

Department of Diabetes

Clinic Guide

Foot screening
I targets
Treatment
Healthy lifestyles
Type 1
Type 2
Eye screening
About diabetes
Sick day rules
Insulin dose adjustment
tesmyway
VE

St John's Hospital
Livingston
West Lothian
EH54 6PP



Contents

- Introduction 1
- Contact details 2
- A few statements about diabetes 3
- Your review appointment at the Diabetes Clinic 4
- Understanding the letter that you receive 7
after your hospital appointment
- Biochemistry section 10
- Personal targets 13
- Eye screening 14
- Foot screening 15
- Healthy lifestyles 17
- Useful information for local activities 18
- DAFNE - Dose Adjustment For Normal Eating 19
- General advice on insulin dose adjustment 20
- Pregnancy and diabetes 22
- Sick Day Rules 24
- Research 30
- Mydiabetesmyway 31



Introduction

Welcome to the diabetes department at St John's Hospital.

Everyone in the department is here to help you with your diabetes. This guide has been produced to give you some information about how the clinics run, what is available in terms of services and how we share information with you.

We want to support people with diabetes, their families and carers by providing advice, education and first-class treatment by fully-trained staff. This support and care will be tailored to suit your individual needs and requirements and we will discuss this with you at every stage of your treatment.

We aim to do this in a friendly and efficient manner in a safe and clean environment.

If anything is not clear please ask and we welcome comments on our services and this publication.



Contact details

Secretaries

Karen Robertson (Dr. Walker's secretary) 01506 523855
Joyce Mighton (Dr. Adamson's secretary) 01506 523838
Tracy Smith (Department Secretary) 01506 523858

Diabetes Nurses 01506 523856

Liz Hazzard / Eilidh Vass / Maureen McKay
Kirsty Aitken / Anna Gibson

Research Nurse 01506 523854

Katie Fairley

Podiatrists 01506 523175

Suzanne Ralston / Colette Cargill

Dietitians 01506 523174

Emma Shaw / Jane Macdonald
Grace Bathgate

Reception (OPD 1) 01506 523181

Retinal Screening 0131 536 4145

Smoking Cessation 01506 523871

Email addresses

liz.hazzard@nhslothian.scot.nhs.uk
eilidh.vass@nhslothian.scot.nhs.uk
maureen.mckay@nhslothian.scot.nhs.uk
kirsty.aitken@nhslothian.scot.nhs.uk
anna.gibson@nhslothian.scot.nhs.uk
karen.adamson@nhslothian.scot.nhs.uk
james.walker@nhslothian.scot.nhs.uk

A few statements about diabetes

1. Diabetes is a serious condition that needs to be treated with respect and the younger you are at the time of diagnosis the more respect it deserves.
2. Diabetes can damage any of the blood vessels in the body and the aim of treatment of diabetes is to protect the blood vessels from the damage that high glucose levels, high blood pressure levels, high cholesterol levels and smoking can cause.
3. We know that the blood vessels of the eyes, kidneys and nerves are protected by having good blood glucose levels.
4. We know that the larger blood vessels are protected by having good levels of blood pressure and cholesterol and not smoking.
5. In Type 2 diabetes glucose levels tend to rise with age as weight tends to increase and so more therapy is needed.
6. Weight loss and regular exercise improve insulin levels and action in people with type 2 diabetes and thus weight loss is a very important treatment for type 2 diabetes.
7. Treatment with insulin can cause low glucose levels (hypoglycaemia). This should be an uncommon event and quickly recognised by you
8. Technology can help with the management of glucose levels but controlling glucose levels can be hard.
9. Diabetes is a family affair. Members of your family and close friends should understand living with diabetes and help you.
10. The majority of people with diabetes do extremely well.

