



## **DIETARY MANAGEMENT OF DIABETIC PATIENTS**

**By**

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*Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment of B.Sc.  
in Nutrition and Food Engineering*

Supervised By

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**FACULTY OF ALLIED HEALTH SCIENCE (FAHS)**

**DAFFODIL INTERNATIONAL UNIVERSITY**

**2<sup>nd</sup> MARCH 2023**

## LETTER OF TRANSMITTAL

Date:

To

Dr. Nizam Uddin  
Associate Professor and Head In-Charge  
Department of Nutrition and Food Engineering Faculty of Allied Health Sciences  
Daffodil International University  
Daffodil Smart City, Birulia, Savar, Dhaka.

**Subject:** Submission of Internship Report.

Dear Sir,

We would like to ask for your guidance and support in the preparation of this report. It is a great pleasure and honor for me to have the opportunity to publish my project work report on Dietary management of diabetic patients. I am working on this topic at Birdem General Hospital. You have really supported me a lot and it would have been really hard without your supervision. I have tried my best to achieve the purpose of the report. I hope my efforts serve the purpose. The practical knowledge and experience I gained through report writing will be of immeasurable help in my future professional life. We apologize that despite our best efforts, you may still see errors in your reports.

I would appreciate it if you could take a look at my report and let me know what you think. If there are any errors in this report, we would appreciate it if you could spot them.

Thank you again for your support, patience and advice.

Yours Sincerely,

*Bithi*

Sahara Tasmim Bithi  
ID: 182-34-120  
Department of Nutrition and Food Engineering  
Daffodil International University.

## LATTER OF AUTHORIZATION

Date:

To

Dr. Nizam Uddin  
Associate Professor and Head In-Charge  
Department of Nutrition and Food Engineering Faculty of Allied Health Sciences  
Daffodil International University  
Daffodil Smart City, Birulia, Savar, Dhaka.

**Subject:** Declaration regarding the validity of the Internship Report.

Dear Sir,

This is my honest statement that the "Internship Report" I have prepared is not a copy from anywhere but my original work experience. What I understand and see is exactly formed here. In addition, I declare that I will not transfer it to any other person in the future. I also honestly acknowledge that the aforementioned internship report has not to date been used to fulfill any other research-related purpose of mine, nor has it been passed on to others for my academic purposes only.

Sincerely yours,

*Bithi*

Sahara Tasmim Bithi  
ID: 182-34-120  
Department of Nutrition and Food Engineering  
Daffodil International University.

## APPROVAL CERTIFICATION

On the behalf of the university, this is to certify that **Sahara Tasmim Bithi** bearing ID: **182- 34-120**, Program B.Sc. in Nutrition & Food Engineering is a regular student, department of Nutrition & food Engineering, Daffodil International University. She has successfully completed her Intern program of 30 days in BIRDEM General Hospital, Dhaka, Bangladesh. Then she completed this report under my direction. We aware that, Sahara Tasmim Bithi completed her Intern report by observing our teacher. In addition, I ensure that his report is a worth of fulfilling the partial requirements of NFE program.

-----  
Dr. Nizam Uddin  
Associate Professor and Head In-Charge  
Department of Nutrition and Food Engineering  
Faculty of Allied Health Sciences  
Daffodil International University  
Daffodil Smart City, Birulia, Savar, Dhaka.

*Nawal Sarwer*  
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Supervisor  
Md. Nawal Sarwer  
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Faculty of Allied Health Sciences (FAHS)  
Daffodil International University  
Daffodil Smart City, Birulia, Savar, Dhaka

## **APPROVAL CERTIFICATION**

This is to certify ID-182-34-120, **Sahara Tasmim Bithi**, Program B.Sc. The Bachelor of Nutrition and Food Engineering is a regular student branch of the Faculty of Nutrition and Food Engineering of Allied Health Sciences at Daffodil International University. She successfully completed her 30-day internship her program at BIRDEM General Hospital. No work, or any part thereof, of this internship has been submitted for the award of a degree, diploma, association, or scholarship. I am also pleased to confirm here that the data and findings in the report are the bona fide work of her Sahara Tasmim Bithi. Internship with me During her program, she was punctual and diligent. I wish her every success in life

-----  
Quamrun Nahar, PhD  
Principal Research Officer,  
BIRDEM

## **APPROVAL**

This Internship titled “**Dietary Management of Diabetic Patients**”, submitted by Sahara Tasmim Bithi to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents. The presentation has been held on -----

## **EXAMINING COMMITTEE**

---

**Name**

**Member**

**Designation**

Department of NFE

Faculty of Allied Health Sciences

Daffodil International University

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**Dr. Nizam Uddin**

**Departmental Head**

**Associate Professor and Head In-Charge**

Department of NFE

Faculty of Allied Health Sciences

Daffodil International University

## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Nawal Sarwer, Lecturer, Department of NFE**, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

**Supervised by:**

*Nawal Sarwer*

---

**Md. Nawal Sarwer**  
**Lecturer**  
Department of NFE  
Daffodil International University

**Submitted by:**

*Bithi*

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**Sahara Tasmim Bithi**  
ID: 182-34-120  
Department of NFE  
Daffodil International University

## ACKNOWLEDGEMENTS

First of all, I would like to express my gratitude to Almighty Allah for completing this report on nutrition management of diabetic patients. I would like to express my sincere appreciation and gratitude to **Md. Nawal Sarwer** for providing excellent guidelines for working in the research field of a hospital. Special thanks to **Dr. Quamrun Nahar**, Principal Investigator of BIRDEM General Hospital Dhaka. They provided excellent guidelines for working in the research field at BIRDEM General Hospital. Thanks to everyone's support, advice, support, and supervision, I was able to complete the internship successfully. With respect and admiration, I must express my sincere gratitude to the Co-Director (Administration) Sir **Md. Ashfaqur Rahman** for accepting this internship and granting me an internship at BIRDEM General Hospital.

