

## First Pillar - Exercise

- 1) **Influence of education:-**
- 2) **Understanding diabetes:-**
- 3) **Pre-diabetic state:-**
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- 27) Blood circulation – basis for healthy life-force:-**
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## **1. Influence of education:-**

We cannot go to the doctor for advice every day after getting diabetes. It is therefore necessary for us to acquire as much information about the various aspects of this ailment as possible.

Many people being highly educated are completely uneducated about diabetes. The very first Pillar is knowledge if only because, only after getting true knowledge we can accept the other Pillars. Besides acquiring the knowledge is quite easy. The patient who knows the most suffers the minimum.

There is a saying in English 'Ignorance is bliss'. Some people are not interested in knowing about diabetes and feel that they are living in bliss. A grave mistake indeed!

In China knowledge about diabetes control has been linked to their traditional medicine. India can also learn a good lesson from this. Ayurveda may be useful but we should not forget about the important research conducted about diabetes.

Former chief of Egypt, Nasser and health minister Abu Salam, both had diabetes. Perhaps it was because of this that the Diabetes Association of Egypt could successfully carry out a process. In those days match sticks were used extensively in all house holds. On the match sticks small sentences about diabetes were printed which influenced the general public in a big way. In this way through bus and rail tickets and other media, awareness about healthy lifestyle can be brought home to the man on street.

Dr. Joslin in whose name Joslin Diabetic Centre is being run says that those diabetics who know the most live the longest. If you read the things given here a couple of times, you will very well understand everything and will be inspired to inculcate the other Pillars in your life.

*Advantages of group discussions among diabetics:*

1. Get to know the others with similar affliction.
2. It feels nice to know that there are others who also suffer like me.
3. Get a chance to air our fears and anxieties.
4. Get to know what people say about one's lifestyle.
5. One becomes aware of oneself & about the various aspects of the ailment
6. One gets inspiration by observing the other.
7. Each one can get help and cooperation from the other.

Diabetes patients can help each other quite a lot, by exchanging their respective experiences. In a panel discussion, Robert Fernandes while describing his experience said, 'I had slept yesterday night at 12:30. When the alarm rang at 6:30 I was feeling very sleepy so even as I was thinking of not going for my morning walk my wife woke me up asking me to start for the walk and that she would accompany me. After about 45 minutes walk I felt very fresh and felt that I would have missed this experience of freshness and energy if I had avoided the walk and kept on sleeping.'

From this narration of Robert many got the inspiration and were determined to go for a regular morning walk.

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## **2. Understanding diabetes:-**

Most people think that diabetes means shortage of Insulin. But many diabetics have more Insulin than normal persons, though this Insulin is not working on the body cells due to which sugar retention in the blood increases. Some people also say that there is diabetes in urine but no diabetes in the blood or there diabetes in blood as well as urine and so on. Some diabetes patients have 250mgdl blood sugar but still it does not appear in urine. This state is known as diabetes with 'the increase of the capacity of the kidneys to save sugar'. All the same, the real meaning of diabetes is increase of sugar in proportions not acceptable in the blood. Normally when blood sugar increases beyond 180 mgdl it starts appearing in urine also.

Research conducted on patients with type-1 diabetes it is found that this capacity could be from 60 mgdl to 216 mgdl Thus in some cases only after it reached 216 in the blood. This is the reason why blood sugar testing is a must. In fact increase of sugar in the blood is important. Having diabetes means having sugar in excess of 125 mgdl. fasting and 200 mgdl. two hours after meals. In some cases even when the blood sugar level is around 125 sugar starts appearing. This is not diabetes. This state is called glucosuria and entails treatment different from diabetes. While it is easier to get sugar in urine checked frequently, it is important to get blood sugar checked at least once a month. Because if blood sugar is under control diabetes is under control.

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### 3. Pre-diabetic state:-

If 2 hours after consuming 75 grams of glucose if the blood sugar shows between 140 and 200 mgdl then it means that you have no diabetes but there is a good possibility that you may be afflicted with the ailment.

This state is due to diminished ability of the body to use-up glucose or 'insulin-resistance'. Meaning is that terrorists have not entered the country but are waiting for an opportunity on the border, be cautious! About 8% people in this category become diabetic every year. Which in effect means that after 5 years 40% of these people will become diabetic.

*Please remember.....*

It is not sufficient just to acquire knowledge of diabetes, it is also imperative that it is used at the right time.

After acquiring the knowledge, after about a couple of months or a year, the patients tends to forget what is told. It is therefore necessary to be refreshed about it after a while. This is reason why in the camp for 'Living positively with diabetes' we exhort the participants that they should educate at least one patient every month. As the Chinese proverb says, what we hear we forget, what we see we may remember but what we tell others we always remember.

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### 4. A history worth knowing:-

The history of diabetes is very long. Some of the facts that are worth knowing and interesting are described.

First of all, in the ancient Ayurvedic treatises of Sushrut, Charak and Wamabhata we find the description of symptoms of ketoacidosis caused by increase in blood sugar, and also the various types of diabetes. Demetrius of Epamia had noticed the difference between thirst in an ordinary person and the one craved for by a diabetic. He had noticed that whatever a diabetic patient drinks, it is excreted through urine.

The word diabetes is in vogue all over the world except that in German language it is known as 'Zuckerkrankheit' apart from diabetes. In Maharashtra it is also known as 'madhumeh'.

Dr. Gallen, 50 years junior to Dr. Eretius has written, 'During my entire lifetime I had the occasion to know only two diabetics.' This indicates that diabetes was very rare in those days. In therapeutic books like 'Corpus Hippocraticum' and Egyptian Peppiri, which were written many years before Christ, do not give proper description of diabetes.

Because in diabetes one has to urinate a lot Gallen thought that it was a disease of the kidneys. For many centuries health carers believed in this theory. In the middle of the 18th century a British chemist named Mathew Dobson could segregate sugar from the urine of a patient.

In 1682 Brunner observed excessive urination from dogs whose pancreas had been removed. They also suffered from excessive thirst.

In 1894 Adolf Kusmaul has described about deaths of some diabetics due to a strange affliction arising out of diabetes.

In all these three instances, heaviness of breath, faster rate of heart-beat, smell of apple from the breath and unconsciousness were common symptoms described.

Just as Gallen believed diabetes as a disease of the kidneys, it would be interesting to know what the other doctors thought about it. Thomas Sydenham spread the word that diabetes is a disease of the digestive system. Richard Mead thought it to be an ailment of the spleen. Kullen publicised it as an affliction of the brain.

Even 300 years before Christ the Greek health-carers knew about the pancreas but nobody thought that it had link with diabetes till the 19th century.

For a long time it was believed that pancreas was a useless limb and that in an adult it remains as a part of fat. It was Dr. Johaan Conrad Brunner who was a professor in Heidenburg, did extensive research on the pancreas. He experimented with animals by tying up the pancreas and removing it. Experiments conducted in 1682 showed symptoms of diabetes, but what a coincidence, Dr. Brunner could not identify them as a disease of the pancreas. After almost about 200 years, in the year 1889 experiments conducted by Merring and Minkaoski it was proved that diabetes is indeed a disease of the pancreas.

In 1869 a young man named Dr. Paul Langerhans wrote a 32 page thesis for his Ph.D. in which he described the various cells of the pancreas. Out of these the 9th ones he named as 'island cells'. These cells later became famous as 'Islets of Langerhans'. Merring and Minkaoski have accepted that it was just a coincidence that they could identify the link between pancreas and diabetes. They were actually experimenting on the subject of how the fat is utilized. Dr. Minkaoski told Dr. Merring to cut the pancreas of the dog and his assistant executed the order on the same day. At that time nobody was aware of the impending problem. The dog started urinating all over in the laboratory. Minkovasky had a sudden inspiration and he tested the urine of the dog and found considerable amount of sugar in it. Immediately they experimented on many other dogs. There was no sugar in their urine before removal of the pancreas. It was there after it was removed. You will be surprised but it was because of this experiment the link between diabetes and pancreas was established. If pancreas was tied, many of the cells used to die but there was no diabetes. It used to happen only when the pancreas was completely cut off.

