Your Guide to Hyperglycemia

Tom Moore

A Complete reference Guide for Hyperglycemia patients

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About the Author

Tom Moore did not know what hyperglycemia was or the risks which were associated with it until his brother was diagnosed with the condition.

Tom later discovered that some of his other relatives had also suffered the condition. He realized that this could mean that he also had a higher than average risk for getting it.

So, Tom started to find out as much as he could about hyperglycemia, the associated risks and how the condition was detected and treated. His primary focus was to get the best information for his own use, but also to help his brother and, especially his brother's family so they could give him the best support possible.

Tom looked at both the information from regular medical sources and promoters and users of herbal and other treatments.

Now, Tom Moore has compiled the information into a book which he hopes will help other patients and their families like it has helped his brother.

Part-I: Introduction

1. High Blood Sugar (Hyperglycemia) - An Overview

Hyperglycemia is a condition when blood glucose levels become very high.

Insulin helps to ease the transportation of glucose through the body. When insulin levels are low, glucose transportation becomes less efficient and the result is higher levels of glucose in your blood.

Blood glucose levels are measured in either milligrams per deciliter (mg/dL) or Millimoles per liter (mmol/L). Measuring by milligrams per deciliter is the standard measure in most countries, including the United States of America, Japan, Colombia, Egypt and many others.

Most scientific journals now use mmol/L as the primary unit for measurement of blood sugar levels but they also quote mg/dl in brackets.

Blood glucose levels vary between individuals.

The normal range of glucose levels for adults is 80 to 120 mg/dL or 4 to 7 mmol/L when fasting.

If your blood sugar level consistently records above 126 mg/dL or 7 mmol/L, you probably have hyperglycemia. Hyperglycemia is said to be in place when the patient's blood glucose levels are 180 mg/dL.

But you may not notice the hyperglycemia symptoms until blood glucose levels are in the range of 270-360 mg/dL.

Hyperglycemia is common in diabetic people due to low levels of insulin in their bodies. Diabetic people might register chronic hyperglycemia even when in a fasting state.

Hyperglycemia in diabetic people may be either of two types; fasting hyperglycemia or postprandial hyperglycemia.

If your blood sugar is more than 130 mg/dL after fasting for at least 8 hours, it is referred to as fasting hyperglycemia.

Postprandial hyperglycemia does not normally cause your blood sugar to exceed 140 mg/dL after meals except in rare cases which usually involve a particularly heavy meal. If your postprandial hyperglycemia is consistently high, it could indicate the onset of Type II diabetes.

Hyperglycemia in non-diabetic people is primarily due to eating disorders, high stress levels, medications and lack of regular physical exercise.

If you consume too many calories from simple and complex carbohydrates at a single meal, your blood sugar levels may increase.

Certain medications, like corticosteroids, antipsychotic agents, beta-blockers, protease inhibitors, pentamidine, L-asparaginase, thiazide diuretics and niacin can disrupt blood sugar levels.

If your stress levels are very high, you might develop hyperglycemia. When your body is stressed, endogenous catecholamines are released. These tend to increase blood sugar levels.

Physical stress, caused by ailments like flu, colds or other illnesses may start to make your blood sugar levels to increase.

Mental stress, like misunderstandings and emotional upsets at home, school, workplace or between partners may be a factor when blood sugar levels increase.

Common symptoms of hyperglycemia include:

- frequent hunger
- poor healing of wounds
- excessive thirst
- repeated urination
- fatigue
- blurred vision
- excessive weight gain
- regular vaginal infection
- impotence in men
- dry mouth
- drying up of your skin
- groin rash
- itchy skin
- chronic constipation or diarrhea, etc.

If your hyperglycemia condition deteriorates, you could develop other complaints which might include:

- ketoacidosis
- dehydration due to osmotic diuresis (increased urination)

- glycosuria (an excess of sugar in the urine)
- extreme thirst or hunger
- lowered consciousness, and
- an increase in anxiety levels.

In acute hyperglycemia, insulin levels fall very low. Your body cannot get good use of any glucose present without insulin. So, your body breaks down stored fats to use as energy.

Waste products are produced during this breaking down of the fats.

These waste products are ketones. Your body cannot sustain higher ketone levels and tries to get rid of them through your urine.

But, it is likely that not all the excess ketones are excreted, so they start building up in your blood.

This leads to ketoacidosis. Ketoacidosis is very serious.

It involves the development of "ketone bodies" (toxic acidic chemicals produced to aid the breaking-down of fat in the body and also higher acidity of your blood. It requires immediate treatment, usually in a hospital. Common symptoms of ketoacidosis include very dry mouth, fruity breath, nausea and vomiting, and shortness of breath. This may lead to loss of consciousness.

High blood sugar or hyperglycemia can cause serious damage to your kidneys, eyes, nerves, blood vessels, and heart. Sometimes, hyperglycemia might cause coma and eventual death.

Early detection of hyperglycemia can help you adopt proper treatment methods before it gets worse.

The common treatment options for hyperglycemia is dietary control which specifies:

- ✓ what you eat
- ✓ regular exercise
- ✓ measures to control stress and
- ✓ medications as prescribed by your physician.

Check Your Blood Sugar Levels

You should check your blood sugar levels regularly. If your blood sugar is more than 240 mg/dl, you should check your urine for ketones. If you have ketones, you should not exercise as exercising with ketones could increase your blood sugar further.

Hyperglycemia can affect people of any age.

Even children and teens are reported with hyperglycemia.

Parents of children with hyperglycemia need to take extra care to maintain their blood sugar at normal levels.

Children should be helped to understand their symptoms so that they can seek help whenever necessary. Educate your children on the benefits of good diet, regular exercise and proper medications.

A first-time hyperglycemic needs to undergo various tests like random plasma glucose, fasting plasma glucose, or two-hour postprandial plasma glucose levels before a diagnosis of diabetes can be made.

You and your doctor need to understand what the true condition is.

Managing hyperglycemia requires you to check your blood glucose levels often. Please ask your doctor to confirm how frequently you should check your blood glucose levels.

It is possible to check your blood sugar level at home with a simple kit. Regular checking of blood sugar levels may help to prevent development of acute hyperglycemia.

Always carry and wear your medical identification that states you have diabetes. This can help you receive immediate and correct medical care in case of an emergency.

Part-II: Understanding Hyperglycemia

2. What is Hyperglycemia?

Hyperglycemia is a medical condition when glucose levels are very high in your blood.

The word, 'Hyperglycemia', is a Greek term. 'Hyper' means excessive, 'glyc' means sweet, and 'emia' means of the blood. Hyperglycemia is also referred to as 'high blood sugar'.

Insulin is responsible for lowering blood sugar levels in your body. A hyperglycemic condition develops if insulin produced by your body is ineffective at controlling blood sugar levels or if your body does not produce enough or any insulin at all.

Hyperglycemia is likely to occur if you eat a sugar-rich diet, have high stress levels, and do not do any physical exercise.

Sometimes, surgery or illness might cause hyperglycemia. Measuring sugar levels in blood may indicate the presence of hyperglycemia.

Common symptoms of hyperglycemia include increased thirst, hunger even after eating, repeated urination, low energy and dry skin.

Hyperglycemia causes diabetes.

Type I or Type II Diabetes.

Diabetes can be **Type I** or **Type II**.

In Type I diabetes, your pancreas does not secrete sufficient insulin to process glucose. Therefore, there is excess glucose in the bloodstream.

In Type II diabetes, cells are unable to receive and utilize energy produced in the body. Glucose levels remain high.

Extreme hyperglycemia can cause blurred vision, dizziness, and confusion in thoughts due to inability to think clearly.

Hyperglycemia can prove fatal if left untreated. It could lead to ketoacidosis due to production of ketones and eventually cause death.

3. Factors in the Development of Hyperglycemia

Common factors in the development of hyperglycemia may include:

Food: If you eat lots of food and mostly complex and simple carbohydrates, your blood sugar levels increase. Some of your food remains in the digestive system and continues to release glucose into the bloodstream, causing the level of glucose in your blood to increase.

Lack of Physical Activity: If you do not do any physical activity, some of the glucose present in your body remains unused. You further increase your existing blood glucose levels through eating more food.

Your body could convert excess glucose to fats and store it in your body. The excess fats may cause insulin resistance which might encourage the development of hyperglycemia.

Medications: There are certain medications that increase blood sugar levels.

Glucocorticoids: May not allow insulin to function normally and increase blood sugar levels.

Diuretics: May suppress insulin secretion in body which could, again, cause blood sugar levels to increase due to low insulin levels in your body.

Other medications that may increase blood sugar include:

- chemotherapeutic medicines
- calcium channel blockers
- Chlorpromazine

- Diazoxide and
- Propranolol.

Prolonged Exercise: If you exercise for long periods, there might be a sudden drop in blood glucose levels and your pancreas may release the glucagon hormone into the bloodstream.

This increases blood sugar levels.

Then, after the hours of exercise, you would be hungry and consume more food.

This is also likely to increase your blood sugar levels.

Bacterial Infections: High blood sugar levels may cause bacterial infections where the bacteria feed on and multiply because of the glucose in the digestive system. The bacteria may be a factor in the increase of blood glucose levels.

Constipation: If you regularly suffer from constipation, your bowels are never totally cleared. Bowel retention may cause similar results to the over-consumption of food and blood sugar levels are likely to increase.

Stress: Mental and emotional stress may cause lot of harm. Stressful emotions like fear, anger and anxiety tend to cause matter to be retained in the bowel, which prompts the pancreas to release glucagon. This could encourage an increase in your blood sugar level.

Ketoacidosis: When insulin levels are low, your body breaks down fats to get energy. This increases glucose levels in blood and can lead to hyperglycemia. Ketones are formed during the breakdown of fats. Your body cannot easily excrete ketones, which may cause

infections leading to an increase in blood sugar levels and other problems.

Diabetes: Insulin is most effective at lowering the concentration of blood sugar. Diabetics have low insulin levels in their bodies. This increases blood sugar levels and may lead to hyperglycemia.

Pregnant women may develop gestational diabetes when the blood sugar levels increase during pregnancy. Their blood sugar levels become normal after you deliver your baby.

Obesity: Obese people have an accumulation of fatty tissue. Excess fats in the body may cause an increase in blood sugar levels.

Eating Disorders: You should have a healthy diet. If you eat too much at one time and starve at other times, your blood sugar levels may fluctuate immensely, which could cause an increase in blood sugar levels. That’s a recognized factor in the development of hyperglycemia.