Your review appointment at the Diabetes Clinic

Diabetes UK has issued a 15 point checklist to help you ensure you are getting all the care you need. Getting all the checks, seeing the right healthcare professionals and understanding your diabetes are all essential in helping you manage your condition. The 15 measures are:

1. Have your blood glucose levels measured annually. The HbA1c check is a measure of your overall glucose control. In discussion with your doctor or nurse, you should agree an individual target that is appropriate for you.
2. Have your blood pressure measured annually.
3. Have your blood fats (cholesterol) measured annually.
4. Have your eyes checked annually.
5. Have your legs and feet checked annually.
6. Have your kidney functions monitored annually.
7. Have your weight checked annually.
8. Receive support if you are a smoker.
9. Receive care planning to meet your specific individual needs.
10. Attend an education course.
11. Receive paediatric care if you are a child or young person.
12. Receive high-quality care if you are admitted to hospital.
13. Get information and specialist care if you are planning to have a baby.
14. See specialist diabetes healthcare professionals.
15. Get emotional and psychological support.

The aim of your annual review appointment at our Diabetes Clinic is to make sure you are getting these checks, as well as support and education.

Please note: The appointment time on your letter is the time we aim to start the first of your 'checks' and not the time you see the doctor. Please allow a couple of hours for your clinic visit.

Please remember to bring the following:

- Your appointment letter
- An early morning urine sample
- Your blood glucose meter if you have one
- A list of your current medication
- A list of any queries you may wish to discuss during your consultation.

The following is a brief summary of the clinic process.

On arrival, check in at the front desk. You will be directed to our waiting area. Our health care assistants will then:

1. Take some blood from you. One of the samples will be analysed in our department for HbA1c and glucose: the result will be available when you see the doctor.
2. Check your details are correct on our computer system.
3. Download your blood glucose meter. The results will be ready for you and the doctor to see on the computer at your consultation.
4. Weigh you. If this is your first visit, your height will also be measured.
5. Test your urine sample.

6. Ask you to complete a questionnaire that helps assess your psychological well-being.
7. Ask you to complete a questionnaire about smoking, if you currently smoke.
8. Check your feet and legs.

When the results of the tests are available, you will be seen by one of the clinic doctors. In the course of the consultation, the doctor will:

9. Discuss any concerns you may have in connection with your diabetes.
10. Review the results of your tests.
11. Confirm your eye screening check is up to date.
12. Check your blood pressure.
13. Agree any changes to monitoring or treatments with you.
14. Refer you to any other health care professional who may be able to help you with your diabetes.
15. Agree when you should next be seen, and by whom.

The clinic doctors wish each patient to have the best possible chance to discuss any concerns they may have, so please be patient if you feel you have been waiting a while for your turn to see a doctor.

You will be provided with a booklet about hypoglycaemia.

A summary of the discussion you have with the doctor, as well as the results of the different checks will be sent to your GP and you will receive a copy of this letter. An explanation of the different tests and results is provided on the next page.

Understanding the letter that you receive after your clinic appointment

Diabetes Type

Diabetes occurs when the level of sugar (glucose) in the blood is too high. To stop sugar levels going too high the body produces a hormone called insulin. This hormone is made in the pancreas gland.

In **Type 1 diabetes** the pancreas stops making insulin altogether. In **Type 2 diabetes** you do not make enough insulin and the cells in your body cannot use insulin properly. There are other less common types of diabetes.

HADS (Hospital Anxiety and Depression Score)

This is a self-screening questionnaire for depression and anxiety. The score is calculated from the responses you made on the sheet you completed in the waiting room. We ask you to complete this as high levels of anxiety and/or depression can affect you generally and also how well you can look after your diabetes.

What does the score mean?

- 0 - 7 = no increase in anxiety or depression
- 8 - 10 = mild increase in anxiety or depression
- 11 - 14 = moderate increase in anxiety or depression
- 15 or higher = severe increase in anxiety or depression

High levels will be noted by the clinic doctor and your GP who may wish to discuss this with you.

HbA1c: In the blood are red blood cells which contain a protein called haemoglobin. Glucose (sugar) can stick to haemoglobin resulting in a substance called 'glycosylated haemoglobin' which is also known as HbA1c. The more glucose in the blood the higher the HbA1c level.

