

South Australian Perinatal Practice Guideline

# Diabetes Mellitus and Gestational Diabetes

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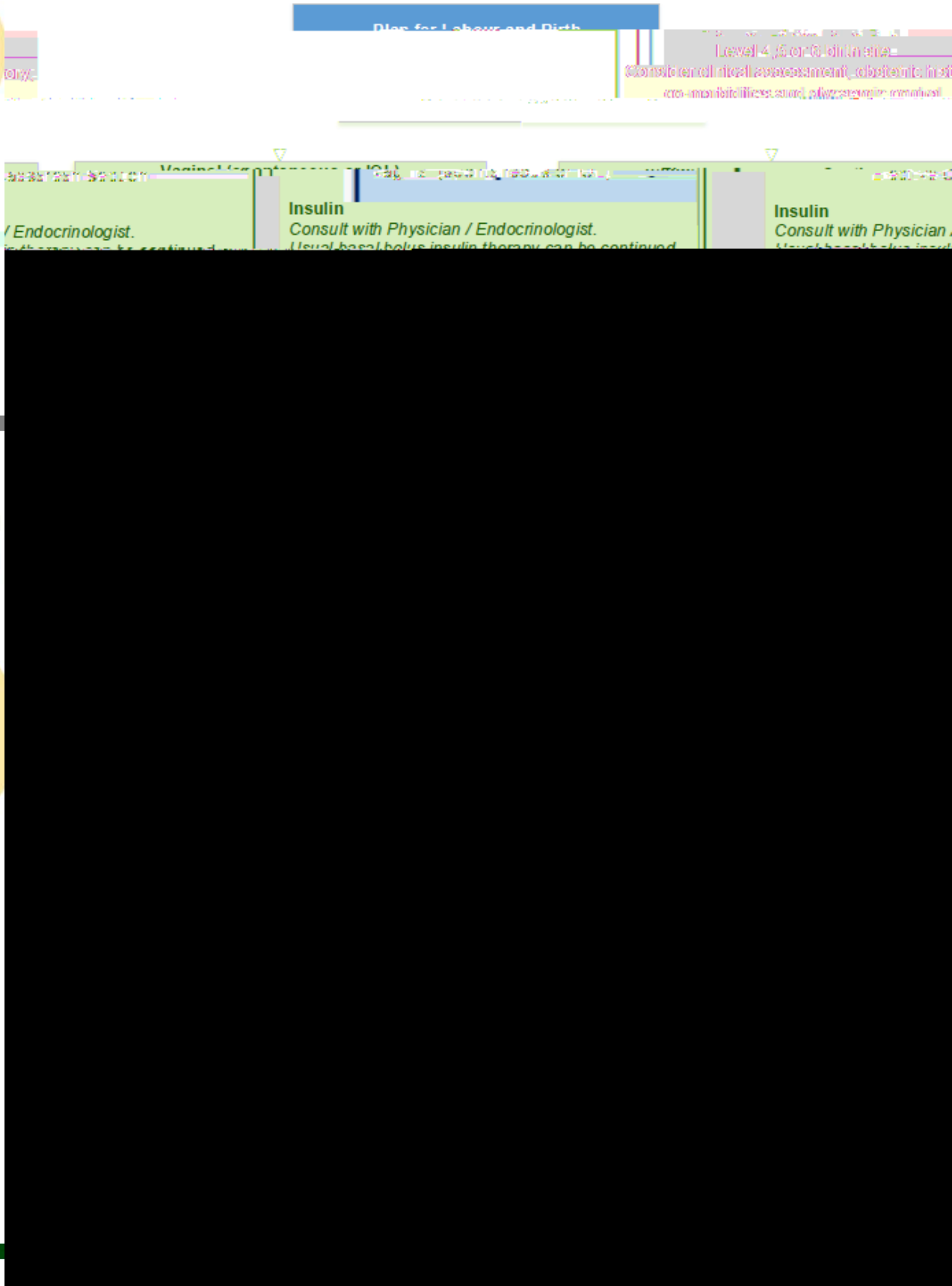


# Diabetes Mellitus and Gestational Diabetes

## Flowchart 2: Intrapartum management for women with type 1 diabetes



# Diabetes Mellitus and Gestational Diabetes



Plan for Labour and Birth

Level 4 (6.0-6.9 birth rate)

Consider clinical assessment, obstetric history, and medical history.