Liver and Kidney Diseases: If you suffer from liver or kidney disease, your blood sugar levels increase. Any infection in the pancreas can disrupt insulin production in your body.

Low insulin levels could encourage an increase in blood sugar levels leading to hyperglycemia.

Spoiled Insulin: If your pancrease secretes low levels of insulin doctors could prescribe regular insulin injections.

If the injected insulin has not been kept at proper temperature or is beyond its expiry date, you might develop hyperglycemia as your blood sugar levels increase.

Insulin needs to be injected and cannot be taken as medication because your stomach acids act on the insulin and prevent it from functioning.

Injuries and Surgery: Injuries and surgery may cause blood sugar levels to increase.

Some injuries may develop into infections which could increase blood sugar levels.

Some surgical procedures may require you to be on intravenous drips and other medications which may be a factor in increased blood sugar levels.

Genetic: Hyperglycemia is hereditary. If your parents or your siblings have hyperglycemia, you have a higher than average chance of developing it at some point in your life.

Diabetic Medications: If you are a diabetic, you should take medications as prescribed by your physician.

If you are irregular taking your medications or take less medications than are prescribed for you, your blood sugar levels could increase, increasing the risk of hyperglycemia.

4. How to Check If Your Hyperglycemia is Related to Diabetes?

Your blood sugar level is not always the same.

You may have just occasional episodes of high blood sugar and not be alarmed because your blood sugar returns to normal levels by itself.

You should always seek medical treatment if your blood sugar levels remain high and it does not return to normal levels or you have repeated episodes like that just described.

Hyperglycemia indicates high blood sugar levels.

Diabetes Mellitus is a medical condition due to low insulin levels. This causes blood sugar levels to increase. There is very little demarcation between hyperglycemia and diabetes. Hyperglycemia commonly occurs in diabetes, Cushing's syndrome and other ailments.

It could be due to low insulin levels in your body or because your body is unable to use insulin to turn glucose into energy.

Analyzing if Your Hyperglycemia is related to Diabetes

High blood sugar levels do not automatically categorize you as a diabetic.

Your physician will conduct specific tests to determine if your blood sugar levels are sufficiently high to diagnose you as a diabetic.

Your doctor could suggest regular monitoring of your blood sugar levels with proper dietary control and, possibly, some medications.

If your blood sugar levels return to normal after a specific period, it is likely that you do not have diabetes.

Certain conditions, including some infections and illnesses may cause your blood sugar levels to shoot up and hyperglycemia to occur.

This may not make you a diabetic as your blood sugar levels could return to normal after the specific conditions subside.

In such a case, you have hyperglycemia but are not diabetic.

Some serious ailments and surgical procedures may sometimes cause an increase in blood sugar levels due to medications and intravenous drips.

Such events may make you hyperglycemic temporarily. You do not necessarily have diabetes.

Your doctor would suggest certain blood tests to determine if you are a diabetic.

You could have to undergo a fasting blood test and another blood test two hours after eating food.

Normal blood sugar levels range between 60-110 mg/dL.

If your fasting blood sugar level ranges between 110 and 125 mg/dL, you could be diagnosed with impaired glucose tolerance. This condition could develop into diabetes.

You should exercise strict dietary control and follow a regular exercise pattern to prevent the condition progressing into Type II diabetes.

If your fasting blood sugar level is more than 126 mg/dL, you are likely to be diagnosed with diabetes.

• If two of your blood sugar readings over a specific period are above 200mg/dL, you may be diagnosed with diabetes.

• Doctors sometimes adopt a traditional method of diagnosing diabetes. With this procedure, you would undergo an oral glucose tolerance test (OGTT). You have to drink a solution with a high concentration of glucose. Your blood would be checked two hours after drinking the solution.

This would determine whether you have diabetes. This method is rarely used now.

If your hyperglycemia levels are always high, doctors could suggest a Hemoglobin A1C or glycosylated hemoglobin test. This test would measure your average blood sugar levels for ninety days. You may have to undergo this test every three months after that.

Your hyperglycemia could develop into diabetes if you consume more carbohydrates than the amount of insulin administered into your body. Even consuming too many calories through carbohydrates in simple and complex forms may cause you to develop diabetes.

If you exercise very little or not at all, you may develop diabetes.

If you exercise too much, you could develop diabetes. You should therefore regulate your physical exercise to do just the amount which your physician advises you to do.

If you suffer from extensive emotional stress or remain anxious at all times, your hyperglycemia levels could encourage the development of diabetes.

Stress releases specific hormones into the bloodstream which may increase blood sugar levels.

• If your blood sugar levels increase greatly, you may develop **diabetic hyperosmolar syndrome** or **diabetic ketoacidosis**.

In **diabetic hyperosmolar syndrome**, your blood becomes thicker.

In **diabetic ketoacidosis**, your body breaks down fats for energy and produces ketones. These are toxic and acidic.

Both conditions require immediate medical treatment.

Diabetes and hyperglycemia are commonly associated with:

- increased hunger
- increased thirst
- excessive urination and
- perpetual tiredness.

But, not everyone with these symptoms develops diabetes and hyperglycemia.

Some people might develop Type II diabetes without appearing to have any symptoms at all.

Regular blood tests can help an early diagnosis.

Hyperglycemia and diabetes, if left untreated, can cause serious health problems.

Consistently high sugar levels in the blood damage vital body organs including your heart, kidneys and others.

It can affect your vision and your central nervous system.

Early diagnosis of these medical conditions is essential.

Children with hyperglycemia or diabetes may not develop serious ailments but there is always some risk.

Serious consequences could result if symptoms and signs are not reviewed by your doctor.

5. The Signs and Symptoms of Hyperglycemia

Hyperglycemia, if untreated, can develop into ketoacidosis which is very serious and can be fatal.

So, it is essential to detect hyperglycemia in the early stages.

The earliest signs of hyperglycemia may include:

Headaches: Headaches which persist for hours could make you feel tired and devoid of any energy.

Increased Thirst: This may be related to hyperglycemia if your body is trying to excrete high levels of glucose present in your blood.

This could make you feel dry in your throat and extremely thirsty. You could lose lots of water through frequent urination and you feel very thirsty as your body tries to keep you hydrated.

Blurred Vision: High levels of sugar in the blood may affect the nervous system and could cause blurred vision.

Difficulty in Concentrating: If you find that you are not able to think as clearly as you usually can and you feel really confused, this may be a symptom worth checking into.

Fatigue: Increased sugar levels may make you feel very tired and even exhausted when your body is unable to use the glucose to produce the necessary energy.

Frequent Urination: If you feel very thirsty, you drink more water and you urinate more often.

Sometimes, this may be a sign that your kidneys are responding to high blood sugar levels in your blood by trying to flush out the extra

glucose in the urine. You therefore urinate in larger volumes and more often.

Blood Glucose more than 180 mg/dL: Your body is unable to process available glucose, so your blood glucose levels increase beyond normal levels.

Weight Loss: Constant headaches and a nauseous feeling makes you eat less and you lose body weight.

Low insulin levels do not let your body break down the glucose which becomes available through food. This may lead to a loss of body weight.

Dry Mouth or Skin: Your skin and mouth become dry and you develop itchy skin.

Slow Healing of Cuts and Sores: High sugar levels in your blood may prevent quick healing of sores or cuts.

Excessive Hunger: You may feel hungry soon after having your food and develop unusual hunger pangs at frequent intervals.

You may not be able to have a full meal as you feel nauseated.

Thickening of Blood: High glucose levels in the blood may make your blood very thick where it cannot flow easily. Then, you may be unable to get sufficient energy and feel very tired.

If you have prolonged hyperglycemia in diabetes, symptoms include:

- Vaginal and skin infections due to low immunity levels
- Decreased vision as high blood sugar levels may damage the small capillaries supplying blood to your eyes

- Nerve damage causing painful cold or insensitive feet due to numbness as your nerves lose their elasticity
- Dizziness when you stand up. You feel dizzy on standing, as your energy levels are very low. Your body is unable to produce energy from the sugar in your blood.
- Loss of hair on the lower extremities
- Erectile dysfunction is common in men.
- Stomach and intestinal problems, like diarrhea or chronic constipation: Your body does not receive sufficient energy. You remain fatigued and do not eat properly. Lack of sufficient fiber in your diet may cause constipation.
- You may develop confused thoughts and could go into a coma.

It is essential to treat hyperglycemia immediately on detection. When insulin levels in the body decrease, your body is unable to process glucose into energy.

Your body then processes accumulated fats into energy. Ketones are produced as waste products when fats are processed for energy.

Your body tries to excrete ketones through urine but cannot excrete all the ketones and these start accumulating in your blood.

This is ketoacidosis which can be fatal.

Symptoms of ketoacidosis may include:

- Vomiting and nausea
- Fruity breath
- Shortness of breath causing rapid breathing
- Very dry mouth

If you detect what seem to be symptoms of hyperglycemia, you should consult a medical practitioner immediately.

Early detection can help you adopt preventive techniques and you can control your blood sugar levels better.

If blood sugar levels shoot up, it may be difficult to lower sugar levels in the blood even with medications.

The process might become prolonged and there is a chance it might develop with further complication and diseases.

6. The Risk Factors and Complications With Hyperglycemia

Hyperglycemia can cause a variety of complications if you do not take proper care in the initial stages.

Some of the complications may include:

Kidney: Hyperglycemia affects kidney functions.

Your kidneys try to excrete excess blood sugar through your urine which causes extra work for them.

Your body starts to break down fats for energy production. This forms ketones and your body may not excrete ketones properly which might cause some damage to your kidneys.

As a result, valuable protein and amino acids get excreted from your body.

Waste Products: As your kidneys do not function properly, waste products accumulate within your body, including your kidneys. The waste also gets into your blood and is circulated within it to other body parts. This may cause more serious infections.

Eye Problems: There are very small blood vessels in your eyes. Hyperglycemia damages these blood vessels and you can suffer from blurred and improper vision.

Eye problems surface in the later stages of hyperglycemia only. So, it is important to go for regular eye checkups if you are diagnosed with blood sugar problems.

Amputation: High blood sugar levels could encourage the development of gangrene in the legs and fingers. Your body parts

start deteriorating slowly and it may become necessary to amputate your legs to restrict the spread of further infection.