Finally, I would like to thank my family for their unconditional, definite and loving support.



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# INTRODUCTION

Diabetes mellitus is a group of diseases that affect how the body uses blood sugar (glucose). Glucose is an important energy source for the cells that make up muscles and tissues. It is also a major fuel source for the brain. The main causes of diabetes vary by type. Diabetes due to high blood sugar (hyperglycemia), polydipsia, polyphagia. The number of DM patients is increasing rapidly every day. The prevalence of DM increased from 108 million to 422 million (1980 to 2014) in just 34 years. WHO estimates that diabetes will be the seventh leading cause of death by 2030. Diabetes is a serious chronic disease that occurs when the pancreas either does not produce enough insulin (the hormone that regulates blood sugar) or when the body cannot effectively use the insulin it produces. Elevated blood sugar levels, a common result of uncontrolled diabetes, can over time cause serious damage to the heart, blood vessels, eyes, kidneys and nerves. More than 400 million people have diabetes. The global incidence of diabetes among adults 18 years and older has increased from 4.7% (1980) to 8.5%. Among various countries, China has the highest proportion of people with diabetes, about 116 million people. India ranks 77th on the list. Diabetes cannot be prevented, but it can be controlled with a healthy lifestyle. There are three main types of diabetes. Type 1, type 2 and gestational diabetes. Although it is currently impossible to completely cure diabetes, you can control it by leading a healthy lifestyle. To lead a healthy lifestyle, you need to break these habits.

1. Making healthy food choice.
2. Controlling blood pressure.
3. Controlling cholesterol
4. By being physically active.

## **Type 1**

Type 1 DM is caused by the autoimmune annihilation of the pancreatic of beta cell with no insulin production. This type of diabetes is popular for children, young people and teens. This is also called insulin depended diabetes. When someone suffer from Type 1 diabetes their body stop making insulin hormone or makes a very little. Insulin is a hormone that body uses to allow sugar to enter cells and it helps to make energy. So, if in our body there creates no any insulin hormone, we have to intake it through medicine. This type of DM is seen about 5-10% of total diabetes patients.

## **Type 2**

This type of diabetes is very popular and it is a major type of diabetes. It is caused by insufficient production of insulin or desensitization of insulin receptors that precludes the entry of glucose into the cell. This type of diabetes has high risk of those who are obese, overweight, maintain unhealthy

diet, have previous family history, physical inactivity and so on. Smoking also can be relate with this disease. This type of diabetes is generally seen in 90 to 95% of cases.

### **Gestational diabetes**

This kind of diabetes occurs only during pregnancy. Gestational diabetes causes high blood sugar that can affect pregnancy and baby's health. GDM occurs approximately 5-15% of pregnant women. For the pregnant women Gestational diabetes is dangerous because it can create DM after 5-10 years of pregnancy. Uncontrolled diabetes is the potential threat for other disease like cardiovascular disease, blindness, renal failure, neurological disorder, hypertension, peripheral neuropathy and many other diseases.

## **ORIGIN OF THE REPORT**

Daffodil International University is a prestigious University, Nutrition & Food Engineering is a University Department. An internship is mandatory for obtaining a bachelor's degree in this subject. Students complete this after completing all theory courses. Therefore, as a student of Nutrition & Food Engineering, you should choose a reputable organization associated with our program. This could be a hospital or training center where I need to have a proper understanding of the subject studied in formal qualification. I choose Birdem General Hospital for my internship program because I want to pursue a career in the hospital sector. I have only completed a theory course so far, so I have no practical knowledge on this topic, there is a lack of practical knowledge. Through this internship, we can fill the gap. The topic of the internship report is dietary management for diabetics. My main objective here is to connect with patients and observe their management system. I also talk to them and know their physical condition, their diet chart, if they have any dietary restrictions. This report is an important prerequisite for getting a bachelor's degree.

## **OVERVIEW OF BIRDEM GENERAL HOSPITAL**

BIRDEM is the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders, Shahbagh, Dhaka, Bangladesh, a 600-bed general hospital owned by the Diabetes Association of Bangladesh. Built on government land and funded by the government in 1980 with financial support from Bangladesh, the hospital is housed in three large multi-storey buildings. Housed in a 15-story building, the hospital currently has 542 beds, 80 of which are provided free of charge for needy diabetics. BIRDEM treats 3,000 patients daily in its outpatient clinic (OPD). No other hospital in Bangladesh treats so many diabetic patients. BADAS was registered with the Department of Social Services under the Social Registration Act of 1860 as a non-profit, voluntary social health service. It is governed by her 32-member National Council (NC), of which 18 represent the Life Members category and 6 represent the Affiliates category. They are directly elected by life members or representatives of affiliated associations. One-third of the members (i.e., 6) are from the Life Membership category and 2 are retired from affiliated associations on a rotating basis each year, and these elections to his third office are made at the Association's Annual General Meeting (AGM). is done in the elected members elect the officers of the National Council, which consists of the President, three Vice Presidents, the Executive Director, the Treasurer, the Co-Treasurer, and the Joint Treasurer. Research activities are carried out in cooperation with various national and international research institutes. Professor Mohammad Ibrahim (1911-1989), the founder of BIRDEM, was very interested in his social work, such as the social rehabilitation of patients. In the mid-1950s, he first thought about treating diabetes in this country. He knew very well that diabetes could be incurable. However, the individuals involved can live productive and respectful lives. He considered the problem to be a social medicine problem. Although the true extent of the diabetes problem in this country was not clear, he was able to foresee the situation at the time and organized a group of social workers, philanthropists and professionals. With their help, he founded the Diabetes Association of Bangladesh (then East Pakistan) on his February 28, 1956. BIRDEM's Chief Executive Officer is the Executive Director and operates under a Board of Directors appointed by the National Council of Bangladesh Diabetes Association.

