

### Fast action can save many lives!

During a heart attack a "clot" blocks the artery and prevents blood reaching the heart muscle. That part of the heart muscle begins to die. The more time passes without treatment the more the damage. Timely treatment dissolves the clot and opens the arteries to rejuvenate the muscle.

### Heart attack warning signs!

#### Chest discomfort

Feeling uncomfortable with pressure, pain, squeezing, and heaviness in the centre of the chest which lasts more than a few minutes or goes and comes back. (Especially, if it lasts beyond 30 minutes or not responding to sorbitrate, it is extremely suggestive of a heart attack).

#### Discomfort in other parts of the body besides the chest

Discomfort (pain or heaviness) may be present in the arms, back, neck, and jaw. Chest discomfort may spread to the arms, shoulders, jaw or neck or, sometimes, may travel to the chest from those areas.

Much less common is upper abdominal pain with feeling of fullness, acidity and indigestion. This does not respond to antacids and should not be ignored but checked up for a possible heart attack.

### Eye Care

Retina in the eye is that area of the eye where light changes into electrical impulses which are then sent to the brain.

Diabetes can damage blood vessels throughout our bodies. The vessels in the eyes seem especially vulnerable to damage. In the early stages of retinopathy, fluid can leak from small blood vessels in the retina. If this leaking occurs in the macula, then objects may appear blurry. (The macula is the center of the retina which controls our sharp reading vision).



Proliferative retinopathy is an advanced form of retinopathy. Proliferative retinopathy occurs when abnormal blood vessels grow on the retina and sometimes into other parts of the eye. If these vessels bleed into the vitreous - the clear fluid in the center of the eye, light can't reach the retina and vision can become cloudy. The blood may be slowly reabsorbed and vision can return to normal but if the bleeding continues, vision may be cloudy until the problem is treated.

Tissue can also grow along with the abnormal blood vessels, distorting vision or making objects appear blurry. Over time, the tissue can shrink, pulling the retina away from its base.

If the blood doesn't reabsorb or if the tissue affects your vision, the vitreous may need to be surgically removed to avoid loss of vision. All these problems of the eyes can be prevented if prevention is started early.

### Early Detection is the key to prevention!

When you go the doctor for an eye examination, he or she will check your retina using one of several methods.

Your pupils will be dilated and the eye specialist will check the retina with a device called an ophthalmoscope, which directs a beam of light into your eye to look at the blood vessels in the back of the eye.

A slit lamp, a microscope used to magnify the inside of the eye, is another tool your doctor might use to examine your eyes. Again, your eyes are dilated and a lens is held near your eye so the doctor can see the eye in detail.

If the retina looks suspicious, your doctor might want to do a fluorescein angiogram. A dye called fluorescein is injected into your arm, taking only a few seconds to reach the eyes. Technicians will take several photographs of your retina. These photographs will show if any leakage or abnormal blood vessels are present. Your doctor will know exactly what areas of the retina need to be treated. Once these leaks or new vessels are accurately detected then they can be sealed with laser treatment. This can prevent vision loss.

### What you can do for your eyes

- Carefully control the amount of glucose in your blood. Better the blood sugar control lower are the chances of retinopathy. Even if it occurs it will be later and milder.
- Visit the Doctor for a retina check before Vision is affected.
- Visit the eye doctor for a detailed retina examination at least once a year.
- Maintain a good control of the blood pressure.
- Maintain optimal lipid levels.
- If there is even a minute change in vision see the eye doctor immediately.

Remember, YOU are the most important person caring for your diabetes. Your actions and those of your doctor will save your vision.

### Footcare

Remember, foot problems in diabetes are preventable!

There are three reasons why people with diabetes are at high risk for foot problems.

- The first is decreased circulation to the legs and feet.
- A second reason is the loss of the sensation in the feet.
- The third reason for concern is a decreased ability to fight infection when diabetes is poorly controlled.



