सत्यमेव जयते

NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

National Guidelines for Diagnosis & Management of Gestational Diabetes Mellitus

Maternal Health Division
Ministry of Health and Family Welfare
Government of India

December 2014

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unite for children

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लव वर्मा
सचिव
LOV VERMA
Secretary

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भारत सरकार
स्वास्थ्य एवं परिवार कल्याण विभाग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Government of India
Department of Health & Family Welfare
Ministry of Health & Family Welfare

Preface

In view of the high prevalence of "Gestational Diabetes Mellitus (GDM)" in the Indian population and the maternal & fetal risks associated with inappropriately managed GDM, the Ministry of Health and Family Welfare has prepared Technical and Operational Guidelines for identification and management of Gestational Diabetes Mellitus in pregnant women.

In the past two decades Ante-natal Care coverage has improved across India, but some of the key tests, for instance, screening for GDM were not part of our routine ANC service package leading to dilution in the quality of care. Identification of GDM in pregnant women is critical in view of its wide prevalence and the impact it has on pregnancy outcomes. Taking cognisance of this situation, the Ministry of Health and Family Welfare has developed these technical guidelines, which clearly articulate the standard protocols for the diagnosis and management of GDM.

These guidelines will go a long way in minimising the ill effects of unmanaged GDM at the community level which in turn will lead to further reduction in maternal morbidity and mortality.

I wish to put on record my appreciation of the domain experts and technical experts who gave their time and their unstinting support in developing the guidelines for diagnosis and management of GDM.

I am certain that the States and programme officers will make optimum use of this valuable resource which will help both the mother and neonate in leading a healthy life.

(Lov Verma)

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Ministry of Health & Family Welfare
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Dated: 28th November, 2014

Foreword

Strong health systems are lynch pins of a successful public health programme. I am happy to note that India has made substantial progress in improving its health systems at all levels – increased footfalls and improved service provision are a testimony to this. We have also turned to corner to improving maternal and child health with considerable improvement in reduction of maternal and infant mortality in the country.

However, there are certain burden of diseases especially non- communicable disease which need to be addressed from our public health facilities if we are to optimise the ground gained and keep the momentum of reducing maternal and infant morbidity and mortality.

"Gestational Diabetes Mellitus (GDM)"has been identified as a potential risk factor for poor health status in pregnant mothers which has a causal relationship with various complications during pregnancy and child birth, contributing directly to increased maternal or neonate morbidity and mortality.

As we move into the last leg of race in arresting the incidences of maternal mortality, we have sharpened our focus on reducing the prevalence of neonatal mortality or early neonatal mortality. Diagnosis and management of Gestational Diabetes Mellitus is a step forward in preventing the risk factors and causes of morbidity and mortality among mothers and young infants.

Maternal Health Division after wide based consultations with domain experts has developed the technical and operational guidelines to address this issue. These guidelines are aimed at state policy drivers and programme officers and will serve as handy resource for rolling out this intervention, which is now an integral part of our ANC package of services – leading improved quality of ANC services at various level.

I sincerely believe that the state programme officers will utilise this guideline effectively for implementing GDM in public health programme.

C.K. Mishra

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Foreword

In past few years the RCH Programme has especially focussed on reducing the maternal mortality ratio and infant mortality rates. This decline however needs to be accelerated and will only happen if we address all the possible contributory factors.

Prevalence of Gestational Diabetes Mellitus (GDM) is an identified high risk both for the pregnant women and the foetus. If not managed on time, this can pose severe risk both to mother and the neonate. Tamil Nadu is the only State which has implemented the universal screening and management of GDM for pregnant women and evidences clearly indicate its positive outcome.

The indigenous learning and various round of consultations with experts and development partners has lead to the preparation of guidelines on diagnosis & management of GDM for implementation in public health programme as a part of routine ANC in India.

The tireless efforts by the MH Division with support from technical expert from various institutes and development partners has facilitated drafting of this document and made it ready for implementation across the country.

I am confident that this guideline will not only help mother and neonates but also help in preventing GDM. States should effectively utilise this guideline in implementation of GDM programme.

(Dr. Rakesh Kumar)

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Programme Officer's Message

The prevalence of GDM has been observed across the country, however a consistent understanding, standard operating procedures (SOP) for identification and its management is varying from state to state or even within the state.To streamline this important intervention, a working group was constituted to standardise the process and suggest the implementable model.This guidelines has been prepared based on the recommendation of the experts after due deliberations. It is believed states will utilise this to effectively treat all the GDM cases.

I would like to express that these guidelines would not have been possible without the constant encouragement from Mr. C.K Mishra, AS&MD & Ms Anuradha Gupta, Ex AS& MD. Dr. Rakesh Kumar, Joint Secretary (RMNCH+A) headed the expert group meeting and gave valuable inputs in framing this guideline.

I would like to acknowledge the contribution of all members of the Expert Group in developing the content of these technical and operational guidelines. I would also like to acknowledge my colleagues in MH Division especially Dr. Dinesh Baswal, DC (MH) and development partner's for their valuable efforts and inputs in developing this document.

My sincere wishes to all the stakeholders at State and district level to plan and implement this important intervention in improving the quality of ANC services and saving the mothers and neonates from the burden of GDM.

12.12.14

(Dr Himanshu Bhushan)

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List of Abbreviations

ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
BMI	Body Mass Index
BMR	Basal Metabolic Rate
CHC	Community Health Centre
DH	District Hospital
FBG	Fasting Blood Glucose
GDM	Gestational Diabetes Mellitus
IGT	Impaired Glucose Tolerance
MC	Medical College
MO	Medical Officer
PAL	Physical Activity Level
PHC	Primary Health Centre
PPPG	Post Prandial Plasma Glucose
PW	Pregnant Women
SN	Staff Nurse
TSF	Table Spoonfull

Contents

1. Introduction

Gestational Diabetes Mellitus (GDM) is defined as Impaired Glucose Tolerance (IGT) with onset or first recognition during pregnancy. Worldwide, one in 10 pregnancies is associated with diabetes, 90% of which are GDM. Undiagnosed or inadequately treated GDM can lead to significant maternal & fetal complications. Moreover, women with GDM and their offsprings are at increased risk of developing type 2 diabetes later in life.

In India, one of the most populous country globally, rates of GDM are estimated to be 10-14.3% which is much higher than the west. As of 2010, there were an estimated 22 million women with diabetes between the ages of 20 and 39 & an additional 54 million women in this age group with impaired glucose tolerance (IGT) or pre-diabetes with the potential to develop GDM if they become pregnant. In a field study in Tamil Nadu performed under the Diabetes in Pregnancy – Awareness and Prevention project, of the 4151, 3960 and 3945 pregnant women screened in urban, semi urban and rural areas, respectively, the prevalence of GDM was 17.8% in the urban, 13.8% in the semi urban and 9.9% in the rural areas. The incidence of GDM is expected to increase to 20% i.e. one in every 5 pregnant women is likely to have GDM.

Despite a high prevalence of GDM in Indian women, currently screening of pregnant women for GDM is not being done universally as part of the essential antenatal package. The test is sporadically being done at DH and MC in some states as per direction of individual clinician except in the state of Tamil Nadu where every pregnant woman is being screened up to the level of PHC as a part of the government of Tamil Nadu initiative.

Despite the fact that GDM is a sizeable public health problem with serious adverse effects on mother & child, we do not have a standard GoI guideline for diagnosis and management of GDM.

1.1 Consequences of GDM

Maternal risks of GDM include polyhydramnios, pre-eclampsia, prolonged labour, obstructed labour, caesarean section, uterine atony, postpartum haemorrhage, infection and progression of retinopathy which are the leading global causes of maternal mortality.

Fetal risks include spontaneous abortion, intra-uterine death, stillbirth, congenital malformation, shoulder dystocia, birth injuries, neonatal hypoglycaemia and infant respiratory distress syndrome. Immediate and long-term clinical effects of GDM are important contributors to the burden of non-communicable diseases in many countries.

Maternal Risk	Fetal Risk
◆ Polyhydramnios	◆ Spontaneous abortion
◆ Pre-eclampsia	◆ Intra-uterine death
◆ Prolonged labour	◆ Stillbirth
◆ Obstructed labour	◆ Congenital malformation
◆ Caesarean section	◆ Shoulder dystocia
◆ Uterine atony	◆ Birth injuries
◆ Postpartum haemorrhage	◆ Neonatal hypoglycaemia
◆ Infection	◆ Infant respiratory distress syndrome

2. Evidence

2.1 International evidence

Review of international evidences shows definite guidelines for screening pregnant women for GDM. The American & Canadian guidelines recommend universal screening by two step approach. This includes a screening with 50g one hour plasma glucose test (>140 mg/dL taken as screen positive). The screen positive women are subjected to 100gm OGTT and those with 2 or more abnormal values of plasma glucose are diagnosed as GDM. The NICE & Australian guidelines recommend a risk based screening with 75gm 2 hour OGTT with fasting blood glucose ≥126mg/dL & 2hr ≥ 140 mg/dL taken as diagnostic for GDM. The WHO endorses universal screening for GDM at 24-28 weeks of gestation using the 75gm 2hr PG (cut offs fasting ≥126mg/dL & ≥140mg/dL). Almost all guidelines agree to management of GDM using Medical Nutrition Therapy (Diet plan) & insulin therapy if needed.

2.2 National evidence

The Diabetes in Pregnancy Study Group in India endorses the single step test recommended by WHO for diagnosis of GDM using a 75gm OGTT irrespective of the last meal with a threshold value of 2 hour PG>140 mg/dL. Tamil Nadu endorses universal screening of all pregnant women at 12-16 weeks gestation or at first antenatal visit. If the reports are normal, the next screening is done at 24-28 weeks gestation and later at 32-34 weeks. GDM is managed by MNT and Insulin therapy is added if required. In the postpartum period, 75gm OGTT is repeated at 6-12 weeks after delivery. If normal, OGTT is repeated at 6 months & thereafter, every year after delivery.

2.3 Need for National guidelines

Considering the high prevalence of GDM in India and the maternal & fetal morbidity associated with untreated or inappropriately managed GDM, there was an urgent need to formulate our own guidelines for testing all PW for GDM. Timely diagnosis of GDM will allow initiation of appropriate treatment to prevent & minimise the ill effects of uncontrolled GDM on the mother & child in the short term & long term. For this reason, GoI constituted an expert group to deliberate on GDM in detail & formulate guidelines for India.

The present guideline has been prepared based on the recommendations of the experts & available national/international evidences.

