Mid Cheshire Hospitals NHS
NHS Foundation Trust

GESTATIONAL DIABETES DETECTION & MANAGEMENT

Maternity Manual guideline

Document Type:	**Guideline**
Version:	**1**
Date of Issue:	**August 2013**
Review Date:	**August 2016**
Lead Director:	**Divisional Clinical Director**
Post Responsible for Update:	**Midwife – NHSLA Lead**
Ratifying Committee:	**Obstetric Governance Committee**
Ratified by them in the minutes of:	**Obstetric Governance Committee**
Distribution to:	**All Trust staff via the Trust Intranet**

Contents:

Risk Rating		
Who will be affected by this Procedure?	Trust Employees / Patients	
Have any existing risk assessments related to this procedure been appropriately updated	N/A	Details: N/A
Is a new risk assessment required by this procedure?	No	Yes- Date completed
Does this procedure require Health and Safety training?	No	Details if Yes
Does this procedure require specialist equipment?	No	Details if Yes
Name:		

	A **Potential Severity (1-5)**	**B** **Likelihood of Occurrence (1-5)**	**C** **Risk Rating (A x B = C)**
Raw Risk Rating	3	3	**9**
Final Risk rating	3	2	**6**

1. INTRODUCTION / PURPOSE

Gestational diabetes (or gestational diabetes mellitus, GDM) is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy (especially during third trimester) [1].

Gestational diabetes affects 2-5% of pregnancies. Women with unmanaged gestational diabetes are at increased risk of developing type 2 diabetes mellitus or very rarely latent autoimmune diabetes. The term Latent autoimmune diabetes (LADA) is used to describe slow-onset Type 1 autoimmune diabetes in adults. It is estimated that 20% of persons diagnosed as having non-obesity-related type 2 diabetes may actually have LADA.

Gestational diabetes is fully treatable. The multinational Hyperglycaemia and Pregnancy Outcome (HAPO) study defined the relationship of maternal glucose tolerance to neonatal outcomes in over 23 000 women. For women requiring pharmacological treatment oral hypoglycaemic agents were as successful as insulin[2].

Untreated gestational diabetes increases the risk of pre eclampsia, shoulder dystocia, caesarean section and diabetic complications such as diabetic ketoacidosis, Babies born to women with untreated gestational diabetes are at increased risk of developing fetal macrosomia, hypoglycaemia, electrolyte imbalance, jaundice, childhood obesity and risk of type 2 diabetes in later life

It is the policy of the Trust that no one will be discriminated against on grounds of age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex or sexual orientation. The Trust will provide interpretation services or documentation in other mediums as requested and necessary to ensure natural justice and equality of access.

2. GENERAL DIABETES DETECTION & MANAGEMENT

2.1 Screening for gestational diabetes

Gestational diabetes generally has few symptoms and it is most commonly diagnosed by screening during pregnancy.
Universal screening for gestational diabetes in pregnancy is not recommended. Screening is currently offered to women who are at high risk of developing diabetes[2].

2.1.1 Women with gestational diabetes in previous pregnancy:

Women who have had gestational diabetes in a previous pregnancy are at risk of developing gestational diabetes in subsequent pregnancies. Therefore they should be referred to dietician/ diabetes specialist nurse at the dating appointment by the Antenatal clinic Midwife. (Clinic code GDM ANC).

The referral form should be completed and forwarded to the diabetes team. (See frequently used forms on the trust intranet).

Fax copy of referral form to the DSN and dietetic service
Diabetes Specialist Nurses Fax :01270 611956

Dietician Fax : 01270 273627

They are reviewed in the gestational clinic by the Diabetic team (Dietician/Diabetic Nurse) within 2 weeks and offered early self-monitoring of blood glucose. If blood glucose is within targets over a period of 2 weeks women are advised to stop monitoring blood sugars and OGTT is arranged at 28weeks.

However if blood sugars are above target they will be referred to consultant (MZQ clinic) as per pathway.

2.1.2 Women with no previous history of gestational diabetes:

Women with any of the other risk factors for gestational diabetes should be offered an OGTT at 28weeks[3].

2.1.3 Women with other Risk factors for gestational diabetes:

The risk factors are -

- First degree relative with diabetes mellitus
- Previous macrosomia (baby > 4.5 kg)
- Obesity - BMI ≥ 30 kg/m2 at booking
- Family ethnic origin with a high prevalence of diabetes South Asian, Black African-Caribbean, Middle Eastern.

