Title: Glucose Tolerance Test in Pregnancy Procedure
Reference No: MAT 086
Status: Final

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The latest approved version of this document is online.
If the review date has passed please contact the Author for advice.

Powys Teaching Health Board is the operational name of Powys Teaching Local Health Board
Bwrdd Iechyd Addysgu Powys yw enw gweithredol Bwrdd Iechyd Lleol Addysgu Powys

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Version Control:

Version	Summary of Changes/Amendments	Issue Date
1	Initial Issue	June 2023

Engagement & Consultation

Key Individuals/Groups Involved in Developing this Document

Role / Designation
Midwife Sonographer

Circulated to the following for Consultation

Date	Role / Designation
19/4/2023	Powys Midwives and clinical Maternity Support Workers
19/4/2023	Powys Leadership and Management Team
19/4/2023	Medicines Management
19/4/2023	Members of the Women and Children's Guidelines Group

Groups Approved At

Date	Group
09/5/2023	Maternity Guidelines Group
15/5/2023	Women and Children's Guidelines Group

Evidence Base

Please list any National Guidelines, Legislation or Health and Care Standards relating to this subject area?

MAT 051 All Wales Strategy for Screening and Managing Gestational Diabetes

NICE 2015 Diabetes in pregnancy: management from preconception to the postnatal period

Impact Assessments

Equality Impact Assessment Summary					
	No impact	**Adverse**	**Differential**	**Positive**	**Statement** Please remember policy documents are published to both the **intranet** and **internet.** The version on the internet must be translated to Welsh.
Age	x				
Disability	x				
Gender reassignment	x				
Pregnancy and maternity	x				
Race	x				
Religion/ Belief	x				
Sex	x				
Sexual Orientation	x				

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Marriage and civil partnership	x				
Welsh Language	x				
Human Rights	x				

Risk Assessment Summary

Have you identified any risks arising from the implementation of this policy / procedure / written control document?

No risks identified

Have you identified any Information Governance issues arising from the implementation of this policy / procedure / written control document?

No information governance issues arising.

Have you identified any training and / or resource implications as a result of implementing this?

No resource implications identified.

1 Introduction

Undiagnosed and poorly controlled diabetes in pregnancy has serious consequences for both mother and baby. It has long been recognised that both pre-existing and gestational diabetes have an increased risk of stillbirth.

When combined with a systematic assessment of the risk factors for Gestational Diabetes, the Glucose Tolerance Test (GTT) can identify pregnant women who are gestational diabetic and who will require further monitoring.

2. Objective

To provide safe and effective care
To ensure a clear and consistent approach

3. Definitions

- **PTHB** – Powys Teaching Health Board
- **GTT** – Glucose Tolerance Test
- **MSW** – Maternity Support Worker
- **NMC** – Nursing and Midwifery Council
- **CPD** – Continuing Professional Development
- **NICE** – National Institute for Health and Care Excellence
- **DGH** – District General Hospital
- **GP** – General Practitioner

4. Role / Responsibilities

4.1 Head of Midwifery and Sexual Health Services

The Head of Midwifery and Sexual Health Services must:

- Ensure all staff read and understand this procedure
- Arrange regular review to monitor compliance with this procedure

4.2 Assistant Head of Midwifery and Sexual Health Services

The Assistant Head of Midwifery and Sexual Health Services has responsibility for:

- Ensuring dissemination of this document to all relevant staff
- Ensure competence in carrying out this procedure is reviewed as part of the appraisal process

4.3 Band 7 operational team lead (OTL)

The OTL has responsibility for:

- Ensuring dissemination of this document to all relevant staff
- Ensure competence in carrying out this procedure is reviewed as part of the appraisal process

4.6 Women and Children's Risk and Governance Lead

The Women and Children's Risk and Governance Lead has responsibility for:

- Monitoring review of incidents in relation to content of this document

4.7 All Staff working within maternity services

All staff working the maternity services have responsibility for:

- Reading and being familiar with contents of this document
- Referring women appropriately for additional care where required
- Working to the requirements of their role within the scope of this guideline
- Midwives have a responsibility to risk assess and identify women on their caseload who will require a GTT.
- Midwives and clinical MSW's will be responsible for arranging and or performing the GTT and following up the results with appropriate referral for specialist care where indicated
- Midwives and DAU maternity support workers already hold the skills for carrying out a GTT; they are skilled at phlebotomy and competent to administer the required glucose preparation

5. Risk factors at booking indicating need for a GTT

During the initial consultation the midwife identifies women who have any of the following risk factors and advises and arranges a GTT at the appropriate time. Verbal and written information (Appendix 2) must be provided by the midwife to facilitate informed consent and ensure the pre-test procedure is followed.