3. Technical guidelines on testing & management of GDM

3.1 Target population

All pregnant women in the community

3.2 Pre-requisites for testing & management of GDM

- Availability of supply & testing facility
- Trained human resources to manage the cases after diagnosis
- Appropriate referral linkages

3.3 Selection of facility

- States are free to choose the number of districts where the programme will be implemented
- Once a district is chosen, implementation of programme should be universal in that district from Medical College to sub-centre
- A health facility chosen for implementation of programme should have all the pre-requisites in place

- The service provider & programme officer must be oriented and trained about the programme

3.4 Protocol for investigation

- Testing for GDM is recommended twice during ANC.
- The first testing should be done during first antenatal contact as early as possible in pregnancy.
- The second testing should be done during 24-28 weeks of pregnancy if the first test is negative.
- There should be at least 4 weeks gap between the two tests.
- The test is to be conducted for all PW even if she comes late in pregnancy for ANC at the time of first contact.
- If she presents beyond 28 weeks of pregnancy, only one test is to be done at the first point of contact.
- If the test is positive at any point, protocol of management should be followed as given in this guideline.
- At MC/DH/other CEmOC Centres, availability of glucometer must be ensured at all ANC clinics with facility for collection of sample and interpretation of result there itself (by training of personnel).
- At all other facilities upto PHC level, there should be an in-house arrangement for conducting the test & giving report immediately so that necessary advice can be given on the same day by the treating doctor.

3.5 Methodology: Test for diagnosis

- Single step testing using 75 g oral glucose & measuring plasma glucose 2 hour after ingestion.
- 75g glucose is to be given orally after dissolving in approximately 300ml water whether the PW comes in fasting or non-fasting state, irrespective of the last meal. The intake of the solution has to be completed within 5 min.

- A plasma standardised glucometer should be used to evaluate blood glucose 2 hours after the oral glucose load.
- If vomiting occurs within 30 min of oral glucose intake, the test has to be repeated the next day, if vomiting occurs after 30 minutes, the test continues.
- The threshold plasma glucose level of ≥140 mg/dL (more than or equal to 140) is taken as cut off for diagnosis of GDM.

3.6 Instrument used for diagnosis

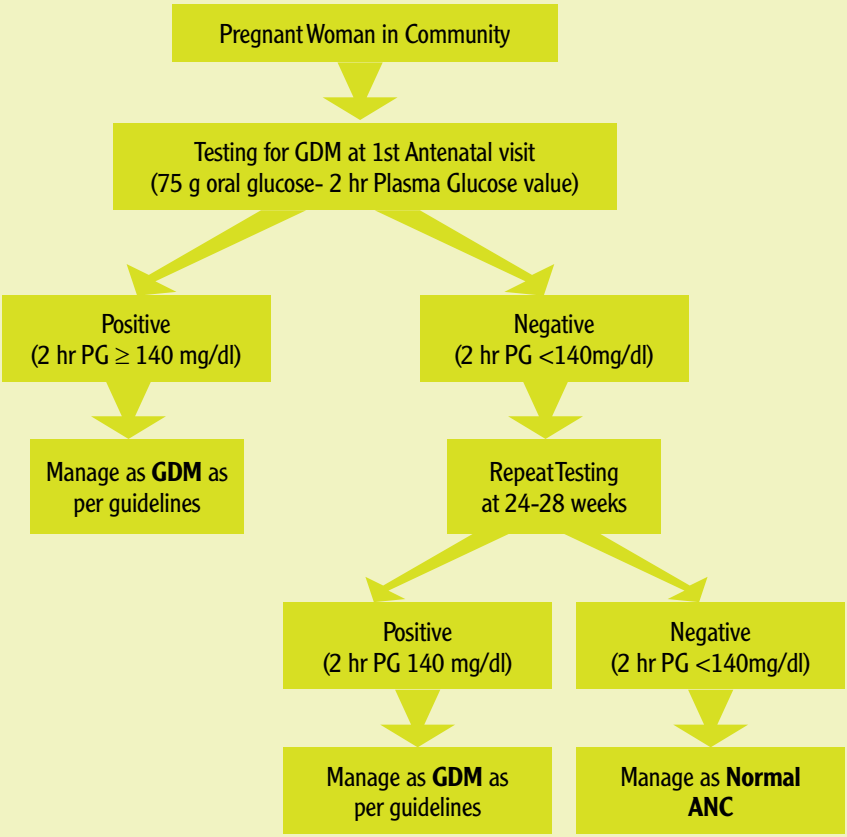
- For this programme, it has been decided that a plasma calibrated glucometer should be used for diagnosis of GDM instead of a semi-auto-analyser or auto-analyser or any other testing methodology as it may lead to delay in getting the results immediately.
- Since it will be difficult for PW to come another day just to collect the result, testing facility with a glucometer should be available at all facilities in the ANC clinic itself. This facilitates getting the result immediately so that necessary advice may be given the same day.
- A glucometer should also be available in the labour room for close monitoring of GDM cases during labour.
- Calibration of Glucometer recommended after 20 measurements using calibration test strips, provided with glucometers.
- Specification for the glucometer is given at Annexure 8
- Details on plasma calibration of glucometer is given in Annexure 9

3.7 Management of GDM

Guiding Principles

- All PW who test positive for GDM for the first time should be started on Medical Nutrition Therapy (MNT) for 2 weeks.
- After 2 weeks on MNT, a 2 hrs PPPG (post meal) should be done.

Universal testing for GDM



- If 2hr PPPG <120 mg/dL, repeat test every 2 weeks in second trimester & every week in third trimester
- If 2hr PPPG ≥120mg/dL medical management (Insulin Therapy) to be started as per guidelines.

Thus, GDM is managed initially with MNT and if it is not controlled with MNT, insulin therapy is added to the MNT.

Medical Nutrition Therapy (MNT)

Principles of MNT

- **Healthy eating during pregnancy**

All pregnant women with GDM should get Medical nutrition therapy (MNT) as soon as diagnosis is made. MNT for GDM primarily involves a carbohydrate controlled balanced meal plan which promotes

- Optimal nutrition for maternal and fetal health
- Adequate energy for appropriate gestational weight gain,
- Achievement and maintenance of normoglycemia

- **The importance of the individualised nutrition assessment in GDM**

Nutrition assessment in GDM should be individualised to allow an accurate appraisal of the woman's nutritional status.This assessment includes defining her Body Mass Index (BMI) or percentage of desirable pre-pregnancy body weight and optimal pattern of weight gain during pregnancy.

- **Calories and GDM**

- Individualisation is important when determining energy requirement, and adjustments should be made based on weight change patterns.
- Energy requirement during pregnancy includes the normal requirement of adult and an additional requirement for fetal growth plus the associate increase in the body weight of pregnant woman.

- Energy requirement does not increase in the first trimester unless a woman is underweight.
- Energy requirement increases during second and third trimester.
- Energy intake should be adequate enough to provide appropriate weight gain during pregnancy.
- As per Indian ICMR guidelines for an average weight gain of 10-12 Kg, an addition of 350 K.cal/day above the adult requirement is recommended during second and third trimester.
- Equations proposed by ICMR (1989) expert group can be used to calculate adult energy requirement which are as follows:
    - Energy requirement (K.cal/d)= BMR ×PAL

      *BMR= Basal metabolic rate

      *PAL= Physical activity level
    - BMR (K.cal/d)for adult females (18-30yrs)= 14×B.W (Kg) + 471
    - BMR (K.cal/d)for adult females (30-60yrs)= 8.3×B.W (Kg) + 788

      *B.W= body weight
    - Ideal body weight can be taken in to consideration when calculating the requirement.
    - PAL values proposed by ICMR expert group (2009) are as follows

Level of activity	PAL value
Sedentary work	1.53
Moderate work	1.8
Heavy work	2.3

- An addition of 350 k. cal can be made after calculating the energy requirement for adults as stated in above table.

Example

How to determine calorie requirement of a 28 years of age sedentary active pregnant woman in second trimester with height=153 cm, current weight=60 Kg, and pre-pregnancy weight=54 Kg.

1. First calculate the BMI
   BMI (kg/m2) = weight in Kg/Height in meter square
   = 54/1.53*1.53
   = 23.06 Kg/m2
   BMI is in normal range

2. Calculate BMR
   - BMR (K.cal/d)for adult females (18-30yrs) = 14×B.W(Kg) + 471
     = 14 ×53+471
     = 1213K.cal

3. Identify PAL
   PAL of sedentary activity is 1.53

4. Total energy requirement of adult = BMR×PAL
   = 1213×1.53
   = 1856K.cal

5. Total energy requirement in pregnancy = Total energy requirement of adult+350 Kcal/d
   =1856+350 = 2206 kcal per day

Maternal weight gain is the important measure in follow up visits to determine whether energy intake is adequate to support fetal growth. Weight gain targets for pregnancy are based on women's pre pregnancy Body Mass Index (BMI).

Pre-pregnancy weight	BMI (kg/m^2)	Total weight gain range (kg)
Normal weight	18.5 to 24.9	11.5 to 16 kg
Under weight	Less than 18.5	12.5 to 18 kg
Over weight	25 to 29.9	7 to 11.5 kg
Obese (include all classes namely grade I, II, and III)	Equal/more than 30	5 to 9 kg

*Desirable weight calculated from the Ideal height/weight chart (Annexure 1)

- Hypocaloric diets in obese women with GDM can result in ketonemia and ketonuria. However, moderate caloric restriction (reduction by 30% of estimated energy needs) in obese women with GDM may improve glycemic control without ketonemia and reduce maternal weight gain.

Select Carbohydrates Carefully

Carbohydrate foods and daily intakes

- Carbohydrate foods are essential for a healthy diet of mother and baby. Once digested, carbohydrate foods are broken down to glucose which goes into blood stream. The type, amount and frequency of carbohydrate intake has a major influence on blood glucose readings.
- Foods sources of carbohydrate include cereals (wheat, bajra, ragi, corn rice etc.) and its products (suji, refined flour, breads, pasta, noodles etc), pulses (green gram, bengal gram, black gram etc.), starchy vegetables (potato, sweet potato, corn tapioca etc), fruits, sweets, juices etc.
- Large amounts of carbohydrate foods eaten at one time will lead to high blood glucose level and should be avoided.

- Spreading carbohydrate foods over the day will help to prevent this. It is better to spread carbohydrate foods over 3 small meals and 2–3 snacks each day than taking 3 large meals

- Complex carbohydrates (like whole-grain cereals like oats, bajra, jowar, ragi, whole pulses, vegetables and fruits with skins) should be preferred over simple carbohydrates like food with lots of added sugar or honey, or foods that are made from refined white flour. Some examples of simple carbohydrates include sweets, cakes, puddings, sweet biscuits, pastry, juice, soft drinks, chips, white bread, naan, pizza etc

- Counting the number of carbohydrate serves that a mother eats during the day will help her to eat the right amount of carbohydrate. As a guide, aim should be for 2–3 carbohydrate serves at each major meal and 1–2 carbohydrate serves at each snack.

