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**GESTATIONAL
DIABETES
MELLITUS**

Two lives - Twice as precious

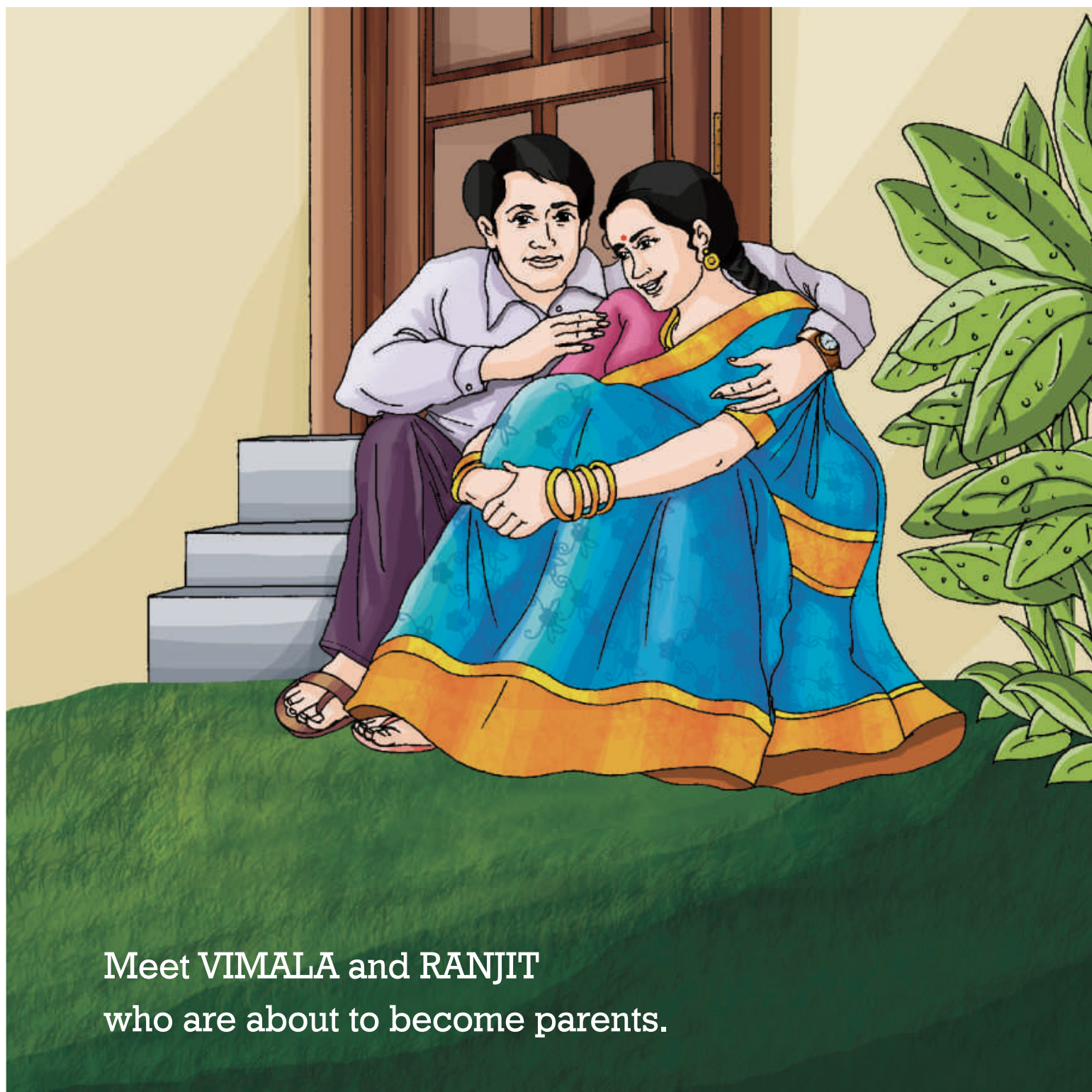




"A woman is the full circle.
Within her is the power to
create, nurture and transform."

~ Diane Mariechild





Meet VIMALA and RANJIT
who are about to become parents.



OB VISIT

Dr. Meera: Congratulations Vimala! You are going to become a mother for the very first time. This must be very exciting for you. You are about 7 weeks pregnant. You will need some blood tests.

Vimala: Of course... but I am also worried about my baby being born healthy.

Dr. Meera Lets make sure you are starting out healthy. We will get tests for Diabetes, anaemia and other routine tests done.

Vimala: Why Diabetes doctor? I am young and healthy.

Dr. Meera Women of India are at high risk for Diabetes and these days even the young women are at risk. This is a routine test because we are seeing a lot of women during pregnancy with Gestational Diabetes (GDM).

Vimala: My best friend developed Diabetes during pregnancy only during her 7th month.

Dr. Meera You are correct. Most women develop it only after 24 weeks but many women are being diagnosed during early pregnancy these days. Let us wait for your results.



One out of every 6 pregnant women in India has Gestational Diabetes

By diagnosing early in pregnancy, we can start treatment immediately and look forward to a healthy pregnancy and healthy baby.





OB VISIT

Dr. Meera: I am glad we did your blood sugar test. It looks like you have GDM.

Vimala: That is not possible doctor. My mother got Diabetes only at 50 and I have no symptoms.

Dr. Meera: There are many risk factors for GDM. Family history is an important one.

Vimala: Now, I am very worried doctor. Will my baby be born with Diabetes?

Dr. Meera: Please don't worry. Babies are not born with Diabetes because of mother's Diabetes.

Vimala: What else can happen to the baby? What can happen to me?