### **Mission:**

- To give complete medical care including rehabilitation to all diabetic individuals regardless of gender, socioeconomic status or financial status.
- To provide all the Bangladeshis with reasonable BADAS medical treatment through self-sustaining institutes by expending these services.
- To establish medical products and best quality foods for the all-diabetic patients.
- To make high quality specialist manpower (physicians, technicians, research scientists, associate employees and nurses)
- To establish medical care management throughout a comprehensive and integrated management system.

**Vision:**

- “No diabetic individuals shall die unfed, untreated or unemployed in Bangladesh”
- “Medical care will be provided with all individuals at a reasonable cost”



**Figure 1:**



**Figure 2:**

## **SERVICES**

Birdem is a clinic that provide free of cost diabetic treatment to the all-registered patients. This clinic has several sectors like they have emergency patients service, indoor patient's services, outdoor patient's services, laboratory services, Birdem library, birdem academy. There people also get consultation with doctors, medicine, nutritional information, and for indoor patients they also provide a diet chart according to their disease. Birdem also provide their patients medicine at a very little cost. They have some other services like general ward, cabin, ICU, CCU, HDU, OT or post operative, radiology and imaging, surgical Emergency, Medical Emergency.

## **MY WORK AND ACTIVITIES**

I worked in both indoor and also outdoor sectors. But mostly I visited in indoor wards and cabins. There were various types of patients but I met with diabetic patients who are suffering from CKD, heart problem, eye disease, leg problem and electrolytic imbalance. As my internship topic is dietary management of diabetic patients so I visited with them and talk about their dietary intake, their current nutritional status, if there are any restricted food, and also take their family history, work experiences. After talking with them and observing their diet chart, I can understand their problem and make a diet chart for them by their require calories.



# OBJECTIVE

## **General Objective:**

The main goal of working in the hospital is to fulfill the requirement of our department to complete my bachelor degree. Without internship I will not be able to gain knowledge in this area. As I want to establish my career in the clinical sector so I need to gain vast knowledge in this sector. So, it was a great opportunity for me to explore my experiences. After working in the hospital, I have gained some practical knowledge that was lacking in me.

## **Specific Objective:**

- To learn more about the operational activities of the health sector.
- To enhance the practical knowledge by working in the hospital.
- To understand the general sign and symptoms about diabetes.
- To gain vast knowledge about nutritional diet chart according to their compilations.
- To learn about patients' problem and how to take initial step for their proper handling.

# TYPE 1 DIABETES

Type 1 diabetes is a chronic (life-long) autoimmune disease that prevents your pancreas from making insulin. Over the past decade, knowledge of the pathogenesis and natural history of type 1 diabetes has grown substantially, particularly with regard to disease prediction and heterogeneity, pancreatic pathology, and epidemiology. Type 1 diabetes is also increasing and it is becoming a threat to the people. Technological improvements in insulin pumps and continuous glucose monitors help patients with type 1 diabetes manage the challenge of lifelong insulin administration.

## Complication of Type 1 Diabetes

Type 1 diabetes is being popular now a days. if someone is suffering from type 1 diabetes, we should treat it carefully. We know type 1 diabetes patients cannot create insulin in their body. Because of lacking of insulin they always bear high blood sugar level that cause high glucose in the urine. As we know this patient have frequent urination so they loss electrolytes and water. For this people also cannot store fat and protein. This dysregulation leads to the process of ketosis and the release of ketones into the blood. Ketones acidify the blood; this condition is named diabetic ketoacidosis (DKA). Diabetic ketoacidosis is common and dangerous for this patient. this can cause nausea, vomiting, abdominal pain. when they are seen we should take initial steps. If it is not treated then it can cause heart failure and patients can go to coma.

## Signs and Symptoms of Diabetes

- Feeling excessive thirsty.
- Unexplained weight loss.
- Excessive hunger.
- Blurred vision
- Frequent urination, including frequent full diapers in infants and bedwetting in children.
- Fatigue
- Slow healing of cuts and sores,
- Vaginal yeast infection.

## Risk factor for type 1 diabetes

1. Having a family history (parent or sibling) of Type 1 diabetes: If there are someone who is suffering from type 1 diabetes in your family you will be at risk of having it. There will be a great chance to get this from them. Specially if your parents bear it then you should check it.
2. Injury of pancreas (such as by infection, tumor, or accident). Mostly in some cases there are risk of having type 1 diabetes after injury to the pancreas.
3. Presence of autoantibodies (sometimes antibody attack body's tissues or organs).
4. Physical stress (surgery or illness). Physical stress also can cause diabetes. It increases the risk of diabetes.
5. Some illness that is caused by viruses.

## TYPE 2 DIABETES

Type 2 diabetes is a common condition that causes high level of sugar (glucose) in the blood. It's a lifelong condition that can affect someone's regular life and activities. You may need to change your diet, take medicines and have regular check-ups for controlling type 2 diabetes.

### Complication for type 2 diabetes

For type 2 diabetes we can cause two types of complications like acute complications and chronic complications. Acute complications are that type of complications that can happen at any time but chronic complications take time to build up. But they are very serious.

#### Acute complications are:

**Hypers:** This is a situation that occurs when the blood sugar levels are become too high

**Hypos:** This is opposite of hypers. It causes the blood sugar level too low.

**Diabetic ketoacidosis (DKA):** This is an emergency situation. This cause because of lack of insulin and high blood sugars leads to a build-up of ketones.

**Hyperosmolar hyperglycaemic state (HHS):** This is also a life-threatening emergency situation that cause only in type 2 diabetes. It's brought on by severe dehydration and very high blood sugars.

#### Chronic complications are:

Chronic problems are long term problems that cause gradually but that is very serious. It can cause to serious damage if it is untreated.

**Heart attack and stroke:** If someone suffer from a long time for diabetes and do not take any treatment for a long time. Then it can damage their blood vassels. Because of damaging blood vessels sometimes can cause heart attack and stroke.