- One serve = approximately 15 grams of carbohydrate. Exchange list for carbohydrate is given in annexure 3

Understanding Fat Intake during Pregnancy

Saturated fat intake (sources - ghee, butter, coconut oil, palm oil, red meat, organ meat, full cream milk etc) should be less than 10 % of total calories and dietary cholesterol should be less than 300mg/d. In obese and overweight patients, a lower-fat diet overall can help slow the rate of weight gain.

Ways to trim the fat from your diet

- Use less fat in cooking and avoid frying of foods

- Using to low-fat dairy products in place of whole milk or full cream products.

- Choosing low fat snacks like substituting fresh fruit for high-fat snacks such as cakes, biscuits, chocolates and pastries.

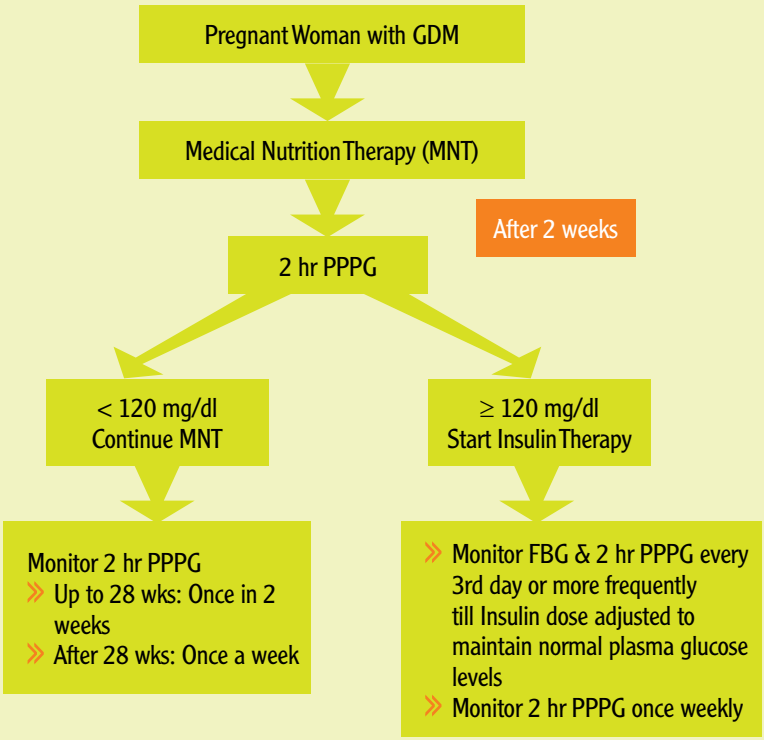
- Using lean meat in place of red meat

Protein: Protein requirement in pregnancy is increased (additional 23 g/d) to allow for fetal growth. At least 3 serving of protein foods are required every day to meet the increased demand. Sources of protein are milk and milk products, egg, fish, chicken, pulses (dal), nuts etc

Fiber: High fibre foods especially soluble fibre may help control blood sugar by delaying gastric emptying, retarding the entry of glucose into the bloodstream and lessening the postprandial rise in blood glucose. Soluble fibre in flax seed, psyllium husk, oat bran, legumes (dried beans of all kinds, peas and lentils), and pectin (from fruit, such as apples) and forms in root vegetables (such as carrots) are helpful.

Further details on dietary intake, sample diet chart (Annexure 2) and food exchange chart for MNT (Annexure 3).

Management of Pregnant Woman with GDM



Medical Management (Insulin Therapy)

- Insulin therapy is the accepted medical management of PW with GDM not controlled on MNT in 2 weeks..
- Oral tablets for diabetes treatment in pregnancy– not to be given as they are not safe
- All PW in whom MNT fails to achieve a 2 hr PPG <120 mg/dL are started on insulin, along with MNT.
- At PHC, MO should initiate treatment & refer PW with GDM to a higher centre if plasma glucose levels are not controlled or there is some other complication.
- At CHC/DH/MC, a Specialist/Gynaecologist/Physician/MO can start Insulin
- Any PW on insulin therapy should be instructed to keep sugar/jaggery/ glucose powder handy at home to treat hypoglycemia if it occurs

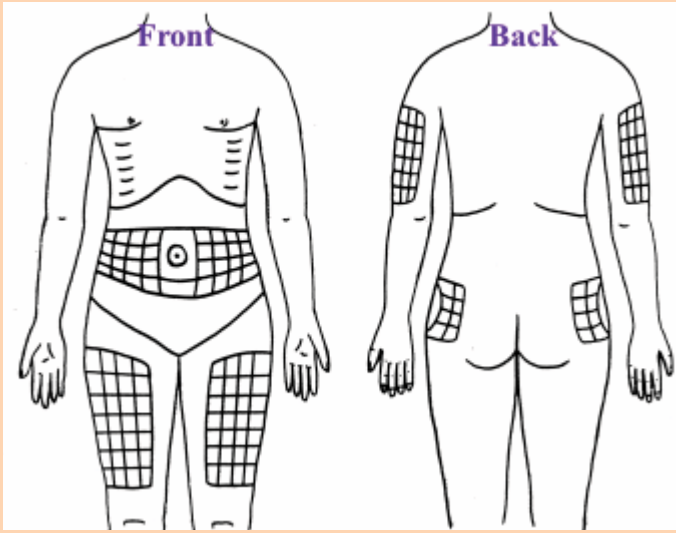
Very high 2 hr PPPG:

- If 2hr PPPG is >200mg/dL at diagnosis, starting dose of insulin should be 8 units pre-mixed insulin.
- The dose to be adjusted on follow-up and at the same time MNT has to be followed. Frequency of monitoring to be decided by the treating Physician/Gynaecologist/MO.
- If PW requires more than 20 units insulin/day, she should be referred to higher health-care centre.
- The dose of insulin should be followed as per the flow chart given on page 18.

Site of Insulin Injection:

- Front/Lateral aspect of the thigh or over abdomen
- Insulin injection is to be given subcutaneously only.

Insulin Injection Sites



Details of Insulin injection & Syringe

- Only Injection Human premix insulin 30/70 is to be administered
- Insulin syringe – 40 IU syringe is to be used
- Insulin vial – 40 IU/mL is to be used

Storage of insulin vial & syringe:

- Insulin vials have to be made available along with disposable syringe to the PW for use.
- Appropriate arrangement should be made for storage of insulin in refrigerators at 40^0–80^0C (in the door of the refrigerator) and battery backup in areas with an erratic supply of electricity. Vial should never be kept in freezer compartment of refrigerators. If by mistake, vials are stored in freezer and frozen, they should be not be used at all and discarded
- At PHCs, stock of insulin vials should be stored in refrigerators.
- Insulin vials should not be exposed to direct heat/sunlight, and are stable up to 25^0-30^0C
- Open insulin vials (in current use) should be stored in refrigerator or in dark and cool place. If refrigerator is not available, the vial should be kept in earthen pots filled in water or kept in cool place (near drinking water storage).
- Once opened, an insulin vial should be used within one month. If not used within one month, it should not be used and discarded.

Insulin syringe

- Single insulin syringe can be used safely for 14 injections if capped & stored properly.
- Before use, check syringe every time whether needle is straight or not
- Never clean needle with spirit or any other disinfectant. It will make needle blunt
- Tip of needle should not come in contact with anything else except cleaned skin
- After use, place the cap over needle carefully without touching the tip of needle

- Syringe in use can be stored at room temperature without direct exposure to sunlight or heat.There is no need to store in refrigerator.
- Proper disposal of syringe should be taught to the PW.

Disposal of syringe

(i) Disposal of home used syringes:

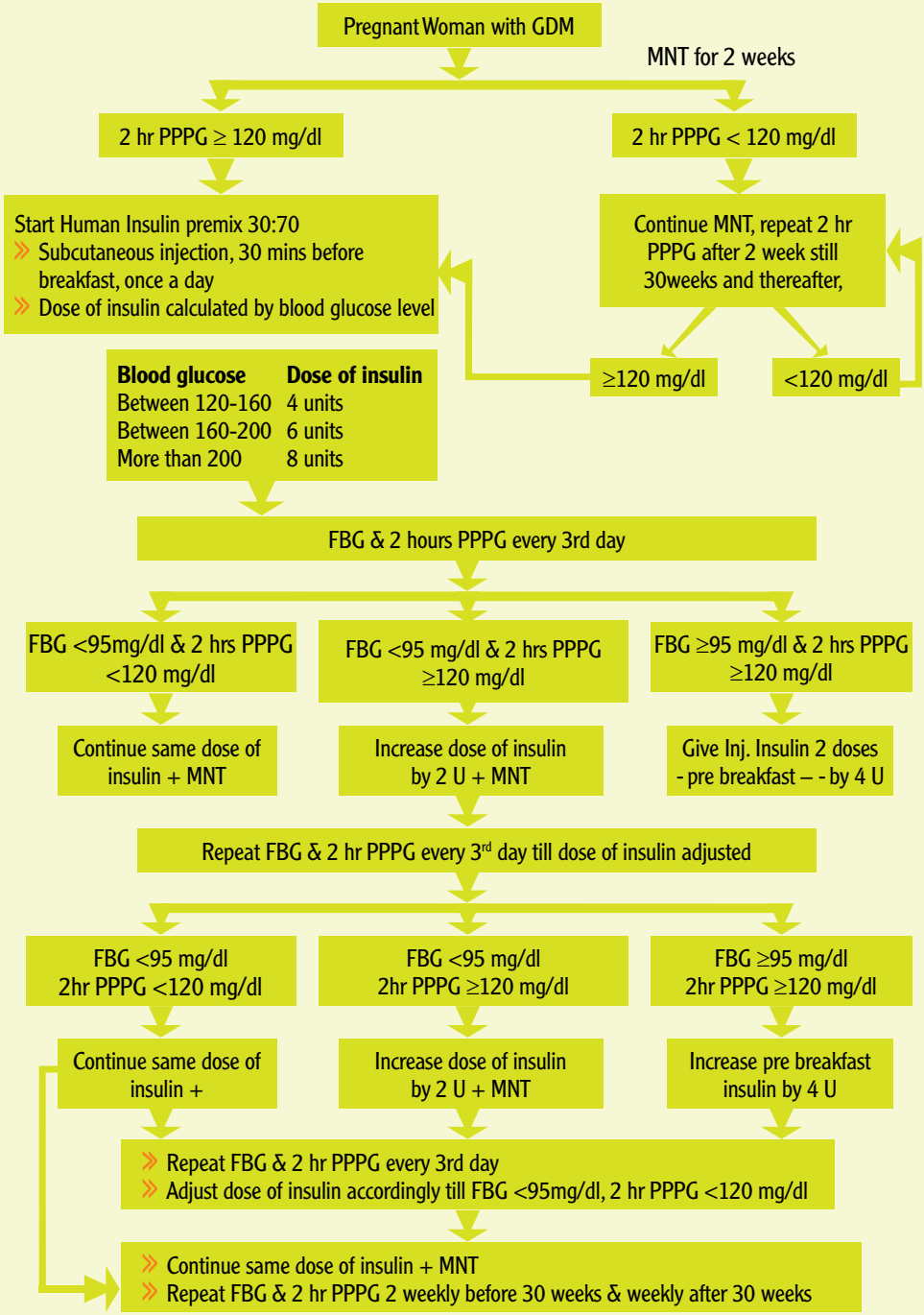
- Syringe with needle should be discarded if tip is blunt, bent, causing pain or has been used for 14 injections.
- This syringe should not be used by any other person or PW.
- Recap syringe and place the entire syringe with needle in an opaque plastic bottle with a screw cap or a plastic or metal box that closes tightly. Carry it to hospital on next visit where it can be given to the staff for disposal.
- The disposal after recommended number of syringe use:
  - At home, the used syringe should be either burnt or buried far away from reach of children
  - Or the PW should carry the used syringe to the health facility for the waste management
- Never throw used syringe in dustbin

