

# Barns Medical Practice Service Specification: Diabetes

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## **Introduction**

Diabetes mellitus is a life-long progressive condition that can be controlled but not cured. In 2014 the global prevalence of diabetes was estimated to be 9% among adults aged 18+ years (1). Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood sugar (2). Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. Evidence suggests that controlling blood glucose and blood pressure to near normal levels reduces and /or delays long term complications. It is also very important to modify lifestyle to help manage this condition; this includes weight management, smoking cessation and attention to alcohol consumption. Diabetes can largely be self-managed with the correct education, understanding and support. Barns medical Practice offers services to diagnose, treat, support and monitor diabetic patients as explained below. The clinicians also work with the wider multidisciplinary team. This includes podiatrists, dieticians and specialists in diabetes within secondary care. The staff at Barns Medical Practice refers patients to these services if indicated.

## **Diagnosis**

### **Type 1 diabetes**

Type 1 diabetes (previously known as insulin-dependent, juvenile or childhood-onset) is characterized by deficient insulin production and requires daily administration of insulin. The cause of type 1 diabetes is not known and it is not preventable with current knowledge. Symptoms include excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes and fatigue. These symptoms may occur suddenly.

### **Type 2 diabetes**

Type 2 diabetes (formerly called non-insulin-dependent or adult-onset) results from the body's ineffective use of insulin. Type 2 diabetes comprises 90% of people with diabetes around the world (2), and is largely but not always the result of excess body weight and physical inactivity. Symptoms may be similar to those of Type 1 diabetes, but are often less marked. As a result, the disease may

be diagnosed several years after onset, once complications have already arisen. It is often picked up during routine screening and annual blood reviews in people who have other conditions such as hypertension, hypothyroidism and cardiovascular disease. Until recently, this type of diabetes was seen only in adults but it is now also occurring in children who are overweight.

### **Gestational diabetes**

Gestational diabetes is hyperglycaemia with blood glucose values above normal but below those diagnostic of diabetes, occurring during pregnancy. Women with gestational diabetes are at an increased risk of complications during pregnancy and at delivery. They are also at increased risk of type 2 diabetes in the future. They should therefore be advised at diagnosis to attend 3 yearly for screening as per appendix 3. This group of patients do not receive a letter to attend for review. Gestational diabetes is diagnosed through prenatal screening, rather than reported symptoms (6).

### **Impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG)**

Impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG) are intermediate conditions in the transition between normality and diabetes. People with IGT or IFG are at high risk of progressing to type 2 diabetes, although this is not inevitable. Lifestyle modification can often be beneficial in delaying/preventing the progression to diabetes.

### **Methods and criteria for diagnosing diabetes**

At diagnosis individuals often complain of the symptoms listed above but can occasionally be asymptomatic. Diagnosis is always confirmed by blood sampling which is done by one of the clinicians in the surgery. The current World Health Organisation (WHO) diagnostic criteria for diabetes are used widely within the U.K.

Fasting plasma glucose  $\geq 7.0$ mmol/l or 2-h plasma glucose  $\geq 11.1$ mmol/l.

This is the diagnostic method used within Barns Medical Practice. In 2011 there was a decision by the WHO to accept the use of glycosylated haemoglobin (HbA1c) testing in diagnosing diabetes. HbA1c is a blood test that reflects the blood glucose of an individual over the preceding 6-8 weeks and is widely used in routine monitoring.

1. Diabetes symptoms (e.g. polyuria, polydipsia and unexplained weight loss for Type 1) plus:
  - a random venous plasma glucose concentration  $\geq 11.1$  mmol/l or
  - a fasting plasma glucose concentration  $\geq 7.0$  mmol/l (whole blood  $\geq 6.1$  mmol/l) or
  - Two hour plasma glucose concentration  $\geq 11.1$  mmol/l two hours after 75g anhydrous glucose in an oral glucose tolerance test (OGTT). For OGTT procedure see appendix 1
2. With no symptoms diagnosis should not be based on a single glucose determination but requires confirmatory plasma venous determination. At least one additional glucose test result on another day with a value in the diabetic range is essential, either fasting, from a

random sample or from the two hour post glucose load. If the fasting random values are not diagnostic the two hour value should be used.