As with any selective policy it is acknowledged that some of those at risk will not be identified

Women who have pre-existing impaired glucose tolerance (IGT) or fasting glycaemia (IFG) outside pregnancy should be referred to diabetic team at booking
Repeated glycosuria is neither sensitive nor specific for hyperglycaemia in pregnancy and is **not** considered an indication for screening for GDM.

Other conditions for which OGTT should be considered include polyhydraminos.

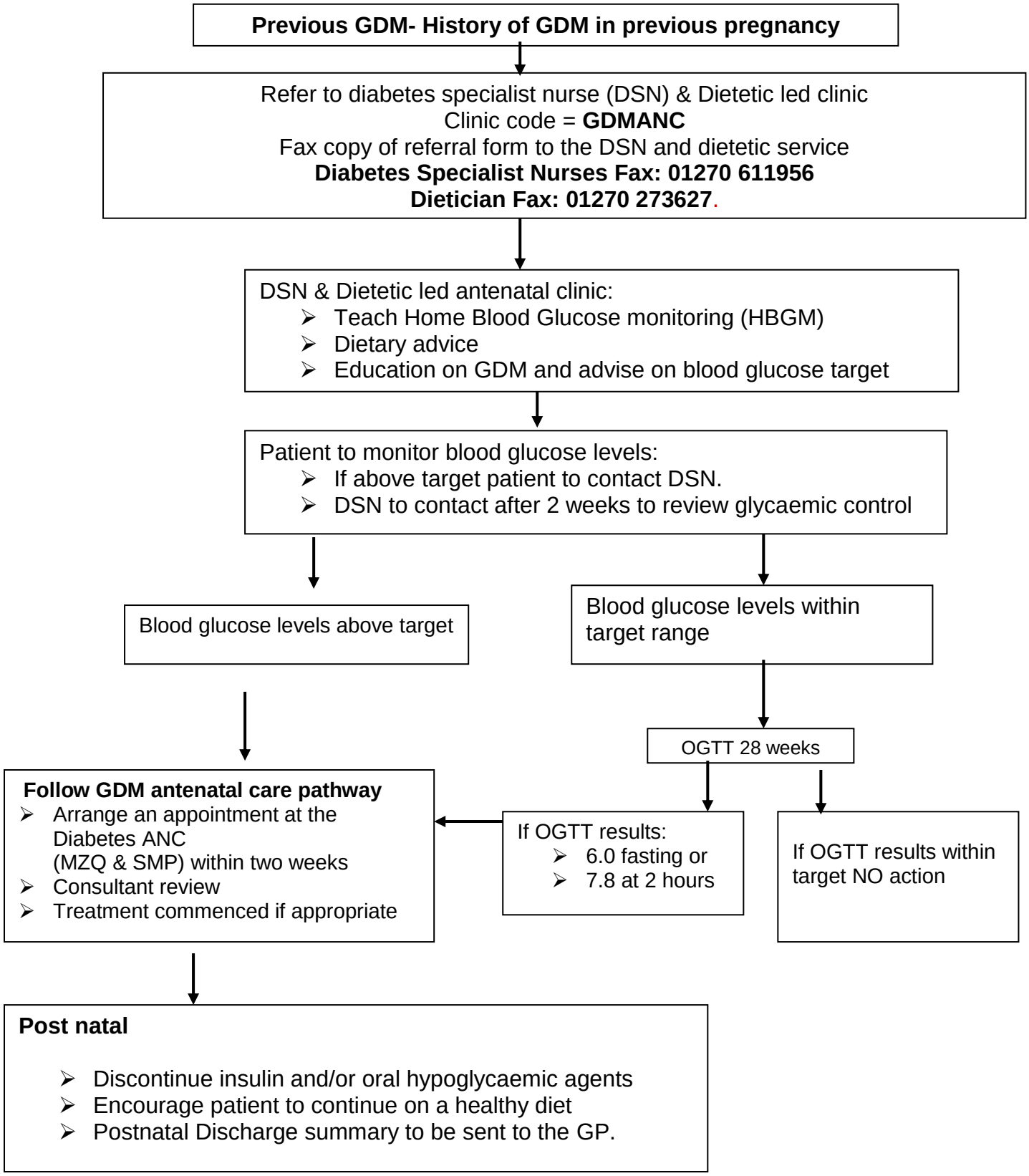
Screening for gestational diabetes using fasting plasma glucose, random blood glucose, glucose challenge test and urinalysis for glucose should not be undertaken.

