# Advertisement / Call for Participation
# Hackathon for Developing a WhatsApp-Based Pregnancy Registration & Maternal Care Platform

*Innovate for Safer Motherhood | Digital Public Health Challenge*

The State Transformation Commission, Government of Uttar Pradesh, invites startups, companies, trusts, developers, public health innovators, students, technology institutions, and social enterprises to participate in a hackathon for designing and developing a WhatsApp-based pregnancy registration and maternal care support platform for Uttar Pradesh.

## Objective

To create an easy-to-use, bilingual (Hindi and English), mobile-first platform integrated with WhatsApp for improving early pregnancy registration, maternal tracking, and service delivery across urban and rural areas in Uttar Pradesh.

## Proposed Key Features

The roadmap detailing the strategy is at www.transformup.in. It is advisable to study this document for better understanding of the requirements.

### Design Principles

| Principle | Implication for system design |
|---|---|
| Single journey, not fragmented episodes | Every woman should have a single longitudinal pregnancy record that persists across facilities and visit types. |
| Actionable risk management | Flagging high-risk status should trigger follow-up, birth planning, referral logic, and accountability. |
| Closed-loop referrals | A referral is complete only when the receiving facility is informed, transport is arranged where needed, the mother reaches, and the outcome is captured. |
| Mother-facing communication | The system should communicate with the woman and family and other involved stakeholders on due ANC, missed visits, birth plan, referral destination, and transport support. |
| Role-based accountability | ASHA, ANM, MO, facility, transport desk, call center, district, and state teams should each have visible responsibilities and pending actions. |

| Principle | Implication for system design |
|---|---|
| Interoperability with ecosystem | The platform should align with existing identifiers and state systems rather than create a disconnected parallel workflow. |

Participants are invited to build solutions that enable:

### 1. Self-Registration of Pregnancy

- Pregnant women can register directly through WhatsApp chatbot
- Aadhaar/mobile-based OTP verification (where applicable)
- Auto-generation of a unique pregnancy ID, it can be through Linking to existing ID instead of creating a new ID

### 2. Assisted Registration

- Registration by ASHA, ANM, Anganwadi Worker, health staff, Panchayat Sahayak, Gram Pradhan, Village Health Nutrition Sanitation Committee members, etc.
- Offline-to-online sync options

### 3. Auto-assignment of stakeholders of that particular area (Geofencing)

### 4. ANC (Antenatal Care) Tracking

- Scheduled ANC visit reminders
- High-risk pregnancy alerts
- TT vaccination tracking
- Hb, BP, weight, and test record updates
- Details of Medicines prescribed and centers visited
- Due ANC alerts are sent to mother/family and frontline worker
- Missed ANC alerts and overdue follow-up queue
- Clinical entry at each visit, including advice and treatment given
- Escalation to ANM/MO where repeated visits are missed or abnormal parameters are recorded

### 5. Flagging of High-Risk Pregnancy

- Once flagged, it should be monitored at all levels.
- HRP logic runs after every relevant update.

### 6. Birth Planning Module

- Expected date of delivery reminders
- Choice of delivery facility
- Transport planning
- Emergency contact preparedness

### 7. AI Predictive Analysis and Nudges to make sure of accountability and escalation history

### 8. Centralized records per patient, which will be uniform across all facilities.

### 9. Citizen Engagement

- Nutrition messages
- Danger sign alerts
- Government scheme information
- Multilingual voice/text interaction

### 10. Dashboard & Analytics

- Real-time district/block/state dashboards with admin panel for monitoring at centralized war room
- High-risk pregnancy mapping
- Due list for field workers
- Service gap alerts

### 11. Integration Readiness

- APIs with HMIS, RCH, ABDM, civil registration systems, etc.

### 12. Mandatory 30-Day HRP Pre-Delivery Alert Rule

For every High-Risk Pregnancy (HRP) case, the system shall trigger a mandatory pre-delivery alert exactly 30 days before the Expected Delivery Date (EDD). This alert must inform all relevant stakeholders, including transport or ambulance services, and require acknowledgement, readiness marking, or escalation where needed.

