

# **CARING FOR CLIENTS WITH DIABETES**

## **Abstract**

The Certified Nursing Assistant will likely care for clients with either type 1 or type 2 diabetes during the course of a career. When the client's blood glucose is not controlled, serious short-term and long-term complications are possible. In order to maintain normal blood sugar levels and avoid complications, diabetic clients must follow a special diet, watch their weight, and try and stay active. For some diabetic clients, oral or injectable medications are required to maintain normal blood glucose levels, and those diagnosed with Type I diabetes must take daily injections of insulin.

## Learning Goals:

1. Understand the role of insulin deficiencies in diabetes.
2. Understand the difference between Type I and Type II diabetes.
3. Identify signs and symptoms of high blood sugar in a Type II diabetic.
4. Describe the signs and symptoms of low blood sugar.
5. Identify two types of medications that can be used to control diabetes.
6. Identify important aspects of caring for a person with diabetes.

## **Introduction**

Diabetes is one of the most common diseases in the United States. It is a disease that affects the way the body handles blood sugar, and approximately 24 million Americans have this disease. There is no cure for diabetes; however, it is a disease that can be controlled with proper care. Without good management, diabetes can cause devastating and irreversible complications.

### **Type I and Type II Diabetes**

There are two main types of diabetes: *Type I* and *Type II*. Type II diabetes is much more common than Type I. In addition, there is a third, less common type of diabetes called gestational diabetes. This form of diabetes occurs in a small percentage of women during pregnancy and usually goes away after the baby is delivered. The Certified Nursing Assistant (CNA) will care for diabetic people who tend to have either Type I or Type II diabetes. For this reason, gestational diabetes will not be discussed here.

In both types of the diabetes, the body has a deficiency or a lack of a hormone called *insulin*. Insulin helps move *glucose* - often called blood sugar - into the cells where it can be burned for energy. The terms glucose and blood sugar are often used interchangeably. The blood sugar level of a person with Type I or type II diabetes can become elevated because this person does not produce insulin, does not produce enough insulin, or does not utilize the insulin that the body produces. If the blood glucose is not controlled, serious short-term and long-term complications are possible.

In order to maintain normal blood sugar levels, diabetic clients must follow a special diet, watch their weight, and try and stay active. For

nearly all diabetic individuals, these measures are not enough for them to maintain normal blood sugar levels; they also need to take oral or injectable medications. People with Type I diabetes must take daily injections of insulin.

Diabetes is also called diabetes mellitus. Diabetes mellitus comes from ancient Greek and it is roughly translated as "honey urine." Many centuries ago physicians would taste a client's urine to see if it was sweet and thus confirm a diagnosis for diabetes.

### **Glucose And Insulin**

The body needs energy to function, and a great deal of this energy is provided by a substance called glucose. Glucose is derived from the breakdown of foods people eat, particularly carbohydrates such as fruits, grains, *etc.* Blood sugar, or glucose, is the final product of many of these foods once they are broken down by the body. It is a very important source of energy. It is one of the most important "fuels" that the body needs to operate.

Once foods have been digested and glucose is formed, the next step in the process is moving glucose into the cells where it can be used by the body's cells to power metabolism. This is where insulin comes in.

Insulin is a hormone produced by the pancreas. Unlike some nutrients and substances, glucose molecules are too large to simply move through cell membranes to where they are needed. In order for glucose to be moved into the cells where it can be used for energy, it must attach to insulin. Insulin acts as a transporter molecule moving the attached glucose into the cells.

In the normal person, blood glucose is maintained within a narrow range of 70-125 mg/dL, and fasting glucose for adults should be 70-100 mg/dL. When blood glucose rises (*i.e.*, after a person eats a meal), more insulin is produced. This increased insulin attaches to glucose and transports it into the cells, keeping the blood glucose level within 70-125 mg/dL. This process happens quickly and efficiently. Even if someone ingests a meal with very high glucose content, the blood glucose will not rise above that normal level.

Close control of blood glucose is important for several reasons. A blood sugar level that is too low or too high can be dangerous.

Low blood sugar is called *hypoglycemia*. This can have serious consequences for brain function. Glucose is the only nutrient that can be used by the brain. It depends on a constant supply of blood sugar. If a person's blood sugar is too low, brain tissue can be irreversibly damaged. With acute hypoglycemia, the brain may shut down completely.

