

DIABETES MELLITUS



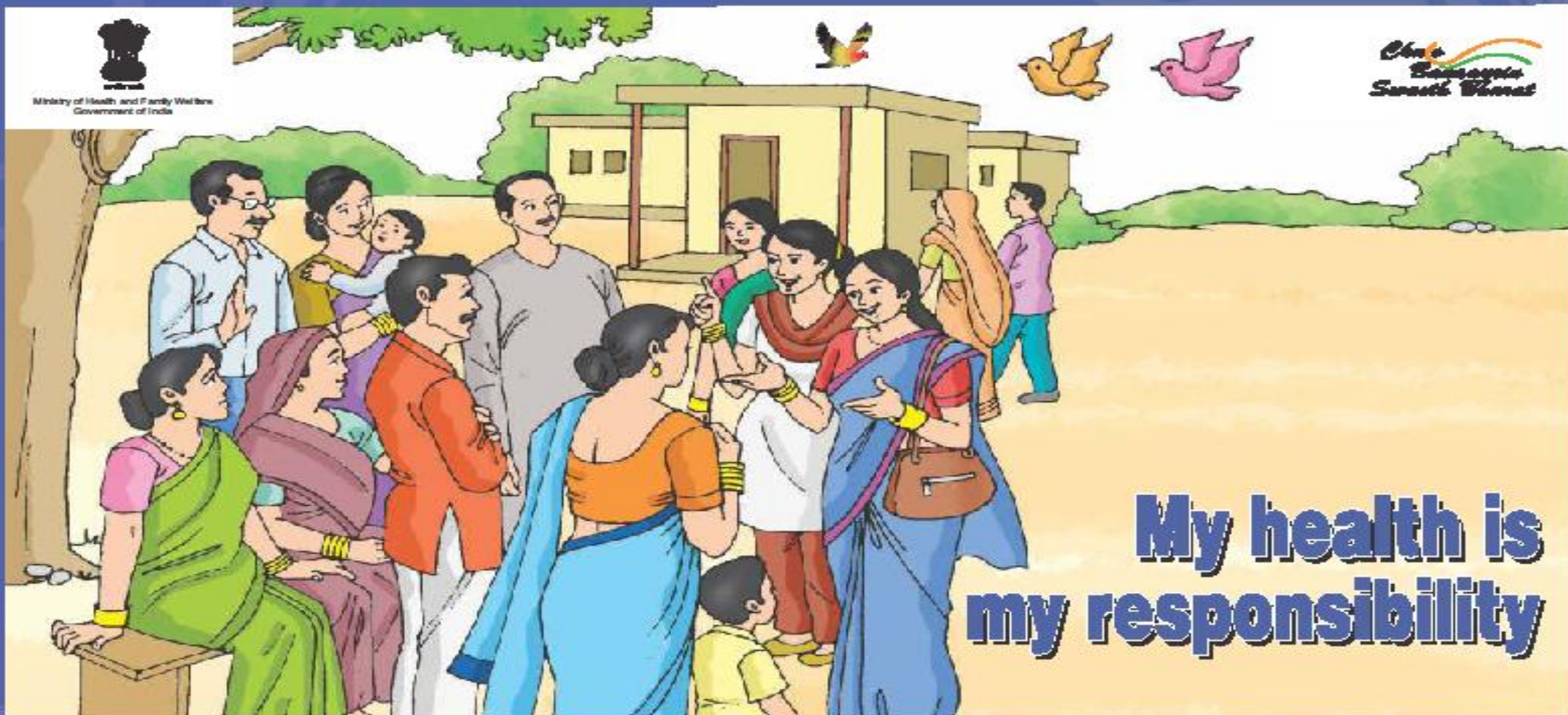
National Health Mission
Deptt. of Health & Family Welfare
Govt. of Odisha.





