

For child

- Macrosomia (birth weight $\geq 4000\text{g}$).
- Respiratory problems.
- Neonatal hypoglycemia after birth.
- Increased risk of birth injuries.
- Long-term risks:
 - + Overweight or obesity in childhood.
 - + Developing type 2 diabetes later in life.



GDM management during pregnancy

Nutrition



Physical activity

Pharmacological treatment

However, **80-90%** of GDM cases can be managed with **diet** and **exercise**, without the need for medication.

1. Diet modifications

- Eat a balanced and varied diet.
- Eat 3 main meals and 2-3 snacks per day, spaced at least 2 hours apart.
- Do not skip meals.
- Limit sugary foods and drinks (sweets, soft drinks, dried fruits, refined sugar, etc.)
- Reduce intake of starch, fat, and salt.
- Eat more green leafy vegetables.
- Drink at least 2 liters of water daily.

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2. Physical activities

Consult your obstetrician before starting any new exercise plan. Exercise at a moderate level one hour after meals, which can be divided into 2-3 sessions per day, at least 10 minutes each.

3. Regularly monitor blood sugar

Check your blood sugar levels before and after meals as your doctor advises. Share the results with your doctor for timely treatment adjustments if needed.

4. GDM check-ups

Pregnant women with GDM should have a check-up every 1-2 weeks at the Department of Endocrinology, Thai Binh Provincial General Hospital or TBUMP hospital.

5. Labor and delivery

Based on your blood sugar levels and your baby's development, your obstetrician will give you advice on the safest plan for labor and delivery.

Postpartum care

- Initiate breastfeeding within 30 minutes after birth to prevent newborn hypoglycemia.
- **Exclusive breastfeeding** for at least 6 months is optimal for both mother and child.
- An OGTT at **8-12 weeks postpartum** is recommended to check for type 2 diabetes or a high risk of progression.

DỰ ÁN NGHIÊN CỨU "SỐNG CHUNG VỚI BỆNH MẠN TÍNH: HỖ TRỢ GIA ĐÌNH VÀ CỘNG ĐỒNG TRONG QUẢN LÝ BỆNH ĐÁI THÁO ĐƯỜNG TẠI VIỆT NAM - ĐÁI THÁO ĐƯỜNG THAI KỲ" - TÀI TRỢ BỞI DANIDA
In bản, khổ 21x29,7 tại Công ty TNHH in Thành Trung- số 49, Trần Phú, TPTB.
GPXB số/GP-STTTT của Sở TT&TTB cấp ngày/12/2023. Xuất bản phẩm không bán.

Gestational diabetes mellitus

What you need to know



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GDM is diagnosed by the **Oral Glucose Tolerance Test (OGTT)**.

The test must be performed in the morning, after overnight fasting (at least 8 hours).

Women are diagnosed with GDM if they meet any of the following thresholds:

- **FBG (before drinking): ≥ 5.1 mmol/L**
- **1h-PBG: ≥ 10.0 mmol/L**
- **2h-PBG: ≥ 8.5 mmol/L**

Effects of GDM on mother and baby

For pregnant women

- During pregnancy: GDM increases the risk of:

- + High blood pressure.
- + Pre-eclampsia or eclampsia.
- + Preterm labor.
- + Polyhydramnios.
- + Stillbirth or miscarriage.
- + Urinary tract infection.
- + Cesarean section.

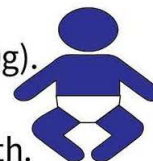
- For long-term risks:

- + 50% of women with GDM develop type 2 diabetes within 5-10 years after delivery.
- + High risk of GDM in future pregnancies.



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NUTRITION THERAPY



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The role of nutrition therapy in GDM management

Diet modification is one of the primary methods for GDM management.

A balanced and healthy diet helps to:

- Provide essential nutrients for pregnant women and fetal development.
- Prevent blood sugar spikes after meals while achieving treatment goals.
- Maintain appropriate weight gain throughout pregnancy.
- Prevent GDM-related complications for the mother and fetus.