The 30-day HRP alert must be sent to the following stakeholders:

- Pregnant woman / beneficiary
- Husband or family contact
- ASHA
- ANM
- Mapped CHC or higher referral facility
- Designated doctor / obstetric team
- Ambulance or transport desk, including 102/108 integration where applicable
- District nodal monitoring team for critical HRP cases

### 13. The platform should integrate the distribution of six maternity benefit kits.

It should ensure end-to-end beneficiary tracking, stage-wise delivery status, date of distribution, and beneficiary acknowledgement.

### Closed-loop referral chain

The referral engine should work as a closed-loop system rather than a one-way transfer note. Once a referral is generated, the platform should support hospital intimation, digital case summary sharing, acceptance/acknowledgement, ambulance assignment, mother pickup and drop confirmation, admission status, and referral closure.

| Stage | Required action / system event |
|---|---|
| Referral initiation | Reason for referral, urgency, required level of care, and destination facility recorded. |
| Hospital intimation | Receiving facility notified; referral summary and key clinical details shared. |
| Clinical preparedness | The relevant doctor/unit views records in advance; readiness for labor, OT, blood, or newborn support can be planned. |
| Transport linkage | 102 for planned maternal transport and 108 for emergency referral support can be triggered from within the workflow. |
| Transfer completion | Dispatch, pickup, travel, drop, and reached status are time-stamped. |
| Admission and closure | Receiving facility confirms admission, and the final outcome is recorded in the same mother record. |

## Desired Technical Specifications

- WhatsApp Business API enabled
- AI Chatbot / NLP capability
- Cloud scalable architecture
- Data privacy & consent framework
- Bilingual (Hindi + English)
- Open standards / interoperable APIs

## Who Can Participate?

- Startups
- IT Companies
- Students / Universities
- Health-tech Innovators
- NGOs / Social Enterprises
- Individual Developers / Teams

- Companies / Trusts

## Evaluation Criteria

- Innovation & usability
- Scalability
- Public health relevance
- Inclusion & accessibility
- Data security
- Integration capability
- Cost effectiveness

## Awards

- 1st Prize: ₹ 500000
- 2nd Prize: ₹ 300000
- 3rd Prize: ₹200000

## Important Dates

- Launch of Hackathon:
- Registration Deadline:
- Mentoring Round:
- Final Demo Day:

## How to Register

Interested participants may register at: https://transformup.in/

Email:hackathon.upstc@gmail.com Helpline: 0522-2236116

## Tagline

***"Every Pregnancy Counted, Every Mother Connected."***

Join us in building a next-generation maternal care digital platform.

# Frequently Asked Questions (FAQ)

**1. Who will own the patient data collected through the platform?**

The patient data collected through the platform will remain under the ownership and control of the State Transformation Commission / concerned department. Any selected participant or implementation partner, if engaged further, will act only as a technology partner for development, deployment, or support, without any independent ownership rights over the data.

**2. What will happen to the winning solutions? Will they be procured, piloted, or archived?**
The selected solutions may be taken forward for implementation

**3. Will SLA and uptime requirements be specified for the platform?**
Since the platform is intended to support maternal care and emergency-linked workflows, it should be designed for high reliability and availability. The solution should target ~99.9% monthly uptime for core services, 24x7 monitoring and support for critical workflows, incident acknowledgement within defined timelines, priority handling of critical cases, and appropriate backup, disaster recovery, and failover mechanisms. Detailed SLA, uptime, incident response, recovery timelines, and support arrangements may be finalized at the pilot, procurement, or implementation stage.

**4. How will “high-risk pregnancy” be defined for the purpose of the platform?**
The indicative high-risk pregnancy parameters and conditions to be considered for the platform are provided in **Annexure 1**. The HRP document is attached for reference, and participants are expected to align their solution with key parameters and the applicable government maternal health protocols.