The HbA1c level provides an average measure of glucose levels over the last three month period, as this is how long red blood cells live for in the body.

A target level of 58 mmol/mol has been suggested but this will be discussed with you individually. Good glucose control over the years is important to protect the blood vessels from damage.

Prolonged high glucose levels can lead to increased risk of visual problems, kidney damage, nerve damage, foot ulceration, impotence, heart disease, stroke and reduced circulation to the legs.

Weight: measured in kilograms (1kg = 2.2lbs, 14lbs = 1 stone)

BMI: Stands for **B**ody **M**ass **I**ndex and is calculated from your weight (in kilograms) and height (in metres). To calculate your BMI divide your weight in kilograms by your height in metres squared. For example: if you weigh 75kg and are 1.75 metres tall then your BMI is $75 / (1.75 \times 1.75) = 22.9$. What does this figure tell you?

Please look at the accompanying table:

BMI	Classification	Health Risk
<18.5	Underweight	Some risk
18.5 - 24.9	IDEAL	NORMAL
25 - 29.9	Overweight	Moderate
30 - 39.9	Obese	High
>40	Very obese	Very high

Blood Pressure: If you have diabetes you should aim to keep your blood pressure well controlled because high blood pressure is something that can damage the blood vessels. High blood pressure usually has no symptoms. The only way to know if you have it is to have it measured with a blood pressure monitor.

What do the numbers mean?

An example blood pressure reading might be 124/80.

- The top or first number is the systolic pressure and is the pressure in the vessels when the heart pumps. This value should be under 130.
- The bottom or second number is the diastolic pressure and is the pressure in the blood vessels when the heart is relaxing and filling with blood. This should be under 80.

Loss of hypoglycaemic awareness: Advice on this is provided in a separate booklet available in the clinic.

Smoking Status: No one should smoke and particularly no one with diabetes as it also damages the blood vessels increasing the risk of heart disease and stroke and many other health problems, particularly cancers.

Everyone knows that cigarette smoking is bad for you. Recently there have been two major publications from the United States looking at the effect of smoking on death rates. These studies involved 114,000 women and 89,000 men aged over 25 years of age.

The results showed that the death rate of current smokers of both sexes was three times that of people who had never smoked. Life expectancy was shortened by more than 10 years among current smokers compared to those who had never smoked.

Those who had stopped smoking when they were about 30 gained 10 years of life, those that stopped smoking at about the age of 40 gained 9 years of life and those that stopped when they were 50 gained 6 years of life compared to those who continued to smoke.

There is no question that smoking is associated with a shorter life and in addition it is associated with many distressing diseases of both the lungs and the blood vessels. We know that some people find it very difficult to stop smoking and others do not want to stop smoking and we respect this.

If you do want to stop smoking please mention this to the doctor that you are about to see as there are a lot of ways that can make stopping smoking easier.

Biochemistry section

Creatinine: This is a waste product of the body. The kidneys help get rid of waste products in the body by filtering the blood. By measuring the level of creatinine in your blood we can determine whether your kidneys are working properly. When the kidneys are functioning correctly they maintain the level of creatinine in the normal range (under 130). The higher the level the less well the kidneys are filtering the blood, which can be a sign that your blood vessels in the kidneys are damaged.

ALB/CREAT ratio: (short for albumin:creatinine ratio)

This is a measure of how much albumin (a protein found in the blood) leaks from the kidneys and into the urine. Normally the kidney filtering system ensures that proteins are kept almost completely out of the urine. A normal level is under 2.5 for men and 3.5 for women. Higher levels in the urine indicate that the kidney is becoming leakier and that diabetic kidney disease is likely to be present.

Controlling sugar levels and blood pressure to within normal limits is the best treatment for preventing diabetic kidney disease.

eGFR: (short for estimated Glomerular Filtration Rate)

This is another method of assessing how well the kidneys filter the blood. The “glomerulus” is part of the filtering system of the kidney. The eGFR is calculated by a complicated equation that takes into account factors that affect creatinine production (see above), as well as age, sex height and ethnicity. A normal level is above 60. The lower the level the less well the kidneys are filtering the blood.

