meds if necessary – labetalol, methyldopa or nifedipine.
- Target HbA1c <6.5% prior to conception – changes in medication or introduction of insulin may be necessary
- Prescribe Folate 5mg daily at least 1 month prior to conception
- Establish if any complications are present prior to pregnancy
- Hypoglycaemia is more common in early pregnancy - teach partners to recognise and treat hypoglycaemia with glucagon if necessary

4.3 Antenatal Care

Women should contact their Diabetes Specialist Nurse as soon as a pregnancy test is positive. Care will be hospital based, from a multi-disciplinary team. Women attend every 2 to 4 weeks until 28 weeks and then every 1-2 weeks thereafter.

Glycaemia

Target blood glucose levels of 3.5 – 5.5 mmol/L fasting and before meals, and <8.5mmol/L 2hrs post-prandial. Target HbA1c <6.5%

Metabolic Complications

Hypoglycaemia with loss of awareness more common in 1st trimester. It has no long term adverse effects on foetal development.

Ketoacidosis can cause foetal death at any stage. All women should check urinary ketones if unwell or if blood glucose is >14mmol/L.

Microvascular Complications

Diabetic retinopathy and nephropathy can deteriorate during pregnancy. Digital retinal photography will be performed in each trimester.

Proteinuria increases transiently through pregnancy, returning to pre-pregnancy level within three months.

Nephropathy should be managed by an expert team.

Timing and Mode of Delivery

The timing and mode of delivery is individualised and in women with good control and no complications is usually planned for between 38 and 40 weeks. Women with diabetes have a higher caesarean section rate even after controlling for confounding factors.

Infants of Diabetic Mothers

A paediatrician will be present at the delivery of all women with diabetes. Babies of diabetic mothers have a higher rate of symptomatic hypoglycaemia, early feeding is advised to avoid this

Post Natal Care

Insulin requirements fall dramatically after delivery-reduce dose to pre-conception dose. Breast feeding mothers may need to reduce their doses further.

Discuss contraception prior to discharge.

All women should be reviewed at the clinic in 6 weeks.

4.4 Gestational Diabetes

Screening

Urine should be checked at each antenatal visit.

Timed laboratory plasma glucose should be measured:

- At booking
- At 28 weeks
- In persistent Glycosuria

Diagnosis

A 75g Oral Glucose Tolerance Test (OGTT) should be performed if plasma glucose is:

- >5.5 mmol/L 2 or more hours after food
- >7.0 mmol/L within 2 hours of food

Diagnosis of Gestational Diabetes Mellitus (GDM) is made after an OGTT as follows:

- Fasting glucose > 5.1mmol/L
- 2 hour glucose >8.5 mmol/L

Management

- Refer immediately to combined clinic (Tel: Diabetes Specialist Nurses, contact details on page 8).
- Teach blood glucose monitoring.
- Blood glucose management is individualised but if fasting blood glucose >5.5 mmol/L or 2 hr level >7 mmol/L intensive dietary modification is recommended plus oral metformin and/or multiple daily injections of insulin as appropriate.
- For those diagnosed before 30 weeks and/or with foetal abdominal circumference above 75th centile there is greatest benefit from aggressive management of glycaemia.
- Glucose targets are similar to established diabetes.
- Discontinue insulin at delivery.
- Ensure normoglycaemia returns.
- A 75 g OGTT should be performed 6 weeks post-partum.

Follow-up

- Annual fasting plasma glucose should be checked in the community in patients with GDM to detect asymptomatic diabetes and all future pregnancies should be screened.
- The benefit of exercise and weight loss should be highlighted in an effort to avoid future diabetes.

5.0 Medical Emergencies

5.1 Hypoglycaemia

All documented blood glucose values of <4.0 mmol/L can be considered a hypoglycaemic event and should not be tolerated in any patient on a regular basis.

- Hypoglycaemia is a serious side effect of therapy, which can be fatal.
- Hypoglycaemia is less common in patients treated with a sulphonylurea than in those taking insulin, but may be more prolonged and more severe, particularly when associated with alcohol excess.
- Glibenclamide is particularly prone to causing hypoglycaemia and should not be used in the elderly.
- All patients started on sulphonylurea drugs should be warned about the possibility of hypoglycaemia and asked to discontinue the tablets and seek advice should it occur.
- The symptoms and signs of hypoglycaemia can be variable. A high index of suspicion is often required.
- Hypoglycaemia occurring in the absence of glucose lowering treatment requires further investigation. In particular Addison's should be considered. (Pigmentation, hypotension, hyponatraemia, hyperkalaemia). Should be discussed with endocrinologist.