Dr. Meera: I am giving you a fact sheet on GDM. Let us look at it together. It shows why we should take GDM seriously and follow the diet, physical activity and monitoring guidelines very sincerely.

Keeping the blood sugars in the target range will ensure that your baby will be born healthy and you will have an uncomplicated pregnancy.

GDM also means the risk of future Diabetes for you is high. Please meet Anu, our Diabetes educator/nutritionist.

Your next appointment with me is in 2 weeks with your blood sugar results.

Fact Sheet

QUESTION

SOLUTION

What is Gestational Diabetes?

Gestation means Pregnancy. Diabetes that is detected during pregnancy is called Gestational Diabetes or GDM. This type of Diabetes is usually temporary but it also indicates a high risk for future Diabetes.

Why do women develop GDM?

A woman's body makes hormones during pregnancy that are called pregnancy hormones. These hormones typically are anti insulin in nature. Therefore, even a normal pregnancy requires a woman to make more insulin to counter these pregnancy hormones. Some women are unable to produce the extra insulin that is needed during pregnancy, and their blood sugars start to rise. These are the women who typically develop GDM. Family history, being overweight, sedentary lifestyle, polycystic ovary syndrome and belonging to a ethnic group with high risk of Diabetes are the usual risk factors.

How common is this problem?

It is becoming very common in India. Some recent studies have shown that as many as 1 in every 6 pregnant women develops Gestational Diabetes. It depends on mother's age, coexisting medical problems, family history, pre-pregnancy weight, physical activity.

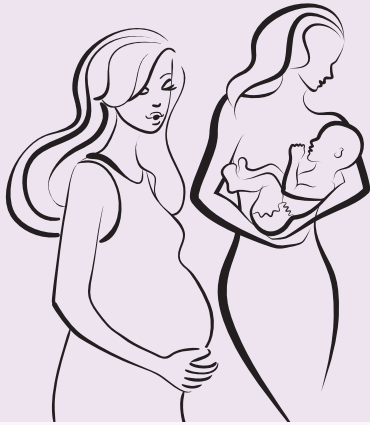
How can we find out if I have GDM and when?

It is a simple blood test. Your doctor will ask you to undergo a fasting blood sugar and/or a 75 gm GTT (Glucose Tolerance Test). Some doctors do 100 gm GTT. Based on pre-established cut offs, the diagnosis of GDM is made. Women are now tested at first booking and again at 24-28 weeks.

QUESTION

SOLUTION

What will happen if we don't find out?



What is my diet recommendation?

The general principles are:

Should I start exercising?

Gestational Diabetes has many consequences.

Mother:

Can develop pregnancy hypertension, hydramnios (too much water around the baby), premature labour and sometimes pregnancy losses (early or late).

Baby:

The baby can gain too much weight (called Macrosomia) and having difficulty during delivery. Sometimes there are birth injuries due to the size. C sections may become necessary. The newborn baby can develop low blood sugar or low calcium or high bilirubin. The baby of a mother with GDM is at increased risk for childhood obesity and Diabetes at an early age.

Nutrition guidelines are very important to follow strictly. The baby has to gain weight, the mother has to eat enough and the blood sugars have to be in the target range with the right diet.

1. Eat small frequent meals.

2. Avoid a big breakfast

3. Include 2-3 servings of dairy/day (preferably low fat or non fat).

4. Avoid simple sugars like sweets, fruit juice, soft drinks, sugar and fruit that are very sweet like mangoes, sitaphal (custard apple), sapota, jackfruit.

5. Eat a high fiber diet with millets, grains and vegetables.

6. Eat chicken, eggs, lean meats as a source of protein. Fish should be limited to twice a week and avoid fish like shark, sword fish, mackerel and tile fish. These may contain more mercury.

Being physically active is very important. Women can usually continue the exercise routine that they are used to prior to getting pregnant. However, it is always advisable to check with your Obstetrician if the activity that you are doing or planning to start is safe. Being active helps with glucose control, limits weight gain and helps women bounce back quickly after their delivery.

QUESTION	SOLUTION
<p>How can we know if my blood sugars are under control?</p>	<p>There are 2 ways. Home glucose monitoring with a glucometer is very helpful and provides round the clock access to testing. It is simple, easy to learn and quick. The other method is to give a blood sample to the laboratory. Self monitoring of blood glucose (SMBG) is preferred by many of the Diabetes specialists.</p>
<p>How will I know if the baby is doing well?</p>	<p>We get a detailed ultrasound called anomaly scan around 20 weeks. This is a scan that carefully looks at the heart and other body parts like the spine, extremities, the facial bones and for any evidence of birth defects or growth problems.</p>
<p>What are the diabetes medications that are safe during pregnancy?</p>	<p>Insulin is safe, effective and can be tailored to suit your needs. There are quick acting, short acting, intermediate acting, long acting insulins, pre-mixed insulins and pre-filled pens and cartridges. Metformin and Glyburide (Glibenclamide) are approved in some countries. Your doctor will decide on the best line of treatment for you.</p>
<p>Is it possible for me to have a normal delivery?</p>	<p>Absolutely GDM does not automatically mean C section. Your Obstetrician will decide the type of delivery based on baby's weight, position, your health condition, how your labour is progressing, etc. The timing of delivery will also be decided based on glucose control, use of insulin and previous delivery history and mother's medical history.</p>
<p>Will my blood sugars become normal after delivery?</p>	<p>Most women will have normal blood sugars from the moment the baby is delivered. Some women will continue to have Diabetes and medications will be prescribed. Please keep in mind, Gestational Diabetes is a forerunner of future Diabetes. It is probably smart to eat healthy and be active and get to a good and healthy weight even if the blood sugars have returned to normal.</p>
<p>When should I recheck my sugars?</p>	<p>Your blood sugars will be checked immediately after your delivery and before you go home. You will be asked to check your blood sugars again (after drinking 75 gms of glucose) about 6-12 weeks after delivery. This will tell us if your blood sugars are normal or abnormal. This is the only way to find out early and start treatment.</p>

QUESTION**SOLUTION**

Is breastfeeding good for the baby?