Minkovasky and Hedon also made other experiments in which they fed the pancreas after cutting it to the same dog but it did not make any difference. But when they transplanted a part of the pancreas under the skin, diabetes started healing. This fact established that there is some substance which gets assimilated in the blood due to which blood sugar comes under control.

In 1906 Wilhem Heiburg developed a process of counting the 'Islets of Langerhans' cells precisely and found that these cells become significantly less in diabetes.

Before 1908 more than 300 ml blood was needed for testing. In 1908 Christian Beg discovered a process by which blood testing could be done with 10 ml blood. In 1905 Benedict found a way to test blood by just 0.5 ml.

The credit for discovery of Insulin goes to Dr. Frederic Grant Banting and his student, Charles Best. It was a coincidence that even before this many other doctors had experimented on the contents of the pancreas. But no one dared to experiment on the human being.

The history of discovery of Insulin is also quite interesting. Dr. Banting was an Osteopath. He was just 30 years old in 1921. He thought of experiment on the inner substance of the pancreas. He contacted the director of Institute of Physiology of Toronto, Dr. McLeod. He gave him one room for experiments, ten dogs and two students. These experiments were not expected to go on for more than 8 weeks in which Charles Best and Clerk Nobel were to assist him. They tossed for the assistant in the first month and Charles Best it was. As Nobel was busy

in some other work best had to continue work in the second month also. And thus Charles Best became world famous.

Dr. Banting tied the tubes in the pancreas of the dogs and after seven weeks, he injected in the dogs whose pancreas was cut off, whatever 'Islets of Langer' were left, from those pancreas-tied dogs. Within 2 hours they found that the sugar in their urine had been significantly reduced. After many experiments, on 11th January 1922, a diabetic boy of 14 years, Leonard Thompson, was injected Insulin for the first time. It is true that he had an abscess on place of injection but it also considerably helped in his diabetic control and resultant recovery.

Now everybody knows the word 'Insulin' but in the beginning it was termed as "Isletin".

### "History makes the man wise"

- Francis Bacon (Essays of Studies)

Until 1922 it was thought that those afflicted with diabetes cannot live for more than a year or two and that if anybody does manage to live beyond, then he may well be honoured with a reward.

A well known personality from France was diagnosed for diabetes. He thought that since death is inevitable why not spend the rest of life in complete luxury! And he started living in a remote place in France drinking heavily. After a while Insulin was discovered and people started living long. One of his friends made the news known to him through a letter. And lo! Mr. Wells returned and lived a long and fruitful life with the help of Insulin. Today there should be no fear of diabetes as many effective medicines and treatments have been found while Insulin and lifestyle changes have brought long and fruitful living well within the reach of common man.

Oral medicines for diabetes became available from 1955 itself while from 1983 synthetically made human Insulin has become available. Research to find out immunisation against diabetes is also underway. Preventive shots made of GUD-65 are being experimented on humans. Similar experiments are being conducted for BCG and Dengue-fever and the results are encouraging. It has been found that the BCG shots calm down the disturbance causing immune system. Until 1960 people with diabetes had problems finding jobs. They could not get driving license and were generally treated as low grade citizens.

Dr. Peter Sonsken and his associates from St. Thomas Hospital of London have conducted extensive research to find out which particular things help in diabetes control. From a study conducted in 1891 (or is it 1981?) it has been found that men have better control of diabetes when compared to women. This probably is the reason why women take more care of their families while neglecting their own health.

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## **5. Why did I get diabetes?**

Some truths about diabetes uncovered have revealed some of the causes leading to diabetes. As per a study conducted by WHO, incidence of diabetes was found to be between 16-22% among people from Asia, China and American Hispanics who have settled in other developed countries.

There are hardly any diabetics in the villages of Papua New Gini. But when Indians started settling in Fiji have been found to be highly diabetic. Similarly according to the results of another WHO study people from India who have settled in Singapore, South Africa, Mauritius, Tanzania and England are excessively diabetic. It can therefore be surmised that because they have adopted the lifestyle of those respective countries incidence of diabetes among them has increased by 7 to 8 fold. The lifestyle changes have caused the following happenings:

Doctors who have crossed 60 years know that diabetes used to happen only after the age of 65 years, but now it has started happening at the age of 35 years itself.

Diabetes in India:

1. Incidence is very high
2. More among men
3. Happens at an early age
4. Hereditary nature - a major reason
5. Villagers are unaware in great numbers
6. Pre-diabetic stage in great numbers both in villages and cities
7. State of Insulin resistance enormous
8. Fewer patients whose diabetes has not been controlled by oral medication.

(Based on a write-up by Dr. A. Ramachandran)

The possibility of diabetes increases with age. Diabetes has been found among people living in cities between 55 and 64 years of age.

Figures of a study published in South India are shocking to say the least. Seven out of ten families have diabetes.

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## **6. Old is gold!:-**

When the Europeans settled in Australia great changes occurred in the lifestyles of the natives. Earlier they used to do lumbering, catch fish, hunt and so on. All this stopped. The settlers started to give them maida, sugar, mutton etc. in ration. Their land was confiscated which also resulted in stress. And this new lifestyle became their ware withal. This is the reason why the incidence among them is more than 20%. Their life span has also reduced by 20 to 25 years. When among some of these Australian natives the earlier lifestyle was restored, diabetes immediately came under control.

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## **7. Easy going lifestyle...!:-**

In the modern lifestyle a person is able to exercise very little. Because of the modern means of transport man have very little distance to walk? Many people in big cities if asked how much do they walk, they would reply, 'From my room to bath room.' Lack of exercise breeds

many diseases. Exercise does not only increase the use of sugar but also reduces the necessity of Insulin.

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## **8. Lifestyle change: Better than medicine:-**

Some people who were likely to have diabetes were divided into two groups. One group was given information about the controlled food intake necessary to control diabetes and were also made to walk for 150 minutes a day. Having gone through this rigmarole they found their weight reduced by about 7%.

The other group was administered the Metformin tablet. The results were quite encouraging. Those who exercised had the possibility of having diabetes reduced by 58% while those who had been administered possibility to become diabetic were reduced by only 21%. This observation surmises that exercise and food restrictions can be three times as powerful as Metformin in preventing diabetes.

It should be deeply understood that the more we increase the need for Insulin the more our body becomes addicted to it. We will take an example to make this aspect clear. You have a house in the village which you have locked. You happen to go to your village house after a few years and try to open the lock with the key that you have. It refuses to open. Why? The lock has rusted. Similarly Insulin acts as the key on the receptor of each and every cell of the body, which acts as lock. If the receptor does not respond or in simple language, it has rusted, the lock will not open. Only if the sugar in blood enters the body cells it can produce energy. The rust in the cell receptors is due to lack of exercise. And thus lack of exercise becomes the fore runner of many diseases, including diabetes.

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## **9. Food: Past and present:-**

It is said that we dig our grave with our own teeth. Earlier one used to consume abundant natural food like raw vegetables, fruits etc., while at the same time using less of maida and bread. When flour is ground fine it destroys good aspects of the grain, besides destroying some vitamins and minerals that are minutely available in the food. Even rice, the more we polish it the more the vitamins get destroyed. In the present times we prefer precooked food. Deep fried and canned foods which contain many substances required to prevent it from being decomposed, kill the nutritious elements in the foods besides causing deleterious effect on the body. This is an age of fast foods. Now we think about how long, for how many months or years we can keep food from being spoiled. As a result many poisonous substances have to be added to the food. Man is

heading towards fast death due to fast food. Due to daylong hectic life people are not able to have a proper breakfast or even lunch, but after coming back in the night they have a hearty meal, which is a very big mistake. You should have hearty breakfast in the morning, lunch should also be sumptuous but night meal should be meagre. Because the time required for digesting the night meal is minimum. Besides, eating one meal heavily body parts get used to excess of Insulin. Let us take an example to make this clear. If you have problem having sleep, in the beginning taking just half a sleep causing tablets gets you sound sleep in a short time. But whenever you are under stress you think that you can get sleep only if you take two tablets. And you start taking two tablets on and off. After taking two tablets continuously for a period of time you think that 'today there is not much stress let me take only half a tablet', but then you are deprived of sleep for hours together. Why it has happen? As the body system got accustomed of two tablets. In the same way if we take heavy meal at one time we need more Insulin at a stretch and then sugar does not enter the blood cells with lesser Insulin. This getting used to higher doses of Insulin is a major cause of diabetes. The body gets accustomed to Insulin by eating sweet substances also. But please remember that if it is necessary to get Insulin injected in order to keep the blood sugar under control, it must be taken, because administration of Insulin is done in absolutely required quantities only. And this is not habit forming. Any fatty food may or may not cause obesity but it does cause necessity for excess Insulin.

