

Your professional health care staff

Nurse: _____


Team Leader: _____

Home Health Aide: _____

Therapist: _____

Social Worker: _____


Important Phone Numbers *(Patient to complete)*


 Ambulance/Police/Fire
911 or _____


 Hospital


 Doctor


 Doctor

 Non-Emergency Transportation


 Pharmacy

 Poison Control
911 or _____

 HME (Oxygen)

 Electric Company

 Phone Company

 Water Company

 Family

Diabetes Patient Education Guide

STATEMENT OF CONFIDENTIALITY

This booklet may contain protected health information. Persons other than you and your health care providers must have your permission to view this booklet.

Understanding Diabetes

This booklet is designed to help you, your family and caregiver understand Diabetes.

Diabetes is a major medical problem, as well as a chronic illness, affecting millions of persons. It is estimated that one out of every 20 persons has diabetes. Even though diabetes is an old disease, it continues to spur new interest and research.

It is important that you, your family/caregivers and your health care providers (*doctors, nurses, pharmacist, and other health care professionals*) work as a team and be involved in managing your condition. The more you know about your disease, the more you can be involved in your care and treatment. By working with your health care team and following a few simple guidelines, you may live longer and you can improve the quality of your life.

Although diabetes is a chronic disease that has no cure, people with diabetes can live healthy, happy lives when they follow a diabetes treatment plan. However, your health and happiness are mainly in your own hands. Good choices will improve and maintain health. Poor choices will result in health risks.

When you are able to recognize the common early symptoms of your condition, you can keep your doctors and nurses updated on your condition, receive appropriate and timely treatment and help prevent serious complications.

Keep this booklet as a resource for yourself, your family and caregivers. It contains forms that can be used to record your blood sugar, weight, vital signs, medicines and other important information.

As the home health nurse instructs you in the information contained in this booklet, please ask questions. Please call our office if something is unclear or if you have questions or concerns.

We look forward to being a member of your diabetes health care team!

Your Professional Home Care Staff

PATIENT SCHEDULE WORKSHEET

MONTH: _____

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

MONTH: _____

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

PATIENT SCHEDULE WORKSHEET

MONTH: _____

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

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Diabetes Patient Education Guide

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Rev. 12/02

Purpose: This booklet is for informational purposes only and is not designed to replace your physician's advice or treatments. The information contained in this booklet may change, as practice guidelines change.

Disclaimer: We have attempted to make the information contained in this booklet as accurate as possible; however, Medical Forms Management, Inc. makes no guarantees as to its accuracy and assumes no liability for the use of this publication and forms.

Research Resources: American Diabetes Association; CDC Prevention Guidelines; National Guideline Clearinghouse

Professional Consultants: MedForms would like to thank the following home health agencies and their staff for the time, input, clinical guidance and participation in the pilot study of this booklet: *American Nursing Care, Milford, OH; HomeCall, Frederick, MD; Methodist Alliance Health Systems, Memphis, TN*

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Editor: Connie King-Sauer, RN, Medical Forms Management, Inc.

THREE DAY DIET DIARY

DAILY: ___ Milk ___ Fruit ___ Bread ___ Meat ___ Vegetable ___ Fat

Date: _____ Was this a usual day? _____

BREAKFAST	LUNCH	DINNER	SNACK
Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free
Time: _____	Time: _____	Time: _____	Time: _____ Time: _____ Time: _____

Date: _____ Was this a usual day? _____

BREAKFAST	LUNCH	DINNER	SNACK
Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free
Time: _____	Time: _____	Time: _____	Time: _____ Time: _____ Time: _____

Date: _____ Was this a usual day? _____

BREAKFAST	LUNCH	DINNER	SNACK
Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free	Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free
Time: _____	Time: _____	Time: _____	Time: _____ Time: _____ Time: _____

SECTION III. Types of Diabetes

There are two major types of diabetes: Type 1 diabetes and type 2 diabetes. Other types of diabetes include gestational diabetes and a type resulting from certain genetic syndromes, surgery, drugs, malnutrition, infections, and other illnesses.