The 2-hour 75 g oral glucose tolerance test (OGTT) should be used to test for gestational diabetes and diagnosis made using the criteria defined by the World Health Organization[4]

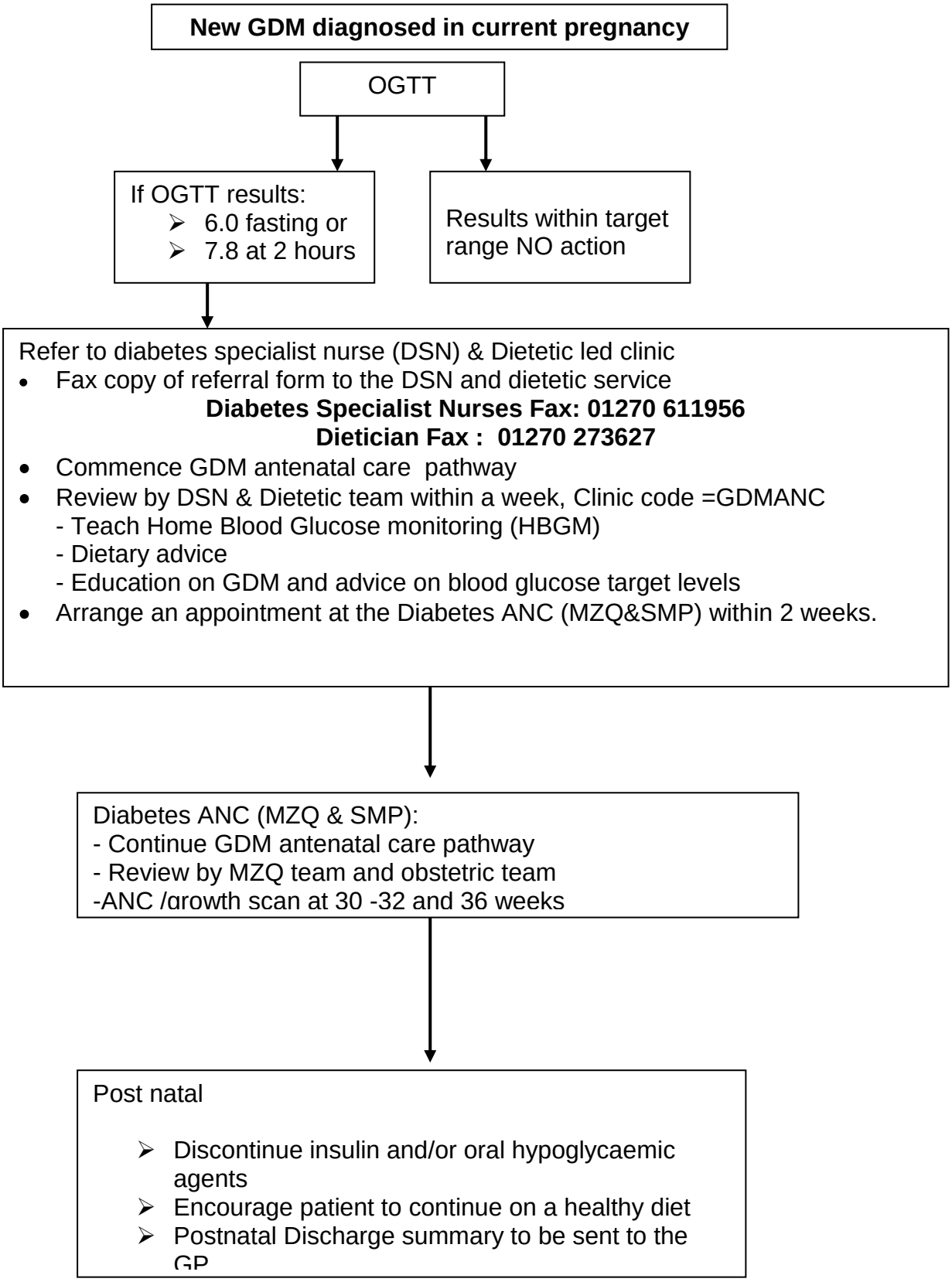
1999 WHO Diabetes criteria - Interpretation of Oral Glucose Tolerance Test								
Glucose levels	**NORMAL**					Diabetes Mellitus **(DM)**	
Venous Plasma	Fasting	2hrs				Fasting	2hrs
(mmol/L)	<6.1	<7.8				≥6.1	≥7.8

The flowcharts depict the Gestational Diabetes Mellitus Care Pathway for women with GDM in previous pregnancy and for women with GDM diagnosed in current pregnancy.