Breastfeeding is the best thing that the mother can do for her child. Breast milk has the right proportion of nutrients, boosts immunity, does not cause obesity (usually) and also allows the mother-baby bond to strengthen. Breastfeeding is great for the mom too! Mothers who breastfeed lose their pregnancy weight faster and are able to control their blood sugars much better.

What about contraception?

All methods of contraception are safe for women who have had Gestational Diabetes. Intrauterine device (IUD), oral contraceptives, condoms are all safe. Please discuss with your doctor if you are breastfeeding. She may choose a particular type of oral contraceptive. Many women think that breastfeeding automatically offers contraception. It is not entirely true. Contraception is recommended (at least barrier) whenever sexually active.

What can I do to prevent diabetes?

1. Remember that GDM means you have greater risk of diabetes in the future.
2. Always eat healthy. A low fat, high protein, low carbohydrate, balanced diet with more vegetables, legumes (pulses), millets and fresh fruit. Portion control is very important.
3. Be as active as you can be.
4. Avoid sedentary pursuits like TV watching, sitting for long periods of time.
5. Include plenty of stress busting fun activities with your friends and family.
6. See your doctor regularly for blood sugar checks.

How can I take care of the baby?

The most important thing is to pay attention to good nutrition, making sure that the baby is active and that the baby gains only the right amount of weight. Childhood obesity is a forerunner of future Type 2 Diabetes and other health problems. Please see the Paediatrician regularly and do not miss the immunization visits.

DIABETES EDUCATOR VISIT

Anu: Good morning Vimala. Let us talk about your typical day in terms of eating and physical activity and also your food allergies, preferences and cravings. I am giving you a form to fill out.

Vimala: My grandmother and my mother are insisting that I should be eating more to help the baby grow.

Anu: They mean well but you have to eat the right foods at the right time and the right portions. We need to pay attention to your weight, your baby's growth and your blood sugars. The recommended weight gain for your BMI is

Vimala: I dont feel like eating much these days and have nausea in the mornings.

Anu: That is common in early pregnancy. You will start feeling better soon and eating better. I am giving a list of do's and don'ts. The simple approach is small frequent meals with plenty of vegetables, protein and avoidance of simple sugars, empty calories and energy-dense "junk foods". Stay active throughout your pregnancy. Please check with your Obstetrician if and when you want to start a new exercise program.

GLUCOSE TARGETS:

Fasting

< 95 mg/dl

1 Hour
Post Prandial















< 140 mg/dl

2 Hrs
Post Prandial

< 120 mg/dl



Do's and Dont's


-  It is important to eat healthy and gain the recommended amount of weight only.
-  Keeping active helps maintain blood sugars in the target range.
-  Small frequent meals are better than 2 large meals to keep hunger away.
-  Breakfast should be small as women with GDM have more difficulty with glucose control in the mornings.
-  Avoid simple sugars like sugar, honey, sweets, sugary soft drinks, fruit juices, milk shakes, cakes, pastries, cookies and icecreams, and white bread.
-  Include vegetables, and dhals.
-  Include dairy (skimmed or low fat milk, buttermilk and yogurt) at least 2-3 servings/day.
-  Eggs are a great source of nutrition for the pregnant woman.
-  Include millets like Ragi and Kambu and include oats in your diet.
-  Limit the use of rice and substitute with rotis, multigrain dosas, millet dosas and oats idli, etc.
-  Do talk to your Obstetrician, your Diabetes, Educator and your Diabetologist regarding your health and get all your doubts cleared.
-  Do not panic, feel sad or be upset about being told to have GDM.
-  Your pregnancy can be very happy and healthy if your partner with your medical team and follow their recommendations.
-  Do your home glucose monitoring as suggested by your medical team. It will allow you to stay on target.

Gestational Weight Gain Chart

Get down to a good and healthy weight

A tool for health care providers to support women in having healthy weights when planning a pregnancy, during pregnancy, and postpartum.

BMI	Weight Gain (kg)	Weight Gain (lb)
Less than 20	12.5 - 18.0	28 - 40
20 - 27	11.5 - 16.0	25 - 35
Greater than 27	7.0 - 11.5	15 - 25



Body Mass Index (BMI) - $\text{weight (kg)} / [\text{height (m)}]^2$

Women with a BMI of 30 or greater may have personalized weight gain recommendations that are different from this range, including no weight gain or even a small weight loss. Health care providers are to determine individualized, healthy weight patterns for women with a BMI of 30 or greater.





OB VISIT

Dr. Meera: Well done Vimala. Your blood sugars are good.

Vimala: Can I relax my diet now?