Symptoms of hypoglycaemia may include:

- Hunger
- Blurred Vision
- Sweating
- Headache
- Trembling of arms and legs
- Feelings of palpitation
- Tingling in tongue and mouth

Confirmation by blood glucose measurement is desirable but glucose strips may be inaccurate at low blood glucose concentrations.

Treatment of Mild Hypoglycaemia

Rapid acting carbohydrate i.e. 3 glucose tablets, ordinary Coke or lemonade, milk with 2 teaspoons sugar. Follow with slow acting carbohydrate i.e. sandwich, roll, toast, banana, apple, 2-3 biscuits or next meal if due.

Treatment of Moderate-Severe Hypoglycaemia

HYPOSTOP is a thick glucose gel, which is easily absorbed through the buccal mucosa. It is indicated in confused or drowsy patients; **care should be taken to avoid swallowing of the gel when consciousness is impaired.** Intravenous dextrose is the emergency treatment of choice in the unconscious patient (Min-I-Jet is a convenient formulation containing 50 ml of 50% dextrose in a preloaded disposable syringe).

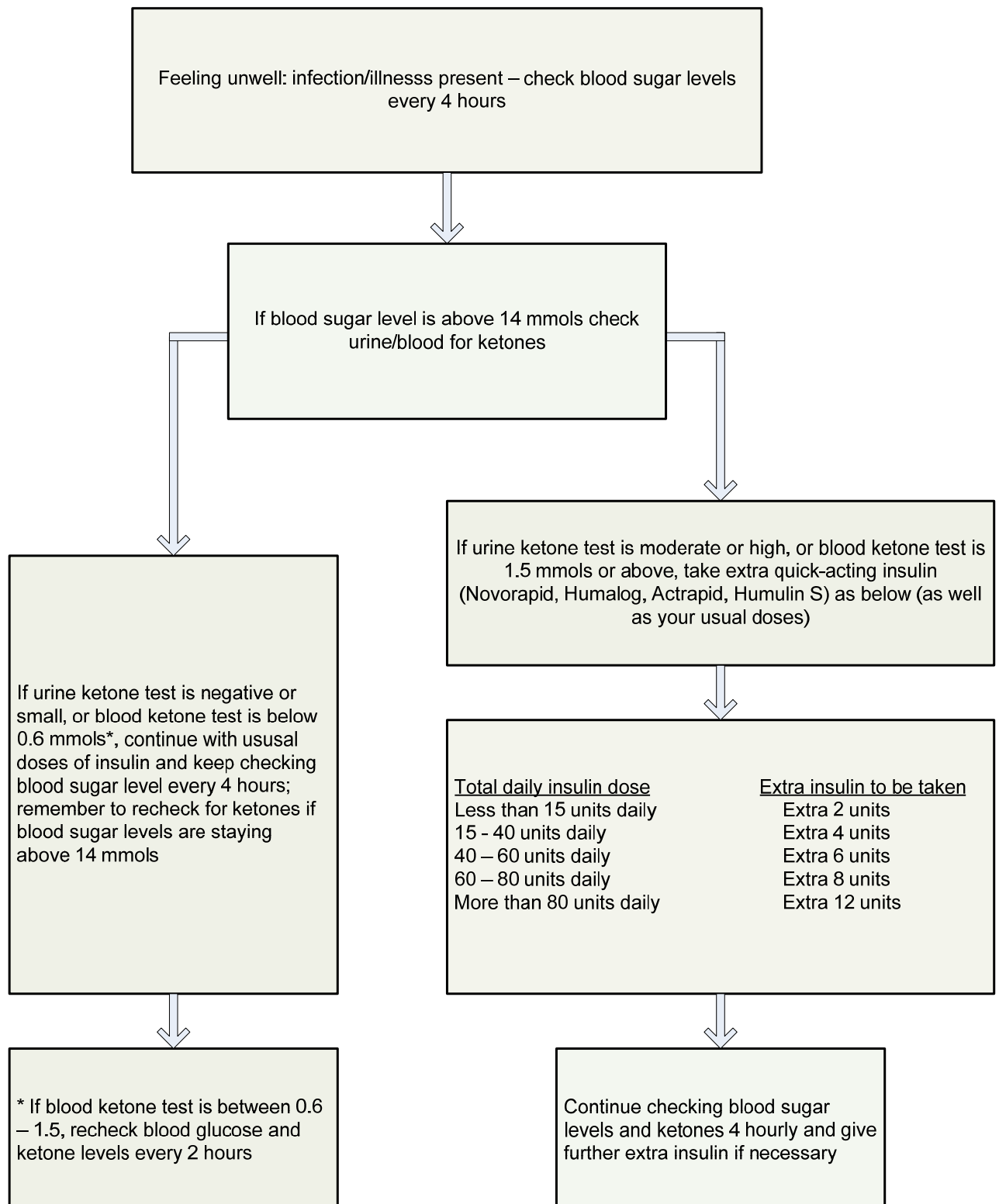
GLUCAGON (iv, im or sc) is also useful, in insulin-taking patients. It may take 10-15 minutes to act as it relies on endogenous stores of glycogen. Glucagon may be less effective in some patients with depleted glycogen stores (e.g. in starvation or in alcoholics). It's less useful in hypoglycaemia induced by sulphonylureas, as it may stimulate further insulin secretion in a glycogen-depleted patient.