**5. What should be the fallback mechanism where Aadhaar or OTP-based verification is not feasible?**

Aadhaar/mobile-based OTP verification may be used where applicable. However, the platform should also support alternative or assisted registration pathways in situations such as poor connectivity, non-availability of Aadhaar, shared mobile numbers, or registration through frontline workers such as ASHA, ANM, Anganwadi workers, or other authorized personnel.

**6. Will participants be provided any dummy datasets, APIs, or sandbox environment for demonstration?**

Participants may use simulated data for demonstration purposes, aligned with the intended workflow and system requirements.

Annexure-1

## Conditions for High-Risk Pregnancy

**High Risk Factors of Pregnancy and Their Management at an ANC Clinic**

Complications can occur during pregnancy and affect the health and survival of the mother and the fetus. The health care provider should ensure that proper history is elicited and complete general physical, systemic and abdominal examinations are performed on the PW during each ANC visit. Though any case could develop complication during or after pregnancy or childbirth, but a pregnancy with a high risk factor poses higher than normal risk for the pregnant women and the fetus.

**Common High Risk Conditions of Pregnancy (HRP Parameters):**

- Severe **Anaemia** (Hb less than 7gm/dl)
- Pregnancy-induced **hypertension** (BP >= 140/90 in two consecutive readings at any time of pregnancy)

  **Pre-eclampsia** When the blood pressure is >=140/90 but <160/110 recorded 4-6 hrs apart, associated with proteinuria > 3 gm/dl in a 24hrs specimen or with proteinuria trace, 1+ or 2+.

  **Severe pre-eclampsia** The blood pressure is >= 160/110 with proteinuria 3+ or 4+

  **Eclampsia**- Convulsions with BP >=140/90 and proteinuria more than trace
- **Syphilis/ HIV Positive**
- **Gestational Diabetes Mellitus**- In 1st ANC with 75gm oral glucose, 2hours Plasma Glucose value of >=140mg/dl is considered diagnostic of GDM. Repeat testing is done at 24- 28 week of pregnancy if earlier value were negative.
- **Hypothyroidism**- Pregnancy-specific and trimester-specific reference levels for TSH are as follows: Ist trimester - 0.1-2.5mIU/l; 2nd trimester - 0.2-3mIU/l; 3rd trimester - 0.3-3mIU/l.

  In pregnancy, SCH(sub clinical hypothyroidism) is defined as a serum TSH between 2.5 and 10mIU/L with normal FT4 concentration

  And OH (overt hypothyroidism) is defined as serum TSH>2.5-3mIU/l with low FT4 levels. TSH>10mIU/l irrespective of FT4 is OH.
- **Young primi** ( less than 20 years) or **Elderly gravida** ( more than 35 years)
- **Twin / Multiple pregnancy**
- Malpresentation
- **Previous LSCS**
- **Low lying placenta, Placenta previa**
- **Positive Bad obstetric history** (History of still birth, abortion, congenital malformation, obstructed labor, premature birth etc.)
- Rh negative
- Patient with History of any current systemic illness(es)/past history of illness

*Warning signs to be explained to each pregnant woman using the safe motherhood booklet.*

***Warning Signs Requiring Immediate Medical Attention:***

- Fever >101.3°F/for more than 24 hours.

- Headache, blurring of vision.
- Generalized swelling of the body and puffiness of face.
- Palpitations, easy fatigability and breathlessness at rest.
- Pain in abdomen.
- Vaginal bleeding / watery discharge.
- Reduced fetal movements.

# Hypertensive disorders of pregnancy

Hypertensive disorders complicate around 10% of pregnancies

**Hypertension is defined as BP >=140/90 in two consecutive readings at any time of pregnancy.**

**Types of hypertensive disorders in pregnancy**

- Chronic Hypertension- hypertension that antedates the pregnancy or present before 20 weeks of gestation. It can be complicated by pre-eclampsia when there is proteinuria as well.
- Pregnancy induced hypertension- hypertension after 20 weeks of pregnancy.
- Pre-eclampsia- May present with any symptoms of headache, blurring of vision, epigastric pain or oliguria and oedema .**When the blood pressure is >=140/90 but <160/110 recorded 4-6 hrs apart, associated with proteinuria > 3 gm/dl in a 24hrs specimen or with proteinuria trace, 1+ or 2+**
- Severe pre-eclampsia- **The blood pressure is >= 160/110 with proteinuria 3+ or 4+**
- Eclampsia—Eclampsia is the occurrence of generalized convulsion(s), usually associated with background of pre-eclampsia during pregnancy, labour or within seven days of delivery. However, it can occur even in normotensive women.**Convulsions with BP >=140/90 and proteinuria more than trace**