**Kidney problems:** Long time of diabetes can cause kidney damage. For a damage kidney it is harder to clear extra fluid and waste from body. It is known as diabetic nephropathy or kidney disease.

**Foot problems:** For people with diabetes, it is very serious. For them very common foot problems can turn into infection and serious complications such as amputation. Various types of foot damage can occur due to diabetes like fungal infection of nails, calluces, corns, blisters, dry skin, diabetic ulcer and so on.

**Eye problem:** Diabetes can harm the eyes. It can damage the small blood vessels in the retina, the back part of your eye. When this occurs this condition is called diabetic retinopathy. For diabetic patients they have risk of having glaucoma, cataracts and other eye disease.

**Nerve damage:** Nerve damage can cause for the complications of diabetes. Nerve damage make it difficult for nerves to carry messages between brain and other parts of our body. Finally it can affect how we hear, see, feel and move.

**Sexual problems in women:** Damage to blood vessels and nerves can restrict the amount of blood flowing to people's sexual organs and that can cause of losing some sensation. People with high blood sugar are more likely to get thrush or a urinary tract infection.

**Sexual problems in men:** The amount of blood flowing to the diabetic patient's sexual organs can be restricted which may cause them to have difficulty getting aroused. It is a common problem for men who r suffering from diabetes. It may lead to erectile dysfunction, sometimes it is called impotence.

### **Sign and symptoms for type 2 diabetes**

Type 2 diabetes can develop slowly. At the first stage the signs and symptoms are not so serious and it can be cure at this stage. The early symptoms are:

1. **Lack of energy:** For type 2 diabetic lacking energy is early symptoms.
2. **Excessive hunger:** If there is uncontrolled diabetes and the blood glucose remain constantly high (hyperglycemia), in this case the blood glucose cannot enter in the cell of body. It causes because of lacking of insulin or insulin resistance. So, the body can't convert the food you eat into energy. So there always remain a lack of energy in the body. That is why people feel hungry so much.
3. **Frequent urination:** When kidneys can't keep up, the excess glucose is excreted into urine, dragging along fluids from tissues, which makes the patients more dehydrated. Then people feel thirstier. So, they take more fluids to quench thirst, then definitely they will urinate even more.
4. **Fatigue:** Fatigue is one of the most common symptoms associated with poorly controlled blood sugar.
5. **Blurry vision:** There are so many effects that can cause of diabetes. But swelling of the eye lens is a potential effect that cause for diabetes. It leads to blurry vision. When our blood sugar level constantly changes from low to high then the shape of eyes lens can be affected and vision can be blurred.
6. **Numbness in hand or feet:** These were the first stage of symptoms in diabetes type 2. But if it is untreated then it became more serious and symptoms become more severe.

When the blood sugar level become too much high for a long time then there are some symptoms they are:

1. Kidney disease (Nepropathy)
2. Feelings of numbness in extremities or neuropathy
3. Eye problems (diabetic retinopathy)
4. Heart attack or stroke

## 5. Gum disease

### **RISK FACTORS FOR TYPE 2 DIABETES**

The fact is everyone thought that type 2 diabetes has strong link with genetic, it means it is like a trend to the families. If someone have a parent, brother, or sister who has diabetes, then he has chances rise. Diabetes which is related to genes and cause by family history, age, race, for them we cannot change risk factors. But by maintaining a healthy lifestyle we can some of them control.

#### **Risk factors:**

1. High blood triglycerides (fat levels) It's too high if it's over 150 milligrams per deciliter (mg/dL).
2. Low cholesterol level also can cause diabetes. Less than 40 (mg/dl) is too less.
3. Age is also a significant reason for this disease. The more the age the more the risk. After 45 it has a great risk. The risk of type 2 diabetes begins to rise significantly around age 45 and rises considerably after age 65.
4. Obesity is also a risk factor and also over weight.
5. Sometimes high fat and carbohydrate diet can be the result of food insecurity if we do not have access enough to healthy food.
6. Being ethnic is also a reason of type 2 diabetes. African Americans, Native Americans, Hispanic Americans, and Asian Americans are more likely to get type 2 diabetes than non-Hispanic whites.
7. If there have diabetes in the family then you are at high risk of type 2 diabetes.
8. Polycystic ovary syndrome (PCOS)

#### **Gestational Diabetes**

Gestational diabetes is that kind of diabetes which is diagnosed for the first time in the period of pregnancy. It is also like other type of diabetes. It also affects how your cells use sugar. This diabetes can cause bad effects in pregnancy and child. Some people also carry this diabetes after pregnancy. For the woman who has gestational diabetes they are high risk of type 2 diabetes after 5-10 years.

#### **Complications for gestational diabetes**

1. Sometimes due to too high blood sugar during pregnancy child growth is higher than standard it can cause the high length of baby.
2. Premature or early birth can also cause by gestational diabetes.
3. Serious breathing problem
4. Low blood sugar.

#### **Symptoms for gestational diabetes**

For gestational diabetes symptoms are very rarely seen. In most of the cases symptoms are not seen. Sometimes they feel very thirsty and pee more than usual but every pregnant woman should check their blood sugar level between 24-28 weeks of pregnancy.

### **Risk factors for gestational diabetes**

1. Not being physically active.
2. Being overweight during pregnancy.
3. Having prediabetes.
4. If someone has polycystic ovary syndrome.
5. Age can be a great risk factor. The higher your age of pregnancy the higher risk of being gestational diabetes.
6. If someone give a birth of child overweight (9pounds) then she has a risk of gestational diabetes.
7. Having gestational diabetes in previous pregnancy.

## TESTS FOR DIABETES

If someone has a doubt that he or she has diabetes then they should go through some tests to confirm the result. Sometimes provider give them keton tests. By this test we can know that if there are present keton in the urine. Generally this is done if we have a doubt for type 1 diabetes. Therese are some more tests for diabetes they are:

**Fasting blood sugar test:** This test is done after having a fast for the night then the sample will be taken. There is a range for fasting blood sugar test, if the blood sugar level is 5.6 mml/L then it will be called normal. Then if it is 5.6 – 6.9 mml/L then it will be called prediabetes. And if it is more than 7 mml/L then it is called diabetes.