(ii) Waste management including syringe disposal at health facility

Syringes causes the most injuries to the health care providers at all levels. The following safety guideline should be followed when handling sharp instruments such as needles and syringes:

- Sharp instruments should never be passed from one hand to other hand directly
- After use, syringes should be decontaminated by flushing them with a 0.5% chlorine solution three times for ten minutes

Insulin Therapy



* Only Injection human premix insulin 30/70 to be used * Insulin syringe – 40 IU syringe * Subcutaneous injection only

- All syringes/needles should be handled properly and disposed in puncture proof container
- Needles should be destroyed immediately using hub-cutter
- Sharps should be disposed immediately in a puncture resistant container. Needles should not be recapped, bent or broken or disassembled before disposal
- The used needles/syringes once decontaminated and destroyed using hub-cutter should be placed in the red bag and bag should be sealed labelled and audited before disposal
- All sharps including needles once processed as above should be disposed of in the sharps pit located at the health facility

Refer to higher centre if one or more of the following conditions are met:

- Nausea & vomiting and not able to take food orally
- Fasting blood glucose >200mg/dL with or without insulin
- Fasting blood glucose >150 mg/dL or post breakfast>250 mg/dL even after giving insulin is uniformly required.
- Total dose of insulin (combined morning and evening dose) on each day exceeds 20 units
- If pregnant women develops low blood glucose (hypoglycaemia) more than once in a day.
- If pregnant woman refuses to take insulin injection

How to Recognise & Manage Hypoglycemia

- Any PW on insulin can develop hypoglycaemia at any time
- Hypoglycemia is diagnosed when blood glucose level is < 70 mg/dl.
- Important to recognise symptoms of hypoglycaemia & treat immediately

How to recognise hypoglycaemia?

- **Early symptoms -** Tremors of hands, sweating, palpitations, hunger, easy fatigability, headache, mood changes, irritability, low attentiveness, tingling sensation around the mouth/lips or any other abnormal feeling
- **Severe -** Confusion, abnormal behaviour or both, visual disturbances, nervousness or anxiety, abnormal behaviour.
- **Uncommon -** Seizures and loss of consciousness

How to manage hypoglycaemia?

- Ask PW to take 3 TSF of glucose powder (15-20 grams) dissolved in a glass of water
- After taking oral glucose, she must take rest & avoid any physical activity
- 15 minutes after taking glucose, she must eat one chapati with vegetable/rice/one glass of milk/idli/fruits/anything eatable which is available
- If hypoglycemia continues, repeat same amount of glucose and wait
- If glucose is not available, take one of the following: Sugar - 6 TSF in a glass of water/fruit juice/honey/anything which is sweet/any food
- Take rest, eat regularly and check blood glucose if possible
- If PW develops >1 episode of hypoglycemia in a day, she should consult any doctor immediately

3.8 Special obstetric care for PW with GDM

Antenatal care

- Antenatal care of a PW with GDM should be provided by gynaecologist if available.
- In cases diagnosed before 20 weeks of pregnancy, a fetal anatomical survey by USG should be performed at 18-20 weeks.
- For all pregnancies with GDM, a fetal growth scan should be performed at 28-30 weeks gestation & repeated at 34-36 weeks gestation.There should be at least 3 weeks gap between the two ultrasounds and it should include fetal biometry & amniotic fluid estimation.
- PW with GDM in whom blood glucose level is well controlled & there are no complications, should go for routine antenatal care as per GoI guidelines.
- In PW with GDM having uncontrolled blood glucose level or any other complication of pregnancy, the frequency of antenatal visits should be increased to every 2 weeks in second trimester & every week in third trimester.
- Monitor for abnormal fetal growth (macrosomia/growth restriction) and polyhydramnios at each ANC visit
- PW with GDM to be diligently monitored for hypertension in pregnancy, proteinuria and other obstetric complications
- In PW with GDM between 24-34 weeks of gestation and requiring early delivery, antenatal steroids should be given as per GoI guidelines i.e. Inj. Dexamethasone 6 mg IM 12 hourly for 2 days. More vigilant monitoring of blood glucose levels should be done for next 72 hours following injection. In case of raised blood glucose levels during this period, adjustment of insulin dose should be made accordingly.

Fetal surveillance in PW with GDM:

- PW with GDM are at an increased risk for fetal death in utero and this risk is increased in PW requiring medical management. Hence vigilant fetal surveillance is required.
- Fetal heart should be monitored by auscultation on each antenatal visit.

PW should be explained about Daily Fetal Activity Assessment. One simple method is to ask her to lie down on her side after a meal and note how long it takes for the foetus to kick 10 times. If the foetus does not kick 10 times within 2 hrs, she should immediately consult a health care worker and if required should be referred to a higher centre for further evaluation.

Labour & Delivery

- PW with GDM with good control of Blood glucose (2 hr PPPG < 120 mg/dl) levels may be delivered at their respective health facility.
- PW with GDM on insulin therapy with uncontrolled blood glucose levels (2 hr PPPG ≥120 mg/dl) or insulin requirement >20 U/day should be referred for delivery at CEmOC centres under care of gynaecologist at least a week before the planned delivery.
- Such referred cases must get assured indoor admission or can be kept in a birth waiting home with round the clock availability of medical staff for monitoring.
- Timing of delivery: GDM pregnancies are associated with delay in lung maturity of the fetus; so routine delivery prior to 39 weeks is not recommended.
- If a PW with GDM with well controlled plasma glucose has not already delivered spontaneously, induction of labour should be scheduled at or after 39 weeks pregnancy.

- In PW with GDM with poor plasma glucose control, those with risk factors like hypertensive disorder of pregnancy, previous still birth & other complications should be delivered earlier. The timing of delivery should be individualised by the obstetrician accordingly.
- Vaginal delivery should be preferred and LSCS should be done for obstetric indications only.
- In case of fetal macrosomia (estimated fetal weight > 4 Kg) consideration should be given for a primary cesarean section at 39 weeks to avoid shoulder dystocia.

Special precaution during labour

- PW with GDM on Insulin require plasma glucose monitoring during labour by a glucometer.
- The morning dose of Insulin is withheld on the day of induction/labour and the PW should be started on 2 hourly monitoring of plasma glucose.
- IV infusion with normal saline (NS) to be started & regular insulin to be added according to blood glucose levels as per the Table below.

Blood glucose level	Amount of Insulin added in 500 ml NS	Rate of NS Infusion
90-120 mg/dl	0	100 ml/hr (16 drops/min)
120-140 mg/dl	4 U	100 ml/hr (16 drops/min)
140-180 mg/dl	6 U	100 ml/hr (16 drops/min)
>180 mg/dl	8 U	100 ml/hr (16 drops/min)

3.9 Immediate neonatal care for baby of mother with GDM

- All neonates should receive immediately essential newborn care with emphasis with early breastfeeding to prevent hypoglycemia.
- If required, the sick neonates should be immediately resuscitated as per GoI guidelines.
- Newborn should be monitored for hypoglycemia (capillary blood glucose <44 mg/dl). Monitoring should be started at 1 hour of delivery and continued every 4 hours (prior to next feed) till four stable glucose values are obtained.
- Neonate should be also be evaluated for other neonatal complications like respiratory distress, convulsions, hyperbilirubinemia.

3.9.1 Hypoglycemia in a newborn with GDM mother

All babies born to mothers with GDM are at risk for development of hypoglycemia irrespective of treatment whether they are on insulin or not and should be observed closely. All babies of GDM mother should be checked for hypoglycemia at or within one hour of delivery by glucoemeter.

Diagnosis of hypoglycemia

The operational definition cut off of plasma glucose by glucometer is 45 mg/dl. Any new-born with blood glucose lees than 45 mg/dL should be considered as 'baby with hypoglycemia'.

The glucometers are not very reliable for diagnosis of hypoglycemia as their sensitivity decreases at lower blood glucose range. The most definite diagnosis of hypoglycemia is by measurement of blood glucose by established laboratory methods (glucose oxidase method by

calorimetric). In view of non-availability of laboratory facilities at all places and time delay in getting result, plasma glucose values obtained by glucometers will be considered for all operational steps. Where ever lab facilities are available, treating physician can take a decision to send a blood glucose sample to the lab without delaying next management step.

Symptoms of hypoglycemia

Most of the time, new-born baby may not have any symptom of hypoglycemia at all. Symptoms of hypoglycemia are very variable and seen only in a smaller proportion of patients. A physician should observe for following sign in a new-born child for hypoglycemia:

- Stupor or Apathy
- Jitteriness or tremors
- Episodes of cyanosis
- Convulsions
- Intermittent apnoeic spells or tachypnea
- Weak and high pitched cry, limpness and lethargy
- Difficulty in feeding
- Eye rolling
- Episodes of sweating
- Any unexplained clinical feature in baby of diabetic mother

Management of hypoglycemia

All cases of hypoglycemia should be managed in following manner:

Step 1:	Whenever there is suspicion of hypoglycemia BG should be checked immediately with glucometer. In all babies born to diabetic mother, BG should be checked by glucometer between 1-2 hours after birth.
Step 2:	If plasma glucose values is <45 mg/dl, this should be considered as 'hypoglycemia', move to next step
Step 3:	New-born with hypoglycemia – immediately ask mother to give breast feed without any delay. Direct breast feeding is the best management step for neonatal hypoglycemia. If the infant is unable to suck, expressed breast milk from mother should be given. If mother is not in a position to give breast feed or no breast milk secretion/production, baby should be given any formula feed. One of the good options is to dissolve one TSF of table sugar in 100 ml of normal cow's milk and give.
Step 4:	Once feed has been given, check blood glucose again after one hour. If blood glucose is >45 mg/dl, 2 hourly feeding (breast feeding is the best option but if not available, formula feed can be given) should be ensured by explaining to mother/relatives and supervised.
Step 5:	If at any time plasma glucose by glucometer is <20 mg/dl, give immediate intravenous bolus injection of 10% dextrose 2 ml/kg body weight of baby. This should be followed by intravenous infusion of 10% dextrose at a rate of 100 ml/kg/day. Blood glucose should be checked 30 minutes after starting the infusion. If it is still less than 20 mg/dl, infant should be referred to higher centre where paediatrician is available.