Cardiovascular Complications: Hyperglycemia in the postprandial state may cause a rapid increase in blood sugar levels. This affects your heart and its functioning.

Then, you could develop various complications like atherosclerosis.

Risk factors of hyperglycemia may not be the direct cause for the disease. Yet, these factors play an important role in raising blood sugar levels.

If you have any of the risk factors of hyperglycemia, there is every possibility of you developing the disease at some time.

However, the absence of any risk factor does not necessarily protect you from hyperglycemia. You can still encounter increased blood sugar levels.

Critically ill patients could develop hyperglycemia due to the use of dextrose in excess amounts. Intravenous medications and dialysis solutions contain high concentrations of dextrose.

Frequent administration of intravenous drips, medications and antibiotics in dextrose solutions to such patients might lead to hyperglycemia.

7. Types of Hyperglycemia

There are two types of hyperglycemia; fasting and post-prandial or "after meal".

More urination, distorted vision, and increased thirst are some of the symptoms of hyperglycemia.

Fasting hyperglycemia is the condition in which the blood sugar is more than the prescribed 130 mg/dL even eight hours after the last meal.

• When blood sugar is more than 180 mg/dL after a meal, it is termed post-prandial hyperglycemia. An individual with such high post-prandial sugar has high chances of getting type 2 diabetes and must be careful.

You can control hyperglycemia by checking your blood sugar daily and taking the prescribed medicine without fail.

Eating a healthy diet and exercising may also help you keep the sugar levels in check.

8.The Risk of Hyperglycemia is Serious

Hyperglycemia is a serious issue in people with diabetes. If left untreated, it can lead to major life-threatening conditions.

So, it is essential for people at risk of hyperglycemia to know about hyperglycemia, its indicators and possible treatments.

Definition

Hyperglycemia is nothing but high blood sugar. This can happen when the body cannot use the insulin it produces or when there is not sufficient insulin in the body.

Types of Diabetes

• In Type 1 diabetes the person may not have enough insulin and needs to take insulin externally to avoid hyperglycemia.

• In Type 2 diabetes the body cannot use the insulin produced properly, thus leading to hyperglycemia.

• Stress from problems in the home or workplace, lack of sleep and illnesses such as colds or influenza may lead to a rise in the body's blood sugar.

• Eating very heavy meals or a significant lack of exercise can also be factors in the development of hyperglycemia.

Incidence of Hyperglycemia in Hospitalized Patients

Studies indicate that hyperglycemia can have serious repercussions in patients with undetected diabetes, and those who get elevated blood sugar levels which may be hospital-admission related.

Research shows that almost twenty-five percent of patients admitted for heart operations have hyperglycemia and almost forty

percent of patients admitted to hospitals exhibited hyperglycemia due to illness or hospital related stress.

The hyperglycemia may disappear in some patients after discharge from the hospital while some with undiagnosed diabetes may continue to have high blood sugar after their discharge.

Hyperglycemia as a Cause of Heart Disease

Several studies indicate a direct link between untreated high blood sugar and heart disease. This is because high blood sugar leads to atherosclerosis that may cause blockage in the heart arteries and can lead to a heart attack in extreme circumstances.

Proper control and monitoring of blood sugar can reduce atherosclerosis. The levels of safe blood sugar to avoid heart disease vary with the gender and age of the person.

However, women seem at higher risk for heart disease with untreated hyperglycemia.

One team has tried to correlate the incidence of heart disease with non-diabetic hyperglycemia. The team selected thirty-eight studies to measure the blood glucose levels and calculate the relative risk and variance.

Then, they computed the relative risk and 95% confidence intervals utilizing a random-effect model.

The team tracked almost two hundred thousand participants over twelve years and contrasted groups with the highest and lowest glycemic control.

The study concluded that the group with the higher blood glucose had almost thirty percent more chance of developing heart disease.

Do not take hyperglycemia lightly as it can lead to ketoacidosis in people with Type 1 diabetes and Hyperosmolar Syndrome (where blood becomes like a thick syrup due to the presence of excessive blood sugar) in those with Type 2 diabetes.

Thus, hyperglycemia is a serious problem that you simply must not ignore.

Part-III: Diagnosis and Clinical Aspects

9. When to Seek Medical Advice

Since hyperglycemia is a serious condition, call the doctor immediately if you experience any of the following:

- • You feel your heart beating loudly or very fast.
- • There is rapid weight loss without explanation.
- • You feel giddy, unstable and experience perspiration and fatigue without exertion.
- • Urination is frequent and painful.
- • There is an unusual lack of mental clarity.
- • You experience breathlessness or pain in the chest.
- • Your lips show inflammation especially with any change in your medicine.
- • You experience vomiting that does not go away, even with medication.
- • You have four to six loose motions in a day that is not affected even with the use of an anti-diarrhea medicine.

Remember that these are simply indicators and only your doctor can decide what the symptoms refer to and what the proper treatment may be.

10. How is Hyperglycemia Diagnosed?

The diagnosis of hyperglycemia is through blood testing and discovery of whether diabetes mellitus may be the underlying condition.

Hyperglycemia does not have specific, exclusive symptoms.

Your body transforms the sugar present in the food which you eat to glucose and distributes it throughout your body.

When the level of glucose increases in the blood, it releases a hormone called insulin.

But, with a diabetic person, the body produces too little insulin, none or is unable to use the insulin it produces to properly process the blood sugar.

The unused glucose collects in the blood and leads to the condition, hyperglycemia.

Diagnosis of Hyperglycemia

Blood Sugar Test

The blood sugar test involves urine and a blood test. Most doctors recommend a blood test because it can tell the exact amount present at a particular time.

The procedure involves pricking the finger for a drop of blood. People who have type-1 diabetes test the blood sugar level before and after eating, two to four times in a day. However, people with type-2 diabetes may test themselves less frequently.

The Oral Glucose Tolerance Test and the Fasting Glucose Test

These tests measure the ability of your body to metabolize glucose.

The parameters for high blood sugar or hyperglycemia are:

1. For fasting glucose: >125 milligrams per deciliter (125mg/dL) on at least 2 occasions.
2. Oral glucose tolerance test: >200 milligram per deciliter (200mg/mgdL) at two hours.

Gyrated Hemoglobin Test (A1C)

This test tells you how efficiently you have controlled the sugar level in your body for the past two or three months. However, this test is not to diagnose diabetes.

Symptoms That Help with Hyperglycemia Diagnosis

Millions of people are at risk of high blood sugar or hyperglycemia.

This may begin with gradually experiencing physiology changes.

Some of the changes are a display of impaired fasting glucose (100-125 mg/dL) or an impaired glucose tolerance (140-199 mg/dL)

The other symptoms that may lead to the diagnosis of hyperglycemia are:

- Excessive thirst or Polydipsia
- Frequent urination or Polyuria
- Increased fatigue
- Unusual weight loss
- Blurred vision
- Extreme hunger or Polyphagia
- Irritability
- Nausea
- Large amount of sugar in blood and urine

- Poor healing of wounds, scrapes, cuts, etc.
- Recurrent infections e.g. groin rash, vaginal yeast infection and external ear infection.
- Rapid deep breathing or Kussmaul Hyperventilation
- Stupor
- Coma

Diabetes-related Hyperglycemia

Hyperglycemia is one of the more serious complications suffered by people that have diabetes.

This condition occurs mostly when you take insufficient medication or eat too much food.

Hyperglycemia may also be the response to emotional stress or illness.

Frequent hunger without any other apparent symptoms may also indicate that the blood levels are low. This generally occurs when a diabetic patient takes too much insulin or oral medication for the amount of which food they eat.

This hunger is absent in Type 1 diabetes, mostly in the juvenile onset stage. This makes managing prescription of oral hyperglycemic medication difficult.

11. Examinations and Tests For Hyperglycemia Diagnosis

Hyperglycemia is a condition that is related to the unused glucose that collects in the blood.

If you think that you are hyperglycemic but are not diabetic, it is essential that you see a doctor and arrange for a blood test.

But, if you have diabetes and, despite feeling well, you notice that your blood sugar level is rising, then there may be a need for you to take insulin. This must be evaluated by your doctor.

The other options are to adjust your diet and do regular, but not too much, exercise.

If you notice that your blood sugar level is increasing and you feel like vomiting all the time, then you need to consult your doctor immediately.

The Tests and Examinations

In order to detect hyperglycemia, it is necessary to check your urine for ketones and your blood glucose level regularly.

If there is often a rise in the blood glucose level, please see your doctor immediately.

With continuous monitoring of your blood glucose level and regular urine ketone testing, it is much easier to detect hyperglycemia and control the condition before it reaches a severe stage.

There are various examinations and tests to diagnose hyperglycemia, including the following:

Fasting Blood Sugar Test

This test measures the level of the blood sugar overnight or eight hours after a fast. The normal fasting level for glucose is >125mg/dL.

If your glucose level in these circumstances is somewhere between 100mg/dL and 125mg/dL then there is a chance that the blood glucose level is impaired.

If your blood glucose level is above 125mg/dL then the doctor will probably diagnose you as diabetic.

However, to confirm the condition, your doctor may repeat your tests on other days. If the second test also shows your blood glucose level is above normal, then you may be diabetic.

Oral Glucose Tolerance Test (O.G.T.T.)

This test will measure your response to sugar. First, your fasting blood glucose level is measured and then you have to consume some glucose solution. After about two hours, the blood glucose level is measured again.

According to the normal range, the oral glucose tolerance test should show a reading between 140mg/dL to 199 mg/dL.

If the level is somewhere around 200mg/dL or higher, this signifies a chance of hyperglycemia.

Random Blood Glucose Test

The random blood glucose test is to check your blood sugar level at any time during the day. The normal range for the normal random blood sugar level is less than 200mg/dL. If your range is somewhere

between 140 mg/dL to 200 mg/dL this means that there is a possibility of a pre-diabetic symptom in your body.

(A1C) or Gyrated Hemoglobin Test

This test is to check how efficiently your body can control or has controlled the blood sugar level over the past 2 or 3 months. However, this test is not for diagnosing diabetes.

The normal value is less than seven percent. If the reading shows more than seven percent then you must check into the medication that your are using.

The Symptoms

Hyperglycemia brings about physiological changes in you. If you notice the following changes in your everyday pattern of living then you could possibly be suffering from hyperglycemia.

