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### 1. Question: What is diabetes?

Diabetes mellitus simply means “too much glucose or sugar in the blood”. that affects how the body absorbs and uses the glucose that come from the food we eat to produce energy. Now press **2** to learn the cause of diabetes.

### 2. Question: What causes diabetes?

Diabetes happens when the body is not able to use the sugar from food that we eat very well. This sugar accumulates in the blood and causes diabetes. Insulin makes the body cells to absorb the sugar that comes from the digested food we eat. Diabetes is caused by the following:

- Pancreas can be damaged and is unable to produce insulin at all or in enough quantity
- Pancreas is not damaged but the  $\beta$ -cells of the pancreas are unable produce insulin in enough quantity
- The cells of the body may not respond to the message from insulin so are unable to absorb sugar from the blood.

Now press **3** to find out if diabetes is hereditary.

### 3. Question: Is diabetes hereditary?

No, diabetes is not hereditary. However, if a member of your family has diabetes, it increases your risk of developing diabetes. This risk can be reduced through lifestyle changes and you won't develop diabetes. Now press **4** to find out if diabetes can be passed from one person to another.

### 4. Question: Is diabetes passed from one person to another?

No, it is not passed from one person to another. It is a non-communicable disease. Now press **5** to find out the types of diabetes.

### 5. Question: what are the types of diabetes?

There are two main types of diabetes. These are;

- Type 1 diabetes
- Type 2 diabetes

There are other types of diabetes that do not fall into these two groups. They are called atypical forms and include;

- diabetes in the newborn
- maturity-onset diabetes of the young
- latent autoimmune diabetes in adults
- Diseases of the pancreas (pancreatitis)
- Diabetes caused by damage to the pancreas by drugs or chemicals. Drugs that may lead to damage of the pancreas include drugs that fight HIV/AIDS (antiretroviral drugs), steroids, drugs that fight cancer etc
- Another type of diabetes that occurs during pregnancy is called gestational diabetes. This occurs when the blood sugar/glucose levels in a pregnant woman rises above normal levels.

Now press **6** to learn about type 1 diabetes.

#### 6. Question: What is Type 1 diabetes?

Type 1 diabetes happens when the immune system attacks the specialized cells in the pancreas that produce insulin. That is your immune cells will turn around to attack you! When they attack the  $\beta$ -cells they cause type 1 diabetes. This causes insulin production in the body to be low and large amounts of sugar accumulate in the blood and cause serious problems in the body. Type 1 diabetes was formerly called insulin-dependent diabetes because persons with type 1 diabetes must use insulin for treatment.

Now press **7** to learn more about type 1 diabetes

#### 7. Question: What age does type 1 diabetes occur?

Type 1 diabetes is usually first detected in childhood or adolescence. But it can occur at any age. Only five (5) to ten (10) people out of 100 people who have diabetes have type 1 diabetes. Now press **8** to learn about type 2 diabetes.

Now press **8** to learn about type 2 diabetes

#### 8. Question: What is type 2 diabetes?

Type 2 diabetes happens as a result of two serious events;

1. The body cells stop responding very well to insulin. This is called insulin resistance
2. When the beta cells stop producing insulin in adequate amounts

It takes a long time for a person to develop type 2 diabetes after insulin resistance starts. Although insulin resistance causes the amount of glucose (sugar) in the blood to increase, the symptoms of diabetes will not manifest. This stage is called pre-diabetes

Type 2 diabetes was formerly called non-insulin dependent diabetes because some persons affected by type 2 diabetes do not need insulin. This is because the beta cells in some person with type 2 diabetes are still producing insulin. But some people with type 2 diabetes have beta cells that are not producing enough insulin and must use insulin as treatment.

Nine (9) out of ten (10) persons with diabetes have type 2 diabetes.

Now press **9** to learn about the risk factors for developing type 2 diabetes.

### 9. Question: What are the risk factors for type 2 diabetes?

There are certain factors that make a person likely to develop type 2 diabetes. They are;

- i. Family history
- ii. Increasing age
- iii. high levels of blood sugar during pregnancy
- iv. weight gain
- v. Low levels of exercise or physical activity
- vi. Poor diet (eating foods that are high sugar, high salt, high saturated fat, high trans-fat and have little vegetables and fruits)
- vii. Using tobacco or alcohol
- viii. Stress

The first two risk factors cannot be changed. That is why they are called non-modifiable risk factors

The last seven risk factors can be changed. That is why they are called modifiable risk factors.

Now press **10** to learn about pre-diabetes.

### 10. Question: What is pre-diabetes?

Pre-diabetes is when blood sugar rises above normal levels but not high enough to be considered type 2 diabetes.