Pathway for women with gestational diabetes in previous pregnancy:



Pathway for women with gestational diabetes diagnosed in current pregnancy:



Two large randomised controlled trials have investigated the effects of screening, diagnosis and treatment of gestational diabetes.

The Australian Carbohydrate Intolerance Study in Pregnant Women (ACHOIS)[2] established that treatment of gestational diabetes with insulin improved pregnancy outcomes specifically, birth weight, macrosomia and birth weight >90th percentile were all significantly reduced.

Furthermore, the primary composite outcomes (serious perinatal outcomes: death, shoulder dystocia, bone fracture and nerve palsy) were significantly reduced from 4% to 1%. Notably, this trial used the same definition of gestational diabetes as the current NICE guideline.

The Maternal Fetal Medicines Unit (MFMU) Network trial of treatment of mild gestational diabetes used a similar design and intervention to ACHOIS, but the definition of gestational diabetes was at lower levels of glycaemia (fasting glucose <5.3 mmol/l and two or three post load glucoses above established thresholds).
The primary outcome measure did not achieve statistical significance (a composite of perinatal mortality, hypoglycaemia, hyperbilirubinaemia, neonatal hyperinsulinaemia and birth trauma).
However there were significant reductions in mean birth weight ,proportion of infants with birth weight greater than 4 kg (5.9% versus 14.3%), proportion of large-for-gestational-age infants, and caesarean section rate (26.9% Vs. 33.8%

2.2 Management of Gestational Diabetes

2.2.1 Antenatal Care

2.2.1.1 In order to make an informed decision about screening and testing for gestational diabetes, women should be informed that:

- In most women, gestational diabetes will respond to changes in diet and exercise
- Some women (between 10% and 20%) will need oral hypoglycemic agents or insulin therapy if diet and exercise are not effective in controlling gestational diabetes
- if gestational diabetes is not detected and controlled there is a small risk of birth complications such as shoulder dystocia
- A diagnosis of gestational diabetes may lead to increased monitoring and interventions during both pregnancy and labour.

2.2.1.2 Women with gestational diabetes should be instructed in self-monitoring of blood glucose by the diabetic nurse specialist/Dietitian.

Individualised targets for self-monitoring of blood glucose should be agreed.

The aim is to keep fasting blood glucose between 3.5 and 5.9 mmol/litre and 1 hour postprandial blood glucose below 7.8 mmol/litre.

HbA1c should not be used routinely for assessing glycaemic control.

2.2.1.3 Monitoring blood glucose during pregnancy
Women should be advised to test fasting blood glucose levels and blood glucose levels 1 hour after every meal during pregnancy.
Women with insulin-treated diabetes should be advised to test blood glucose levels before going to bed at night during pregnancy. They are also advised to test for urine ketones if they become hypoglycemic or unwell.

2.2.1.4 Women with gestational diabetes should be offered information covering:

- The role of diet, body weight and exercise
- The increased risk of having a baby who is large for gestational age, which increases the likelihood of birth trauma, induction of labour and caesarean section
- The importance of maternal glycemic control during labour and birth and early feeding of the baby in order to reduce the risk of neonatal hypoglycemia
- The possibility of transient morbidity in the baby during the neonatal period, which may require admission to the neonatal unit
- The risk of the baby developing obesity and/or diabetes in later life.

2.2.1.5 Women should be seen by a dietician to discuss an appropriate diet to help control their condition.

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2.2.1.6 Glucose lowering therapy should be considered if diet and exercise fail to maintain blood glucose targets during a period of 1-2 weeks.

Glucose lowering therapy (which may include regular insulin e.g rapid-acting insulin analogues [aspart and lispro] and/or oral hypoglycemic agents e.g. metformin should be tailored to the glycemic profile of, and acceptability to, the individual woman.

Evidence for treatment of Gestational Diabetes:

Lifestyle advice including dietary modification is the primary intervention in all women diagnosed with gestational diabetes. However, 7–20% of women will fail to achieve adequate glycaemic control with diet and exercise alone: oral hypoglycaemic agents or insulin will be required to control their gestational diabetes. Both glibenclamide and metformin are effective treatments for gestational diabetes.