- You feel thirsty quite often
- You urinate more often
- You feel fatigued all the time
- There is an unusual loss of body weight
- You experience blurred vision
- You feel that you are hungry more often
- There is nausea
- You tend to more easily become irritated
- Your urine and blood test reveal a large amount of sugar
- Your cuts, scrapes and wounds take a longer time to heal
- There is a recurring infection, such as vaginal yeast infection, groin rash or an external ear infection

- You experience rapid, deep breathing more often

Take Action

If your blood sugar-count range is above the target range for two or three times in a row, then:

- Go and see your doctor as soon as possible
- Drink plenty of fluids, but without sugar
- Test your urine for ketones
- Test your blood sugar frequently

12. How to Test Your Blood Glucose Level

Your diabetes educator or your doctor is the best person to help you learn the best ways to test your blood glucose level.

You must know how to select the most suitable glucose meter for you and, most importantly, how to use it.

Desirable Features for a Glucose Meter

Look for as many of these features as possible when you select a glucose meter:

- ✓ Fast results
- ✓ Only a small blood sample required
- ✓ Convenient size of the meter
- ✓ Easy readability of the displayed numbers
- ✓ Ability to test the blood sugar in places apart from your finger
- ✓ Easy availability of strips which it uses
- ✓ Smooth data management

Steps to Follow

To test your blood glucose level, you need a simple lancing device, test strips, meter and a lancet.

Follow the manufacturer's or your doctor's instructions closely.

The following is only a general guide and you should check with your medical professional before using these devices:

• Wash your hands properly

• Prick the area with the lancing device

• Drop a little blood on the test strip

• Carefully follow the instructions for inserting the test strip

• In a few seconds, the meter will reflect your blood sugar level

Materials that are provided

• Blood glucose meter: This reads blood sugar

• Test strip: This collects blood sample

• Small needle or lancet: This fits into the lancing device that pricks your finger.

• Lancing device: On the press of a button, it pricks the finger. Many devices have dials to select the depth for the needle to pierce your skin.

• Control solution: This checks the accuracy of the system.

• Check strip: This makes sure that your meter is working. However, it does not check the strips - just the meter.

• User manual: This provides all information you should need about the meter.

• Warranty cards: You must read and be sure you understand the terms under which your meter is supplied. If the supplier requires that you return the Warranty Card with your details, do so promptly so that you have full warranted protection for this important device.

Troubleshooting Tips

When your finger does not bleed

If you are having a problem when trying to squeeze blood from your finger, these tips may make things better for you:

• Rub your hands together while placing them under warm water

• Hang your hand below your waist

• Grasp the area near your finger that you will prick and keep squeezing gently for around three seconds.

• If your lancing device has the dial-a-depth facility, increase the setting by one level.

• Each time you check your blood sugar, use a new lancet.

When it hurts too much

Is your lancing device more of a terror box for you; does it hurt you more than your expect?

Then, here are some ways that may lessen the pain.

• If your lancing device has the facility of dial-a-depth, then reduce the setting by one level.

• Always use a new lancet each time you check your blood sugar

• Try using a different device or a thinner lancet

• Instead of the fingertip pad, try using the sides of the fingertip

• You can also use some other body areas, such as thighs or arms

• If the pain continues, contact your diabetes educator

When there is an error message

• Review the user manual: Your user manual often has problems identified and error codes too.

• Make sure that you drop the right amount of blood on your strip.

• Make sure you drop the blood on the correct portion of the strip.

• If your manufacturer has a help line that is toll-free, call them and sort out the issue.

• You may also ask your diabetes educator for further suggestions.

Testing on Palm, Forearm and Thigh

The alternative sites, apart from the fingertip, for testing your blood glucose level are your palms, thighs or forearms.

However, these alternative sites are not the same because testing in these areas provides a result that is twenty or thirty minutes old. Therefore, these sites are often called 'lagging alternative sites.'

Your palm and the fingertips are the areas that contain the recent memories of blood glucose. Therefore, testing these areas means knowing the glucose level of your body that very moment.

The lagging sites tell you the glucose level that your body had twenty to thirty minutes ago and not the present status.

This is the reason why lagging sites cannot replace the test done in your fingertip. Many monitoring companies provide the ability to test on alternative sites but these tests are reliable only for fasting blood glucose.

What do the Blood Glucose Numbers Indicate?

In order to draw a complete picture of the blood glucose of the entire day, it is essential that you test at various times during the day. Your doctor will help you evaluate the readings for you.

Fasting Blood Glucose: This test on an empty stomach tells how well you use the insulin. The ideal number is somewhere between five and seven mmol/L.

Pre-Meal Blood Glucose: This test shows how effective your breakfast and your lunch insulin doses are. The ideal number should be somewhere between five and seven.

Two Hours after Eating: This test shows whether the insulin you took is enough to cover the carbohydrate you consumed. The ideal reading should be less than ten mmol/L.

Before Bedtime: This test shows whether or not you have a low level of blood sugar when going to bed. The ideal range should be six to eight mmol/L.

13. Myths and Facts about Hyperglycemia

Since hyperglycemia is a serious medical condition, it is important to dispel myths and learn facts about it. Here are some myths and the real story.

Myth: Those suffering from hyperglycemia must stop eating sugar and sweets.

Fact: This is not true. In fact, they can eat a small amount of sugar in moderation just as normal people do to maintain a healthy weight.

Consuming all carbohydrates may also lead to a rise in blood sugar.

Myth: Hyperglycemia is contagious.

Fact: This is the most absurd myth. Hyperglycemia may be genetic but does not spread through contact.

Myth: Those with hyperglycemia must eat diabetic foods to control sugar.

Fact: This is not true. They must eat a healthy diet with proper portions of raw fruit and vegetables. The food must have less salt and oil, and contain fiber. It is better to avoid artificial sweeteners as they have a high fat content.

Myth: Consuming excessive sugar leads to hyperglycemia.

Fact: This is false. Stress, genetics, a sedentary lifestyle and predisposition to obesity are possible factors in the development of hyperglycemia. When the body cannot produce enough insulin or

when it cannot utilize the insulin produced properly, it leads to hyperglycemia and, subsequently, diabetes.

Myth: You cannot have a little diabetes. You either have it or do not.

Fact: Some people find it easier to control diabetes with lifestyle modification and medication while others are not able to do so. When the latter group try to manage their diabetes, it may lead to complications and other health problems, making their life more difficult.

Myth: Those with diabetes have low immunity and fall ill easily. They should not strain the body with rigorous exercise.

Fact: In fact, the converse is true, as exercise in moderation can help control hyperglycemia by lowering blood sugar and reducing insulin resistance.

However, consult a doctor before starting any exercise and exercise under the supervision of a trained person to avoid injury.

Myth: A diabetic can tell his blood sugar just by the symptoms.

Fact: No, it is better to use a blood glucose monitor to determine the exact blood sugar level.

Myth: Even low blood sugar is fatal

Fact: That may sometimes be true. Low blood sugar can cause tingling sensation, in the limbs, giddiness and in extreme cases the person may go into coma.

Thus, it is important to know the facts about hyperglycemia, because if left untreated it can damage the limbs, eyes and heart.

14. High Blood Sugar and Pregnancy Complications

Around one in twenty women have gestational diabetes during pregnancy.

This indicates high blood sugar levels during pregnancy.

Gestational diabetes usually subsides after delivery of baby. Doctors prescribe a regular blood sugar test for pregnant women between the 24th and 28th week of pregnancy.

This test requires you to give a blood sample while fasting. Then, you have to drink 75 ml to 100 ml of a high carbohydrate drink. Doctors could take another blood sample after two hours to determine how your body processes the high sugar load.

This test is non-invasive and painless.

It is best to inform your doctor if you have a family history of diabetes. Genetic factors may prompt symptoms of gestational diabetes much earlier.

Your doctor could conduct required tests to detect your blood sugar levels and adopt any necessary medications and injections.

Symptoms of gestational diabetes are same as those for high blood sugar. These include excessive thirst, excessive weight gain or loss, blurred vision and fatigue.

High Blood Sugar Complications for Pregnant Women

If you have gestational diabetes, you could encounter various complications like:

- Swelling of body parts

- Recurring urinary tract infections
- Pregnancy-induced hypertension
- Yeast infections
- Higher risk of early labor and premature delivery
- Larger than normal baby
- Greater possibility of emergency C-section delivery
- Delivery complications, like dystocia, and more chance of infections

Possible risks to your baby may include:

- Low blood sugar
- Jaundice at birth
- Breathing difficulties at birth
- Weight much more than normal at birth
- Greater risk of becoming obese and developing Type II diabetes later in life
- High insulin levels at birth

Treating Gestational Diabetes

Gestational diabetes is easily treatable. You need to follow a specific diet pattern and do regular exercise.

If your blood sugar levels are very high, you may need a very aggressive course of treatment. Your doctor could prescribe daily insulin injections.

Some doctors would prescribe oral medications like Glyburide or Metformin.

You should not try any self-medication. Follow your doctor's instructions diligently to ensure a safe delivery.

You should eat a healthy diet. It should include fibrous foods like whole grains, vegetables and fruits, healthy fats, eggs, fish, milk, dairy products and lean meat.

You should restrict consumption of foods containing refined sugar and refined flour, and also fast foods.

Eat less non-fibrous carbohydrates.

If you eat more of sugary foods, you may develop high insulin resistance. This situation could progress into Type II gestational diabetes.

You should eat regularly. You should avoid late-night dinners and parties.

Select minimally processed foods or foods that have not been processed at all. Natural foods provide the best nutrition for you and your baby.

You can regulate and control your blood sugar levels during pregnancy by being more disciplined and thoughtful about what you eat.

Exercise should be an intrinsic part of your daily routine. Your doctor would suggest the most suitable exercises for your condition. Diabetes with pregnancy can prove dangerous if you do not take proper care. It could prove fatal for you and your baby.

C-section deliveries carry their inherent risks and surgery may have a negative result in some cases.

Becoming well informed about possible risks of diabetes and high blood sugar during pregnancy can prove beneficial.

You can gift your child a healthy life only if you are healthy.

Part-IV: Treatment for Hyperglycemia

15. How is Hyperglycemia Treated?

Hyperglycemia requires immediate treatment.

If left untreated, it could develop into ketoacidosis. This causes ketones, a waste product released during the break-up of fats, to accumulate in your blood. This is a life-threatening condition.

Treatment of hyperglycemia includes:

Regular testing of blood to record blood sugar levels: If your blood sugar levels one to two hours after a meal are consistently greater than 180mg/dL, you should consult a doctor.