**The following test will show if a person has pre-diabetes:**

- i. **Fasting blood glucose:** 100 mg/dL (5.6 mmol/L) to 125 mg/dL (6.9 mmol/L).
- ii. **2-h blood glucose during 75-g OGTT:** 140 mg/dL (7.8 mmol/L) to 199 mg/dL (11.0 mmol/L) .

Now press **11** to learn the symptoms of type 2 diabetes

### 11. Question: how does type 2 diabetes manifest in the body?

The classic symptoms of diabetes are;

- Always feeling thirsty
- Always urinating
- Always feeling hungry
- Weight loss
- Poor wound healing
- Frequent infections in the skin, genitals, mouth and skin
- Blurred vision
- Dry mouth
- Burning pain and/or numbness of the feet

- Dark patches around the neck and arm pit and other parts of the body

Now press **12** to learn how diabetes is diagnosed

### 12. Question: What blood sugar levels will make you know that you have diabetes?

- A) Fasting plasma glucose:** Blood glucose after eight hours of no food/calorie intake of more than 126mg/dL or 7 mmol/L;

OR

- B) 75-g oral glucose tolerance test (OGTT):** Blood glucose after two hours following a glucose load of 75g of anhydrous glucose dissolved in water of more than 200mg/dL or 11.1 mmol/L;

OR

- C) Random blood sugar** of more than 200mg/dl or 11.1 mmol/L in individuals with symptoms suggestive of hyperglycaemia or DM (increased thirst, increased frequency of urination and increased appetite);

OR

- D) HbA1C** of more than 6.5% (48mmol/mol)

Now press 13 to learn how diabetes leads to weight loss

### 13. Question: How does diabetes lead to weight loss?

When a person has diabetes, the body cells are not absorbing the blood sugar. They are not able to produce energy. The body cells start breaking stored fat to produce energy. This leads to weight loss. It also makes a person to get tired easily.

Now press 14 to learn why diabetes makes a person to feel thirsty and urinate all the time.

### 14. Question: Why does diabetes make a person very thirsty and urinate all the time?

Diabetes makes the cells not absorb sugar, so it accumulates in the blood. This causes the cells to lose water and makes the person thirsty. The increased amount of sugar in the blood also makes the body get rid of the excess sugar through the urine. This leads to frequent trips to the bathroom to pass urine! This makes the body lose large volumes of water. This leads to dehydration. This makes the body want to drink water to relieve dehydration. This causes frequent thirst!

Now press 15 to learn if diabetes can kill.

### 15. Question: Can diabetes kill?

Diabetes has serious complications and can kill if not well managed. Some complications of type 2 diabetes can start very suddenly, cause serious illness, are life-threatening and can lead coma and death if not detected early and managed very well by a trained doctor. These are diabetes keto-acidosis, Hyperglycemic / Hyperosmolar States (HHS) or low blood sugar. Other complications last for a longer time and kill slowly.

Now press 16 to learn about diabetes keto-acidosis, an acute complication of diabetes.

#### 16. Question: What is diabetes keto-acidosis?

**Diabetes Keto-Acidosis (DKA):** Without insulin or adequate response to insulin, the body is unable to use the glucose from food we eat to produce energy, the body looks for other sources of energy. Hence, the body starts to breakdown other sources of energy like fats, proteins etc. This causes the by-products of these fats and proteins to accumulate in the blood in form of acids. These are called ketones. They can accumulate in the blood and reach dangerous levels. This is called diabetes keto-acidosis. In this condition, the breath smells like fruits and there is loss of consciousness with deep heavy breathing. DKA is hardly a complication of type 2 diabetes but can happen in rare occasions when insulin levels are really low. The only way to detect diabetes keto-acidosis is to check for ketones in urine or blood.

Now press 17 to learn about another acute complication called hyperglycemic/hyperosmolar states.

#### 17. Question: what is hyperglycemic/hyperosmolar states (HHS)?

**Hyperglycemic / Hyperosmolar States (HHS):** increase in the levels of blood sugar, leads to frequent passing of urine and dehydration. If blood sugar levels continue to rise without control, this also increases the level of dehydration to a point the body is unable to cope anymore. This happens at blood sugar levels as high as 600mg/dl or 33 mmol/l. This condition is rare but life-threatening. However, there are no ketones in the blood because the body is producing insulin. Symptoms of HHS are increased urination, too much thirst, tiredness/weakness, seizure or coma or confusion.

Now press 18 to learn about another acute complication called hypoglycemia.