Ministry of Health and Family Welfare
Government of India

Chhatarpoo
Swarth Varnat

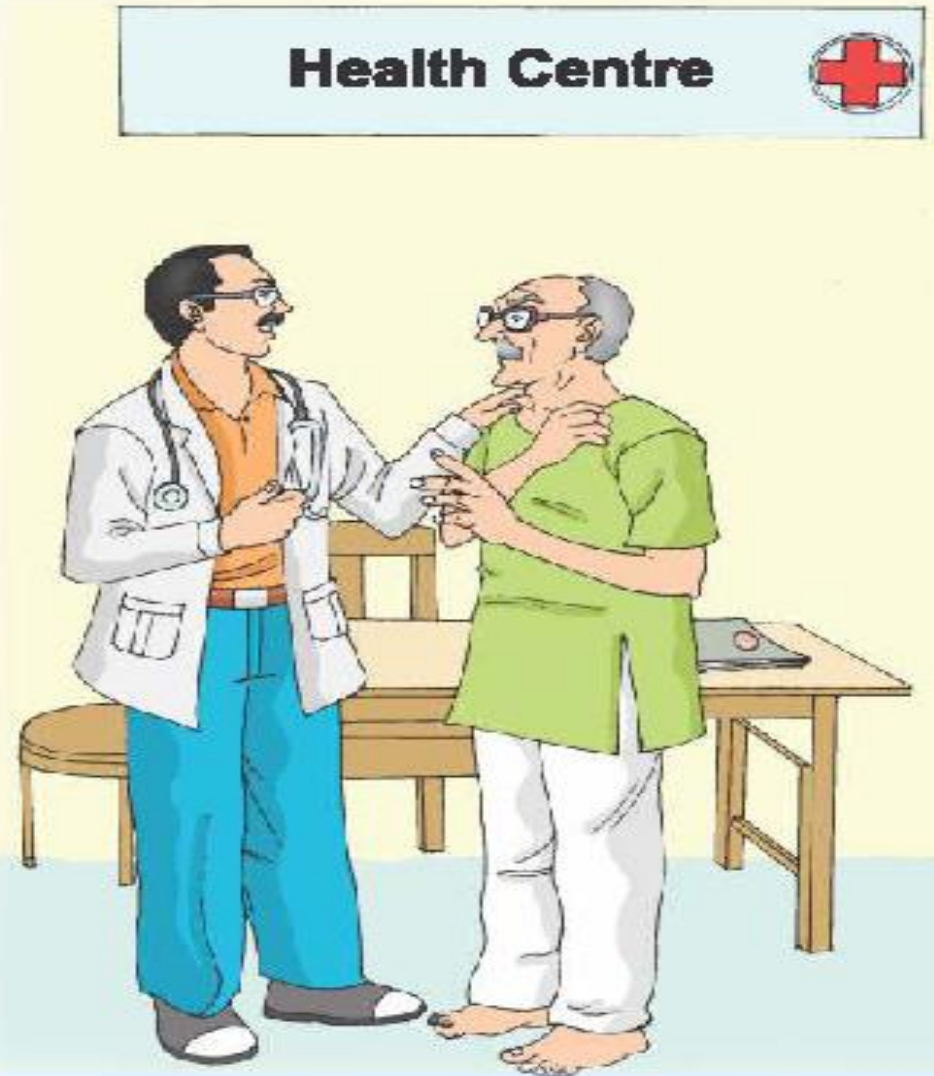


**My health is
my responsibility**



Get screened and save yourself from diseases/ disorders

It is important to get yourself screened



1.