**Insulin**  
Consult with Physician / Endocrinologist.  
Usual basal/bolus insulin therapy can be continued.

**Insulin**  
Consult with Physician / Endocrinologist.

# Diabetes Mellitus and Gestational Diabetes

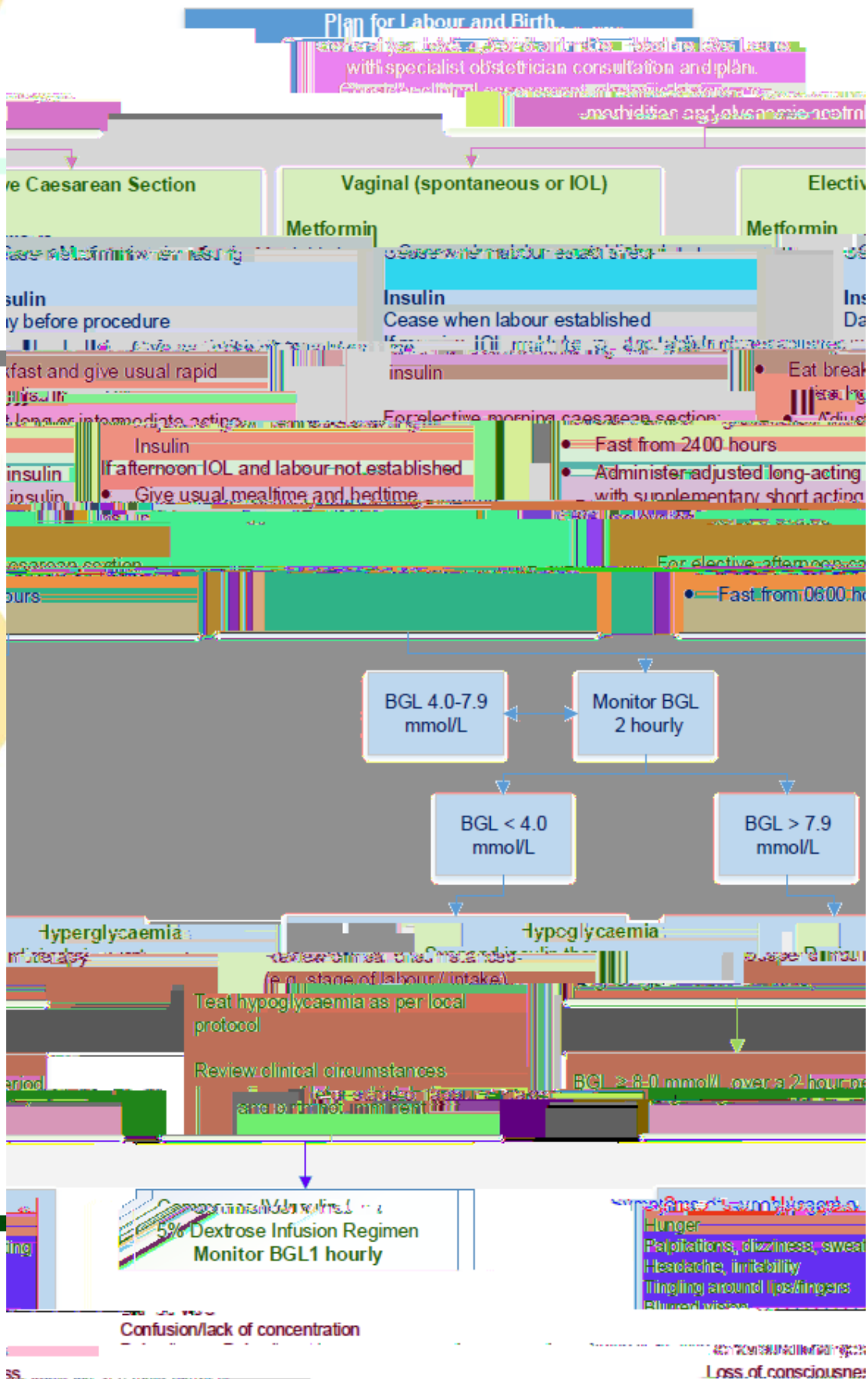
Flowchart 3: Intrapartum management for women with type 2 diabetes

