



Diagnostic testing for gestational diabetes mellitus (GDM) during the COVID-19 pandemic: Antenatal and postnatal testing advice

This advice is provided by the Australasian Diabetes in Pregnancy Society (ADIPS), the Australian Diabetes Society (ADS), the Australian Diabetes Educators Association (ADEA) and Diabetes Australia (DA) – Updated 30 April 2020

Background

- Universal screening of all pregnancies for gestational diabetes (GDM) is the standard of care in Australia and New Zealand. Identification and treatment of GDM improve pregnancy outcomes.
- To slow the spread of COVID-19, it is critical to reduce person-to-person contact, including within the health care setting.
- During the COVID-19 pandemic, temporary changes to the recommended process of diagnostic testing for GDM during pregnancy and for postnatal testing in women who have had GDM may be required.
- These changes are intended to limit the number of women attending pathology collection centres and the amount of time spent at pathology collection centres.
- Local health care institutions should make the decision about the appropriate GDM testing protocol for their local population based on demographic factors and local public health data regarding the risk of COVID-19 exposure.

Guideline for diagnostic testing for GDM during pregnancy in COVID-19 pandemic

- A three phase system for GDM testing during the pandemic is outlined in Table 1.
- Local health care institutions can determine the appropriate phase to enact based on information from local and state government on 'contagion risk' (risk of passing COVID-19 from one individual to another) and the ability of local pathology collection centres to provide social distancing.
- Local health care institutions may opt to move between the phases as the pandemic evolves.
- The 75g, 2-hour oral glucose tolerance test (OGTT) is the gold standard test for the diagnosis of GDM and should be conducted if this test can be performed with minimal risk of exposure to COVID-19.
- In the circumstances where the OGTT cannot be performed due to contagion risk, alternative methods of testing for GDM may be appropriate.
- It is acknowledged that GDM testing procedures other than the standard OGTT will likely miss some women who otherwise would have been diagnosed with GDM. Alternative testing procedures still aim to identify women with GDM who are at the highest risk of adverse pregnancy outcomes.
- NZ midwives and clinicians can refer to the following document released by NZSSD: <https://protect-au.mimecast.com/s/1SxMCP7yBlS4k7Byhzgdju?domain=nzssd.org.nz>
- The changes to GDM protocols outlined in this document are temporary; advice will revert to usual GDM testing procedures after the COVID-19 pandemic.

Table 1: Three phase approach to testing for GDM during the COVID-19 pandemic.

| Status | Definition | Early pregnancy strategy <i>For women at high risk of GDM as defined in Figure 1</i> | 24-28 weeks strategy <i>For all women</i> | Postnatal strategy <i>For women diagnosed with GDM</i> |
|--------|---|--|---|---|
| Green | Collection site able to social distance and contagion risk is low | <ul style="list-style-type: none"> Usual practice | <ul style="list-style-type: none"> OGTT | <ul style="list-style-type: none"> Usual practice OR OGTT delayed 6 months post-partum |
| Amber | Collection site limited ability to social distance and/or contagion risk is moderate-high | <ul style="list-style-type: none"> HbA1c and Random blood glucose (RBG). HbA1c $\geq 5.9\%$ OR Random blood glucose (RBG) ≥ 9.0 mmol/L considered diagnostic of GDM. | <ul style="list-style-type: none"> OGTT OR Alternative method of testing for GDM involving an initial fasting blood glucose (FBG) and subsequent OGTT for women with a fasting blood glucose (FBG) 4.7 – 5.0 mmol/L. Fasting blood glucose (FBG) ≥ 5.1 mmol/L is diagnostic of GDM.* OR Immediate commencement of home blood glucose monitoring (HBGM) in women with GDM in a previous pregnancy. <p>Move to 'Red status' when pathology collection centres are unable to provide social distancing using the 'Amber status' testing strategy.</p> | <ul style="list-style-type: none"> OGTT delayed 6 months post-partum |
| Red | Collection site unable to social distance and/or contagion risk is high | <ul style="list-style-type: none"> HbA1c and Random blood glucose (RBG). HbA1c $\geq 5.9\%$ OR Random blood glucose (RBG) ≥ 9.0 mmol/L considered diagnostic of GDM. | <ul style="list-style-type: none"> Fasting blood glucose (FBG) only. Fasting blood glucose (FBG) ≥ 5.1 mmol/l is diagnostic of GDM. | <ul style="list-style-type: none"> OGTT delayed 6 months post-partum |

*The alternative method of testing for GDM during the 'Amber status' is outlined in detail in Appendix 1.