5.2 Hyperglycaemia in patients with Type 1 diabetes

If vomiting, heavy blood or urine ketone load, hyperventilating or looking unwell refer SRI CAU for treatment of assumed Diabetic Ketoacidosis (Tel bed manager 01786 434 000)

If able to eat and drink, try following Sick Day Rules
(all patients with Type 1 diabetes should have a copy of these at home)

Sick Day Rules



If patients are following sick day rules remind them:

- **Never stop taking your usual doses of insulin**
- Follow all basic advice for illness i.e. replacing solid foodstuffs with lighter substitutes and/or sugary liquids if unable to eat properly; drinking plenty of water/diet juice; **contacting your GP if unable to keep any liquids down** or if you suspect that you may have an infection (may require antibiotics).
- If blood sugar levels are above 28 mmols for more than 2 tests, double the extra dose amounts.
- **If you have had to give an extra dose on 3 occasions, contact the Diabetes Centres (Falkirk 01324 616041 or Stirling 01786 434472) or GP.**
- This guideline should **not be used if you are pregnant**; if ketones are present at any stage during your pregnancy, contact the Diabetes Nurses or Ward 19 in Stirling Royal Infirmary (01786 434419)

5.3 Inter-current illness in Type 2 diabetes

General measures:

- Maintain fluid intake – 100-200 ml per hour
- Continue to take small amounts of carbohydrate regularly – toast, cereal, flat coke, etc
- Generally continue to take medication but patients at risk of dehydration should temporarily withhold ACE-inhibitors and diuretics – GP must consider on an individual basis.
- If equip to do so, patients should check blood glucose 6-hourly
- Sulphonylurea medication may need to be increased temporarily
- Insulin may be required for the duration of the illness

If patient unable to maintain adequate oral intake, drowsy, or ill-looking consider **Hyperosmolar Non-ketotic State (HONK)** – this carries a very high mortality rate. **Refer for immediate admission**, SRI bed manager 01786 434000

6.0 Children and Adolescents

6.1 Children

Any child suspected of having diabetes in primary care should be referred via one of the following numbers:

- Diabetes nurses on 01786 433667
- Paediatrics registrar via SRI switchboard 01786 434000
- Ward 17, SRI, on 01786 434417.

After hospital assessment it may not be necessary to detain a well child for admission, but a formal education and management plan will have been initiated.

Insulin use in children

Typically children are treated with twice daily pre-mixed insulin but different regimens are also used, including once-daily, multiple daily injections, and continuous subcutaneous infusions.

Blood glucose monitoring

Children and their parents/carers will be provided with a blood glucose meter and taught how and when to test capillary blood glucose values and the significance of the results.