Langer et al. demonstrated that a treatment strategy starting with glibenclamide (and requiring progression to insulin in around 4% of cases was associated with similar birth outcomes to a strategy involving initial treatment with insulin[5].

Initial treatment with metformin results in similar outcomes to those treated with insulin though 46%of women in metformin arm required insulin as well (see reference Rowan et al). Metformin treatment was also associated with lower maternal weight gain[6].

Metformin and glibenclamide cross the placenta and, while no immediate safety concerns for the fetus have been demonstrated, potential long-term effects remain under investigation.

2.2.1.7 Schedule of antenatal Appointments

All women are seen in GDM ANC (clinic code GDM ANC) by the dietician and DSN within a week of diagnosis of gestational diabetes

Role of DSN

- Explain diagnosis/management plan
- Teach home BG monitoring
- Education on GDM and advice on Blood glucose target range
- Address health promotion issues/reduction of risk of future Type 2 DM

Role of Dietician

- Review nutrition & meal pattern (Diabetes UK guidelines)
- Review portion sizes and frequency of starchy foods

Advise on dietary management of gestational diabetes, food safety and adequate mirconutrients such as iron and calcium.

Appointment at ANC (SMP/MZQ) within 2 weeks

- All women should be seen in joint SMP/MZQ ANC within 2 weeks following review by DSN and the dietician

- Explain implications for pregnancy & antenatal care/delivery e.g. risk of macrosomia & increased perinatal morbidity/mortality

- Discuss risk of neonatal hypoglycaemia

- Encourage to maintain contact with community midwife

- Growth scan at 30-32 weeks

Follow up appointments ANC (SMP/MZQ):

Obstetrician

- 36wk- growth scan & discuss timing and mode of delivery. An individual plan for fetal monitoring should also be documented.

- Women should have individualised plan of management discussed for the antenatal period and postnatally for 6 weeks. This should be documented in the antenatal health records.

- Delivery – Aim vaginal delivery. No clear evidence is available to inform the optimal timing of delivery .The timing of delivery is determined on individual basis.
  Women whose diabetes is diet controlled offer IOL at 40weeks-41 weeks.
  Women who are on insulin or metformin will have individualised plan of care depending on blood sugar control and fetal growth. In general IOL is offered at 39-40weeks

DSN/Physician
The follow up appointments with physician will be determined on individual basis with review by DSN every 2 weeks

- Patient to contact DSN if blood sugars not within target range

- Review glycaemic control in 2 weeks, if above target range refer to next diabetes clinic to consider oral hypoglycaemic agents/insulin.

- Discuss management of diabetes in labour

- Counsel regarding risk of recurrence in future pregnancy

- Counsel regarding long term risk of Type 2 diabetes

- Advice regarding weight & exercise

- Discuss risk of neonatal hypoglycaemia.

2.2.1.8 Women with fetal macrosomia, polyhydramnios and poor glycaemic control will need individualised plan of care by the consultant obstetrician .

2.2.1.9 Women should be encouraged to report a perceived reduction in fetal movements during pregnancy.

2.2.1.10 Women should be encouraged to report an unexplained reduction in insulin requirements later in pregnancy or increased frequency of hypos.

2.2.1.11 Antenatal steroids should be given if delivery is planned before 34 weeks and elective caesarean sections before 39 weeks, to reduce the likelihood of fetal respiratory distress syndrome. Women requiring steroids will need inpatient stay and monitoring of blood glucose

2.3 Postnatal Care

- Discontinue insulin and/or oral hypoglycaemic agents. No need to monitor BM's unless specifically requested by diabetalogist, refer to antenatal notes

- Postnatal discharge summary to be sent to the GP to highlight the need to repeat the OGTT and full blood count at 6 weeks after delivery. If the sole abnormality on the OGTT done in pregnancy was for the fasting glucose, a repeat fasting glucose alone is acceptable.

3. DEFINITIONS

Please see the **Agreed Obstetric Abbreviations** guideline.

Glycosylated haemoglobin(HbA1c)	A test which measures the amount of glucose-bound haemoglobin and reflects how well the blood glucose level has been controlled over the previous 2–3 months. The way in which HbA1c results are expressed in the UK has recently changed. From June 2011 the values of HbA1c will be expressed as the IFCC reference method of mmol/mol rather than the DCCT units as a percentage.
Hypoglycaemia	Blood sugar below 4mmol/l
Hyperglycaemia	Blood sugar above 10mmol
Ketoacidosis	Ketoacidosis is a type of metabolic acidosis which is caused by high concentrations of ketones, formed by the breakdown of Fatty acids and the deamination of amino acids. High blood sugar levels caused by the lack of insulin can lead to further acidity and in extreme cases ketoacidosis can be fatal.

