

# **HYPERTENSION**



**National Health Mission**  
**Deptt. of Health & Family Welfare**  
**Govt. of Odisha.**



# HYPERTENSION

## High Blood Pressure

Anyone of us can have High Blood Pressure



# Overview of the presentation:

- ✓ What is Hypertension
- ✓ Consequences of Hypertension
- ✓ Common risk factors leading to Hypertension
- ✓ Screening for Hypertension
- ✓ Criteria for diagnosing Hypertension
- ✓ Management and Control of Hypertension

# High Blood Presssure



## What is High Blood Presssure?

- If your systolic blood pressure is more than or equal to 140 and diastolic blood pressure is more than or equal to 90 on 2 consecutive occasions, it means that you have High Blood Pressure
- It is not necessary that you may have any signs or symptoms. Thus if your age is more than 30 years, it is necessary to check your blood pressure

Reduce –

- Weight
- Salt
- Stress

Say NO to –

- Alcohol
- Tobacco
- Gutka
- Smoking

Increase –

- Intake of seasonal fresh fruits and vegetables
- Adequate Physical Activity

# What is Hypertension (High Blood Pressure)?

- Blood pressure is the force of blood against artery walls/blood vessels as it is pumped. Blood pressure helps blood to get to all parts of the body.
- In HT blood pressure in the arteries is persistently elevated. High blood pressure usually does not cause symptoms. Long term high blood pressure, however, is a major risk factor for coronary artery disease, stroke, heart failure, peripheral vascular disease, vision loss, and chronic kidney disease. Hypertension is also referred to as "*silent killer*". This is because it can exist without causing any warning signs or symptoms.
- That is why it is important to screen all individuals at least above the age of 30 years for blood pressure at least once annually.

# High Blood Pressure

Anyone of us can have High Blood Pressure

**High Blood Pressure**  
Anyone of us can  
have high blood pressure



**What do we do? Where do we go? How do we prevent?**

Proper treatment is possible only after getting appropriate tests done

- HBP is a silent disorder initially
- Do not wait for symptoms
- HBP can be diagnosed if you check it regularly
- Follow doctors advise.

## Based on the cause, Hypertension is mainly of two types: Primary/Essential and Secondary Hypertension.

- **Primary or Essential Hypertension** About 90–95% of cases are primary, defined as high blood pressure due to nonspecific lifestyle and genetic factors. Lifestyle factors that increase the risk include excess salt, [excess body weight](#), [smoking](#), and alcohol.
- **Secondary Hypertension** The remaining 5–10% of cases are categorized as secondary high blood pressure, defined as high blood pressure due to an identifiable cause, such as chronic kidney disease, narrowing of the [kidney arteries](#), an [endocrine disorder](#), or the use of [birth control pills](#).
- **Gestational HT**-New onset of HT during pregnancy without protein in urine

# CONSEQUENCES OF HYPERTENSION

- Hypertension, if not controlled, may lead to **life-threatening conditions** causing damage to blood vessels, many types of cardiovascular disease such as stroke and heart failure, diabetes, kidney diseases, diseases of eyes, etc.
- It may also affect the ability to think, remember and learn.
- Reducing blood pressure by even a small extent can help lower the risk of these conditions.



# **RISK FACTORS FOR HYPERTENSION**

**The following are some common factors that can lead to high blood pressure:**

- Advancing Age- The risk of high blood pressure increases with age
- Family history
- Overweight or Obesity
- Unhealthy diet- A diet especially high in salt, fat, sweets and low in vegetables/fruits, whole grains and whole pulses
- Lack of physical activity (or sedentary lifestyle)
- Tobacco use in any form (smoking and chewing tobacco) and second-hand smoke
- Excessive alcohol consumption
- Stress
- Sleep apnea- Breathing is briefly and repeatedly interrupted during sleep
- Certain chronic conditions such as kidney and hormone problems, diabetes and high levels of harmful blood fats.

*Although high blood pressure is most common in adults, children may be at risk, too. For some children, high blood pressure is caused by problems with the kidneys or heart. But for a growing number of children, poor lifestyle habits, such as an unhealthy diet, overweight/obesity and lack of exercise, contribute to hypertension.*

# Most IMPORTANT Questions



1. Do you have a family history of diabetes and/or hypertension?

2. Are you overweight?



3. Are you more than 30 years old?



4. Do you drink alcohol and/or use tobacco?



**If your answer is "YES" to even one of the above questions, you must get screened for NCDs**

# **Get screened and save yourself from diseases/disorders**



**It is important to get yourself screened**

**To prevent disability and death.**

# SCREENING FOR HYPERTENSION

- Undertake screening of all adults 30 years of age and above for Hypertension. This will take place on a fixed day at the sub-centre.
- Regular monitoring of blood pressure helps in making an early diagnosis of hypertension.
- For the purposes of screening, any patient with a blood pressure of 140/90 mm Hg and above should be referred to the medical officer for further diagnosis and management.
- The treatment plan includes not just anti-hypertensive medication but also a plan for addressing any modifiable risk factors.
- Ensure that the patient adheres to the treatment and makes changes in her/his lifestyle to reduce modifiable risk factors.