- BMI above 30 kg/m2
- Previous macrosomic baby weighing 4.5 kg or above
- Previous gestational diabetes
- Family history of diabetes (first degree relative with diabetes)
- Ethnic family origin with a high prevalence of diabetes (See appendix 2 for countries of high prevalence)

Women are advised to have a GTT between 24-28 weeks of pregnancy.
Women with a previous diagnosis of gestational diabetes will be advised to have a GTT as soon as possible after booking and at 28 weeks if the first screening is normal. The named midwife is responsible for arranging the GTT with the Day Assessment Unit or at the birth centre, depending on capacity.

6. Additional Pregnancy Risk Factors

Women may also be advised to have a GTT at any stage of the pregnancy if any of the following risk factors are identified

- Glycosuria of 2+ on one occasion detected on reagent strip testing at routine antenatal consultations
- Glycosuria of 1+ on 2 occasions detected on reagent strip testing at routine antenatal consultations
- Polyhydramnios diagnosed by ultrasound scan (There is no evidence to support repeating a GTT if one has already been done in this pregnancy)
- Estimated fetal weight above the 97th centile by ultrasound scan

- Standard tests for diagnosing gestational diabetes are not validated after 34 weeks. According to the All Wales Guideline for screening for Gestational Diabetes there are no validated tests for screening of gestational diabetes after 34 weeks gestation therefore the following options could be considered: Hba1C (<39mmol/mol) and a fasting plasma glucose (<5.3) OR consider capillary blood glucose monitoring for 1 week.

Should there be the development of clinical risk factors after 34 weeks, this should be discussed with the obstetric team at the DGH of choice to formulate a plan of care with the woman.

7. Oral Glucose ordering and storage

It is the responsibility of each midwifery team to regularly check expiry dates of the current stock of oral glucose preparation and ensure there is adequate supply for upcoming tests.

Medicines management procedures must be followed in terms of storage, as well as the following measures when using the oral glucose preparation (currently Polycal):

Polycal liquid 200ml bottle

- Store in cool, dry place (5 – 25^{o}C)
- Shake well before use
- Once opened, store bottles in a refrigerator for a maximum of 24 hours

8. Pre-test process

Prior to the GTT women will have received information on the process and information on when they should fast and how long the test will take (Appendix 2)

In the 3 days prior to the fasting period women should keep to their normal meals and eating patterns. Women should be asked to advise the midwife if they have felt unwell during the days before the planned test (to avoid false results).

Women should also have been made aware that they will be required to remain at the department for the duration of the GTT.

Women should have been advised to not eat (includes use of chewing gum) or drink (apart from water) or smoke cigarettes (including vaping and e cigarettes) for 12 hours prior to the start of the GTT.

Women using nicotine replacement therapy should be advised to remove the patch first thing on the morning of the test.

Women should be advised to bring something to eat with them for immediately after the test.

If women are taking regular medication/supplements they will be advised to take these later in the day is possible and safe to do so.

Appointments should be arranged in the morning to allow for testing after an overnight fast.

9. Equipment required

- Single use non sterile gloves
- Disposable tourniquet
- Alcotip swab for skin cleaning prior to venepuncture
- Grey top (Na Flouride K2ETDA) vacuette blood bottle x2
- Needle and vacuette tube holders

- Laboratory request form (Ask the woman to verify details on the forms and confirm identity)
- Gauze swab and plaster
- Follow policy for safe disposal of sharps
- Polycal (oral glucose) solution (Variety of flavours available – use plain solution if the woman reports allergies to the additives in flavoured Polycal)
- 50ml oral syringe (for measuring Polycal and water)
- FreeStyle Optimum Neo H blood glucose monitor/test strips (Staff using this device must have attended the necessary training).
- Finger prick lancet

10. Test procedure

On the morning of the test, the practitioner must perform a quality control check on the FreeStyle Optimum Neo H blood glucose monitor and record findings in the Quality Control Record book.

The GTT form (appendix 1) must be used to document the purpose of the test as well as pre-test blood sugar readings. This will then be completed when results are available and filed in the community midwife's tracer.

The practitioner should confirm with the woman that the pre-test process has been followed appropriately before commencing the GTT.

An initial finger prick blood sugar will be taken to exclude women who may have a very high glucose level prior to the GTT (Cleanse with plain water prior to the procedure). If the result of this finger prick test are 7.8mmol/litre or more, do not continue with the GTT and instead initiate a referral to the obstetric and or diabetes in pregnancy specialist team in the DGH of choice.

