

- Choose carbohydrates with a low glycaemic index, e.g. wholegrain products, brown rice, wholemeal bread, oats, chapatti, pasta and noodles, biscuits and cereals. These are also rich in vitamins and important trace elements and contain fibre which slows digestion.
- Filling half the plate with green vegetables.
- Aim for five servings of fruit and vegetables per day (three servings of vegetable and two servings of fruit).
- Limit the amount of processed food. Choose fish and beans instead of red and processed meats as sources of protein. Oily fishes contain omega-3 fatty acids which are good for the brain and heart. Aim for two portions of fish per week.
- Reduce intake of sweetened drinks and food such as biscuits and cakes. Water is best but unsweetened tea and coffee can be taken in moderation. If you have canned drinks, go for diet or 'zero' options.
- Use healthier oils, e.g. canola, olive and peanut, which contain monosaturated fats, and reduce consumption of fried food and cakes as these contain trans fats, which are unhealthy.

**(b) Exercise recommendations**

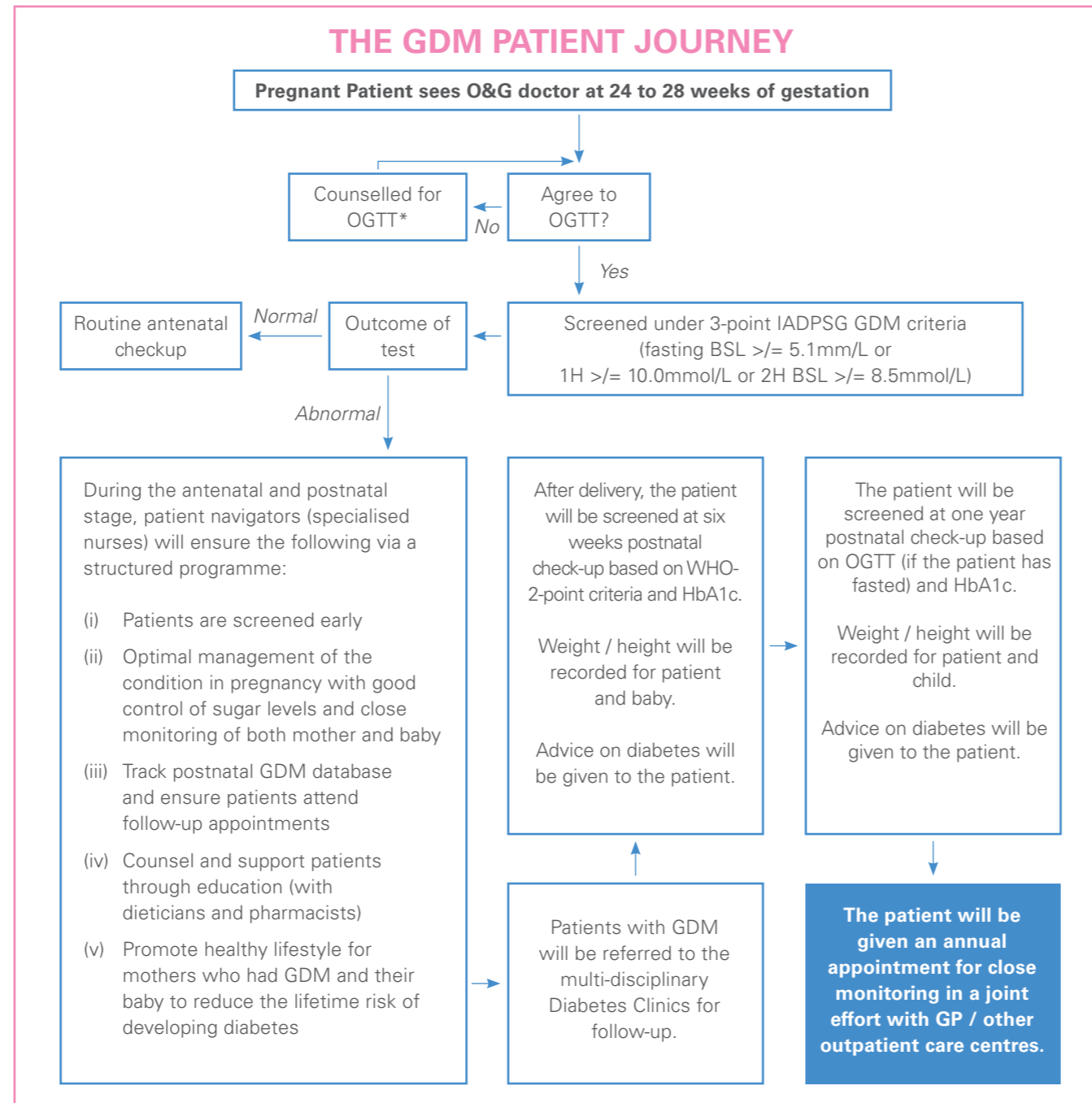
Regular exercise helps to burn calories, thus helping you to achieve weight loss. Aim for at least 150 minutes of physical activity at least three times a week, if there are no medical restrictions. If you are used to a sedentary lifestyle, build your exercise level up slowly by approximately 30 minutes a week over five weeks.

