

QUICK REFERENCE FOR HEALTHCARE PROVIDERS

MANAGEMENT OF *DIABETES IN PREGNANCY*



Ministry of Health
Malaysia



Malaysian Endocrine
& Metabolic Society



Perinatal Society of
Malaysia



Family Medicine
Specialists
Association of
Malaysia



Academy of
Medicine Malaysia

KEY MESSAGES

1. Diabetes in pregnancy is associated with risks to the woman and to the developing fetus.
2. Screening for gestational diabetes mellitus (GDM) based on risk factors using 75 gram oral glucose tolerance test (OGTT) should be done at booking.
3. Overt diabetes in pregnancy should be managed as pre-existing diabetes.
4. Pre-conception care of women with pre-existing diabetes which involve a multidisciplinary team should be fully implemented in all healthcare facilities.
5. Supplement of 5 mg folic acid per day should be given to women with diabetes who plan to become pregnant at least three months prior to conception and continue until 12 weeks of gestation.
6. Pregnant women at risk of GDM and those with diabetes should be given individualised medical nutrition therapy (MNT) which includes carbohydrate-controlled meal plan and monitoring of gestational weight gain.
7. Options of treatment for diabetes in pregnancy include MNT, metformin and insulin therapy.
8. Women with pre-existing diabetes should have ultrasound scans for dating, structural anatomy and growth.
9. Timing and mode of delivery in pre-existing diabetes and GDM should be individualised, taking into consideration the estimated fetal weight and obstetric factors.
10. In women with history of GDM, OGTT should be performed at six weeks after delivery to detect diabetes and prediabetes. If negative, annual screening should be performed.

This Quick Reference provides key messages and a summary of the main recommendations in the Clinical Practice Guidelines (CPG) Management of Diabetes in Pregnancy.

Details of the evidence supporting these recommendations can be found in the above CPG, available on the following websites:

Ministry of Health Malaysia : www.moh.gov.my

Academy of Medicine Malaysia : www.acadmed.org.my

Malaysian Endocrine & Metabolic Society : www.mems.my

Perinatal Society of Malaysia : www.perinatal-malaysia.org

Family Medicine Specialists Association of Malaysia : www.fms-malaysia.org.my

CLINICAL PRACTICE GUIDELINES SECRETARIAT

Malaysia Health Technology Assessment Section (MaHTAS)

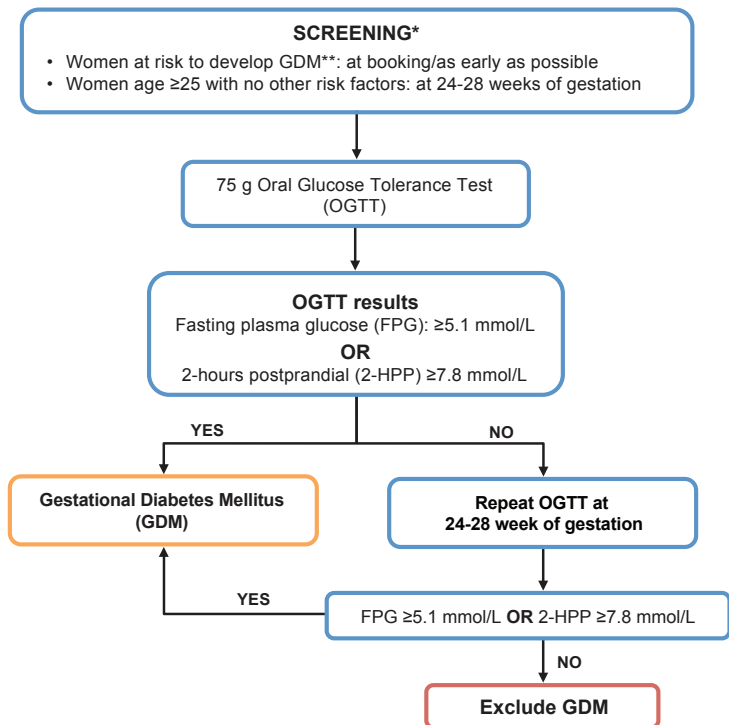
Medical Development Division

Ministry of Health Malaysia

4th Floor, Block E1, Parcel E, 62590 Putrajaya

Tel : +603-88831229 E-mail : htamalaysia@moh.gov.my

ALGORITHM A: SCREENING AND DIAGNOSIS OF DIABETES IN PREGNANCY



***Overt DM is suspected in the presence of at least one of the following:**

- FPG ≥ 7.0 mmol/L
- Random plasma glucose (RPG) ≥ 11.1 mmol/L
- However, the diagnosis of overt DM should be confirmed with a second test (FPG/RPG/OGTT).