#### 18. Question: what is hypoglycemia?

**Hypoglycemia:** treatment of type 2 diabetes can cause the blood sugar to reduce to very low levels. Blood sugar levels of 72mg/dl or 4mmol/l and less will lead to the following symptoms; confusion, headaches, loss of consciousness, seizures etc. Seek help immediately you start experiencing any of these symptoms.

Now press 19 to learn about how diabetes affects the body over a long period of time.

#### 19. Question: How does type 2 diabetes affect the body over a long period of time?

As the levels of sugar in the blood keep rising, it may cause the blood to become thicker than normal. This causes the blood not to flow freely inside the blood vessels. So, blood does not reach many parts of the body in adequate amounts. This leads to slow damage of the cells in these parts of the body. This makes these parts of the body not function well. The increased levels of sugar in the blood also cause damage to the blood vessels. This in turn will lead to the damage of the organs that these blood vessels supply. This is how chronic complications begin and progress over time.

Now press 20 to learn how diabetes affects blood vessels.

#### 20. Question: How does diabetes affect blood vessels?

Raised blood sugar affects the blood vessels in various ways; reduces their ability to open very well and allow blood to pass freely, gradually narrows the blood vessels, causes accumulation of fatty materials in the inner walls of the blood vessels etc. This can make the blood vessels stiff and not open up very well. This causes increase in the force that the blood uses to pass through these blood vessels. This leads to high blood pressure.

Now press 21 to learn how diabetes affects the nerves.

### 21. Question: How does diabetes affect the nerves?

When the blood vessels supplying the nerves of the body become damaged as a result of raised blood sugar, blood and nutrients are not able to reach these nerves in adequate amounts and they become damaged. This is called neuropathy. Nerves that affected by type 2 diabetes are peripheral nerves and autonomic nerves.

Now press 22 to learn how diabetes affects the skin.

### 22. Question: How does diabetes affect the skin?

it becomes dry and cracked. This makes it more prone to infections from germs outside the body. This may lead to boils, change in skin color, etc

Now press 23 to learn how diabetes affects the immune system.

### 23. Question: How does diabetes affect the immune system?

The body cells and chemical messengers that are responsible for fighting germs and protecting the body from infections do not function well. This leads to frequent infections.

Now press 24 to learn how diabetes affects the brain.

### 24. Question: How does diabetes affect the brain?

The levels of sugar in the blood affect the structure and function of the brain. Both high or low blood sugar levels affect the ability of the brain to perform mental work associated with reasoning, decision making, remembering, learning, concentrating, problem solving etc. High blood sugar can also increase the risk for dementia, stroke, depression and anxiety. Whereas low blood sugar can cause loss of consciousness and seizures. Pre-diabetes can increase the risk of developing brain problems that result from raised blood sugar even before symptoms of type 2 diabetes manifest.

Now press 25 to learn how diabetes affects the eyes and may even lead to blindness.

### 25. Question: How does diabetes affect the eye? Can diabetes cause blindness?

High blood sugar damages parts of the eye and the optic nerve. This leads to diseases like cataract, glaucoma, disease of the retina (retinopathy) and accumulation of fluid in the back of the eye (a condition called macular edema). These diseases of the eye can lead to problems of vision and can progress to blindness if not well treated.

Now press 26 to learn how diabetes affects the mouth.

### 26. Question: How does diabetes affect the mouth?

High blood sugar can affect various parts of the mouth like the teeth, gums, jaws, cheeks, tongue, roof of the mouth and bottom of the mouth. These parts of the mouth become prone to infections, buildup of plaque etc.

Now press 27 to learn how diabetes affects the heart.



### 27. Question: How does diabetes affect the heart?

High blood sugar associated with insulin resistance and type 2 diabetes can lead to damage of the blood vessels that supply the heart with nutrients and affect the nerves of the heart. This damage to the heart makes the heart not pump blood very well and also increases the risk of heart attacks.

Now press 28 to learn how diabetes affects the kidneys.

### 28. Question: How does diabetes affect the kidneys?

High blood sugar causes damage to the network of small blood vessels (glomerulus) that are responsible for filtering blood to remove waste particles that are passed in urine. This causes the kidneys to allow materials like albumin which do not normally pass into urine to start passing into urine. The passing of albumin in urine is called albuminuria. This is usually the first sign of kidney damage among persons with type 2 diabetes. However, it can go undetected. Therefore, it is important to check how well the kidneys of persons with diabetes are functioning. If not managed, this can progress to kidney failure and the need for dialysis or kidney transplant.

Now press 29 to learn how diabetes affects the digestive system.

### 29. Question: How does diabetes affect the digestive system?

The blood vessels and nerves that supply the digestive system can become damaged as a result of raised blood sugar. This will lead to symptoms like bloating, constipation, nausea, vomiting, always feeling full, reduced appetite etc.