1. Glycemic Targets in Pregnancy

For the majority of pregnant women with GDM	Fasting blood sugar	1h postprandial blood sugar	2h postprandial blood sugar
	< 5.3 mmol/L	< 7.8 mmol/L	< 6.7 mmol/L

2. Appropriate weight gain during pregnancy

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



Pre-pregnancy BMI	Total weight gain range (kg)	Average weekly weight gain in 2nd and 3rd trimester(kg/week)
<18.5kg/m ²	12.5 - 18	0.51 (0.44 - 0.58)
18.5 - 24.9kg/m ²	11.5 - 16	0.42 (0.35 - 0.50)
25.0 - 29.9kg/m ²	7 - 11.5	0.28 (0.23 - 0.33)
≥30kg/m ²	5 - 9	0.22 (0.17 - 0.27)

First trimester: Average gains 0.5 - 2kg

Source: Quyết định số 6173 /QĐ-BYT ngày 12/10/2018 của Bộ Y tế: Hướng dẫn quốc gia về dự phòng và kiểm soát ĐTDĐ thai kỳ



Rules of diet

1. Energy

Limiting excess energy intake helps prevent excessive weight gain, high blood sugar, and fetal macrosomia.

However, the total energy intake should be **no less than 1600-1800 kcal/day** to ensure fetal development, control blood sugar, and prevent ketosis.

2. Meal distribution across the day

- Divide meals into small portions: 3 main meals and 2-3 snacks.

- Add a bedtime snack if you are at risk of hypoglycemia at night.

- Space meals at least 2 hours apart.

- Eat on time and avoid skipping meals.

3. Nutrient Ratios

a. Carbohydrates

- Should account for **55 - 60%** of total daily calorie intake.

- Carbohydrates in snacks = **1/3 - 1/2** of carbohydrates in meals.

- Carbohydrate intake: ≥ 175 g/day.

b. Fat

- Should account for **20 - 25%** of total daily calorie intake.

- Prioritize plant-based unsaturated fats.

c. Protein

- Should account for **15 - 20%** of total daily calorie intake.

- Combine animal proteins (meat, fish, egg, milk, etc.) and plant-based proteins (beans, peas, peanuts, sesame, etc.).

- Animal protein should contribute more than **35%** of total protein intake.

d. Fiber

- Consume **28g** per day.

- At least 400g of fruits & vegetables/day.

e. Vitamins and Minerals

Get enough vitamins and minerals to meet the increased needs during pregnancy, especially vital micronutrients such as*:

- Calcium: 1,200 mg/day.

- Iron: 32 - 41mg/day.

- Folate: 600 mcg/day.

f. Salt

- Limited consumption **<5g/day**.

- Use iodized salt.

g. Milk and dairy products

Use unsweetened milk and dairy products as your doctor recommends for diabetes.

h. Beverages: Limit coffee, alcohol, tea.

Ensure an ENOUGH, BALANCED, and DIVERSE diet in both quality and quantity of food.

*Nguồn: Bộ Y tế (2017). Hướng dẫn quốc gia dinh dưỡng cho phụ nữ có thai và bà mẹ cho con bú

4. Food choice

- Pregnant women with GDM should use foods with low or moderate glycemic index (GI)

- When eating a high GI food, eat in small amounts and combine with low GI foods.

- Glycemic index of some foods:

Low	Moderate	High
GI ≤ 55	GI = 56 - 69	GI ≥ 70
- Tomato, carrot - Vegetable - Meat - Nuts, beans - Grape, orange, dragon fruit, pear, apple, etc.	- Brown rice - Sweet potato - Oat - Pineapple, papaya, mango, etc.	- Rice - Potato - Bread - Pumpkin - Grilled potato - Watermelon - Confectionery
Eat more	Eat moderately	Eat limited

5. Cooking methods

- Prioritize steaming and boiling.

- Limit fried, stir-fried, and grilled foods.

- Avoid roasted potatoes because they have a high GI after being cooked.

- Eat whole fruits instead of drinking fruit juice or smoothies.

