

INTERNATIONAL DIABETES FEDERATION

IDF GDM MODEL OF CARE

IMPLEMENTATION PROTOCOL

GUIDELINES FOR HEALTHCARE
PROFESSIONALS



International
Diabetes
Federation



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Fund**

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IDF GDM Model of Care

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List of acronyms

ANC	: Antenatal Care
BP	: Blood Pressure
CRF	: Case Report Form
EDD	: Estimated Delivery Date
FFQ	: Food Frequency Questionnaire
FPG	: Fasting Plasma Glucose
GDM	: Gestational Diabetes Mellitus
HAP0	: Hyperglycaemia and Adverse Pregnancy Outcomes Study
HbA1c	: Glycated Haemoglobin
ICU	: Intensive Care Unit
IDF	: International Diabetes Federation
LGA	: Large-for-Gestational Age
LMP	: Last Menstrual Period
MDRF	: Madras Diabetes Research Foundation
mg/dl	: Milligram per decilitre
MNT	: Medical Nutrition Therapy
MoC	: Model of Care
NICU	: Neonatal Intensive Care Unit
NPH	: Neutral Protamine Hagedorn Insulin
OGTT	: Oral Glucose Tolerance Test
PAQ	: Physical Activity Questionnaire
PG	: Plasma Glucose
PPPG	: Post-Prandial Plasma Glucose
RPG	: Random Plasma Glucose
SGA	: Small-for-Gestational Age
SMBG	: Self-Monitoring of Blood Glucose
WINGS	: Women In India with GDM Strategy
WHO	: World Health Organization



INTRODUCTION TO THE WINGS PROJECT

The WINGS Project (Women in India with GDM Strategy)

Gestational Diabetes Mellitus (GDM) is a severe and neglected threat to maternal and child health. Fifteen per cent of pregnant women globally develop GDM during pregnancy¹. Prevalence varies around the world.



Objective

Community-based and facility-based intervention for the management of pregnant women with gestational diabetes in low-resource settings.

and established clinical guidelines. It has now been adapted and made available to other low and middle-income countries worldwide.

Project summary

The WINGS project (Women In India with GDM Strategy) was the first-ever IDF strategy to tackle the rising prevalence of GDM in low resource settings such as India. The aim of the project was to develop a context-adapted model approach to care in low-resource settings to confront the widespread challenges in GDM screening and management. The project developed a standardized approach to GDM care, seeking to improve the health outcomes of women with GDM and their new-borns, and to strengthen the capacity of selected health facilities to address GDM.

These guidelines provide practical information to health care providers from different countries on how to implement the IDF approach to care for GDM in their own clinics.

The IDF GDM Model of Care was piloted in seven (urban and rural) collaborating health centres in Tamil Nadu State (South India), from June 2012 to December 2015. The IDF GDM Model Approach to Care has been developed using best practice of care

¹ International Diabetes Federation, Diabetes in pregnancy – Protecting Maternal Health, Policy Briefing, Sept. 2011