TYPE 1 DIABETES

Type 1 diabetes (*previously called insulin-dependent diabetes*) is an autoimmune disease in which the body does not produce any insulin (*the hormone that "unlocks" the cells of the body*) allowing glucose (*blood sugar*) to enter the cells and fuel them. The body destroys the cells in the pancreas that produce insulin. This usually leads to the total failure of the pancreas to produce insulin. Without insulin, your body cannot control blood sugar levels.

Type 1 diabetes occurs most often in children and young adults who are slim, but it can start at any age. People with type 1 diabetes must take daily insulin injections in order to stay alive. Type 1 diabetes account for 5-10 percent of diabetes and tends to run in families.

Warning Signs of Type 1 Diabetes -

- High levels of sugar in the blood
- High levels of sugar in the urine
- Frequent urination (*and/or bed-wetting in children*)
- Unusual extreme thirst
- Extreme hunger
- Unusual extreme weight loss
- Extreme fatigue, weakness, and tiredness
- Irritability, mood changes, and/or feeling edgy
- Feeling sick to your stomach and vomiting
- Flu like symptoms in children

Type 1 Diabetes Treatment Plan - The treatment plan for type 1 diabetes includes but is not limited to:

- Insulin to lower the blood sugar;
- Meal planning which includes foods to eat and when to eat;
- Exercise program to lower the blood sugar; and
- Blood and/or urine testing to monitor the blood-sugar level.

Three Key Problems of Type 1 Diabetes - You can be prepared for problems caused by type 1 diabetes. These problems are generally put into three categories.

1. **Hypoglycemia** (*low blood sugar*) - also called an "insulin reaction."
2. **Hyperglycemia** (*high blood sugar*) - occurs when the blood sugar becomes too high.
3. **Ketoacidosis** (*diabetic coma*) - a serious condition usually meaning your diabetes is not under good control.

TYPE 2 DIABETES

Type 2 diabetes is the most common form of the disease and accounts for 90-95 percent of diabetes. Type 2 diabetes is increasing to an epidemic level due to the increased number of older Americans, a greater prevalence of obesity and a sedentary lifestyle.

Type 2 diabetes (*commonly called non-insulin dependent diabetes*) is a metabolic disorder resulting from the body's inability to make enough insulin (*insulin deficiency*) or properly use insulin (*insulin resistance*). Type 2 diabetes is a disease that affects the way your body uses food.

Type 2 Diabetes Treatment Plan -

The treatment plan for type 2 diabetes includes:

- Losing weight;
- Improved nutrition;
- Exercise, and
- Oral medications and/or insulin, when indicated.

The exact cause of type 2 diabetes is unknown; however, medical experts and researchers have identified five signs common to those persons likely to develop type 2 diabetes.

- Strong family history of diabetes
- History of gestational (*pregnancy*) diabetes
- Temporary diabetes during stressful situations like surgery or infection
- Abnormal blood glucose levels when taking certain medications, such as cortisone or birth control pills
- Belonging to an ethnic group with a high rate of type 2 diabetes

THREE DAY DIET DIARY

DAILY: ___ Milk ___ Fruit ___ Bread ___ Meat ___ Vegetable ___ Fat

Date: _____ Was this a usual day? _____

BREAKFAST	LUNCH	DINNER	SNACK
___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____
			Time: _____
			Time: _____

Date: _____ Was this a usual day? _____

BREAKFAST	LUNCH	DINNER	SNACK
___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____
			Time: _____
			Time: _____

Date: _____ Was this a usual day? _____

BREAKFAST	LUNCH	DINNER	SNACK
___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____	___ Meat ___ Fruit ___ Fat ___ Vegetable ___ Bread ___ Milk ___ Free Time: _____
			Time: _____
			Time: _____

Sick Day Record

DATE: _____ WEIGHT: _____

TIME: _____ TEMPERATURE: _____

BLOOD GLUCOSE: _____ URINE KETONE: _____

SYMPTOMS: (Mark all that apply.)

Fever Nausea Vomiting Diarrhea Coughing Sneezing Sore Throat

Pain Other: _____

On the chart below, fill in the date, name of each medicine, and dose. Circle the time for each dose you have taken (top line is for AM and bottom line is for PM).

DATE:	MEDICATION	DOSE:	TIMES:	
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12

FOOD EATEN AT BREAKFAST: _____

FOOD EATEN AT LUNCH: _____

FOOD EATEN AT DINNER: _____

SNACKS: _____ GLASSES OF FLUIDS: _____

Those who are at greater risk for developing type 2 diabetes also include people over the age 45; who are overweight; who do not exercise regularly; and those who have low HDL or high triglycerides.