# CRITERIA FOR DIAGNOSING HYPERTENSION

- The only way to detect high blood pressure is to measure it by a BP apparatus.
- As you already know, a blood pressure measurement gives you two readings (numbers). The upper one, which is higher of the two numbers, is called the *systolic blood pressure (SBP)*. The lower number, which is also the smaller of the two numbers, is the *diastolic blood pressure (DBP)*.
- In a screening programme, individuals with a blood pressure of 140/90 mm Hg must be referred to the Medical Officer.

**Table - Classification of Blood Pressure in Adults (age  $\geq$  18 years)**

<b>Classification</b>	<b>Systolic Blood Pressure (mmHg)</b>		<b>Diastolic Blood Pressure (mmHg)</b>
<b>Normal</b>	< 120	AND	< 80
<b>Prehypertension</b>	120-139	OR	80-89
<b>Stage 1 HTN</b>	140-159	OR	90-99
<b>Stage 2 HTN</b>	$\geq$ 160	OR	$\geq$ 100

[\[4\]](#) **Source:** Hypertension: The Silent Killer: Joint National Committee (JNC)-VIII Guideline Recommendations, 2015

## **Why is it important to check blood pressure even among those without any symptoms?**

Regular screening of blood pressure helps in making an early diagnosis of hypertension. This is helpful in taking early corrective measures leading to better control of blood pressure.



## 2 Diseases/ Disorders – Hundreds of troubles!



**Stroke**



**Blindness**



**Heart diseases**



**Kidney diseases**



**Nerve diseases**



## **The management of Hypertension should include the following-**

- ✓ Non- pharmacological (lifestyle changes) and
- ✓ Pharmacological (medication)

*both are required to prevent and manage Hypertension*

# 1. Life-style management

- Eating a healthy diet, being physically active, avoiding the use of tobacco in any form/avoiding exposure to second-hand smoke, reducing the intake of alcohol amongst heavy drinkers, managing stress, reducing weight amongst overweight/obese individuals, etc. are the lifestyle changes.
- Those with family history of high blood pressure should especially reduce their daily salt consumption to not more than 1 teaspoon (5 gms) of salt for each individual in the whole day.

# High Blood Pressure



## Reduce –

- Weight
- Stress
- Salt



## Say NO to –

- Alcohol
- Tobacco
- Gutka
- Smoking



## Increase –

- Intake of seasonal fresh fruits and vegetables
- Physical Activity



# Diseases/ Disorders – Hundreds of troubles!



**Taking treatment and saving yourself is necessary because**

**Diabetes and High Blood pressure affect our whole body. Increases risk of heart diseases, risk of heart attacks, stroke, risk of blindness, kidney diseases**



## 2. Medication

- The Medical Officer at the Primary Health Centre (PHC) will decide on the medication for the patient. Whether a person requires medicines for his high blood pressure and which medicine is best for the patient would depend on-
  - The blood pressure reading
  - Whether the high blood pressure has already affected target organs in the body such as heart, kidneys, eyes and blood vessels
  - Concurrent medical conditions such as diabetes, heart disease, kidney disease and other risk factors like use of unhealthy dietary habits, lack of physical activity or low physical activity, tobacco, alcohol, overweight/obesity and high levels of harmful blood fats/hyperlipidemia, etc
  - Other considerations will be age, sex (male/female) and body weight

*There are several classes of medicines that can be used for the management of hypertension, diabetes and common cancers. Every state has its Essential Drug List (EDL) for common diseases available. The essential drugs for Hypertension, Diabetes and Common Cancers are expected to be available at the PHC, CHC and higher health facilities. This essential drug list is updated on a regular basis and varies state-wise.*

- Drugs for hypertension are available free of cost to those patients who use government health facilities.
- The drugs are prescribed by the medical officer and the patient should be given a month's supply of drugs.
- The patient should be able to collect refills every month from the nearest health facility.
- This could be a Sub-Centre (SC) or a Primary Health Centre (PHC).
- The blood pressure reading should be monitored regularly.
- The frequency depends on the advice of the medical officer.