If two consecutive readings are higher than 300mg/dL, you should see your doctor to get treatment for possible hyperglycemia.

If your blood sugar is above 240 mg/dL, you should check for ketones in your urine.

Exercise: Exercise can help lower blood sugar levels immensely. If you follow any specific exercise pattern, exercise a little more to reduce your blood sugar after consulting your doctor.

Many people may benefit from aerobic exercises for twenty minutes three times a week.

If you have ketones in your urine, do not exercise. Exercising with ketones can push your blood sugar levels still higher.

If you have Type I diabetes and your blood sugar level is more than 240mg/dL, you should check for presence of ketones.

If you have Type II diabetes and your blood glucose is more than 300mg/dL, you should **not** exercise even if you do not have ketones in your urine.

Water: Drink lots of water. Water helps remove excess sugar and ketones from your urine. It also helps your body to avoid dehydration.

If your body gets dehydrated due to high blood sugar, you may require intravenous injections of fluids and salts to restore the electrolyte balance in the body.

You should avoid caffeine and alcohol as these dehydrate you and could increase your blood sugar levels.

Diet: You should consult a dietician to improve your diet. Your dietician can recommend the correct foods you should eat to control your blood sugar levels.

You should keep a record of foods you eat and the number of calories consumed.

You may have to reduce the amount of food you consume or reduce specific types of food to lower blood sugar levels.

You may need to consume many smaller meals throughout the day. This may prevent any huge fluctuations in blood sugar levels in your body.

Medications: Doctors may prescribe medications to lower your blood sugar levels. The effects of these medications differ across people depending on their blood sugar levels and other personal factors.

Oral anti-diabetic agents may help your body utilize insulin more effectively. These medications include Actos, Glipizide, Avandia or Metformin.

These may reduce your blood sugar levels and help to correct weight loss and body cholesterol levels. Some of these medications might cause side effects like loss of appetite, nausea, diarrhea and bowel disturbances.

You should adhere to the dosage prescribed by your doctor. Your doctor could recommend changes in your medications and the timing of dosages if your blood sugar levels do not come down.

Insulin: Insulin is a natural hormone present in your body to regulate blood sugar levels. If your body insulin levels are not sufficient, you could need insulin injections. These injections are given intravenously if you are in hospital. Insulin injections could be for a temporary period initially. The length of the course of insulin injections depend on your blood sugar level. If your blood sugar levels are very high, your doctor could prescribe insulin injections for a long period.

You may have to take additional medications with insulin injections.

Follow-Ups: You should visit your doctor for regular checkups. This is essential even if your blood sugar levels are steady and normal. You should always wear specific medical identification that states your medical condition. This can help you get proper and immediate medical care in emergencies.

If your hyperglycemia is very severe and cerebral edema sets in, you could develop a severe headache, difficulty in breathing, irregular heartbeat or seizures.

You may lose consciousness.

Doctors first administer mannitol to prevent any rapid changes. Doctors then administer intravenous fluids with insulin and salts to restore fluid and electrolyte balance.

Fluid intake and output require careful monitoring.

Serum electrolytes would be tested hourly to restore balance in the body to support normal metabolic activity.

Your treatment would spread over many days.

Treatment of Hyperglycemia in Children

If your child has mild hyperglycemia, doctors prescribe the same treatments as for adults.

If your child develops moderate to severe hyperglycemia, hospitalization in the intensive care unit could be necessary where doctors would monitor your child's response to treatment.

In very rare cases, a hyperglycemic episode in your child could be due to another illness or any stressful situation.

This is transient hyperglycemia.

Your child may not be able to bear any physical or mental stress and could develop hyperglycemia.

Removing the stress-causing factors may provide immediate relief to your child.

Doctors would still insist on careful monitoring and checking for any symptoms of hyperglycemia.

16. Prognosis of Hyperglycemia

Mild to moderate hyperglycemia is easily treatable in children and adults. Sometimes, the condition can be corrected within twenty-four hours.

Severe hyperglycemia with serum glucose levels of 800mg/dL requires immediate medical attention. Otherwise, it could lead to cerebral edema, coma, and even death.

Serious illnesses and diseases could cause hyperglycemia in children. This could prove risky and lead to increased mortality in pediatric intensive care units.

Hyperglycemia in adults is more severe than in children due to long-term complications associated with high levels of blood sugar.

These complications may include:

- nervous system disorders
- heart problems and diseases
- liver diseases
- kidney diseases
- strokes and
- vascular and circulatory conditions.

Part-V: Alternative and Complementary Therapies

17. Alternative Treatments for Hyperglycemia

Alternative treatments for hyperglycemia are claimed to sometimes be compatible with regular treatments and even, in some cases, to provide significant relief from most symptoms of hyperglycemia.

Always consult your doctor or qualified, professional diabetes consultant before you even consider investing in or using any of the products or items mentioned in this section and the next.

Common alternative treatments promoted for hyperglycemia include:

Aromatherapy: Essential oils derived from aromatic plant parts are claimed by some to have extensive healing properties. The promoters may recommend that you use these oils and scents in your bathing water or inhale them to get relief from pains and nauseating feelings. They are also claimed to help lift your moods.

Homeopathy: This treatment is claimed by some to stimulate your body's inherent ability to heal itself. Homeopaths may prescribe extremely diluted potions of substances that could actually cause the disease if taken in higher dosages.

Herbal Remedies: Various herbs are claimed by some to have intrinsic properties that they say may reduce your hyperglycemia. Herbal remedies have been in use since time immemorial.

Acupuncture: This is a Chinese healing method. This healing technique requires insertion of fine needles into specific strategic

points in your body and is claimed by some to reduce hyperglycemia. This technique aims at correcting flow of body energy within different body parts.

Acupuncturists believe disruptions in easy flow of energy through your body is the main cause for ailments.

Nutrition: Eating the right kind of foods at the right time can provide essential nutrition to your body. It can maintain proper emotional and physical well-being. Protein-rich foods provide the best nutrition. You can eat specific foods to lift your depressing mood.

Spiritual Wellness Techniques: Relaxation techniques like meditation, hypnosis, biofeedback, and self-awareness practices are claimed by some to take away stress, control the flow of thoughts and functioning of your brain. They are claimed by some to help your body heal naturally.

Natural or alternative treatments have been in vogue even before prescribed medications came into being. These treatments do not deliver instantaneous results. However, they are claimed by some to bring positive changes in your well-being if followed for a prolonged period.

Some promoters say that some alternative medications do not have any side effects. This is a broad statement and does not take into account your particular medical history or other factors.

These preparations are claimed by some to be very helpful in overcoming some difficult symptoms of hyperglycemia.

18. Herbal and other Natural Treatments for Hyperglycemia

Herbal remedies are naturally occurring substances, usually extracted from leaves, seeds or fruit.

Most herbal remedies require you to consume herbal mixtures or extracts.

These remedies are claimed by some to be effective at controlling hyperglycemia. They claim that you can use herbal remedies alone to control hyperglycemia or with other anti-diabetic medications but you should not even consider this without first consulting your doctor.

Herbal Treatments

Indian Gooseberry: The promoters claim that chewing on Indian gooseberry or amla may reduce blood sugar levels. This fruit is rich in Vitamin C and is claimed by some to be effective at reducing glycosylation and sorbitol. Sorbitol is a sugar that may damage nerves, eyes, and kidney.

Bitter Gourd: Bitter gourd contains plant insulin, a hypoglycemic. This vegetable is claimed by some to be effective at reducing hyperglycemic levels and sugar levels in urine.

Some promoters mix four to five teaspoons of bitter gourd juice with an equivalent amount of water and drink it on empty stomach first thing in the morning.

They claim that you can use bitter gourd as a decoction by boiling cut pieces of this vegetable in water or dry bitter gourd pieces and use the powder in your food daily.

They cook bitter gourd as a vegetable and eat it regularly with meals.

Jambul Fruit: This fruit is claimed by some to be effective at regulating pancreatic functioning. The seeds of this fruit contain jamboline, a glycoside. These seeds are claimed by some to restrict conversion of starch into sugar if there is excess glucose in your body.

Some who use it, dry and powder seeds of jambul fruit. Then mix one teaspoon of powdered jambul seeds in a cup of milk or water.

Madhurakshak: This is a combination of various herbs like Jambul seeds powder, Indian Gooseberry powder and bitter gourd powder. One teaspoon of this mixture is claimed by some to control your hyperglycemia levels.

BioSlim: This is a proprietary herbal preparation that is claimed by some to help reduce your body weight safely. Hyperglycemia often causes excess weight gain.

Gymnema: This herb is claimed by some to reduce your cravings for sugary substances. This herb is promoted as being able to regenerate the pancreas's beta cells and stimulate better insulin production.

Beta cells are predominantly responsible for production and secretion of insulin.

Some people claim that regular use of this herb can reduce your need for insulin injections but that is something I would not consider.

They also claim that you can chew on these leaves to control your blood sugar levels.

Fenugreek Seeds: These seeds are claimed by some to be effective at reducing glucose levels, triglycerides and serum cholesterol levels in the body.

Pterocarpus Marsupium (Kino Tree): The herb of this tree is claimed by some to be effective at reducing blood sugar levels. This herb contains a flavonoid that they claim regenerates beta cells in the pancreas to improve insulin secretion and the control of blood sugar.

Azadirachta Indica or Neem Leaf: This leaf has been used for lowering blood sugar levels since ancient times but, as far as I know, its effectiveness has never been supported by any results from controlled independent testing.

Curcuma Longa (Turmeric): Turmeric is claimed by some to be effective at reducing blood sugar. They claim that it increases insulin activity and glucose metabolism more than threefold.

Zingiber Officinale (Ginger): High blood sugar levels disrupt normal functioning of your stomach. You could develop problems in bowel movement and proper digestion. Ginger is claimed by some to help regulating stomach functions and clears the bowel movements.

Tinospora Cordifolia: The anti-hyperglycemic effect of this herb is claimed by some to be very efficient at controlling hyperglycemia. This herb is claimed to regulate the functioning of various enzymes involved in carbohydrate metabolism.

Natural Treatments for Hyperglycemia

Exercise: Exercise is the simplest way to tackle hyperglycemia. You do not have to jog for many miles or practice at a gym for long hours. Walking for half an hour to forty-five minutes each day can reduce blood sugar levels. Doing simple domestic physical jobs like cleaning and dusting may also help to regulate hyperglycemia levels. Dancing is a good exercise.