Free T4 and TSH: These hormones are important for assessing how well the thyroid gland works. Under active and over active thyroid function are more common in people with diabetes so we test thyroid function every year. The thyroid’s job is to make T4 which is also known as thyroxine. TSH, which stands for Thyroid Stimulating Hormone, stimulates the thyroid gland to produce thyroxine. TSH is produced by the pituitary gland in the base of the brain. Thyroid hormone helps the body use energy, stay warm, and keep the brain, heart, muscles and other organs working as they should. A normal T4 level is between 9 and 21 and TSH should be 0.2 - 4.50.

Cholesterol: Cholesterol is a type of fat made by the liver and also taken up from fatty foods that we eat. It is essential to have enough cholesterol for good health. However, having a high cholesterol level in the blood can increase the risk of heart disease and stroke. High levels of cholesterol (along with high blood pressure levels and smoking) can cause fatty lumps to develop inside the lining of the blood vessels which over time, cause the blood vessels to narrow and harden (this process is known as atherosclerosis).

For example, narrowing of the arteries to the heart can lead to a condition called angina. This is where not enough blood flows to the heart and can cause chest pain. Sometimes a clot can form over a patch of atheroma and block the flow of blood completely. Depending on the blood vessel affected this can cause a stroke, heart attack or other serious problems. To lessen the risk of harm to the blood vessels we measure the cholesterol level once a year and we would like the level to be under 4. We have good medicines (statins) to lower cholesterol.

Eyes: You should be enrolled in the Lothian Diabetic Retinopathy Screening programme, in which case you will get a report from them, or be attending an eye clinic in a hospital. Please remember to also get an annual eye check from your optician.

Feet: Having examined your feet you will be classified as being at low, medium or high risk of developing a foot ulcer. If we are worried about your feet we will have advised you to see your local Podiatrist or we will refer you to the Foot clinic at St John's. You will be given a leaflet after your foot screening in the department informing you of your risk level for developing a diabetic foot ulcer and how to care for your feet.

Medical Conditions and Medication: These are important sections and must be accurate. Please let us know if anything is incorrect and ask if you do not understand any entries.

Personal targets

Targets should be realistic, achievable and based on individual needs. Your healthcare team can discuss these personal targets with you.

HbA1c: HbA1c gives an indication of blood glucose control over the previous two to three months. This is measuring the amount of glucose that has 'stuck' to the haemoglobin (part of the red cells in your blood). It is therefore a guide to the amount of glucose that has stuck to other parts of the body such as your eyes, kidneys, nerves and blood vessels. An ideal level could be between 48 - 58mmol/mol which should be individualised to you.

Blood Pressure: This is a measurement of the pressure on the walls of your arteries as your heart beats by contracting and relaxing. High blood pressure increases your risk of heart disease, stroke and kidney disease. For most people a top figure of less than 130 and a bottom figure of less than 80 should be aimed for.

Blood Fats (cholesterol): Blood is taken at the clinic to check the level of cholesterol. Too much cholesterol in the blood can contribute to developing heart disease and stroke. A target for cholesterol is 4 mmol/l or below.

Weight and Body Mass Index: The BMI (Body Mass Index) is used to quickly and simply determine a person's weight in regard to their height. From a straight forward calculation the BMI can be calculated and gives a measure which can be used to determine if a person is underweight, of normal weight, overweight or obese. The more overweight you are the more difficult it is to control your diabetes, blood pressure, blood sugar and cholesterol.

Target BMI is very individual and will be discussed at your clinic visit.

Eye screening

Diabetes can affect the eye in a number of ways:

1. The most serious eye condition associated with diabetes involves the network of blood vessels supplying the retina at the back of the eye. This condition is called diabetic retinopathy. Diabetes can affect these tiny blood vessels and if they become blocked or leak then the retina and possibly your vision will be affected.
2. Changes in blood glucose levels can affect the lens at the front of the eye. High glucose levels cause water to be absorbed in the lens, distorting its shape. This can result in blurring of vision. If glucose levels are well controlled any blurring will usually improve or disappear altogether.
3. A longer term effect of diabetes is clouding of the lens and this is called a cataract.