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SERVING AND PORTION GUIDE



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Food choices for pregnant women with GDM

Food group	Everyday	3-4 times/week	Limitations
Grains	Rice (white rice, brown rice)	Boiled corn, sweet potatoes	Bread, vermicelli, pho, noodles, sticky rice, crispy rice, roasted brown rice/potatoes
Vegetables	Dark green, yellow, orange-red vegetables	Radish	Pumpkin
Fruits	Less sweet, citrus fruits (grapefruit, orange, apple, dragon fruit, etc.)	Mango, papaya, banana, avocado, etc.	Longan, lychee, jackfruit, custard apple, dried fruit
Meats, fish, eggs, and other proteins	Lean pork, poultry, fish, beans	Low-fat meat (ribs, lean shoulder), eggs, red meat (beef, goat, buffalo, etc.)	Fatty meat, processed foods (sausages, bacon), offal
Milk and dairy products	Unsweetened milk, milk for diabetics	Unsweetened yogurt	Sweetened dairy, desserts, confectionery
Oil, fats, nuts	Vegetable oil, peanuts, sesame	Stir-fried dishes with oil	Animal fats, deep fried foods, etc.
Salt	Less than 5 g/day		
Sugar	Less than 5 g/day		

Source: Quyết định số 6173 /QĐ-BYT ngày 12/10/2018 của Bộ Y tế: Hướng dẫn quốc gia về dự phòng và kiểm soát ĐTD thai kỳ



Daily serving guide for pregnant women with GDM

	First trimester	Second trimester	Third trimester	Serving Size Examples /Alternatives
Water	8 servings	9 servings	10 servings	1 serving 200ml 
Grain	12 servings	13 servings	13.5 servings	1 serving =  Rice 55g (1/2 bowl)  Boiled corn 112g (1 small corn)  Sweet potato 84g  1 slice of bread
Vegetable	3 servings	4 servings	4 servings	1 serving 80g =  Cooked leafy vegetables (2/3 bowl)  Cooked vegetables (2/3 bowl)  Cucumber 80g
Fruit	3 servings	4 servings	4 servings	1 serving 80g =  Dragon fruit (1/6 medium fruit)  Grapefruit (2 large segments)  Orange (3 segments)  Guava (2 segments)
Meats, and other proteins	5 servings	6 servings	8 servings	1 serving =  Fish 44g  Tofu (1 block)  Chicken 77g  Lean pork 38g  Shrimp 87g (3 Shrimps)  Egg (1 egg)
Milk	3 servings	5 servings	6 servings	1 serving (100mg calci) =  Yoghurt (1 count)  100 ml milk
Oil/fat	5 servings	5 servings	6 servings	1 serving =  5g lard or 5g oil 
Salt	<5g	<5g	<5g	 5g salt or 8g soup powder or 8g seasoning powder

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PHYSICAL ACTIVITIES AND GESTATIONAL DIABETES



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Benefits of physical activity

Physical activity is a key component of GDM management.

Benefits of physical activity for pregnant women with GDM:



1. Increase insulin sensitivity



2. Lower blood sugar



3. Control weight gain



4. Strengthen the heart



5. Improve mood



6. Improve sleep quality



7. Prepare for labor and delivery



8. Lower risk of having T2D in the future

**Now is the time to develop healthy habits
for you and your child.**

Recommendations for PA

1. Who should be active?

If there are no obstetric contraindications, physical activity is recommended for all pregnant women, aligning with those for the non-pregnant population, with some minor modifications.

2. How long?

Women should aim for:



OR



Engage in physical activity daily,
aiming for at least 5 days per week.
Avoid more than 2 consecutive days of
inactivity.

3. How intense?

Moderate intensity activities are the best
choice for pregnant women

Tips to know:

Talk test: You should be able to hold a
conversation, but find it difficult to sing.

4. Types of physical activity

Your routine should **incorporate** various physical activities, including aerobic, resistance training, yoga, and gentle stretching.



Walking is one of the best exercises for pregnant women.

Try walking at least once a day (30 minutes) or at least 10 minutes after each meal to help lower your blood sugar.

Some other safe activities:



Ball exercises



Prenatal yoga



Prenatal stretches

- If you are advised to avoid lower-body workouts, try upper-body resistance training with light weights or bands.

5. Be active every day

- Any activity, even light ones, benefits blood sugar control. Pregnant women should engage in daily activities (e.g., watering plants, cleaning the house, etc.).

- Avoid being inactive for long periods after meals: no lying down, excessive screen time, sitting too long, or sleeping right after eating.