Signs of danger: Refer to higher centre

If any of the following sign/reports are observed, infant should be referred to higher centre with 10% dextrose IV infusion drip (100 ml/kg/day)

- Two values of plasma glucose <20 mg/dL in spite of starting 10% dextrose IV infusion

- Occurrence of seizures
- Baby is not able to suck at repeated attempts and blood glucose is <20 mg/dl
- Failure to maintain IV line and blood glucose is <20 mg/dl

Procedure for capillary blood glucose testing

A blood sample obtained from a heel puncture is useful and simple way of collecting blood sample from newborns and is recommended for blood glucose testing.The procedure is not without risk and might cause increased pain in newborns, local trauma, damage to nerves, blood vessels and bones, excessive blood loss and infection. So, It should be performed by a trained health care personnel, preferably by a paediatrician.

Preparation:
Gather the following equipments:

- Gloves
- Cotton wool
- Capillary tube/and or blood bottle
- Clean tray to hold equipments
- Sharps disposal box

Procedure:

- Wash hands and wear gloves
- Select the heel site for puncture
- The back of the heel should be avoided
- The site chosen for the sampling should be free from previous injury
- Ensure baby is lying in a safe and secure place

- Hold the baby's heel
- Hold the ankle with index and middle finger
- Use other fingers to steady the baby's leg
- Partly encircle the baby's heel with thumb
- Clean the proposed puncture site with disinfectant
- Allow the area to dry
- Gently compress the heel and hold the skin under tension
- Puncture the skin in a steady manner
- Relax the tension and wipe away the initial blood flow with cotton
- Whilst maintain the grip hold the heel so that blood is allowed to come out
- Gently but firmly press the baby's heel to form a large droplet of blood
- Do not squeeze
- Hold the capillary tube or blood bottle to the blood droplet and touch
- Momentarily release the pressure to collect subsequent blood then reapply pressure allowing the blood to flow
- Continue until sufficient blood has been obtained
- Once the sample has been obtained apply pressure to the site with gauze, maintain the pressure until bleeding has stopped
- Use the hypoallergenic tape
- Baby should be kept comfortable and handed to mother
- Equipments should be disposed

- The staff doing the puncture should wash hands after the procedure
- The sample should be sent for analysis as soon as possible.

3.10 Post-delivery follow up of PW with GDM

- Immediate postpartum care women with GDM is not different from women without GDM but these women are at high risk to develop Type 2 Diabetes mellitus in future.
- Maternal glucose levels usually return to normal after delivery. Nevertheless, a FPG & 2 hr PPPG is performed on the 3rd day of delivery at the place of delivery. For this reason, GDM cases are not discharged after 48 hours unlike other normal PNC cases.
- Subsequently, ANM to perform 75 g GTT at 6 weeks postpartum to evaluate glycemic status of woman. Cut offs for normal blood glucose values are:
  - Fasting plasma glucose: ≥ 126 mg/dl
  - 75 g OGTT 2 hour plasma glucose
    - Normal: < 140 mg/dl
    - IGT: 140-199mg/dl
    - Diabetes: ≥ 200 mg/dl

- Test normal: Woman is counselled about lifestyle modifications, weight monitoring & exercise.
- Test positive: Woman advised to consult a physician.
- PW with GDM and their offsprings are at increased risk of developing Type II Diabetes mellitus in later life. They should be counselled for healthy lifestyle and behaviour, particularly role of diet & exercise.
- GDM should be a part of NCD programme.

3.11 Pre-conception care & counselling

- Woman with h/o GDM to be counselled about BMI & Plasma glucose estimation before next pregnancy
- Desired Plasma glucose levels:
  - FPG - <100 mg/dl
  - 2 hr PPPG - <140 mg/dl
- Appropriate antihypertensive to be started if needed
- Counselled to consult Gynaecologist as soon as she misses her period

Counselling tips:

- Gestational diabetes mellitus (GDM) can be easily controlled by diet (MNT) and exercise
- Only in few women in whom blood glucose is not controlled by diet, insulin injections are required
- Insulin injections are required only during pregnancy. Insulin will be stopped in most of the cases after pregnancy.
- GDM can not be treated with oral tablets as they may harm the fetus.
- If you are injecting insulin over abdomen, it can not reach your baby in any condition. Injecting insulin over abdomen is 100% safe.
- Modification of diet is very easy and will not cost more. Sweets should be avoided at all times during pregnancy
- If blood glucose is controlled, you and your baby both are safe and healthy
- If blood glucose is not properly monitored, it may harm to both you and baby
- If you are taking insulin, always keep glucose, sugar with you.
- Pregnant women with GDM should deliver at health facilities. It will help in management of any complications which can be countered during delivery.

4. Operational aspects of GDM Programme

4.1 Role of Health personnel at different levels of Health Facility

Village

- ASHA: To mobilise & counsel PW for timely testing & follow up

VHND

- ANM: Testing/MNT/Referral of cases needing medical management

Level I: Sub-centre

- ANM: Testing/MNT/Referral of cases needing medical management
- Maintaining records, monitoring & follow up

Level II: PHC/corresponding Urban centre

- MO/SN/ANM/LT: To undertake activities as per their training & defined jobs
- Counselling & Testing/MNT/Delivery of uncomplicated & controlled GDM cases/referral of uncontrolled & complicated GDM cases to higher centre
- GDM controlled on MNT can be delivered by ANM/SN
- Medical management with Insulin & delivery of GDM controlled on Insulin therapy should be undertaken by MOs
- GDM not controlled on Insulin therapy/GDM with complications should be referred to higher facility for care by a specialist.
- Maintaining records, monitoring & follow up

Level III

A) DH & All CEmOC centres
- ❖ All jobs as defined under Level II

+
- ❖ Specialist/Gynaecologist/MO: Management of all types of GDM cases

B) MC & other Super-speciality centres
- ❖ Comprehensive management of GDM including all referral cases

Community linkages

- ASHA & ANM are the key persons connecting PW in community with health facilities and therefore they have an important role in detection & follow up of GDM cases.
- Testing for GDM for all PW should be integral part of existing Antenatal care.
- GDM cases should be followed during ANC as per the advice of the treating doctor & in the post natal period as defined under follow up protocol.
- In case of any complication or for delivery of PW with GDM, referral facility under JSSK should be made available.
- ANM & outreach workers from sub centre/PHC should periodically visit all those mothers on treatment for GDM in their area & ensure that PW with GDM follow the advice of MNT and medical management.
- MO at PHC should make sure that periodic visits by the GDM mothers are done as per schedule and there are no drop outs.
- In case GDM mothers are moving out of the area, a detailed report should be given to her regarding the management plan for continuing care wherever she goes.
- She should be tracked through MCTS & the concerned District Programme Manager should be informed by the treating doctor/designated officer about her migration along with duly filled in Migration form.

4.2 Capacity building of Health personnel under GDM programme

Activity / Health personnel	General orientation about Programme including awareness & IEC	Counselling & Motivation	Knowledge & Skills for Testing GDM	MNT	Medical Management (Insulin therapy)	Special obstetric care (antenatal/ intrapartum/ postpartum)	Maintaining records & Follow up
ASHA	√	√		√			√
ANM/SN/ LHV/LT/	√	√	√	√			√
MO	√	√	√	√	√	√	√
Ob/Gyn & Specialist	√	√	√	√	√	√	√
State/ District Programme Managers & Facility in-charges	√						√

4.3 Training

Training needs for different cadres

Cadre of health workers	Type of training	Content of training
ASHA	◆ General orientation about Programme including awareness & IEC ◆ Maintaining records & follow up	◆ 1st day orientation on GDM, disease burden, consequences on pregnant women and neonates ◆ Importance of healthy lifestyle including diet in preventing diabetes ◆ Do's and Don'ts for GDM ◆ Recognition of Hypoglycemia ◆ IEC materials on awareness ◆ Maintenance of records and different reporting formats

ANM/SN/LHV/LT/MO/ ObGyn/Programme Manager	◆ All of the above + ◆ Counselling & Motivation ◆ Knowledge & Skills for Testing GDM ◆ MNT	◆ 2nd day orientation on ◆ Methodology of counselling ◆ Awareness & Counselling tips ◆ How to measure blood glucose using a glucometer ◆ How to calibrate glucometer ◆ Diagnosis of GDM based on Blood glucose values ◆ MNT: Calculation of caloric requirement & planning a diet accordingly ◆ Diet charts with locally available foods ◆ How to administer Insulin injection: Site & route of insulin injection ◆ Post-partum testing of glycemic status of mother with GDM
MO & Ob/Gyn	◆ All of the above + ◆ Medical Management (Insulin therapy ◆ Special obstetric care (antenatal/ intrapartum/ postpartum)	◆ 3rd day orientation on ◆ Medical management: When & how to initiate Insulin therapy, titration of dose of Insulin ◆ Recognition & management of Hypoglycemia ◆ Special obstetric care: Antepartum, Intrapartum & postpartum ◆ Management of Neonate ◆ Identification of cases requiring referral and referral protocols

Structure of Training for GDM Programme

- A 3 days training will be organised for GDM programme in every District
- 1st Day: All participants (Programme managers/ANM/SN/LHV/LT/ MO/ObGyn) will attend
- 2nd Day: Only ANM/SN/LHV/LT/MO/ObGyn will attend

- 3rd Day: Only MO/ObGyn will attend
- ASHA: Will have separate batch & 1 day training will be incorporated either in their existing module or separate orientation at block level can be organised.

Batch size

- All delivery points in a District will be mapped
- Health personnel of all delivery points need to be oriented/trained on rotation basis
- One batch can have 40-60 trainees from all cadres
- After the 1st day of training, the number of participants will keep reducing
- One Batch of Trainees will consist of
  - Programme managers: 3-5
  - ANM/SN/LHV: 20-25
  - LT: 5-10
  - MO/ObGyn: 10-15
- Once delivery points are saturated, other health personnel involved in antenatal care will be oriented
- District Training In charge will accordingly prepare Training plan & calendar

Training sites

Prerequisites:

- Seminar/Conference Room with capacity of 50-60 participants
- AV aids & other Training aids
- Facility conducting about 500 deliveries per month

- At least 2 in-house Ob/Gyn & 1 Physician/Endocrinologist
- Availability of in house 1 Paediatrician, 1 counsellor & 1 dietician is preferred
- Facility conducting comprehensive management of GDM including both controlled & uncontrolled cases
- Any Medical College/District Hospital having above prerequisites can be chosen as a Training site

Trainer

- Ob/Gyn, Physician/Endocrinologist, Paediatrician, Counsellor, Dietician to be included as Trainers as per their availability & area of expertise
- 1 day TOT should be organised for 20-25 Trainers at Medical College level

Training material

- GoI guidelines on GDM
- Any other teaching or training material synchronised with GoI guidelines

Training aids

- Job aids/Posters/Handouts
- Presentations
- Video
- Hands on workshop

5. Records & Registers

- GDM reporting should be synchronised with MCTS/RCH portal for reporting purpose
- Health personnel at various levels should keep/maintain records as defined under the programme for various levels as indicated below:
  - Monthly GDM Reporting format for State & District Programme managers (Annexure 4)
  - Monthly GDM Reporting Format for Health Facility (Annexure 5)
  - Migration form for PW with GDM (Annexure 6)
  - Referral slip (Annexure 7)
- Use of SMS and mobile phones may be promoted for collection of information/data regarding GDM.