### **Haemoglobin A1C (HbA1c) testing to diagnose diabetes**

An HbA1c of 48mmol/mol (6.5%) is recommended as the cut off point for diagnosing diabetes. A value of less than 48mmol/mol (6.5%) does not exclude diabetes diagnosed using glucose tests. In patients without symptoms of diabetes the laboratory venous HbA1c should be repeated. If the second sample is <48mmol/mol (6.5%) the person should be treated as at high risk of diabetes and the test should be repeated in 6 months or sooner if symptoms develop (4).

### **What is impaired fasting glycaemia? The WHO has also said that someone has impaired fasting glycaemia if they have:**

- a fasting blood glucose between 6.1 to 6.9 mmol/L, AND.
- a blood glucose of less than 7.8 mmol/L after a two-hour oral glucose tolerance test ( see appendix 1)

### **What is impaired glucose tolerance?**

If you have impaired glucose tolerance, your blood glucose is raised beyond the normal range but it is not so high that you have diabetes. However, if you have impaired glucose tolerance you are at risk of developing type 2 diabetes. Impaired glucose tolerance is sometimes referred to as pre-diabetes.

Between 1 to 3 out of 4 people with impaired glucose tolerance will develop diabetes within ten years.

It is also thought that having impaired glucose tolerance increases your risk of developing cardiovascular disease (that is, heart disease, peripheral vascular disease and stroke). Also, people who have impaired glucose tolerance are more likely also to have other risk factors for cardiovascular disease, including high blood pressure, raised cholesterol levels, being overweight, etc. If diagnosed with this condition the individual is eligible for an annual review which is usually carried out by the Health Care Assistant and the results are assessed by a GP or nurse with a special interest in diabetes. These patients are not lettered annually to come in but will have a yellow reminder flagged in notes and will be asked at diagnosis to attend on an annual basis. For the protocol see appendix 2. For further reading and management see

<http://www.patient.co.uk/health/impaired-glucose-tolerance>

## **Treatment**

Treating type 2 diabetes There's no cure for diabetes, so treatment aims to keep your blood glucose levels as normal as possible and to control your symptoms, to prevent health problems developing later in life.

## **Making lifestyle changes**

After being diagnosed with type 2 diabetes, or if you're at risk of developing the condition, the first step is to look at your diet and lifestyle, and make any necessary changes.

By eating healthy and losing weight (if you're overweight) and exercising regularly you may be able to keep your blood glucose at a safe and healthy level without the need for other types of treatment.

### **Diet**

Increasing the amount of fibre in your diet and reducing your fat intake, particularly saturated fat, can help prevent type 2 diabetes, as well as manage the condition if you already have it. The Diabetes UK website has more information and advice about healthy eating.

### **Weight**

If you're overweight or obese (you have a body mass index (BMI) of 30 or over), you should lose weight, by gradually by reducing your calorie intake and becoming more physically active (see below). To help you achieve changes in your behaviour, you may be referred to a dietician for a personal assessment and tailored advice about diet and physical activity. Currently South Ayrshire Council are working in partnership with NHS Ayrshire and Arran health board to allow us to offer various exercise programmes coordinated via the Citadel leisure centre such as "Weigh to Go" "Invigorate" and "Activity for Health". See appendix 3. The Diabetes UK website has more information and advice about getting active and staying active.

### **Driving**

The websites listed below give details of the implications for driving with diabetes or ask the clinician at a review appointment and patient information leaflets may be supplied.

<http://www.patient.co.uk/doctor/3-diabetes-mellitus-dvla-guide>

<https://www.gov.uk/diabetes-driving>

## **Medicines for type 2 diabetes**

### **Metformin**

Metformin is usually the first medicine that's used to treat type 2 diabetes. It works by reducing the amount of glucose that your liver releases into your bloodstream. It also makes your body's cells more responsive to insulin. If you're overweight, it's also likely you'll be prescribed metformin. Unlike some other medicines used to treat type 2 diabetes, metformin shouldn't cause additional weight gain. However, it can sometimes cause mild side effects, such as nausea and diarrhoea and you may not be able to take it if you have kidney damage.