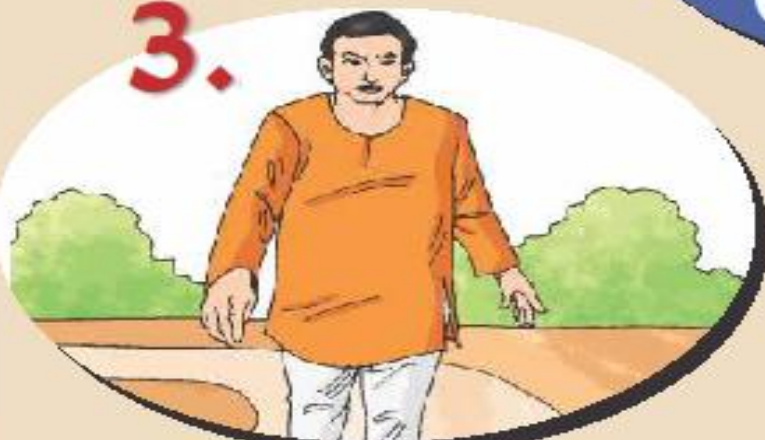


2.



Most IMPORTANT Questions

3.



4.



Overview of the presentation

- ✓ What is Diabetes?
- ✓ Different types of Diabetes (Type 1, Type 2 and Gestational diabetes).
- ✓ Risk factors for Type 2 diabetes.
- ✓ Common signs and symptoms for Type 2 diabetes.
- ✓ Screening for Diabetes
- ✓ Criteria for diagnosing Diabetes
- ✓ Details about Hypoglycaemia
- ✓ Management and Control of diabetes.

What is Diabetes Mellitus?

- All food that we eat is broken down into a sugar called glucose. Glucose is carried by the blood to all the parts of the body to give energy. The hormone which helps glucose move from the blood into the cells, is called **INSULIN**.
- DM is a metabolic disorder in which there are high blood glucose level over a prolonged period.
- It is due to pancreas not providing enough insulin or cells fails to respond to insulin.

Insulin helps to keep the blood sugar levels normal. In diabetes, the body does not produce insulin or cannot use the insulin properly. The glucose builds up in the blood, resulting in high blood glucose levels. Normally, a blood glucose level taken randomly (that is at any time of the day) of over 140 mg/dl should lead to a suspicion of diabetes.

Diabetes is a problem of INSULIN production and/or function and not a problem of SUGAR.

CLASSIFICATION

- Diabetes is classified into three types namely:
 - Type 1 Diabetes
 - Type 2 Diabetes
 - Gestational Diabetes

CLASSIFICATION (Contd.)

Types of Diabetes	What is it?	Who gets it?
Type 1 Diabetes (T1DM)	<p>Pancreas does not produce enough insulin i.e. deficient</p> <p>Onset is sudden, mostly in children , body size is thin or normal and prevalence is 10%.</p>	<p>The disease can affect people of any age but usually in adults</p>

CLASSIFICATION (Contd.)

Types of Diabetes	What is it?	Who gets it?
Type 2 Diabetes (T2DM)	<p>This is the most common type of diabetes. Insulin resistant cells fails to respond to insulin.</p> <p>Onset is gradual, mostly in adults, body size is obese and prevalence is 90%.</p>	<p>This type of diabetes used to be seen only in adults but it is now also occurring increasingly in children and adolescents. It is strongly associated with ageing populations, family history, excess body weight, unhealthy lifestyle- poor dietary habits, lack/low of physical activity, tobacco and alcohol consumption, etc.</p>

CLASSIFICATION (Contd.)

Types of Diabetes	What is it?	Who gets it?
Gestational Diabetes (GDM)	Diabetes which occurs among women during pregnancy.	Women who are prone to getting diabetes later. The children of women with Gestational Diabetes are at an increased risk of type 2 diabetes in the future

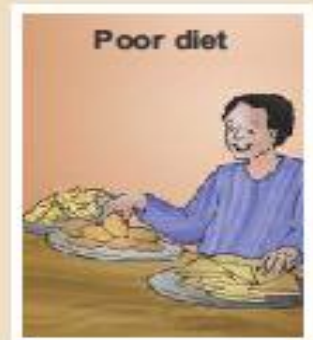
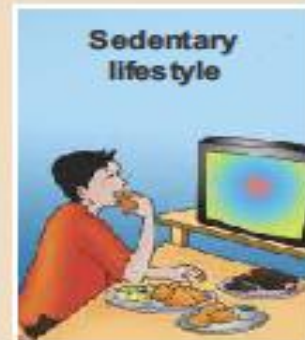
**In this section, we will only discuss about Type 2
Diabetes as it is the most common**

Who is at Risk?