People with type 2 diabetes often develop the disease but are not aware they have diabetes until severe symptoms occur or they are treated for one of its serious complications. Symptoms can be so mild they go unnoticed or are confused with signs of aging.

Warning Signs of Type 2 Diabetes -

- Any of the type 1 symptoms
- Frequent infections
- Blurred vision
- Cuts/bruises that are slow to heal
- Tingling/numbness/loss of feeling in the hands or feet
- Recurring skin, gum, vaginal or bladder infections
- Dry, Itchy skin

GESTATIONAL DIABETES

Another type of diabetes is gestational diabetes, which develops in 2% to 5% of all pregnancies but disappears when the pregnancy is over. The exact cause of gestational diabetes is unknown; however, gestational diabetes starts when the body is unable to make and use all the insulin it needs during the pregnancy. Medical experts know that hormones from the placenta help the baby grow and the same hormones also block the normal action of your insulin during pregnancy. Women who experience gestational diabetes have an increased risk for developing type 2 diabetes later in life.



SECTION IV. Diabetes Medication Management

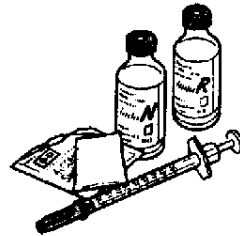
When your diabetes is closely and properly managed, you will feel better and will also reduce symptoms and complications. It is very important to follow instructions given to you by your doctor, home care nurse and other members of your health care team. Your medication(s), as well as diet, daily activities, exercise, lifestyle, health habits and family support are all important parts of your diabetes management/care plan.

INSULIN

People with type 1 (*insulin dependent diabetes*) diabetes no longer make insulin since the beta cells in the pancreas have been destroyed.

As a result, insulin shots are required to use glucose from meals. Insulin cannot be taken as a pill since it is a protein and would be broken down during digestion, just like the protein in food. In order for insulin to get into your blood, it must be injected into the fat under your skin.

There are almost 30 types of insulin and they differ in how they are made, how they work in the body, and price. Insulins today are very pure and allergic reactions to insulin are rare.



Insulin comes from animals or is made in laboratories by bacteria or yeast that are transformed into little "factories" that produce synthetic human insulin. There are three broad types of insulin, based on:

- how soon the insulin starts working (*onset*);
- when it works the hardest (*peak time*); and
- how long it lasts in your body (*duration*).

Onset, peak time, and duration are given as ranges since each person responds to insulin in his or her own way.

TYPE OF INSULIN	ONSET	PEAK TIME	DURATION
Rapid-acting Insulin (Lispro)	5 minutes	1 hour	2-4 hours
Short-acting or Regular Insulin	30 minutes	2-4 hours	4-8 hours
Intermediate-acting (NPH/Lente)	2-6 hours	4-14 hours	20-36 hours
Long-acting Insulin (Ultralente)	6-14 hours	14-24 hours	20-36 hours

Diabetes Care Plan

1. Medications (name, dose, frequency) used to control your diabetes:

2. Meal plan ordered by physician: (caloric requirements, dietary/fluid restrictions, etc.)

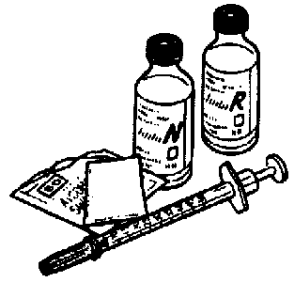
3. Weight loss goal(s): _____
4. Check blood glucose (fingerstick frequency): _____
5. Report blood glucose levels below _____ and above _____
6. Glucose level goal(s): Before meals _____ Bedtime _____
7. Check ketones in urine (frequency): _____
8. Report ketone levels above: _____
9. Specific treatment for hypoglycemia (low blood sugar): _____

10. Exercise/Activities permitted and/or restrictions: _____

11. Sick Day Plan
 - a. Blood Glucose Frequency: _____
 - b. Urine Ketone Frequency: _____
 - c. Medications permitted: _____
 - d. Foods permitted and how to eat: _____

 - e. Call the doctor or nurse when: _____

 or follow guidelines in booklet on page 32.



