Healthcare Improvement Scotland | SIGN Evidence-based clinical guidelines

Diabetes in Pregnancy

A booklet for patients, carers and family members

Area for cover image

Acknowledgments

Any acknowledgments or thanks.

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www.healthcareimprovementscotland.org

Contents

Who is this booklet for?

This booklet is for you if:

- You live with Type 1 or Type 2 diabetes and are planning a pregnancy
- You have developed diabetes during pregnancy (gestational diabetes)

Family members, friends and carers may also find this booklet helpful.

Details of support organisations and other places you can find out more information are on page 23.

What is this booklet about?

This booklet explains the recommendations in a guideline produced by the Scottish Intercollegiate Guidelines Network about managing diabetes during pregnancy.

The guideline is based on what we know from current research.

The booklet will cover:

- Preconception care
- Antenatal care
- Glucose monitoring during pregnancy
- Medication management
- Lifestyle interventions
- Postnatal care

There are two different types of recommendations in the booklet

What is diabetes?

Diabetes is a health condition that affects how your body handles glucose, a type of sugar in your blood. When you have diabetes, your body either doesn't make enough insulin (a hormone that helps glucose get into your cells) or can't use insulin properly. This leads to high levels of glucose in your blood, which can cause various health problems if not managed well.

Blood glucose levels: This refers to the amount of glucose (sugar) present in the blood. Glucose is the body's primary source of energy, and maintaining stable blood glucose levels is crucial for overall health.

Types of diabetes

There are two main types of diabetes:

Type 1 diabetes is when the pancreas produces little to no insulin, a hormone necessary for regulating blood glucose levels.

Type 2 diabetes is where the body becomes resistant to the effects of insulin or doesn't produce enough insulin to maintain normal blood glucose levels.

There are other types of diabetes:

Gestational diabetes is diabetes that can develop during pregnancy. It affects women who haven't been affected by diabetes before.

Maturity Onset Diabetes of the young (MODY) is a rare form of diabetes which is different from both type 1 and type 2 diabetes, and runs strongly in families.

MODY is caused by a mutation (or change) in a single gene. If a parent has this gene mutation, any child they have, has a 50% chance of inheriting it from them. If a child does inherit the mutation they will generally go on to develop MODY before they're 25.

For more information on types of diabetes, please see Diabetes UK's website.

Pre existing diabetes including type 1 and type 2 diabetes

Preconception care

Optimising diabetes management before pregnancy is important for women with pre-existing diabetes. Research shows that when diabetes is well-managed before conception, it significantly improves pregnancy outcomes.

What steps should I take before planning pregnancy to maximise my diabetes management?

Recommendation based on the research evidence

Before planning a pregnancy you should:

- Aim for an HbA1c as low as possible without excessive hypoglycaemia.
- Be offered advice on the importance of taking folic acid before and during pregnancy and review all medications, ensuring only insulin and/or metformin are used to manage blood glucose levels during pregnancy.

Glycated Haemoglobin (HbA1c): A measure of average blood glucose levels over the past two to three months. It provides valuable information about long-term blood glucose control.

It's OK to Ask

When you go to your healthcare appointment(s), we encourage you to ask four key questions that will help you and your healthcare professionals make decisions together. This will make sure the care is right for you.

1. What are the benefits of my treatment?
2. What are the risks of my treatment?
3. What alternative treatments can I try?
4. What if I do nothing?

Learn more about "It's OK to ask"

Learn more about realistic medicine

Without a doubt my pregnancy was the hardest thing I have ever done. But it was so incredibly worth it. Read Sarah's story.

Recommendation based on the clinical experience

Before planning a pregnancy you should:

- Talk to your healthcare providers for advice and support.
- Receive lifestyle advice such as smoking cessation, healthy eating, weight management, and exercise recommendations.
- Use contraception until you're ready for pregnancy.
- Take 5mg folic acid for a few months before stopping contraception and during the first trimester of pregnancy to reduce the risk of birth defects.
- Review your medications with your healthcare provider and switch to safer options for pregnancy if necessary.
- Understand the importance of maintaining optimal **HbA1c** levels and managing blood glucose levels during pregnancy, with a focus on reducing hypoglycaemia.
- Aim for a HbA1c level below 48 mmol/mol which can lower the chances of problems during pregnancy and birth. Your healthcare plan should be based on your individual needs.
- Explore various blood glucose monitoring methods and discuss the potential benefits of diabetes technologies like Continuous Glucose Monitoring (CGM) or insulin pumps.
- Prepare for potential increases in insulin requirements during pregnancy, with ongoing support from the diabetes team to adjust and self-manage effectively.