ANM with support of the ASHA will be responsible for ensuring:

- ✓ Monthly monitoring of blood pressure
- ✓ Compliance to treatment plan of medication and encouraging the patients not to stop or change the dose of medicine without medical advice
- ✓ The patient's blood pressure is under control
- ✓ Follow-up: Check-up at the PHC/CHC as advised

The common medicines used for management of Hypertension are:

- Angiotensin Converting Enzyme (ACE) inhibitors
- Calcium channel blockers
- Diuretics
- Beta- Blockers

**Table- : Dosage of Common anti-hypertensive medications**

Class of Drug	Drug	Initiation dose	Maximum dose
ACE Inhibitors	Enalapril	5 mg once daily (OD)	10 mg twice daily (BD)
	Ramipril	5 mg OD	10 mg OD
	Lisinopril	5mg OD	20mg OD
Calcium Channel Blocker	Amlodipine	5mg OD	10 mg OD
Diuretic	Indapamide	1.5 mg OD	2.5 mg OD
	Chlorthalidon	12.5 mg OD	25 mg OD
Aldosterone antagonist	Aldectone	25 mg OD	100 mg OD
β-Blocker	Atenolol	50 mg OD	100 mg OD
	Metoprolol	25 mg BD	50 mg BD

# TREATMENT GOALS

- Initial aim should be to obtain blood pressure level less than 140/90 mm of Hg
- Maintain healthy blood pressure throughout the person's life
- Prevent and control risk factors which could give rise to high blood pressure or complications

**CARDIOVASCULAR AND  
CEREBROVASCULAR COMPLICATIONS  
(HEART ATTACK AND STROKE)**

## **In this chapter, you will learn about:**

- What is a cardiovascular disease and risk factors?
- What is Atherosclerosis and Hyperlipidemia?
- Warning signs of Heart Attack and Stroke
- Prevention of Heart Attack and Stroke
- Cardiovascular Diseases (CVD) risk prediction through charts

# What is a Cardiovascular Disease?

- Cardiovascular Disease (CVD) includes dysfunctional conditions of the heart, arteries, and veins or blood vessels that supply oxygen to vital life- sustaining areas of the body like the brain, heart itself and other vital organs.

# **Risk factors of Cardiovascular Disease**

**The common risk factors are as follows-**

- Advancing age
- Family History
- Gender- A man is at a greater risk of heart disease than a pre-menopausal woman. But once past the menopause, a woman's risk is similar to a man's. Risk of stroke is similar for men and women.
- Unhealthy diet- high in fat, sugar, salt, animal fat and low in fruits, vegetables, whole grains and whole pulses
- Lack of physical activity/low physical activity
- Use of Tobacco -smoking or chewing tobacco and passive smoking
- Excess intake of alcohol
- High blood pressure/Hypertension

# Risk factors of Cardiovascular Disease

**The common risk factors are as follows-**

- High blood glucose level/Diabetes
- Abnormal blood lipids (**Hyperlipidemia**)\*-High total cholesterol, LDL-cholesterol and triglyceride levels, and low levels of HDL cholesterol
- Being overweight/obese
- Atrial fibrillation (a heart rhythm disorder)- risk factor for stroke
- Certain medicines may increase the risk of heart disease
- Stress, social isolation, anxiety and depression



- The more risk factors one has the higher the chance of developing cardiovascular disease unless corrective action to modify risk factors is taken.

## **Atherosclerosis**

In atherosclerosis, the walls of arteries/blood vessels become thick and stiff because of the build up fatty deposits. The fatty deposits are called plaques or formation of clot. When this happens, the flow of blood is restricted. It can happen in any part of the body.

In the arteries of the heart it is known as Coronary Artery Disease, in the legs, Peripheral Arterial Disease. Atherosclerosis happens over a period of time without causing symptoms. The rupture of a plaque/clot can lead to chest pain/angina (if the arteries that supply the heart with blood- coronary arteries are affected) and serious consequences such as heart attack and stroke.

A person who has hypertension is at risk for having a heart attack and stroke. These are complications of hypertension.

# What is Hyperlipidemia\*?

- This refers to the condition where there is high level of lipids (fats, cholesterol and triglycerides) circulating in the blood. These lipids can enter the walls of arteries and increase the risk of developing [atherosclerosis](#). Lipids comprise of fats, cholesterol and triglycerides present in the blood.
- Cholesterol is found in foods especially animal products such as red meats- mutton, liver, kidney, brain, egg yolk, chicken, fish and dairy products-full-fat/cream milk and milk products, fats like butter, ghee, vanaspati and processed foods/packaged foods which are prepared in vanaspati can raise cholesterol levels. All plant/vegetable sources are cholesterol-free. There are two types of cholesterol: low-density lipoproteins (LDL) and high-density lipoproteins (HDL).