6. Monitoring and Quality Assurance

State & district Programme Managers to ensure

- Constant supply of Insulin & its proper storage and distribution
- Supply, maintenance & calibration of glucometers and glucometer strips
- Accreditation of training sites and timely completion of training
- Periodic evaluation of technical skills of ANM/SN/LHV
- Any maternal death if attributed to GDM should be specially mentioned in Maternal Death Review (MDR reporting)
- Include GDM in State IEC plans
- GDM testing & care to be linked to the existing NCD programme
- Reflecting adequate budget in PIP & ensuring timely release of funds
- Monitoring the outcome & progress

7. Outcome measures to be assessed

- Number/Percentage of PW who tested positive for GDM out of total ANC
- Number/Percentage of PW diagnosed as GDM in 1st trimester out of total ANC
- Number/Percentage of GDM women requiring Insulin out of total diagnosed as GDM
- Number/Percentage of GDM women requiring referral for further management out of total diagnosed as GDM

8. Key points

- Universal testing of all PW for GDM
- Testing recommended twice in pregnancy at 1st antenatal visit and then at 24-28 weeks of gestation.
- Single step 75 g 2 hr PPPG test performed.
- PW testing positive (2 hr PPPG > 140mg/dl) should be started on MNT for 2 weeks
- If 2 hr PPPG ≥ 120 mg/dL after MNT, medical management (Insulin therapy) of PW to be started as per guidelines.
- PW to be monitored by 2 hr PPPG throughout pregnancy as per guidelines.
- Antenatal visits 2 weekly in 2nd trimester & weekly in third trimester
- PW with GDM on Insulin therapy with uncontrolled Blood glucose levels (2 hr PPPG ≥120 mg/dl) or insulin requirement >20 U/day should be referred for delivery at CEmOC centres
- GDM pregnancies are associated with delay in lung maturity of the fetus; so routine delivery prior to 39 weeks is not recommended.

- Early delivery with administration of prophylactic corticosteroid therapy for fetal lung maturity to be planned only if uncontrolled plasma glucose or any other obstetric indication
- Vaginal delivery preferred, LSCS for only obstetric indications or fetal macrosomia.
- Neonatal monitoring for hypoglycaemia and other complications
- Postpartum evaluation of glycemic status by a 75 g OGTT at 6 weeks after delivery.

9. Budget

- Infrastructure: Not required
- Human resource: No separate human resource required
- Equipments/Instruments:
  i. Plasma calibrated Glucometers
  ii. Glucometer strips
  iii. Insulin syringe: 40 IU
- Drugs:
  i. Insulin: pre-mixed 30:70 & regular
- Stationery:
  i. Monthly GDM Reporting format for State & District Programme managers (Annexure 4)
  ii. Monthly GDM Reporting Format for Health Facility (Annexure 5)
  iii. Migration form for PW with GDM (Annexure 6)
  iv. Referral slip (Annexure 7)

Case Load for GDM program:

a. Nearly 14% of ANC screened pregnant women may be tested positive for GDM.
b. Around 3% of these women may need insulin therapy.

Budget estimates and provision for following needs to be done by the state/district programme officer:

1 **(a) Insulin:** Human Premix insulin 30/70

(b) Insulin syringe

i. On an average one woman may need 5 units of insulin per day and initial estimation for 180 days needs to be done.

ii. Thus one woman will need average 900 units of insulin during her treatment of 180 days, this amount to an average 9 vials of insulin per woman.

iii. One syringe can be used for 10 days.Thus each woman will need 18 insulin syringes during her treatment of 180 days.

2 **(a) Glucometer**

i. Availability of glucometer is to be ensured at all such centres where GDM is being implemented

ii. Before procuring new equipment, availability of existing glucometer through regular programme or under NCD needs to be accounted for.

iii. No separate budget for sub centre may be required since untied funds can be utilised for this

iv. Even at higher facility the untied funds can be utilised since the cost of device is not high

v. MCH L2 level centres should have 2 glucometers. One to be kept in Labour room and another in lab/ANC room for testing blood sugar during ANC.

vi. MCH L3 level centres including Medical Colleges should have 3 glucometers. One to be kept in Labour room, another in lab/ANC room for testing blood sugar during ANC. One standby glucometer is suggested to be kept in the equipment store for use due to any exigency like currently used glucometer becoming non-functional.

vii. Sub health centres (MCH L1) needs to have one Glucometer.

(b) Testing strips for Glucometer

i. It is estimated that each PW will be tested twice during the ANC period for diagnosis of GDM.
ii. The PW on MNT will require Fasting and Post-Prandial Blood sugar estimation every month. Thus each such PW will require 2 strips per month i.e 16 strips for the 6 months of treatment.
iii. The PW on Insulin will require Fasting and Post-Prandial Blood sugar estimation every 15 days. Thus each PW will require 4 strips per month i.e 24 strips for the 6 months of treatment.
iv. Strips can be purchased either from state/regular PIP budget or JSSK diagnostic funds

3. **Glucose pouch**
   i. Ideally state should procure 75 gm glucose pouch
   ii. It is estimated that each PW will be tested twice during the ANC period for diagnosis of GDM.
   iii. The PW on Insulin will require Fasting and Post Prandial Blood sugar estimation every 15 days. Thus each PW will require 4 glucose pouch per month, i.e. 24 glucose pouch for the 6 months of treatment.

4. **Training:**
   i. A 3 days training will be organised for GDM programme in every District
   ii. 1st Day: All participants (Programme managers/ANM/SN/LHV/LT/MO/ObGyn) will attend
   iii. 2nd Day: Only ANM/SN/LHV/LT/MO/ObGyn will attend
   iv. 3rd Day: Only MO/ObGyn will attend

Budget for 3 days training of District level officers for GDM, Batch size of 50

Sr. No	Head	Unit Cost	Number of Participants	Days	Total
1	DA to district level Programme officers	Rs. 700/day	10	1	Rs. 7,000/-
2	DA to Staff Nurses/ANM/LHV	Rs. 400/day	25	2	Rs. 20,000/-
3	DA to Medical Officers/ObGy	Rs. 700/day	15	3	Rs. 31,500/-
4.	Lunch &Tea Day 1	Rs. 200/day	50	1	Rs.10,000/-
5	Lunch &Tea Day 2	Rs. 200/day	45	1	Rs. 9,000/-
6	Lunch &Tea Day 3	Rs. 200/day	20	1	Rs. 4,000/-
7	Honorarium to district and Sub-district level guest faculty**	Rs. 600/ (per day)	2	3	Rs. 3,600/-
8	Honorarium to State level faculty	Rs. 1000/day	2	3	Rs. 6,000/-
9	Accommodation for State level faculty (as per actual, if Govt. accommodation not available, receipts to be produced)	Rs. 2000/day	2	3	Rs. 12,000/-
10	Logistic expenses like study material, course material, photocopying, job aids, flip chart, Audio Visuals etc. (Rate x number of participants)	200	50	-	Rs. 10,000/-
	Sub Total				Rs. 1,13,100/-
11	Incidental overhead (10% of sub-total)				Rs. 11,310/-
	Total for One batch				Rs. 124,410/-

Note: ***TA to be given as per state Norms.

*The state need to adjust the training norms as per the training load of the district and state.

Note:

Every district programme officer needs to undertake advanced planning and budget estimates for universal screening of GDM in the district

State programme officer needs to reflect the budgetary requirement either in the state/NHM PIP

Necessary equipments/supplies either cash or in kind needs to be made available in advance to all the health facilities in the district.

Similarly training institutes also needs to be provided the training budget as per the estimates in advance

Any procurement should be done through competitive and transparent bidding.

Certification of manufacturer for meeting the requirement of specifications and variations, if any by comparing the results from a regularly calibrated auto analyser for precision and accuracy needs to be clearly mentioned for glucometer supplied

Process of calibration and standardisation of glucometer also needs to be mentioned in manufacturer certificate

Wherever applicable AMC should be in built against all major procurements

Annexures

10. Annexures

Annexure 1: BMI Chart (Ideal height weight chart)

Body Mass Index (BMI) Chart for Adults

Obese (>30) | Overweight (25-30) | Normal (18.5-25) | Underweight (<18.5)