## Likely complications

Maternal; HELLP Syndrome, ARDS, Renal failure, pulmonary edema, DIC Fetal; IUGR, IUD, Fetal distress, prematurity.

## Monitoring ofPIH, Severe PE, Eclampsia during ANC

Focused ANC for rising BP and abnormal weight gain to be looked for at every visit

PE profile to include CBC with peripheral smear, coagulation profile, **serum uric acid**, serum creatinine, blood urea, Hepatic enzymes,Urine; albumin and C/S.

IUGR to be ruled out through clinical assessment and necessary investigations by 34 weeks.

## Management

The definitive treatment is delivery but one has to wait until lung maturity and satisfactory gestational age is reached. The cornerstone would be controlling hypertension, assessing the severity, monitoring the maternal and fetal condition and preventing onset of eclampsia.Treatment with anti-hypertensive initiated at 90-100mmHg when treated through OPD. Proper rest, high protein diet and the following drugs are recommended

1. Tab Alpha methyl dopa 250 mg twice or thrice daily;
2. Nifedipine 10-20 mg orally bd/tds(the second line of treatment after alpha methyl dopa).
3. Lobetalol 100 mg twice daily is equally effective.
4. In setting of preeclampsia, prophylactic MgSO4 could be given IM.

1 gm /day of calcium in pregnancy after 1$^{st}$ trimester reduces risk of Pre-eclampsia by 50%. The case may be referred to a FRU for further management.

## Danger signs to be told to patient

Any imminent symptom of eclampsia like headache, blurring of vision, epigastric pain or oliguria and increasing edema, rising BP, bleeding PV or absent /decreased fetal movements.

## Planning delivery

Delivery decisions are to be taken on obstetric grounds and for a CEmOC center. Prolonged induction to be avoided.

# Anaemia during pregnancy and in the postpartum period

Prevalence of Anaemia in pregnant women in India is 58.7%.**For HRP , Hb level < 7 g/dl**
Anaemia is defined as Hb level < 11g/dl in pregnancy or immediate post partum period. Anemia is grouped as mild (10-10.9g/dl), moderate (7-9.9 g/dl), severe (< 7 g/dl).
Iron deficiency anemia is the commonest.

## Complications due to anaemia in pregnancy;

Maternal; Cardiac failure, susceptibility to infections, preterm labour, PPH, sub-involution, failing lactation, DVT
Fetal; Prematurity, IUGR, Anemia of newborn.

## Diagnosis

History of weakness, giddiness or breathlessness Assess for pallor.
Investigations; Hb estimation using haemoglobinometer or by Standard Hb color scale. Complete blood count and examination of a thin film for cell morphology, peripheral blood smears for malaria.
Urine for blood or pus cells and stool for occult blood/ova/cyst

## Management

For **prophylaxis** give IFA tablet (with 100 mg elemental iron and 0.5 mg folic acid) once daily for 180 days (6 months) starting after the first trimester.
**Mild to moderate anemia**is first investigated for type of anemia and treated by iron and folic acid tablets (100 mg elemental iron + 0.5 mg folic acid) twice daily and to be continued during postpartum period. Hb level assessed monthly. Administer parenteral iron preparation if there is noncompliance / intolerance to oral iron.
Cases of moderate and severe anemia may receive anti helminthicdrugs (Tab. Mebendazole 100 mg bd for 3 days or Tab. Albendazole 400 mg single dose) especially in hookworm endemic areas during 2nd/3rd trimesters of pregnancy.
Cases of **severe anemia** should be referred to FRU for further investigations and treatment as they might need a blood transfusion.
Women with Hb< 7 gm% at term should deliver at FRU.
Blood loss during delivery must be minimized by practicing AMTSL in all cases.