Education

The Children's Diabetes Liaison nurse will provide support and education for the child with newly-diagnosed diabetes and their family. Initial topics of education will include practical matters such as coping with hypoglycaemia and the possible effects of exercise on diabetes. Following the initial education, the family will learn about other aspects of diabetes.

Hospital contacts will be frequent over the initial weeks of diabetes. Once a good initial grasp of diabetes management is achieved attendances at clinic are likely to be every 3 months.

School

The family and child will plan the return to school with their Diabetes Nurse around their own circumstances and will receive an information pack to be passed to the school.

The class teacher should be aware of the diagnosis and should understand the following:

- The need for mid morning and afternoon snacks
- How to recognise and treat hypoglycaemia
- Sport should be encouraged with the usual precautions

Further advice

Diabetes nurses can be contacted by parents and patients between 9 and 5, Monday to Friday (contact details on page 8); the Diabetic Helpline for children with diabetes and their carers operates out with these hours, from 7am – 11pm, every day, Tel: 0845 2700070.

6.2 Adolescents

Aims of Diabetes Care during Adolescence:

- Promotion of physical and psychological well being
- Normal growth and development
- Avoidance of hospitalisation
- Achievement of good glycaemic control to prevent long term microvascular complications
- Adequate screening for the detection of complications
- Integration of the patient into the normal school, social and working life of people in their age group

Clinics for adolescents and Young Adult Clinics

Adolescent and Young Adult Diabetes Clinics are run in Falkirk & Stirling Royal Infirmaries.

To avoid the transfer of care from paediatric to adult services being traumatic, a “Transition” clinic runs with input from both paediatric and adult physicians, nurses, dietitian, podiatrist and in some cases, psychologists. Enrolment in this clinic is at the discretion of the paediatric staff based on the physical and emotional maturity of the individual. Generally adolescents between the age of 12 – 16 are seen in this setting, jointly.

At some point between the age of 16 and 20 they progress to the Young Persons clinic. The default rate has been shown to be significantly lower when attending these types of clinic than for young adults who attend the standard adult diabetes clinic.

Management of Type 1 diabetes in adolescents

Insulin regimens which were suitable in a child may not meet the additional requirements for flexibility in an adolescent or young adult – multiple daily injections are more common in this age group.

Home blood glucose monitoring is to be encouraged, but a heavy-handed approach can lead to conflict.

Patients should be reminded of Sick Day Rules and be confident they would know when and how to test for ketones.

Alcohol, Sex and Drugs

Most young people with diabetes use alcohol to the same extent as those without. Alcohol excess is the commonest identifiable cause of ketoacidosis in male teenagers. Alcohol consumption is also a major contributing factor towards hypoglycaemia and has been implicated in sudden unexplained nocturnal death in young people.

A complete ban on alcohol is likely to be ignored and sensible advice regarding moderate and safe consumption should be given.

Unplanned pregnancies still occur regularly in young diabetic females. Contraception and pregnancy should be routinely discussed because of the deleterious effect of poor glycaemic control on foetal development.

Counselling and contraceptive advice is available to males and females attending the Young Adult Clinic.

Illicit drug use is no more common in adolescents with diabetes but use of illicit drugs in diabetes may result in potentially serious adverse metabolic consequences. Ecstasy has been associated with severe dehydration and the development of ketoacidosis.

Further information can be obtained from:

- 'My Life – for Young People with Diabetes' on the Diabetes UK website: <http://www.diabetes.org.uk/Guide-to-diabetes/My-life/>
- Your local Forth Valley Diabetes team (contact details on page 8)

Appendix 1 Changing Behaviour

During the clinic *two* distinct stages are identified:

1 Assessment of Risk Behaviours

This stage involves clearly establishing the patient's current behaviour in relation to the areas of exercise, smoking and diet. The purpose of this stage is to identify which of these behaviours the patient will be encouraged to consider changing.

2 Assessing Motivation to Change and Planning Action

This stage involves explaining to the patient which behaviours they would be advised to try to change, to determine their motivation to make such change and to negotiate an action plan which they will follow in attempting to change ONE TARGET BEHAVIOUR initially.

This section gives some advice on how you can assess motivation to change and negotiate an action plan with your patients.

The process of behavioural change

Many people are inclined to think that behaviour change simply involves a conscious decision to do things differently. However, the process of change, particularly of long-standing habitual behaviours, is more complicated than this.