More the quantity of Insulin in blood, the more is the possibility of becoming diabetic. If for once a person's ability to assimilate glucose diminishes, Insulin also starts diminishing in the blood. You may wonder why this should happen at all. The fact is that when the pancreas is exhausted a person's ability to assimilate glucose also diminishes. The exhausted pancreas is unable to produce the right type of Insulin in right quantity. Substances like vitamin C, zinc, magnesium and chromium play a very useful role in the prevention and control of diabetes.

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## **10. Effect of the modern times: Mental stress:-**

The people from China who migrated to Mauritius and adopted Martian lifestyle started being more and more stressful. In modern times apart from over activity, individual expectations have also started increasing which leads to stress if not fulfilled. There are about 14 chemicals in the body which reach directly in blood the moment they are produced by the glands. These are called 'the inner fluids.' This is only glandular fluid which reduces blood sugar while all others increase it. Because of stress, level of Insulin does not increase but the other pancreatic fluid Glucagons increases substantially. Glucagons increase sugar. Glucagons and adrenalin both increase level of glucose in blood. But there is difference in their process. Adrenalin shows its effect for a long time. When a person experiences stress a type a fluid called noradrenalin increases in the concerned blood vessels. Noradrenalin also has effects like adrenalin. As a result stress maintains sugar at a high level in blood for a long span of time.

A spike of mental stress has a bad effect on the body cells also which can also lead to Insulin resistance. Insulin resists the process of creating glucose out of proteins called 'gluconeogenesis' and the process of producing glucose out of glycogens called 'glycogenolysis'.

The body always tries to see that glucose does not increase in the blood. When glucose level increases in the blood, the liver stops producing glucose itself. The liver reduces glucose

production even when ketone bodies are produced due to excessive glucose. Normally the body tries its best to keep us healthy but when we keep on hurting it continuously it is unable to bear and we become ill. In diabetes this resistance by the body does not happen properly resulting in increase of sugar in blood. A fluid called 'epinephrine' increases which reduces Insulin.

Mental state is very important in diabetes. The more the stress, the more the hopelessness that much faster will be the rise in blood sugar level. It is very important what we think about ourselves. When someone criticises us sugar increases a little in the blood, but when we ourselves denigrate ourselves blood sugar increases very fast.

"You should not do any work concerned with the head", the doctor told the patient. "But that is the base of my life", the patient replied. Doctor asked, "Are you a scientist, teacher or a poet?" The patient replied, "No Sir!. I am a barber."

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## **11. Relation between Insulin and brain:-**

State of mind, passion, stress etc. deeply influences the Insulin fluid. To understand this you have to first understand the work of the head.

The head controls all the limbs of the body. This control happens to be of two types. One: Control through will and thought. Example, moving the hand up and down, moving the legs etc. This is called the 'voluntary system'. This control takes place during waking state. Second: Processes like digestion, heart beating, and work of the kidneys keep on happening without consciously thinking about them. This second type of process is called 'involuntary system.'

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## **12. Obesity: Ladder of death:-**

In 1969 Dr. Kelly West conducted surveys for diabetes related subjects in many countries. It was observed in those surveys that the most important reason for diabetes is obesity. Obesity is the gift of modern age. Body fat can also adversely affect pancreas, the gland which produces Insulin.

In our country if someone's weight increases by 10 kg. it can be safely assumed that 7kg is in the stomach. There is a high probability of such people afflicted with diabetes. Stomach fat is mostly due to consumption of sugar, maida and high calorie deep fried snacks which aggravates possibility of having diabetes. For those who have most of their fat in the stomach are not only more prone to diabetes, but also that it becomes extremely difficult for them to control blood sugar once afflicted with diabetes. For reducing stomach fat it is essential that apart from reduced food intake they also have to do lot of brisk walking and exercise the prescribed postures.

Please ponder....

In the present age peoples' hearts are shrinking and tummies are enlarging.

Diseases caused by obesity are: 1. Blood pressure, 2. Heart disease, 3. Diabetes, 4. Arthritis, 5. Kidney diseases, 6. Lumbago, 7. Hernia, 8. Gall stones, 9. Blockage of the intestines, 10. Difficulty to breath in sleep, 11. Disfiguring of the feet etc.

It is also very essential to reduce body weight even after having diabetes. If your body weight is in consonance with your need then the possibility of death due to diabetes is remote. If your weight is more by 5 to 15% then the possibility is twice as much. If the weight is more by 16 to 20 % then the possibility increases four fold and if your weight is more than 30% then possibility of death is 10 times as much.

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### **13. Obesity and diabetes among women:-**

The state where there is obesity, high blood pressure, excessive triglycerides (a kind of fat in blood), and less of HDL (good fat) is called 'metabolic syndrome'. Among women where this metabolic syndrome is found it is observed that there is an accompanying ailment of the ovaries. This state is called 'polycystic ovarian syndrome'. Women with affliction have a probability of having diabetes. These women have been found to grow hair on the upper lip and inability to bear children. Most women come for treatment with this ailment alone. Research has shown that possibility of heart attack increases seven fold among such women. Research has also shown that if weight is reduced by 10 to 20% among women problems like growing moustache-like hair, pimples, and monthly course get resolved.

Women who exercise regularly greatly improve pimples and MC related problems.

According to the medical science obesity takes a person nearer to death but each obese person does not become a diabetic and every lean person may not be able to save himself from diabetes. Insulin tolerance among the muscular cells becomes less due to obesity and so requirement of Insulin goes up to reduce blood sugar. To give an example, if we tune our car from time to time and take proper care of it, it will run quite a distance in a litre of petrol. Similarly if we reduce obesity Insulin can be enabled to work more. People who take less than 1000 calories intake a day, their metabolic rate reduce by around 45%.

Remember.....

"Diabetes and obesity, both are twin sisters."

Proper exercise and balanced food habits are the two correct ways to reduce weight. Both these form a part of healthy lifestyle. By adopting them you can reduce your weight slowly but surely. You should have a long term goal otherwise there are chances of your being disappointed. Start with a ten minute walk.

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## 14. Where did they get the inspiration to slim down?

It will quite interesting to know where the people who managed to reduce their weight by 10 kilos or more and did not allow it to increase for more than a year got the inspiration to do so. Presented here are some true stories. Only names and occupations have been changed.

"Arre jadya! Give me a rupee." Rajesh Dalal was exhorted by a beggar outside the Mahalaxmi Temple. Rajesh had gone ahead but he had become so much angry that he came back and beat up the beggar in front of other people. But he could not sleep whole night. His weight was 110 kg. He then decided that he must reduce his weight by all means. He started going for a walk for 45 minutes in the morning and 30 minutes in the evening. He also started eating little food staggering four times a day. This reduced his weight by 3 kg within a month and 16 kg within 8 months.

Mukti Patel did not go to office today. The postman came with a registered letter. While returning he asked casually possibly noticing her big tummy, 'Madam when are you going to deliver?' Mukti was shocked to say the least. She was not even pregnant yet. She kept looking at her body in the mirror. Indeed her tummy had become quite noticeable. From that very day Mukti started reducing her weight. She could reduce 20 kg in a year.