**Indications and dose for parenteral iron therapy**:• Intolerance to oral Iron, poor absorption, non compliance of treatment, moderate to severe anaemia in late pregnancy.

For Hb between 7-8 gm%, IM iron therapy in divided doses along with oral folic acid daily if women do not have any obstetric or systemic complication; repeat Hb after 8 weeks

**Delivery** of a PW with severe anaemia to be planned for a FRU with available blood transfusion services.

# Twins/ Multiple pregnancy

Widespread practice of ART has resulted in increased incidence of multiple pregnancies.

## Risk of Twins/ Multiple pregnancy

Fetal risk; prematurity, IUGR/IUD, congenital anomalies, malpresentations, PROM, cord prolapse, placenta previa, placental insufficiency, twin to twin transfusion, stuck or conjoint twin.
Maternal risk; Anemia, hyperemesis, early onset PET, Acute Hydromnious, Atonic PPH, Increased risk of operative delivery.

## Diagnosis

When fundal height > POG, an USG to be done to confirm diagnosis (and assess viability, rule out congenital malformations, fetal growth, fetal position)

## Management

Early diagnosis can improve maternal and fetal outcome.
Requires more frequent visits, increased calories, protein intake, iron supplementation and appropriate rest in lateral position
Refer to a FRU at 36 weeks for timely delivery.

## Placenta Previa

The implantation of the placenta wholly or partly in the lower segment of the uterus. It is an important cause of perinatal mortality mainly due to prematurity. Incidence is 4-5 per 1000 pregnancies.
It is classified depending on the relation to the internal os and if it lies on the anterior or posterior wall.

**Etiology;**

Maternal age, multiparity, uterine scar, multiple pregnancy, previous abortion

**Diagnosis;**

- Painless bleeding P/V, Uterine height corresponds to period of gestation, soft non-tender uterus and fetal parts palpable, abnormal presentation, presenting part high floating,
- Placental location to be confirmed during USG.
- Warning bleeding to be taken seriously

**Management**

- No PV to be done
- PW to be admitted and to check Hb and blood transfusion if needed
- Routine ANC to continue till 37 weeks
- If patient goes into labour or heavy bleeding then pregnancy to be terminated

# Syphilis

**Government of India has taken a policy decision for universal screening of pregnant women.**

**All pregnant women should be tested for Syphilis in the first ANC visit itself using POC test**.

**Pregnant women considered to be at high risk for acquiring STIs, including Syphilis If:**

- Women with current or past history of STI
- Women with more than one sexual partner
- Sex workers
- Injecting drug users

Signs and symptoms may vary depending on which of the four stages of syphilis the woman presents with.

**Risk of Syphilis in pregnancy**

Fetal; LBW, perinatal deaths and congenital syphilis

Maternal; Still birth, spontaneous abortions, presence of co morbid condition like HIV

**Diagnosis**

If facility has testing for RPR available then testing using RPR may be done. Those with high risk of syphilis or with history of adverse outcome in previous pregnancy to be screened again in the third trimester. Testing of spouse in syphilis positive woman is important.

**Treatment of maternal syphilis**

Although severe allergy to penicillin is rare, the provider should rule out history of allergy before administering penicillin. The emergency drugs for managing anaphylaxis should be kept ready prior to administering penicillin

| Stage of syphilis | Treatment Recommended |
|---|---|
| In the early stage (primary and secondary syphilis of <2 years' duration; RPR titer< 1:8 approximately), | A single intramuscular injection of 2.4 million IU benzathine benzyl penicillin |
| In the late stage (tertiary > 2 years or unknown duration, RPR titer>1:8 approximately | Total of three intramuscular injections of 2.4 million IU benzathine benzyl penicillin once a week for 3 weeks. |
| **For Penicillin–allergic women** | |
| Early stage syphilis; | Erythromycin, 500mg orally 4 times daily for 15 days |
| Late stage syphilis | Erythromycin, 500mg orally 4 times daily for 30 days |
| **Or** | |
| Primary Syphilis | Azithromycin, 2g orally as a single dose |

**Delivery;**

A FRU/EmOC center to be selected for conducting delivery of a syphilis positive pregnant woman.