**Random blood sugar test:** For this test the sample will be taken at a random time. For this test the last time of eating doesn't matter. if the blood sugar is 11.1 mml/L or more than it then it will be called diabetes.

**Glycated hemoglobin test (A1C):** For this test we do not need any fasting. We can test it any time. even after eating we can go through this test. But it has an interesting point that is we can see the average blood sugar level of the patients for last 2 to 3 months.

Oral glucose tolerance test: For this test we need to fast overnight. Then we have to check the blood sugar level. If the blood sugar level is less than 7.8 than it is normal. After that we have to drink a sugary liquid and after drinking, we have to tale rest for 2 hours and then measure the blood sugar level. If the reading is more than 11.1 mml/L then you have diabetes. And if it is 7.8 mml/L means you have prediabetes.

### Prediabetes

Prediabetes is a condition where people have higher blood sugar than normal but it is not too much high to be called diabetes. For this patient they have higher risk of being diabetetic. But if someone suffer in prediabetes for a long time then he has risk of some disease like heart and kidney disease.

### Symptoms for prediabetes:

- Increased thirst
- Frequent urination
- Blurred vision
- Fatigue
- More hunger
- Slow healing sores

### Risk factors for prediabetes:

- Age
- Family history
- Physically inactive

- Overweight
- History of having gestational diabetes.

### **Treatment for diabetes**

Diabetes is a serious and long-term disease. It cannot be treated by us. For treating it we will need the support of doctors, including foot and eye doctors, nutritionist, and also a diabetes specialist. For treating a diabetes patient firstly, we have to focus on their blood sugar levels. We have to set a sugar level for each patient. We can maintain it by proper medication, diet and exercise. Sometimes patients need insulin to control their diabetes. There are five types of insulin that are injectable they are:

1. Rapid-acting (taking effect within a few minutes and lasting 2-4 hours)
2. Regular or short-acting (taking effect within 30 minutes and lasting 3-6 hours)
3. Intermediate-acting (taking effect in 1-2 hours and lasting up to 18 hours)
4. Long-acting (taking effect in 1-2 hours and lasting beyond 24 hours)
5. Ultra-long-acting (taking effect in 1-2 hours and lasting 42 hours)

These insulins are given by the recommendation of diabetes specialist. They provide proper guidelines for injecting them.

### **Diabetes medication**

When doctors cannot control blood sugar by proper diet and exercise then they provide them medicine to control blood sugar. These medicine helps to lower insulin level for taking medicine we have to plan about treatment. we have to keep some information in our mind like-

1. Set up a target blood sugar level.
2. What to do if blood sugar gets too low or high.
3. Gain some knowledge about the side effects of diabetes medicine.
4. Think about if the medicine affects with other medicine.

There are different types of drugs for diabetes treatment for example

**Metformin (Glumetza, Fortamet):** this medicine is used in the very beginning of type 2 diabetes. It helps to lowering the blood glucose production in the liver and improve bod's sensitivity to insulin that helps body to use insulin more effectively. For this medicine there can be some side effects like; nausea, bloating, abdominal pain, diarrhea. **SGLT2 inhibitors:** This medicine is very helpful. It helps to reduce the amount of sugar in kidneys absorb and passes it out in the urine. It means it help to reduce glucose in blood. These tablets are suggested to take one in a day. While taking this medicine if we test urine then it will be positive. It has some side effects they are: there have risk of gangrene, bone fractures, vaginal yeasts infections, urinary tract infections and so on.

**Sulfonylureas:** It helps our body to secrete more insulin. So, it is helpful for diabetes patients. Moreover, it has also some side effects like after consuming this medicine there are risk of gaining weight and lower blood sugar.



## **How to manage diabetes?**

1. Keep blood sugar level as near to normal by proper diet and exercise.
2. For managing diabetes, we need to control our blood cholesterol level.
3. By exercise we can manage our diabetes. For controlling blood sugar level, we need to do minimum 30 minutes exercise regularly. It can be done by walk, swimming, and others.
4. Plan a healthy meal. If possible, we can follow a Mediterranean diet or a dash diet. These diets are very helpful. These diets are full of nutrition and fiber. But it has very little fats and calories. That's why it is good for diabetes patients.
5. Take medicine and insulin regularly if prescribed. For taking medicine try to follow the doctor's recommendation for how and when need to take it.
6. Monitoring blood sugar level regular at home.

## **Activity for a diabetic patient**

The amount of carbohydrate taken during exercise depends on the type of activity. There are lots of activity. We need to choose them. People who have type 2 diabetes and take exercise low or moderate intensity by walking, they do not need any changes in their medication and dietary intake. But if patients are on insulin and they plan for taking strenuous exercise they need to reduce their insulin dose. People with type 1 are unlikely to require extra carbohydrate if blood glucose levels are above 10 mmol/L. For them at starting they need to take 20 to 30 minutes exercise for moderate activity they can do it for 30 to 60 minutes. For doing this they need to add 10 to 20 g carbohydrate with their meal. And for strenuous activity lasting 30-60 minutes need to add 30-50 g carbohydrate.

## **Timing of exercise:**

For reducing the risk of hypoglycemia, it is important to consider the activity timing and activity sessions. For the people who are on insulin, should avoid the time at peak action of short acting insulin. People who are taking oral hypoglycemic agents they should avoid exercise at high-risk times for example they should not do exercise before the mid-day meal. Doing exercise in the morning is helpful. Morning exercise before taking insulin or any food has low risk of hypoglycemia. On the other hand, late afternoon or early evening exercise can increase the risk of late hypoglycemia during the night. So, for a diabetes patient exercise timing is very serious issue.