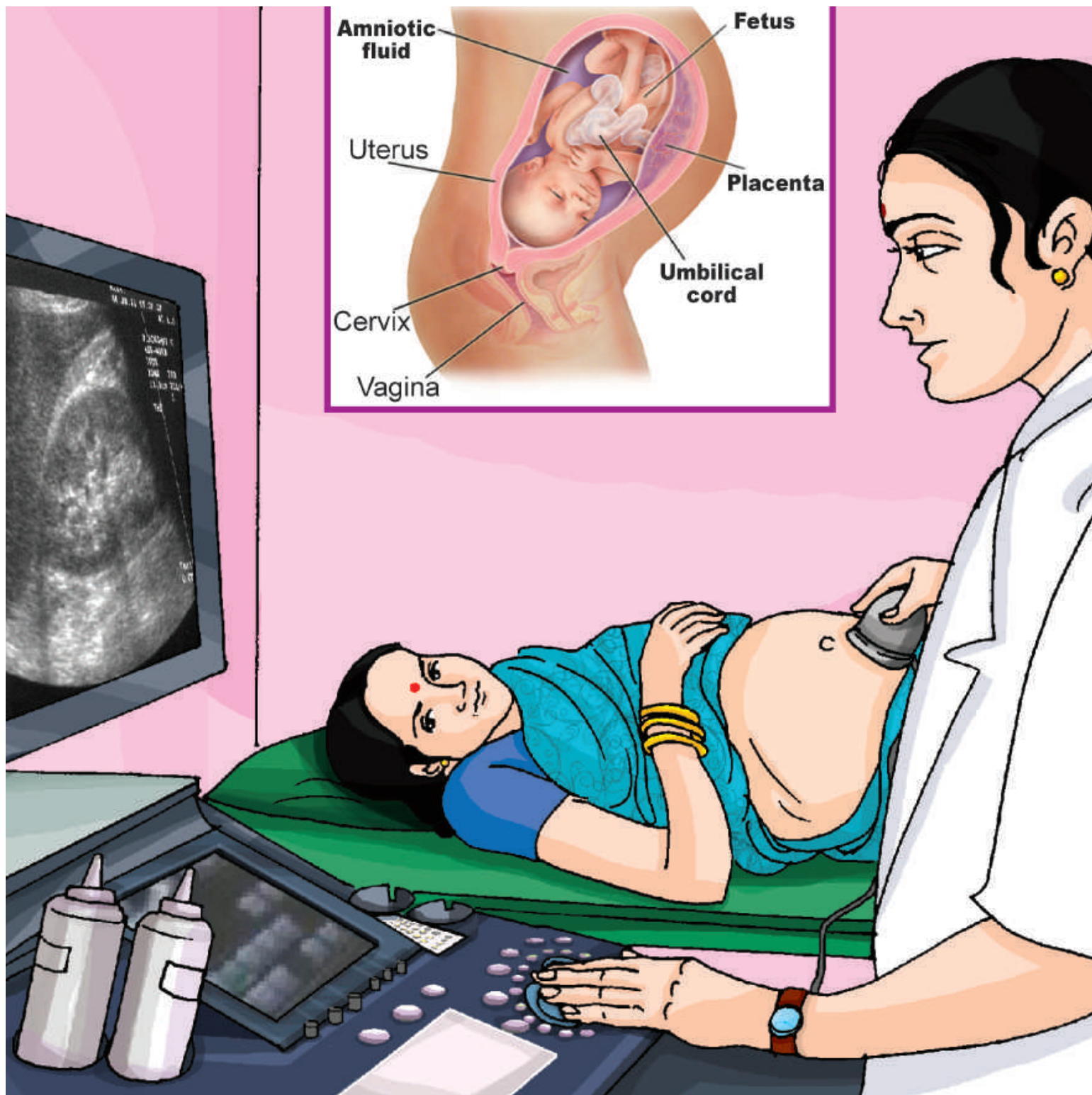
Dr. Meera: Please don't do that. You have to follow a strict diet and physical activity program till the birth of the baby. Every day of good glucose control helps the baby to maintain optimum weight and remain healthy.

Vimala: How can I do that?