High blood sugar is called *hyperglycemia*. If a person's blood sugar is too high, the person may develop a condition called *diabetic ketoacidosis* (DKA). Most importantly, a blood sugar level that is too high for too long can cause chronic health problems such as eye and kidney damage. This last point is the most crucial reason why blood sugar levels *must* be well-controlled in someone who has diabetes.

### **Causes Of Type I and Type II Diabetes**

It was mentioned earlier that there are two main types of diabetes, Type I and Type II.

### **Type I Diabetes**

Type I diabetes is also called *juvenile diabetes* or *childhood-onset diabetes* because most people develop Type I diabetes in late childhood or their early teens. Type I diabetes is also called insulin-dependent diabetes, which is abbreviated as IDDM.

People who have Type I diabetes do not produce insulin. They need to be supplied with insulin in some manner for their entire lives to control their blood sugar level. Type I diabetes is an *autoimmune disease*. Although it is not known exactly how the process happens, either an infection or some type of environmental influence causes the body to produce antibodies that destroy the portion of the pancreas that produces insulin. Antibodies are part of the immune system that the body uses, normally, to destroy bacteria and viruses. Autoimmune diseases describe the circumstance where the body produces antibodies against its own structures and organs.

Type I diabetes is thought to be caused by an environmental trigger in susceptible individuals. It is not clear what those environmental triggers are but some of the suspects include childhood infectious diseases (or the organisms that cause them) such as mumps or rubella, exposure to cow's milk, toxic chemicals, and upper respiratory infections. These environmental triggers are suspected of being part of the cause of Type I diabetes but there is no definitive proof of this.

Approximately 5% of people with diabetes have type 1. As mentioned

previously, Type I diabetes is sometimes called childhood-onset diabetes or juvenile diabetes but many people who develop the disease do so when they are in their 20s. Risk factors for type 1 diabetes include:

- Family history: having a parent, brother, or sister with type 1 diabetes.
- Age: type 1 diabetes can occur at any age, but more likely to develop in children, adolescents or young adults.

In the U.S., type 1 diabetes is more likely to develop in Caucasians than African Americans and Hispanic/Latino Americans.

## **Type II Diabetes**

Type II diabetes is also called *adult onset*, or *non-insulin dependent diabetes mellitus*, and the latter is frequently abbreviated as *NIDDM*. This type of diabetes most often develops later in life. People with Type II diabetes do produce some insulin but not enough. It is also thought that their bodies do not completely utilize the insulin they do produce, a condition called *insulin resistance*.

Type II diabetes is thought to be caused by a combination of genetics and lifestyle. Certain people inherit the genetic tendency for diabetes. However, a lack of exercise, obesity, and diet then combine with this inherited problem and these people develop Type II diabetes.

There are some risk factors, aside from the ones mentioned above, that can increase the chances of developing Type II diabetes.

- Age > 45 years
- Body weight > than 120% of desirable body weight
- Family history of Type II, especially if a first-degree relative such as a parent or sibling has the disease
- Schizophrenia and depression: The presence of these psychiatric conditions seems to increase the risk of developing Type II diabetes
- Hypertension, elevated serum cholesterol, elevated serum triglycerides
- Gestational diabetes, or delivering a baby with a birth weight of over 9 lb
- Polycystic ovarian syndrome

When people first develop Type I diabetes, it is very clear they have the disease because they begin to exhibit several characteristic signs and symptoms. They need to urinate more often than what is considered normal, they are often hungry, and they are excessively thirsty. However, it is much more difficult to detect when people begin to develop Type II diabetes.

Type II diabetes is often discovered during a routine blood test. Unfortunately, without a blood test, many people with Type II diabetes may have high blood sugar for many years and be unaware of it. This is especially dangerous because many of the complications of diabetes years to develop and do not produce signs and symptoms while they progress.

## **Diabetes And Genetics**

There is a genetic component involved in the development of Type I diabetes. It is estimated that if both parents have Type I diabetes, the chance that their children will develop the disease is approximately 30%. If the mother of a child has Type I diabetes, the child has a 2-3% risk of developing the disease. If the father of a child has Type I diabetes, the child has a 5-6% risk.

The evidence for a genetic cause of type II diabetes is less clear than it is for Type I diabetes, and there are multiple genes that can influence whether someone does or does not develop type II diabetes.

### **Diagnosis Of Diabetes**

Type I diabetes is an autoimmune disease, and people with Type I diabetes do not produce insulin. Type II diabetes is caused by genetic and lifestyle factors, and people with Type II diabetes produce some insulin but not enough and they do not utilize the insulin that is produced - they have insulin resistance. These differences play a role in how diabetes is discovered and diagnosed.