HEIGHT in feet/inches and centimeters

WEIGHT		4'8"	4'9"	4'10"	4'11"	5'0"	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'0"	6'1"	6'2"	6'3"	6'4"	6'5"
lbs	(kg)	142cm		147	150	152	155	157	160	163	165	168	170	173	175	178	180	183	185	188	191	193	196
260	**(117.9)**	**58**	**56**	**54**	**53**	**51**	**49**	**48**	**46**	**45**	**43**	**42**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**32**	**31**
255	(115.7)	57	55	53	51	50	48	47	45	44	42	41	40	39	38	37	36	35	34	33	32	31	30
250	**(113.4)**	**56**	**54**	**52**	**50**	**49**	**47**	**46**	**44**	**43**	**42**	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**30**
245	(111.1)	55	53	51	49	48	46	45	43	42	41	40	38	37	36	35	34	33	32	31	31	30	29
240	**(108.9)**	**54**	**52**	**50**	**48**	**47**	**45**	**44**	**43**	**41**	**40**	**39**	**38**	**36**	**35**	**34**	**33**	**33**	**32**	**31**	**30**	**29**	**28**
235	(106.6)	53	51	49	47	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30	29	29	28
230	**(104.3)**	**52**	**50**	**48**	**46**	**45**	**43**	**42**	**41**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**30**	**29**	**28**	**27**
225	(102.1)	50	49	47	45	44	43	41	40	39	37	36	35	34	33	32	31	31	30	29	28	27	27
220	**(99.8)**	**49**	**48**	**46**	**44**	**43**	**42**	**40**	**39**	**38**	**37**	**36**	**34**	**33**	**32**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**
215	(97.5)	48	47	45	43	42	41	39	38	37	36	35	34	33	32	31	30	29	28	28	27	26	25
210	**(95.3)**	**47**	**45**	**44**	**42**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**28**	**27**	**26**	**26**	**25**
205	(93.0)	46	44	43	41	40	39	37	36	35	34	33	32	31	30	29	29	28	27	26	26	25	24
200	**(90.7)**	**45**	**43**	**42**	**40**	**39**	**38**	**37**	**35**	**34**	**33**	**32**	**31**	**30**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**24**
195	(88.5)	44	42	41	39	38	37	36	35	33	32	31	31	30	29	28	27	26	26	25	24	24	23
190	**(86.2)**	**43**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**24**	**23**	**23**
185	(83.9)	41	40	39	37	36	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	23	22
180	**(81.6)**	**40**	**39**	**38**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**
175	(79.4)	39	38	37	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21
170	**(77.1)**	**38**	**37**	**36**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**	**21**	**20**
165	(74.8)	37	36	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20	20
160	**(72.6)**	**36**	**35**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**	**21**	**20**	**19**	**19**
155	(70.3)	35	34	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	20	20	19	19	18
150	**(68.0)**	**34**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**23**	**23**	**22**	**22**	**21**	**20**	**20**	**19**	**19**	**18**	**18**
145	(65.8)	33	31	30	29	28	27	27	26	25	24	23	23	22	21	21	20	20	19	19	18	18	17
140	**(63.5)**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**23**	**23**	**22**	**21**	**21**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**17**
135	(61.2)	30	29	28	27	26	26	25	24	23	22	22	21	21	20	19	19	18	18	17	17	16	16
130	**(59.0)**	**29**	**28**	**27**	**26**	**25**	**25**	**24**	**23**	**22**	**22**	**21**	**20**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**
125	(56.7)	28	27	26	25	24	24	23	22	21	21	20	20	19	18	18	17	17	16	16	16	15	15
120	**(54.4)**	**27**	**26**	**25**	**24**	**23**	**23**	**22**	**21**	**21**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**15**	**14**
115	(52.2)	26	25	24	23	22	22	21	20	20	19	19	18	17	17	16	16	16	15	15	14	14	14
110	**(49.9)**	**25**	**24**	**23**	**22**	**21**	**21**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**13**	**13**
105	(47.6)	24	23	22	21	21	20	19	19	18	17	17	16	16	16	15	15	14	14	13	13	13	12
100	**(45.4)**	**22**	**22**	**21**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**14**	**13**	**13**	**12**	**12**	**12**
95	(43.1)	21	21	20	19	19	18	17	17	16	16	15	15	14	14	14	13	13	13	12	12	12	11
90	**(40.8)**	**20**	**19**	**19**	**18**	**18**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**13**	**13**	**13**	**12**	**12**	**12**	**11**	**11**	**11**
85	(38.6)	19	18	18	17	17	16	16	15	15	14	14	13	13	13	12	12	12	11	11	11	10	10
80	**(36.3)**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**13**	**13**	**13**	**12**	**12**	**11**	**11**	**11**	**11**	**10**	**10**	**10**	**9**

Note: BMI values rounded to the nearest whole number. BMI categories based on CDC (Centers for Disease Control and Prevention) criteria.

www.vertex42.com BMI = Weight[kg] / (Height[m] x Height[m]) = 703 x Weight[lb] / (Height[in] x Height[in]) © 2009 Vertex42 LLC

Annexure 2: MNT & Sample diet chart

The meal plan composition:

- The recommended composition of the GDM mother diet is~50%-60% calories from carbohydrate, 10-20% from protein, 25-30% from fat.

- The distribution of calories, particularly carbohydrate, makes a difference in the postprandial blood sugars. The total intake of carbohydrate should be controlled and monitored and carbohydrate foods with a lower glycemic index should be emphasised.

Important tips for planning meals for GDM mother

- A mother should follow discipline regarding meal timings. Eating heavy at one meal or skipping any meal or fasting for long hours should be avoided. She should include all food groups in her daily diet i.e cereal, pulses, milk and milk products, fruits, vegetable, and fats. For non- vegetarian mothers eggs, low fat meat like well- cooked fish or chicken can be included. Meal plan should be divided in to 3 major meals (breakfast, lunch and dinner) and 2-3 mid-day snack.

Breakfast

- A pregnant woman should start her day with a healthy breakfast. She should never skip her breakfast. Breakfast should consist of 1-2 carbohydrate servings (like chapati/dalia/sandwich/poha/idli etc) as mentioned in exchange list along with one serving from protein rich foods (like milk/curd/paneer/egg etc.)

Lunch/dinner

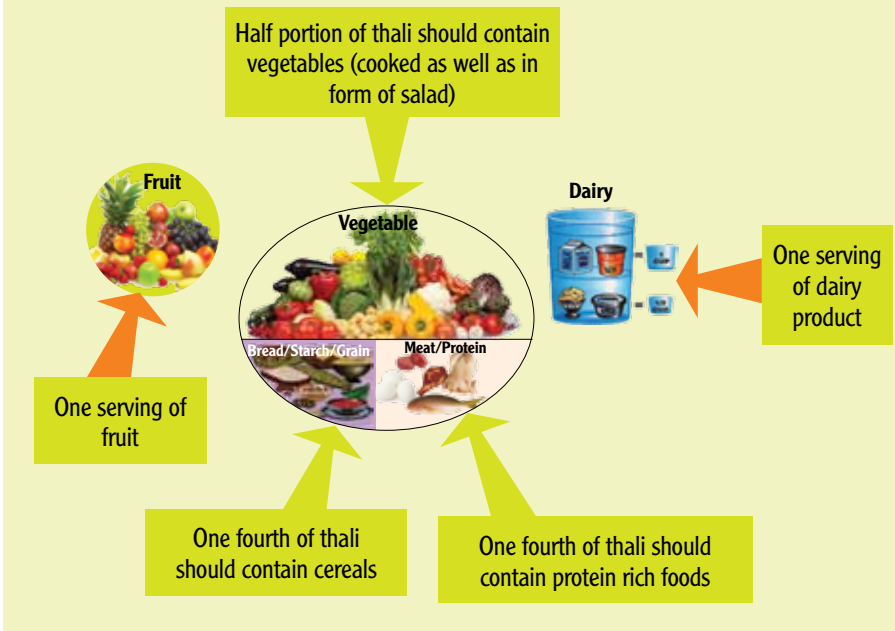
- In lunch and dinner the thali/plate can be divided in two halves

- Fill the first ½ with vegetables like bottle gourd, ridge gourd, lettuce, broccoli, spinach, carrots, green beans, tomatoes, celery, cabbage,

mushrooms etc. as vegetable provide fibre which helps in controlling post prandial glucose level.

- The remaining half should be divided into two equal ¼th parts.
- The ¼ portion of the plate can be filled with protein rich food like dal, soy nuggets, tofu, eggs, paneer, chicken, fish etc
- The remaining ¼ can be filled with chapati, brown rice, bread, cereals etc.
- Mother should have at least 1 serving of low fat, sugar-free yoghurt, curd or milk.
- It is also important for a mother to have at least 1 serving of fruits like guava, apple, berries or any citrus fruits.

Composition of lunch and dinner thali



- Carbohydrate serving in lunch and dinner should be between 2 to 3. Taking heavy meals should be avoided.
- Skipping lunch and dinner and taking meal at irregular time should be avoided.

Mid day snack

- Along with major meals a pregnant woman should consume at least 2-3 healthy mid-day snacks.
- One to two carbohydrate serving can be taken in mid-day snack.
- A mother should maintain 2-3 hour gap with major meal when taking mid-day snack.
- Eating fried foods or junk foods or food with high amount of free sugars should be avoided.
- Some options for snack could be murmura chat, sprouts, vegetable dalia, vegetable poha, idli, vegetable uttapam, besan chilla with low amount of oil etc.

General tips

- Fried foods should be avoided rather mother should steam, boil or sauté food in a non-stick pan.
- Whole fruits should be preferred over juices
- Prefer fish or chicken over red or organ meat.
- Fiber should be increased in the diet by including salad, beans, non-starchy vegetables, whole fruit, whole grain cereals, whole pulses.
- A mother should drink water, buttermilk, soups, soy milk and other unsweetened healthy beverages instead of soda or fruit juices.

Sample Meal plan

Sample meal pattern for pregnant woman are planned using cup measures.
1 cup measure and equivalents are as follows

1cup= 240 ml (8 oz or 227 gm) = 16 table spoon=48 tea spoon

½ cup= 120 ml (4oz or 113 gm) =8 table spoon=24 tea spoon

1/3 cup= 80 ml (2.6 oz. or 76 gm) =5 table spoon= 16 tea spoon

¼ cup=60 ml (2 oz. or 57 gm) = 4 table spoon= 12 tea spoon

1 table spoon = 3 tea spoon

1 tea spoon = 5ml

1800 Calories sample meal plan for GDM

Meal	Menu	Amount	Number of carbohydrate serves as per exchange list
Breakfast (7-8 am)	Dalia/Porridge/Oats Milk	½ cup 1 cup	2 Other varieties can be included in meal plan as per the exchange list
Mid- Morning (10-10.30 am)	Mung bean sprouts (ankurit mung)/Roasted Mung	½ cup	1
Lunch (1-1.30 pm)	Chapati Or chapati + Rice	2 1+1/3 cup	2-3
	Vegetables	1 cup	
	Yogurt/Curd	¾ cup	
	Soya nugget (soya badi) curry/Dal	½ cup	
Evening (4.30-5 pm)	Seasonal fruit (medium size)	1	1-2
	Murmura chat with vegetables/idli with sambhar	1 ½ cup/1	
Dinner (8-8.30 pm)	Chapati Or chapati + Rice	2 1+ 1/3 cup	2-3
	Vegetable	1 cup	
	Dal Or Fish (curry/grilled/steamed)	½ cup ½ cup	
Bed time (10-10.30 pm)	Milk	1 cup	1
	Brown bread	1	
Total fat/d		4 tsp/d	

* Meal plan containing 1800 k.cal approximately provides 70 gm protein, 60 gm fat and 247 gm carbohydrate

2000 Calories sample meal plan for GDM

Meal	Menu	Amount	Number of carbohydrate serves as per exchange list
Breakfast (7-8 am)	Whole grain Bread (Brown Bread) Egg bhurji/egg omelet	2 1	2
Mid- Morning (10-10.30 am)	Vegetable Dalia	½ cup	1
Lunch (1-1.30 pm)	Chapati Or chapati + Rice	3 2+1/3 cup	3-4
	Vegetables	1 cup	
	Yogurt/Curd	¾ cup	
	Soya nugget curry/Dal Or Chicken/fish curry	½ cup 1 cup	
Evening (4.30-5 pm)	Seasonal fruit (medium size)	1	1-2
	Vegetable Poha/vegetable upma	½ cup	
Dinner (8-8.30 pm)	Chapati Or chapati + Rice	2 1+ 1/3 cup	2-3
	Vegetable	1 cup	
	Dal	½ cup	
Bed time (10-10.30 pm)	Milk	1 cup	1
	Chapati	1	
Total fat/d		5 tsp/d	