Safety precautions

1. Consulting with your obstetrician

- Ask your doctor about your health condition and any exercise contraindications.



- Absolute contraindications to exercises:

- Placental abruption.
- Preeclampsia.
- Gestational hypertension.
- History of premature birth.
- Prolonged vaginal bleeding.
- Cervical insufficiency.
- Placenta previa after 26 weeks.
- Multiple pregnancy (≥ 2 fetuses).

- Talk to your doctor about safe exercises and precautions during pregnancy.

2. Exercises to avoid

- Exercises with a risk of collision or falls.
- High-intensity or jumping exercises (e.g., running, volleyball, basketball, etc.).
- Abdominal or supine exercises.
- Exercises in extreme heat or humidity.

3. Essential items



Supportive sports bra



Comfortable shoes



Water & healthy snacks

4. Progression tips

- Start slowly.
- Always drink enough water.
- Do not forget to stretch after exercising.
- Avoid exercising if experiencing: swelling, hypertension, or hypo-/hyperglycemia.

WARNING SIGNS TO STOP:

- *Dizziness or difficulty breathing.*
- *Irregular heartbeat.*
- *Lower abdominal pain.*
- *Signs of hypoglycemia (hunger, fatigue, shaking hands, cold sweat).*
- *Vaginal bleeding or discharge.*
- *Uterine contractions.*

MENTAL HEALTH



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Pregnancy can be a challenging time, making women more sensitive, stressed, or anxious.

These feelings can significantly impact maternal well-being and fetal development. Conversely, good mental health benefits both the pregnant woman and the overall development of the fetus.

Mental health improvement

1. Proper nutrition

- Adjust diet for pregnant women with GDM.
- Prioritize fresh, nutrient-rich foods.
- Avoid processed foods (sausages, bacon, etc.), sugary treats, and greasy fried foods.

2. Stay active every day

- Daily exercise helps control blood sugar and improves mental health.
- Engage in 20 to 30 minutes of exercise every day.
- Practice yoga or meditation to enhance blood circulation, regulate breathing, boost health, and balance emotions.



3. Rest and relaxation

- Get enough sleep:

- + Aim for 7-9 hours of sleep per night.
- + Take a nap for 30-60 minutes at noon.
- + Avoid lying down right after eating.
- + Do not stay up too late.

- Reduce stress in work and home:

- + Seek help with housework from your husband and family.
- + Don't hesitate to ask for support from colleagues or discuss workload adjustment with your manager if needed.

- **Think positively:** Focus on the good and engage in relaxing activities you enjoy (e.g., walking, listening to music, watching movies, etc.).

- **Share your feelings:** Openly talk about your thoughts, feelings, and difficulties with trusted people, especially your husband.

**REMEMBER THAT YOU ARE NOT ALONE
REACH OUT FOR SUPPORT WHENEVER
YOU NEED IT!**

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SELF-MONITORING BLOOD GLUCOSE AT HOME



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Aim of blood glucose monitoring

Monitoring blood glucose is crucial for pregnant women with GDM to support optimal fetal growth and development while minimizing the adverse effects of GDM on both mother and child.

Aims of blood glucose monitoring:

Blood glucose	Goal
During pregnancy	
FBG	< 5.3 mmol/L
1h-PBG	< 7.8 mmol/L
2h-PBG	< 6.7 mmol/L

- Blood glucose levels measured at different times of the day are important indicators, enabling doctors to assess treatment effectiveness and make timely adjustments as needed.
- Maintain blood glucose ≥ 4.0 mmol/L.
- Keep HbA1c < 6% (tested once a month).

Nguồn: Quyết định số 6173/QĐ-BYT của Bộ Y tế:
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đái tháo đường thai kỳ



Self-monitoring at home



Pregnant women with GDM should regularly monitor their blood sugar levels at home, allowing for timely adjustments to diet, physical activity, and medication to achieve optimal blood glucose control.

The most common method for testing blood sugar at home is **the capillary blood glucose test**.

1. Recommended frequency of testing:

- After being diagnosed with GDM:

Test **at least 3 times per day** at the following times:



- Before meals.
- 1 hour or 2 hours after meals.
- When necessary: before bedtime, at night or if you experience signs of hypo/hyperglycemia.