Diagnosing Type I diabetes is relatively easy. Starting in childhood or the early teens (for most people) there are some obvious signs and symptoms that clearly indicate the presence of Type I diabetes. These signs and symptoms would include a constant thirst, fatigue, an unusual level of hunger, a persistent and excessive need to urinate, and weight loss. Serum glucose is measured and the diagnosis is made.

Making a diagnosis of Type II diabetes is not as straightforward. Some people who have Type II diabetes may have some signs and



symptoms, and it can be diagnosed if a client complains of a symptom that is common to people who have the disease, such as numbness and tingling in the feet.

However, for many people the disease will be present for years before it is detected because there is nothing to indicate that they have Type II diabetes - they look fine and they feel fine. In some cases, the disease is diagnosed during a routine medical exam that included measurement of serum glucose.

In most cases, Type II diabetes is detected because the individual has clear risk factors for developing the disease and a physician decided to screen the person. The risk for developing Type II diabetes is very high if someone is > 45 years of age, obese, has a sedentary lifestyle, hypertension, and/or elevated serum cholesterol and triglycerides. Physicians are aware of this and, if the risk factors are present, they will look for the disease.

### **Medications For Diabetes**

People who have Type I diabetes must inject insulin every day. There are several different types of insulin. Some lower the blood sugar very quickly and have a short duration of action. These are called the *rapid-acting insulins*, such as Humalog and Novolog, or *short-acting insulins* such as Regular Insulin. These take effect in 10-15 minutes and will regulate the blood sugar for approximately three to five hours. Other insulins such as Lantus are *long-acting*. They begin to affect the blood sugar 60 minutes after injection and they have a duration of action of approximately 24 hours.

For people who have Type II diabetes there are many different types of oral medications that can be prescribed. These medications work in different ways; some increase the production of insulin, some decrease how much glucose the body can absorb, and some increase the body's sensitivity to insulin. The medications that are most commonly prescribed for people who have Type II diabetes are *metformin* and one of the sulfonylureas such as *glyburide* or *glimepiride*. Many people who have Type II diabetes must take several diabetic medications and if the blood sugar is not well-controlled with oral medications and diet, insulin may be needed, as well.

### **Can Diabetes be Cured?**

There is no cure for diabetes. Type I diabetes is caused by destruction of the cells in the pancreas that produce insulin, and once those cells have been destroyed they cannot regenerate.

Type II diabetes can be well-controlled with lifestyle modifications such as exercise, weight loss, good control of complicating factors such as hypertension, careful attention to diet, and medications. Some people with diabetes who lose weight, exercise, and eat right are able to, for periods of time, avoid taking medications; however, this does not mean that these people are "cured".

### **Complications Of Diabetes**

Although there is no cure for diabetes, with proper diet, exercise, and the right medications (when needed), diabetes can be controlled; however, if a person with diabetes does not take proper care and

follow the physician's advice, diabetes can cause very serious long-term complications.

- **Blindness:** Diabetes is the leading cause of blindness in adults. People with diabetes are approximately 25 times more likely to become blind than people without the disease.
- **Heart disease:** Atherosclerosis is much more common in people with diabetes than in people who do not have diabetes. The risk of dying from heart or vascular disease is increased significantly - twice as much for men, four times as much for women - for people with diabetes. Finally, people with diabetes often have hypertension, they are obese, and they have high serum cholesterol and triglycerides, which are conditions that cause heart disease.
- **Stroke:** Having diabetes doubles the risk of having a stroke.
- **Kidney disease:** Diabetes is one of the leading causes of irreversible kidney disease.
- **Nerve damage:** Nerve damage is very common in people with diabetes. Nerve damage contributes directly to other complications
- **Wound and skin infections:** People who have diabetes are prone to wound and skin infections because their circulation is compromised, especially in the feet and lower legs. The wounds are called diabetic skin ulcers.
- **Amputations:** People who have diabetes often have poor circulation, an increased risk of wound and skin infections, and nerve damage that makes it difficult for them to know when they have pain or injuries. Because of that, damage to an extremity, especially the feet, is common and the great majority of toe amputations are performed on people who have diabetes. Most

amputations of the lower limb are performed on people who have diabetes.

These are obviously serious medical issues and they are all caused by a chronic, high blood sugar. A serum glucose that is high and is persistently high causes inflammation, poor circulation, and tissue damage, and the eyes, the heart and circulation, the kidneys, and the nerves are the areas of the body that are the most affected.