Smt. Sujata Patil's husband used to be a heavy smoker. He suffered from lung cancer and died after 7 months. At that Sujata's age was 34 and weight 92 kg. She was thinking about her future and found that she had to live for her children. For which she decided to reduce her weight, come what may. She did try in the previous 3/4 years but it used to reduce by 3 or 4 kg but after a while it used to increase by 5/6 kg. This time she adopted consistent healthy practices and got her weight reduced by 14 kg in 6 months.

42 year old J. D'souza was weighing 100 kg this time. He was feeling pain in the legs. Yet it seemed quite difficult to reduce weight. One day he saw his 15 year photograph. He could not take his eyes off it. How handsome he looked then, could he not become like that again? That was that. He started manfully doing the exercises advised. And lo! He reduced 20 kg in a year flat!

Smt Singh was attending her Society's meeting one day. At the end just as she was about to leave she heard somebody's voice. 'In which flat does this Tuntun live?' Such incidences happen with many people but Mrs.Singh did not give up, and kept up the rigmarole to reduce weight. Needless to say her weight came down by 25 kg.

Mr. Ramnath Mishra had gone to attend the wedding of the son of his friend. He was sitting in a chair with two hands. He weighed 107 kg. when he tried to get up the chair would not release him. Everybody started staring. Some were trying to smother smile by keeping their palms on the mouth. It was quite embarrassing. He took to weight reduction in all seriousness. By the end of the year his weight had been reduced by 20 kg.

Dr. Abhay Srivastav had gone to deliver a lecture. When he saw his short distance photograph he thought that his cheeks were rather puffed and fat had accumulated in the throat. He felt hatred towards that photograph. He decided then and there that he would reduce his weight, even if the heavens fall. His consistent efforts were awarded with 12 kg reduction in weight.

'Doctor I do not eat anything yet my weight keeps increasing', Miss Chhaya Shirodkar was complaining to Dr.Vyas. The doctor asked her, 'What in particular you like to eat?' Miss Shirodkar replied in one breath, 'I eat very little of sweets and deep fried snacks. Yet my weight keeps increasing. I like to eat frozen food.' Dr. Vyas advised her, along with other things to note

down the time every time she opens the fridge. She did as advised and found that she opened the fridge 21 times for food. Only then she realized that she eats excessively. Most peoples' position is similar. They feel that they eat much less but if they keep a diary of their eating they will realize that they eat more than necessary.

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## 15. Right way to reduce weight:-

Proper exercise and balanced food habits are the two correct ways to reduce weight. Both these form a part of healthy lifestyle. By adopting it you can reduce your weight slowly but surely. You should have a long term goal otherwise there are chances of your being disappointed. Start with a ten minute walk. One of my patients Ramesh Bhatt told me that when I am tired I plan to walk for just 10 minutes. I keep feeling so well during those 10 minutes that ends up walking for 30 minutes.

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## 16. Other small ways:-

With each drop a pond gets filled. Similarly some attempts should be made, even so in a small way, as and when possible, in weight reduction. For instance-

1. Walk to the second or third floor instead of using the lift. I have noted that the required from getting into the lift, pushing the button and the lift reaching the destination floor is almost the same that is required to climb the stairs.

2. If you are using the bus for transportation, walk one stop ahead and alight one stop before the destination and walk the remaining distance. Do walk in office or at home as and when ever possible.

Please ponder.....

*When you can walk, do not stand*

*When you can stand, do not sit*

*When you can sit, do not sleep.*

3. When we are travelling in a bus or car, keep on moving the feet, hands and neck on and off. This will not only remove tiredness but also reduce the time you have to give for exercises.

4. While we eat make use of ginger, turmeric, cardamom, cloves, green chillies etc. as per our taste. This increases the metabolism of the body and also uses up some more calories. You should, however not use them if you have some discomfiture or pain in the stomach.

The enzymes that cause digestion work at 37 degrees C. These enzymes do not work if you drink cold water from the fridge. This promotes the fermentation process which produces foul smelling gas. So avoid drinking cold water while eating. Even so you may drink fridge water by all means, 3 hours after food. This ensures that the body uses about 40 calories to keep the liver temperature normal. If you use up as many calories as you produce, this change alone can reduce your weight by about 2 kg per year.

6. Whenever you feel like eating...Often we feel like eating even though there is no apparent need. At that time one has to be aware of some things.

- a) Experts feel that at such times you are probably thirsty, not hungry. So drink a glass of water. It is quite possible that you may not feel the need to eat.
- b) You may not be really hungry but are bored, so stretch or have a small walk.
- c) You are not hungry, perhaps you need some rest. So relax for five minutes or listen to some good music.
- d) You are not hungry but are experiencing disappointment in life. Read some inspirational books or listen to spiritual discourses. Try to mend relationships.
- e) Drink hot soup instead of eating something. You will feel contented besides, soup has fewer calories.

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## **17. Things to remember when buying a gymnastic machine:-**

It is essential to determine that you are going to make use of it regularly. My brother bought a machine. After two months when I went to his place I found that it was used for drying clothes.

A manager bought a stair-stepper. Well as it got set in the room, his head was hitting the roof as he tried to use it. Well! he wondered, what a waste of money just because he did not do a little planning in advance!

Sanjay and Sudhir were childhood friends. When they met after a long span of time in a super market Sudhir exclaimed in wonderment, 'Sanjay! You have become so fat!'. You know I have subscribed yearly fee to a gym to avoid that', Sanjay replied. After a few friendly exchanges and getting each other's addresses etc. they bid good bye to each other. After a year Sudhir was paying a visit at the home of Sanjay. The moment he saw Sanjay he exclaimed, 'You have become even more obese than before. You were saying that you had joined as gym to obviate it!' Sanjay's wife interjected to say that there are many people who pay yearly fee of the gym but do not bother to attend the gym even for 15 days in the year. 'It is only waste of money. How can obesity be reduced like that?' she rued.

Eight among 10 obese people, having increased Insulin have been found to have imbalance in blood sugar.

Every now and then newer and newer books on diet keep coming in the market. Every writer of such books puts across his formula in such a forceful way that the reader is fully convinced that this is the way to reduce weight by 10 kg in a month. But that is not true.

If schools, colleges, companies, banks, social service organizations and the government concentrate on one little fact most of the modern diseases like diabetes, blood pressure, heart disease, arthritis and the like can be prevented in a big way. And that little fact is that the children, young people and others who are obese should be inspired to become slim having shown proper ways to reduce weight.

About 5% people have increased blood sugar due to obesity. Having found blood sugar in excess of 125 if for once they reduce weight their blood sugar becomes normal. Such people may be said to have be saved from diabetes but they have to be careful in maintaining their weight, eating with restraint, exercising regularly and live stress less life. They should get their blood sugar checked every month.

Dr. Parashuram Suva is a senior physician in the Fiji based Colonial War Hospital. He has written a fine essay on specific problems in diabetes control in developed countries. Along

with him many other specialists agree that the basic cause of diseases like diabetes, blood pressure, heart disease, dental decay, many types of cancer, arthritis etc. is in today's high speed lifestyle and fast foods.

The obesity aspects are similar in humans and rodents. Based on this an injection has been prepared called Leptin. When it was injected in the blood of mice, their fat cells were reduced. Experiments on the possibility to use them on humans are in progress.

The real battle starts only when your weight becomes normal and you want to maintain it at that level.

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## **18. If the parents have diabetes .....**

Reasons of contracting diseases can be understood in the form of a spectrum. On the one side are the diseases caused entirely due to hereditary reasons while on the other are those caused entirely by surrounding factors. For instance haemophilia is entirely a hereditary disease while cold is an entirely an atmosphere related disease. Most diseases are caused in any one part of the spectrum. Diabetes is neither entirely hereditary nor entirely based on surroundings.