Non-modifiable:



Modifiable



Who is at Risk?



Who is at Risk?

Following / below mentioned category of people are at risk.

Non-modifiable: which are not in our control	Modifiable: which can modify and reduce the risk
<ol style="list-style-type: none">1. Family history2. Ageing	<ol style="list-style-type: none">1. Overweight/Obese2. Tobacco use3. Alcohol use4. Sedentary lifestyle5. Poor diet

RISK FACTORS FOR Type 2 Diabetes

- Advancing age- It occurs most frequently in adults, but is seen increasingly in adolescents as well
- Family history of diabetes
- Being overweight/obese (BMI is $\geq 23\text{kg/m}^2$)
- Unhealthy eating habits
- Lack of physical activity
- High Blood Pressure
- High levels of harmful blood fats/Hyperlipidemia- Triglyceride and/or cholesterol levels are higher than normal
- Addictions like tobacco use, drugs and harmful use of alcohol
- If the woman during pregnancy had diabetes or even mild elevation of blood sugar level during pregnancy
- Women with polycystic ovarian syndrome
- Stress and depression

COMMON SIGNS AND SYMPTOMS OF Type 2 Diabetes

- Frequent urination
- Increased hunger
- Excessive thirst
- Unexplained weight loss
- Lack of energy, extreme tiredness
- Lack of interest and concentration
- Blurred vision
- Repeated or severe infections such as vaginal infections
- Slow healing of wounds, dry or itchy skin
- Impotence in men

Warning Signs/symptoms of Diabetes



Don't ignore, immediately get your Blood Sugar checked and visit Health Centre

Diabetes

Anyone of us can have Diabetes



Diabetes

Anyone of us can have Diabetes

Diabetes

Anyone of us
can have Diabetes



Screening – checking by glucometer



If blood sugar is equal to or greater than 200mg/dl



**Go to the nearest health facility for confirmation - Fasting and Post
Prandial (PP)**



If Confirmed, follow doctors advice and adhere to treatment

DAMAGE TO ORGANS DUE TO HIGH BLOOD GLUCOSE

- Kidneys – causing kidney failure
- Heart and blood vessel disease- causing heart attack and stroke
- Nerves (Neuropathy) – Diabetes can damage blood vessels throughout the body. It causes numbness, tingling in hands and/or feet, making it hard to feel injuries. Diabetes also makes it harder for wounds to heal, easily leading to foot ulcers and infections. Fungus on the feet can also lead to infection. A foot infection can spread to the whole leg if not treated. The leg may become so infected that it needs to be removed (amputated). But good foot care and managing blood sugar levels can prevent amputations.

(Contd.)

- Eyes (Retinopathy) - Diabetes can damage blood vessels in the eyes, leading to gradual loss of vision or blindness. If an eye clinic is available, a person with diabetes should have their eyes tested once a year. If vision becomes blurry, keeping sugar levels down may help the eyes recover.
- Oral cavity – Diabetes worsens gum infections which, in turn, makes diabetes worse. People with diabetes should brush their teeth at least twice a day with a toothbrush or a chewstick (miswak, neem stick). A person with diabetes will benefit from seeing a dentist.