It has been suggested that such change can be viewed as a process consisting of six different stages through which a person passes. During each stage the person's motivation to change will be different and therefore their willingness to accept advice and help will vary. Being aware of which stage a particular patient is at can help you decide how best to encourage them towards actually making the change.

Pre-contemplation

“Not interested in changing risk behaviour”

Many people are not interested in changing risk behaviours such as smoking, poor nutrition, inactivity or overeating. They may not ever have considered change or been made aware of the risks they are running. They may have become demoralised about their ability to change or defensive about their risk behaviour.

A person at this stage is unlikely to respond to advice that they should change or to want to discuss action plans for change. The aim should be to establish whether the person understands fully the risks associated with their present behaviour and to correct any misconceptions they may have.

Possible areas for discussion:

- Does the patient think their present behaviour is in any way bad for their health? If so, how?
- To provide them with information about the actual risks they are running.
- To suggest that they might wish to think about changing their behaviour.
- To emphasise that help is available to assist them to change if they decide to attempt it.

For some patients this may be the only intervention that is appropriate on their first visit to a clinic, although they may be more motivated to change their behaviour at a follow-up visit.

Contemplation

“Thinking about changing risk behaviour”

Once aware of the potential benefits of change, people go through a stage of thinking about change. They weigh up the costs and benefits and seek information to help them decide. They may not yet be convinced that the benefits outweigh the costs or that they are capable of making the change.

Possible areas for discussion:

- Encourage the patient to discuss or list the reasons for changing (benefits) and the reasons for not changing (costs).
- Try to encourage recognition of any benefits they may have overlooked.
- Encourage the patient to express any doubts they may have about their own ability to change.
- Emphasis that such doubts can be addressed when considering a plan of action to change.

Preparation

“Preparing to change risk behaviour”

At this stage, a person has decided to actually attempt to change their behaviour and is thinking about how they will do it. If your patient is at this stage they are likely to be helped most by a discussion of an action plan which they can follow.

Possible areas for discussion:

- Discuss what ideas the patient has for how they might change their behaviour.
- Identify any problems or barrier they see which might interfere with their plans.
- Offer advice on how they might amend their plan to maximise their chances of success.
- Discuss how they might prepare to cope with any problems or barriers that arise.
- Negotiate a clear plan of action which is recorded on a patient feedback and goal planning form.

Action

“Making changes to risk behaviour”

Action is the stage in which a person actually makes changes to their behaviour. A clear realistic plan, support and rewards are features of success at this stage. Since it is the aim of the clinic to prepare clients for this stage, your role is likely to be to try to ensure that the patients plan for change is realistic, to encourage them to enlist the support of family or friends in making the change and, where appropriate, to agree a specific date on which you will see them again to review progress.

Maintenance

“Maintaining changes in risk behaviour”

Once habits are broken a person has to settle into a new way of behaving. When new habits become well-established the person is seen as moving out of the change process into a long term “safer” lifestyle. Sometimes maintaining the new behaviour is difficult and remains a struggle for some time, requiring constant vigilance and support to avoid relapse. Some of your patients may be in this stage when they first attend your clinic or at follow-up visits, when they have attempted to implement agreed action plans.

Possible areas for discussion:

- To encourage the patient to identify any problems or threats to maintaining their new behaviour.
- To discuss how they might overcome or cope with these problems.
- To encourage them not to see any lapses as complete failures but rather to view them as difficulties from which they can learn.
- To strongly reinforce and congratulate them on any success they have had in beginning the process of change.

Relapse

“Going back to the risk behaviours”

When a person is unable to maintain the change, old habits return. Sometimes this is because the costs/benefits balance has shifted due to other changes in the person’s life and the change is no longer perceived as worthwhile. Sometimes the environmental or individual support has been withdrawn or become less effective, thus making it seem too difficult to maintain the change. If your client is in this stage, having tried but failed to change a risk behaviour, your aim should be to try to encourage them to think of trying again when they feel ready.

Possible areas for discussion:

- To advise the patient that people often take several attempts before they succeed in changing risk behaviour for good.
- Encourage the patient to look at what they can learn from their last attempt.
- Encourage the patient to try again when he/she feels ready.
- Stay supportive and positive, aim to help rebuild their self confidence.