Now press 30 to learn how diabetes affect the sexual health.

### 30. Question: How does diabetes affect the sex organs?

The blood vessels and nerves that supply the sexual organs such as the vagina in women and penis in men can become damaged. This causes dryness of the vagina in women, frequent vaginal infections and frequent urinary tract infections. In men, this can cause erectile dysfunction, urinary problems etc.

Now press 31 to learn how diabetes affect the feet

### 31. Question: How does diabetes affect the feet?

The damage to blood vessels and nerves cause the feet to become dry and not able to detect pain. The foot may become numb. The feet can also develop abnormalities like calluses, wounds that don't heal etc.

Now press 32 to learn how to prevent the complications of type 2 diabetes.

### 32. Question: How do you prevent complication of type 2 diabetes?

Maintaining blood sugar within normal limits reduces the risk of developing these complications. Treating other diseases such as hypertension and dyslipidemia reduces the progression of type 2 diabetes and associated complications. Screening for complications frequently can help to detect them early and help you take steps to prevent them from progressing.

Now press 33 to learn how to prevent eye complications in type 2 diabetes.

### 33. Question: How do you prevent eye complications in type 2 diabetes? How do you prevent a person with type 2 diabetes from getting blind?

Persons with type 2 diabetes should have a comprehensive eye examination at the time of diagnosis. If there are no signs of eye problems, this should be repeated every year. If there are signs of eye problems, this should be repeated more frequently to monitor the progression of the eye problems and treat them promptly.

Now press 34 to learn how to prevent kidney complications in type 2 diabetes.

### 34. Question: How do you prevent kidney complications in type 2 diabetes? How do you prevent a person with type 2 diabetes from getting kidney failure?

Check for protein/albumin in urine regularly. This is easily done with a microalbumin dipsticks. Discuss with your doctor to conduct a comprehensive kidney function frequently.

Now press 35 to learn how to prevent diabetes foot complications.

### 35. Question: How do you prevent feet complications in type 2 diabetes? How do you prevent a person with type 2 diabetes from getting foot ulcers?

Practice good foot care. This involves wearing comfortable shoes, wash feet every day and dry them carefully particularly between the toes, use emery boards to file down toes nails to avoid cuts, avoid putting feet in hot or cold water, put feet up when sitting and do not cross legs for long periods of time and avoid smoking. Inspect foot every morning in a well-lit room to check for cracks, blisters, red spots, warm spots, calluses, nail abnormalities, and foot abnormalities etc .

Now press 36 to learn how type 2 diabetes can be treated.

### 36. Question: What does treatment of type 2 diabetes involve?

The clinical treatment of type 2 diabetes involves the following;

- Lifestyle changes that focus on healthy diets, increased physical activity and weight management.
- Emotional support to manage stress and other psychological problems.
- Use of medications that lower blood glucose.
- Treating other related illnesses that may contribute to the progression of type 2 diabetes complications (cardiovascular disease, kidney disease etc).
- Preventing infections.

Now press 37 to learn about the medications used to treat type 2 diabetes.

### 37. Question: What medications are used to treat type 2 diabetes?

There are different groups of drugs that reduce the levels of blood glucose in the blood.

- Insulin works by making body cells to absorb and use glucose in the blood.
- Drugs that make the pancreas to release insulin. There are two types of drugs that function this way. They are sulphonylureas and meglitinides. Examples of sulphonylureas are glibenclamide, gliclazide etc. Examples of meglitinides are Repaglinide and Nateglinide.

- Drugs that prevent the liver from releasing blood glucose from its stores. These are biguanides. An example of a biguanide is metformin.
- Drugs that make the body cells to respond to insulin better. These are called Thiazolidinediones. An example is Rosiglitazone (avandia) and Pioglitazone (actos).
- Drugs that stimulate the pancreas to release insulin after a meal like the Dipeptidyl-peptidase IV (DPP-4) inhibitors and Glucagon-like peptide-1 (GLP-1) receptor agonists (GLP-1RAs). An example of a dipeptidyl peptidase IV is vildagliptin. While an example of a glucagon-like peptide 1 receptor agonist is liraglutide or semaglutide.
- Drugs that reduce the digestion and absorption of carbohydrates. These are called Alpha glucosidase inhibitors. An example is acarbose, voglibose.
- Drugs that cause the excretion of glucose from urine. These are called Sodium Glucose Co-Transporter-2 (SGLT2) Inhibitors. An example is canagliflozin, dapagliflozin, empagliflozin.
- Finally we have a newer group of drugs called Amylin which prevent the secretion of glucagon, delays food from leaving the stomach and helps a person to feel full. Amylin is an injectable.