But, always consult with your personal doctor who knows your full medical condition and history before taking on any level of extra exertion.

Reduce Sugar Consumption: Do not eat cakes, candies or sugary snacks. Reduce or remove your intake of sugary drinks and sodas. Cut down your sugar intake in your daily diet. Eat less starchy cereals.

Take Adequate Supplements if necessary: Your diet may not include all essential nutrients. Take adequate supplements to make up for any deficiency which has been positively identified if your doctor advises you to.

Chromium is claimed by some to be very effective at reducing blood sugar.

These natural cures might help to keep you healthy and restrict your body weight.

Then, you may be at a lower risk of contracting serious heart ailments or diabetes.

Part-VI: Preventing and Coping with Hyperglycemia

19. Managing the Complications of Hyperglycemia

Coping with Hyperglycemia during the Day

• Insulin functions differently for different people. You have to get a proper analysis of when insulin peaks and the duration of insulin in your body. This will help your doctor to decide the amount of insulin you need to take.

• Excessive and strenuous exercise can cause hyperglycemia due to stress and dehydration. Check glucose levels before and after exercising. If you feel unwell during exercising, stop and check your blood glucose. Do not strain your body with exercise.

• Do not exercise if you have ketones in your urine or if your blood sugar is over 240 mg/dL. Wait for blood sugar levels to come down to start exercising.

• Always maintain a record of:

- ✓ the food you eat
- ✓ blood glucose levels
- ✓ stress
- ✓ illness, your activities and
- ✓ medications taken.

Present this to your doctor to show how your body reacts to insulin injections. Your doctor can then plan any necessary changes.

• Keep an interval of two to four hours between snacks. Snacking frequently can increase blood glucose levels. If you have had a heavy meal, allow sufficient time for your body to assimilate the glucose available from the meal before eating anything else.

• Insulin pumps are only tools to help with insulin therapy. They are not cures for managing hyperglycemia. Pumps could prove very easy. However, that does not mean you eat all-day and use insulin pumps thereafter. Your glucose levels could increase too much as your body needs time to react to insulin after eating and return to normalcy.

• Get to know your insulin-sensitive timings. Some people could be sensitive at all times of the day while some others would be sensitive only at specific times of the day. Your insulin requirements peak during breakfast. Doctors could adjust your insulin dosages according to your requirements and test results.

• Your blood glucose can be within target levels four hours after a meal. Yet, it could be as high as 300-500 mg/dL one to three hours after eating. You may feel your target level after four hours is being maintained but you may experience hyperglycemia in between. Hyperglycemia can cause serious damage to your eyes, kidney and nervous system.

Tackling even the slightest indication of hyperglycemia is very important. You could undergo an HbA1c test three to four times in a year.

• If you are sick, your blood glucose levels may increase due to stress resulting from sickness. You could require more insulin to handle this increase. Doctors provide specific instructions to handle insulin on sick days.

Vomiting can lead to dehydration and hyperglycemia if you stop taking insulin, as you cannot hold down food. Doctors may prescribe anti-nausea drugs to prevent vomiting.

• If you have a rotavirus infection, your need for insulin could reduce due to extreme intestinal irritation caused by the rotavirus. This virus interferes with your body's ability to absorb carbohydrates. You may feel fine with basal insulin.

Coping with Hyperglycemia during the Night

• If you have a high-fat dinner, you may experience delayed hyperglycemia during that night. Your blood sugar levels could be normal two hours after dinner but increase later as fat keeps blood glucose levels elevated many hours after eating.

Your blood glucose could rise very high and you would probably not check the blood sugar levels late at night.

Consume less fat at dinner.

• Your blood sugar levels increase at dawn. Your pituitary gland releases special hormones around two hours before you wake. This increases insulin resistance and your blood sugar levels shoot up. This is the "Dawn Effect".

• To counter the Dawn Effect, you may require more insulin at certain times during the night. If you experience high blood glucose on waking in the morning, consult your doctor for a recommendation as to whether you may need an increased dose at bedtime.

Changing the timing and type of bedtime snack can help with blood sugar levels during the night.

20. How You might Reduce the Risk of Hyperglycemia

Hyperglycemia could have serious consequences if it becomes severe.

Taking preventive measures can control hyperglycemia. You should practice good diabetes control, detect, and treat hyperglycemia early.

Reduce the Risk of Hyperglycemia

Diet: Blood sugar levels fluctuate predominantly due to your diet. Half of your diet should constitute carbohydrates.

You should avoid sugar and sugary products.

Use artificial sweeteners like aspartame, NutraSweet, or saccharin after consulting your doctor about them.

Simple carbohydrates like fruits and complex carbohydrates like pasta and cereals have the greatest impact on blood sugar levels. Protein intake should be restricted as increased consumption of proteins might cause long-term damage to your kidneys.

You should combine a carbohydrate and a protein at every meal.

Decrease your consumption of saturated fats and oils.

Include lots of vegetables and fibrous food. These maintain proper bowel movements and may reduce the risk of higher blood sugar levels.

Eating Habits: Reading labels on food can help you to understand how many calories you are eating. You can take proper steps to control and restrict your diet accordingly. A sensible bedtime snack may prevent low blood sugar levels during nighttime.

Keep track of the number of calories you consume daily. You should have a balanced breakfast to avoid any serious fluctuations of blood sugar levels during the day. You should eat every three to four hours.

Get the Help of a Dietician: You should get a dietician to formulate the most suitable diet pattern just for you. Dieticians are professionals who can provide all necessary guidance to plan the right diet to reduce your risk of hyperglycemia.

Check Blood Sugar Levels Regularly: If you have diabetes or hyperglycemia, get a blood sugar monitor kit to check your blood sugar levels at home. Your doctor or supplier could teach you the correct way to check your blood sugar up to four times a day.

You should make sure your blood sugar levels do not register any huge fluctuations and remain well within the normal range.

After completion of necessary treatment for hyperglycemia, it might be sufficient to check your blood sugar levels twice in a day.

Family and Friends: Keep your family and friends informed of your condition and educate them of possible symptoms that could indicate serious hyperglycemia. Give them instructions to seek proper medical help in case of emergencies. Always wear a medical identification bracelet. This will help you get proper medical care if you encounter any serious situation while going out.

Inform Your Doctor: Before starting any treatment for hyperglycemia, inform your doctors of any other medications, vitamins or herbal remedies you are currently taking for any other ailments.

Different medications could react adversely and cause further complications.

Some medications could be the cause for an increase in blood sugar levels.

If you have had any serious ailments of the heart, kidney, or liver, inform your doctor before starting your hyperglycemia treatment. Inform your doctor of any side effects of medications. You may be able to adopt remedial measures to overcome some side effects.

Water: Drink lots of water to keep your body well hydrated. Water flushes out toxins and excess sugar from your body. Do not drink too much water at any particular time.

Alcohol: Do not drink alcohol. Alcohol can cause blood sugar levels to shoot up or drop down extensively. If you consume alcohol directly, it could reduce your blood sugar to very low levels. If you mix alcohol with syrupy drinks, it could increase blood sugar levels extensively.

Alcohol may cause fatal interactions with hyperglycemia medications.

Feet Inspection: Hyperglycemia can affect your feet. You should inspect your feet daily for any cracks, rashes or hardened areas and sores that do not heal well or take too long to heal.

Keep your feet clean and dry. Apply moisturizers on your feet but do not apply them between your toes.

Always wear cotton socks.

Very high blood sugar levels could cause decreased sensations in your feet and legs. This is due to a restricted blood supply to your feet. Infections and wounds may start to take a very long time to heal.

Eyes: High blood sugar levels may affect your vision. You experience blurred vision in the early stages. As your blood sugar levels continue to increase, you may have decreasing vision.

In some cases blindness can happen. You should have regular eye checkups to prevent any damage to your eyes. Seek medical help as soon as you develop any discomfort in your eyes or vision.

Kidneys: Hyperglycemia can affect kidney function. You should have regular urine checks for the presence of proteins. Any damage to your kidneys may lead to the presence of proteins in urine. An early diagnosis of kidney damage can help you take preventive measures like a stricter diet, specific exercises and medications. Following them regularly can prevent further damage to your kidneys.

Hemoglobin A1C Test: This is a special blood test to measure your blood sugar levels for ninety days. Undergoing this test regularly can keep your blood sugar under control.

You can seek proper medical supervision if your blood sugar levels increase.

Exercise: Simple aerobic exercises or walking for half an hour daily can help to control your blood sugar levels. Exercise promotes the flow of oxygen into your blood and lungs. This may lower blood sugar levels and help to prevent hyperglycemia.

If you follow a regular exercise pattern, your doctor can prescribe medications and dosages accordingly. You might be able to control your blood sugar levels much better.

Temporary Hyperglycemia: Certain illnesses, pregnancy, use of steroids or infections can cause a temporary form of hyperglycemia. Your blood sugar may return to normal level afterward. Doctors

could prescribe specific medications to tackle such hyperglycemia. You should also follow specific dietary recommendations to overcome the effects of the temporary situation.

Schedule Doctor Appointments: You should see your doctor regularly for help to regulate your blood sugar. You should keep all appointments with your doctor diligently. This can help you get indications of any changes in blood sugar in the early stages.

Stress: Stress is a silent killer. Stress can be the main cause behind your high blood sugar levels. Let go of your stress or any anxious thoughts and feelings like anger, fear and depression. Practice relaxation techniques like meditation, yoga and biofeedback to control your emotions and remain calm.

This may enable your blood sugar levels to remain stable.

Obesity: Obesity is another risk factor for hyperglycemia. If you are obese, take steps to control and reduce your weight. You should adopt healthy eating habits and follow regular exercises to keep your body weight under control.

Controlling stress and doing away with unnecessary habits like smoking and drinking can help with your obesity.

Obesity prevents the proper use of insulin in your body.

Form a Support System: Hyperglycemia is not any isolated medical condition. There are many like you trying to regulate blood sugar levels. Form a support system of people having similar medical conditions.

You can:

- ✓ be a support to each other

- ✓ learn how to inculcate certain lifestyle changes to prevent hyperglycemia
- ✓ learn from other's experiences and
- ✓ share your concerns.

Symptoms: Hyperglycemia does not develop on a single day. It develops gradually and often gives sufficient warning signals.