- LDL (Bad) Cholesterol- LDL cholesterol is considered the “bad” cholesterol because it leads to [atherosclerosis](#). It carries the cholesterol around the body in the blood.
- HDL (Good) Cholesterol- HDL cholesterol is considered “good” cholesterol because it helps remove LDL (bad) cholesterol from the blood.
- The other blood fat is Triglyceride
- Triglyceride is the most common type of fat in the body. These fats are important for muscle energy and are used to store excess energy from the diet. High levels of triglycerides in the blood are associated with atherosclerosis. A diet very high in simple sugars increases the level of triglycerides in blood.
- High levels of triglyceride combined with high levels of LDL cholesterol increase the risk for heart attack, stroke, diabetes, etc. High cholesterol and triglyceride levels have no symptoms. A blood test is the only way to detect them.

**Table 9**

**ATP III Classification of LDL, Total, HDL Cholesterol and Serum Triglycerides (mg/dl)**  
**LDL Cholesterol**

$\leq 100$	Optimal
100-129	Near optimal/above optimal
130-159	Borderline high
160-189	High
$\geq 190$	Very high

Source-ATP III At-A-Glance: Quick Desk Reference, 2001. Available at-  
<https://www.nhlbi.nih.gov/health-pro/guidelines/current/cholesterol-guidelines/quick-desk-reference-html>.

# Total Cholesterol

$<200$	Desirable
200-239	Borderline High
$\geq 240$	High

# HDL Cholesterol

<40	Low
> 60	High

## SERUM TRIGLYCERIDES

$< 150$	Normal
150-199	Borderline high
200-499	High
$\geq 500$	Very high

# HEART ATTACK

- A heart attack (myocardial infarction) occurs when the heart's supply of blood is stopped due to deposition of fat, thus blockage in the blood vessel of the heart.
- It is defined as severe chest pain for more than 30 minutes, radiating to left arm, shoulder or jaw and not relieved by pain killers.



# WARNING SIGNS OF HEART ATTACK

- Intense pain, pressure or constriction in the centre of the chest that lasts more than a few minutes, or that goes away and comes back
- Nausea, swelling or unconsciousness.
- Discomfort in other areas of the upper body such as pain or discomfort in one or both arms, the back, neck, jaw or stomach.
- Shortness of breath with or without chest discomfort.
- Other signs like sweating, nausea or lightheadedness.

# STROKE

- Stroke is a Cerebral Vascular Disease which is caused by atherosclerosis, due to narrowing and / or blockage of the blood vessels that flow to the brain. If the flow of blood is cut off this can lead to strokes and transient ischemic attacks.
- Stroke is defined as paralysis or numbness of one side of the body, difficulty of speech, hearing, reading or writing. A stroke occurs when the blood supply to the brain is interrupted.
- This can happen either when a blood vessel in the brain or neck is blocked or bursts. If this happens, the brain is deprived of oxygen and parts of the brain may be permanently damaged.
- The consequences of a stroke can include problems with speech or vision, weakness or paralysis.

# TRANSIENT ISCHEMIC ATTACKS

- Just as stroke occurs when the flow of blood is blocked, TIAs happen when there is a brief blockage.
- The temporary loss of blood to the brain causes a brief, sudden change in brain function.
- This may manifest as temporary numbness or weakness on one side of the body, loss of balance, confusion, blindness in one or both eyes, double vision, difficulty speaking, or a severe headache.
- But these will disappear quickly and permanent damage is unlikely. A TIA can be a warning that one is at risk of stroke sometime in the future.

# WARNING SIGNS OF STROKE

- The signs of stroke appear suddenly and often there is more than one sign at the same time.
- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- **Remember FAST**
  - **F :Facial drooping**
  - **A : Arm weakness**
  - **S : Speech difficulties**
  - **T : Time**
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden severe headache with no known cause
- Heart attack and Stroke are both an emergency condition, which can kill or leave a person with a permanent disability, so refer to the nearest health facility within one hour (called the golden period).

# PREVENTION OF HEART ATTACK AND STROKE

- Eating a healthy diet, being physically active, avoiding the use of tobacco in any form/avoiding exposure to second-hand smoke, reducing the intake of alcohol amongst heavy drinkers, managing stress, maintain healthy weight, people who are overweight/obese should lose weight, restriction of caffeinated beverages, etc. are lifestyle changes. The details of these messages have been covered in the chapter on Health Promotion. In addition, maintaining healthy levels of blood pressure, blood sugar and blood fats can prevent heart attack and stroke in an individual.
- **The role of ANM in control of Heart Attack and Stroke (The following steps can be undertaken with support of ASHA)**
- Knowing the warning signs of heart attack and stroke and seeking immediate medical help can improve the outcomes. Individuals with any of the signs of heart attack and stroke should be referred immediately to a CHC for assessment and management.