All cells have antigens in their outer coverings. If any limb of one patient is transplanted in another, it works only if the antigens of the one in whom the limb is transplanted match with the transplanted limb. If they don't match then the body considers them as enemy cells and tries to kill them. More or less this is what happens in chromosome-6. It is called 'HLA-system'. Every person possesses 46 chromosomes, which are formed in 23 pairs. Among these chromosomes one is derived from the father and the other from the mother. On a given portion of a chromosome there are about 10 antigens that are nomenclated as dr-1, dr-2, dr-3, dr-4..... etc. It is possible that you might have acquired dr-4 from father and dr-6 from mother.

If antigens of the people are examined in large numbers and if it is found that in diabetes patients certain type of antigens are found in excess as compared to normal people, then we can infer that, that very antigen is responsible for diabetes.

HLA system of chromosome-6 has been studied among diabetes patients and it has been found that among them a-1, a-2, b-8, b-18, b-15, b-40, dw-3, dw-4, dr-3, dr-4 antigens have been found in large numbers. Among 30 to 40% of cases dr-3 and dr-4 are found to be related. Dr-3+dr-4 HLA has been found to be related in 50 to 60% of the cases.

Diabetes is also a dynastic disease. If both parents have diabetes then their offspring having diabetes increases by 55 to 60%. If one of the parents has diabetes then the possibility of the offspring having diabetes is 25 to 30%. Even if the parents get diabetes after the birth of children the possibilities stated above still hold good. The research in Joslin Diabetes Centre on which children are likely to have diabetes-1 was quite exciting. The pregnant women that used to come to Joslin Centre between 1960-1980 and men who had diabetes-1 were examined. The study was to find out how many children of such parents contacted diabetes-1 before they crossed 20th year of their age. Results of this research are revealing. Among children of women who had diabetes-1 only 2.1% became diabetical, whereas children among diabetical men the percentage was 6.17.

This research shows if the father has diabetes-1 the possibility of children having diabetes is greater. In another study it was found that if women with diabetes-1 bear children after the age of 25 then the offspring having diabetes is as good as nil. Many times parents may not have diabetes but they might be carrying the diabetes syndrome, in such cases also the offspring may have diabetes. The diabetes that happens between one week and 25 years of age, hereditary aspect is negligible. The idea of 'thrifty gene' propounded by Dr. J.V.Neil has been found to be unfounded. Many patients say, 'My parents did not have diabetes how did I get it then?' Even if your parents did not have it, if your lifestyle is wrong then you would still contract diabetes besides it is also possible that your parents did get their blood sugar checked at all, a reason why they did not know that they had diabetes.

Dr. David Payke of London found out that diabetes-2 has been found rampant among twins. If one of them contracts diabetes, the other gets it too, almost certainly within 7 years. We Indians should observe a little more caution in this regard because we possess certain genes which make it thrice as possible for us to have diabetes as others.

In a study conducted by Prof.V.Mohan and associates it has been found that 58% of near relatives of diabetics are diabetic. In America every year 8 lakh new diabetics are identified. This figure might be many times bigger in India. Even though we might be carrying diabetes carrying genes, we can still be saved from diabetes. Because genes are like a loaded rifle while lifestyle is the trigger. Until we press the trigger the bullet will not leave the gun. Even so when we make mistakes in lifestyle, the trigger gets pressed. Moral is that even if your parents may be having diabetes, if you adopt the right lifestyle you will not get diabetes. Even if we might possess diabetic syndrome we can still prevent diabetes from manifesting. A good example of this is that a sibling among twins can have diabetes while the other can be free of it through out his life.

For Type-1 diabetes possibility of using mumps and rubella viruses has been thought of. Finland which possesses maximum type-1 diabetics, the entire population has been inoculated with this, yet there is no sign of decrease in type-1 diabetes.

In the study conducted by Prof. Ramachandran and his associates it has been found out that even though people carry diabetes possibilities, it is the lifestyles that are responsible for its manifestation. They have found that people of the same caste who live in cities are 5 times more diabetic than those living in villages.

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## 19. Diseases of endocrine glands:-

Cortisol, growth hormone and adrenalin have an effect directly opposite of insulin. Therefore in diseases where these glands are overactive, diabetes ensues. These three diseases are coshing syndrome, acromegli and philochromocytoma. Any disease of the pancreas can cause diabetes. Cancer of the pancreas, long term effect of bacteria on the pancreas, secretion of iron in pancreas etc. can cause diabetes.

Diabetes is like a demon. In India goddesses are shown to trample demons. Most of us have seen such pictures. If each patient adopts the right lifestyle he/she can trample the demon of diabetes.

The aspects that can cause diabetes

Cause	Explanation
Hereditary and caste based	Type-1, type-2 happens due more to genes. Inter relational

people	marriages have greater possibility of diabetes
Economic	City dwelling poor women have a greater incidence of diabetes.
Urbanization	City dwellers are more susceptible compared to village dwellers to diabetes.
Age	Advancing age increases the possibility of diabetes. It is caused due to ageing of the pancreas
Sex	Women, specially those who have four or more children are more susceptible to diabetes
Body-weight	Obesity increases possibility of diabetes even as slimness reduces its possibility. Though slim people can also have diabetes due to other reasons.
Exercise	Lack of walking or cycling increases possibility
Carbohydrates	Wheat, maize, less polished rice etc. are preventive. whereas sugar, maida etc. increase possibility of diabetes and disturb control.
Fibre rich food	Helps in diabetes control
Proteins	Less than 10% can have bad effect while excess of 30% can cause increase in fat
Fat	More of it increases possibility of diabetes by blocking big and small nerves
Stress	Increases possibility of diabetes and weakens control

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## 20. Cities as compared to towns:-

There is one more major difference between cities and towns. In cities half the people are not aware that they have diabetes while in small towns three times the people who know they have diabetes, are not aware that they have it.

Types of diabetes:

### 1) Type-1 diabetes:

Diabetes Mellitus Type-1: This diabetes strikes children wherein all the cells producing insulin among them become inactive. In this type of diabetes the beta cells of the pancreas are destroyed in the following manner:-

1. *The flow of lymphocaines or cytokaines destroys the beta cells through the macroles remaining in the blood.*
2. *Toxic free radicals are created, which are fatal for the beta cells.*
3. *The chemical 'interlukin' is not produced in required quantity.*

Dr. Juan Carlos of Argentina, Basambe, has conducted exclusive research on type-1 diabetes. In this system the antibodies of the near relatives of the patients who have type-1 diabetes are measured. Dr. Juan did a comparative study of 22 children in whose blood

excess sugar was found 2 hours after lunch, with 20 children who had normal blood sugar. These 22 children were not relatives of type-1 diabetics. Their fasting sugar was also normal. He measured antibodies and first stage of insulin. He found that only 4 out of 22 children did not have antibodies and first stage insulin was also normal. There were antibodies in 9 children and first stage insulin was also found to be abnormal. This brought them to the conclusion that those children that are not related to type-1 diabetics but have excess blood sugar, have a greater possibility of having type-1 diabetes. Therefore they must take Insulin injections to keep diabetes under control as oral medication does not work. Hereditary factor is least in this kind of diabetes.

Possibility of type-1 diabetes happening to the other twin is 30% more among twins with similar features. But if the facial features are not similar then this possibility is reduced to just 10%.

Possibility of type-1 diabetes is high if in the genes 'cytoplasmic islet cell antibody' is greater than 40 JDF units, or if Insulin auto-antibodies are in excess of 39 NUMI or if the first stage Insulin production is very less. Among 45% of those whose genes contain excess of ICA antibodies have a possibility of having diabetes within the next 5 years. This test can predict what degree of possibility there is, of having diabetes for near relatives of type-1 diabetics. Type-1 diabetes is one of the most common ailments among children. It is essential to ensure that the growth of such afflicted children occurs properly and is not stunted. If the child is overweight, then it must be reduced. This will not only make the child enthusiastic but will also help in building up his self confidence. Blood sugar may differ but Insulin will still be necessary. This for children with type-1 diabetes. In type-2 diabetes, which occurs among adults, reduction of weight does help considerably. Among total diabetics in India type-1 diabetics are only 1% while it is 10 times as much in foreign countries.