The higher the blood sugar and the longer it is elevated, the more likely that kidney damage, nerve damage, *etc.*, will occur. Unfortunately, these complications develop slowly over many years and there are no early warning signs. A person with complications from diabetes will complain of vision problems or have a stroke, discovering from these conditions that he or she had diabetes for years.

Hypoglycemia and hyperglycemia are also complications of diabetes, but they can be considered short-term complications.

### **Hypoglycemia And Hyperglycemia**

After it has been established that someone has diabetes - either Type I or Type II - it is important that those who are caring for the diabetic client know the signs and symptoms of abnormal levels of blood sugar.

A low blood sugar level is called *hypoglycemia*. In both Type I and Type II diabetes, it is usually easy to know when the blood sugar level is very low. Remember, blood sugar is one of the primary fuels that the body needs to function. For example, the brain is completely

dependent on blood sugar for energy so when blood sugar levels get very low, the body and brain become stressed. The typical signs and symptoms of a low blood sugar are:

- Confusion
- Anxiety
- Weakness
- Rapid heart rate
- Sweating
- Pale, cool skin
- Tremors

Low blood sugar can be caused by poor diet control by the diabetic, or an excess of their diabetic medications. It often occurs when the diabetic is active and neglects to eat. It is more common in Type I diabetics because their blood sugar levels are usually much more difficult to control and can vary widely.

Knowing and recognizing the signs and symptoms of hypoglycemia is important. If the blood sugar becomes too low, the diabetic can suffer a seizure and brain death. Hypoglycemia can be a medical emergency.

An elevated blood sugar level is called *hyperglycemia*. For people with Type I diabetes, high blood sugar levels will cause the signs and symptoms mentioned above - excessive thirst, excessive hunger, and excessive urination.

For people with type II diabetes, blood sugar levels may not become as high as is possible with people with Type I diabetes, and the levels may take longer to become elevated. For those reasons, there may not

be any signs or symptoms, or the signs and symptoms may be very subtle.

However, the situation in people with Type II diabetes can get a bit confusing at times. People with Type II diabetes who have a high blood sugar level that has been rising over a period of days or weeks may develop a condition called *diabetic ketoacidosis* (often abbreviated as DKA). Because the body cannot use glucose, it starts to break down fats for energy. This gradual change in metabolism can cause confusion, weakness, tremors, and rapid heart rate - many of the signs and symptoms of low blood sugar.

Some of the signs and symptoms of hypoglycemia and hyperglycemia are identical. The only way to distinguish between hypoglycemia and hyperglycemia is to obtain a blood sample and measure the glucose.

A diabetic person's blood sugar level may need to be measured to know if the confusion, weakness, rapid heart rate, *etc.*, that person is experiencing is due to a high or a low blood sugar. However, if the diabetic person's lifestyle is known, the CNA can often be relatively certain what is causing the symptoms. If the person is a Type I diabetic and he or she has been exercising, has not eaten most of the day, and suddenly develops symptoms, the blood sugar is almost certainly low. If the person is a Type II diabetic, has gradually gotten symptomatic, and that person is suspected or known to not have been following a proper diet, and has not been compliant with the medication regimen, the blood sugar is almost certainly high.

What should be done if the CNA suspects someone has an abnormally low or high blood sugar? First, that person should be kept safe. Many people with hypoglycemia become confused and disoriented, so safety is the primary concern. The next step would be to give glucose. The American Diabetes Association recommends the Rule of 15.

- If the blood sugar is low, eat 15 grams of an easily absorbed carbohydrate.
- Fifteen grams of easily absorbed carbohydrates would be 4 ounces of fruit juice, 5 lifesaver candies, a tube of glucose gel or tablets, a tablespoon of honey, or 15 jellybeans.
- If possible, check the serum glucose in 15 minutes. If it is  $< 70$  mg/dL, eat another 15 grams of carbohydrate.
- When the blood sugar is normal or the person feels as if she/he is back to normal, a protein/fat snack should be eaten.

If someone has hyperglycemia, sugar is not the answer. That person needs a medical evaluation as soon as possible. However, giving a small amount of sugar to someone who has hyperglycemia will *not* cause harm, but it may be very helpful to someone who has hypoglycemia.

Any easily absorbed carbohydrate can be used to treat hypoglycemia. But some people find that glucose tablets or glucose gel are the easiest and most convenient way to handle an episode of hypoglycemia. Glucose tablets and gel can be bought anywhere over-the-counter.