SCREENING FOR DIABETES

- The ANM, will undertake screening of all adults 30 years of age and above for diabetes. This will take place on a fixed day at the sub-centre. Regular monitoring of blood sugar helps in making an early diagnosis of diabetes. This is helpful in taking early corrective measures leading to better control of blood sugar levels. You are already familiar with the use of glucometer in the sub-centre. For the purpose of screening, any patient with a random blood sugar over 140 mg/dl should be referred to the medical officer for further diagnosis and management.
- It is the medical officer's responsibility to develop a treatment plan for the patient, based on the level of blood glucose and the presence of other conditions such as high levels of blood pressure and high levels of fat. The treatment plan includes not just anti-diabetic medication but also a plan for addressing any modifiable risk factors. It is part of your role to ensure that the patient adheres to the treatment and makes changes in her/his lifestyle to reduce modifiable risk factors.

Details of the tests for Diagnosing Type 2 Diabetes

- Please remember that the following tests will be done by a laboratory technician at the PHC level and above.
- Most blood glucose tests actually measure the amount of glucose in the liquid part of your blood called the blood plasma, rather than the amount of glucose in your whole blood. This is called plasma glucose.

Diagnosing Type 2 Diabetes (Contd.)

1. Fasting Blood Glucose (FBG)

- Before taking the blood test, the person should have taken no food for at least 8 hours. The easiest way to do this is to arrange an appointment for the patient to have the blood test first thing in the morning. They should fast overnight and must not have anything to eat until after the test. Fasting plasma glucose is described as a fasting blood glucose level of ≥ 126 mg/dl.

Diagnosing Type 2 Diabetes (Contd.)

- 2. Random Blood Glucose-** Sugar level or blood glucose measured at any time of day without regard to time since the last meal. It does not take into account what the patient has been eating or drinking. It is therefore less sensitive than the other tests. However, it is the easiest to perform.
- Where a random plasma glucose level more than and equal to 100 mg/dl and less than 200 mg/dl is detected, a FPG should be measured, or an OGTT performed, or an HbA1c measured.
 - However, as explained earlier, for the purpose of **SCREENING**, random blood sugar over 140 mg/dl is taken as requiring further follow-up.

Diagnosing Type 2 Diabetes (Contd.)

- 3. Two- hour venous plasma glucose after ingestion of 75g oral glucose load (Oral Glucose Tolerance Test- OGTT)**
- The Oral Glucose Tolerance Test (OGTT) is a method which is used to diagnose Type 2 diabetes by measuring how well the body's cells are able to absorb a fixed amount of sugar or glucose.

Diagnosing Type 2 Diabetes (Contd.)

4. HbA1c (Glycosylated, or Glycated haemoglobin)

- It is a form of haemoglobin in the RBCs. The HbA1c level is proportional to average blood glucose over the previous two to three months. It is an excellent indicator of how well the patient has managed his/her diabetes over the last four weeks to three months. It is recommended for monitoring blood sugar control in diabetic patients. However, the test is more costly than blood glucose measurement. WHO recommends an HbA1c goal of less than 6.5 % for people with diabetes.

What is Hypoglycaemia (Low Blood Glucose)?

- Among those with Diabetes a condition called – Hypoglycaemia or **low** blood sugar levels can occur. Hypoglycaemia occurs when blood sugar (glucose) level falls below a level of 70 milligrams per decilitre (mg/dl) or less. If not treated, hypoglycaemia can be life-threatening. The only way to know if someone has hypoglycemia is to check blood glucose. Testing blood sugar levels regularly can help understand when sugar levels are dropping too low.

Hypoglycemia (Contd.)

- Symptoms are tremors, nervousness or anxiety, sweating, irritability, confusion, rapid/fast heartbeat, dizziness, hunger, nausea, blurred/impaired vision, headaches, weakness or fatigue, lack of coordination, falls, seizures, unconsciousness and can lead to other harmful injuries and even death.

Hypoglycemia (Contd.)

There are several reasons why this may happen. These are-

- Missing or skipping a meal
- Long gap between two meals or delay in eating meals
- Taking more than recommended dosage of insulin or tablet
- Side- effects of some anti-diabetic drugs and
- Increased physical activity.

Hypoglycemia (Contd.)