Recommendation based on the clinical experience

Your healthcare provider should consider other things like if you have high blood pressure, and the condition of your eyes and kidneys due to diabetes when setting goals for your HbA1c.

Recommendation based on the clinical experience

If your HbA1c is higher than 86 mmol/mol, it's better to avoid getting pregnant until it's under control.

Information

The following information should be discussed with you:

- Pregnancy planning during annual review, covering preconception, pregnancy, and post-pregnancy issues.
- Access to pre pregnancy clinics and multidisciplinary support.
- Setting individual HbA1c targets considering factors like BMI and diabetic complications.
- Lifestyle changes, regular monitoring, and medication adjustments including contraception.
- Hypoglycaemia recognition and management
- Driving regulations.
- Vitamin D supplementation and discuss antenatal care, risks, and the role of the multidisciplinary team.
- Sick day management and plan delivery of postnatal care, including breastfeeding support.

You can ask about any of these points if they are not discussed with you.

Recommendation based on the clinical experience

If you have Type 2 diabetes and are thinking about getting pregnant, your healthcare professional might suggest sending you to a specialist for support of your diabetes. They might recommend using continuous glucose monitors (CGM) if your blood glucose levels aren't where they should be before pregnancy.

What should happen if I become pregnant and have type 1 or type 2 diabetes

Antenatal care

Antenatal care is essential for all pregnant women to ensure the health and well-being of both the mother and the developing baby. However, if you have diabetes and become pregnant, the importance of antenatal care becomes even more pronounced due to the potential complications that diabetes can introduce during pregnancy.

Both your diabetes and pregnancy care teams should talk to you early on in your pregnancy. This should happen right after you find out you're pregnant, before your official antenatal appointment.

Recommendation based on the research evidence

Your healthcare professional should make sure you:

- Understand the increased frequency of appointments during pregnancy and the involvement of various healthcare professionals.
- Receive personalized communication regarding potential risks associated with diabetes during pregnancy, with support to evaluate choices without judgment.

How does Continuous Glucose Monitoring (CGM) benefit pregnant women with diabetes?

Continuous Glucose Monitoring (CGM) is a medical technology that tracks glucose levels in real-time throughout the day and night. CGMs continually monitor your blood glucose, giving you real-time updates through a device that is attached to your body.

Recommendation based on the research evidence

CGM helps you to maintain optimal glucose levels, reducing risks of complications like a big baby, pre-eclampsia and neonatal hypoglycaemia. If you have Type 1 diabetes, healthcare professionals should make sure that you have access to CGM during pregnancy. CGM should be considered for pregnant women with Type 2 diabetes.

Pre-eclampsia: A serious condition characterized by high blood pressure and signs of damage to organs, such as the kidneys, that can develop during pregnancy. It requires medical attention to prevent complications for both the mother and baby.

Neonatal Hypoglycaemia: Low blood glucose levels in newborn babies, which can happen if the mother has diabetes or if the baby produces too much insulin in response to high glucose levels during pregnancy

What are the recommended blood glucose targets during pregnancy for women with diabetes?

Maintaining blood glucose targets during pregnancy is important for mother's and baby's health. Precise management ensures optimal outcomes for both mother and baby.

The table below shows the glucose levels you should aim for:

Type of diabetes	Before meals	One Hour After Meals	Two Hours After Meals	Before Bed:
Type 1	Between 4 and 6 mmol/L.	Less than 8 mmol/L	Less than 7 mmol/L.	Greater than 6 mmol/L.
Type 2	Between 4 and 6 mmol/L.	Less than 8 mmol/L	Less than 7 mmol/L.	Greater than 6 mmol/L.
Gestational diabetes	Less than 5.5 mmol/L	Less than 8 mmol/L	Less than 7 mmol/L.	Greater than 6 mmol/L.

Mmol/L refers to the concentration of glucose in your blood, measured in millimoles per litre of blood. It indicates the number of glucose molecules present in one litre of blood.