# **SOME EXERCISE ADVICE FOR DIABETES PATIENT**

## **Before exercise:**

1. Check blood sugar level regularly. Measure is before, after and during exercise.
2. Reduce insulin 30-50% for training of exercise.
3. Before starting any endurance event eat low GI meal. Meal should be taken before 2-3 hours.
4. If blood glucose level is 6-13 then it is optimum blood glucose level.
5. If blood glucose level is less than 6 then take 10-20g fast acting carbohydrate
6. If blood sugar level is more than 13 mmol/L then we have to delay the exercise.

## **After exercise:**

For maintaining a healthy glycogen stores we have to consume high carbohydrate rich foods within 30-60 minutes of exercise. After physical exercise it is really needed for body.

## **During exercise:**

- If we exercise for 20-30 minutes and if it is light or moderate activity then there is no need of extra carbohydrate.
- 30-60 minutes moderate activity needs extra 10-20g high GI carbohydrate.
- 30-60 minutes of strenuous activity requires 30-50g high GI carbohydrate.
- For preventing dehydration during activity, we need to consume adequate fluid.

## **Diabetic kidney disease**

There are several complications for diabetes like eye disease, heart disease, foot disease. Among them kidney disease is one, it is also called diabetes nephropathy. And it is very risky for diabetes patients. A kidney which is affected by diabetes sometimes looks normal under an ultrasound but it can show its damage under the microscope. It is caused by the damage to the small blood vessels in the kidneys. It is this damage to the filtering units, which causes protein to leak into the urine, which is an important marker for diabetic kidney disease. Generally, there are very few symptoms for kidney disease. Very first sign for kidney disease is leaking of protein in the urine that is called albumin. So, for every diabetes patient, they should check their kidney at least once in a year.

## **Diabetic nephropathy cause:**

For a long time, poor diabetes control causes damage to blood vessel clusters in the kidney which filter wastes from our blood. This is the reason for kidney damage and it also causes high blood pressure. Next this high blood pressure becomes a threat for kidney disease.

## **Symptoms of diabetic kidney disease:**

- Increasing urination need.
- Worsening blood pressure control.
- Confusion or difficulty concentration.

- Reduce need of diabetes medicine.
- Shortness of breathing.
- Loss of appetite.
- Protein leaking with the urine.
- Nausea and vomiting.

**Complications for diabetic kidney disease:**

- High potassium levels in blood.
- Heart disease which leads to stroke.
- Reduce red blood cell numbers which transport oxygen.
- Pregnancy complications that can cause of risk to mother and the fetus.
- Irreversible damage to kidneys, sometimes it leads to either dialysis or a kidney transplant for survival.

**Prevention of diabetic kidney disease:**

- Manage high Blood pressure.
- Take treatment for diabetes as early as possible.
- Always take appointment for diabetes management.
- Always try to keep a healthy weight, and maintain a diet chart.
- Do not smoke.

## DIET CHART FOR DIABETIC KIDNEY DISEASE

Diet chart for 1400kcal for diabetic kidney patients are given bellow:

### Morning:

**Table 1:**

| Meal      | Serving | Quantity |
|-----------|---------|----------|
| Bread     | 2       | 60gm     |
| Egg       | 1       |          |
| Vegetable | 1       |          |

For mid-morning snacks we need to take one cup milk that is 125 ml.

### Lunch Meal:

**Table 2:**

| Meal      | Serving  | Quantity |
|-----------|----------|----------|
| Rice      | 2.25 cup | 270gm    |
| Fish      | 1 piece  | 60gm     |
| Vegetable | 1 cup    |          |

As midafternoon snacks we can provide them a fruit or one glass of water

### Dinner meal:

**Table 3:**

| Meal      | Serving  | Quantity |
|-----------|----------|----------|
| Bread     | 2 pieces | 240gm    |
| Chicken   | 1 piece  | 60gm     |
| Vegetable | 1 cup    |          |

For a kidney patient they have to follow protein restricted diet. They need to avoid lentil, seed and pulses.

# DIET AND DIABETES

If someone have diabetes then for them a healthy life style is very important and for a healthy life style nutrition and physical activity is a very effective part. Just by following a healthy meal we can control our blood glucose level and keep it in our targeted range. For the beginner it is really tough to control our meal. So, we should not control it sudden. we have to take time and have to gradually reduce our meal. Besides taking healthy meal we have to be physically active. By this we will be able to control our blood sugar level and make a healthy weight. It also helps us to prevent various diabetes problems or make them delay.

## **Types of foods that can be eaten for diabetes patients:**

Now a days some people think that if u have diabetes that means you will not be able to eat your favorite or desire food. It is really a wrong concept. The fact is you can eat any kind of food but very small portion and we have to take them occasionally .so we will need a diatetian who will make a healthy meal plan for a diabetes patient. There are several food groups so we have to choose foods from every food group and pick them very carefully.

## **Food groups are:**

### **Grains:**

For a diabetes patient they should take whole grain daily. The grain they take in a day half of them should be whole grains. There are several types of grain like, wheat, oats, rice, barley, cornmeal and so on. The example of grain foods are pasta, cereal, and bread.

### **Protein:**

There are several types of protein.

Plant based proteins are:

- Beans
- Lentils such as brown, green or yellow
- Soya nuts
- Nuts like almond butter, cashew butter or peanut butter.
- Tempeh, tofu

### **Fish and sea food:**

We have to take fish at least two times per week

- Fish high in omega 3 fatty acids like herring, tuna, salmon and so on
- Shellfish including clams, lobstars, crab, shrimp and oysters
- Other fish like catfish, cod, tilapia, halibut

**Vegetables:**

There are two types of vegetables

- **Starchy:** carrots, broccoli, eggplants, tomatoes, beans.
- **Non starchy:** potato, cauliflower, beets, onion, asparagus and so on.

**Fruit:**

There are so many foods in the market but for a diabetes patient they have rules for the quantity for fruit. They have to take them as servings. Different types of fruits are

Orange, Apple, Banana, melon, grapes and so on.