## **Sulphonylureas**

Sulphonylureas increase the amount of insulin that's produced by your pancreas. An example of a sulphonylurea commonly used in Barns Medical Practice is gliclazide. You may be prescribed one of these medicines if you can't take metformin, or if you aren't overweight. Alternatively, you may be prescribed sulphonylureas and metformin if metformin doesn't control blood glucose on its own. Sulphonylureas can increase the risk of hypoglycaemia (low blood sugar) because they increase the amount of insulin in your body. They can also sometimes cause side effects including weight gain, nausea and diarrhoea.

## **Glitazones (thiazolidinediones, TZDs)**

Thiazolidinedione medicines (pioglitazone) make your body's cells more sensitive to insulin so that more glucose is taken from your blood. They're usually used in combination with metformin or sulphonylureas, or both. They may cause weight gain and ankle swelling (oedema) you shouldn't take pioglitazone if you have heart failure or a high risk of bone fracture. Another thiazolidinedione, rosiglitazone, was withdrawn from use in 2010 due to an increased risk of cardiovascular disorders, including heart attack and heart failure.

## **Gliptins (DPP-4 inhibitors)**

Gliptins work by preventing the breakdown of a naturally occurring hormone called GLP-1. GLP-1 helps the body produce insulin in response to high blood glucose levels, but is rapidly broken down. By preventing this breakdown, the gliptins (linagliptin, saxagliptin, sitagliptin ) prevent high blood glucose levels, but don't result in episodes of hypoglycaemia. You may be prescribed a gliptin if you're unable to take sulphonylureas or glitazones, or in combination with them. They're not associated with weight gain.

## **GLP-1 agonists**

Exentide is a GLP-1 agonist, an injectable treatment that acts in a similar way to the natural hormone GLP-1 (see the section on gliptins, above). It's injected twice a day and boosts insulin production when there are high blood glucose levels, reducing blood glucose without the risk of hypoglycaemia episodes ("hypos"). It also leads to modest weight loss in many people who take it. It's mainly used in people on metformin plus sulphonylurea, who are obese. A once-weekly injectable medication has also been introduced in this class of drug and is called Bydureon. Another GLP-1 agonist called liraglutide is a once-daily injection (exenatide is given twice a day). Like exenatide, liraglutide is mainly used for people on metformin plus sulphonylurea, who are obese, and in clinical trials it's been shown to cause modest weight loss.

## **Acarbose**

Acarbose helps prevent your blood glucose level from increasing too much after you eat a meal. It slows down the rate at which your digestive system breaks carbohydrates down into glucose. Acarbose isn't often used to treat type 2 diabetes because it usually causes side effects, such as bloating and diarrhoea. However, it may be prescribed if you can't take other types of medicine for type 2 diabetes.

## **SGLT2 inhibitors**

There are three different tablets in this group. SGLT2 Inhibitors work by reducing the amount of glucose being absorbed in the kidneys so that it is passed out in the urine and reducing the amount of glucose in your blood. All are taken once a day. Because of the way they work, your urine will test positive for glucose while you are on this medication. How effective it is depends on your kidney function. There is a risk of genital infections and urinary tract infections.

## **Insulin treatment**

If glucose-lowering tablets aren't effective in controlling your blood glucose levels, you may need to have insulin treatment. This can be taken instead of or alongside your tablets, depending on the dose and the way that you take it. Insulin comes in several different preparations, and each works slightly differently. For example, some last up to a whole day (long-acting), some last up to eight hours (short-acting) and some work quickly but don't last very long (rapid-acting). Your treatment may include a combination of these different insulin preparations. Insulin must be injected because if it were taken as a tablet, it would be broken down in your stomach like food and unable to enter your bloodstream. If you have type two diabetes and require to progress to insulin there are clinicians within the surgery who can assist with its initiation and support you as you develop the skills required to manage this. We offer frequent appointments and telephone consultations to ensure that you have the necessary support.

## **Other treatments**

If you have type 2 diabetes, your risk of developing heart disease stroke and kidney disease is increased. To reduce your risk of developing other serious health conditions, you may be advised to take other medicines, including:

- anti-hypertensive medicines to control high blood pressure
- a statin such as simvastatin or atorvastatin, to reduce high cholesterol
- low-dose aspirin to prevent a stroke
- an angiotensin-converting enzyme (ACE) inhibitor, such as lisinopril or ramipril, if you have the early signs of diabetic kidney disease

Diabetic kidney disease is identified by the presence of small amounts of albumin (a protein) in your urine. If treated early enough, it may be reversible.