Remain aware of common symptoms like increased thirst, increased and frequent hunger, and recurrent urination.

Other symptoms may include blurry vision, weight loss, fatigue or drowsiness, poor wound healing and dry or itchy skin.

Test your blood sugar if you have any of these symptoms.

Your Body's Immune System: If you have had blood sugar problems in the past, you can develop them again if you do not follow the specific guidelines as prescribed by your doctor. Your immune system may be weak and therefore not able to adequately resist infections or other illnesses.

You may develop high blood sugar levels from these incidents. Inform your doctor beforehand of your hyperglycemia before getting treatment for any other medical condition.

Gradual Treatment: Prevention of hyperglycemia does not take place at once. You should adopt a gradual program to absorb the changes in your routine and practice them diligently.

Sudden inclusion of a new exercise routine or restriction on your diet may produce an upsetting reaction. It could prove difficult to control them. Adopting a gradual path of change is better for bringing in a long-term program to reduce your risk of hyperglycemia.

21. Managing Hyperglycemia with Lifestyle Changes

Simple lifestyle changes can go a long way in helping you cope with hyperglycemia. The changes to treat hyperglycemia are not the same for everyone.

You should consider your individual health, predominant factors for hyperglycemia in your case and adopt changes that suit.

No single lifestyle change can bring appreciable change in blood sugar levels. All factors work in combination and you should give equal importance to each.

Suitable lifestyle changes may include:

Attack Obesity: This is a very important factor causing hyperglycemia. You have to reduce your body weight. You can find positive changes in your blood sugar levels even if you only lose 1.5% of your body weight.

If you can lose 15% of your body weight, you might be able to discontinue oral medications for blood sugar.

Alcohol Consumption: Do not consume alcohol. Alcohol reacts with blood sugar and worsens your glucose tolerance. This can damage your nervous system and your vision. If you cannot give up alcohol altogether, adopt a gradual weaning program and reduce it over a period.

Smoking: Smoking is a strict no-no. You should give up smoking totally as nicotine in combination with high blood sugar levels may cause extensive damage to your kidneys and heart.

Physical Activity: You should keep yourself physically active instead of being sedentary. If you cannot adhere to a regular

exercise pattern, do simple household chores like cleaning, gardening, choose the stairs instead of the elevator and go for a small stroll after dinner.

This can help to:

- ✓ keep your muscles physically active
- ✓ strengthen your heart and lungs
- ✓ lower blood pressure, and
- ✓ improve your self-image.

Stress: Stress is very harmful.

Stress leads to increased body weight.

Stress releases certain hormones like cortisol and adrenalin in your body.

These hormones increase your demand for energy suddenly.

Adrenaline breaks down glycogen into glucose and cortisol restricts insulin action.

Both may be factors in the development of hyperglycemia.

Avoid stress by adopting relaxation techniques like meditation, yoga, aromatherapy etc.

These help to keep you calm and restrict your negative emotions like anger, fear or anxiety.

Plan your schedule to keep your emotions under control.

Diet: Your diet should follow a specified pattern. Eating a balanced breakfast can maintain your blood glucose levels at a steady level for the entire day.

You might start the day with a glass of orange juice; eat a whole orange, or any other fruit.

Avoid fatty foods or foods high in carbohydrates.

If you have a high-fat dinner or eat a carbohydrate snack at bedtime, you could develop hyperglycemia at night. This would disrupt your schedule for the next day.

Take nutritional supplements and vitamins if you need them to provide essential energy to your body.

Illnesses: Certain diseases and ailments could disrupt your body functions. Absorption of nutrients could be slow or absent.

Improper usage of an insulin pump can cause problems.

Premenstrual stress can disturb medications.

Some illnesses may causes dehydration.

Hereditary hyperglycemia also plays an important role.

You should consider all these factors while administering insulin or changing your pattern of physical activity.

Exercise: Mild exercise can reduce body weight and improve insulin sensitivity. Walking is a good form of exercise for treating hyperglycemia for some people.

Regular exercises can decrease your insulin requirements. Do not do strenuous exercises or exercise for long periods at one time. This could increase blood sugar levels.

You should consult your doctor for the ideal exercises and routine to suit your hyperglycemia.

Your exercise pattern should activate your large muscle groups for at least ten minutes at a time. Ideal exercises may include

attending aerobic exercise classes, dancing, swimming and brisk walking.

Do not swim or go for long walks alone.

Practice resistance exercises like resistance bands, weight lifting and, perhaps, even exercise on weight machines up to three times a week.

Take a few precautionary steps before starting with exercise programs:

- ✓ Visit your doctor for a complete check-up and seek advice on what type of exercise would suit your specific condition.
- ✓ If you experience numbness in your feet, avoid exercises that could injure your ankles or feet.
- ✓ You should avoid exercises that cause extra strain on your lower head positions and your eyes if you suffer from retinopathy.
- ✓ Start with as little as ten minutes of exercise and increase gradually. This will regulate blood sugar levels. Exercising for long hours at the start can cause your blood sugar to plummet drastically.
- ✓ Always wear your hyperglycemia identification.
- ✓ Check blood sugar levels before and after exercises. Glucose-lowering effects of exercise lasts for many hours after exercising. You should adjust your food and insulin patterns to suit these levels.
- ✓ Always carry fast acting glucose tablets, juices or necessary insulin medications and an insulin meter while exercising.

- ✓ If you feel any pain or discomfort while exercising, stop exercising immediately and check your insulin levels. Have a snack or adjust your insulin level according to your requirements. Start exercising again only after you are fully comfortable.
- ✓ If you are on insulin injections, inject insulin on a limb which is not used for the current physical activity. If you inject insulin into an exercising limb, the insulin will act faster than usual.

While adopting lifestyle changes to manage hyperglycemia, do not be rigid. Be ready to incorporate changes in your schedules and patterns, as every day may not be the same.

You may develop different symptoms and problems with hyperglycemia on any particular day.

Be ready to alter your lifestyle pattern to meet body requirements for the day.

22. Your Diet for Hyperglycemia

Managing your diet is of prime importance to manage your hyperglycemia. The food you eat plays the most important role in deciding your blood sugar levels.

Your body gets energy from the food you eat. It is essential to have a nutritious and balanced diet to maintain steady blood sugar levels.

Relationship between Diet and Hyperglycemia

Hyperglycemia refers to having excessive sugar in your bloodstream.

The primary constituents of your diet are carbohydrates, proteins, and fats.

Only carbohydrate foods contain glucose. The carbohydrates you consume should be converted into the simplest form of sugar glucose for use as energy by your body.

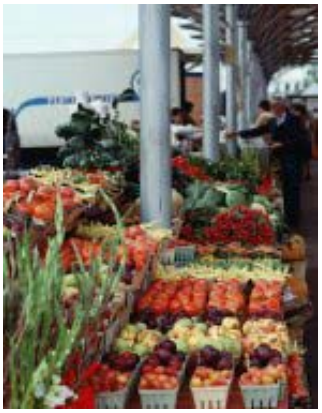
Proteins and fats do not contain any glucose and do not affect your blood sugar.

Carbohydrate foods include grains, starchy vegetables, beans, and fruits. Some carbohydrates are absorbed quickly and can affect your blood sugar levels drastically. Such carbohydrates include potatoes, white bread, cornflakes, candy, and corn syrup. These foods have a low percentage of fiber, minerals and vitamins.

Your body requires a lot of time to absorb complex carbohydrates. The digestive system takes more time to break down these complex carbohydrates into the simplest form of glucose for use as energy in your body.

Complex carbohydrates include green vegetables, beans, whole grains, and fruits. These carbohydrates have a very high percentage of vitamins, minerals and fiber.

What Should You Eat?



Your diet should be rich in complex carbohydrates. You should eat more fresh vegetables, nuts and beans.

You should eat moderate amounts of whole grains and fresh fruits. You should eat only little portions of foods containing concentrated starches like bread, potatoes and refined sugars.

Fresh vegetables are storehouses of antioxidants and phytochemicals. These promote good health and may help to prevent diseases.

Fresh fruits are also rich in phytochemicals. But, fruits have a greater effect on blood sugar levels than vegetables as fruits contain glucose. The amount of glucose differs between different fruits.

You should also consider the glycemic component of the food you eat. Foods with a high glycemic component; close to 100, increase blood sugar quicker than foods with a low glycemic component.

White bread, white rice and baked potatoes have a glycemic component of 95. Mashed potatoes are close to 90 while boiled potatoes, chocolate bars and corn have a glycemic component of about 70.

The glycemic component of a banana is 70, white pasta is 55 and rye bread and unsweetened juice is 40.

The glycemic component of lentils is 30 and it is 15 for soy.

Green vegetables have a glycemic content of less than 15.

Consume more quantities of foods that have a low glycemic component like vegetables, soy, and lentils.

Some Dietary Tips For Hyperglycemic People

No Sugar: Sugar is easily absorbed into your blood. If you eat foods rich in sugar, your body has to release more insulin to maintain normal blood sugar levels.

Before eating, check the ingredients listed on the label. Ingredients that end in 'ose' as in dextrose, sucrose and glucose contain sugar.

You should avoid these foods. Avoid cakes, pies, sweetened yogurt, cookies, candy, ice cream, corn syrup, fruit drinks, maple syrup, sodas, high fructose corn syrup, honey, brown sugar, turbinado sugar and molasses.

Fruit juices are available without added sugar. Yet, you should not consume these as fruits already contain naturally occurring sugars and can increase your blood sugar levels.

It is a good idea to drink a small quantity of fruit juice with your meal, as the rate of absorption is then slower.

Similarly, eating a whole fruit is lot better than drinking fruit juice as the whole fruit contains fiber that restricts the absorption of sugar into your bloodstream.

Do not eat fruits in syrup.

Drink vegetable juices like tomato juice or a combination of carrot, beet, and tomato with a little ginger and lime juice.

You can eat unsweetened breakfast cereals and breads without adding extra sugar.

Increase Dietary Fiber Intake: Your diet should be rich in fibrous foods like whole grains, vegetables, dried beans and cereals. A major portion of each meal should consist of fibrous foods.

These foods require very little insulin. Such foods help maintain your blood sugar levels within the normal range.

Eat more Complex carbohydrates: Complex carbohydrates provide a lot of energy. Your body takes lots of time to digest and absorb these carbohydrates into your bloodstream.

Your pancreas can provide sufficient insulin to process these foods.