If a woman vomits at any point following commencement of the GTT procedure, the test is invalidated and must be re-booked for another day

- First venous blood sample will be taken with consent
- A registered practitioner (midwife) is required to check the Polycal solution prior to administration
- **113ml** of Polycal is combined with tap water (ideally chilled) to make the total solution up to 200ml (113ml of Polycal liquid provides an equivalent carbohydrate load to a standard 75g dose of anhydrous glucose)
- The woman must consume the glucose drink within 5 minutes [keep an eye on the time to ensure this]
- The woman should then drink a further 100ml of water.
- The woman must continue to fast until the test is complete (sips of water only)

- 2nd venous blood sample will be taken 2 hours after the start of the administration of the Polycal solution
- Follow protocol of DGH laboratory in terms of labelling of blood samples (I.e handwritten or patient addressograph sticker).
- The woman should be advised to eat before leaving the department
- The woman should be advised that she will be telephoned directly within 48 hours to discuss the results

11. Record Keeping

- Documentation that the woman has attended for the GTT must be recorded in the pregnancy hand held records and community midwife's tracer.
- The GTT form must be completed (appendix 1) and filed in the community midwife's tracer
- Paper copies of the results should be filed and hand written in the woman's hand held record at the earliest opportunity.

12. Interpreting results

The results of the GTT should be reviewed the following day by the practioner who performed the GTT (or as soon as results are available). If this is not possible, arrangements must be made for results to be followed up by one of the community midwife team. The results should be accessed online or by telephoning the laboratory. If results have not been reported by the laboratory within 48 hours the practitioner should telephone to ensure the samples were received and are being processed.
The midwife should contact the woman by telephone as soon as results are available to inform her of the outcome of the GTT.
Results should be recorded on the GTT form (appendix 1) and on the community midwife's tracer. Laboratory reports should be received by the community midwife team within 7 working days and must be filed in the woman's hand held record at the earliest opportunity (i.e at the next antenatal contact).

A diagnosis of gestational diabetes should be made if:

- The fasting plasma glucose level is 5.6mmol/litre or more
- The 2 hour plasma glucose level is 7.8mmol/litre or more (NICE, 2015)

The midwife must refer the woman as soon as possible to an obstetric consultant and or pregnancy diabetes specialist in the DGH of choice.
Women with a diagnosis of gestational diabetes should be referred for consultant-led care and advised to birth their baby in a DGH.
The community midwife must ensure that serial growth scans have been arranged in Powys or at the DGH of choice.

13. Postnatal follow up

Women who were diagnosed with gestational diabetes and whose blood glucose levels returned to normal following birth:

- Offer lifestyle advice
- Advise the woman to contact her GP for a fasting plasma glucose test 6-13 weeks after the birth. If a fasting plasma glucose is not performed before 13 weeks, the woman should be advised to request a HbA1c test from the GP.
- Women who have had a diagnosis of gestational diabetes should be advised to have an annual HbA1c test at their GP surgery
- **A postnatal GTT is not routinely required.**

14. Monitoring Compliance / Audit *(Mandatory section header)*

Monitoring of this guideline will be undertaken through routine record keeping audits, DATIX and case reviews in response to any adverse incidents.

15. Review and Change Control

This document will be reviewed every three years or earlier should audit results or changes to legislation / practice within PTHB indicate otherwise.

16. Related Guidance

MAT 051 All Wales Strategy for Screening and Managing Gestational Diabetes

17. References / Bibliography

NICE 2015 [last updated 16 December 2020] Diabetes in pregnancy: management from preconception to the postnatal period

Appendix 1

GTT proforma

Patient label	EDD..... Phone number..... Allergies.....

Named midwife.....

Date taken.....

Person taking sample.....

Reason for GTT:-

Fasting sample result: <5.6mmol/l is non-diabetic response	**2 hour sample result:** <7.8mmol/l is non-diabetic response

Client informed: Date of informing.....Time..... Name of informer..... Actions:

Appendix 2

GTT patient information leaflet

GIG CYMRU NHS WALES
Bwrdd Iechyd Addysgu Powys
Powys Teaching Health Board

Why am I being offered this test?

The midwife will have talked to you about your current health and medical history. Women who are identified with the following considerations are at an increased risk of developing gestational diabetes and should be offered a Glucose tolerance test.

- Body Mass Index 30 or above.
- First degree relative with diabetes
- Previous baby with birth weight greater than 4.5 kg.
- Family origin with high prevalence of diabetes South Asian (India, Pakistan or Bangladesh),Black Caribbean, Middle Eastern (Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon and Egypt)
- Previous experience of Gestational Diabetes
  [NICE 2015]

The midwife may also offer you this test if during your pregnancy she notices that you have glucose in your Urine or that you baby appears to be bigger than expected.