**Dairy—nonfat or low fat**

- Milk or lactose-free milk if have lactose intolerance
- Cheese
- Yogurt

**Foods that have restriction for diabetes patients:**

- Any sweet foods like sugar, sweet, chocolates, ice cream, baked goods
- Foods that are high in saturated fat and trans-fat for example fried foods
- Any beverage which is made by sugars like juice, energy drinks, soft drinks etc. instead of these drinks we should drink fresh water.
- Sodium rich food like salt.

## DIET CHART FOR DIABETES PATIENT

If I want to make a diet chart of diabetes patients who is needed 1600kcal regular then I will need

- Carbohydrate 50%
- Protein 20%
- Fat 30%
- We know 50% carbohydrate means 190 gm
- 20% protein means 76gm
- 30%Fat means 53gm

**Table 4:**

| Food Groups     | Serving | CHO  | Protein | Fat |
|-----------------|---------|------|---------|-----|
| Milk            | 01      | 15gm | 8gm     | 5gm |
| Leafy vegetable | 04      | 12gm | 8gm     | 0   |
| Fruits          | 02      | 30gm | 0       | 0   |
| Pulses          | 2       | 30gm | 14gm    | 0   |
| Snacks          |         |      |         |     |
| Total           |         | 87gm | 30gm    | 5gm |

No of cereals = 6 serving

Number of Egg/meat/fishes = 4 servings

No of cooking oil 5 gm

### Menu planning for breakfast:

**Table 5:**

| Meal      | Serving  | Quantity |
|-----------|----------|----------|
| Bread     | 2 pieces | 60gm     |
| Egg       | 1 piece  |          |
| Vegetable | 1 cup    |          |

### Menu planning for Mid-Morning Snacks:

**Table 6:**

| Meal   | Serving           | Quantity |
|--------|-------------------|----------|
| Fruits | 1 piece           |          |
| Milk   | 1 serving (30 gm) | 125 ml   |

### Menu for lunch

**Table 7:**

| <b>Meal</b>  | <b>Serving</b> | <b>Quantity</b> |
|--------------|----------------|-----------------|
| Rice         | 2 cups         | 240gm           |
| Fish/Chicken | 2 pieces       | 120 gm          |
| vegetable    | 2 cups         |                 |
| lentil       | 1 cup          | 20 gm           |

For midmorning snacks you can take any one fruits like Apple, Guava, papaya or Orange

### Menu for Dinner

**Table 8:**

| <b>Meal</b>     | <b>Serving</b> | <b>Quantity</b> |
|-----------------|----------------|-----------------|
| Bread           | 2 pieces       | 60gm            |
| Fish or chicken | 1 piece        | 60 gm           |
| vegetable       | 1 cup          |                 |
| lentil          | 1 cup          | 20 gm           |

### Some tips for maintaining diet:

Cooking oil 5 tea spoon

Drink 2.25 litre regularly

Take 5 meals per day.



## **LEARNING OUTCOME**

I have completed my internship in Biredm General Hospital and there I discuss with the diabetics patients and try to learn about lifestyle, diet and regular dietary intake. Directly I talked with the patients and I have discussed with them if they aware of diabetic and different diabetic disease. In the hospital they provide every patient a diet chart according to their health conditions and keep them in observation which is very important. Checking diabetic is also necessary. People who take insulin they need to check their diabetes level often. And every person needs to maintain their diet chart, ignore all type of sweet and oily food.

## CONCLUSION

In conclusion we can say that diabetes is a life-threatening disease which has no cure but it can be prevented by following some rules and regulation and also by maintaining some diet. Healthy life style is also a good way to maintain diabetes. If someone suffer from diabetes for a long time and it remain untreated then he will face various disease like eye problem. Foot problem, kidney problem, heart problem and also nerve problem. These diseases are the effect of diabetes. If someone keep their diabetes under control then they have less risk of this disease. Diabetes mellitus has reached epidemic proportions and can lead to devastating complications if not managed properly. Due to the personal and financial costs of managing diabetes, there are many challenges to successful diabetes management. Its long-term consequences lead to enormous human suffering and economic costs. However, comprehensive diabetes care can slow the progression of complications, maximize quality of life, and minimize healthcare costs. Insulin is indicated for all types of diabetes mellitus. However, diet, exercise, and diabetes education remain important components of diabetes management. We need to be proactive in tackling the problem of obesity and stressing lifestyle changes. GLP-1 analogues and DPP-4 inhibitors are relatively new additions to oral pharmacotherapy and are reasonable options for obese patients. Although there is no cure for diabetes with current treatments, there is hope for a brighter future for people with diabetes as new technologies to cure diabetes emerge.

# CASE STUDY

## Patient 01

### Information about Patient

Name: Motaleb  
Address: Munshiganj  
Admission date: 29.08.2022  
Ward no.: 72  
Bed no.: 702

Reason of admission: Ulcer in Right leg for 1 month.

### Anthropometric parameters

Table 9:

|         |        |            |             |           |
|---------|--------|------------|-------------|-----------|
| Age: 51 | Sex: M | Weight: 66 | Height: 164 | BMI: 22.3 |
|---------|--------|------------|-------------|-----------|

- Normal

### Nutritional Status

- 18.5 – 23

### Activity Level

- Active

| Lab/Biochemical test (Blood) | Result   | Lab/Biochemical test (Blood) | Result |
|------------------------------|----------|------------------------------|--------|
| Blood Glucose(F)             |          | SBP                          |        |
| Blood Glucose (ABF)          |          | DBP                          |        |
| HbA1c                        |          | Magnesium                    |        |
| Albumin                      | 27.8 g/L | Phosphate                    |        |

|                   |           |                |            |
|-------------------|-----------|----------------|------------|
| Total Protein     | 62.8 gm/L | Calcium        |            |
| HDL               |           | Potassium      | 3.4 mmol/L |
| LDL               | 181 U/L   | Sodium         | 138 mmol/L |
| Total Cholesterol |           | Serum Chloride | 107 mmol/L |
| BUN               |           | Hb             |            |
| Creatinine        | 0.6mg/dl  | Hematocrit     | 27.9%      |
| Urea              |           | ESR            | 67mmL      |
| Amylase           |           | SGOT           |            |
| S. TCO2           | 18mmol/L  | SGPT           |            |
| Uric Acid         |           | Alk.Phos.      |            |
| TG                |           | Others         |            |
| Bilirubin         | 0.4mg/dl  | Others         |            |
| Bicarbonate       |           | Others         |            |