Insulin Delivery - Syringes, pumps, jet injectors, pens, and infusers all do the same thing. They deliver insulin through the outermost layer of skin and into fatty tissue so it can be used by the body.

Today's syringes are smaller and have finer points with special coatings that help make injections as easy and painless as possible. When insulin injections are given properly, they are almost painless.

It is important for the syringe to match your insulin dose since it helps you to draw up the insulin more accurately. If you are only taking 30 units of insulin, a 3/10 cc syringe would be all you need. Patients taking 50 units of insulin or less could use a ½ cc syringe and a 1 cc syringe is designed for those needing up to 100 units of insulin.

No matter what size and kind of syringe you choose, make sure you can draw up your dosage easily and you can easily read the markings on the syringe. If the syringe plunger is a different color than the syringe, it is easier to see the markings on the syringe. The syringe you use must match the insulin strength. For example, U-100 insulin needs a U-100 syringe.

Some needles are shorter than others and may be more comfortable. How deep the insulin is injected can change the absorption. Check with your doctor or a member of your health care team to determine whether a shorter needle is right for you.

Cost of the insulin syringes is very important, so shop for a good price. Make sure the syringe brand you select comes packaged like you prefer.

Reuse of Syringes - Most syringe manufacturers do not recommend reusing syringes since there may be some increased risk to patients. However, some patients reuse syringes without any problems. If you are ill, have open wounds on your hands, or have poor resistance to infection for any reason, never risk syringe reuse. Syringe makers will not guarantee the sterility of syringes that are reused so keeping them germ free is up to you. You can keep the needle clean by keeping it capped when you're not using it.

Don't try to clean it with alcohol since alcohol removes the coating that helps the needle slide into the skin easily.

- 1 jar peanut butter
- Cans of tuna, salmon, chicken, nuts
- 6 cans fruit (*lite*)
- 1 package dry cereal (*unsweetened*)
- 1 small box powdered milk
- 1 week's supply of water (*one gallon of water per day per person*)
- 6 cans sugar-free soda
- 6 small cans of fruit juice
- 1 spoon, fork and knife per person
- Disposable cups/paper plates
- 4 packages glucose tablets or small hard candies for low blood sugar
- Manual can opener

Be sure to check supplies and replace them as needed every year.

Medical Supplies - Use a plastic box or container that can be sealed tightly to store a two week's supply of medical supplies. Keep the container in a dry, easy to access area. Recommended supplies include:

- Insulin or diabetes pills that you take every day
- Insulin syringes/injection devices
- Alcohol swabs
- Sharp's container for your syringe and sharps (*lancet*) disposal
- Glucose meter and its supplies (*lancets, lancet device, glucose strips*)
- Strips to use with your meter or strips for visual reading
- Glucose tablets, hard candy, can of regular soda
- Prefilled glucagon syringe if ordered and if you take insulin
- Prescription(s) for diabetes supplies
- Insulated bag for diabetes supplies in case of power loss, especially if you live in a warm climate

Check the supplies at least every three (3) months and replace any items that have expired.

If you don't feel well, try to reach your doctor or home care nurse. If you are unable to reach them, or if you are out of food and/or medicine, you should go to the nearest hospital, call the police (*if able*), contact the American Red Cross, or go to an emergency shelter. Be sure to wear your diabetes medical identification at all times.

SECTION XIV. Medical Identification Products



Everyone with diabetes should have a medical identification tag, particularly people who take insulin. Such identification can save time in an emergency and may save your life since medical identifications provide emergency personnel with important information that allows them to act quickly. Keep in mind that sometimes a person experiencing hypoglycemia (*an insulin reaction*) can also be mistaken for a person who has had too much to drink unless they are aware that you have diabetes.

Medical identifications need to be easily seen. Medical identifications may be a wrist or ankle bracelet, necklace pendants or neck chains with dog tags, watch charms, shoe tags, iron on tags, or wallet cards. When selecting a medical identification, select something that you normally would wear all the time.

Necklaces, neck chains with pendants, and wrist bracelets are the first things emergency personnel look for, then watch charms and shoe tags. You should wear one medical identification and also keep a medical ID card in your wallet. The medical identifications should include your name, medical condition and an emergency phone number for information.

