

Diabetes Education

✓ **Diet:** Modification of diet is the cornerstone of good Diabetes management. Following principles should be followed about diet–

1. Avoid as much as possible direct sugars as contained in sweets, soft drinks, sherbets, sweet tea, coffee, biscuits, jam, jelly, cake, pastry, ice cream, honey, jaggery, toffee, chocolates etc.
2. Avoid as much as possible fried food like puri, kachori, samosa, khasta, pakora, paratha and chaat etc.
3. Avoid or minimize the use of additional fats like ghee, butter and cream.
4. Average amounts of milk, yogurt, mattha and home made paneer (cottage cheese) can be consumed. Only fat free double toned milk should be used.
5. Avoid as much as possible high caloric starchy vegetables like potato, arabi, jimikand and singhara etc.
6. 5 - 10 pieces of almonds can be consumed daily; other dry fruits including ground nuts should be avoided.
7. Red meat (mutton) is to be avoided. Chicken and fish can be taken in moderate amounts. Egg whites can be consumed. Those having high uric acid or a kidney problem must ask the doctor specifically about how much non-vegetarian food, egg and paneer should be consumed.
8. Avoid refined flour like maida and besan. Use instead, the whole grain flours. Prefer brown breads to white.
9. Avoid high caloric fruits like mango, cheeku, sharifa, banana and grapes etc. consume 100 – 150 grams of other seasonal fruits every day.
10. Eat plenty of fresh salad with every meal.
11. Eat plenty of seasonal vegetables with every meal. Vegetables should be cooked with minimum amount of cooking oil.
12. Use sufficient quantities of natural anti-oxidants as in sprouts, lemon, tomato, amla and tulsi leaves.
13. All the three cooking mediums (fats) namely, refined oil, mustard oil or olive oil and desi ghee should be used in equal quantities, although in minimal amounts. As a rule all cooking should be done in non-stick utensils only.
14. Deep frying should be avoided as much as possible. Grilling, baking, boiling and steaming should be preferred.
15. Pulses like daals, razma, chholey and green peas should be used in average quantities. Daals should preferably be cooked with skin.
16. Spices and salt should be used in moderate amounts.
17. Both chapattis and rice can be eaten. The doctor should be consulted about the number of chapattis, or amount of rice. As a golden rule however, 10% less food should be eaten than the stomach capacity. **Never Ever Overeat.**
18. Eat in small frequent meals rather than a few heavy meals.
19. Avoid drinking water immediately after food. It should best be taken 40 minutes after the food.
20. If possible sit in vajrasana posture for 10 minutes after every meal.
21. Avoid too much of tea and coffee.
22. Smoking, tobacco (in any form) and paan masala etc. should be totally avoided.
23. Alcohol should best be avoided. For those who consume alcoholic drinks, red wine may be considered the best option. Total amount of alcohol should not exceed 30 grams at a time (i.e. 80 ml of whiskey or rum, 200 ml of wine or 750 ml of beer) and not more than twice in a week.
24. Keep body weight under ideal control by dieting, exercise, yoga and medicines.

Remember that these are only general guidelines. For personalized advice on diet, Get a diet chart from a qualified dietician according to doctor's advice.

✓ **Exercise (Aerobics and Pressure Exercises):** As a rule, only those people maintain ideal health who are involved in some or the other type of regular exercise. According to feasibility any form of aerobic exercise can be chosen from the list of jogging, brisk walk, outdoor games, cycling, swimming, dancing and skipping. Important rules about aerobics and pressure exercises are as follows –

1. It should be done for atleast one hour per day, at least five days a week (preferably all 7 days).
2. It should be done at whatever maximum speed / intensity is possible.
3. It should be done with good quality sport shoes and sports wear.
4. It should be done silently and with full concentration. No talking and no gesturing during exercise or aerobics.
5. It should be done with empty stomach, preferably in the morning.
6. Even if the patient is not able to perform much exercise because of arthritis or any other limitation, still,

whatever is possible should be started immediately without any further delay.