In a study conducted by Gamble & Taylor it has been observed that type-1 diabetes is related to 'Kokshaseki B4' virus. Type-1 diabetes patients are maximum in the Scandinavian countries, i.e. Finland, Denmark, Sweden and Norway. In Finland every year 28.6 patients are identified with type-1 diabetes in a population of one lakh. This figure is 22.6 in Sweden, 17.6 in Norway, and 13.6 in Denmark. Compare this with Japan where this figure is just 0.8 among lakh children who have type-1 diabetes.

## 2) Type-2 diabetes:

This diabetes occurs among adults of over 30 years of age. This ailment is caused due to lifestyle and aspects pointed out henceforth. In earlier times this was caused after the age of 60-65 but now it is found at 35 years of age also. According to a write-up published in 2000 AD in an American magazine called 'Diabetes care', this ailment is now fast spreading among children also. This essay contains description of type-2 diabetes among children with less than 12 years of age between 1982 to 1994. In the age span of 10 to 19 years it increased 10 times within 12 years. Diabetes assumes many disguises. *The most important symptom of diabetes is that it has no symptom.* Nine out of 10 type-2 diabetics are insulin resistant. 50% patients do not show any symptoms. After a few years it comes out in the guise of an altogether ailment caused by diabetes. Therefore all those above 35 years of age must get

their blood sugar tested at least once a year if they are obese or if they have to face stressful conditions or have a diabetic in the family.

*Important functions of Insulin:*

1. *Get sugar entered in the crores of cells in the body.*
2. *Convert sugar in glycogen and store it in the liver.*
3. *Prevent sugar production from protein and vasa if the production is in excess of requirement.*

3) Diabetes caused by stress:

If a person is under excessive stress for a few weeks or for months, his blood sugar can go up. After the stress returns to normalcy the sugar may normalise or remain high causing diabetes.

The weight of Mamta Patil was 55 kg. She used to go for an hour's walk every day. Control on food intake was also perfect. The moment she was counselled about food restrictions she immediately agreed to adhere by the advice and that on every single day in the year there would be no deviation in food intake. Even then her fasting blood sugar was not coming below 200 mgdl. Once her husband told the doctor that his wife Mamta is very much worried about their daughter. Doctor told her that she should be aware that worry increases blood sugar. She replied, 'What can I do. One has to worry about children all the same!' The doctor was also a chastened person. He asked her, 'Has God sent you on the earth with a contract to worry about children? Your children have now grown to 18 to 20 years old. Children whose mother dies soon after being born, do they not grow? Do they not study?' These words were ringing in Mamta's ears for two continuous days. She started thinking, 'the One who sent them to this earth will also take care of them.' Well! And that was that! Her sugar came down to 120 mgdl in a week's time.

Whenever the mind gets excited, it keeps burning the beta cells in the pancreas. It has been observed from psychoanalyses of thousands of people that anger, jealousy, and passionate nature work as poisons. As against this calmness, contentment and witness-like nature act as nectar.

In India cars might be available of 50 to 100 models. But no company can compare with the human models that God creates. God produces only one car of one model. Therefore keep your self respect high by exhorting yourselves again and again that you are special.

4) Diabetes occurring among pregnant women:

If blood sugar is checked among pregnant women, many of them will be found to have high blood sugar which becomes normal after delivery. In some cases this blood sugar does not become normal even after delivery. Possibility of diabetes is high among those women that deliver babies of bigger size.

Possibility of giving birth to disabled babies is thrice as much for mothers with high blood sugar at the time of conception itself. This possibility can be considerably reduced if blood sugar is properly controlled.

Among pregnant women there is possibility of sugar appearing in urine even though there may not be sugar in blood because during this period the ability of the kidneys to resist sugar is fairly low. In modern times almost all pregnant women are examined for glucose tolerance test. Because if it is found to be positive, then immediate medication becomes necessary because the possibility of diabetes among Indian women is 11 times more compared to British women.

#### 5) Diabetes caused by drugs:

Some drugs and steroids meant to reduce blood pressure can increase possibility of diabetes.

#### 6) Diabetes caused by malnutrition:

People who do not take balanced food, vitamins and minerals in right proportions can also have diabetes which can be brought under control by correcting food intake. This kind of diabetes is found among children of 10 to 20 years. 15% of TB patients are also found to be diabetic.

#### 7) Diabetes caused by protein deficiency:

Dr. Hughes Jones of Jamaica found in a study conducted in 1955 that in 13 patients among 213 a specific type of diabetes was noticed. After a few years it was also noticed among Indian immigrants settled in Natal in Africa and in some other countries of Asia. These patients are victims of malnutrition and are generally very frail. Symptoms of diabetes appear very slowly among these patients. They normally come with complaints of debility and pain. Most of these patients are in an age span of 10-20 years. There is lot of sugar in urine but ketone bodies are absent. More than 60 IU of Insulin becomes necessary to bring blood sugar under control. This type of diabetes is found among patients in municipal, government and other hospitals where poor people get themselves treated sometimes among 40 to 53% patients of less than 30 years of age. This ailment is known as 'Protein Deficient Diabetes Mellitus'. These patients start improving with proper nutrition but diabetes is not cured. It can be surmised with this that malnutrition in childhood can destroy beta cells in the pancreas. It can be surmised by the surveys conducted by Dr. R. D. Lele and S.M. Sedikot that deficiency of zinc, selenium, retinal and alfatokoferol is responsible for the destruction of the beta cells of the pancreas. However this ailment is not found in the family members of the afflicted, which leads to the inference that malnutrition alone is responsible for its occurrence.

## 8) Special kind of diabetes:

In 1959 Dr. P. J. G. Verghese identified a particular kind of diabetes in Kerala among 1700 people. This ailment was identified as '*Tropical Calcific Pancreatitis*'. So many patients were identified for the first time in the world. Apart from this, patients of another type of diabetes were found in Tamil Nadu, Karnataka, Orissa, Maharashtra also which is also identified as '*Fibro Calculus Pancreatic Diabetes*'. This ailment however is found in very few cases. This disease occurs between 10 and 40 years of age. About 70% of the patients of this ailment are thin and complain of stomach ache right from childhood. Among these patients an external glandular cell produces less of a chemical called 'trypsin'. Patients with this ailment have a great possibility of developing pancreatic cancer.

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## 21. Importance of tests in diabetes:-

Australian Diabetes Federation, if appropriate expenditure is incurred right in the beginning, future expense involving big bills of the doctor can be saved.

### Perfect Time to go for the Diabetic Test:-

When ever doctor tells a person to get his sugar checked, her first reaction is, 'Do you want my sugar stopped?' The fact is that the doctor does not want only your sugar stopped but he may advise anybody to get his sugar checked if he feels that it is necessary for maintenance of his health. Sugar level in blood is at its lowest 6/7 hours after eating. After taking food at 10 or 11 pm and get their blood sugar checked in the morning, can have water if you like, but before having a cup of tea, it should be between 70 and 125 mgdl. According to recent research it has been found that less than 125 is fine though in some reports it is mentioned as 110 as the limit for normalcy. Two hours after food it should be less than 175 though in some reports this limit is mentioned as 140. Efforts should be made to get this post food blood sugar checking is done two hours after food, not after 1½ hours or after 2½ hours. If 2 hours post lunch sugar is high then it will start receding in 3 hours. Therefore it is equally necessary to get fasting sugar checked. Patient should not make changes in exercise food habits etc. a few days before checking sugar because only will the control of blood sugar be known with the current level of exercise and food habits of the patient.

Any other test? See, people try to be smart and observe strict diet control, do exercise and what not. So to counter this test is conducted which tells you how the blood sugar was controlled during the past 3 months. It can also give information if you have had proper control during the past one month but not during the previous two months. It is called 'Glycosulated haemoglobin' (H1b2ac) test. This test is slightly costly but if you want to know whether you controlled your diabetes properly during the past three months, then this is the test that will give you the right information.

Urine glucose test can be conducted every day, which also gives an indication about blood sugar level.

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## 22. How to test sugar in urine?