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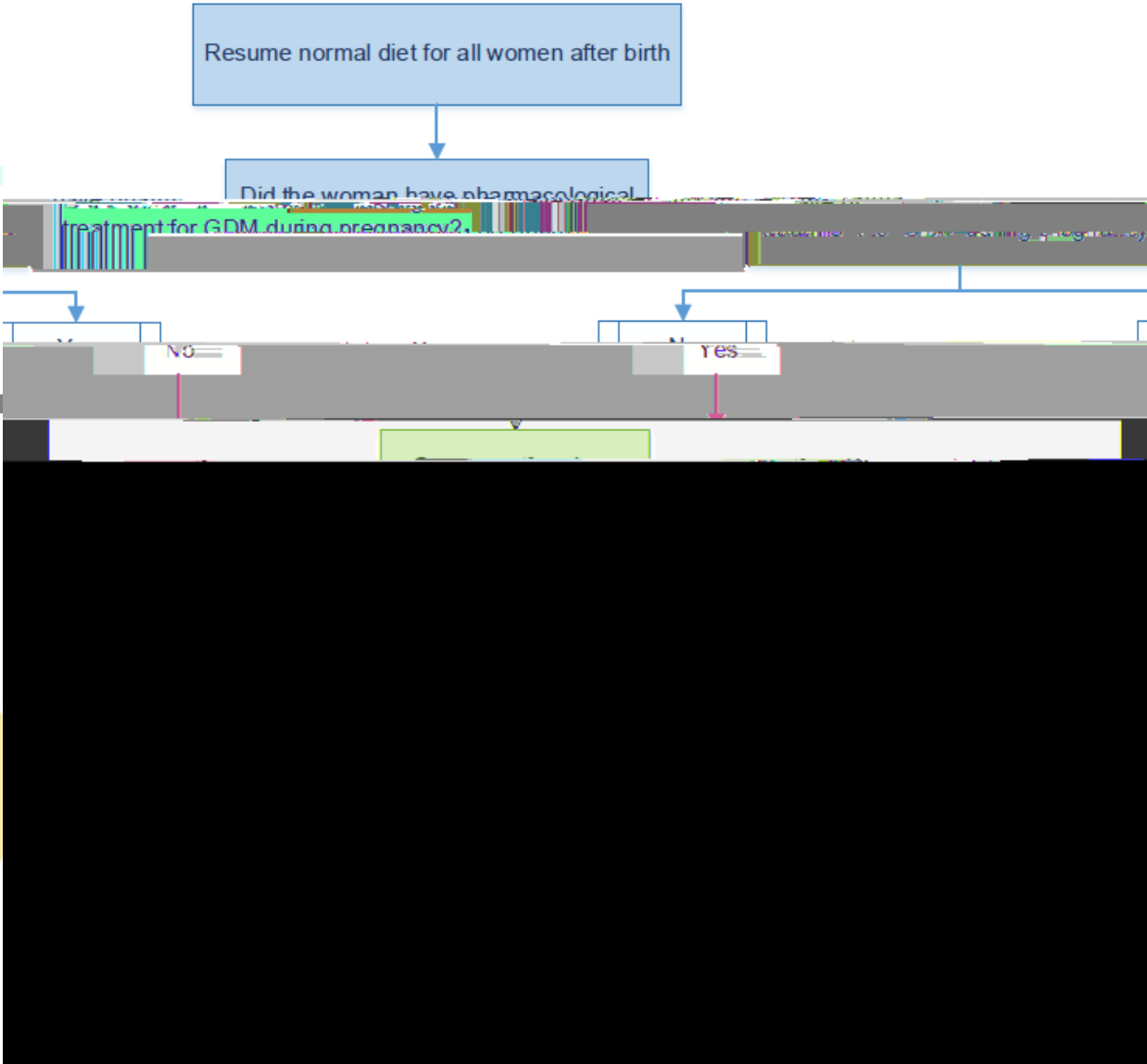
# Diabetes Mellitus and Gestational Diabetes

Flowchart 4: Intrapartum management for women with GDM requiring insulin and/or metformin in pregnancy



# Diabetes Mellitus and Gestational Diabetes

Flowchart 5: Postnatal management for women with GDM



# Diabetes Mellitus and Gestational Diabetes

Table 1: Maternal Diabetes – Intrapartum monitoring and early neonatal Care

Maternal diabetes	Intrapartum maternal / fetal monitoring	Early neonatal care
Type 1 Diabetes mellitus	Once labour is established: ! Commence hourly blood glucose measurements	





# Diabetes Mellitus and Gestational Diabetes

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# Diabetes Mellitus and Gestational Diabetes

## Summary of Practice Recommendations

Women with established diabetes benefit from preconceptual counselling with referral to specialist services at this time