## Regular Review

Effective diabetes care can be achieved through working closely with your diabetes healthcare team – they are there to support you in self-managing your diabetes. Barns Medical Practice adopts a multidisciplinary team approach to diabetes management. Once diagnosed and stabilised on treatment you are offered a biannual review with a nurse and/or GP who have a special interest in diabetes. There is also access to the dietician, the optician and podiatry where indicated. The most important person in the team is you – because the decisions made will affect you. Taking responsibility for your diabetes will enable you to manage your diabetes more effectively. Ask questions and request more information if you need to. Prior to each 6 monthly visit you are asked to attend the Health Care Assistant (HCA) to complete a preview including blood sampling. For protocol see appendix 4. The nurse and/or GP will be available to discuss the blood results and answer any questions you have regarding the progression of your condition. Efforts will be made to motivate you and encourage you to make any recommended lifestyle changes. There is robust screening for the potential complications of diabetes and particular attention is paid to cardiovascular screening such as BP and cholesterol to try to minimise the risk of heart attacks and strokes in the future. All the potential problems, complications and treatments are considered at your review. The management broadly follows the guidance as recommended by the Scottish Intercollegiate Guidelines Network (SIGN), ie. SIGN 116, 2010 and reference may also be made to the NICE Type 2 Diabetes in Adult Guideline, 2016

### **Monitoring blood glucose levels**

If you have type 2 diabetes, the diabetes care team will need to take a reading of your blood glucose level about every six months. This will show how stable your glucose levels have been in the recent past and how well your treatment plan is working. The HbA1c test is used to measure blood glucose levels over the previous two to three months. HbA1c is a form of haemoglobin, the chemical that carries oxygen in red blood cells, which also has glucose attached to it. A high HbA1c level means that your blood glucose level has been consistently high over recent weeks, and your diabetes treatment plan may need to be changed. Your diabetes care team can help you set a target HbA1c level to aim for. This will usually be less than 60mmol/mol (7.5%).

### **Monitoring your own blood glucose**

If you have type 2 diabetes, as well as having your blood glucose level checked by a healthcare professional every six months, you may be advised to monitor your own blood glucose levels at home. Even if you have a healthy diet and are taking tablets or using insulin therapy, exercise, illness and stress can affect your blood glucose levels. Other factors that may affect your blood glucose levels include drinking alcohol, taking other medicines and, for women, hormonal changes during the menstrual cycle. A blood glucose meter is a small device that measures the concentration of glucose in your blood. It can be useful in detecting high blood sugar (hyperglycaemia) or low blood sugar (hypoglycaemia). If blood glucose monitoring is recommended, you should be trained in how to use a blood glucose meter and what you should do if the reading is too high or too low. Ask a member of Barns Medical Practice diabetes care team prior to purchasing one as this can be supplied by the surgery if indicated.

Resources for Staff and or Patients

The Diabetes Clinical Advice Service provided via the Diabetes Clinical Mailboxes for Ayr  
**Clinical\_Specialty\_DiabetesClinicalAdviceService\_Ayr**

Practice specific information: See attached appendices

## **Internet information**

[www.diabetes.org.uk](http://www.diabetes.org.uk)

[www.mydiabetesmyway.scot.nhs.uk](http://www.mydiabetesmyway.scot.nhs.uk)

DVLA- [www.gov.uk/browse/driving/disability-health-condition](http://www.gov.uk/browse/driving/disability-health-condition)

My Diabetes My Way - <http://www.mydiabetesmyway.scot.nhs.uk/default.asp>

Stop Smoking Guidance <http://athena.adtc/DTC%20%20Clinical%20Guidelines/ADTC20.pdf>

## **Staff involved and training required**

HCA: blood sampling, OGTT procedure, annual review procedure, BP monitoring, foot examination, onward referral and booking review appointments.

GPs and Nursing staff with a special interest in diabetes: There should be a commitment to ongoing personal development and updating with regard to the management of diabetes and treatment choices. They should commit to auditing the service that is established and improve if indicated. There is 3 years of audit data available for the service received by newly diagnosed diabetics and the audit criteria is shown in appendix 5.

## **Advertising of service to patients**

Details of this service will be available on the practice website.

Patients will be advised of the service at the point of diagnosis.

## References

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