01

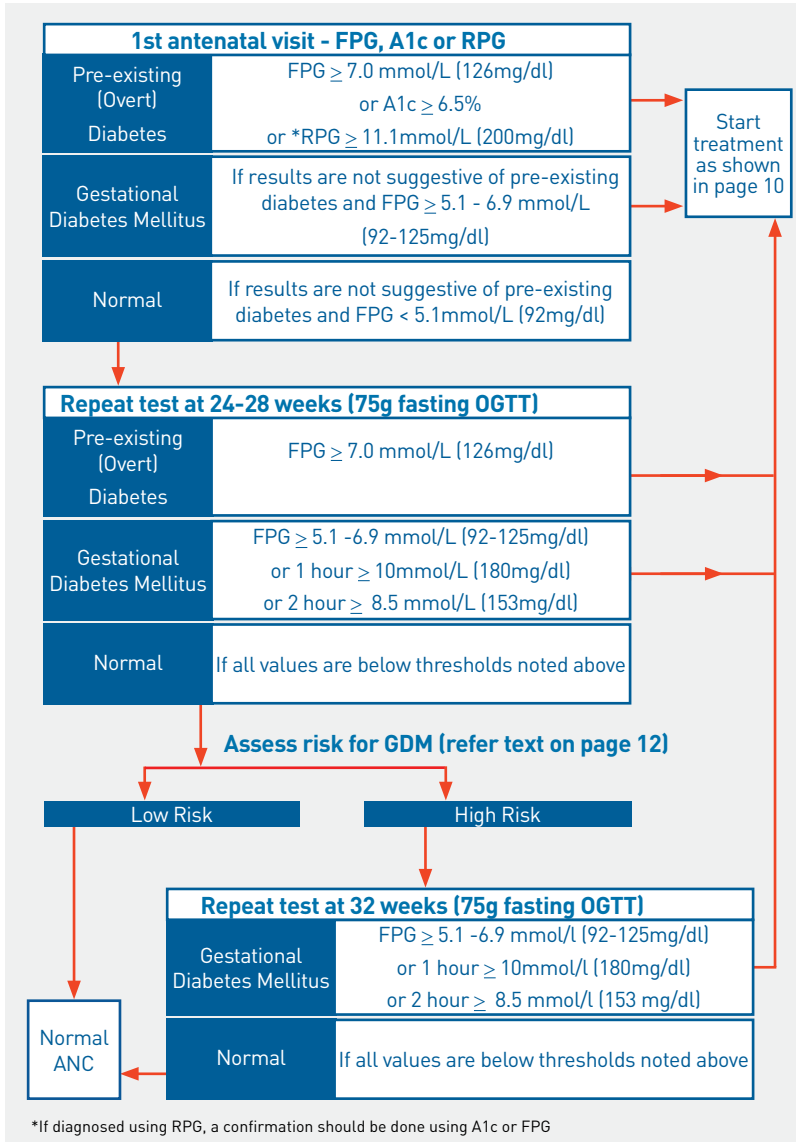
RECOMMENDED PROTOCOL FOR SCREENING, MANAGEMENT AND FOLLOW UP OF WOMEN WITH GDM

Screening for GDM

Screening Criteria

1st antenatal visit - FPG, A1c or RPG*
→ All pregnant women are screened at their first appointment (regular antenatal clinic).
→ Screening at 1st visit is done to rule out pre-existing diabetes. Overt diabetes is diagnosed if any one of the following are present: <div style="text-align: center;"> FPG value \geq 7.0 mmol/L (126 mg/dl) or A1c \geq 6.5%. or RPG \geq 11.1 mmol/L (200 mg/dl) </div>
→ A confirmation test using A1c or FPG is recommended on a subsequent visit
At 24-28 weeks; The GDM screening test: Oral Glucose Tolerance Test (OGTT)
→ Testing is to be performed by a lab technician at the health centre.
→ Patient should be fasting for at least 8 hours (overnight). The time of last meal taken the previous night should be noted.
→ Women are advised not to consume any food, drink or smoke for the duration of the test.
→ In the fasting state, 5ml venous blood is drawn into a fluoride tube
→ The woman is then administered a glucose solution consisting of 75gm glucose powder in 200 to 300ml of water to be drunk within 5 minutes.
→ Venous blood samples (5ml) are drawn at 1 and 2 hours after the glucose load
*FPG - Fasting Plasma Glucose, A1c - Glycated Hemoglobin, RPG - Random Plasma Glucose