What is a Glucose Tolerance Test?

Sugar, or glucose, is found in many of the foods you eat, insulin is produced by the body to regulate how much sugar is in the blood stream and how much is stored by the body for energy. During pregnancy, your body has to produce more insulin in order to meet the needs of your growing baby. Gestational diabetes [diabetes in pregnancy] is caused when not enough insulin is produced. A glucose tolerance test, also called an oral glucose tolerance test (OGTT), checks how your body regulates your sugar levels. The test is used to diagnose gestational diabetes and is offered to women who are thought to be most likely to develop the condition.

Important Instructions prior to attending for your test

Appointments are arranged in the morning. You will need to have not eaten or drank anything (except plain water) for 12 hours prior to your test. For example if your appointment is at 9am, you shouldn't eat or drink after 9pm the night before the test. This includes things like chewing gum. If you usually take regular medication/vitamin supplements in the morning, on the day of the test you will need to take this later in the day when the test is complete.

If you smoke, you should not have had a cigarette in the last 12 hours (this includes vaping). If you are using nicotine replacement therapy in the form of a patch, you should remove the patch first thing on the morning of the test.

You will need to bring something to eat with you for immediately after the test, as it is important that you eat and feel well before leaving the department.

What does the test involve?

The midwife will ask you to attend the birth centre where you will need to remain for approximately 2-3 hours. A blood test will be taken from your finger (finger prick) to check your blood glucose level before the test commences. Following this, a venous blood sample (i.e from your arm/hand) will be taken. The midwife will then ask you to drink a sugary solution within 5 minutes, followed by a measured amount of plain water. A 2nd venous blood sample will be taken 2 hours later and until this point you will need to remain in the department and cannot eat or drink (sips of water only).

When will I get my results and what happens if the test is positive?

The midwife should get your results back in 48 hours and will contact you to tell you the result. If the test is positive, the midwife will need to refer you to hospital for review with a specialist obstetrician or diabetes midwife. The diabetes team within the hospital will explain to you the best way to manage diabetes and plan your ongoing pregnancy care.

If you have any questions please do not hesitate to contact your Powys Midwife who will be happy to help.

Appendix 3

Powys GDM diagnosis pathways

Hospital	Pathway
Wrexham Maelor Hospital	• Email GDM referral form to Dr Lee's secretary: sharon.langford@wales.nhs.uk • Switchboard: 01978291100
Shrewsbury & Telford Hospitals	• Telephone diabetes specialist midwives: 01952565774 • If previously MLC, email full SATH referral form and booking summary off WPAS to the clinical referral team: sath.crt@nhs.net • Switchboard: 01952641222
Hereford County Hospital	• Email consultant-led care antenatal referral form to antenatal clinic: hhn-tr.anreferrals@nhs.net • Switchboard: 01432 355444
Bronglais General Hospital	• Telephone antenatal clinic (01970635637) – appointment is then made for the next Monday clinic with Dr Alan Treherne. • Email antenatal referral form to dietician, antenatal clinic (bronglais.antenatalclinic@wales.nhs.uk) and specialist nurse Lorna Phillips. • Switchboard: 01970 623131
Glangwili General Hospital	• Email antenatal referral form to antenatal clinic stating that the client is newly diagnosed GDM. • Follow this up with a phone call to ensure the form has been received. • Hospital Switchboard: 01267 235151
Neville Hall and The Grange	• Email antenatal referral form to antenatal clinic: (ABB.ANCBookingsNHH@wales.nhs.uk) stating the DGH of choice and that the client is newly diagnosed GDM. • For Neville Hall Hospital also email referral to diabetes specialist nurse: Lynn.Woolway@wales.nhs.uk • Follow this up with a phone call to ensure the form has been received.

	• Switchboard NHH: 01873 732732 • Switchboard The Grange: 01633 623623
Prince Charles Hospital (Merthyr Tydfil)	• Email antenatal consultant care referral form to antenatal clinic stating that the client is newly diagnosed GDM (Louise.Dowd@wales.nhs.uk). • Follow this up with a phone call to ensure the form has been received. • Switchboard: 01685 721721
Neath Port Talbot Hospital	• Email antenatal referral form to antenatal clinic stating that the client is newly diagnosed GDM. • Follow-up with a phone call to ensure the form has been received. • Switchboard: 01639 862000
Singleton	• Email antenatal referral form to antenatal clinic stating that the client is newly diagnosed GDM • Follow-up with a phone call to ensure the form has been received. • Switchboard: 01792 205666