Now press 38 to learn what to eat to prevent or manage type 2 diabetes.

### 38. Question: What diet works best for preventing or managing type 2 diabetes?

Food is a strong determinant of how well type 2 diabetes treatment will work. It is also important for preventing type 2 diabetes. The best food for diabetes is food that is rich in vegetables. Half of the plate should be filled with raw vegetables. One-quarter of the plate should be filled with proteins. Then one-quarter of the plate should be filled with whole grains. That is grains that have not been processed by blending or sieving. An example of processed grain is white flour, white rice, quick oats. Avoid sugary drinks like juice, soda/mineral water. It is important to avoid unhealthy fats that become solid in room temperature like margarine, palm oil, lard, vegetable oils etc. Healthy fats are those that don't become solid in room temperature like olive oil, peanut oil etc.

Now press 39 to learn how what is low carb or keto diet.

### 39. Question: Is low carb or keto best?

Low carbohydrate, very low carbohydrate and ketogenic diets have been shown to reduce blood sugar significantly. Sometimes, they even reverse type 2 diabetes. However, it does not work for everybody. Some people are not able to start and sustain these types of diet because they don't like the types of food required for keto. Sometimes, these diets are also difficult to maintain for a long time.

Now press 40 to learn if a person with type 2 diabetes can eat carbs.

### 40. Question: can a person with type 2 diabetes eat carbs?

Yes, a person with type 2 diabetes can eat carbs or carbohydrates. But it needs to be in small amounts that the body can handle. The carbohydrate should also be healthy one like whole grains. The carbohydrate should also contain a lot of fiber. Avoid adding sugar to drinks or food. Also avoid sugary drinks like juice, soda/mineral water. Avoid eating large amounts of fruits that have high sugar content like mango, pineapple, banana, etc. Berries like strawberry, black berry and blue berries are the best choice. But they are not readily available everywhere.

Now press 41 to learn about glycemic index.

#### 41. Question: What is glycemic index?

This is the measure of how quickly a carbohydrate is broken down into sugars and will lead to a rise in blood sugar. Simple sugars, sugar drinks and processed foods like white bread have high glycaemic index because they do not need to be broken down, they are absorbed very quickly from the digestive system and will lead to a rapid increase in blood sugar. Therefore, sugars and sugary drinks like juices have high glycaemic index. Unprocessed carbohydrates like whole grains that have very high fiber content are slowly digested. Hence, they will release sugars very slowly and do not cause rapid rise in blood sugar. They have lower glycaemic index. Vegetables have very low carbohydrate content and high fiber content. Hence, they do not tend to cause rapid rise in blood sugars. They have low glycaemic index.

Now press 42 to learn about glycemic load.

#### 42. Question: What is glycemic load?

This measures the extent that the carbohydrate will cause a rise in blood sugar by considering both the glycaemic index to the amount of the carbohydrate in the food consumed. For example, eating a very tiny portion of a carbohydrate with a high GI may not have a significant rise in blood sugar compared to eating a large portion of a carbohydrate with low GI.

Glycaemic load is calculated as;  $GL = \text{Glycemic index} \times (\text{amount of carbohydrate in the food expressed in grams divided by } 100)$ .

Now press 43 to learn about carbohydrate counting.

#### 43. Question: What is carbohydrate counting?

It is important to keep record of the amount of carbohydrate eaten during each meal. This process is called carbohydrate counting. This is useful for adjusting the dose of insulin and other glucose lowering drugs that induce the secretion of insulin, achieving weight loss goals and gaining a better understanding of how to limit carbohydrate intake when eating a low carbohydrate or very low carbohydrate diets.

As a general rule, 15grams of carbohydrate is equal to one carbohydrate count.

Now press 44 to learn about net carbs.

#### 44. Question: What are net carbs?

Net carbohydrate refers to the amount of carbohydrate that is absorbed into the blood stream after digestion. This is an important concept because not all carbohydrates are absorbed through the gut. Fibers are not absorbed while sugar alcohols are partially absorbed.

Net carbohydrate is calculated by subtracting fiber and half of the amount of sugar alcohols from the total carbohydrate foods.

Now press 45 to learn about if a person with diabetes taking insulin should avoid carbs.

#### 45. If a person with diabetes have to take insulin to cover carbs, why not just quit eating carbs?

A person with diabetes is not taking insulin to cover carbs. The person is taking insulin to help the body to use all foods for energy including carbs and those that are not carbs. Insulin is also important to help

the body use proteins and fats and oils. Insulin is also important for maintaining the body's organs like the liver, kidneys etc.