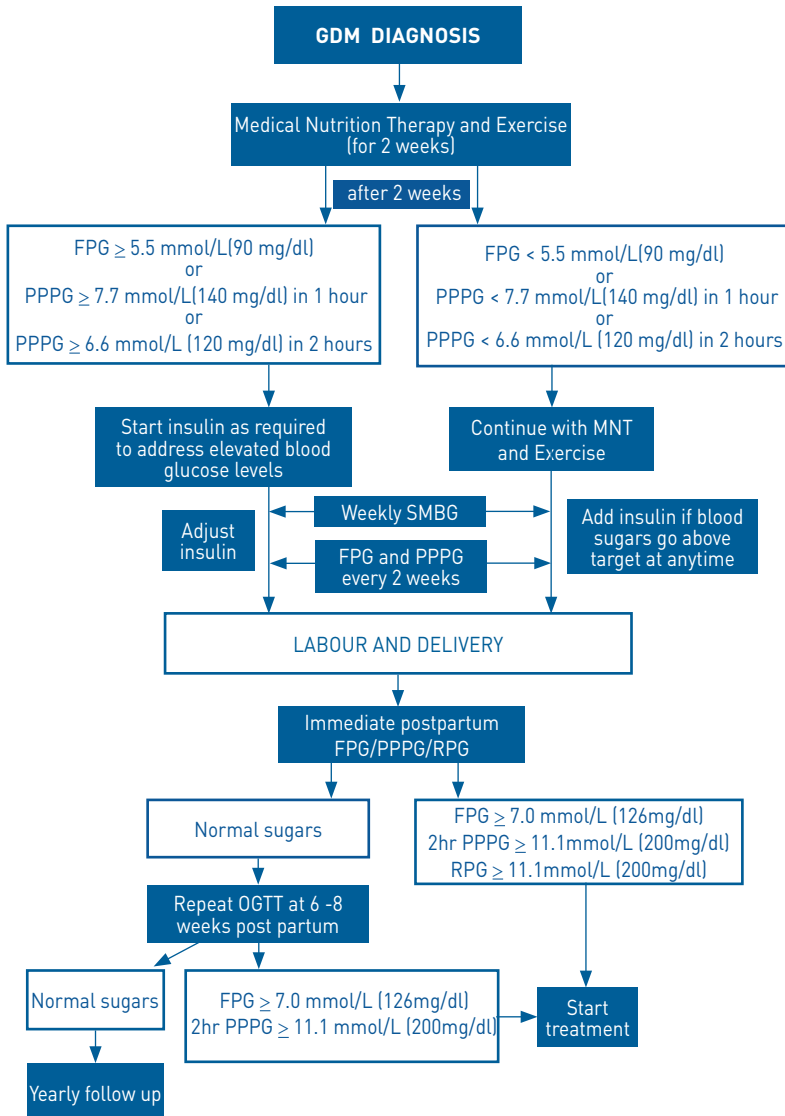
DIAGNOSTIC ALGORITHM²: INTERPRETATION OF RESULTS



2. International Association of Diabetes and Pregnancy Study Groups Consensus Panel, Metzger BE, Gabbe SG, Persson B, Buchanan TA, Catalano PA, Damm P, Dyer AR, Leiva Ad, Hod M, Kitzmiller JL, Lowe LP, McInyre HD, Oats JJ, Omori Y, Schmidt MI. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. Diabetes Care. 2010 Mar;33(3):676-82.

Management protocol for GDM

This algorithm will help to decide on the line of management of women screened under the Model of Care.



*PPPG - Post-Prandial Plasma Glucose

Management of women with GDM

I. Confirmed cases of gestational diabetes mellitus (GDM)

Women who are diagnosed with GDM as per the diagnostic algorithm will be managed with:

Medical Nutrition Therapy (MNT) and Exercise for the first two weeks to try to achieve target blood glucose levels. Refer to the Management Protocol for further details

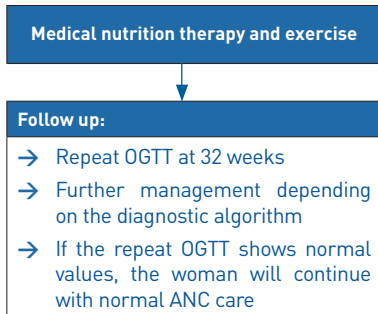
Follow up monitoring of GDM:

- Fasting and postprandial plasma glucose testing every 2 weeks
- If the fasting value is less than 5.5 mmol/L (90 mg/dl) or the 1 hour postprandial plasma glucose (PPPG) is less than 7.8 mmol/L (140 mg/dl) or 2 hour PPPG is less than 6.7 mmol/L (120 mg/dl), continue the same management
 - ◇ Advise self-monitoring blood glucose (SMBG) with a hand held meter at frequent intervals and FPG and PPPG advised every 2 weeks at the health centre.
- If the FPG is more than or equal to 5.5 mmol/L (90 mg/dl) OR the 1 hour PPPG is more than or equal to 7.8 mmol/L (140mg/dl) OR the 2 hours PPPG is more than or equal to 6.7 mmol/L (120 mg/dl), treatment with insulin should be started.
(please refer detailed management protocol for choice of insulin and dosage)
 - ◇ Advise self-monitoring of blood glucose (SMBG)³ with a hand held meter every week until target levels are achieved.
 - ◇ When targets are reached check a minimum of once per month until late in the 2nd trimester
 - ◇ Then increase to every 2 weeks

³ Metzger BE, Buchanan TA, Coustan DR, De Leiva A, Hadden DR, Hod M. Summary and recommendations of the fifth international workshop-conference on gestational diabetes mellitus, Diabetes Care. 2007; 30(suppl 2):S251-260.

II. Women with risk factors of GDM but with normal OGTT

In women with any one of risk factors for GDM⁴ (obesity, family history of diabetes in parents or sibling, history of GDM in previous pregnancies, history of impaired glucose tolerance but having normal blood glucose levels in OGTT, hypertension, etc.), management includes



III. Women with normal OGTT and no known risk factors for GDM

Normal Antenatal Care

4. American Diabetes Association. Gestational diabetes mellitus. Diabetes Care. 2003 Jan;26 Suppl 1:S103-5.

DETAILED MANAGEMENT PROTOCOL

Education on diet

On diagnosis of GDM, an information booklet on gestational diabetes is provided to all women. The medical provider will explain the usage of the booklet for healthy eating, glucose monitoring and physical activity.

The patient will be educated regarding healthy eating, spacing of meals and portion control. The pregnant women diagnosed with GDM will be encouraged to increase low glycemic index foods in their diets. Taking 6 – 8 small meals and snacks spread throughout the day including more fruits and vegetables will be encouraged.

Education on physical activity⁵

Exercise at a minimum of 30 minutes every day will be advised. Strength training exercises may be performed with certain upper body exercises being safe even in late pregnancy. The booklet explains some of these exercises with diagrams. A pedometer can be suggested to the pregnant women and its usage should be explained to them. The woman is encouraged to measure and record the number of steps taken every day in the booklet. This is expected to provide self-motivation for exercise and overall improvement in physical activity.

Insulin therapy

Treatment with insulin is indicated when the target blood glucose levels are not

achieved with diet and physical activity.

Human insulin is recommended in pregnancy. Rapid acting insulins (lispro and aspart) have been shown to be safe in pregnancy. They improve postprandial levels of blood glucose and lower the risk of postprandial hypoglycemia.

Long acting insulin: the usual recommendation is to use NPH or Detemir as basal insulin. Detemir has been approved for use in pregnancy. Premixed insulins are a convenient alternative but lack the flexibility of a basal bolus regimen.

Starting dose: If the fasting blood glucose levels are found high, NPH is to be started at bedtime. If the postprandial blood glucose levels are high, soluble or rapid acting insulin is to be started before the meal. A suggested starting dose is 4 units, titrating 1-2 units/every 2 days until targets are reached. The woman will be educated on how to administer the insulin, how to store the insulin and self-management of hypoglycemia.

Treatment with Oral Hypoglycemic Agents (OHAs)

There is some evidence that the use of oral hypoglycaemics such as metformin or glyburide (glibenclamide) are safe in pregnancy⁶. However, metformin and glyburide cross the placenta and long term safety data is not available. If the pregnant woman is already on metformin, it may be continued during the pregnancy. Metformin may be used if insulin is not available, not practical or refused by the woman.

5 Metzger BE, Buchanan TA, Coustan DR, De Leiva A, Hadden DR, Hod M. Summary and recommendations of the fifth international workshop-conference on gestational diabetes mellitus. *Diabetes Care.* 2007; 30(suppl 2):S251-260.