7. Pressure exercises like gym workout, traditional Indian exercises, weights, bull worker and dumb bells etc. should also be included in the exercise programme, under professional guidance.
8. All types of exercises should be started at minimum intensity and then should slowly and steadily be increased to maximal levels. It has to be continued life long. Serious complications are not possible as long as regular exercises are continued.
9. Heart patients must discuss the exercise issue with their doctor before starting anything.

✓ **Yoga:** Include yoga in your everyday schedule. It is extremely effective in Diabetes and almost every other chronic disease. Three main aspects of yoga should be followed i.e. Asanas (Postures), Pranayam and Dhyana (Meditation). The general rules of yoga are as follows –

1. Yoga should be done with empty stomach, preferably in the early morning. If it is not possible in the mornings, then doing yoga in the evening is much better than not doing it at all.
2. 40 to 60 minutes should be devoted to yoga every day, at a time.
3. It should be done in a clean and quiet place.
4. It should be done sincerely, silently, with full devotion and with eyes closed.
5. Asanas should include king and queen exercises, sarvangasana, halasana, bhujangasana, pashchmittosana, chakrasana, vajrasana, balasana, mandukasana, supta vajrasana, pawan muktasana, butterfly movement, siddhasana and shavasana. Asanas should be coordinated with respiration.
6. Pranayam (Anulom - Vilom) should be done with back erect and eyes closed after taking a bath in an absolutely clean place sitting in siddhasana or on a chair. It should be done for 15 minutes.
7. Meditation should be done in the same posture as pranayam with fingers in gyaan mudra, eyes closed and all concentration fixed on respiration, feeling every aspect of respiration. Breathing should be absolutely normal and relaxed. It should be done for 20 minutes.
8. Methods of yoga should best be learned from a skilled yoga teacher.

✓ **Fixed Lifestyle:** All functions of the body occur at definite intervals, on a set rhythm. The more vigorously the rhythms of life are maintained, the better is Diabetes control and general health. It is best to make a comfortable and convenient daily timetable and then stick to it. The time to get up in the morning and to sleep in the night, time for breakfast, lunch and dinner, exercise, yoga, rest and recreation should all be fixed. Special programmes should be created for weekly holidays, festivals and vacations. Once established, these rhythms should not get easily disturbed. For best health, one should take dinner latest by 7 pm; go to sleep by 10 pm and get up in the morning at 5 pm. Breakfast should be taken at 8 am, lunch at 1 pm and evening tea at 5 pm. It is very important to manage time very effectively. In a usual working day, 1 hour should be devoted to exercise / aerobics, 1 hour to yoga, 7 hours to sleep, 3 hours to fulfill personal hobby, 3 hours to daily personal chorus and 9 hours to work and travel. The 9 hours of work and travel period should ideally start at 8.30 to 9 am and finish by 6 to 6.30 pm. It is inclusive of 30 minutes of lunch break at 1 pm.

✓ **Full Sleep:** Sleep is as important for good health as oxygen. Lack of oxygen kills in minutes and lack of sleep kills in weeks. Chronic sleeplessness is a very important cause of worsening of Diabetes. Seven hours of good quality sleep is a very important requirement for good control of Diabetes. And a good quality sleep is that which is achieved without any tablets or alcohol. If all the aspects of a healthy lifestyle are followed, good sleep comes spontaneously and naturally. For some people a change of mental attitude is required for good sleep. Change of attitude, although difficult, is still possible with certain mental exercises.