Now press 46 to learn about saturated fats.

#### 46. Question: what are saturated fats? What are unhealthy fats?

Saturated fats are made up of fatty acids that have single bond between the carbon atoms. This makes it easy for them to form a single line and pack together easily and in a very neat fashion. That is why it is easy for them to stay packed together to form solids at room temperature. Imagine tiny square blocks packed together to form a wall. **As a rule of thumb, saturated fats/oils are solid at room temperature. There are both animal and plant sources of saturated fats. Animal sources include meat, milk, cheese, lard, butter etc. Plant sources include palm oil, palm kernel oil, coconut oil, butter, shea butter, cocoa butter.**

Now press 47 to learn about trans-fats.

#### 47. Question: what are trans-fats?

Trans fats are another group of fats that are formed by adding hydrogen to vegetable oil to make it more solid at room temperature. It also makes the oils to last longer and taste better. This is called hydrogenation and it is done through an industrial process that leaves a product that is very unhealthy to the body. Examples of trans fats are; stick margarine and partially hydrogenated vegetable oils. Because they last longer and taste better than vegetable oils, trans fats are used in processed foods like cake, biscuits, pizza, ice creams, French fries.

Trans-fats are very unhealthy fats.

Now press 48 to learn about unsaturated fats.

#### 48. Question: What are unsaturated fats?

Unsaturated fats are made up of unsaturated fatty acids which have double or triple bonds between the carbon atoms. So it makes them form chains that are bent or kinked. These chains cannot pack together in a straight line and in a neat fashion. They cannot form a solid block. **As a rule of thumb, unsaturated fats do not form solids at room temperature. There are different types of unsaturated fats/oils. These are mono-unsaturated fats, poly-unsaturated fats and omega-3-fats.** Examples are olive oil, canola, avocado, melon/pumpkin, sesame oil, fish oil, soy oil, flaxseed oil etc.

Unsaturated fats are healthy fats.

Now press 49 to learn a little about cholesterol

#### 49. Question: what is cholesterol?

**Cholesterol:** Cholesterol is produced in the body by the liver and plays many useful functions in producing hormones and maintaining cell structure. However, cholesterol can be found in many foods including meat, eggs, fish etc. Eating large amounts of food with dietary cholesterol also clogs the heart and blood vessels.

Now press 50 to learn about bad fats.

### 50. Question: What are bad fats?

Fats and oils are useful in maintaining cell function and the structure of cell membranes and organs. However, not all fats are useful to the body. Some are actually harmful.

Examples of bad fats and oils are trans-fats and saturated fats. Trans-fats encourage the body to form bad cholesterol. They also tend to clog the arteries. They contribute to inflammation and insulin resistance. Trans-fats are so dangerous that an additional 2 percent of calories from trans-fat consumed daily increases the risk of coronary heart disease by 23 percent. Saturated fats do not show any benefits to heart health. However, they play a role in inflammation and insulin resistance.

Now press 51 to learn about good fats.

### 51. Question: What are good fats?

Unsaturated fats are good fats because they are associated with lower cholesterol levels in the blood. It lowers the bad cholesterol (LDL-C) and increases the good cholesterol (HDL-C). They have long term beneficial effects on the heart. Omega-3-fatty acids have shown to stabilize heart rhythm. Therefore, the rule of thumb is to replace saturated fats with unsaturated fats in food preparation. It is also important to eat fish, nuts and seeds that contain omega-3-fatty acids.

Now press 52 to learn how much proteins a person with type 2 diabetes should eat.

### 52. Question: How much protein should a person with type 2 diabetes eat?

According to most nutritional guidelines, Proteins should make up about 10% to 35% of total calories consumed per day. Persons living with type 2 diabetes also need to eat this same amount of proteins. Proteins can be derived from both plant and animal sources. However, there is need to reduce protein intake among persons are living with both type 2 diabetes and kidney disease. Plant sources of protein have been reported to produce better outcomes among persons with kidney disease.

Now press 53 to learn how to avoid taking too much sugar.

### 53. Question: How do I avoid taking too much sugar?

Here are some tips that might help to reduce taking too much sugar.

- ❖ Replace recipes that will require sugar or sweetener with savory options. For example, instead of having oats porridge for breakfast, this can be replaced with vegetables or stir fries etc.
- ❖ Replace sugars with fruits when preparing food. For example, instead of using sugar in a pancake, use banana or berries
- ❖ Drink more water
- ❖ Drink good, plain and old coffee instead of latte or cappuccino

Now press 54 to learn how to avoid taking too much salt.