Do not test the first urine after waking up because this used happens to be accumulated urine of the whole night. 15 / 20 minutes after passing the first urine urinate again and use this urine for testing. Use a chemically treated diastick. Probability of error in this is less. In the Benedict test strip possibility of error is high. Results can be wrong if tests are conducted after taking drugs like aspirin. You may cut the diastick straight up into two if want to save money.

Testing fat in blood:

Fat content in blood is also found to be excessive in diabetics. Good fat (HDL) is less and bad fat (LDL) is more. Therefore it is necessary to test this every six months and corrective steps like diet restrictions and exercises should be strictly applied to bring it under control.

Microalbumin:

If you are diagnosed of diabetes for more than 5 years then it is a good practice to get tested for microalbumin in urine at least once a year. Because indication of excessive microalbumin in urine indicates start of degeneration of kidneys for which immediate corrective treatment has to be taken up.

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## 23. Use of Gluco-metre :-

Blood sugar testing can also be done through the gluco-metre. There may be difference in results in testing by gluco-meter and getting tested at the pathologist. This is because the blood taken for gluco-meter testing is taken from the thin capillaries while the pathologist takes impure blood from thick nerves for testing where the level of sugar is slightly different. Even in the gluco-meter when you take a bigger drop of blood, it makes a little difference too. This 5-10% difference makes for hardly any difference, so if you do not wish to visit the pathologist or you want to test blood sugar at home you can safely use the gluco-meter.

For those with type-1 diabetes it is necessary to test blood often. Gluco-meter comes handy for such people. Gluco-meter can also prove to be a boon for pregnant women. In pregnant women if diabetes is controlled perfectly, possibility of giving birth to defective or still-born babies can be reduced considerably.

Gluco-meters have started appearing from the 1970s. This enables the patients to check blood frequently. A study has shown that among those who make this a practice, diabetes is under control and related problems are also fewer.

In a study conducted in New Castle, 46 patients of type-1 diabetes properly checked their blood sugar while almost an equal number did not. These results were quite inspiring. Those who had checked their blood sugar had much better control over diabetes than those who did not. Most of those who used gluco-meters said that its use has not only helped keep their diabetes under control but also increased their self confidence. Mr. Sumit Pandey told , 'I used to check blood sugar once a month even when I had no gluco-meter when his blood sugar used to be around 220 mgdl 6 / 7 times a year. Now I check it once or twice a week. Advantage is that the moment my fasting blood sugar goes beyond 125 immediately I start doing exercises and adjusts my food intake appropriately. Meditate twice a day nicely. My diabetes therefore is well under control. Sumit Pandey's example inspires and shows the extent to which the use of gluco-meter can be beneficially put to use.

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## 24. Problems caused by diabetes:-

1. *Reduction in weight even though one feels quite hungry:* Sugar in the blood increases but is unable to enter the cells where it is necessary to be converted into energy. Therefore the body cells try to produce energy by breaking up the fat. Thus fat starts reducing slowly and one becomes thinner and thinner. At the same time since the cells are starved of energy they keep sending message to the brain that they have not been having food. So the hunger inducing centres become excited and the person starts feeling hungry. This symptom is also not to be seen in many patients. Before Insulin was discovered the biggest fear was due to this. Everybody believed that diabetes causes fear which ends up in the patient's death.
2. *Excessive urination:* When sugar increases, the body tries to throw out the excess sugar. When urination takes place only sugar does not get ejected, water in the body also gets ejected. Because of this the patient has to urinate frequently besides the quantity of urine is also massive.
3. *Feeling thirsty frequently:* When the water in body is excessively ejected from the body, naturally one will feel thirsty. These three symptoms are considered to be the main causes of diabetes but in most cases no symptoms are observed. Some of the patients may start perspiring while eating.
4. *Cuts not healing :* If there is any cut, big or small, the blood that flows attracts many bacteria as it contains abundant sugar, which do not allow the hurt to heal. Healing of the cut also slows down because of obstruction in blood circulation. Increase of sugar in blood starts a poisonous cycle. Because of excessive urination water from blood gets reduced. Reduction of 100 ml water from one litre of blood leads to increase in sugar. In such a condition even more water gets excreted. If the patient does not drink enough water or does not get himself treated, sugar starts increasing in geometric proportions. This happens mostly among aged people who live alone, because they cannot take proper care of themselves.

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## **25. Why does one swoon when diabetes is high? How to save from that situation?**

As explained earlier, fat is used in diabetes to produce energy when sugar is not available for the same. And when fat is being used for energy production a toxic by-product called 'ketone body' is created. Increase of ketone bodies poses a serious problem. This results in the blood becoming acidic which can affect the brain. In this condition, in the beginning the patient feels drowsy and weak and as time passes he goes into a coma.

In a study conducted on the 'Rothe Island it has been observed that 70% of the patients who had gone into coma had not got in touch with the doctor two days before having gone into coma although they were aware of the symptoms.

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## **26. Treat legs like the venerated Brahmin:-**

In the scriptures Brahmins have been shown to be like the tuft at the top of the social ladder while legs have been shown to be the bottom of the social status like the shudras. But after the advent of diabetes legs become the top like the Brahmins. In the camp for positive living with diabetes many patients complain about pain in legs. For this and other problems in diabetes, the main reason is impediment in blood circulation. Blood reaches the legs alright, but its reverse journey towards the heart is impeded. This leads to toxic elements getting slowly accumulated. This together with the capillaries getting damaged causes pain. The possibility of setting in of gangrene in toes and legs among diabetics is 50 to 60 times more than in normal people. Research conducted on 4399 Pioma Indians by Dr. G. R. Nelson it has been found out that 95% of those who had to get their legs amputated, were diabetic. In developing countries like India people dying due to gangrene of legs is more because people do not get proper treatment until it is too late. Regular exercise of the legs must be gone through as a necessary step of treatment. To start with 4 to 5 times during the day and slowly increasing its frequency over a period of time up to 25 / 30 times a day. It should however be ensured that there should be no pain after the exercise. If it does pain then lessen the frequency of exercise. While sleeping during the day or in the night keep the feet over a pillow so that they remain slightly above the rest of the body. This will help the toxins accumulated in the feet to be taken to the heart for purification. Change in food habits as advised will also help in reducing the problem. If in spite of this pain does not subside then vitamins as prescribed by the doctor will have to be taken and the necessary tests conducted.

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## **27. Blood circulation – basis for healthy life-force:-**

Dr. Samar Banerjee, chief of Medicine, NRS Medical College and other experts believe that in pre-diabetic stage itself deterioration sets in the arteries. Fact is that in diabetes, nerves, capillaries and arteries are elastic like rubber in normal circumstances, become inelastic like plastic after diabetes sets in which hinders blood circulation. This is main reason why all parts of body have a deleterious effect in diabetes.

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## **28. Capillaries get changed in diabetes:-**

It is necessary to understand another major problem in diabetes. In a healthy person blood travels from the arteries to the capillaries and nerves to the entire body and from there impure blood travels back to the heart for purification by the same route. In diabetes new blood vessels are formed and impure blood gets mixed with pure blood. Now did you understand enormity of the problem? This prevents body parts from getting pure blood resulting in big and small cells decomposing and dying. This also results in numbness of hands and feet, hot and cold sensation dying, development of feeling as if walking on cotton etc. It has been observed in many patients they are not aware that their foot wear is no longer in their feet, much after it gets removed. One patient had a nail stuck in his feet; only after his foot was x-rayed did he know that there is a nail inside his foot.

Increase in blood sugar also increases water content in the retina which results in the retina being bloated thereby increasing the lens number. Those with diabetes have a 40% increased possibility of contracting glaucoma than others. Glaucoma increases pressure on the eyes which in turn affects the retina as well as the subtle capillaries in the eye. Diabetics have a greater possibility of having cataract compared to others. Diabetics have cataract in younger age and ripen fast too. Due to inadequate blood supply the retina is unable to perform its functions properly. In course of time the capillaries become like balloons. They also increase in numbers and after a while possibility blood oozing from them increases. If the retinal damage is not checked in time, 25% patients can become blind. And 70% patients become blind within 5 years.