6 Perkins JM, Dunn JP, Jagastia SM. Perspectives in gestational diabetes mellitus: a review of screening, diagnosis and treatment. *Clinical Diabetes.* 2007;25(2):57-62.

Education for women diagnosed with GDM under the Model of Care

"Having a baby? Now is the time to learn about gestational diabetes" is a practical booklet to be distributed to pregnant mothers with gestational diabetes mellitus (GDM) and those at risk. It offers guidance ranging from tips on eating healthy and physical activity, to postnatal follow-up. It encourages pregnant women with GDM to log their activities including their blood glucose results throughout the pregnancy.

It is suggested the woman brings the booklet to every clinic visit so that important medical details can be filled in either by her health care providers or by herself.

The booklet is currently available in English, Hindi and Tamil, but can be translated into other languages as needed. Prior to translation, please refer to IDF Brussels Executive Office.

Monitoring and Evaluation


The woman should visit the health centre every 2 weeks for clinical and lab follow up.

After delivery, blood glucose levels should return to the non diabetic range, that is fasting less than 6.1 mmol/L (110 mg/dl), and 2 hour less than 7.8 mmol/L (140 mg/dl) and medication should no longer be necessary. However, in some women with GDM, the diabetes may continue after the delivery.

Approximately 50% of women with gestational diabetes will develop type 2 diabetes mellitus within 5 – 10 years following their pregnancy⁷. Hence, the mother is advised to return to the clinic for follow-up testing 6 - 8 weeks after delivery and an OGTT test will be done to assess her glycaemic status. Screening for diabetes once every year is advised.

7. Kim C, Newton KM, Knopp RH. Gestational Diabetes and the Incidence of Type 2 Diabetes: A Systematic Review, Diabetes Care 25, 2002.

ANNEXES



FBI LABORATORY

Lab No.

File No.

MDRF - 24 HOUR DIETARY RECALL

Interviewer

Date

24 hr recall time

Geometric Weight

Geometric Tolerances: positive (Shurt, Not-)

24 - HOUR DIETARY RECALL

Only recall foods: 24 hours (24 hr) or more (48 hr) multiple days

Interviewer & Date	Food Intake (List the amount)	Portion (cup?)	Serving Size (oz, g, lb, etc. N/A)	Portion (cup?)	Food quantity consumed	FOOD RECIPIENTS (Ingredients, brand, type & preparation method if any were changed)	How often consumed in a 24 hr period (times, 24 hrs)
Early Morning							
Midday							
Mid Evening							
Evening							
Night							
Total							

LABORATORY REPORT

6

CONFIDENTIAL
See Research Paper 748



APU

UK 999 code indicated on

Wine

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QUESTIONNAIRE (WINGS STUDY)

Interview

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Day Month Year

(Indication of habitat to which the
Pteris, Spore)