✓ **Happy, Satisfied and Positive Mind:** Mind exerts the most powerful influence on general health, diabetes control, blood pressure, development of diabetic complications including coronary heart disease, quality of sleep, secretion of hormones and maintenance of biological rhythms. A mind that is unconditionally positive, utterly peaceful, inherently happy, eternally satisfied, filled with love (for all) and is always focused on what is to be done (instead of what happened or what should have happened or what will happen), gives rise to supreme physical health. These attributes of the mind can be developed by practice of certain mental exercises. Few such mental exercises are described below –

1. Whenever something big happens in life, either good or bad, say 'so what?' Then close your eyes and remember with all your heart and soul that whatever has happened is short lived, unimportant and unnoticeable

for the entire world. It has not happened to you for the first time in the world. Open your eyes only when this feeling goes deep inside.

2. When you are filled with rage, anxiety or any other strong emotion, sit straight on the chair, close your eyes and take a deep breath. Hold the breath for as long as possible and then release it slowly. Do it 5 times and then, still with eyes closed, find out where is the rage or that disturbing emotion. Open the eyes only when you have studied the disturbance thoroughly.
3. Practice watching yourself. This is a three step exercise. In the first step watch (be aware of) your body. Feel every movement of the body with full awareness. In the second step watch your mind. With closed eyes, let the thoughts come and go. Just look at the changing thoughts as if they are not passing through your own mind; as if they have no relationship with you. Don't comment, don't criticize; just watch. In the third step watch your emotions. For example when anger or frustration affects you, close your eyes, with back erect, feel and experience the full extent of the emotion. Feel how and from where it is getting generated and how it is affecting your body and mind. Once again, don't comment, don't criticize; just watch.
4. More mental exercises can be learnt when proper time comes. In the beginning however the above described three exercises are sufficient. In most cases, they are sufficient to radically change the quality of the mind and solve the problem.

✓ **Home Blood Glucose Monitoring:** In a diabetic subject, longevity and general health is always in direct proportion of the ambient blood sugar level. Every diabetic must carry a good quality glucometer. Without a glucometer, good control of Diabetes is just not possible. Blood sugar should be checked with the glucometer fasting, 2 hours after lunch and before dinner at least twice in a week. Apart from that, a random value should be checked whenever there is some unexpected or new problem. All the values must be entered in a diary and the diary should be shown to the doctor during consultation. The home blood glucose recording forms the most important basis for the doctor to decide the line of medication. Blood sugar values by good quality glucometers are more reliable than lab values. The main advantages of glucometer are as follows -

1. When blood glucose is checked by glucometer, the daily routine is not disturbed. Disturbance of the daily routine itself can alter the blood sugar value significantly.
2. Glucometer requires only a tiny drop of blood while for lab test about fifty times more blood is required.
3. The report is available in 10 seconds.
4. Quality control of the testing device is in your own hands.
5. Blood sugar can be checked several times throughout the day and night, giving full diurnal sugar profile.
6. During hypoglycemia and other emergencies, blood sugar testing by glucometer may be life saving.

✓ **Regular Consultations and Investigations:** No diabetic subject should wait for a problem to occur. The main theme of Diabetes management is to avoid, prevent and delay complications. If and when a problem occurs, it is already too late. Complications of Diabetes are though preventable, but once they occur, they are mostly untreatable. It is therefore of utmost importance that the patient must visit the doctor at fixed intervals of three months or as directed by the doctor. From time to time, the doctors would do certain investigations. Line of medication would be changed or new medicines would be started as and when some abnormality is detected. No anti-diabetic medicine is effective for ever. Regular checkups and investigations is the most important method of preventing complications and achieving a problem free life of hundred years.

✓ **Management of Hypoglycemia:** Low sugar or hypoglycemia is possible in every diabetic patient. As and when sugar level becomes low, the patient may feel giddiness, weakness, blackouts, nausea, perspiration, tremors etc. If these symptoms are not recognized and catered to, unconsciousness may follow. Hypoglycemia is a potentially serious condition and it should be treated promptly and effectively. First of all it should be remembered that chances of hypoglycemia increase many times during fasts, undue physical work, simultaneous consumption of ayurvedic and home remedies for Diabetes and during certain illnesses and consumption of certain medicines. These situations should be carefully avoided and / or effectively managed. On recognition of hypoglycemia, the following four steps should be taken -

1. Step 1. Blood sugar should be checked by glucometer. If the value is less than 70 (in patients less than 50 years of age) or less than 80 (in those over 50), proceed to step 2. If glucometer is not available go straight to step 2.
2. Step 2. Give 4 tea spoons full of Glucose or sugar dissolved in half a glass of water (or anything sweet, if

glucose and sugar are unavailable).