## **Basic Care Of The Diabetic Client**

The basic care of a client with diabetes is not complicated. One easy way to remember the areas of concern is to think of diabetic care as the Four Ms: **M**eals, **M**edication, **M**otion, and **M**onitoring. The client with diabetes will need help and encouragement with meals and diet. Oral and injectable medications must be taken consistently. Motion refers to exercise, an important part of diabetic self-care, and to diabetic foot care, and monitoring refers to monitoring serum glucose.

The areas of care that the CNA should be most concerned with and be most involved with are: 1) diabetic foot and skin care, 2) monitoring blood sugar, 3) monitoring for complications, and 4) meals, hydration, and nutrition.

### **Diabetic Foot and Skin Care**

Diabetes interferes with circulation and causes nerve damage, so the feet of a person with diabetes are very susceptible to injury and infection. Also, if a wound, ulcer or infection does happen, the healing process in someone who has diabetes is often slow and ineffective. If the damage is not detected, the consequences can be severe so diabetic foot care is very important. Remember, diabetes is one of the leading causes of toe and lower extremity amputations.

The diabetic or the person caring for the diabetic should examine the feet every day. Look for cracks in the skin, blisters, or swelling, and ask if there is any pain. Wash the feet gently with warm - not hot - water, and pat them dry; do not rub them. If the toenails need cutting, the CNA should make sure that he/she or the client is allowed to do so. Some diabetics will only have their toenails cut by a podiatrist. If the CNA does cut them, this should be done after a bath



when they are soft. Cut them straight across. The person with diabetes should not walk barefoot and should wear loose fitting, and comfortable shoes.

If a client with diabetes has any significant injury to his or her feet such as a sudden trauma, a cut or laceration, the client's physician should be notified and the feet should be closely monitored. Very hot or cold temperatures should be avoided. Cold temperatures can compromise circulation, and heat can cause burns that may not be sensed by someone who has diabetes. Cold or hot packs should never be applied to the feet of a diabetic person.

Controlling blood sugar and changing lifestyle factors such as smoking cessation and controlling high blood pressure can help prevent foot problems. These recommendations are specifically about the feet. However, they also apply to any skin area of someone who has diabetes.

### **Monitoring Blood Sugar**

Normal blood sugar is measured using units called *milligrams per deciliter*, and this is abbreviated as mg/dL. Normal blood sugar ranges from 70 to 100 mg/dL.

The blood sugar can be measured by taking blood and having the sample sent to a laboratory, but CNAs caring for diabetic clients will either be using or helping clients use a monitoring system that only requires a small drop of blood. These can be used by anyone, anywhere. There are several of these systems that are sold. One of the most common is the Accu-Chek®.

Using a home glucose monitor is not difficult and the process of checking the blood sugar is essentially the same, regardless of the system that is used. However, each type of home glucose monitor has its own instructions and procedures, so a detailed discussion on how to measure blood sugar with these devices will not be included here.

Most diabetics will check their blood sugar several times a day; usually, they will check it the first thing in the morning, an hour or two before meals, perhaps after meals, and at night before going to bed. Each person will follow his or her own specific schedule. The blood sugar can also be checked if it is suspected that it may be high or low.

Using these monitoring systems is easy. After cleaning the skin, a small lancet (basically a tiny knife) is used to penetrate the skin on the tip of a finger and a drop of blood is squeezed onto a small strip of paper. The strip is inserted into the monitoring unit, and there is a digital display of the blood sugar level. The process is quick and simple, and all the monitoring systems have instructional manuals that make them simple to use. The glucose level will be available almost immediately on a read out on the monitor. The CNA should notify a supervisor immediately if the blood sugar is below or above the normal limits.

Some people with diabetes may also monitor their blood for the hemoglobin A<sub>1C</sub> level, also referred to as the HbA<sub>1C</sub> test. The HbA<sub>1C</sub> test measures something called *glycated hemoglobin*. Hemoglobin is a protein in the blood that carries oxygen. When blood glucose levels are high some of the glucose will become attached to hemoglobin, forming

a compound called glycated hemoglobin. Glycated hemoglobin is abbreviated as HbA<sub>1C</sub>.

The HbA<sub>1C</sub> level is useful because it represents the *average* blood sugar level over time, usually three months. Because diabetic complications develop slowly and are directly related to high blood sugar levels, this is very useful information. Knowing the HbA<sub>1C</sub> level can help the treating physician know how well controlled the client's disease is, and what level of risk for complications the client may have.