* Meal plan containing 2000 k.cal approximately provides 80 gm protein, 65 gm fat and 270 gm carbohydrate

2200 Calories sample meal plan for GDM

Meal	Menu	Amount	Number of carbohydrate serves as per exchange list
Breakfast (7-8 am)	Veg uttapam/Besan chilla with green chutney Veg Raita	2 1 cup	2
Mid- Morning (10-10.30 am)	Vegetable sandwich (whole grain bread)	½	1
Lunch (1-1.30 pm)	Chapati Or chapati + Rice	3 2+1/3 cup	3-4
	Vegetables	1 cup	
	Yogurt/Curd	¾ cup	
	Soya nugget curry/Dal Or Chicken curry	½ cup 1 cup	
Evening (4.30-5 pm)	Seasonal fruit (medium size)	1	1-2
	Thepla	2	
Dinner (8-8.30 pm)	Chapati or Or chapati + Rice	3 2+ 1/3 cup	3-4
	Vegetable	1 cup	
	Dal Or Fish (curry/grilled/steamed)	½ cup ½ cup	
Bed time (10-10.30 pm)	Milk	1 cup	1
	Whole grain biscuits (sugar free)	3	
Total fat/d		6tsp/d	

*Meal plan containing 2200 k.cal approximately provides 85 gm protein,70 gm fat and 300 gm carbohydrate

2400 Calories sample meal plan for GDM

Meal	Menu	Amount	Number of carbohydrate serves as per exchange list
Breakfast (7-8 am)	Vegetable stuffed chapati (sabjiyo bhari roti) Curd/ Raita	3 1 cup	3
Mid- Morning (10-10.30 am)	Vegetable poha	½ cup	1
Lunch (1-1.30 pm)	Chapati Or chapati + Rice	3 2+1/3 cup	3-4
	Vegetables	1 cup	
	Yogurt/Curd	¾ cup	
	Soya nugget curry/Dal Or Chicken curry	½ cup 1 cup	
Evening (4.30-5 pm)	Seasonal fruit (medium size)	1	2
	Idli With green chutney	2 As desired	
Dinner (8-8.30 pm)	Chapati or chapati + Rice	3 2+ 1/3 cup	3-4
	Vegetable	1 cup	
	Dal Or Fish (curry/grilled/ steamed)	½ cup ½ cup	
Bed time (10-10.30 pm)	Milk	1 cup	1
		1	
Total fat/d		7tsp/d	

*Meal plan containing 2400 k.cal approximately provides 90 gm protein,75 gm fat and 330 gm carbohydrate

**Any food item in above mentioned meals can be substituted with other food item as per the amount mentioned in the exchange list

Annexure 3: Food exchange list

Food Exchange list

Carbohydrate food exchange list is a comprehensive guide to make you understand amount of particular food to be taken in place of other food without affecting the total amount of carbohydrate.

For example – if you are taking one cup of rice (cooked) and want to change with idli, as per list, one third cup of white rice will be equal to one three inch round idli or 1 chapati.

Food Groups	Food	Portion
Carbohydrate Exchange Serving Choose any serving of the food mentioned here,each serving will provide – 80 calories 3 gm protein 0-1 gm fat	Bread	1 slice (1oz)
	Idli plain	3" round
	Naan	¼ of 8"x2"
	Plain dosa	1
	Rice white or brown, cooked	1/3 cup
	Roti (bajra, corn, juwar)	½ (6")
	Murmura (puffed rice)	1 ½ cup
	Millet, cooked	1/3 cup
	Museli	¼ cup
	Oats, cooked	½ cup
	Pasta, cooked	½ cup
	Puffed cereal	1 ½ cup
	Pop-corn (no fat)	3 cups
	Biscuit (2 ½" across)	1
	Chowmein noodles	½ cup
	Muffin, small	1 (1 ½ oz)
	Popcorn, microwave	3 cups
	Dhokla	1 "square
	Poha	1 cup
	Starchy vegetables:	
	Potato , baked or boiled	½ cup
	Potato mashed	½ cup
	Yam, sweet potato, plain	1 small
		½ cup
		½ cup

Fruit Exchange Serving Choose any serving of the fruits mentioned here, each serving will provide – 60 calories 15 grams carbohydrate	Apple, small, unpeeled	1 (4 oz)
	Apricots, fresh	4 whole
	Blueberries	¾ cup
	Dates	3
	Grapes , small	17 (3 oz)
	Guava, medium	1 ½
	Mango, small	½ cup
	Orange, small	1
	Papaya cubes	1 cup
	Peaches, medium, fresh	1 (6 oz)
	Pear, large, fresh	½
	Pineapple, fresh	¾ cup
	Plums, small	2
	Sapota, (chikoo)	1 med
	Seetaphal	1 med
	Strawberries whole	1 ¼ cup
	Watermelon, 1 slice	1 ¼ cup
	Grapes, small	17 (3oz)
	Guava, medium	1 ½
	Mango, small	½
	Orange small	1
	Papaya, cubes	1 cup
	Kiwi, medium	1

Vegetable Exchange Serving 1 serving = ½ cup cooked (100 gms) or 1 cup raw vegetables . Choose any serving of the food mentioned here, each serving will provide- 25 calories 5 gms carbohydrate 2 gms protein 0 gm fat	Beans (green, wax, italian) Bean sprouts (moong) Beets (chakunder) Bottle gourd (lauki) Broad beans (papdi) Broccoli Brussels sprouts Cabbage Carrots Cauliflower Cluster beans (guvar) Cucumber Drumsticks (surgavo) Eggplant (brinjal) Fenugreek leaves Green onion Green papaya Onion Parwal Radish Ridge gourd (torai or turia) Salad greens Spinach (palak) Tomatoes fresh Zucchini	
Milk Exchange Serving Choose any serving of the food mentioned here, each serving will provide – 25 calories 12 gms carbohydrate 8 gms protein	**Skim and very low fat milk (1-3gm fat)** Skimmed milk Non fat buttermilk Plain non fat yogurt Paneer, 1% milk Masala tea , with 1% milk **Whole milk (8 gm fat)** Whole milk Goat's milk Lassi, regular	 1 cup 1 cup ¾ cup 1 cup 1 cup 1 cup 1 cup 1 cup 1 cup

Annexure 4: Monthly GDM Reporting format for State & District Programme managers

Monthly GDM Reporting format for State & District Programme managers for month of ……, year……

Name of State: Name of District:

Estimated no of Pregnant Women:

Estimated no of deliveries:

Total no of ANC conducted (including all 4 ANC visits) in reporting month:

No of new GDM cases diagnosed in the reporting month:

No of GDM cases diagnosed in 1st trimester in reporting month:

No of new GDM cases on treatment in the reporting month:

No of new GDM cases started on Insulin therapy in the reporting month:

Cumulative no of GDM cases on Insulin therapy in the reporting month:

Supplies (Insulin & Glucometer) available in all districts-Yes/No

If No, identify district & reflect requirement in PIP

Note:

Districts will report to their States

Information will be compiled at State level for sending information to GoI

Annexure 5: Monthly GDM Reporting Format for Health Facility

Monthly GDM Reporting Format for Health Facility

Name of the Health facility: ..... Month: .....Year:.....

Name of State: Name of District:

Total no of deliveries:

Total no of ANC conducted (including all 4 ANC visits) in reporting month:

No of new GDM cases diagnosed in the reporting month:

No of GDM cases diagnosed in 1st trimester in reporting month:

No of new GDM cases on treatment in the reporting month:

No of new GDM cases started on Insulin therapy in the reporting month:

Cumulative no of GDM cases on Insulin therapy in the reporting month:

No of GDM cases referred for management to higher facility:

Whether adequate supplies (Insulin & Glucometer) were available throughout the month at reporting facility-Yes/No

If No, indicate requirement:

Note:

Facility will send report to the District

Information will be compiled at District level for sending information to State

Annexure 6: Migration form

Migration form for PW with GDM

Name:

Husband's/Father's Name:

Present Address:

Health Facility attended:

Migration Address:

Address of Health Facility to be attended:

Diagnosis of GDM: Date Period of gestation: weeks

Treatment given:

Information about migration given to:

Name:

Designation:

Mobile no/Telephone no:

Place of work:

Signature of Doctor

Annexure 7: Referral Slip

Referral Slip

Name of referring facility:

Address: Telephone:

Name of the patient_____

Father's/Husband's Name: _____ Contact no_____

Address: _____

Referred on ____/____/____ (d/m/yr) at _____Time _____

_____ (Name of the facility) for management.

Provisional Diagnosis:

Admitted in the referring facility on ___/___/___ (d/m/yr) at _____ (time) with chief

Complaints of: _____

Summary of management:

Blood group: Hb:

Value of last Blood sugar measure

Other investigations

Procedures and critical interventions carried out

Treatment given

Dose of insulin..... Duration

Condition at time of referral:

Consciousness: Temp: Pulse: BP:

Reason for referral:

Mode of transport for referral: Govt./PPP/Vehicle arranged by patient/any other:

Telephonic information on referral provided to the institution referred to:

Name of the person spoken to_____

Signature of referring physician/Health functionary

(Name/Designation/Stamp):

Annexure 8: Glucometer Specification

Glucometer specification

Construction - Hand-held

Blood volume – should be <1µL

Sample of blood used - Fresh whole blood

Measuring time – should be less than <10 seconds

Reported result range 20–600 mg/dL

Unit of measure - mg/dL

Haematocrit - 30–55%

Assay method - Glucose oxidase biosensor

Should be able to work at high altitude up to 10,000 feet

Test strip storage conditions - 2°C to 35°C

Meter storage temperature range -25°C to 70ºC

System operating conditions - 5°C to 45ºC

Relative humidity operating range - 10% to 90%

Memory capacity of glucometer - 500 blood glucose results with time and date

Automatic power off

Power supply - One replaceable battery

Calibration – should be plasma-equivalent

Calibration – calibration strips/fluid should be provided along with it.

Automatic shutoff 2 minutes after last action

Annexure 9: Glucometer Calibration

What is glucometer calibration?

- Calibration means checking accuracy and correctness of glucometer
- It should be done regularly to check correctness of glucometer

Why we need to do calibration of glucometer?

- Glucometer needs to be calibrated regularly to get accurate results

What will happen if we do not calibrate regularly?

- It may give incorrect reports which may be higher or lower than actual blood glucose report

How frequently glucometer should be calibrated?

- After every 20 measurements of blood glucose
- A new vial of test strips is used
- Whenever the machine is dropped

What to do if glucometer calibration shows out of range result?

- It should not be used for testing
- It should be sent back to manufacturers for calibration corrections

How to do calibration?

- It is carried out by calibration strip or calibration fluid
- It will be demonstrated during training of glucometer

Who will do calibration?

- Calibration is very simple and can be done by the person who is using it

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