### 54. Question: How do I avoid taking too much salt

Here are some of the tips that might help to reduce taking too much salt

- ❖ Avoid packaged and processed foods because salt and sodium containing compounds are used as preservatives.
- ❖ Eat more fresh and whole foods
- ❖ Avoid the use of bouillon cubes, stock cubes and seasonings
- ❖ Avoid the use of mono-sodium glutamate
- ❖ Use more natural spices such as cinnamon, ginger, garlic, mint, scent leaves, pepper, onions etc
- ❖ Use shreds of seafood, fish and meat to enhance the taste in recipes.

Now press 55 to learn how to avoid taking too much fats/oils.

#### 55. Question: How do I avoid too much fats/oils?

Here are some tips that might help to avoid taking too much fats/oils.

- ❖ Limit cooking oil to olive oil and other mono-unsaturated or poly-unsaturated fats
- ❖ Do not add oil in foods that already have high fat content example meat, seeds like melon/pumpkin, sesame, fish
- ❖ Among cultures that rely on use of palm oil as cooking oil, use other natural food ingredients that can give the red color to cook examples are:
  - Use of turmeric and curry powder in sauces instead of palm oil
  - Use of red colored vegetables to cook lentils and whole grains
  - Limit the quantity of red oil used to the barest minimum

Now press 56 to learn how much water a person with type 2 diabetes should drink.

#### 56. Question: How much water should a person with type 2 diabetes drink?

It is important to drink from 3-6 liters of water everyday depending on the weather, level of physical activity and health condition. Do not wait until you are thirsty to drink water. Tips to help you drink more water include:

- Use a portable water bottle filled with water all the time.
- Put a glass of water in front of you while you are at work to remind you to drink water
- Drink water before and after every meeting with friends and colleagues.

Now press 57 to learn about the types of beverages a person with type 2 diabetes should drink.

#### 57. Question: What beverages should a person with type 2 diabetes drink?

Always opt for beverages without sugar. For instance, opt for plain black coffee instead of latte or cappuccino. Opt for unsweetened hot chocolate instead of the sweetened version. Opt for green tea instead of Consider using fruits and spices to add some taste to plain drinks.

Now press 58 to learn if a person with type 2 diabetes should drink alcohol.



### 58. Question: should a person with type 2 diabetes drink alcohol.

There is no clarity on the evidence of any harmful or benefits of drinking alcohol for persons living with type 2 diabetes. However, drinking alcohol within healthy limits is recommended. Wine/beer at one glass a day for females/ two glasses a day for males is recommended.

Important things to note about alcohol are:

- ❖ Excessive consumption of alcohol increases the risk of developing type 2 diabetes as well as complications related to diseases of the heart and blood vessels
- ❖ Alcohol may enhance weight gain
- ❖ Alcohol may lower blood sugar. Therefore, alcohol should not be taken on an empty stomach, before or during exercise. It is important to monitor blood sugar when drinking alcohol. This will help detect when blood sugar levels are low and make the needed adjustments in insulin or other glucose lowering medications that promote the secretion of insulin.

Now press 59 to learn healthy tips for eating outside the home.

### 59. Question: what are the healthy tips for eating outside the home?

Eating outside the home can interrupt a healthy eating routine. Here are coping tips:

- When eating out with friends, always choose a healthy dish like a salad and limit alcohol intake
- Plan for these events ahead of time
- When travelling for a short or long period of time, plan your meals and identify sources of healthy meals in the place where you are going.
- Avoid the eating the snacks at bus stops and airports

Now press 60 to learn the types of physical activity/exercise a person with type 2 diabetes should do.

### 60. Question: What types of exercise or physical activity can a person with type 2 diabetes do?

Persons living with type 2 diabetes are recommended to have:

- At least 150 minutes of moderate-intensity aerobic physical activity. This can be increased to more than 300 minutes a week.
- At least 75 minutes of vigorous intensity exercise. This can be increased to as high as 150 minutes a week to get maximum benefits.
- At least 20-minute session of resistance/strength training exercises for about 2 or more days a week.

These exercises should be done as a combination every week. It is important to avoid long periods of being sedentary per day.

Now press 61 to learn the benefits of exercise/physical activity.



### 61. Question: what are the benefits of physical activity?

Physical activity improves mental health, cognitive function, builds muscle and bone mass, makes the heart and lungs stronger and helps the kidneys to remove waste from the body.

Now press 62 to learn if physical activity reduces blood sugar.