**Note: Your normal moving about over the course of a day does not count as exercise!**

**Suggestions:**

- Taking a 20-minute walk after dinner.
- Using the stairs instead of the lift.
- Getting off the bus one stop earlier and walking the rest of the way to your destination.
- Go swimming.

The following diagram demonstrates the plan of care for a patient diagnosed with GDM.



**Useful telephone number**

Appointments / Specialist 6294-4050  
 Outpatient Clinics  
 Enquiries Hotline



100 Bukit Timah Road  
 Singapore 229899  
 Tel: 6-CALL KKH (6-2255 554)  
 Fax: 6293-7933  
 Website: [www.kkh.com.sg](http://www.kkh.com.sg)  
[www.facebook.com/kkh.sg](https://www.facebook.com/kkh.sg)

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## Gestational Diabetes Mellitus (GDM)

PATIENTS. AT THE HEART OF ALL WE DO.

### What is Gestational Diabetes Mellitus (GDM)?

GDM is a condition in which high blood sugar develops during pregnancy because the body cannot produce enough insulin – a hormone that controls blood sugar levels – to meet the needs of pregnancy. This condition can occur in nearly a quarter of pregnant women. It usually disappears after delivery.

### What are the risks associated with GDM?

Most women diagnosed with GDM will have normal pregnancies and babies. However, if not well controlled, GDM can cause harm to both mother and baby.

These risks are illustrated in the table below.

Risk to mother:	Risk to baby:
<p><b>In pregnancy, higher chances of:</b></p> <ul style="list-style-type: none"> <li>- Miscarriage</li> <li>- High blood pressure</li> </ul> <p><b>At delivery, higher chances of:</b></p> <ul style="list-style-type: none"> <li>- Induction of labour</li> <li>- Delivery with forceps or vacuum</li> <li>- Caesarean section</li> <li>- Difficult / traumatic delivery</li> <li>- Extended vaginal tears (3<sup>rd</sup> or 4<sup>th</sup> degree perineal injury)</li> </ul> <p><b>After delivery, higher chances of:</b></p> <ul style="list-style-type: none"> <li>- Wound complications</li> <li>- Type 2 diabetes in future</li> </ul>	<p><b>In pregnancy, higher chances of:</b></p> <ul style="list-style-type: none"> <li>- Premature birth before the 37<sup>th</sup> week of pregnancy</li> <li>- Loss of the baby (stillbirth)</li> <li>- Birth defects</li> <li>- Polyhydramnios (too much amniotic fluid around baby)</li> <li>- Baby growing larger than usual</li> </ul> <p><b>At delivery, higher chances of:</b></p> <ul style="list-style-type: none"> <li>- Shoulder dystocia (condition during delivery where the baby's head is born but one side of the shoulders gets stuck behind the mother's pubic bone, delaying the birth of the baby's body).</li> </ul>

In most cases, the baby will be born promptly and safely, with extra help from the healthcare team. Only a small number of cases experience serious complications such as brain damage (cerebral palsy), bone fractures or handicap of the arm.