## Hypothyroidism

Prevalence of Hypothyroidism in pregnancy in the Indian population is 4.8-12%

### Diagnostic criteria in pregnancy

TSH levels during pregnancy are lower as compared to TSH levels in a non-pregnant state. Pregnancy-specific and trimester-specific reference levels for TSH are as follows:

- **I$^{st}$ trimester** - 0.1-2.5mIU/l; **2$^{nd}$ trimester** - 0.2-3mIU/l; **3rd trimester** - 0.3-3mIU/l.
- In pregnancy, **SCH**(sub clinical hypothyroidism) is defined as a serum TSH between 2.5 and 10mIU/L with normal FT4 concentration

And **OH(**overt hypothyroidism) is defined as serum TSH>2.5-3mIU/l with low FT4 levels. TSH>10mIU/l irrespective of FT4 is OH.

### Risk of Hypothyroidism in pregnancy includes;

Maternal; recurrent pregnancy loss, miscarriage, stillbirth, incidence of pre-eclampsia, incidence of Abruptio placentae.

Fetal; IUGR, preterm delivery.

**Screening for hypothyroidism** is recommended in PW with following high risk factors;

- Residing in area of known moderate to severe iodine insufficiency
- Obesity
- History of prior thyroid dysfunction, goiter
- History of mental retardation in family/prev birth
- History of recurrent miscarriage/still birth/preterm delivery/IUD/Abruptio placentae
- History of infertility

### Management of Hypothyroidism in pregnancy

Levothyroxine Sodium is the drug of choice to be taken empty stomach in the morning.

| | |
|---|---|
| TSH level is <2.5 in first trimester and <3 in second and third trimester, | No further management is required and pregnant woman will continue routine pregnancy care |
| If TSH is between 2.5/3 to 10 | To be started on 25 µg of levothyroxine per day |
| TSH is >10 | To be started on 50 µg of levothyroxine per day |

Once treatment started, TSH levels to

be repeated after 6 weeks of starting date of treatment.

### Delivery

Uncomplicated cases may be delivered at PHC/CHC by a MO. Cases with associated complication to be delivered under supervision of an Obstetrician.

## Gestational Diabetes Mellitus (GDM)

In 1st ANC with 75gm oral glucose, 2hours Plasma Glucose value of >=140mg/dl is considered diagnostic of GDM. Repeat testing is done at 24- 28 week of pregnancy if earlier value were negative.

Rates of GDM in India are estimated to be 10-14.3%.