Less than half of those with diabetes will develop an eye complication. The following will help reduce the risk of developing diabetic eye disease or slow its progress if already present:

- Good blood glucose levels
- Good blood pressure levels
- Good cholesterol levels
- Not smoking
- Keeping fit, including maintaining a healthy weight
- Attend for regular retinal screening appointments
- Attend for regular appointments at your optician

Your retinal screening appointment: Retinal screening is performed using a digital camera and for most people, it can be done without the need for eye-drops to dilate the pupil. However, some people will still require eye-drops. You should bear this in mind when making arrangements to attend, as you will not be able to drive for several hours afterwards.

If you have diabetes and are pregnant, retinal screening is carried out more often during pregnancy and for a while after you have had your baby. This also applies to women who develop gestational diabetes.

Please do remember: The most effective thing you can do to prevent sight loss is to attend your retinal screening appointments. Early detection and treatment prevents sight loss.

Foot screening

Why do I have my feet screened?

People with diabetes are more likely to be admitted to hospital with a foot ulcer than with any other complication of diabetes. This is because diabetes may lead to reduced feeling in the feet and/or reduced blood flow to the feet. Foot screening is carried out annually to detect any problems early.

What does foot screening involve?

You will be asked to remove tights / socks and footwear and sit up on a couch.

The foot screener will:

- Check the circulation by feeling the pulses in your feet. A small machine (Doppler) may be used to listen to the blood flow. They will also feel how warm your feet and legs are and check for colour changes in the skin. You may be asked if you have had any previous problems or are experiencing any pain when walking.
- Check for altered sensation (Neuropathy) in your feet using a fine plastic strand called a monofilament. A neurothesiometer may also be used to see if you can feel different levels of vibration.
- Examine your feet for any corns, callus, nail problems, wounds or other skin problems.

None of these tests cause any discomfort or pain. Please tell the person who is screening your feet if you have any altered sensation or pain in your feet. They will pass this information onto to the clinic doctor who will see you.

They may give you simple footcare advice or advise you on suitable footwear.

At the end of the examination you will be advised if you are at low, medium or high risk for developing a diabetic foot ulcer and given a leaflet with appropriate footcare advice.

If required, you may be asked to see a Podiatrist for further care.

Healthy lifestyles

We should all have a healthy lifestyle. A balanced diet and regular physical activity can help with the management of diabetes.

For general health the current advice is for a low sugar, low fat, high fibre diet which includes 5 portions of fruit and vegetables per day. Your calorie intake will need to be reduced if you are over weight and want to lose weight. The advice for physical activity is for 30 minutes on 5 day per week. This can be broken up into 10 minute bursts.

As well as making you feel better and helping with weight management physical activity also:

- Improves diabetes control
- Reduces the risk of heart attack or stroke
- Prevents or improves high blood pressure
- Improves blood fat levels including cholesterol

A recent study has shown that a 15 Kg (2 stones, 5 pounds) weight loss in people with Type 2 diabetes made their diabetes go away. If you think this is for you please raise it with any of the clinic staff.

Useful information for local activities

'Put your west foot forward'

Free walks throughout West Lothian for all ages and abilities, no need to book. New programmes start every 3 months.

Contact: **Susan Rose**

Phone: **01506 775626**

'Ageing Well' tea dances

Held throughout West Lothian. There is an admission charge that includes refreshments.

Contact: **Avril Kerr**

Phone: **01506 237950**

'Xcite'

8 Sports and Leisure venues across West Lothian

Contact: **Tracy McAlpine**

Phone: **01506 237950**

Referral for exercise may be available through your GP practice - if you feel this will help you please discuss it with your GP or any member of the diabetes team.