**** Presence of any risk factors:**

- Body mass index >27 kg/m²
- Previous history of GDM
- First degree relative with diabetes mellitus
- History of macrosomia (birth weight >4 kg)
- Bad obstetric history
- Glycosuria $\geq 2+$ on two occasions
- Current obstetric problems (essential hypertension, pregnancy-induced hypertension, polyhydramnios and current use of corticosteroids)

HbA1c alone is not a useful alternative to OGTT as a diagnostic test for GDM.

RISK FACTORS OF GDM

- Body mass index $>27 \text{ kg/m}^2$
- Previous history of GDM
- First degree relative with DM
- History of macrosomia (birth weight $>4 \text{ kg}$)
- Bad obstetric history
- Glycosuria $\geq 2+$ on two occasions
- Current obstetric problems (essential hypertension, pregnancy-induced hypertension, polyhydramnios and current use of corticosteroids)

PRECONCEPTION CARE

- Preconception care, provided by a multidisciplinary team, consists of:
 - discussion on timeline for pregnancy planning
 - lifestyle advice (diet, physical activities, smoking cessation and optimal body weight)
 - folic acid supplementation
 - appropriate contraception
 - full medication review (discontinue potentially teratogenic medications)
 - retinal and renal screening
 - relevant blood investigations
- Women with pre-existing diabetes should be informed of the glycaemic control targets and empowered to achieve control before conception. They are also counselled on the risk and expected management approaches during pregnancy.

SELF-MONITORING OF BLOOD GLUCOSE

- Self-monitoring of blood glucose (SMBG) should be done in diabetes in pregnancy. The blood glucose targets should be as the following:
 - fasting or preprandial: $\leq 5.3 \text{ mmol/L}$
 - 1-hour postprandial: $\leq 7.8 \text{ mmol/L}$
 - 2-hour postprandial: $\leq 6.7 \text{ mmol/L}$
- The frequency of SMBG should be individualised based on mode of treatment and glycaemic control.

TIMING FOR SELF-MONITORING OF BLOOD GLUCOSE

Timing of SMBG & Mode of treatment	Breakfast		Lunch		Dinner	
	Pre	Post	Pre	Post	Pre	Post/Pre-bed
Diet only	✓	✓		✓		✓
OAD or single dose insulin	✓	✓		✓		✓
Multiple dose insulin	✓	✓	✓	✓	✓	✓

MANAGEMENT IN PRE-EXISTING DIABETES

- Low dose aspirin supplementation (75-150 mg daily) should be given to women with pre-existing diabetes from 12 weeks of gestation until term.
- In women with pre-existing diabetes,
 - retinal assessment should be performed at booking and repeated at least once throughout the pregnancy
 - renal assessment should be performed at booking; those with pre-existing renal disease should be managed in a combined clinic

METFORMIN THERAPY

- In GDM, metformin should be offered when blood glucose targets are not met by modification in diet and exercise within 1–2 weeks.
- Metformin should be continued in women who are already on the treatment before pregnancy.

INSULIN THERAPY

- Insulin should be initiated when:
 - blood glucose targets are not met after MNT and metformin therapy
 - metformin is contraindicated or unacceptable
 - FPG ≥ 7.0 mmol/L at diagnosis (with or without metformin)
 - FPG of 6.0-6.9 mmol/L with complications such as macrosomia or polyhydramnios (start insulin immediately, with or without metformin).
- Human insulins are the preferred choice in pregnant patients who need insulin therapy.
- Both rapid and long acting (basal) insulin analogues are as efficacious as human insulin in pregnant women with pre-existing diabetes and GDM.
- Insulin analogues are associated with fewer incidences of hypoglycaemia.

FETAL SURVEILLANCE USING ULTRASOUND SCAN

TIMING	PARAMETERS
11-14 weeks of gestation	<ul style="list-style-type: none"> • Early scan is performed to: <ul style="list-style-type: none"> ◦ confirm gestational age using crown-rump length measurement ◦ assess for major structural malformation including acrania and anencephaly
18-20 weeks of gestation	<ul style="list-style-type: none"> • Detailed structural anatomy scan which includes the spine and heart (four-chamber, outflow tract and three-vessel views)
28-36 weeks of gestation	<ul style="list-style-type: none"> • Serial growth scan is performed every four weeks to assess fetal growth and amniotic fluid volume. • The rate of fetal growth should be used to facilitate decisions with treatment, and timing and mode of delivery.