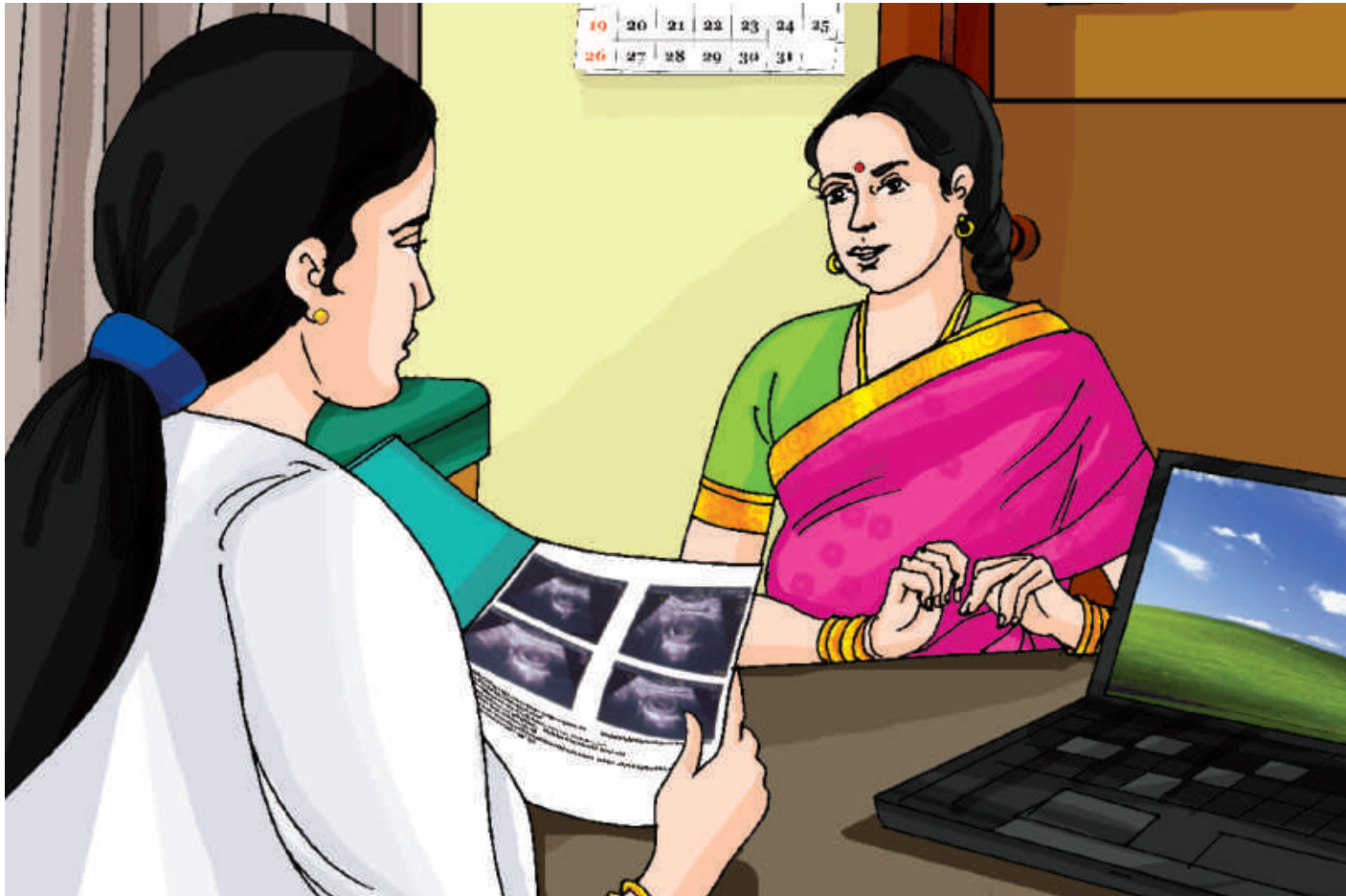
Dr. Meera: I want you to start doing home glucose monitoring using a glucometer. It is simple, safe and extremely useful method to keep the blood sugars in the target range.

Vimala: How will I know that my baby is not affected by my Diabetes?

Dr. Meera: I want you to get an ultrasound which will tell us a lot about the baby.



ULTRASOUND VISIT



Dr. Meera: The ultrasound report is excellent. The baby has no major birth defects and is growing well. Have you been monitoring your blood sugars?

Vimala: I have been checking at least once every day and my numbers seem to be outside the target range you had given me.

Dr. Meera: I am glad that you did the home monitoring. I want you to meet our diabetes specialist who will review all this and suggest medications.





DIABETOLOGIST VISIT

Vimala: These are my test reports and my home monitoring log sheet.

Dr. Nalini: Well done Vimala. You are keeping an excellent record. But the blood sugars are outside the target. Let us first review your diet and physical activity.

Vimala: I am trying my best to follow the recommendations given by the Nutritionist. I have difficulty with snacks.

Dr. Nalini: You can eat snacks like salad, fresh fruit, fat free yogurt, sundal, oats biscuits, buttermilk, sprouts, egg whites, oats or even a roti or nuts.

Vimala: I will do that. Do I need medications?

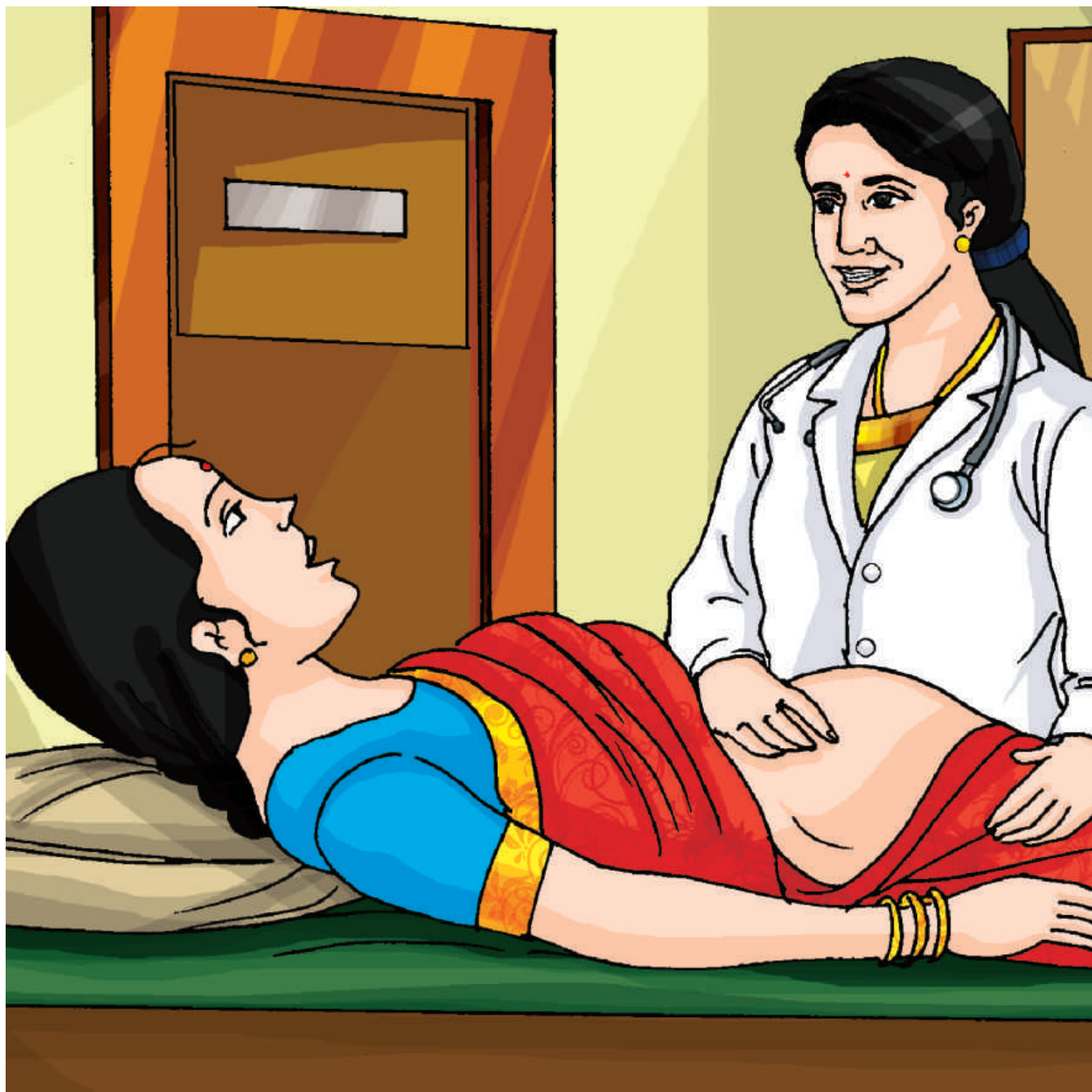
Dr. Nalini: Yes. Since your postmeal is 158 mgdl (we want it below 140 after 1 hour and below 120 after 2 hours), we will be starting you on insulin. My Educator will teach you how to use it.