DAFNE - Dose Adjustment For Normal Eating

The DAFNE training Programme is designed for people with Type 1 diabetes. It originated in Europe in the early 1980s and has been running successfully in the UK since 2000. We have been running DAFNE courses at St John's for over 6 years.

This is a blood glucose management course that can reduce both short and long term complications of diabetes and improves quality of life. We offer a 5-day course or a day course over 5 weeks, held at St. John's, for groups of 8 people with Type 1 diabetes looking at carbohydrate (CHO) estimation, blood glucose, ketone monitoring, insulin regimes, hypoglycaemia, eating out, illness and exercise. Most people get something useful from the course, can offer something to other participants, and we have had positive feedback from those who have completed the course.

Please discuss this with a doctor or nurse if you feel it will benefit you. We can schedule a course to suit your timetable.

General advice on insulin dose adjustment

Insulin doses may need adjusting for exercise, meal composition, patterns in blood sugar levels, during illness and weight loss or gain episodes.

Do not adjust dose on a single raised blood glucose.

Adjust according to the chart above and monitor for at least 48 hours to judge the effect before further adjustment.

Insulin Dose Adjustment - Pre-mixed insulin (2 injections daily)

Blood testing times	Blood glucose <4mmol/l or Hypo	Blood glucose 4-7mmol/l	Blood glucose 8-14mmol/l	Blood glucose >15mmol/l
Before bed and/or before breakfast	Reduce evening meal insulin by 4 units	Optimal	Increase evening meal insulin by 2 units	Increase evening meal insulin by 4 units
Before lunch and/or before evening meal	Reduce morning insulin by 4 units	Optimal	Increase morning insulin by 2 units	Increase morning insulin by 4 units

Blood testing times	Blood glucose <4mmol/l or Hypo	Blood glucose 4-7mmol/l	Blood glucose 8-14mmol/l	Blood glucose >15mmol/l
Before breakfast	Reduce bedtime long acting insulin by 4 units	Optimal	Increase bedtime long acting insulin by 2 units	Increase bedtime long acting insulin by 4 units
Before lunch	Reduce morning short acting insulin by 2-4 units	Optimal	Increase morning short acting insulin by 2 units	Increase morning short acting insulin by 4 units
Before evening meal	Reduce lunchtime short acting insulin by 2-4 units	Optimal	Increase lunchtime short acting insulin by 2 units	Increase lunchtime short acting insulin by 4 units
Before bed	Reduce evening meal short acting insulin by 2-4 units	Optimal	Increase evening meal short acting insulin by 2 units	Increase evening meal short acting insulin by 4 units

Pregnancy and diabetes

Women with Type 1 and Type 2 diabetes usually have healthy babies although there is an increased risk of complications for both mother and baby. These risks can be minimised with careful planning and optimising glucose levels.

Pre-pregnancy care

- Aim for blood glucose levels around 6 to 8 mmol/l without too many low levels
- Aim for an HbA1c of under 55 mmol/mol
- Commence Folic acid 5mgs and continue to 12 weeks
- Review of medicines
- Referral to a dietician

As soon as you have a positive pregnancy test please contact the Diabetes Clinic asking for **Liz Hazzard** or **Eilidh Vass**
Phone: **01506 523856**

Pregnancy care

Ante-natal care will be hospital based although it is important to book in with your Community Midwife for referral to obstetric service. Dr. Alison Macleod is the Consultant Obstetric who looks after ladies with diabetes.

- A dating scan at 12 weeks and a consultation with Dr Alison Macleod, Consultant Obstetrician
- Eye screening every 12 weeks
- An ultrasound scan at 20 weeks to check all is well with the baby
- Aim for very tight BG control (6-8 mmol/l) being careful not to have too many low levels

Low glucose levels (hypoglycaemia) do not have adverse effects for the baby; however **ketoacidosis** can be very serious for the unborn child. It is therefore vital to have means of checking for blood ketones at home.

After 36 weeks 3 times a week visits to hospital for monitoring the baby are necessary.