REFERRAL

- Pregnant women with pre-existing diabetes and women with GDM who have poor glycaemic control or fetal complications should be referred to secondary or tertiary care.

TIMING AND MODE OF DELIVERY

- In pregnant women with pre-existing diabetes with:
 - no complications, deliver between 37+0 and 38+6 weeks
 - maternal or fetal complications, deliver before 37+0 weeks
- In women with GDM:
 - on diet alone with no complications, deliver before 40+0 weeks
 - on oral antidiabetic agents or insulin, deliver between 37+0 and 38+6 weeks
 - with maternal or fetal complications, deliver before 37+0 weeks
- Mode of delivery should be individualised, taking into consideration the estimated fetal weight and obstetric factors.

MEDICATION TABLE

Oral Antidiabetic Agents

Drugs	Formulations	Minimum Dose	Maximum dose
Metformin	Metformin 500 mg tablet	Initial dose 500 mg OD Usual dose 1500 mg OD	1000 mg TDS
	Metformin SR 850 mg	Usual dose 850 mg BD	850 mg TDS
	Metformin XR 500 mg/ 750 mg	Initial dose 500 mg OD Usual dose 1500 mg OD	2000 mg OD

Insulin

Types of Insulin preparation	Onset of Action	Peak Action (hours)	Duration of Action (hours)	Timing of Administration of Insulin
PRANDIAL				
Short Acting, Regular Actrapid Humulin R Insugen R Insuman R	30-60 min	2-4	6-10	30 min before meal
Rapid Analogues Aspart Lispro	0-20 min	1-3	3-5	5-15 min immediately before/after meals
BASAL				
Intermediate-acting, NPH Insulatard Humulin N Insugen N Insuman N	1-2 hour	4-8	8-12	Prebreakfast/ Prebed
Long Acting Analogues Glargine Determir	30-60 min	Less Peak	16-24	Same time everyday (Flexible once daily injection)
PREMIXED INSULIN				
Mixtard 30	30 min	Dual	18-23	30-60 min before meals
Humulin 30/70	30 min	Dual	16-18	30-60 min before meals
Novomix 30	10-20 min	1-4	16-20	5-15 min before meals
Humalog mix 25/75	15 min	0.25-2.5	16-18	5-15 min before meals
Humalog mix 50/50	15 min	0.25-2.5	16-18	5-15 min before meals