HbA1c  $\geq 8.0\%$  increases the risk of birth defects and pregnancy should be deferred until an adequate HbA1c is achieved

The target HbA1c at conception is  $\leq 6.5\%$ , whilst preventing severe hypoglycaemia

Commence folate 5 mg daily at least 6 weeks before conception

Consider addition of insulin if oral treatment is inadequate to maintain tight control of blood glucose

Some oral hypoglycaemic agents are contraindicated and should be ceased in pregnancy and breastfeeding

Women with established diabetes require early referral to endocrinologist / obstetric physician, obstetrician and Credentialed Diabetic Educator (CDE) in pregnancy

Consider tertiary level morphology ultrasound at 19-20 weeks as part of routine care

Women with markedly elevated ( $\geq 10\%$ ) HbA1c should have a fetal echocardiogram at 20-22 weeks if their morphology ultrasound was not at a tertiary level facility

Women should be encouraged to adjust insulin based on post prandial glucose values rather than pre-prandial values and anticipated carbohydrate intake

Planned early birth to prevent stillbirth without significantly increasing the risk of neonatal morbidity can be considered dependent on clinical assessment, obstetric history, co-morbidities and glycaemic control

Women with type 1 diabetes require an insulin / dextrose infusion regimen when in established labour or fasting with modification of usual long-acting insulin dose

Women with type 2 diabetes and gestational diabetes (GDM) may not require an insulin / dextrose infusion regimen in labour but require close monitoring

All women with risk factors for overt diabetes should be screened with an early oral glucose tolerance test (OGTT). Women with a positive result require referral to a diabetes clinician

All women with a negative result on early OGTT or without risk factors should be screened for gestational diabetes with an OGTT between 24 and 28 weeks of pregnancy

Women who screen positive for GDM in second trimester require referral to a CDE +/- obstetric physician / endocrinologist +/- obstetric medical officer depending on glycaemic control, need for pharmacological therapy and presence of co-morbidities

Plan for labour and birth for women with GDM is dependent on clinical assessment, obstetric history, co-morbidities and glycaemic control

Women with GDM require postnatal follow-up with OGTT and their GP at 6-8 weeks

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# Diabetes Mellitus and Gestational Diabetes

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## DIABETES MELLITUS

### Preconception counselling of women with established diabetes

Aim for review by the woman's endocrinologist / physician, Credentialed Diabetes Educator (CDE) and General Practitioner (GP)

Explain:

Control of blood glucose

Reasons for and benefits of optimal blood glucose and glycosylated haemoglobin concentrations prior to and during pregnancy.



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Assess for complications of diabetes, especially retinopathy and nephropathy, consider potential for ischaemic heart disease or cerebrovascular disease.

Consider need for consultation e.g. ophthalmologist and/or nephrologist review

Instruct on the use of a menstrual calendar to establish date of conception

Commence folate 5 mg daily ideally at least 6 weeks before conception. (Note level of evidence for 5 mg rather than 0.5 mg is inconclusive, unless there has been a previous pregnancy complicated by a fetal neural tube defect)

Consider need for iodine and vitamin D supplementation. For further information, refer to Vitamin and mineral supplementation in pregnancy in the A to Z index at [www.sahealth.sa.gov.au/perinatal](http://www.sahealth.sa.gov.au/perinatal)

Prepare for diabetes management after conception i.e.:

1. Recommend changes to diet as per current pregnancy guidelines
2. Test and record blood glucose measurements to include fasting and 2 hour postprandial readings. Women with pre-conception diabetes, who have been monitoring pre-prandial blood glucose for determination of insulin dose in relation to their proposed dose will need advice on the possibility of changing to or adding post prandial blood glucose monitoring, as adjusting treatment to these values has been shown to be associated with improved perinatal outcomes
3. Contact a Diabetes Clinician for advice on treatment 18 (ho)-12.9 (a)-na.acholhoa In destiusoncDo (h



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- ! Insulin may be needed in type 2 diabetes to improve glucose control
- ! Ceasing oral agents and starting or switching to insulin should be done in collaboration with a physician / endocrinologist to minimise hyperglycaemia during critical stages of fetal growth and development
- ! Commence low dose aspirin 100 mg / day orally especially if the woman has a high risk of vascular disease or has had previous pre-eclampsia

## Education

- ! Reinforce dietary advice and physical activity recommendations
- ! Appropriate blood glucose monitoring (and blood ketone monitoring if type 1 diabetes)
- ! Advise on the likely need for additional/increased insulin
- ! Involve a CDE

## Referral

- ! Arrange CDE and obstetric physician or endocrinologist referral
- ! Arrange ophthalmologist referral

## Subsequent Antenatal Visits

### Frequency of visits

- ! All routine antenatal care should be provided by an obstetric medical officer
- ! Obstetrician and endocrinologist/obstetric physician review should be performed 2, 4 or 6 weekly according to the stability of BGL control and risk of complications. CDE monitoring of diabetes control and supervision of diabetes management should occur at least weekly.