Caesarean sections are more common for the safe delivery of the baby.

Post-Natal care

After delivery insulin requirements fall dramatically and therefore pre-pregnancy doses are usually advised.

Breast feeding mothers often need to reduce insulin further and/or take extra amounts of carbohydrates.

Sick day rules

People with diabetes, like everyone, can become unwell with colds, coughs, 'flu or an upset tummy. If you become unwell your diabetes control may be affected. This is because your body's natural response to illness is to make more glucose from stores within the body. This can make your blood glucose levels rise, even if you are vomiting and unable to eat or drink.

For those with **Type 1** diabetes dehydrating illnesses can cause problems. If the body is seriously short of insulin stores of fat are broken down and produce **KETONES** in the blood and these spill into the urine. Having high levels of ketones in the blood and urine means that the body is very short of insulin and that the blood is becoming acidic. More fluids, more insulin and monitoring usually solves the problem and the ketones disappear. However, if you cannot keep anything down then hospital treatment is necessary.

A few general points

- Dehydrating illnesses (vomiting/diarrhoea) can cause problems for those with diabetes
- Some tablets used in diabetes care can make dehydrating illnesses worse, such as metformin, water tablets (diuretics), pain killers or anti-inflammatory medicines such as ibuprofen and most tablets used for treating high blood pressure - as a rule of thumb it is best to **stop all these** with vomiting and/or diarrhoea
- Drink at least 5 pints / 2-3 litres of sugar-free liquids a day
- Try to eat your normal diet. If you are unable to do this, replace your meals with fluids such as milk, fresh fruit juice, soup, lucozade (see page 25)
- **IF YOU TAKE INSULIN FOR YOUR DIABETES DO NOT STOP THIS EVEN IF YOU ARE NOT EATING**

Try to take small amounts every hour if possible. Here are some examples of how much to take:

Milk	1 cup (200mls)
Unsweetened fruit juice	1 small glass (100mls)
Lucozade	50mls
Coca cola/Lemonade (not diet)	150mls
Ice-cream	1 scoop
Jelly (not sugar-free)	2 tablespoons
Yoghurt	1 small carton

If you are taking insulin

A person with type 1 diabetes is at risk of developing the severe complication of diabetic ketoacidosis during acute illness. This is a serious condition requiring hospital treatment and is due to a lack of insulin and dehydration.

A person with type 2 diabetes is much less susceptible to ketoacidosis therefore the rules for management during periods of illness are slightly different.

KEEPING A GOOD FLUID INTAKE IS VERY IMPORTANT

If you have Type 2 diabetes

- If blood glucose level is less than 10 mmol/l, take your usual insulin dose
- Check your blood glucose every 4 hours
- If your blood glucose levels are persistently higher than this you will have to take extra insulin. If you take fast acting insulin (Novorapid, Humalog, Apidra, Actrapid, Humulin S) then increase each dose as detailed below until blood glucose levels settle below 10 mmol/l. If you are on a twice-daily insulin regime you can also increase both doses as detailed.

Blood glucose level (mmol/l)	What to do?
10 - 16.9	Take an extra 4 units
17 - 28	Take an extra 6 units
Over 28	Take an extra 8 units and consult your Diabetes team or NHS 24

For fast-acting insulins these doses can be repeated every 4 hours. If you are in any doubt contact your diabetes nurse specialist, GP or NHS 24.

If you have Type 1 diabetes

If you are unwell and your blood glucose levels are over 15 mmol/l it is important to test for ketones. Please ensure that you always have a supply of either ketostix for urine testing or blood ketone strips. Check expiry dates regularly. Please remember that having high levels of ketones in the blood and urine means that the body is very short of insulin and that the blood is becoming acidic.

No ketones present: If your blood glucose levels are high but you have no ketones then test your blood glucose and a ketone level every 4 hours. Take your usual insulin doses to cover food with the corrective doses of insulin as detailed in the table above. Remember it is important to drink at least 100 mls of sugar-free fluids every hour and try to take carbohydrate in any form you can tolerate (examples above). If you are on a twice-daily insulin regimen talk to your diabetes nurse about having quick acting insulin (Novorapid, Humalog or Apidra) available to use during period of illness.