Meals rich in complex carbohydrates keep you feeling full for a longer period and you do not crave so much for snacks between meals.

Foods which are rich in complex carbohydrates include whole-grain cereals like brown rice and cracked wheat, vegetables, breads, black beans, soybeans and chickpeas.

Six-Meal Schedule: Follow a six-meal pattern with three full meals and three small meals or snacks each day.

Space them evenly so that your blood sugar levels remain fairly even at all times.

Fresh vegetables like cucumbers and carrots are a wonderful snack. They are very low in sugar.

Your bedtime snack should contain complex carbohydrates and proteins like whole-grain crackers with low-fat cheese or an apple.

Eat Low-Fat Diets: Your body needs fat to absorb certain vitamins and maintain good health. Do not eat high-fat foods, as insulin is less efficient at processing these.

You can eat foods that are rich in monosaturated and unsaturated fats like fish, margarine and vegetable oils. Avoid fatty foods like butter, whole milk, fatty meats, cream, full fat cheeses and food made of coconut or palm kernel oil.

Example Diet Plan

Before starting this or any other change to your current diet, check and confirm that your doctor approves every item and action in it.

Breakfast

- ½ cup orange juice
- 1 slice whole-wheat toast with 1 tsp. margarine
- ¾ cup oatmeal with ½ cup skim milk

Morning snack

- Yogurt smoothie of a cup of plain yogurt and ½ banana

Lunch

- Salad with 1-cup fresh spinach and 2 tbs. low-calorie Italian dressing
- ½ fresh tomato
- ½ cup garbanzo beans
- ½ cup cantaloupe chunks
- 2 oz. water-packed tuna
- 1 bran muffin

• 1 cup skim milk

Afternoon Snack

• 6 whole-grain crackers with 1 tbsp. peanut butter

• ½ sliced apple

Dinner

• 3 oz. skinless chicken breast

• 1 cup tossed salad with 1 tbsp. low-fat dressing

• ½ cup cooked broccoli

• 1 baked potato

• 1 piece corn bread

• 1 fresh peach

• 1 cup skim milk

Bedtime Snack

• 2 cups plain popcorn

• Fresh carrot sticks

• 1 oz. low-fat cheese

Important Eating Tips for Hyperglycemia Sufferers

You should select the correct type of foods and follow disciplined eating patterns to maintain steady blood sugar levels.

Simple tips can help you get the best of your food intake include:

• Do not snack too often. Your diet plan contains three snacks. Do not go beyond this limit. Excessive snacking strains your digestive system and your pancreas has to increase insulin production. This causes stress on the whole system and you feel more fatigued.

• Adhere to having timely meals and eat around the same time each day. This maintains blood sugar levels.

• Eat lots of fibrous foods like green leafy vegetables, grains and fruits.

• Do not drink alcohol. If that is difficult, cut down on your alcohol consumption gradually and then wean yourself off.

• Avoid foods rich in fat and sugar as these foods increase your calorie intake and make you obese. These foods do not contribute to your good health.

• Eat a variety of foods. Do not eat same type of food at each meal.

• Always, prefer whole grain bread and cereals to white bread and processed cereals.

• Eat low-fat foods like lean meat, low-fat dairy products and foods prepared with little or no fat.

• Restrict your intake of caffeine and salt.

Managing Your Hyperglycemic Diet While at Parties or Restaurants

• Look through the menu card to plan your meal around the same type of foods which you eat in your daily diet.

• Time your meal to match your regular meal times.

• Have an appetizer if your meal could be delayed.

• While eating out, stick to barbecued, grilled, marinated, baked, steamed or poached foods.

• Restrict your intake of creamed, fried and buttered foods. Eat less breads and avoid foods that are served with sauces.

• Do not add butter, gravy, sour cream or salad dressing to your food.

• Avoid drinking alcohol. If it is not possible to avoid alcohol completely, have it in moderation. However, do not drink on an empty stomach.

• Always carry snacks like crackers and cheese or fruit and some fast-acting sugar. You can have your snack if the meal could be late.

Take along your medications and monitor when you go out. Wear your medical identification and remain aware of emergency medical help in the vicinity.

Inform your host or your friends of your hyperglycemia. They can seek medical help if you develop any serious problem.

Exercise and Your Diet

Exercises regulate blood sugar levels. Thirty minutes of daily aerobic exercises may prove very beneficial.

Walking is the simplest form of exercise.

Obesity could cause you to be sedentary. Being overweight can increase your blood sugar levels.

Exercises help reduce your body weight. You could find a remarkable difference in your blood sugar levels with even a little reduction in body weight.

Doing regular physical activity can help you to maintain proper body weight.

Your overall health could improve and you would feel better mentally and physically.

Always consult your medical practitioner before starting on any exercise program.

Exercise and dietary control may help you to overcome hyperglycemia.

Part-VII: Hyperglycemia Glossary

23. Hyperglycemia - Glossary of Terms

Abnormal: Not normal, some change from usual condition, level, or position

Blood: Red-colored fluid flowing within your body containing platelets, red and white blood cells, proteins and other elements. Blood could flow in two directions; venous or arterial. Arterial blood carries oxygen and nutrients to body parts while venous blood carries metabolic by-products and carbon dioxide to the kidneys and lungs for excretion.

Blood Glucose: This is the main sugar produced by your body from your food. Blood carries glucose to all body parts. Glucose provides energy for all body cells. These cells require insulin for breaking down glucose and utilizing energy.

Blurred Vision: An inability to see perfectly due to lack of sharpness of vision. Blurred vision could be due to eye disease.

Carbohydrates: It is one of the three main types of nutrients used as a source of energy by your body. This consists mainly of sugars and starches. Chemically, carbohydrates are neutral compounds of carbon, hydrogen and oxygen.

Chronic: That which lasts for a long time. The word originates from the Greek word 'chronos'.

Condition: This has different meanings when used in medical situations:

1) A state of fitness, like 'getting into condition'.

2) An unhealthy state, like 'a progressive condition'.

3) In 'precondition', it shows something that is essential for occurrence of something else.

4) In 'behavioral conditioning', it indicates causing a change in something so that a previous response associated with certain stimulus now becomes associated with another stimulus.

Constipation: Incomplete and infrequent bowel movements. This may be caused by diverticulosis, irritable bowel syndrome or some medications. This is the opposite of diarrhea. Excessive use of laxatives can cause constipation. Ailments like colon cancer narrow the colon and cause constipation. A high-fiber diet can relieve constipation except where there is colon cancer.

Cuts: Perforated skin. Caring for most cuts require washing and keeping the area clean and dry. If a cut is deep and requires stitching, seek medical care immediately. If there is any swelling, redness, pus or increased pain in the cut it could indicate an infection. Consult your doctor immediately. Avoid putting iodine or alcohol hydrogen peroxide in cuts as it delays healing.

Dehydration: Excessive loss of water from the body. This can occur due to gastrointestinal diseases, kidney diseases, long hours of exercising or diuretic medications.

Diabetes: This could be diabetes mellitus or diabetes insipidus. A common symptom of both conditions is excessive urination.

Diarrhea: Excessive and unusually frequent watery excretions of fecal material. Such liquid bowel movements may be due to many infectious and non-infectious causes. This is the opposite of constipation. This word is derived from Greek 'diarrhoia', which means flowing through.

Dysfunction: Abnormal function.

Endocrinology: This is the study of hormones, their receptors, conditions and diseases associated with them

Erectile dysfunction: Consistent inability to sustain an erection required for sexual intercourse, inability to achieve ejaculation, or presence of both conditions.

Event: A set of outcomes.

Fatigue: Unable to work efficiently or according to your ability. Fatigue could be consistent or occur suddenly. Acute tiredness and exhaustion accompany fatigue.

Feet: Anatomically, plural of foot.

Glucose: This is the simplest form of sugar or starch, monosaccharide that can be processed by your body into energy. Your body makes glucose mostly from carbohydrates and little amounts from proteins and fats. This is the same as dextrose.

Hyperglycemia: A high-level of sugar glucose in the blood.

Hyperosmolar: Refers to osmolar concentration of body fluids that is abnormally increased. Examples could be hyperglycemic hyperosmolar syndrome and hyperosmolar coma.

Infection: Development of a parasitic organism within the body.

Insulin: Hormone produced by the pancreas to control blood sugar levels. Body cells require insulin to process glucose and produce energy.

Ketoacidosis: Uncontrolled diabetes mellitus characterized by combination of ketosis and acidosis. Ketosis is an accumulation of ketone bodies in blood. Acidosis is increased acidity of the blood.

Lancet: A surgical instrument with short, sharp-pointed, wide two-edged blade. This is used to prick skin to draw capillary blood for testing.

Nerve: Bundle of fibers that use chemical and electrical signals to transmit sensory and motor information from one body part to another.

Postprandial: After meals.

Skin: The largest body organ that covers your outer body and protects against injury, infection and heat. It regulates body temperature and stores water, fat and vitamin D. It consists of an outer layer (epidermis) and an inner layer (endodermis).

Stomach: Sac-shaped digestive organ located in the upper abdomen. The upper part of the stomach connects to the esophagus and the lower part leads into the small intestine.

Stress: Outside factors affecting your body functions. Stress causes various problems.

Syndrome: A set of signs and symptoms occurring together indicating the presence of a particular disease or a probability of developing a particular disease.

Tired: Overcome by fatigue.

Type 1 Diabetes: An autoimmune disease causing T cells to attack and decimate beta cells in the pancreas. These pancreatic cells are required for insulin production. Without adequate insulin, your body cannot metabolize blood glucose for energy production. This leads to the build-up of toxins in your body. Symptoms include excessive thirst, frequent hunger and urination. Complications due to this disease include kidney failure, accelerated atherosclerosis, extensive

nerve damage and blindness. There is no specific cure but long-term treatment may prevent complications from setting in.

Type 2 Diabetes: In this type of diabetes, beta cells in your pancreas produce insulin but your body is unable to use this insulin. This is due to insulin resistance of the body’s cells. This condition can be controlled through diet, regular aerobic exercises and oral medications. These decrease insulin resistance and help burn excessive glucose. This is the same as non-insulin dependent diabetes, insulin-resistant diabetes and adult-onset diabetes.

Urine: Clear and transparent fluid excreted as a waste product from your body. The chemical constituents of this fluid include urea, uric acid, sodium chloride and water.

Weight Loss: Decrease in body weight due to exercise, diet control or illness.