### Maternal surveillance

- ! Review maternal HbA1c, renal function and proteinuria results at first visit. Repeat every two to three months or as indicated. Blood pressure measurement and urine dipstick for protein every visit.

### Fetal surveillance

- ! Confirm gestational age with a dating and viability ultrasound at an estimated 7 to 9 weeks gestation.
- ! At 12 weeks gestation offer nuchal translucency assessment and serum screening
- ! Offer early morphology ultrasound at 16 weeks if appropriate
- ! 19-20 week morphology ultrasound (document that the woman has





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! Macrosomia or growth restriction

! Development of hypertension / pre-eclampsia (or plan birth earlier as indicated)

If birth is likely to occur before 37+0 weeks:

Consider administration of corticosteroids for fetal lung maturity.

There is insufficient evidence to dictate the particulars of the administration of antenatal corticosteroids to diabetic pregnant women. Each case should be assessed by the attending obstetrician and a decision made taking into account the type of diabetes, the gestational age, the planned mode of birth and the likelihood of fetal or maternal complications.

! Admission for additional glucose monitoring and increased insulin dosing should be at the direction of the physician / endocrinologist.

! If not in labour, an insulin infusion is not generally required but in labour an infusion may occasionally be considered if high doses of insulin have been required during pregnancy (see [insulin infusion regimen](#) in appendix) and refer to local hyperglycaemia management protocols

## Method of birth

Vaginal birth if estimated fetal weight is < 4,000 grams as clinically indicated

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for elective caesarean section reduced the incidence of shoulder dystocia in this population<sup>3</sup>.

When discussing the mode of birth with the woman, the medical officer should also take into consideration that current estimations of fetal weight with ultrasonography are associated with a 95% likelihood of a greater than 20% error (above or below) the stated estimated fetal weight.

Discuss with the woman the potential risks and benefits of induction of labour.

## Intrapartum care

### Type 1 Diabetes

Labour and birth needs to be managed within a Level 4, 5 or 6 hospital (see Standards for Maternal and Neonatal Services in South Australia available at [www.sahealth.sa.gov.au/perinatal](http://www.sahealth.sa.gov.au/perinatal))

Normal labour management.

Continuous electronic fetal monitoring ([refer to table 1](#))

Care of the woman with type 1 diabetes in labour should be in consultation with the obstetric physician / endocrinologist (see [flowchart 2](#))

The physician / endocrinologist should document a clear plan in the woman's casenotes when induction of labour (IOL) or elective caesarean section is planned.

If IOL is planned, modify usual long acting insulin the evening before in consultation with the physician / endocrinologist. [www.sahealth.sa.gov.au/perinatal/0\(p\)-3.2 \(h\)-15.3](#)





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Be aware of the increased risk of shoulder dystocia.

## Insulin regimen

- ! Once in labour, a [5 % dextrose infusion](#) should be commenced at a rate based on the woman's BGL





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Glibenclamide and glipizide are excreted in low concentrations in breast milk and may be used in breastfeeding women<sup>10</sup>. There is a lack of human data regarding the use of gliclazide and glimepiride and caution should be exercised with their use with consideration being given to alternatives.

Thiazolidinediones (rosiglitazone, pioglitazone), acarbose, dipeptidyl peptidase-4 inhibitors (e.g. sitagliptin), glucagon-like peptide-1 antagonists and sodium glucose cotransporter-2 inhibitors are not recommended for use by breastfeeding women<sup>10</sup> as there are no human data available on their transfer into breast milk. Alternative options should be considered.



# Diabetes Mellitus and Gestational Diabetes

## GESTATIONAL DIABETES MELLITUS

### Introduction

Gestational Diabetes (GDM) is associated with an increased risk of adverse perinatal outcomes<sup>11</sup> and screening for GDM is recommended for all women not otherwise diagnosed with diabetes.