The recent guidelines commissioned by NHS Diabetes recommend that the term variable rate intravenous insulin infusion (VRIII) should replace the ambiguous term 'sliding scale'.

4. ASSOCIATED DOCUMENTS

i. **Caesarean Section Maternity Manual Guideline**

ii. **Induction of Labour Maternity Manual Guideline**

Diabetes: Gestational: Labour /LSCS Maternity Manual guideline

Diabetes: Betamethasone Administration to non labouring women with diabetes. Maternity Manual guideline

5. DUTIES

All staff working within the maternity service have an individual responsibility to be aware of the contents of any clinical guideline which may be relevant to their clinical practice.
Please refer to the current version of the Maternity Service Risk Management Strategy.

6. CONSULTATION AND COMMUNICATION WITH STAKEHOLDERS

This guideline has been developed in consultation with:

- Divisional Clinical Director
- Consultant Obstetrician Clinical Lead for Obstetrics and Gynaecology
- Consultant Obstetrician Lead Obstetrician for Risk Management and Labour Ward
- Consultant Obstetrician Lead Obstetrician for Audit
- Clinical Governance Lead
- Risk and Governance Manager for Maternity
- CNST Lead for Women's Health
- Supervisor of Midwives
- Head of Midwifery
- Obstetric, Gynaecology & Sexual Health Governance Committee
- Diabetes Multidisciplinary Team
- **Governance.policies@mcht.nhs.uk**

7. IMPLEMENTATION

This document will be available for all staff to access on the trust intranet under policies and procedures maternity manual.
An email is sent to all relevant staff informing them of the publication of a new updated guideline.

8. EDUCATION AND TRAINING

Within the maternity unit all staff attend mandatory training according to their clinical role. When guidelines are reviewed/ amended at the Obstetric Governance Committee, the Divisional training needs analysis will be reviewed and updated with any additional training requirements.

9. MONITORING AND REVIEW

9.1 Process for Monitoring Compliance with all of the above requirements, review of results and subsequent monitoring of action plans

Adverse incidents relating to *GESTATIONAL DIABETES: DETECTION AND MANAGEMENT* should be reported via the Trust Incident Reporting System, such incidents will be investigated and managed in accordance Trust Policy *'Integrated Governance & Risk Management Strategy 2010 – 2013'* March 2011.

This guideline will be monitored via the 'Monitoring Compliance Assessment tool'. Maternity health records will be assessed on a monthly basis for compliance and results will be fed back into the directorate via the monthly report which is discussed at the Obstetric, Gynaecology and Sexual Health Governance meeting before being distributed for information to all Ward and Departments.

The requirement to audit this guideline will be included in the Divisional Clinical Audit programme in liaison with the Divisional Clinical Audit Lead and will be approved by the Obstetric, Gynaecology and Sexual Health Governance meeting.

The results of the completed audits will be reported to the Obstetric, Gynaecology and Sexual Health Governance meeting. The meeting will consider the recommendations, approve the actions to be taken and will agree subsequent monitoring arrangements.

Standard/process/issue	Monitoring and Audit			
	Method	By	Committee	Frequency
Audit of the process of this guideline on a rolling basis. Processes to be audited will be selected based on any previous hot spots of clinical incidents.	Audit 1% of health care records of all women who have delivered and have a diagnosis of Gestational Diabetes Detection & Management	Clinician nominated by Clinical Audit Lead as part of the departmental rolling audit programme.	Clinical Audit Meeting.	3 yearly.

9.2 Audit Proforma

The MCHFT Audit proforma must be used to demonstrate effective monitoring and implementation of planned actions. This can be found on the intranet in frequently used forms/clinical audit.

9.3 Review

This guideline will undergo review at least on a 3 yearly basis or earlier if new guidance is published.