- Breathing difficulties (respiratory distress syndrome)

#### After birth, higher chances of:

- Low blood glucose levels
- Imbalances of minerals in the body
- Jaundice
- Admission to high-dependency or intensive care unit
- Baby developing obesity and / or diabetes in later life

### Who should test for GDM?

Although the risk of GDM is higher in certain groups of women, it can happen to any woman in her pregnancy. Therefore, we offer GDM screening for all pregnant women. Detection of GDM is important so that appropriate treatment can be given to reduce the risks to the pregnancy.

### How is GDM diagnosed?

The test for GDM is called an oral glucose tolerance test (OGTT) and is usually performed between 24 to 28 weeks of pregnancy. If you have had GDM before or have symptoms suggestive of diabetes, the OGTT will be offered earlier in pregnancy and repeated at 24 to 28 weeks if the first test is normal. The OGTT involves

taking three blood samples – one immediately before drinking a standard glucose drink, followed by two blood samples one hour and two hours after. The glucose drink is taken on an empty stomach, usually in the morning, after a period of overnight fasting. GDM is diagnosed if any one of the three blood results indicate a higher than expected blood glucose level.

### Are there any risks or side effects from the OGTT?

The standard glucose drink is sweet and may cause some to feel nauseated. In rare cases, it may trigger vomiting. If this happens, we will need to reschedule the test to be done on another day if you are agreeable.

### Why should I do the OGTT?

We strongly encourage all pregnant women to undergo the test as GDM is a common condition in pregnancy, and there are potential risks to the pregnancy if it is not detected and treated promptly. Should you decline to do the test, please help us understand your reasons for not wanting to do so. We would like to reassure you that your decision, whatever it may be, will not affect your subsequent antenatal care.

### What happens if the test shows that I have GDM?

You will be given an appointment to attend a session to teach you how to use a blood sugar kit to monitor your sugar levels at different time points within the day (pre-meals, two hours after meals and at bedtime). You will also be referred to a dietician for dietary advice. A blood test (HbA1C) that assesses the average blood sugar level over a three-month period will be performed.

If your blood sugar levels are very high, treatment with either oral medications or insulin injections may be required. You may also be referred to a doctor who specialises in diabetes for further monitoring during your pregnancy.

We will check your blood pressure and urine at every visit as you have an increased risk of developing pre-

eclampsia (high blood pressure condition that develops only during pregnancy). Ultrasound scans may be performed more frequently to monitor the baby's growth. As to when and how the baby will be delivered, this will depend on various factors such as the blood sugar control, growth of the baby, size of the baby, blood pressure measurements and previous surgeries, etc. Your doctor will discuss this with you at an appropriate time.

Breastfeeding after delivery is encouraged.

### What happens after delivery if I have GDM?

GDM usually resolves after delivery. In most cases, if you have to take medications to control GDM during your pregnancy, you do not need to continue taking them after your delivery.

At routine follow-up in the clinic six weeks after delivery, a repeat OGTT will be performed for you. This is to ensure that the GDM has resolved.

If the OGTT is still abnormal at this time, you will either be referred to a doctor who specialises in diabetes or to the polyclinic for follow-up, depending on the severity of the results.

Even if the OGTT is normal, you are encouraged to go for diabetes screening every year as there is still a one in three chance of developing diabetes at a later stage if you have had GDM during your pregnancy.

### Why is it important to follow up after delivery?

Although most women with GDM recover after the pregnancy, these women still have a much higher risk of developing diabetes in future. If GDM is not detected early or well-controlled, diabetes can lead to serious and permanent complications such as kidney failure, blindness and lower limb amputation. Following up with your doctor after delivery can help in early detection of diabetes, allowing timely intervention and treatment, so

that these risks can be reduced.

### How can I reduce my risk of developing diabetes in future?

Sensible eating and regular exercise, both of which contribute to reducing body weight and therefore body mass index (BMI), can help reduce the risk of diabetes in future.

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)} \times \text{Height (m)}}$$

A high BMI is associated with a higher risk of developing diabetes.

Weight loss should be slow, steady and sustained. A reduction of 5 to 7% of body weight in six months is a safe and effective weight loss goal.

### Here are some recommendations regarding diet and exercise.

#### (a) Dietary recommendations

My healthy plate (Health Promotion Board, Singapore) can be used to guide eating patterns.

“My Healthy Plate” is a friendly visual tool on healthy eating habits designed for Singaporeans by the Health Promotion Board (HPB).