- If someone is having signs of hypoglycemia, it's important to treat it right away.
- Hypoglycaemia can be treated by consuming a small amount of sugar-rich foods as soon as symptoms appear. For such an emergency, diabetic patients should be advised to always carry something to eat such as loose sugar, rock candy (misri) or toffee etc.

Management of Hypoglycaemia

- If a patient's blood glucose drops below 70 mg/dL, remember the 15/15 rule and treat hypoglycemia, without any delay.
- The 15/15 Rule
 1. Check blood glucose level (<70 mg/dl).
 2. The patient has to eat or drink 15 grams of carbohydrates (such as sugar-rich foods). If blood glucose levels cannot be checked at the moment, the patient should be given 15 grams of carbohydrates to be safe. Give any of the following food items to the patient.
 - 5 or 6 pieces of toffee
 - 1 tablespoon of sugar or honey
 - 2-3 teaspoons (1 teaspoon is 5 grams) of glucose powder as is or diluted in water
 - 3-4 teaspoons of sugar/powdered sugar
 - $\frac{1}{2}$ cup fruit juice or normal cold drink
 3. Wait 15 minutes. Check the blood sugar once again. If the blood sugar level, is still below 70 mg/dl, again eat one of the food items listed above and check blood glucose sugar after 15 minutes.
 4. If blood glucose level is still lower than 70 mg/dl or the patient still has symptoms of hypoglycemia, then the patient should be taken to the PHC for management.

Management of Hypoglycaemia (Contd.)

- **Ways to prevent Hypoglycaemia**
- Creating awareness on hypoglycaemia
- Regular blood sugar testing/monitoring
- Taking correct dosage of medicines that are prescribed by the Medical Officer or a trained medical doctor
- Eating small and frequent meals
- Not skipping or delaying meals
- Checking blood sugar before exercise
- Not going empty stomach for morning walk

Management of Hypoglycaemia (Contd.)

- **Please Note-** People with diabetes should be advised to always carry one of the above food items with them to avoid hypoglycaemia. Sugar packets, rock candy (misri) or toffees, etc are easy to carry. People may also wear/carry some form of identification, mentioning they are diabetics. In addition, people in the community should be made aware of the people living with diabetes in their community. This will help in prompt management in case of emergency situations like hypoglycaemia.

Management of Diabetes

- No matter what type of diabetes a person has, glucose control is key to managing the diabetes. Management of Diabetes should be initiated as soon as diagnosis is established even if the patient is asymptomatic. Patient education on diabetes management and life style modifications is the corner stone of effective diabetes control and management and prevention of complications.
- The management should include the following:
- Non- pharmacologic (lifestyle changes) and
- Pharmacologic (medication/drug) therapy, both are required to prevent and manage type 2 diabetes

1. Life-style management (The ASHA will support ANM in spreading health messages in the community)

- Change in lifestyle behaviours is effective in preventing or delaying the occurrence of Type 2 diabetes. 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. The details of these messages has been covered in detail in the chapter on Health Promotion. Those who have diabetes should regularly take small frequent meals as missing or skipping a meal can lead to low blood sugar level.

2. Pharmacological / Medication for Type 2 Diabetes

- The Medical Officer at the Primary Health Centre (PHC) will decide on the drug therapy for the patient. Whether a person requires medicines for his high level of blood sugar and which medicine is best for the patient would depend on:
- The blood sugar reading
- If the target organs in the body such as heart, kidneys, eyes and nerves are affected
- Presence of co- morbidities or concurrent medical conditions such as high blood pressure (on anti-hypertensive treatment), heart disease, kidney disease, nerve and eye damage, and other risk factors like use of unhealthy dietary habits, lack of physical activity/low physical activity, tobacco, alcohol, overweight/obesity and high levels of harmful blood fats/hyperlipidaemia (on lipid control with statins), etc
- Other considerations such as age, sex (male/female) and body weight.

Contd.

- 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 Diabetes 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.

Contd.