Section XV. Emergency Preparedness

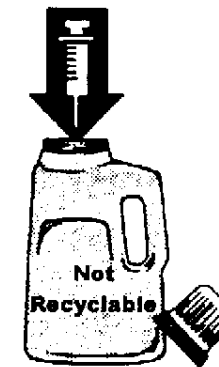
Diabetes can be hard to manage during emergencies or natural disasters, such as floods, hurricanes, tornadoes, and earthquakes. It is very important for you to plan ahead and be prepared. During a disaster, it may be difficult to get food supplies, medicine and medical supplies. The following are recommendations for emergency preparedness:

Food Supplies - Keep the following items in a dry, easy to access location:

- 1 large unopened box of saltine crackers
- 2 packages cheese and crackers or 1 jar soft cheese

Never let the needle touch anything but clean skin and the top of the insulin bottle. Never let anyone use a syringe you've already used and NEVER use anyone else's syringes.

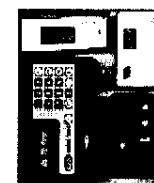
Reusing syringes may help you cut costs, avoid buying large supplies of syringes, and reduce waste. However, talk with your doctor or nurse before you begin reusing syringes/needles to decide whether reuse would be a wise choice for you.



Disposing of Syringes - Your syringe is medical waste and proper syringe disposal is important. Always follow appropriate guidelines when disposing of your syringes and lancets.

Place used "**sharps**" (*syringes, needles, lancets*) directly into a clean rigid container with a screw-on or tightly secured lid. Use a hard plastic or metal container (*for example, plastic bleach jug, liquid detergent bottle, plastic milk bottle, coffee can*). Before discarding a container, reinforce the lid with heavy-duty tape. Never overfill the containers or recap needles once used. **DO NOT use glass** or clear (*light weight*) plastic containers and never put "sharps" in containers that will be recycled or returned to a store. Seal the container with tape and place in the trash can or dispose of according to area regulations. (*Note: Your home care nurse may provide you with specific disposal instructions to follow.*)

Insulin Pumps - The insulin pump is a computerized device, about the size of a call-beeper, and may be worn on your belt or placed in your pocket. It delivers a continuous, measured dose of insulin through a flexible plastic tube with a small needle that is inserted through the skin into the fatty tissue, then taped in place.



The insulin pump is able to release a surge (*bolus*) of insulin, for instance, prior to eating to decrease the rise in blood glucose after the meal.

Since the pump releases very small doses of insulin on a continuous basis, it closely imitates the body's normal release of insulin. Pumps can also deliver very precise insulin doses for different times of day. Insulin pumps are not for everyone since it requires you to test your blood glucose four times a day or more and learn how to make adjustments in insulin, food, and exercise in response to the blood glucose test results.

Injection Aids for the Diabetic - An injection aid device makes giving injections with syringes or a syringe alternative easier. When selecting an injection aid, look for one that is easy to use and durable.

Since some injection aids require more user skill and dexterity, test several to see which one is easier for you before you buy one.

- **Insertion Aids** - Insertion aids are devices designed to make needle insertion into the skin faster. The majority are spring loaded and the needle is hidden from view. Some insertion aids even assist in pushing down the plunger of the syringe.

- **Syringe Alternatives** - There are several syringe alternatives that can be utilized to administer insulin. Examples are listed below.

Infusers - actually create a port into which insulin can be injected. With an infuser, a needle is inserted into subcutaneous (*fatty*) tissues (*usually on the abdomen*), and is secured with tape. It usually stays in place for 48 to 72 hours. Instead of injecting insulin into the skin, the insulin is injected into the infuser port. Infections can occur using this method.

Insulin Pens - An insulin pen looks very much like a cartridge pen; however, it has a needle in the end instead of a writing point and an insulin cartridge instead of an ink cartridge. Some insulin pens are disposable and the device is convenient, accurate, and used often by diabetics who require a multi-dose insulin regimen. Insulin cartridges may come in limited total quantities of Regular, NPH, lispro, or 70/30 premixed insulin. Insulin pens are very good for people with impaired coordination or for those on the go.

Jet Injectors - A jet injector releases a tiny jet stream of insulin, which is then forced through the skin with pressure, not a needle stick. Although this device doesn't use needles, it may cause bruises.