3. Step 3. When the patient feels better, let him eat some carbohydrate meal like chapatti, rice, bread, noodles, daliya etc.
4. Step 4. As soon as possible, inform the treating doctor about the whole episode and get new instructions.

✓ **Diabetic Complications:** Diabetes is a serious disease because in due course of time it gives rise to serious complications. Sugar is a tissue toxin. It damages all the different types of body organs that are exposed to high levels of sugar in the blood. Although every organ of the body is slowly damaged by high levels of sugar, yet some organs are more vulnerable than others for this type of sugar mediated damage. Diabetics can develop heart attack, paralysis, kidney damage, blindness, damage to nerves, chronic foot ulcers and gangrene, impotence and repeated infections. Common infections include Tuberculosis, UTI, skin infections, and infections of the genital parts, viral infections, chest infections and septicemia. Diabetics are admitted to ICU much more commonly than non-diabetics. Diabetics are also more prone to develop osteoporosis and arthritis. They develop chronic liver disease, intestinal dysfunction and paralysis of urinary bladder much more commonly than non-diabetics. Fortunately all these complications can be prevented by tight control of diabetes right from day one. The damage to various organs caused by diabetes is slow, progressive, definite and accumulative. This is not easily perceivable in the beginning except by lab investigations. Often the patient knows about the complication only when the organ failure or severe damage has already taken place. For these reasons diabetics require the high end therapeutic procedures and surgeries like coronary bypass surgery, angioplasty, joint replacements and laser treatment of eyes much more commonly than non-diabetics. One must always remember that the diabetic complications are although preventable but not treatable. And this is the reason why diabetic subjects must be examined and investigated regularly on a fixed pre-decided protocol. By this approach development of complications can be significantly prevented.

✓ **Insulin Education:** Insulin is the most important and effective medicine for Diabetes. All patients of Type 1 Diabetes (Diabetes that occurs in children) have to be treated necessarily with Insulin right from day one for their entire lives. In Type 2 Diabetes, which occurs in adults, Insulin is required for variable periods of time, several times in their lives. Most cases require Insulin permanently at some stage of the disease. Indian patients have many myths about Insulin like 'Once on Insulin – always on Insulin' and that Insulin treatment indicates very advanced stage of the disease after which lifespan remains small or that Insulin can be avoided. All these are baseless myths. Truth is that lifespan and the quality of life are significantly reduced if Insulin is not given when it is scientifically indicated. Nowadays very fine quality needles and newer Insulin delivery devices known as 'Insulin Pens' are available in the market. An 'Insulin Pen' is called so because it looks like a pen. These devices have simplified the process of injection tremendously. Insulin injections are virtually painless.

Insulin works best when it is preserved and injected correctly. If preservation of Insulin or injection technique are not correct, much of its possible benefit gets wasted. Following things must be remembered about Insulin –