Recommendation based on the clinical experience

Studies have shown that maintaining blood glucose within these target ranges can help minimize the risk of complications like large-for-gestational-age (LGA) babies or neonatal hypoglycaemia (low blood glucose in newborns). However, the evidence quality is generally low.

Large-for-Gestational-Age (LGA): Refers to babies who are larger than average for the gestational age, often weighing more than 90th percentile for their gestational age. LGA babies can pose risks during delivery and increase the likelihood of cesarean section births.

Recommendation based on the research evidence

For pregnant women with gestational diabetes, it's beneficial to aim for glucose levels similar to those in individuals without diabetes. This can help lower the rates of Caesarean births, large-for-gestational-age babies, low blood glucose in newborns, and pre-eclampsia. However, achieving these target glucose levels might mean needing more medication and closer monitoring during pregnancy.

Recommendation based on the research evidence

Sometimes, achieving tighter blood glucose targets may require more intensive use of glucose-lowering medications, such as insulin. Additionally, more frequent follow-ups with healthcare professionals may be needed.

When should pregnant women with diabetes monitor ketones levels?

Recommendation based on the clinical experience

You should monitor ketone levels in your blood if your blood glucose level is 10 mmol/L or higher, or during illness. Ketones are chemicals produced when your body breaks down fat for energy. Checking blood ketones helps assess the risk of diabetic ketoacidosis (DKA), a serious complication of diabetes characterized by high ketone levels and acidic blood. This monitoring is particularly important during periods of elevated blood glucose levels or illness, as these conditions increase the risk of developing DKA.

When is it recommended to deliver the baby for women with diabetes during pregnancy?

Recommendation based on the research evidence

It's important to talk with your healthcare professional about when and how you plan to give birth during your antenatal appointments as soon as possible after becoming pregnant. Final decisions about when and how to deliver your baby will be made during the third trimester of your pregnancy.

Recommendation based on the research evidence

For women with type 1 or type 2 diabetes without complications, an elective birth by induction of labour or a Caesarean birth between 37 and 38+6 weeks of pregnancy is advised. For women with gestational diabetes without complications, delivery can be delayed until 40 weeks.

Induction of Labour: A medical intervention to stimulate uterine contractions artificially to initiate the process of childbirth when it doesn't start naturally.

Caesarean Birth: A surgical procedure to deliver a baby through an incision in the mother's abdomen and uterus, often performed when vaginal delivery is not possible or advisable.

Patient experience quote – suggestions welcome from reviewers

Gestational diabetes

What is gestational diabetes mellitus (GDM)?

Gestational diabetes is a type of diabetes that develops during pregnancy. It occurs when your body can't produce enough insulin to meet the extra needs during pregnancy, leading to high blood glucose levels. This condition usually goes away after giving birth, but it can increase the risk of complications for both the mother and the baby during pregnancy if not managed properly. Gestational Diabetes can predict your future risk of Type 2 Diabetes.

How do healthcare professionals diagnose gestational diabetes (GDM)?

Healthcare professionals usually use a test called OGTT (Oral Glucose Tolerance Test) to diagnose various types of diabetes, including gestational diabetes (GDM).

When diagnosing gestational diabetes, healthcare professionals use a single-step test called the 75-gram OGTT. If you have risk factors and your test shows any of these results, you will be diagnosed with gestational diabetes:

- Fasting blood glucose level of 5.3 mmol/L or higher
- One-hour blood glucose level after the glucose drink of 10.6 mmol/L or higher
- Two-hour blood glucose level after the glucose drink of 9.0 mmol/L or higher

How should lifestyle interventions be approached for women with gestational diabetes?

Recommendation based on the research evidence

You should receive lifestyle guidance from a trained healthcare professional if you have gestational diabetes. This includes dietary advice and tips for staying active.

Recommendation based on the clinical experience

You should also have access to a dietitian for nutritional advice, whether you're following a specific diet plan or not. This support can be offered one-on-one or in group sessions, depending on what works best for you.

Dietary interventions typically focus on reducing refined carbohydrates, avoiding excessive weight gain, and increasing physical activity. Specific dietary recommendations may vary based on individual needs and preferences.

Recommendation based on the research evidence

Exercise is important for women with gestational diabetes and can help improve glucose control. You should aim for 150 minutes of moderate physical activity each week while pregnant. This is especially crucial if you have gestational diabetes

Recommendation based on the clinical experience

Diabetes teams should strongly encourage you to engage in personalised physical activities.