### Diagnosis

The standard test for the diagnosis of GDM recommended by the Australasian Diabetes in Pregnancy Society (ADIPS) is the 75 gram fasted Oral Glucose Tolerance Test (OGTT). The ACHOIS trial<sup>2</sup> demonstrates the benefit of treatment of GDM for mother and baby and the HAPO study<sup>11</sup> shows the progressive increased risks with worsening degrees of untreated hyperglycaemia at the end of the second trimester.

### Recommendations for early testing for hyperglycaemia in pregnancy for women with risk factors

Women, not known to have pre-existing glucose abnormalities, but with risk factors (see below) for overt diabetes in pregnancy (and therefore potentially pre-existing diabetes) should be tested early in pregnancy with an OGTT. If the practitioner wishes to test earlier than 12 weeks, then HbA1c can be performed as described below under 'Alternative diagnostic tests'. Women not diagnosed at early screening with overt diabetes in pregnancy or with OGTT results that would be consistent with GDM diagnosed at the end of the second trimester require repeat testing between 24 and 28 weeks gestation.

NOTE: Treatment of overt Diabetes diagnosed early in pregnancy is indicated to minimise the risks associated with pre-



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## Routine testing for hyperglycaemia in pregnancy

### Oral Glucose Tolerance Test (OGTT)

Women not known to have diabetes should have a 75 gram oral glucose tolerance test (OGTT) at 24 - 28 weeks gestation. There is no need for a 3 day high carbohydrate diet before the OGTT

After an eight (at least) hour fast from food (plain water is acceptable), venous blood is drawn, before a 75 gram glucose drink is given to the pregnant woman, to be drunk over 10-15 minutes.

Further venous blood is drawn at one hour and at two hours after the glucose drink has been given

The woman should remain seated and non-smoking for the duration of the test.

The test may be performed at any time after the first trimester if symptoms and signs of abnormal glucose tolerance are present e.g. excess thirst; polyuria, polyhydramnios, fetal macrosomia.

### Diagnosis using OGTT

Timing of blood glucose measurement	Venous glucose result for diagnosis of <u>overt</u> Diabetes Mellitus	Venous glucose result for diagnosis of Gestational Diabetes Mellitus
Fasting	• P P R O /	5.1-6.9 mmol/L
1 hour post 75gm glucose drink		• P P R O /
2 hours post 75gm glucose drink	• P P R O /	8.5-11.0 mmol/L

Once diagnosis is confirmed, refer woman for initial diabetes education, including a dietitian for nutritional therapy and a CDE for diabetes education and self-blood glucose monitoring.





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## Timing of birth

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All women with gestational diabetes can resume a normal diet immediately postpartum.

Women with GDM who did not require pharmacological treatment in pregnancy do not necessarily require BGL testing postpartum, but should have a follow up OGTT as below.

Women who did require pharmacological treatment in pregnancy:



# Diabetes Mellitus and Gestational Diabetes

## References

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6. Stewart ZA, Wilinska ME, Hartnell S, et al. Closed-loop insulin delivery during pregnancy in



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## Considerations

- ! Consider maintenance of insulin pump therapy basal settings in type 1 and type 2 women previously using continuous subcutaneous insulin infusion.
- ! Consider maintenance of long-acting insulin at the usual time in type 1 and type 2 women previously prescribed insulin.
- ! Variations of the intrapartum insulin infusion regimen may be considered in consultation with the physician/endocrinologist (e.g. in women who are still eating and not requiring a glucose infusion)

## Documentation

04D



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### Write Group

Dr Bill Jeffries  
Professor Bill Hague  
Dr Julie Chemmanam  
Collette Hooper  
Hazel Grigg  
Jane Giles  
Emma Merkel  
Dr Lee Tan

### Other Major Contributors

Rebecca Smith

### SAPPG Management Group Members

Sonia Angus  
Dr Kris Bascomb  
Lyn Bastian  
Elizabeth Bennett  
Dr Feisal Chenia  
John Coombas  
A/Prof Rosalie Grivell  
Dr Sue Kennedy-Andrews  
Jackie Kitschke  
Catherine Leggett  
Dr Anupam Parange  
Dr Andrew McPhee  
Rebecca Smith  
A/Prof John Svigos  
Dr Laura Willington



# Diabetes Mellitus and Gestational Diabetes

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 Contact: [HealthCYWHSPerinatalProtocol@sa.gov.au](mailto:HealthCYWHSPerinatalProtocol@sa.gov.au)  
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