1. Insulin should always be preserved at 4-8 degrees C temperature. Insulin is a temperature sensitive molecule and gets destroyed at higher or lower temperatures. Unfortunately a heat destroyed Insulin doesn't look different from normal effective Insulin. Insulin should always be preserved in the lower compartments of a refrigerator in a clean plastic box. It should never be kept in the freezer. If by mistake Insulin gets frozen, it should be discarded as frozen Insulin again becomes ineffective. While travelling, Insulin should be carried in a cool pack. Cool packs are available in chemist shops or may be procured through the field staff of Insulin making companies. Cool packs should always be kept in the freezer and should only be taken out at the time when Insulin is taken out from the refrigerator. Once out of the freezer, the cool packs maintain temperature in the range of 4-8 degrees C for around 48 hours.
2. Always ensure that the Insulin vial and the syringe match in terms of concentration of Insulin. Insulin is available in two concentrations 'U40' and 'U100'. U40 Insulin should be injected only with U40 syringe and U100 Insulin with only U100 syringe.
3. At the time of injection, the Insulin vial should be taken out of the refrigerator or cool pack and kept at room temperature for about 10 minutes.
4. If the Insulin is not clear and watery (Rapid acting Insulin or Regular Insulin) and it is cloudy or milky (Premixed Insulins), it should be gently inverted 10 to 15 times or rolled between the palms so as to mix the contents well.
5. The injection site should be cleaned with a spirit swab and allowed to dry.
6. Insulin should then be withdrawn in the syringe after pushing equal amount of air in the vial, or proper dose should be fixed by dialing up to the correct number in the Insulin Pen.
7. Insulin should be injected only at the proper injection site. Abdomen and thigh are by far the best Insulin

injection sites. In the abdomen the midline as well as a 2 inch diameter circle around navel should be avoided. Injection prick site should be changed every time although the main area of injection (abdomen or thigh) should be the same every time that particular dose is taken. It may be a good idea to take the morning dose on the abdomen and the evening dose in the thigh.

8. Injection should be taken absolutely straight at 90 degrees angle. Those having very thin skin may take it at slight angle (45 to 60 degrees). The needle should be allowed to stay inside the skin for 4-5 seconds so that all the medicine may come out.
9. After taking out the needle, it should be wiped with a spirit swab. Remember that the needle is not to be cleaned before the injection. After cleaning the needle it should be closed with the cap and put inside the plastic box for further use. One needle may be used for up to 5-7 days.
10. For better understanding of Insulin injection technique, [see the pictures](#).

✓ **Follow the Doctor 100%:** This is probably the most important rule of all. Most patients create their own problems by not following their doctor's advice 100%. It is very important that the patients should follow the doctor's advice 100% in terms of diet, exercise, other aspects of lifestyle management, investigations, medicines, insulin, follow up visits or any other treatment related matter. The doctor is familiar with all the various nuances of the disease. He is a professional and a specialist on the subject. Don't request him for prescribing or avoiding any particular treatment on the basis of your own personal prejudices or like and dislikes. Let him handle your problems in the best possible way scientifically and professionally. If you have some problem with any particular aspect of treatment, discuss it out with the doctor, and allow the doctor to have the final say in matters of your treatment. Follow ultimately what the doctor advises you. You are free to choose your doctor but not the treatment that he prescribes.

✓ **Indicators of ideal control of Diabetes**

1. It should be ensured that you are following all the steps mentioned above. Merely obtaining normal sugar reports with the help of medicines doesn't guarantee much.
2. Body weight should be well within healthy limits according to height.
3. Abdomen should not be prominent or bulging and the waist / hip ratio should be <0.9 for men and <0.8 for women.
4. Blood Pressure should be ~ 120 / 80.
5. Fasting Blood Sugar should be 80 - 100 and PP (2 hours after lunch) 120 – 140 (to be tested twice a week by glucometer).
6. HbA1C should be ~ 6.5% (to be tested once in three months).
7. Total cholesterol should be <200, LDL <100, Triglyceride <150 and HDL >50 (to be tested annually).
8. Microalbuminuria test (to show earliest stage of kidney damage) should be negative (to be tested annually).
9. Eye test (fundus) should be normal (to be examined annually).
10. Feet examination and foot prints should be normal (to be examined annually).
11. The patient should not be smoking or ingesting tobacco in any other form. If and when some parameter comes out to be abnormal, new medicines will be started to normalize it. That particular test will be then be done more frequently to know the efficacy of treatment.