- Drugs for Type 2 diabetes 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. For diabetes, both oral drugs and insulin injections can be provided based on the decision of the Medical Officer. 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 sugar 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:

- Raising awareness on diabetes, generally to prevent the onset of diabetes and its complications in the community
- Motivating pregnant mothers for blood glucose testing as a part of their antenatal care. Pregnant women who have diabetes should be encouraged to have good control of their sugar levels to reduce the risk of complications during pregnancy as well as congenital defects in the foetus.
- Encourage the patient for early detection of complications-examine their feet daily for sensations, look for foot injuries, regular eye check-up, maintain oral hygiene, etc.
- Help in identifying symptoms of hypoglycemia and management of hypoglycemia.
- Monthly monitoring of blood sugar level

- Providing support to them and their family members through the consultation and diagnostic processes as required
- Compliance to treatment plan for drugs as prescribed by the medical doctor and encouraging the patients not to stop or change the dose of medicine without medical advice
- Check for presence of any side-effects of the medicines being taken
- Ensure that the patient does not share the medicine with other diabetic patients as every patient is prescribed as per his / her requirement
- The patient's blood sugar is under control
- Follow-up: Check-up at the PHC/CHC as advised to the patients
- Accompany the ASHA in regularly conducting home-visits by prioritizing those households which are vulnerable and marginalised where there are treatment defaulters or those who experience complications and bring these cases to the notice of the Medical Officer.

Common anti-diabetic medications

- Most Type 2 diabetes patients are usually initiated on one or more oral anti-diabetic medicines. Over a period, they will need two or more oral drugs to control their blood glucose levels. These are-
 - Biguanides (Metformin)
 - Sulphonylureas (Glibenclamide)

Common anti-diabetic medications

Medicine class	Name	Dosage	How it works	When to take
Biguanide	Metformin	250mg to 2000mg/day	Lowers the amount of sugar produced by the liver, Helps body use insulin better.	After a major meal
Sulfonylureas	e.g. Glibenclamide	Glibenclamide varies from 2.5-20mg/day given in one or two doses.	Increase the amount of insulin released by pancreas.	30 min before meals.

Injectable medicine for diabetes (Insulin)

- Insulin is another form of drug therapy used for diabetic patients. Insulin is given in the form of injections. It may come in a vial and syringe; or a device that looks like a pen which is easier to use and measures the correct dose. There are three types of insulin- Short-acting, Long-acting and Mixed dose or pre-mixed. People who have Type 1 diabetes require insulin every day to be healthy. Type 2 diabetic patients can also be advised to take insulin, in combination with oral medicines to help achieve good control of diabetes. Medical Officer at the PHC, will determine the need of insulin, type of insulin and dose for an individual depending on the blood sugar profile of the diabetic person.

- As explained earlier patients with diabetes are prone to problems such as foot ulcers and eye problems. You should be able to provide all diabetic patients in your community with advice on foot care

Education of the patient for foot care

- Inspect your feet daily for cracks, blisters, infections, and injuries. If you can't check your own feet, have someone else do it for you.
- Cleanse your feet daily as you bathe or shower, using warm water and mild soap. Dry your feet with a soft towel making sure to dry between the toes. Don't use hot water. You may burn your skin as you may not be able to feel the hotness of the water.
- Apply oil to dry skin to keep the skin soft and free of cracks.
- Clip toenails straight across. Use a nail cutter; don't use scissors
- Always wear something on your feet (socks, slippers, shoes) to protect from injury - even in your house.
- Choose soft good shoes. Let them be a size bigger than what you feel is appropriate. Wear socks made of cotton or wool (in winter).
- Treat minor breaks in the skin promptly. Cleanse the area with soap and water, dry, and cover with clean gauze. Observe for signs of infection such as redness, swelling, warmth, pain or drainage. Don't put weight on the foot that has an injury.
- See your doctor to check your feet during your regular visits for diabetes care. Take off your shoes and socks at every visit.

Thank you