These three problems often work together to make even a common occurrence like a callous, a threat to your foot and therefore your health. Because of loss of feeling, you may not be aware of a callous forming. As it becomes thicker, the tissue under the callous can be damaged. If the skin is very dry, cracking can occur, allowing bacteria to enter. Infection can easily develop. When there is decreased circulation or poor control of blood glucose, it will be very hard for the body to fight this infection.

Without prompt treatment there is a serious risk of further damage to the tissue to create a condition called gangrene. If this happens it is not reversible and the only treatment is amputation.

In most cases, however, serious foot problems can be prevented. Keeping your blood glucose well controlled is crucial for general foot health and healing. You must also make foot care a part of your daily routine.

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# Diabetes

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### What happens in diabetes?

When enough insulin is not available or when the insulin isn't able to perform its task well, as in Type II diabetes, the body reacts much like a machine running out of fuel.

Glucose is the fuel of the body, the fuel of each and every cell of the body. Insulin provides the key which allows glucose to enter the cells. When enough insulin is not available or when insulin is not able to function, then, the fuel- glucose can't get into the cells, where it is needed; it then builds up in the blood. The unused glucose circulates through the kidneys. When the amount of glucose is more than what the kidneys can handle, the extra glucose spills out into the urine.

### What are the different "types" of diabetes?

Diabetes can be of different types

- Type I diabetes
- Type II diabetes
- Gestational diabetes

**Type I diabetes** usually occurs in younger people, children and adolescents.

**Type II diabetes** is the commonest diabetes. It usually occurs after age 40 - but Indians in India, all over the world are getting it at a much younger age.

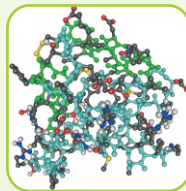
Another type of diabetes is called "gestational" diabetes. It occurs only during pregnancy. Although, gestational diabetes goes away after the baby is born, women who have had it, are at higher risk for Type II diabetes, later on.

Some individuals may have blood glucose levels above normal but not high enough to be labelled as diabetes. This is called "**prediabetes**" or "**impaired glucose tolerance**". It is especially important for these people to make changes in their eating habits, exercise frequently and to lose weight, if needed, to prevent full blown diabetes. Even at this stage diabetes can be prevented and the prediabetes state can be returned back to normal. Regular blood glucose tests should be done by the doctor. This condition may progress to Type II diabetes especially if lifestyle of the individual does not change.

### Pancreas & Insulin

The pancreas is a small gland, located just below and behind the stomach. The islets of Langerhans within the gland contain beta cells, which secrete insulin. The islets make up only about one percent of the pancreas.

The beta cells are amazing! A normal pancreas has about 100,000 islets of Langerhans, and each islet has from 80 to 100 beta cells. These cells can measure the blood glucose every 10 seconds to within a range of 2 milligrams percent. (That's brilliant, faster than any laboratory!) Within a minute to a minute and a half, the beta cells can deliver the exact amount of insulin needed to keep blood glucose levels normal.



When diabetes is not present, it's almost impossible to raise the blood glucose level too high. The insulin supply is almost inexhaustible.

The pancreas has several other functions, including producing certain enzymes needed for digestion. In addition, the pancreas contains alpha cells, which make a substance called glucagon. Glucagon seems to balance out the effects of insulin and helps keep blood glucose levels normal. Delta cells are also found in the pancreas. These cells make yet another substance, called somatostatin, which appears to carry messages between insulin and glucagon.

### What does insulin do?

Insulin is like the key that control movement of fuel (glucose) and storage of fuel.

The body uses two types of fuel - glucose and fats. Carbohydrate is the most readily available source for glucose and can easily be converted into fuel for immediate use. Some glucose will be stored in the liver and muscles as glycogen to be used later and during exercise. Carbohydrates not needed for immediate energy or replacement for glycogen will be converted to fat. Insulin is required for each of these processes to take place.

Protein, which is made up of amino acids, can be another source for glucose. If the body doesn't receive enough carbohydrate to use as a fuel source, the liver, with insulin present, can change some of the amino acids into glucose. Insulin also allows amino acids to be used for building and repairing muscle and body tissues (in other words for healing our injuries).