The HbA<sub>1C</sub> can also be used as a diagnostic test to check for the presence of diabetes. A normal HbA<sub>1C</sub> should be < 5.7%. If the HbA<sub>1C</sub> is between 5.7 and 6.4%, the client is said to be pre-diabetic, and if the level is 6.5% or higher, the client has diabetes.

### **Meals, Nutrition, And Hydration**

The client who has diabetes will receive information about diet from his or her physician and, most likely, from a diabetic education specialist. What the client eats, how much, and when will depend on someone's age, appetite, nutritional needs, activity level, and food preferences. However, although diet will be adjusted to individual needs there are some basic principles that all clients with diabetes should follow.

Meals and snacks should be taken at regular intervals. This will help keep the serum glucose at a healthy level. Regular food intake will also help prevent hypoglycemia. Alcohol should be avoided or, at most, diabetic people should have no more than one to two drinks a day.

There is no “diabetic diet.” Aside from monitoring the amount of carbohydrates that are consumed, someone who has diabetes can essentially eat what anyone else would eat. However, it *is* more important for the person with diabetes to follow basic, healthy dietary principles. Because diabetes is associated with heart disease, hypertension, and obesity, excess calories should not be consumed, fat intake should be limited, and foods high in cholesterol should be eaten sparingly. The ideal diet for someone who has diabetes would be low in fat and high in fiber, fruits, and vegetables, which is recommended as a good diet for non-diabetics, as well.

Carbohydrate regulation, also called carbohydrate counting, may be used by some people with diabetes, and it can be an effective strategy for keeping the blood sugar within normal limits. Carbohydrate counting can be basic or advanced.

Basic carbohydrate counting involves knowing the carbohydrate content of a food, understanding how that carbohydrate will affect blood glucose, and coordinating carbohydrate intake with blood sugar and physical activity. Advanced counting is used for clients who require insulin; clients learn basic carbohydrate counting, and they also adjust the amount of insulin they use based on the amount of carbohydrate they ingest.

### **Monitoring For Complications Of Diabetes**

Complications of diabetes can be classified as short-term and long-term. The short-term complications are hypoglycemia and hyperglycemia, and these have been discussed. The long-term complications have also been covered. Monitoring for these is the

responsibility of the client's physician but a CNA who is caring for a client who has diabetes should know what these complications are and have a basic understanding of what signs and symptoms to look for that may indicate the presence, or progression of one of these complications, which may include symptoms of:

- Blurred vision
- Dizziness
- Numbness and/or tingling in the extremities
- Sudden onset of confusion and weakness, *i.e.*, signs of a stroke.
- Sudden onset of confusion and weakness caused by diabetic ketoacidosis (DKA) due to a buildup of acids in the blood.

The CNA should also remember that someone who has diabetes may *not* have the same level of pain sensation and perception as someone who does not have the disease. For that reason, people with diabetes may be experiencing a serious illness such as a heart attack and they may not have the typical intense and dramatic signs and symptoms. That person may simply complain of indigestion or say that he or she feels anxious and restless and be a bit sweaty.

Any physical complaint by someone who has diabetes should be evaluated very carefully and the client's physician should be consulted. Also, the CNA must understand that *any* illness that affects diet and fluid intake or causes vomiting or dehydration can be more serious for a diabetic. These situations can drastically affect blood sugar levels.

## **Summary**

The Certified Nursing Assistant (CNA) may care for diabetic people who tend to have either Type I or Type II diabetes. In both types of the diabetes, the body has a deficiency or a lack of a hormone called insulin. Insulin helps move glucose - often called blood sugar - into the cells where it can be burned for energy.

The blood sugar level of a person with Type I or type II diabetes can become elevated because this person does not produce insulin, does not produce enough insulin, or does not utilize the insulin that the body produces. If the blood glucose is not controlled, serious short-term and long-term complications are possible.

For people with Type I diabetes and for many people with Type II diabetes, the blood sugar cannot be controlled by diet and exercise. The person with Type I diabetes must inject insulin and will need to do so forever. People with Type II can take a variety of oral medications. And every diabetic must be careful to follow a lifestyle that includes exercise, weight control, avoidance of alcohol and tobacco, and a special diet.

These restrictions can be difficult to follow for some, but many people with diabetes live full, active lives. Without good care, it is almost certain that a diabetic will suffer from complications such as kidney failure, blindness, heart disease and amputations. People with diabetes should be encouraged to follow a healthy lifestyle and comply with their physician's treatment plan.