### 62. Question: Does physical activity reduce blood sugar?

Moderate and vigorous intensity exercises tend to reduce blood sugar levels. Hence, there is need to monitor blood sugar levels before and after exercise. If a reduction in blood sugar is observed, it is important to adjust the dosage of insulin and other blood glucose lowering medications appropriately. Avoid exercising on an empty stomach. Low to moderate intensity physical activity like walking or cycling after a meal helps in reducing blood sugar after a meal. Brief high intensity exercises may reduce blood sugar levels for days after exercise.

Now press 63 to learn how a person with type 2 diabetes can form the habit of taking their medications correctly and consistently.

### 63. Question: How does a person with type 2 diabetes ensure that they take their medications correctly and consistently?

Correct and consistent use of medications over a long period of time is very important for maintaining good health, achieving treatment outcomes and preventing both short- and long-term complications of type 2 diabetes.

Here are strategies to start and sustain correct and consistent use of medications over a life-course.

- Understand what and how the medication is used
- Monitor and report side effects
- Plan to buy and sustain supply of the medication
- Set reminders to take medication on time
- Avoid taking multiple pills for the same condition

Now press 64 to learn how to stay healthy and strong with type 2 diabetes.

### 64. Question: Can a person with diabetes be just as healthy as someone without it if they properly control it?

Yes, they can be as strong, healthy, and happy as someone without type 2 diabetes. To do this, they need to adjust in their lifestyles and work with their doctor and clinical care team to manage type 2 diabetes. Some key adjustments include;

- i. Changing diet and eating pattern to healthier choices
- ii. Exercise often
- iii. self-monitoring, care and management
- iv. take medications correctly and consistently

Now press 65 to learn things that people believe and spread as rumours but are not true about type 2 diabetes.

### 65. Question: Is diabetes caused by eating too much sugar?

Diabetes is not caused by eating too much sugar. It is not cured when a person stops eating sugar.

Now press 66 to learn why slim people can still have type 2 diabetes

### 66. Question: Can slim people get type 2 diabetes?

Yes, it is true that weight gain is a risk factor for type 2 diabetes. But people who have normal weight or are even slim or skinny can get type 2 diabetes. This may happen if they have risk factors or conditions that prevent their body from producing or responding to insulin. This may be due to a combination of factors such as lack of exercise, poor diet, too much stress etc.

Now press 67 to learn if diabetes can be cured or not

### 67. Question: Can type 2 diabetes be cured or reversed?

Type 2 diabetes cannot be cured. It cannot be reversed. But in some cases, type 2 diabetes can be treated by combining intensive changes in diet and physical activity to the point that a person achieves normal blood sugar levels without medications. But this is not a cure because if the person stops the intensive lifestyle changes, the blood sugar will increase again. For people with pre-diabetes, combined diet and physical activity can successfully reduce the risk of developing type 2 diabetes by 50-60% for up to three to six years. The reduced risk can persist for a long time if the person remains consistent.

Now press 68 to learn if diet only or physical activity only is enough to control or prevent type 2 diabetes.

### 68. Question: Is diet only or physical activity only enough to prevent or control type 2 diabetes?

No, diet only or physical activity only is not enough to prevent or control type 2 diabetes. This is because a combination of both is required for preventing or controlling type 2 diabetes. For people with pre-diabetes, combined diet and physical activity can successfully reduce the risk of developing type 2 diabetes by 50-60% for up to three to six years. The reduced risk can persist for a long time if the person remains consistent.

Now press 69 to learn the best way to control type 2 diabetes without medication.

### 69. Question: What is the best way to control/manage type-2 diabetes without medication?

It is important to manage type 2 diabetes with the guidance of a medical doctor and a clinical care team. The doctor will determine if you need medications or not. They will prescribe treatments based on the severity and duration of type 2 diabetes. However, if you opt to manage type 2 diabetes without medication, you will need to adhere to very strict diet and physical activity regimen. You also have to be closely monitored by a medical doctor and clinical care team to determine if the strict diet and physical activity is working. If it is not working, they may recommend medications.

### 70. Question: Are there any strategies to reduce the harmful effects associated with occasionally eating foods rich of sugar?

People believe that after eating a food that is high in sugar, they need to take a bitter or sour drink or food to counter the effect of this sugar. This does not work because there are no strategies to reduce the

harmful effects associated with occasionally eating foods that are high in sugar. It is important to avoid eating too much sugar. Here are some tips to avoid eating too much sugar.

- ❖ Replace recipes that will require sugar or sweetener with savory options. For example, instead of having oats porridge for breakfast, this can be replaced with vegetables or stir fries etc.
- ❖ Replace sugars with fruits when preparing food. For example, instead of using sugar in a pancake, use banana or berries
- ❖ Drink more water
- ❖ Drink good, plain and old coffee instead of latte or cappuccino

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