**Table 10:**

**Appetite:**

- Good

**Socioeconomic & Cultural factor:**

Religion : Islam

Occupation : Service Holder

Living status : Middle class

Rural/Urban : Rural

**Nutritional status:** Normal

**Restrictions:**

- Yes

**Table 11:**

|         |            |
|---------|------------|
| Calorie | Free sugar |
| Fat     | Na         |
| K       | Other      |



## Patient 02

### Information about Patient

Name : Kalpana dash  
Address : Old Dhaka  
Admission date : 27.08.2022  
Ward no. : 63  
Bed no. : 650  
Reason of admission : Eye problem

### Anthropometric parameters

**Table 12:**

|                |               |                   |                    |                  |
|----------------|---------------|-------------------|--------------------|------------------|
| <b>Age: 60</b> | <b>Sex: F</b> | <b>Weight: 51</b> | <b>Height: 151</b> | <b>BMI: 22.3</b> |
|----------------|---------------|-------------------|--------------------|------------------|

- Normal

### Nutritional Status

- 18.5 – 23

### Activity Level

- Sedentary worker

**Table 13:**

| <b>Lab/Biochemical test (Blood)</b> | <b>Result</b> | <b>Lab/Biochemical test (Blood)</b> | <b>Result</b> |
|-------------------------------------|---------------|-------------------------------------|---------------|
| Blood Glucose(F)                    |               | SBP                                 |               |
| Blood Glucose (ABF)                 |               | DBP                                 |               |
| HbA1c                               |               | Magnesium                           | 0.80 mmol/L   |
| Albumin                             | 35.2          | Phosphate                           | 4.6 mmol/l    |
| Total Protein                       |               | Calcium                             | 7.7 mg/dl     |
| HDL                                 |               | Potassium                           | 4.6 mmol/L    |
| LDL                                 |               | Sodium                              | 129 mmol/L    |
| Total Cholesterol                   | 96 mg/dl      | Serum Chloride                      |               |

|             |          |            |       |
|-------------|----------|------------|-------|
| BUN         |          | Hb         |       |
| Creatinine  | 1.9mg/dl | Hematocrit | 27.6% |
| Urea        | 65 mg/dl | ESR        |       |
| Amylase     |          | SGOT       |       |
| S. TCO2     |          | SGPT       |       |
| Uric Acid   |          | Alk. Phos. |       |
| TG          |          | Others     |       |
| Bilirubin   |          | Others     |       |
| Bicarbonate |          | Others     |       |

**Appetite:**

- Poor

**Socioeconomic & Cultural factor:**

Religion : Islam

Occupation : Housewife

Living status : Middle class

Rural/Urban : Urban

**Nutritional status:** Over weight

**Restrictions:**

- Yes

**Table 14:**

|         |            |
|---------|------------|
| Calorie | Free sugar |
| Fat     | Na         |
| K       | Other      |

### **Patient 03**

#### **Information about Patient**

Name : Shahin Akter  
Address : Chittagong  
Admission date : 23.08.2022  
Ward no. : 71  
Bed no. : 708  
Reason of admission : Morbid Obesity for 6 months

#### **Anthropometric parameters**

**Table 15:**

|                |               |                   |                    |                   |
|----------------|---------------|-------------------|--------------------|-------------------|
| <b>Age: 50</b> | <b>Sex: F</b> | <b>Weight: 91</b> | <b>Height: 161</b> | <b>BMI: 35.13</b> |
|----------------|---------------|-------------------|--------------------|-------------------|

- Obesity

#### **Nutritional Status**

- 30 – 39.9

#### **Activity Level**

- Ambulatory bed rest



**Table 15:**

| Lab/Biochemical test (Blood) | Result    | Lab/Biochemical test (Blood) | Result     |
|------------------------------|-----------|------------------------------|------------|
| Blood Glucose(F)             |           | SBP                          |            |
| Blood Glucose (ABF)          |           | DBP                          |            |
| HbA1c                        |           | Magnesium                    | 0.7 mmol/L |
| Albumin                      | 37.9 g/L  | Phosphate                    | 5.3 mg/dl  |
| Total Protein                |           | Calcium                      |            |
| HDL                          |           | Potassium                    | 3.4mmol/L  |
| LDL                          |           | Sodium                       | 131 mmol/L |
| Total Cholesterol            |           | Serum Chloride               |            |
| BUN                          |           | Hb                           |            |
| Creatinine                   | 0.6 mg/dl | Hematocrit                   | 30.6%      |
| Urea                         | 17 mg/dl  | ESR                          |            |
| Amylase                      |           | SGOT                         | 70 U/L     |
| S. TCO2                      | 26 mmol/L | SGPT                         | 82U/L      |
| Uric Acid                    |           | Alk. Phos.                   |            |
| TG                           |           | Others                       |            |
| Bilirubin                    |           | Others                       |            |
| Bicarbonate                  |           | Others                       |            |

**Appetite:**

- Good

**Socioeconomic & Cultural factor:**

Religion : Islam

Occupation : Housewife

Living status : lower class

Rural/Urban : Rural

**Nutritional status:** Over weight

**Restrictions:**

- Yes

**Table 16:**

|         |            |
|---------|------------|
| Calorie | Free sugar |
| Fat     | Na         |
| K       | Other      |