1) Early testing for high risk women

- High risk women (as defined in Figure 1) should receive early testing for GDM.
- Standard care is recommended if the collection site allows social distancing and contagion risk is low.
- If social distancing is not possible and/or risk of contagion is moderate to high, a random blood glucose (RBG) and HbA1c should be performed. Women with HbA1c $\geq 5.9\%$ or random blood glucose (RBG) ≥ 9.0 mmol/L in the first trimester of pregnancy should be treated for GDM.
(Nb. HbA1c assays used for early GDM testing should have optimal CV's of $< 2.0\%$).

Figure 1: Risk Factors for GDM

- BMI ≥ 30 kg/m² (pre-pregnancy or on entry to care)
- Ethnicity (Asian, Indian subcontinent, Aboriginal, Torres Strait Islander, Pacific Islander, Maori, Middle Eastern, non-white African)
- Previous gestational diabetes
- Previous elevated blood glucose
- Maternal age ≥ 40 years
- Family history diabetes mellitus (1st degree relative or sister with gestational diabetes)
- Previous macrosomia (birth weight > 4500 g or $> 90^{\text{th}}$ percentile)
- Previous perinatal loss
- Polycystic ovarian syndrome
- Medication (corticosteroids, antipsychotics)
- Multiple pregnancy

2) 24-28 week testing for women who have not been diagnosed with GDM in a previous or the current pregnancy

- The standard of care for the diagnosis of GDM is the 75g OGTT at 24-28 weeks gestation (ADIPS/IADPSG criteria for diagnosis). During the pandemic, the OGTT should be conducted if the collection site is able to provide social distancing and contagion risk is low (Table 1: Green Phase).
- If social distancing is not possible and/or risk of contagion is moderate to high, consideration of alternative testing may be appropriate. Alternative testing should NOT be considered a new approach to GDM testing but provides an alternative during the pandemic. This decision should be made at the level of the local health care institution, taking into account local population factors (Table 1: Amber Phase).
Options include:
 - a) OGTT at 24-28 weeks (standard care)
 - b) Perform a fasting blood glucose (FBG) test at 24-28 weeks and subsequent OGTT for women with a fasting blood glucose (FBG) 4.7 – 5.0 mmol/L. Fasting blood glucose (FBG) ≥ 5.1 mmol/L is diagnostic of GDM. See Appendix 1.
- If collection site is unable to provide social distancing and risk of contagion is high, a fasting glucose only may be appropriate. Fasting blood glucose (FBG) ≥ 5.1 mmol/L is diagnostic of GDM (Table 1: Red Phase).

3) Women who have been diagnosed with GDM in a previous pregnancy

- Previous GDM is a risk factor for GDM, so women who have been diagnosed with GDM in a previous pregnancy should consider having early testing as outlined in Step 1 of this document.
- For women who have not been diagnosed with GDM in the current pregnancy, the standard of care for the diagnosis of GDM is the 75g OGTT at 24-28 weeks gestation (ADIPS/IADPSG criteria for diagnosis). During the pandemic, the OGTT should be conducted if the collection site is able to provide social distancing and contagion risk is low (Table 1: Green Phase).
- If social distancing is not possible and/or risk of contagion is moderate to high, consideration of alternative testing may be appropriate. Alternative testing should NOT be considered a new approach to GDM testing but provides an alternative during the pandemic. This decision should be made at the level of the local health care institution, taking into account local population factors (Table 1: Amber Phase).

Options include:

- a) OGTT at 24-28 weeks (standard care)
 - b) Perform a fasting blood glucose (FBG) test at 24-28 weeks and subsequent OGTT for women with a fasting blood glucose (FBG) 4.7 – 5.0 mmol/L. Fasting blood glucose (FBG) \geq 5.1 mmol/L is diagnostic of GDM. See Appendix 1.
 - c) Be automatically considered to have GDM and can commence home blood glucose monitoring. Information on NDSS GDM registration and changes during the COVID-19 pandemic is available at - <https://www.ndss.com.au/health-professionals/changes-to-the-ndss-for-health-professionals>
- If the collection site is unable to provide social distancing and risk of contagion is high, a fasting blood glucose (FBG) only may be appropriate. Fasting blood glucose (FBG) \geq 5.1 mmol/l is diagnostic of GDM.