Vimala: Can I not take pills?

Dr. Nalini: Some doctors use pills like Metformin and Glibenclamide, traditionally used for non-pregnant diabetics but many of us prefer insulin. It has a very long safety record and can be adjusted to suit your need.

Vimala: Will I always be on insulin?

Dr. Nalini: Usually only till delivery. Some may need it a little longer. We can also consider pills after delivery if necessary.





OB VISIT

Dr. Meera: Your pregnancy is coming along well. We are now only 8 weeks from your due date. Your weight gain is good, the baby's growth is good and your blood sugars are under control. We have to plan your delivery.

Vimala: Will I need a C section?

Dr. Meera: We cannot tell now. Just because you have GDM, it does not mean you will need a C section. We will plan for inducing labor around the beginning of 39 weeks.

Vimala: Will I need my insulin till then?

Dr. Meera: Yes, you will. I am giving you a checklist for preparing for delivery. Good glucose control is important till the baby is born. In fact, very important during delivery.



OB VISIT

Dr. Meera: You are now 36 weeks pregnant. Because you are being treated for Gestational Diabetes with insulin, we should plan on delivering you at the start of 39 weeks (which means in 2 weeks)

Vimala: Does this mean a C Section?

Dr. Meera: No. Just means we will induce labour and see how it progresses. Sometimes we have to do a C section but many times it is a normal vaginal delivery.

Vimala: Can I come back then? Can I stop checking my sugars?

Dr. Meera: I want you to see me again next week and we will assess the well being of the baby as we have been doing.
Please see Dr. Nalini (Diabetologist) and make sure that your blood sugars stay in great control till the baby is out. In fact, the time during delivery is very very important. If the blood sugars are high at that time, the baby may have low sugar at birth! Please talk to Anu or Dr. Nalini about this.

Vimala: Are there any special instructions?

Dr. Meera: Eat healthy. Keep monitoring your blood sugars. If you develop any abdominal pains or contractions or a bloody or watery discharge from your vagina, please call us immediately and if you are not able to connect by phone, come to our hospital. You will be examined and maybe sent back if it is a false alarm!

Checklist For Preparing For Delivery:

- ◆ Please pack your suitcase to take with you to the hospital. (Comfortable clothes, foot wear for hospital, pillow or back support, cosmetics, tooth brush, clothes for returning home from the hospital).
- ◆ Medical records & medications
- ◆ Home Glucose monitoring kit
- ◆ ID proof
- ◆ Keep emergency phone numbers (to reach family members, doctor's office, ambulance ready)
- ◆ Mobile phone & chargers
- ◆ Camera / Video camera
- ◆ Reading materials
- ◆ Baby stuff: Diapers, dresses blankets, towels, etc.
- ◆ Car seat (for bringing baby home if required by law)

GLUCOSE MONITORING KIT



Blood Glucose Meter

Test Strips

- ◆ Insulin pump supplies (for insulin pump users)
- ◆ Glasses
- ◆ Cash / Credit cards
- ◆ Driving license
- ◆ Insurance papers



DELIVERY



Dr. Meera: Congratulations Vimala. You are now a mother of a healthy and lovely little girl. I encourage you to breastfeed at least till the baby is 6 months to 1 year. This will help the baby with good nutrition and help with your blood sugar and weight control.

Vimala: Can I now go of my diet?

Dr. Meera: GDM means that you are at high risk for future Diabetes. 50% of women with GDM develop diabetes within 5-10 years of their delivery. That is why you should always eat healthy, be active and have regular blood sugar checks.

Vimala: I will meet you in 6 weeks with the blood sugar test (75 gm GTT) as suggested by you.

Checklist For Barriers To Postpartum Followup Of GDM Patients

Please mark a against any of below that you feel is the reason for difficulty in coming back for followup after delivery for checking the sugar.