To avoid the retinal problem, apart from diabetic control and control over blood pressure, strict abstinence from all kinds of tobacco consumption needs to be observed. To avoid these bad retinal occurrences it is necessary to get oneself checked by an eye specialist at least once in six months, because until there is no bloating of blood in the capillaries the patient may not have difficulty in his vision. This is reason why among some patients eyesight suddenly vanishes. Therefore it is very essential that the retinal testing is done regularly.

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## **29. Why is it necessary to save eye-sight in diabetes?**

1. Urine and blood testing becomes difficult;

2. One has to depend upon others;
3. If eye sight is lost reading and writing also becomes difficult. Fingers start becoming numb is the first important indication of this malady. If problem is detected in the retina early enough, laser therapy can be used to effect a cure for the same.

You should observe the following scrupulously to avoid eye problems:

1. Clean the eyes with pure water thrice a day.
2. Maintain full control over diabetes.
3. Bring blood pressure under control if high.
4. Give up smoking and consumption of tobacco.
5. Get eyes checked from an eye specialist once a year.
6. Look skyward every day for 5 to 10 minutes

Ensure that you consult an eye specialist if –

- a) Start seeing hazy;
- b) Have difficulty in reading a book;
- c) Have double vision;
- d) One or both eyes have pain;
- e) Eyes do not become normal after becoming red;
- f) Eyes feel pressure;
- g) Start seeing blackness;
- h) Start seeing straight line as crooked;
- i) Side view is blocked.

Among patients of type-1 diabetics if afflicted from childhood, eye problems do not occur until 15 years of age. Therefore it is not necessary to get retinal check for those below the age of 15. As against this for type-2 diabetics it should be done immediately because for these people eye problems can start right from the beginning. The possibility of losing eye sight is found to be 10 to 20 times more among diabetics as compared to others.

It is necessary to be attentive to the following 9 things to avoid retinal problems:

1. Try to maintain good control on blood sugar. In a research paper published in 1993 called 'Diabetes control and Complication Trial' it has been written that those who did not control blood sugar were 400 % extra susceptible to retinal problems. Even among those who already had retinal problems, its growth was reduced to half when sugar was brought under control. This itself proves how advantageous it is to keep blood sugar under control while not doing so can be extremely devastating.
2. According to research conducted in Scotland it was observed that the retina of those diabetics who are alcoholics gets damaged fast.
3. Smoking and tobacco consumption can also adversely effect both big and small nerves. This can devastatingly affect the retina.
4. In type-1 diabetes retina of the eye gets adversely affected.
5. Blood pressure and cholesterol should also be kept under control.
6. Kidney deterioration should also be attended to. If kidney needs transplantation it should be done as early as possible.
7. Pregnant diabetic women have also been found to be suffering from eye problems.

8. If there is a retina problem, then before getting the cataract operated the retina should be rectified first through laser operation.

If a person has to face eye problems in diabetes he has to suffer a lot financially and also socially apart from facing many day to day difficulties. Preventing eye problem is therefore the best way out.

### **30. Healthy kidneys means safety from toxins:-**

One of the most important body parts is the kidney. There will be no perceptible difference felt by the patient if out of the two kidneys, one is completely dysfunctional and the other is only 50% functional. Minerals are very essential for healthy life, which are properly controlled by the kidneys. Kidneys help in maintaining the right temperature of the cells. When in good health they also throw out the impurities in our body through the medium of urine. They prevent proteins and other essential chemicals from being filtered out. In diabetes this process is disturbed and proteins and impurities and toxins start getting into the blood. At the end of the various processes of the body substances like urea, uric acid, creatinine etc. keep adding in the blood. When blood passes through the kidneys they segregate these substances and excrete through the urine. Kidneys maintain the right proportion of these acids in the blood. If this process does not happen properly it can result to death. If the work of the kidneys does not proceed properly even the bones can be weakened.

Research was conducted for finding out the relation between kidney failure and diabetes. The type-1 diabetes patients who came to Josline Clinic between 1967 and 1972 and who were below 21 years of age were identified. 500 patients who were alive in 1987 out of 66 patients who were alive who had started to have kidney trouble were studied. Their cases were studied in relation to those 102 patients who did not have kidney trouble started as yet. Their blood sugar levels were found out during the past 15 years. The result was quite inspiring for every patient. Compared to those who had blood sugar under control, 10 times more were the kidney trouble afflicted that did not have their blood sugar under control, which means that if you are keeping the blood sugar under control right from the beginning, possibility of facing kidney failure is as good as nil. Diabetes is one of the most important reasons for kidney failure. Out of all the reasons for kidney failure comprise 25% happen to be diabetes. In this condition the only alternatives are to get dialysis done twice or thrice a week or getting a kidney transplant done. And both these treatments are atrociously costly. Therefore the only way to have a happy life is to keep blood sugar and blood pressure under complete control.

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### **31. Save the brain – enhance efficiency:-.**

Symptoms like numbing of feet, burning sensation, pain like needle pricks are felt. If the nerves problem gets complicated, jerks in legs while sitting or reclining, can start happening. About 30% of the patients may suffer from problems of brain and the veins related to it. In some

cases touch sensation completely disappears while in some others it becomes too sensitive and the person starts feeling burning sensation to such an extent that they can't even bear the pull over to touch the feet resulting in remaining awake for the entire night.

Patients who are careless in control face excessive reduction of salt and water in the blood, which is called dehydration coma and can prove to be fatal.

Effects on the brain due to non-availability of glucose

- a) *Overall – diminished concentration, neurosis, giddiness, odd behaviour, sleeplessness, drowsiness, fits.*
- b) *In particular limbs – hazy eyesight, impediment in speaking, weakness in limbs, stroke.*
- c) *Not quite perceptible – tiredness, headache, nausea.*

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### **32) An important reason for death – heart disease:-**

The heart provides blood to the entire body, but the heart also needs blood which it receives through some special veins called 'arteries'. Even these arteries are damaged in diabetes resulting in possibility of impediments in the flow of blood. About 50% of diabetics have high blood pressure. Those diabetics, who suffer from high blood pressure, are saddled with 5 times the possibility of death compared with others.

In a study it was found that those diabetics who keep good control over blood pressure are able to keep eye and kidney problems to the extent of 37% down while the possibility of heart failure is reduced to 50%. When a diabetic gets up from a sitting position he feels giddiness. Diabetics should never ever allow their blood pressure to rise above 85/130 limit. To achieve this all the steps necessary to keep diabetes under control are necessary together with reduction in consumption of salt. Taste of food may be increased with the help of rock salt, turmeric, ginger, asafoetida, cardamom, green chillies etc. Some use of a little red chilli can also be made.

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### **33. Figures that will surprise you!**

There is diabetes among 50% cases of stroke. In other words if all the causes ending in stroke are evaluated 50% of them are due to diabetes. 25% of those who had heart attack have been found to be diabetic. Among All the cataract operations performed in the Colonial War Memorial Hospital, 40% were on diabetics.

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### **34. Towards old age ...**

After studying the various branches of physiology and biochemistry Dr. Bresco and Dr. Bendit have proved that if after being diagnosed of diabetes even if there may not be any problems, the age of the person reduces by 20 to 30 years than his normal life span. This is based not on external symptoms but on observation of changes in internal system. Dr. Stefen S. Phajanas of the University of Michigan has written a good report in this matter.

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### **35. Talk and download your mind ...**

"This sermon was quite inspiring!" said a patient. Well that the doctor has explained, he never gave me any chance to speak. All the other patients accompanying him concurred with the view. As long as the patients do not convey their mind neither does they listen to what he says. Therefore in lectures arranged for diabetics, they should be given a chance to air their grievances by all means. Because the patients also wish to tell how they feel after being diagnosed of diabetes.

While educating about diabetes it should always be remembered that 'the more the patient is allowed to talk, the more he will expose his mind'. If his mind is unburdened he will also listen to you.

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