Fat fuel in the form of triglycerides is absorbed from the intestine. Insulin allows triglycerides to go directly into fat cells where it is stored and used for future energy needs.

**Insulin, therefore, is important not only for the body's use of glucose, sugar and carbohydrates, but in the use of protein and fat as well.**

### Diabetes is preventable !

**It's real, diabetes is preventable!**

**You can prevent diabetes if you**

- Indulge in brisk walking (or other forms of physical activity) for minimum 30 minutes, 5 times a week.
- Maintain an ideal body weight; or lose about 5-7% of your body weight ( if you body weight is more than desired). Even 2-3 kgs of weight loss can make a difference.

Scientific evidence conclusively shows that diabetes is preventable even in people who are at a high risk for developing diabetes.

**When are you at a high risk of developing diabetes ?**

- You are overweight ; your BMI is more than 22.9.
- Your parents or brother sisters or grandparents have or had diabetes.
- If you delivered a baby whose birth weight was 3 kg or more.
- If you have had diabetes or even mild elevation of blood sugars during pregnancy.
- If you are physically inactive, that is, you exercise less than 3 times a week.
- If you have high blood pressure.
- If you have pre-diabetes.
- If your triglycerides and or cholesterol levels are higher than normal.

**What is pre-diabetes?**

Pre-diabetes is a condition where the blood glucose levels are higher than normal but not high enough to be called diabetes. Pre-diabetes has been shown to have harmful effects on the body in the long run.

People with pre-diabetes are more likely to develop diabetes and are also more likely to develop **heart attack** or **stroke**.

Life style changes can actually turn back the clock and return elevated glucose levels to the normal range.

- Cheers! diabetes can be prevented!
- Small changes can bring big benefits!!
- Be **physically active** for 150 minutes in a week
- Lose about 5-7% of your body weight, if your BMI is more than 22.9

### Diabetes Prevention

Diabetes prevention & management: Regular control of blood sugar along with control of risk factors is the main stay of diabetes management. Also, since diabetes can affect the eyes, kidneys and the foot, vigilance has to be maintained on these fronts too.

Unlike 50 years back, advances in medicine and science have shown that diabetes can be prevented even in people who are prone to it. If one already has diabetes then complications due to diabetes are also preventable in majority of the people through appropriate diabetes care.

- Prevention is very effective when it is started early.
- Don't wait for symptoms to appear to check for complications. By the time you get symptoms its too late to prevent problems.

**Always use insulin when needed.** It has been seen that many times patients and even doctors are hesitant to use insulin even when it is needed. Insulin is very safe and is not addictive. Moreover, with advances in medical technology, taking insulin injections is almost painless and very easy.

The key to good control of blood sugars is appropriate balancing of diet, physical activity and the medicines (when prescribed).

### Diabetes Management

#### Blood sugar control

What do we mean by " Blood Glucose Control? "

Everyone's blood glucose values vary throughout the day. Many factors influence this: food, exercise, medications, and stresses to name a few. Good control means balancing these factors to keep glucoses as close to normal as possible.

For individuals who don't have diabetes, the blood glucose levels are almost always between 60 and 140 milligrams of glucose per deciliter of blood (mg/dl).

With diabetes, we need to look at the blood glucose before meals and one to two hours after meals to understand how you are doing. A comfortable goal before meals is 60 to 110 mg. After meals, aim for levels below 160 mg/dl.

#### How does one control blood sugars?

Blood sugars are a function of an appropriate balance between diet, physical activity and medicines (if medicines are required). If one is overweight then gradual reduction of body weight to normal levels helps to control blood sugars and bring down the medication. If one is inactive, then, increase in the daily **physical activity** levels (for example brisk walking every day) can bring down the sugar levels.

### Diabetes & Heart

People who have diabetes are also more susceptible to heart attacks. Many times these heart attacks can be silent.

**Don't hesitate to seek medical help!**

Many times heart attacks are silent when a person has Diabetes