# **SIMPLE WAYS OF PREVENTING HEART ATTACK AND STROKE ARE-**

- Ensure that all above 30 years of age are screened annually for hypertension and diabetes.
- Blood pressure and blood sugar should be monitored regularly in high-risk individuals – including those with a family history of stroke or heart attack.
- Motivate those with high blood pressure and high blood sugar to change their lifestyle (as given in Health Promotion chapter) and regularly take their medicines to keep the BP or glucose under control. .
- Create awareness among the community on the warning signs of heart attack and stroke and these are both preventable and treatable
- Create awareness among the community on the services available for early management of heart diseases and stroke in health facilities
- Emphasize that if there are any signs of heart attack or stroke, she/he should seek immediate medical attention by a qualified health professional at the higher facilities
- Encourage patients to follow medical advice provided by a qualified health professional and ensure compliance to treatment.

# **Diagnosis & Management of Gestational Diabetes Mellitus**

## **Technical and Operational Guidelines**

# **Revised national guidelines for Diagnosis & Management of GDM- What's New**



**February 2018**



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



# Concerns & Issues



- Universal vs high risk screening
- Duplication of glucose testing i.e. blood sugar by glucometer & urine sugar
- Oral hypoglycaemics
- Desirable fasting sugar – 95mg% vs 90mg%
- New born hypoglycaemia management – 10% dextrose at <45mg% vs 20mg%
- Calibration of glucometer
- No of times insulin syringe can be used
- Linking GDM with NCD





- Evidences for safety & possibly superiority of metformin published
- As shown in MIG study compliance & acceptability of oral metformin much better than injectable insulin
- Particularly relevant in our country with large rural population & high level of illiteracy
- Decision to update guidelines taken by MOH, GOI

# Concern ? Universal Testing

- Universal testing was recommended

# Method of Testing

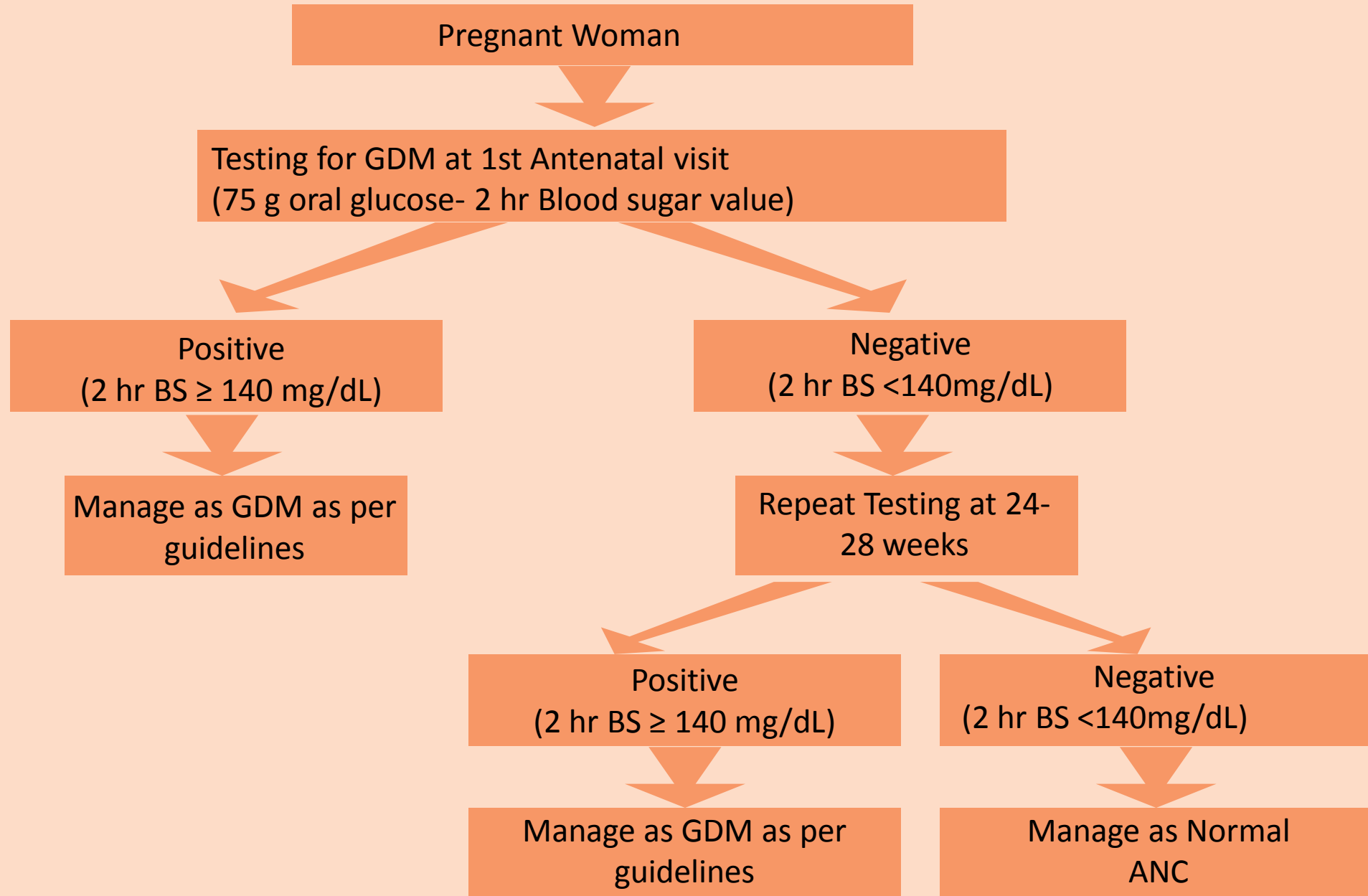
- One step test as recommended by DIPSI
- 75g glucose load irrespective of meals
- 2 hour later test with **plasma calibrated glucometer**
- **140mg%** taken as cut off