10. REFERENCES / BIBLIOGRAPHY

1. RCOG Diagnosis and Treatment of gestational diabetes SAC Opinion paper 23 http://www.rcog.org.uk/files/rcog-corp/SAC23Diabetes.pdf

2. HAPO Study Cooperative Research Group, Metzger BE, Lowe LP, Dyer AR, Trimble ER, Chaovarindr U,Coustan DR, et al. Hyperglycemia and adverse pregnancy outcomes. N Engl J Med 2008; 358:1991–2002

3. National Institute for Health and Clinical Excellence. NICE clinical guideline 63: Diabetes in pregnancy. Management of diabetes and its complications from pre-conception to the postnatal period. London: NICE; 2008 [http://www.nice.org.uk/nicemedia/pdf/CG063Guidance.pdf]

4. International Association of Diabetes and Pregnancy Study Groups Consensus Panel, Metzger BE, Gabbe SG, Persson B, Buchanan TA, Catalano PA, Damm P, et al. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycaemia in pregnancy. Diabetes Care 2010; 33:676–82.

5. Langer O, Conway DL, Berkus MD, Xenakis EM, Gonzales O.et al A comparison of glyburide and insulin in women with gestational diabetes mellitus. N Engl J Med 2000; 343:1134–8.

6. Rowan et al Metformin versus insulin for the treatment of gestational diabetes New England Journal of medicine 2008 May 8; 358(19):2003-15.

7. HAPO Study Cooperative Research Group. Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) Study: associations with neonatal anthropometrics. Diabetes 2009; 58:453–9.

8. Third International Workshop-Conference on Gestational Diabetes Mellitus: Summary and Recommendations. (1991) Diabetes, 40 (Suppl 2): 197-201.

11. APPENDICES

A Version Control Document
B Communication / Training plan
C Equality Impact and Assessment Tool

APPENIDX A - Control Sheet

This must be completed and form part of the document appendices each time the document is updated and approved.

VERSION CONTROL SHEET			
Date dd/mm/yy	**Version**	**Author**	**Reason for changes**
06-08-13	1	Dr A Verma	New Document

APPENDIX B - Training needs analysis

Communication/Training Plan (for all new / reviewed documents)	
Goal/purpose of the communication/training plan	To ensure all relevant staff are aware of the contents of this guideline.
Target groups for the communication/training plan	All relevant Staff.
Target numbers	All relevant Staff.
Methodology – how will the communication or training be carried out?	Reviewed via the practice development midwife and incorporated into the divisional training programmes as required.
Communication/training delivery	Internal experts.
Funding	None.
Measurement of success. Learning outcomes and/or objectives	See monitoring table in section 10.
Review effectiveness – learning outputs	See monitoring table in section 10.
Issue date of Document	May 2012
Start and completion date of communication/training plan	Ongoing from date of issue of document.
Support from Learning & Development Services	N/A

APPENDIX C - Equality Impact Screening Assessment

Please read the Guide to Equality Impact Assessment before completing this form. To be completed and form part of the policy or other document appendices when submitted to **governance-policies@mcht.nhs.uk** for consideration and approval or to be completed and form part of the appendices for proposals/business cases to amend, introduce or discontinue services.

POLICY/DOCUMENT/SERVICE – GESTATIONAL DIABETES: DETECTION AND MANAGEMENT

		Yes/ No	Justification and Data Sources
A	**Does the document, proposal or service affect one group less or more favourably than another on the basis of:**		
1	Race, ethnic origins (including gypsies and travellers) or nationality	**No**	
2	Sex	**N/A**	**Guideline only applies to pregnant woman**
3	Transgender	**N/A**	**Guideline only applies to pregnant woman**
4	Pregnancy or maternity	**N/A**	**Guideline only applies to pregnant woman**
5	Marriage or civil partnership	**No**	
6	Sexual orientation including lesbian, gay and bisexual people	**No**	
7	Religion or belief	**No**	
8	Age	**No**	
9	Disability - learning disabilities, physical disability, sensory impairment and mental health problems	**No**	
10	Economic/social background	**No**	
B	**Human Rights – are there any issues which may affect human rights**		
1	Right to Life	**No**	
2	Freedom from Degrading Treatment	**No**	
3	Right to Privacy or Family Life	**No**	
4	Other Human Rights (see guidance note)	**No**	

NOTES

If you have identified a potential discriminatory impact of this document, proposal or service, please complete form 2 or 3 as appropriate.

Date: 6th August 2013…….. Name: Miss S Pinto

Signature: …… Job Title: Consultant Obstetrician

Date: 6th August 2013…….. Name: J.Dunn

Signature: …… Job Title: NHSLA Lead Midwife