Guideline for post-partum testing if GDM was diagnosed

- Women are advised to delay the post-partum OGTT for 6 months (or until after the pandemic) unless advised otherwise by their healthcare provider.
- Performing an HbA1c at 4-6 months post-partum may also be appropriate.
- All women are advised to have the post-partum OGTT performed before their child turns 12 months old or before they start trying for a subsequent pregnancy.
- For women at high risk of type 2 diabetes (e.g. HbA1c \geq 6% in pregnancy or a very high insulin requirement in pregnancy), continued home blood glucose monitoring after pregnancy may be appropriate.
- A very small number of women thought to have GDM will actually have type 1 diabetes. Women should be educated about symptoms of hyperglycaemia.
- Women should be given clear parameters about how and when to contact a healthcare provider.

Further Reading

- Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. *The New England journal of medicine*. 2020;382(13):1199-207.
- van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *N Engl J Med*. 2020;382(16):1564-7.
- Crowther CA, Hiller JE, Moss JR, McPhee AJ, Jeffries WS, Robinson JS, et al. Effect of treatment of gestational diabetes mellitus on pregnancy outcomes. *N Engl J Med*. 2005;352(24):2477-86.
- Landon MB, Spong CY, Thom E, Carpenter MW, Ramin SM, Casey B, et al. A multicenter, randomized trial of treatment for mild gestational diabetes. *N Engl J Med*. 2009;361(14):1339-48.
- Church D, Halsall D, Meek C, Parker RA, Murphy HR, Simmons D. Random blood glucose measurement at antenatal booking to screen for overt diabetes in pregnancy: a retrospective study. *Diabetes Care*. 2011;34(10):2217-9.
- Hughes RC, Moore MP, Gullam JE, Mohamed K, Rowan J. An early pregnancy HbA1c $\geq 5.9\%$ (41 mmol/mol) is optimal for detecting diabetes and identifies women at increased risk of adverse pregnancy outcomes. *Diabetes Care*. 2014;37(11):2953-9.

Screening and diagnosis of GDM during COVID-19 pandemic

COVID-19 pandemic

- **Applies to:** Pregnant women regardless of COVID-19 status
- **Rationale:** To support social distancing and minimise blood collection time (i.e not based on new evidence)
- **Implementation:** Commence as practical and convenient. Seek expert advice as clinically appropriate

- Risk factors for GDM**
- **BMI > 30 kg/m²** (pre-pregnancy or on entry to care)
 - **Ethnicity** (Asian, Indian subcontinent, Aboriginal, Torres Strait Islander, Pacific Islander, Maori, Middle Eastern, non-white African)
 - **Previous GDM**
 - **Previous elevated BGL**
 - **Maternal age ≥ 40 years**
 - **Family history DM** (1st degree relative or sister with GDM)
 - **Previous macrosomia** (birth weight > 4500 g or > 90th percentile)
 - **Previous perinatal loss**
 - **Polycystic ovarian syndrome**
 - **Medications** (corticosteroids, antipsychotics)
 - **Multiple pregnancy**

Assess all women for risk factors

Risk factors or GDM clinical concerns?

Yes

No

First trimester HbA1c

HbA1c > 41 mmol/mol (5.9%)?

No

Yes

Check fasting FBG

- At 24–28 weeks gestation or
- If clinical concerns after first trimester

If FBG ≤ 4.6 mmol/L

- OGTT *not* required

If FBG 4.7–5.0 mmol/L

- OGTT *recommended*
 - If COVID-19 suspected or confirmed seek expert clinical advice
- OGTT advice for women
 - Fast (except for water) for 8–14 hours prior to OGTT
 - Take usual medications

If FBG ≥ 5.1 mmol/L

- OGTT *not* required

OGTT normal?

Yes

No

Routine antenatal care

- Unless clinical concerns

GDM care

| HbA1c (%) | HbA1c (mmol/mol) |
|-----------|------------------|
| 5.0 | 31 |
| 6.0 | 42 |
| 6.5 | 48 |
| 7.0 | 53 |
| 8.0 | 64 |
| 9.0 | 75 |
| 10.0 | 86 |
| 11.0 | 97 |
| 12.0 | 108 |

GDM diagnosis

HbA1c first trimester only

- ≥ 41 mmol/mol (or 5.9%)

OGTT one or more of:

- Fasting ≥ 5.1 mmol/L
- 1 hour ≥ 10 mmol/L
- 2 hour ≥ 8.5 mmol/L

BGL: blood glucose level, **BMI:** body mass index, **DM:** diabetes mellitus, **FBG:** fasting blood glucose **GDM:** gestational diabetes mellitus, **HbA1c:** glycated haemoglobin, **OGTT:** oral glucose tolerance test, **≥:** greater than or equal to, **>:** greater than