### Risk of GDM in Pregnancy

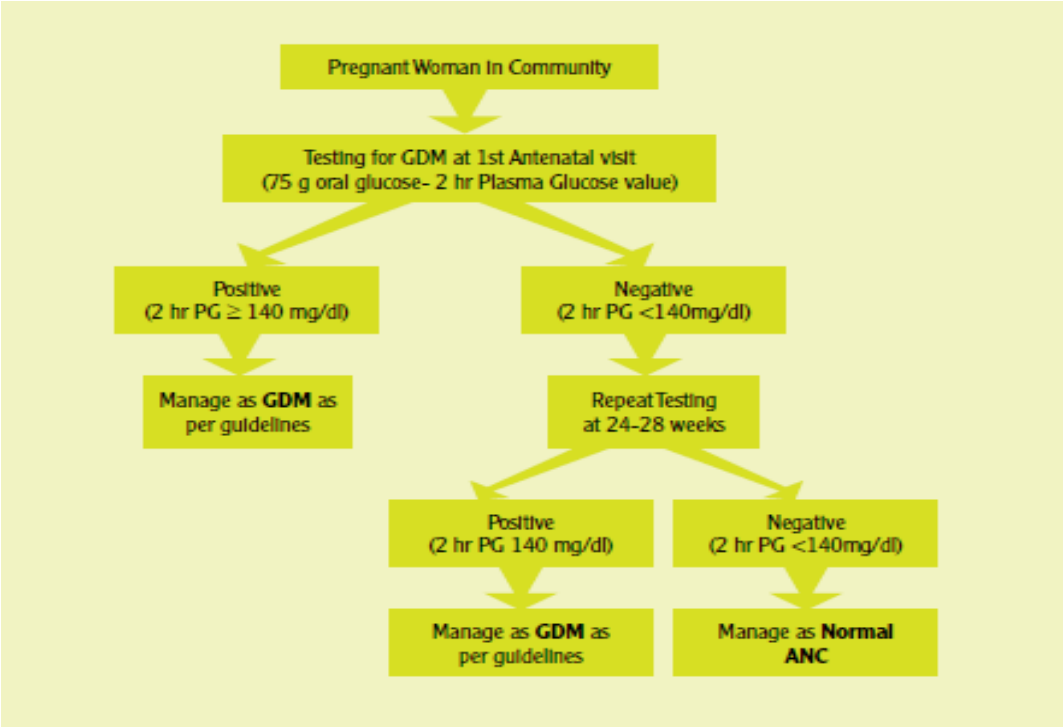
Maternal; Polyhydramnios, Pre-eclampsia, Prolonged labour, Obstructed labour, Caesarean section, uterine atony, PPH, infection

Fetal; Spontaneous abortion, IUD, Stillbirth, Congenital malformations, birth injuries, neonatal hypoglycaemia, IRDS.