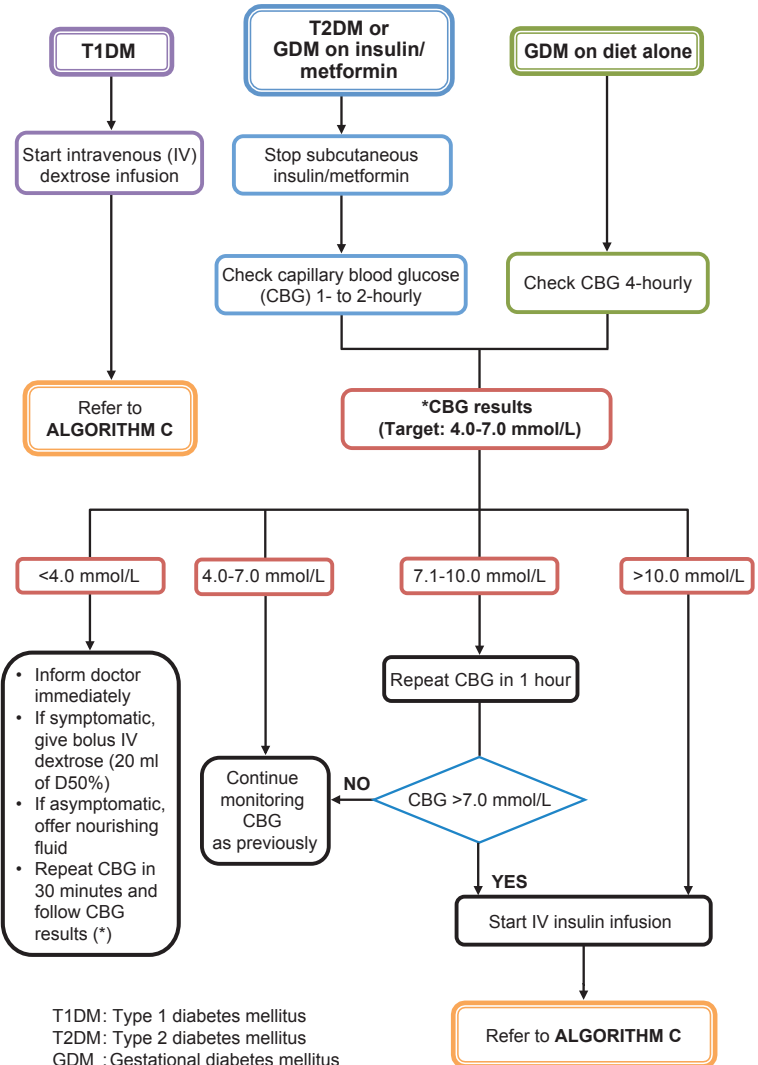
Initiating Insulin Therapy in Pregnancy

Glycaemic abnormality	Suggested Insulin Type and Dose
FPG >5.3 mmol/L	Start 0.2 units/kg of intermediate-acting insulin at bedtime, increase by 2 units every 3 days until targets are reached.
1-hr postprandial >7.8 mmol/L 2-hr postprandial >6.7 mmol/L	Start 6 units of short-acting insulin, increase by 2 units every 3 days until targets are reached. If preprandial short acting insulin dose exceeds 16 units TDS, consider adding 6-10 units intermediate-acting insulin in the morning and titrate accordingly until targets are achieved.

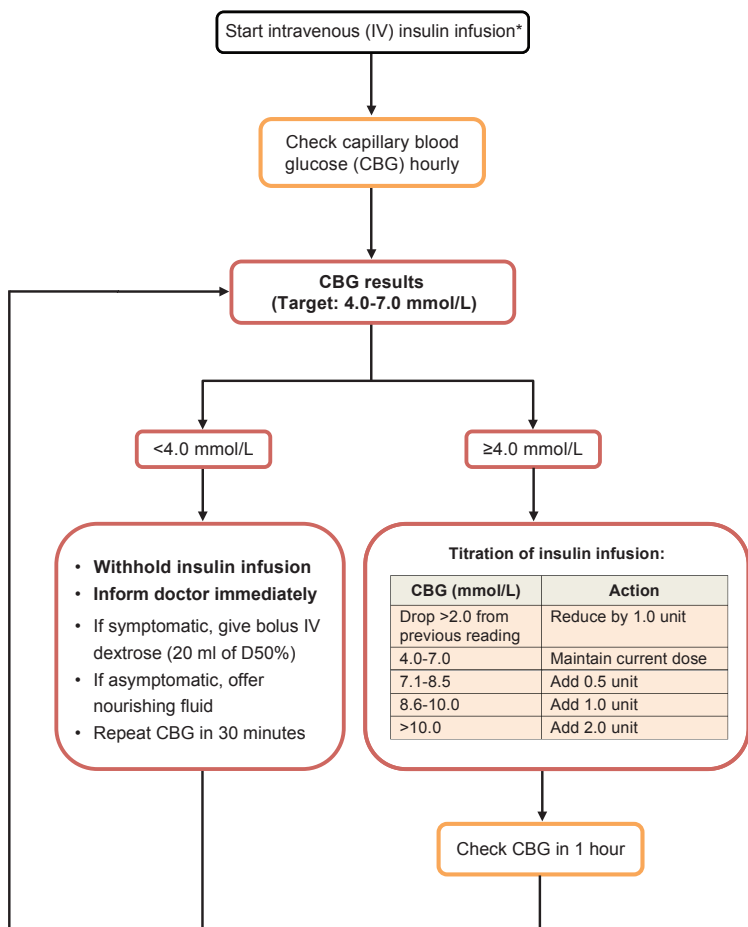
Estimation of total daily insulin requirement by gestation/trimester

Pregnancy gestation	Total daily insulin requirement
1 st trimester	0.7 units/kg/day
2 nd trimester	0.8 units/kg/day
3 rd trimester	0.9 units/kg/day

ALGORITHM B: INTRAPARTUM GLUCOSE MONITORING FOR DIABETES IN PREGNANCY IN ACTIVE LABOUR



ALGORITHM C: INSULIN INFUSION AND TITRATION IN ACTIVE LABOUR



*** IV insulin infusion initiation rate**

- Type 1 diabetes mellitus: 0.01-0.02 unit/kg/hour
- Type 2 diabetes mellitus/gestational diabetes mellitus: 0.05-0.07 unit/kg/hour
- If requirement exceed 0.1 unit/kg/hour, refer the endocrinologist/physician