# Protocol for Investigation

- Test twice during pregnancy
- 1<sup>st</sup> test at 1<sup>st</sup> ANC
- Repeat at 24-28 weeks at least 4 weeks after 1<sup>st</sup> test
- **If presents late ( >24 weeks) then only one test at 1<sup>st</sup> contact**

# Universal testing for GDM



# Management

- Start MNT
- Follow up 2 weeks with PPPG
- If  $< 120\text{mg\%}$  continue MNT
- Monitor 2 weekly in 2<sup>nd</sup> trimester & weekly in 3<sup>rd</sup> trimester

- All women to be started on MNT **& physical exercise (walk/exercise 30min/day)**
- Perform 2hr post prandial plasma glucose after 2 weeks
- If  $< 120\text{mg\%}$  continue MNT & exercise only
- **Monitor monthly or as advised by physician**

## 2hr PPPG >120mg%



Start additional therapy <b>metformin/</b> insulin
Insulin can be started at any gestation
<b>Metformin to be started only if &gt;20 weeks gestation</b>
Insulin maybe added if not controlled with metformin
Metformin may be added if high doses of insulin required
Lifestyle modification to continue

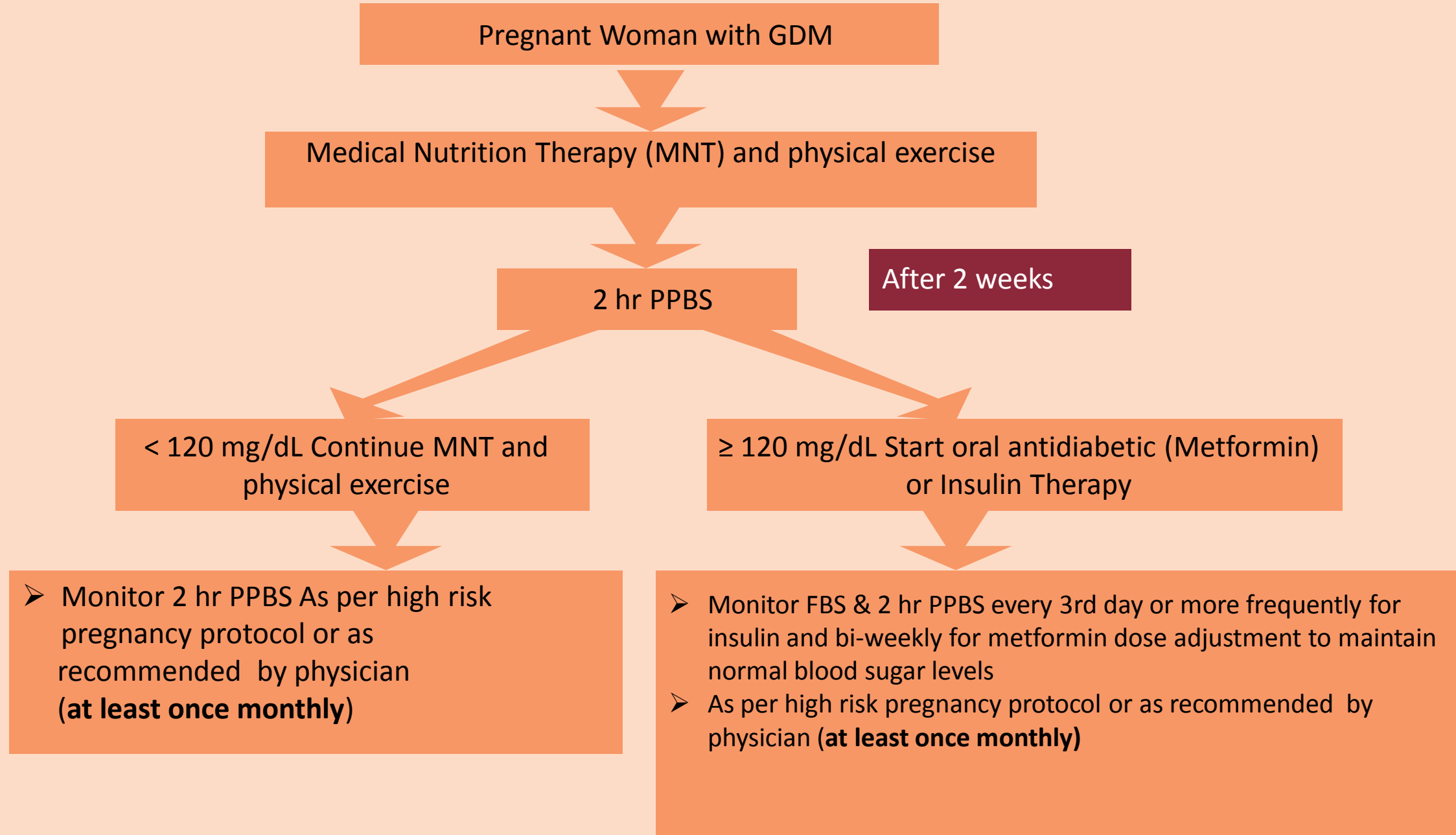
# Metformin



- Can be started at 20 weeks of pregnancy, if MNT has failed to control blood sugar.
- Dose of metformin 500 mg twice daily orally upto a maximum of 2 gm/day.
- If the woman's blood sugar is not controlled with the maximum dose of metformin (2 gm/day) & MNT, Insulin to be added.
- Hypoglycemia and weight gain with metformin are less in comparison to Insulin.
- If Insulin is required in high doses, metformin may be added to the treatment.