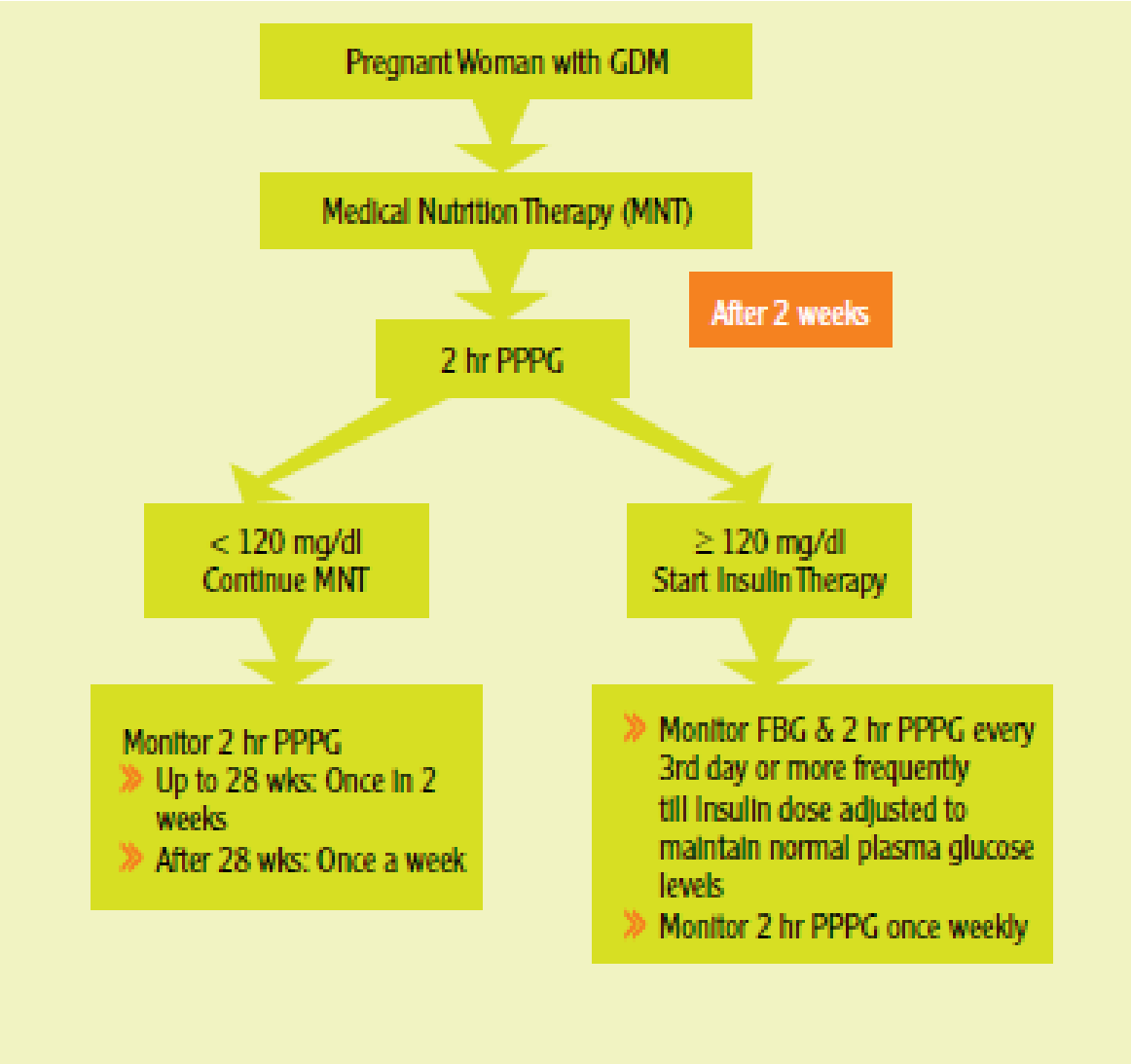
### Protocol for investigation

- 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.

### Test for diagnosis



**Management of GDM**



## Special Obstetric care for PW with GDM

- Antenatal care of a PW with GDM should be provided by gynecologist 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.
- 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 healthcare worker and if required should be referred to a higher centre for further evaluation.

# Pregnancy with Previous Caesarean sections

About 15% of pregnancies suffer from major obstetric complications that require emergency care and nearly10% of the total delivery cases may require CS. In the past 35 years, the rate of cesarean section has steadily increased from 5% to approximately 25%.So pregnancy with
History of previous cesarean section is prevalent in present day obstetric practice

## Risks to mother in subsequent pregnancies;

Risk to PW; Antenatal complications in a woman with history of previous cesarean section is not high but may include; Impending or Uterine rupture & placenta previa or accrete with accompanying hemorrhage, bladder discomfort, incidental morbidity can occur during pregnancy, labor& in repeat cesarean section.

In case of a repeat CS the operative complications may include; operative interference. There are more technical difficulties& increased chance of injury to the surrounding structures during repeat section. Difficulty in stitching the uterine incision due extreme thinning and post-operative complications are likely to be increased.

Risk to fetus; preterm delivery, low birth weight.

## Danger signs in women with previous CS; **Scar** tenderness,

**Birth Planning for Woman with previous CS** The woman is to be advised to deliver at a CEmOC facility with facility for blood transfusion.

# Intrauterine growth retardation (IUGR)

It is referred to birth weight below the $10^{th}$ percentile for the gestational age caused by fetal, maternal or placental factors. The fetus is healthy but small for gestational age(SGA).

**Causes**; Pre-eclampsia, long standing DM, placenta praevia, pre-pregnancy wt of <50 kg, nutritional deficiency particularly protein intake.

**Diagnosis**;

- Accurate assessment of gestational age is critical in diagnosis of IUGR.
- Clinical assessment of fetal growth is done by maternal weight gain and SFH(Symphisio- fundal height) measurement done by using measuring tape. After 20 weeks it is weeks of gestation +_ 2cms. IUGR is suspected if the fundal height is less than 3cms below the GA in weeks.
- Maternal weight gain < 500gms per week.

**Assessment of fetal wellbeing by clinical and USG parameters**

- Daily fetal movement count
- Serial SFH and abdominal girth measurement
- NST (Non stress test) and BPP(Biophysical profile) where possible

**Antenatal steroids ;**One course to be given between 24 and 34 weeks of gestation

**Timing of Delivery;**

It is determined by the gestational age, severity of IUGR and fetal condition. To be conducted in centres with facility for antenatal and intrapartum fetal monitoring and NICU facility.