- After 2 weeks of dietary adjustment:

- If blood glucose is stable, the number of daily tests can be reduced.
- If over 20% of results exceed the target, consult your doctor about insulin options.

- For pregnant women on insulin:

Should test more frequently.



2. Preparation instructions for the test



Glucometer
(ISO 15197:2013)



Testing strips



Sterile lancets and
lancing device

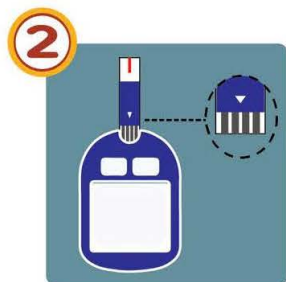


Logbook

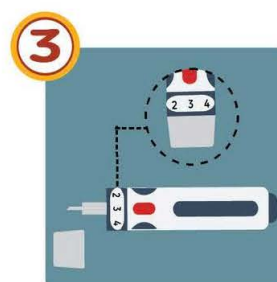
3. How to do the test at home



Wash and dry your
hands thoroughly



Insert testing
strip into meter



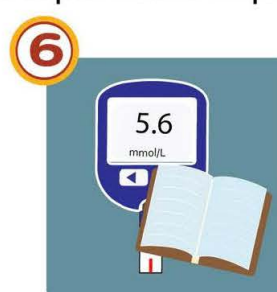
Insert lancet into the
lancing device & adjust
the puncture depth



Gentle prick the side
of your fingertip with
a lancet



Gently squeeze the fingertip to
get a blood drop. Apply the blood
sample to the test strip.



Wait for result &
record it in logbook

4. Storage



- Storage temperature: 4 - 30°C
- Avoid places with high humidity (e.g. bathroom, kitchen, etc.)
- Keep the test strips in their original tube and close the lid tightly.
- Use the test strip immediately after removing it from the tube.
- Never reuse test strips or lancets.

5. Important notes for testing at home

- Test blood glucose according to your doctor's guidelines.
- Record blood test results accurately and completely.
- Make sure the test strip matches the meter and are within their expiration date.
- Alternate between fingers for each test.
- Ensure the blood drop is sufficient to fill the test strip.
- Ensure your hands and equipment are clean before each blood test.



FAMILY SUPPORT



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Family support

The care and support of family members during pregnancy are vital for all pregnant women, especially those with GDM, and can make such a significant difference during this time.

Family members can offer various forms of support to pregnant women.

1. Husband's support

- Learn and share information about GDM with your wife .
- Help your wife manage her blood sugar by:
 - + Modify the diet.
 - + Exercise together.
 - + Remind and support your wife to monitor blood sugar at home.
 - + Learn the signs and treatment of hypoglycemia if your wife uses insulin.
 - + Listen to your wife's feelings and encourage her when she struggles with blood sugar control.
- Attend prenatal checkups together.
- Share housework with your wife.
- Quit smoking.



2. Support from parents, relatives

- Learn about GDM.
- Understand that pregnant women are not at fault for having GDM.
- Learn how to care for and support pregnant women with GDM:
 - + Read the diet advice for pregnant women with GDM to assist them in meal preparation.
 - + Gently encourage pregnant women to exercise daily if they do not have any obstetric contraindications.
 - + Listen and pay more attention to pregnant women's feelings.
 - + Help create opportunities for the women to relax.
 - + Avoid making stressful or judgmental comments about pregnant women's weight or the baby's weight.
 - + Encourage pregnant women to participate in relaxing activities (social activities, clubs, prenatal classes, etc.)

**LET'S ACCOMPANY PREGNANT WOMEN
ON THEIR PREGNANCY JOURNEY
TO WELCOME THE LITTLE ANGEL
OF THE FAMILY!**

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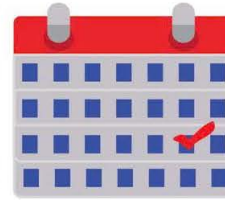
CHILDBIRTH AND POSTPARTUM CARE



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Labor and childbirth

The timing of delivery for pregnant women with GDM depends on blood sugar control and fetal development outcomes.