INDIVIDUAL BARRIERS

- 1 Will not be able to leave the newborn baby at home
- 2 Afraid to find out about abnormal tests
- 3 Do not like having a GTT
- 4 Will not be able to stop breast feeding for a few hours
- 5 Not able to leave other children /family members alone at home
- 6 My body is too weak after the delivery
- 7 Don't like blood tests
- 8 Will lose a lot of blood
- 9 I am too young for diabetes

FAMILY COMMUNITY NORMS

- 1 My family does not want me to take any tests
- 2 The family feels that newborn should not be taken several months for fear of "evil eye"
- 3 We are not allowed to breast feed in public places

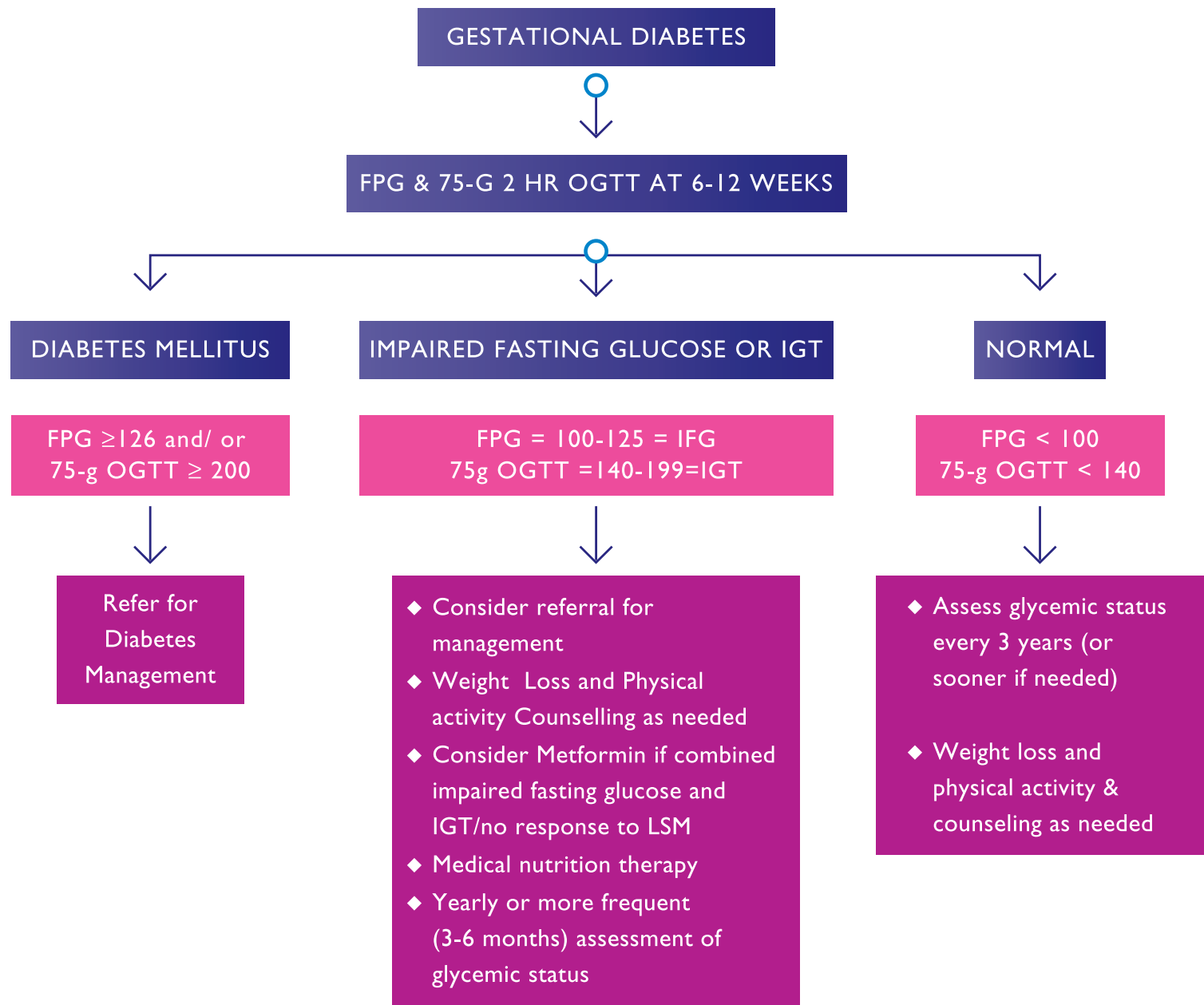
AFFORDABILITY

- 1 Do not have the financial resources for GTT
- 2 Have already spent money during childbirth
- 3 Money is tight this month
- 4 I need to buy baby food

ACCEPTABILITY

- 1 My diabetes has "gone away" I don't need a test
- 2 No one in my family has diabetes

Algorithm For Postpartum Follow Up Of Women With Gestational Diabetes



IAP Recommended Immunization Schedule For Children Aged 0-18 Years (with range), 2013