☐

1	<p>What is the most recent date on your last?</p>	<p>Home 1 Ward 2 Bay 3 House 4 Shop 5 Village 6</p>	<input style="width: 30px; height: 30px;" type="checkbox"/>
2	<p>Is a typical week, how many days do you not drink in the whole week?</p>	<p>Number of days</p> <p style="text-align: right;">(Print)</p> <p style="text-align: right;">(Print name)</p>	<input style="width: 30px; height: 30px;" type="checkbox"/>
3	<p>How many servings of food or fruit have you eaten/drunk in one of these days? (SEE FOOD ATT.)</p>	<p>Number of servings</p> <p style="text-align: right;">(Print)</p> <p style="text-align: right;">(Print first (in this case) only)</p> <p style="text-align: right;">(Print last (in this case) only)</p>	<input style="width: 30px; height: 30px;" type="checkbox"/>
4	<p>Is a typical week, how many days do you not eat vegetables?</p>	<p>Number of days</p> <p style="text-align: right;">(Print)</p> <p style="text-align: right;">(Print name)</p>	<input style="width: 30px; height: 30px;" type="checkbox"/>
5	<p>How many servings of vegetables do you eat in one of these days? (SEE FOOD ATT.)</p>	<p>Number of servings (in cups only)</p> <p style="text-align: right;">(Print)</p> <p style="text-align: right;">(Print name)</p>	<input style="width: 30px; height: 30px;" type="checkbox"/>
6	<p>How often do you consume each of the following? (Print 1) (Print 2) (Print 3) (Print 4) (Print 5) (Print 6) (Print 7) (Print 8) (Print 9) (Print 10) (Print 11) (Print 12) (Print 13) (Print 14) (Print 15) (Print 16) (Print 17) (Print 18) (Print 19) (Print 20) (Print 21) (Print 22) (Print 23) (Print 24) (Print 25) (Print 26) (Print 27) (Print 28) (Print 29) (Print 30) (Print 31) (Print 32) (Print 33) (Print 34) (Print 35) (Print 36) (Print 37) (Print 38) (Print 39) (Print 40) (Print 41) (Print 42) (Print 43) (Print 44) (Print 45) (Print 46) (Print 47) (Print 48) (Print 49) (Print 50) (Print 51) (Print 52) (Print 53) (Print 54) (Print 55) (Print 56) (Print 57) (Print 58) (Print 59) (Print 60) (Print 61) (Print 62) (Print 63) (Print 64) (Print 65) (Print 66) (Print 67) (Print 68) (Print 69) (Print 70) (Print 71) (Print 72) (Print 73) (Print 74) (Print 75) (Print 76) (Print 77) (Print 78) (Print 79) (Print 80) (Print 81) (Print 82) (Print 83) (Print 84) (Print 85) (Print 86) (Print 87) (Print 88) (Print 89) (Print 90) (Print 91) (Print 92) (Print 93) (Print 94) (Print 95) (Print 96) (Print 97) (Print 98) (Print 99) (Print 100) (Print 101) (Print 102) (Print 103) (Print 104) (Print 105) (Print 106) (Print 107) (Print 108) (Print 109) (Print 110) (Print 111) (Print 112) (Print 113) (Print 114) (Print 115) (Print 116) (Print 117) (Print 118) (Print 119) (Print 120) (Print 121) (Print 122) (Print 123) (Print 124) (Print 125) (Print 126) (Print 127) (Print 128) (Print 129) (Print 130) (Print 131) (Print 132) (Print 133) (Print 134) (Print 135) (Print 136) (Print 137) (Print 138) (Print 139) (Print 140) (Print 141) (Print 142) (Print 143) (Print 144) (Print 145) (Print 146) (Print 147) (Print 148) (Print 149) (Print 150) (Print 151) (Print 152) (Print 153) (Print 154) (Print 155) (Print 156) (Print 157) (Print 158) (Print 159) (Print 160) (Print 161) (Print 162) (Print 163) (Print 164) (Print 165) (Print 166) (Print 167) (Print 168) (Print 169) (Print 170) (Print 171) (Print 172) (Print 173) (Print 174) (Print 175) (Print 176) (Print 177) (Print 178) (Print 179) (Print 180) (Print 181) (Print 182) (Print 183) (Print 184) (Print 185) (Print 186) (Print 187) (Print 188) (Print 189) (Print 190) (Print 191) (Print 192) (Print 193) (Print 194) (Print 195) (Print 196) (Print 197) (Print 198) (Print 199) (Print 200) (Print 201) (Print 202) (Print 203) (Print 204) (Print 205) (Print 206) (Print 207) (Print 208) (Print 209) (Print 210) (Print 211) (Print 212) (Print 213) (Print 214) (Print 215) (Print 216) (Print 217) (Print 218) (Print 219) (Print 220) (Print 221) (Print 222) (Print 223) (Print 224) (Print 225) (Print 226) (Print 227) (Print 228) (Print 229) (Print 230) (Print 231) (Print 232) (Print 233) (Print 234) (Print 235) (Print 236) (Print 237) (Print 238) (Print 239) (Print 240) (Print 241) (Print 242) (Print 243) (Print 244) (Print 245) (Print 246) (Print 247) (Print 248) (Print 24</p>		



WINGS - PHYSICAL ACTIVITY QUESTIONNAIRE

PHYSICAL ACTIVITY

In this section, you will be asked about the time spent doing different types of physical activity in a typical day. Please answer these questions even if you do not consider yourself to be a physically active person.