Are there any supplements or alternative treatments for gestational diabetes?

Myo-inositol and probiotics have been studied for their potential effects on preventing or treating gestational diabetes, but evidence on their effectiveness is limited and inconclusive. More research is needed in this area. While some studies suggest potential benefits of probiotics and myo-inositol for managing gestational diabetes, the evidence is not strong enough to support their routine use. Women

should consult with their healthcare professional before considering these supplements.

What medications are available for managing gestational diabetes?

Recommendation based on the research evidence

If you need medication to control your gestational diabetes, your healthcare professional will suggest either metformin or insulin first.

Recommendation based on the research evidence

Diabetes teams should counsel you about the specific side effects of metformin and insulin, including the fact that metformin crosses the placenta. Studies have shown that children exposed to metformin prenatally may have slightly lower birth weights.

Patient experience quote – suggestions welcome from reviewers

Postnatal care

Your healthcare professional will discuss changes after delivery and support you in managing your diabetes.

What will happen if I have Type 1 diabetes or Type 2 diabetes?

After delivery, if you have Type 1 diabetes, you will require a reduction in insulin doses. You'll work on a plan to transition back to your pre-pregnancy insulin doses if you are using injections or a pump supported by the diabetes team.

If you have Type 2 diabetes and required insulin during your pregnancy your insulin dosage may decrease or even be stopped, depending on your specific needs. Consider discussing referral options for Diabetes remission pathways. Depending on your plans for future pregnancies, you may explore alternative oral or injectable therapies. It's important that your cardiovascular risks are reviewed regularly.

What will happen if I had gestational diabetes?

If you had Gestational Diabetes Mellitus (GDM), it’s important to monitor for glucose intolerance after pregnancy. Adjustments may include stopping metformin and insulin as necessary.

Gestational diabetes increases the risk of developing type 2 diabetes and cardiovascular disease later in life. Detecting glucose intolerance early after pregnancy can help start interventions to prevent or delay the onset of diabetes and reduce the risk of complications.

What are the options for testing glucose intolerance after pregnancy?

Tests commonly used include fasting plasma glucose and HbA1c. These tests can detect diabetes, impaired fasting glucose (IFG), and impaired glucose tolerance (IGT) after delivery.

Recommendation based on the research evidence

If you've had gestational diabetes, it's important to know that you could have it again in future pregnancies. There are risks associated with having gestational diabetes again, so when you're planning to get pregnant in the future, your doctor might suggest testing for diabetes beforehand to make sure you and your baby stay healthy.

Recommendation based on the research evidence

After giving birth, if your blood glucose levels returned to normal, you should be offered the following:

- Advice on lifestyle changes like weight management, diet, and exercise.
- A fasting plasma glucose test 6–13 weeks after birth.

If a fasting plasma glucose test has not been done by 13 weeks, a fasting plasma glucose test or HbA1c test should be offered after 13 weeks

Healthcare professionals will not routinely offer a 75 g 2-hour oral glucose tolerance test.

Recommendation based on the research evidence

If your postnatal test is a **fasting plasma glucose test**:

- If your level is below 6.0 mmol/L, you'll have a low probability of diabetes. You'll need annual tests and lifestyle changes.
- If your level is between 6.0 and 6.9 mmol/L, you're at high risk of type 2 diabetes and will receive advice and interventions.
- If your level is 7.0 mmol/L or above, you'll likely have type 2 diabetes and need further tests.

Recommendation based on the research evidence

If your postnatal test is an **HbA1c test:** (R)

- If your level is below 39 mmol/mol (5.7%), you'll have a low probability of diabetes.
- If your level is between 39 and 47 mmol/mol (5.7% and 6.4%), you're at high risk of type 2 diabetes and will receive advice and interventions.
- If your level is 48 mmol/mol (6.5%) or above, you have type 2 diabetes and will be referred for further care.

Most centres in Scotland measure HbA1c 3 months after delivery and offer entry to the type 2 diabetes Framework for prevention, early detection, and intervention.

Recommendation based on the research evidence

Ideally, testing should be done between 6 and 13 weeks after delivery. This timeframe allows for early recognition and treatment.