NEVER STOP TAKING YOUR INSULIN

Ketones present: If you develop ketones the usual corrective doses of insulin may not be enough to bring your blood glucose levels down and to clear the ketones.

You should test your blood glucose and ketone levels every 2 hours. The amount of extra insulin (IN ADDITION TO YOUR USUAL DOSES) you will require will depend on the amount of ketones present.

Over the page is a guide to help you increase insulin doses to bring down glucose levels and clear the ketones from the blood. The presence of ketones in the blood or urine means that the body is breaking down fat in an unregulated ways due to a lack of insulin and the blood can become acidic making you very unwell.

Calculate your total daily dose (TDD) of insulin from the previous day - this is both your **quick and long acting** insulin.

TDD units (Total Daily Dose of insulin from previous day - both quick and long)	Urine ketone + or ++ Blood ketone 1.5-3mmol/l. Take these extra insulin units	Urine ketone +++ or ++++ Blood ketone over 3mmol/l. Take these extra insulin units
15-20	2	4
20-30	3	6
30-40	4	8
40-50	5	10
50-60	6	12
60-70	7	14
70-100	8	16

Take the above doses as **quick acting** insulin every 2 hours **as well as your normal doses** to cover the food you are eating. Do this until urine ketones are a trace or negative or blood ketones are below 1.5 mmol/l. Continue to take your long-acting insulin as usual.

It is important to drink at least 100mls of sugar-free fluids every hour. Try to take carbohydrate regularly as suggested above.

If you don't have quick acting insulin available increase your own insulin at your normal injection times by the doses suggested above.

If you have completed a DAFNE course please follow the Sick Day Advice in your DAFNE Handbook.

If you are unable to drink fluids, have persistent vomiting or diarrhoea, develop abdominal pain or become breathless you should present to an Accident and Emergency Department immediately.

If you are on tablets: If you are vomiting or have diarrhoea and take metformin, you should stop it and contact your GP, NHS 24 or a diabetes nurse specialist for further advice.

If you are on exenatide (Byetta) or liraglutide (Victoza): You should continue to take your injections unless you are vomiting. If you are taking exenatide (Byetta) it is important that you eat after your injection, this can be any of the items listed above. Unfortunately there is no scope to increase your dose with these medications. If your blood glucose levels remain high for a few days or you are concerned, consult your GP, diabetes nurse specialist or NHS 24.

Research

Clinical trials can improve future treatments, wellbeing and outcomes for people with diabetes.

The Diabetes Department is actively involved in research. You may be asked to consider taking part in a trial at clinic. Your participation is entirely voluntary and most people enjoy taking part in trials.

- The length of trials varies from a few weeks to several years
- There is a specialist research nurse attached to the clinic
- St. John's Diabetes Department is part of the Scottish Diabetes Research Network
- For more information please visit **www.sdrn.org.uk**

mydiabetesmyway

The mydiabetesmyway website (www.mydiabetesmyway.scot.nhs.uk) was launched in October 2008 and contains information to help people with diabetes and their carers learn more about the condition generally and their information specifically. The website contains links to validated external sources which have been verified as providing benefit to people with diabetes.

In December 2010, the website was expanded to include a module where people with diabetes can access their own information, based on data which is collected by all of the healthcare professionals who help you with your diabetes. Most people who have used this facility have found it useful. There are details on the website to explain what you have to do to be able to view your own information.

We will ask you if you would like to enrol in this at your clinic visit and complete an enrolment form with you and send it off to Dundee for you.

Your annual review appointment
at the Diabetes Clinic

Biochemistry

Research

Personal

Understanding

Pregnancy and diabetes

Advice

Mydiabe

Department of Diabetes (Clinic Guide)
St John's Hospital
Livingston
West Lothian

Creation date: September 2013
Review date: September 2015

DAFM