Age	Birth	6wk	10wk	14wk	18wk	6mo	9mo	12mo	15mo	18mo	19-23mo	2-3yr	4-6yr	7-10yr	11-12yr	13-18yr	
BCG	BCG	Range of recommended ages for all children															
Hep B	Hep B1	Hep B2		Hep B3			Range of recommended ages for all children										
Polio	OPV0	IPV1	IPV2	IPV3	OPV1	OPV2	IPVB1		Range of recommended ages for all children				OPV3	Range of recommended ages for all children			
DTP		DTP1	DTP2	DTP3	Range of recommended ages for all children			DTPB1		Range of recommended ages for all children				DTP B2	Range of recommended ages for all children		
Tdap															Tdap		
Hib		Hib1	Hib2	Hib3	Range of recommended ages for all children			Hib Booster		Range of recommended ages for all children				Range of recommended ages for all children			
Pneumococcal		PCV1	PCV2	PCV3	Range of recommended ages for all children			PCV Booster		Range of recommended ages for all children				Range of recommended ages for certain high-risk groups			
PPSV23													Range of recommended ages for certain high-risk groups				
Rotavirus		RV1	RV2	RV3	Range of recommended ages for all children												
Measles							Measles	Range of recommended ages for all children									
MMR								MMR1		Range of recommended ages for all children				MMR2	Range of recommended ages for all children		
Varicella								VAR1		Range of recommended ages for all children				VAR2	Range of recommended ages for all children		
HepA								Hep A1 & Hep A2			Range of recommended ages for all children						
Typhoid												Typhoid	Range of recommended ages for all children				
Influenza							Range of recommended ages for certain high-risk groups										
HPV															HPV 1-3		
Meningococcal													Range of recommended ages for certain high-risk groups				
Cholera							Range of recommended ages for certain high-risk groups										
JE							Range of recommended ages for certain high-risk groups										

● This schedule includes recommendations in effect as of November 2013.

● These recommendations must be read with the footnotes that follow. For those who fall behind or start, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.

 Range of recommended ages for all children

 Range of recommended ages for catch-up immunization

 Range of recommended ages for certain high-risk groups

 Not routinely recommended

6 WEEKS AFTER DELIVERY



Dr. Meera: Your blood sugar test says that you have prediabetes. Meet Dr. Nalini again and get the instructions. Breastfeeding is important and good for the baby.

Let us also plan the best contraceptive strategy for you.

PEDIATRICIAN VISIT



Dr. Maya: Baby Shalini is doing well. I am giving her the vaccination.

Vimala: I had GDM during my pregnancy. Should I check the baby's blood sugar?

Dr. Maya: Not necessary. But it is important to make sure that the baby does not gain too much weight. Children of mothers with GDM are prone to obesity and diabetes. Breastfeeding is good for the baby. Let's meet next month.

8 WEEKS AFTER DELIVERY

Dr. Nalini: I am glad you did the follow up blood sugar test. It shows that you now have prediabetes.

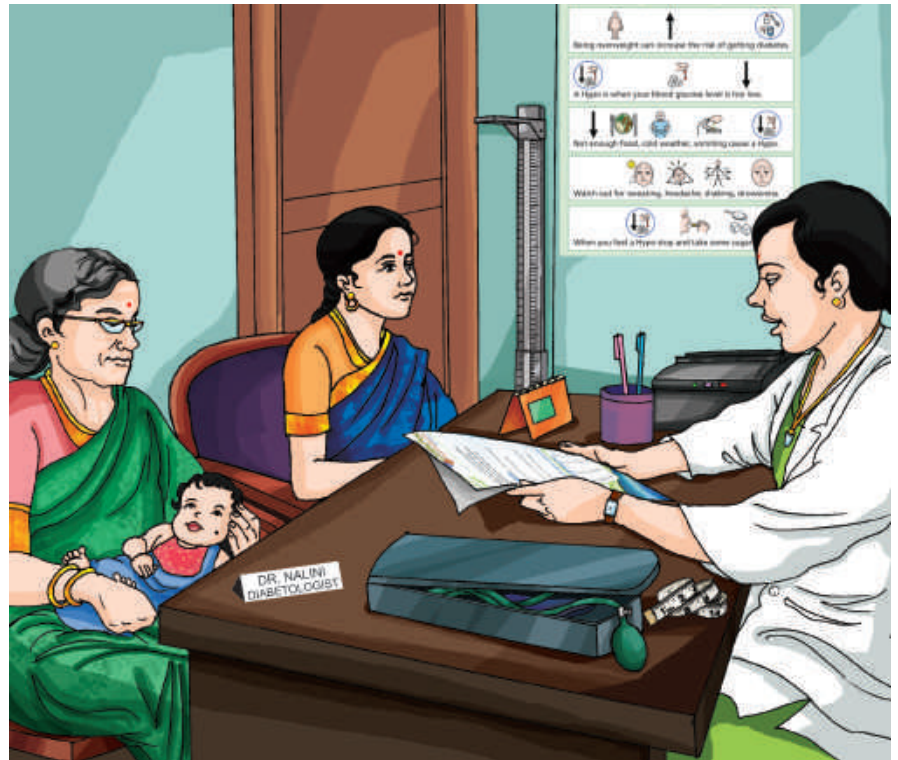
Vimala: What does this mean?

Dr. Nalini: It means that your blood sugars are not normal but somewhere between normal and diabetes range. If you do not take charge and control it, the blood sugars will slowly get into the diabetes range.

Vimala: What should I do?

Dr. Nalini: Please do the following:

1. Eat healthy. Meet Anu again and learn about the diet.
2. Be active. You can now do all the exercises and activities that you did before you got pregnant. Limit TV watching and other sedentary activities.
3. Check your blood sugars once in a week with your home glucose monitor. This is not compulsory but will definitely keep you motivated.
4. Yoga and meditation will also help you.
5. Breastfeed as long as you can. We recommend for 6 months exclusive and complimentary up to 1 year.
6. Discuss birth control measures with Dr Meera if not already done.
7. Always consult us before planning your next pregnancy. It is very important to start your next pregnancy with excellent blood sugar control.



1 YEAR AFTER DELIVERY

Dr. Nalini: You are doing well. Your glucose test (2 hour post 75 gm) is 135 and I am very happy. Keep up the good work. You have to pay a lot of attention to your diet and your baby's diet. Always keep in mind that GDM can lead to diabetes if lifestyle modifications are not adhered to. Be active.



Healthy Mother = Healthy Family