Sources of further information

Diabetes Scotland/Diabetes UK
www.diabetes.org.uk/in_your_area/scotland
Helpline: 0141 212 8710, Monday to Friday, 9am–6pm

X (formerly Twitter): @DiabetesScot

Diabetes Scotland provides a wide range of information on diabetes including leaflets, fact sheets, details of support groups and advice on all aspects of diabetes. The Diabetes UK Learning Zone offers videos, quizzes and interactive tools for managing diabetes day-to-day which are tailored for each individual.
Dietary advice for women with gestational diabetes
https://www.diabetes.org.uk/guide-to-diabetes/enjoy-food/eating-with-diabetes/gestational-diabetes

Juvenile Diabetes Research Foundation (JDRF)
www.jdrf.org.uk
Tel: 01224 248677 (Scotland), 07442 332872 (Central Scotland)

Email: scotland@jdrf.org.uk
Facebook: http://www.facebook.com/jdrf.scotland

JDRF drives research to cure, treat and prevent type 1 diabetes, accelerates access to type 1 diabetes treatment technologies and medicines and supports people living with type 1 diabetes.
Through its international JDRF network, funding of UK researchers, advocacy work with the NHS and the support it provides to people with type 1 diabetes, JDRF pushes new boundaries and generates unprecedented progress to prevent, treat and ultimately find cures for type 1 diabetes.

Insulin Dependent Diabetes Trust
www.iddt.org
Tel: 01604 622 837
X (formerly Twitter): @UK_diabetes

The Insulin Dependent Diabetes Trust is run by people living with diabetes to raise awareness of important issues for people with diabetes. It provides information in non-medical language.

Insulin Pump Awareness Group
www.ipag.co.uk
X (formerly Twitter): @iPAG_Scot

The Insulin Pump Awareness Group was formed and run by a group of people who are either pump users, likely to use pumps in the future, or parents of children with type 1 diabetes.

My Diabetes My Way
www.mydiabetesmyway.scot.nhs.uk
X (formerly Twitter): @MyDiabetesMyWay

Gestational diabetes elearning site
www.elearning.mydiabetesmyway.scot.nhs.uk/courses/gestational-diabetes-course/

My Diabetes My Way is NHSScotland's interactive diabetes website which helps to support people who have diabetes and their family and friends.

Other National Sources

NHS 24
Tel: 111
www.nhs24.scot

NHS 24 is an online and out-of-hours phone service providing the Scottish people with access to health advice and information 24 hours a day, 365 days a year.

NHS Inform
Tel: 0800 224 488
www.nhsinform.scot

This is the national health and care information service for Scotland. It includes information and links to resources and to support people with diabetes and health conditions that can develop during pregnancy.

Breathing Space
Tel: 0800 83 85 87 (Monday to Thursday, 6pm to 2am, Friday to Monday, 6pm to 6am)
www.breathingspace.scot

Breathing Space is a free and confidential phone and webchat service for anyone in Scotland over the age of 16 who may be feeling down or experiencing depression and need someone to talk to.

British Heart Foundation
Tel: 0300 330 3311
www.bhf.org.uk
X (formerly Twitter): @TheBHF

The British Heart Foundation provides a telephone information service for people looking for information on health issues to do with the heart, as well as providing a range of information on its website.

Chest, Heart and Stroke Scotland (CHSS)
Tel: 0131 225 6963
www.chss.org.uk
X (formerly Twitter): @CHSScotland

Chest, Heart and Stroke Scotland aims to improve the quality of life of people affected by chest, heart and stroke illnesses by offering information, advice and support in the community. It produces leaflets on the links between diabetes, heart disease and stroke.