# Management Of Pregnant Woman with GDM



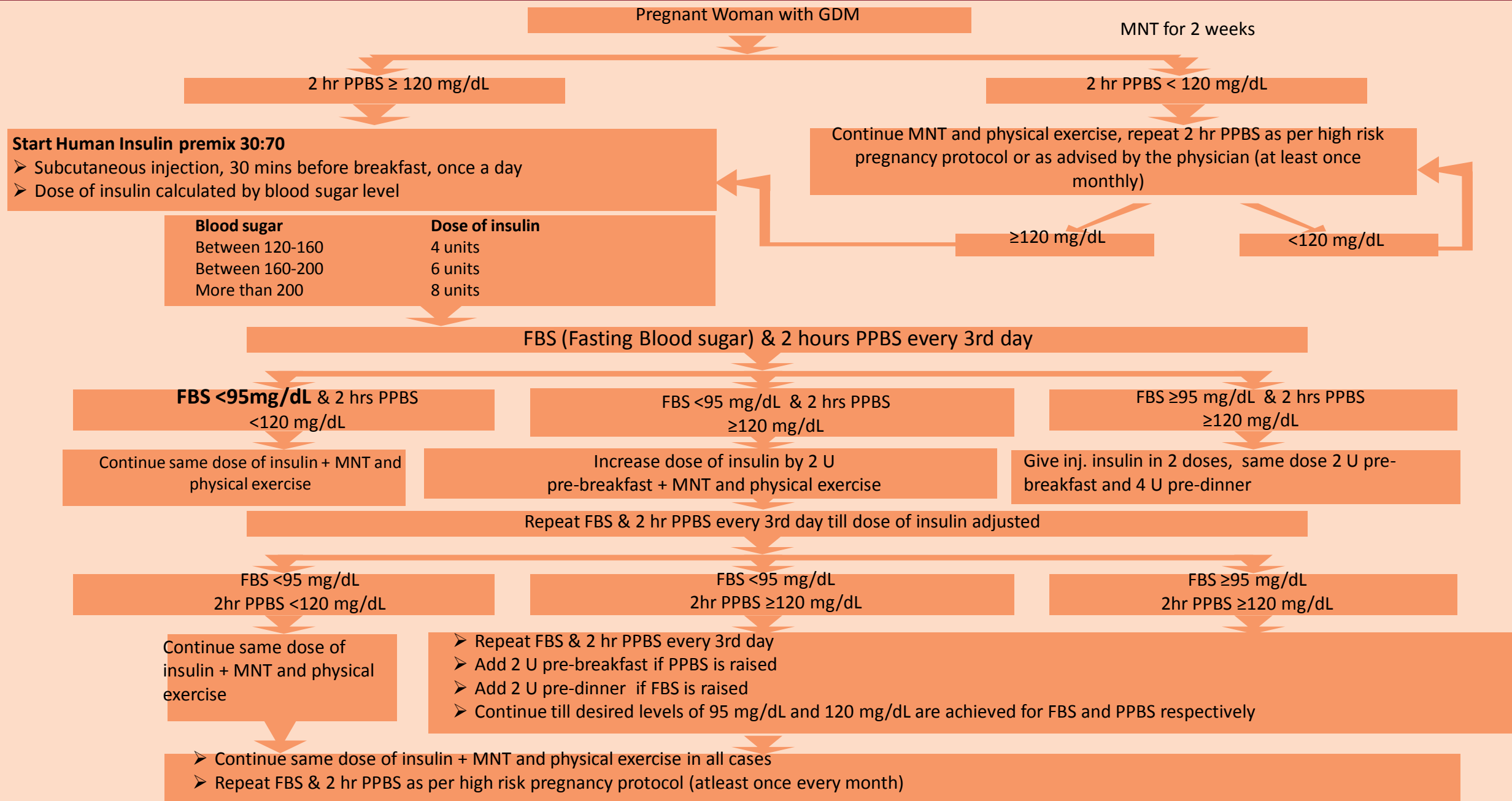
# Insulin Therapy



## As per New revised guideline of 2018

- Insulin syringe/ **pen** may be used
- Syringe/pen needle to be **used only once**
- **All disposables to be carried in puncture proof box to health facility for proper disposal**
- **No role of flushing syringes**
- **State will supply Pen syringes and needle**

# Insulin Therapy



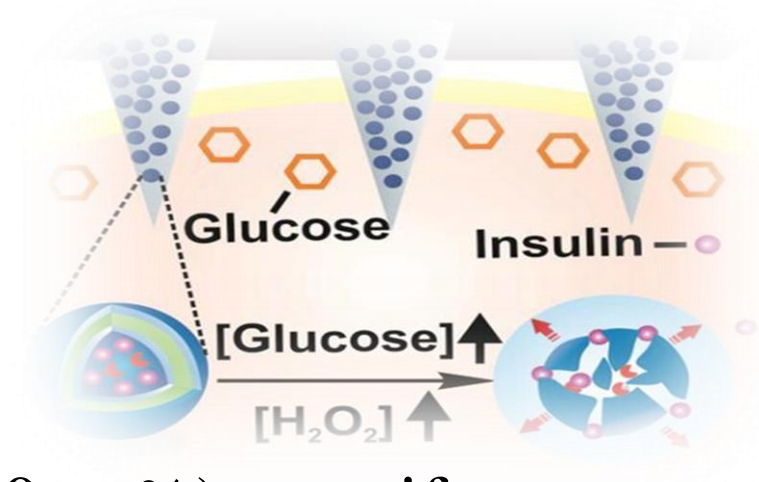
# Obstetric Care



- Preferably by gynecologist
- Anomaly scan at 18-20 weeks & growth scan at 28-30 weeks & again at 34-36 weeks
- **Minimum once a month ANC visits** (old guidelines recommended routine care if controlled & 2weekly till 28 weeks f/b weekly if uncontrolled)
- Monitor for preeclampsia & other complications
- Counsel for DFMC

# Labour & Delivery

- Institutional delivery
- Women on insulin or with uncontrolled PPPG ( $>120\text{mg}\%$ ) even if on MNT & exercise, or metformin must be referred at 34-36 weeks to CEmOC centres for delivery under gynaecologist
- **GDM pregnancies are associated with delay in lung maturity of the fetus; so routine delivery prior to 39 weeks is not recommended**
- **Plan delivery after 39 weeks unless other obstetric indication or poor control**
- Blood sugar monitoring during labour & insulin infusion accordingly



# Management of Newborn

## As per New Revised guideline 2018

- Monitoring newborn for hypoglycaemia starting 1hr after delivery & thereafter every 4hrs
- **The cut off capillary blood glucose for hypoglycemia in normal birth weight newborn is <45 mg/dL and <54 mg/dL in case of intrauterine growth restriction (IUGR), to initiate treatment**
- If <20mg% manage by IV 10% dextrose 2ml/kg f/b 100ml/kg/day
- Refer if not responding

# Post Delivery Care

- OGTT at 6 weeks postpartum in all women who had GDM
- All to be counseled for lifestyle modifications
- Annual OGTT
- Linkage with NCD program



*Thank you*