- If your pregnancy is stable, with well-controlled blood sugar and healthy fetal weight, you may be able to have a vaginal delivery close to your due date.
- For unstable blood sugar or fetal macrosomia, your obstetrician will advise on the optimal delivery approach.

Postnatal follow-up

- Newborn child:

- The child will be weighed and checked for cardiovascular and respiratory health.
- A heel prick test will be performed to check blood glucose levels. If the child's glucose is low (hypoglycemia), your child may need to be monitored in a special care nursery for closer supervision.

- The mother:

- Test fasting blood glucose the next day.
- If you used insulin during pregnancy: Monitor and adjust the dosage as needed.

Breastfeeding

1. The importance of breastfeeding

Create a bond between mother - child and give your child a healthy start:

Breastfeeding protects child from the likelihood of illness and hospitalization by providing easily digestible and essential nutrients and antibodies that bolster the digestive system, reducing the risk of respiratory and digestive infections, allergies, and childhood obesity.

Improve the mother's health:

Breastfeeding helps to lower your risk of developing type 2 diabetes, breast cancer, and cancer of the ovaries in the future. It also helps you lose weight.

2. Common Breastfeeding Positions



Please check out the video

3. Breastfeeding tips

- Breastfeed your child as soon as possible, within the first hour after birth.
- Engage in skin-to-skin contact for at least the first day after birth to help with bonding and milk production.
- In the early stages, feed your child every 2–3 hours, or whenever the child shows signs of hunger.
- Let your child feed as long as the child wants. Switch to the other breast if the child is still hungry.
- If the child cannot breastfeed directly, feed expressed breast milk with a spoon or cup.
- Maintain a nutritious diet of 3 main meals and 1-2 snacks daily with healthy foods (e.g., milk, fruits, nuts, etc.).
- Drink at least 2 liters of warm water.
- Avoid alcohol and soft drinks.
- Prioritize rest and get enough sleep.
- Stay calm and patient while waiting for your milk to come in.



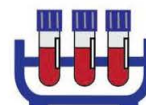
- Only take medication prescribed by a doctor.

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Postpartum care

Most cases of GDM disappear after delivery. However, mothers remain at risk of developing GDM in subsequent pregnancies and have a higher risk of T2D later in life. Thus, it is important to continue managing your health after delivery by following these steps:

1. Blood glucose testing



An **oral glucose tolerance test** should be performed **8-12 weeks** after delivery to check if the mother's blood glucose levels have returned to normal.

Blood glucose	What to do
Normal	Screening once every year
1 value exceeded the threshold	- Pre-diabetes. - Referred to endocrinology for management.
2 values exceeded the threshold	- Diabetes. - Referred to endocrinology for management.

Source: Quyết định số 6173/QĐ-BYT của Bộ Y tế: Hướng dẫn quốc gia về dự phòng và kiểm soát đái tháo đường thai kỳ



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2. Healthy diet

- Continue a healthy diet postpartum.
- Prioritize foods with unsaturated fats (e.g., nuts, avocados, fatty fish, etc.).
- Eat more fiber-rich foods (e.g., whole grains, vegetables, etc.).
- Eat lots of fruits, vegetables.
- Drink enough water.
- Avoid soft drinks and fruit juices.
- Avoid alcohol and smoking.



3. Staying active

- Avoid vigorous exercise right after birth.
- After 6 weeks, start exercising slowly and gently (e.g., walking, yoga, etc.).
- As you regain your strength, gradually increase the intensity and duration of exercise to 30 - 60 minutes daily.
- You can divide exercise into 2-3 sessions daily, each lasting at least 10 minutes.

4. Regular check-ups

- Regularly check blood sugar, HbA1c, and cholesterol levels (e.g., once a year).
- Discuss the results with your doctor and discuss whether you need medication.
- Plan for family planning and contraception.

DỰ ÁN NGHIÊN CỨU "SỐNG CHUNG VỚI BỆNH MẠN TÍNH: HỖ TRỢ GIA ĐÌNH VÀ CỘNG ĐỒNG TRONG QUẢN LÝ BỆNH ĐÁI THÁO ĐƯỜNG TẠI VIỆT NAM - ĐÁI THÁO ĐƯỜNG THAI KỲ" - TÀI TRỢ BỞI DANIDA

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