SECTION I – PHYSICAL ACTIVITY AT WORK:

This section applies only to those who are employed. Housewives and those who are unemployed can skip this section and go to Q.6 on p.11.

- Does your work involve Seasonal Activity?

Yes ☐
 No ☐
- Specify Seasonal / Primary or Full Time Activity / Occupation: _____
- Specify Off-Seasonal / Part-time Activity / Occupation: _____

Q4. Indicate your duration of occupation per Week

a. Seasonal Occupation / Full Time Months <input type="text"/> Year <input type="text"/>	b. Off-Seasonal Occupation / Part-Time Months <input type="text"/> Year <input type="text"/>
--	--

Q5. Indicate your duration of occupation per Week

a. Seasonal Occupation / Full Time Days <input type="text"/> /Week <input type="text"/>	b. Off-Seasonal Occupation (Part-Time) Days <input type="text"/> /Week <input type="text"/>
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Q6. On an average, how many hours per day do you spend at work (specify)?

a. Seasonal Occupation / Full Time Hours <input type="text"/> / Day <input type="text"/>	b. Seasonal Occupation / Full Time Hours <input type="text"/> / Day <input type="text"/>
--	--

Q7. At the rest place, how many hours per day do you spend on the following:

Seasonal Activity / Full Time / Day	Duration (Hrs. / mins)	Off-Seasonal Activity Part - / Day	Duration (Hrs. / mins)
a. Sitting (Office Work)	<input type="text"/> Hrs. <input type="text"/> Mins.	b. Sitting (Office Work)	<input type="text"/> Hrs. <input type="text"/> Mins.
c. Standing	<input type="text"/> Hrs. <input type="text"/> Mins.	d. Standing	<input type="text"/> Hrs. <input type="text"/> Mins.



WOMEN IN INDIA WITH GDM STRATEGY (WINGS)

CASE REPORT FORM

Participant's Code/ID NO:

W	N	I/W	P/G	Enrolment Code	Id code
W	N				

Name of the Centre:

Name of the Participant:

Husband's Name:

Date of birth:

--	--	--	--	--	--	--	--	--	--

Participant's Address:

Contact No. (Land line):

Date of first visit:

d	d	m	m	y	y	y
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Mobile No:

Gestational age:

		Weeks	<table border="1"><tr><td></td><td></td></tr></table> days		

Email id:

Alternate Address (eg. Mother):

Mobile No: (Husband's)

Contact No. (Land line / Mobile):

WINGS Model of care - Participants' case report

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1. International Diabetes Federation, Diabetes in pregnancy – Protecting Maternal Health, Policy Briefing. Sept. 2011
2. International Association of Diabetes and Pregnancy Study Groups Consensus Panel, Metzger BE, Gabbe SG, Persson B, Buchanan TA, Catalano PA, Damm P, Dyer AR, Leiva Ad, Hod M, Kitzmiller JL, Lowe LP, McIntyre HD, Oats JJ, Omori Y, Schmidt MI. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. *Diabetes Care*. 2010 Mar;33(3):676-82.
3. Metzger BE, Buchanan TA, Coustan DR, De Leiva A, Hadden DR, Hod M. Summary and recommendations of the fifth international workshop-conference on gestational diabetes mellitus, *Diabetes Care*. 2007; 30(suppl 2):S251-260.
4. American Diabetes Association. Gestational diabetes mellitus. *Diabetes Care*. 2003 Jan;26 Suppl 1:S103-5.
5. Metzger BE, Buchanan TA, Coustan DR, De Leiva A, Hadden DR, Hod M. Summary and recommendations of the fifth international workshop-conference on gestational diabetes mellitus, *Diabetes Care*. 2007; 30(suppl 2):S251-260.
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