Citizens Advice Scotland
www.cas.org.uk
X (formerly Twitter): @CitAdviceScot

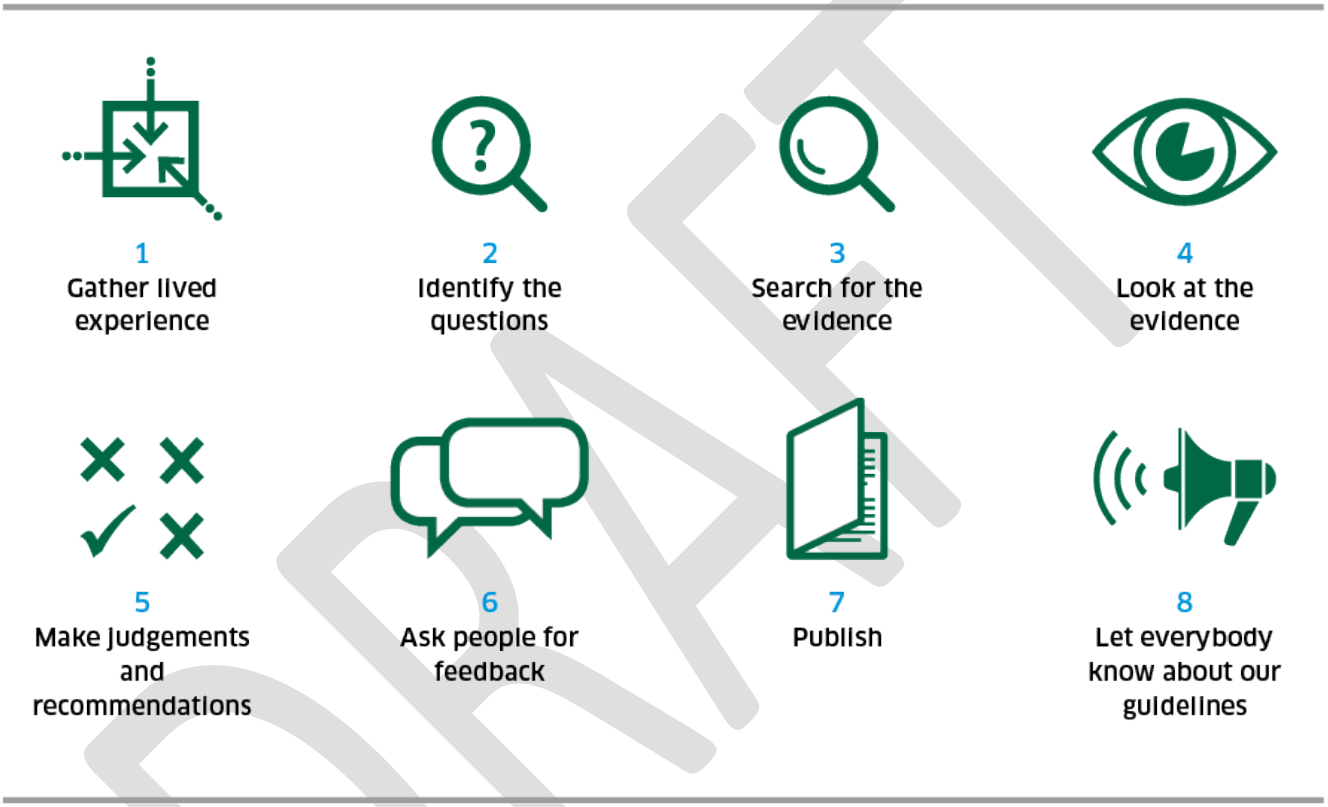
Citizens advice bureaux are local independent charities that provide free, confidential and impartial advice to people who need it.

Driver and Vehicle Licensing Agency (DVLA)
www.gov.uk/diabetes-driving
X (formerly Twitter): @DVLAgovuk

The DVLA is an executive agency of the UK Government Department for Transport. It is responsible for issuing driving licenses and vehicle registration certificates, and also recording driver endorsements, disqualifications and medical conditions. People who use insulin for >3 months to control their diabetes are required to inform DVLA.

How are SIGN guidelines produced?

Our guidelines are based on the most up-to-date scientific evidence. We read research papers to find evidence for the best way to diagnose, treat and care for patients. If we cannot find this out from the research evidence, we ask healthcare professionals to use their clinical experience and judgment to suggest treatments.



You can read more about us by visiting www.sign.ac.uk or you can phone 0131 623 4720 and ask for a copy of our booklet 'SIGN guidelines: information for patients, carers and the public.

The Scottish Intercollegiate Guidelines Network (SIGN) writes guidelines which give advice for healthcare professionals, patients and carers about the best treatments that are available. We write these guidelines by working with healthcare professionals, other NHS staff, patients, carers and members of the public.

We are happy to consider requests for other languages or formats. Please phone 0131 623 4720 or email sign@sign.ac.uk

Healthcare Improvement Scotland

Edinburgh Office
Gyle Square
1 South Gyle Crescent
Edinburgh
EH12 9EB

0131 623 4300

Glasgow Office
Delta House
50 West Nile Street
Glasgow
G1 2NP

0141 225 6999