As with any different method of receiving insulin, you will have to work with your doctor and health care team to make sure you have good blood glucose control when adjusting to this device.

- **Visual Aids** - Poor eyesight can make it very hard to draw up insulin. However, if your vision is impaired, there are several products designed to make drawing up your injections much easier. For example:

- a list of lifestyle changes you need to make such as getting more exercise or stopping smoking;
- teaching sessions for you and your family on how and when to measure your blood glucose levels and urine ketones, how to keep records of these, and how to treat low blood glucose reactions;
- when to see an eye doctor;
- when to see a foot doctor, if needed;
- when to see other specialists, if needed;
- when to come back to your doctor and when you should call the doctor; and
- instructions for caring for your teeth and seeing the dentist.

Future Visits to the Doctor - Your doctor will inform you about when to return for routine follow-up visits and should tell you when it is important to call or come back to see the doctor. The frequency of follow-up visits will depend on several things. As a rule, if you take insulin for your diabetes or if you're having trouble controlling your glucose levels, you should see your doctor at least 4 times a year. Otherwise, you should see your doctor 2 to 4 times a year. If you have complications or start a new medicine or insulin program, you will have to see the doctor more frequently.

GLYCATED HEMOGLOBIN

Testing your blood glucose at home is one way to keep track of the changes in your glucose level. While these tests are very important, the tests will only tell you what your blood glucose level is at any one time. If you want to know how your blood sugar levels have done overall, there's a test that can help. This test is called a glycated hemoglobin test and actually gives you the big picture of your average blood glucose control for the past three to four months. As a result, the test will provide you and your health care team with a good idea of how well your diabetes treatment plan is working. This test is conducted in a laboratory, not through a home glucose monitoring machine.

Type 1 or type 2 diabetics who receive insulin should have the test performed four times a year. Type 2 diabetics who don't use insulin, and whose blood sugar levels are well controlled, should have the test performed at least twice a year; however, if diabetes is not well controlled or in some cases (*for example, pregnancy*), the glycated hemoglobin test may be indicated more often than twice a year.

SECTION XIII. Standards of Diabetes Care

Diabetes is a chronic illness and requires continuing medical care and education to prevent acute complications and reduce the risk of long term complications. It is important that you have good medical care for your diabetes. You should expect your doctor and health care team to be very knowledgeable about diabetes and the treatment for this disease. Your doctor's skill is very important since good care will help you live a full life with as few complications as possible.



The Team Approach - Since diabetes is complicated and your doctor is not an expert in every area, your doctor should put together a team to provide your diabetes care. Generally the team includes an eye doctor, nurses, and a dietitian. If you already have complications or if you develop complications, your doctor may send you to other specialists, for example a foot doctor.

The Goal of Care - Bringing your glucose levels down to as close to normal as is safely possible is the main goal of diabetes treatment. How far down will depend on the target your doctor sets for you; however, suggested goals are 80 to 120 milligrams per deciliter (*mg/dl*) before meals and 100 to 140 *mg/dl* at bedtime. Your treatment plan, which includes measuring your glucose levels, taking diabetes pills or insulin shots, exercising, losing weight, and eating a planned diet, is geared at helping you meet your target glucose level.

Diabetes Care Plan - An important part of your care is an individualized diabetes care plan, if a treatment plan is going to work well. The care plan must include specific things about you and your lifestyle.

You must understand what to do and what is expected and be an active partner in developing your diabetes care plan if the plan is going to fit into your lifestyle.

A complete diabetes care plan should include the following:

- a list of short term and long term goals;
- list of the medicines that you will use to control your diabetes;
- advice on eating;

- The **non-visual insulin measurement syringe** helps you measure an accurate dose of insulin by making a clicking sound at each 2-unit increment of insulin;
- **Needle guides** and **vial stabilizers** help you insert the needle into the correct insulin vial for drawing up an injection; and
- **Syringe magnifiers** will enlarge the measure marks on a syringe barrel.

Since certain aids are designed to fit specific syringes, be careful to make sure the product you want works with your syringe.

ORAL DIABETES MEDICATION

Although the best treatment for type 2 diabetes is losing weight and exercising, sometimes these aren't enough. The next step is taking medicine (*either insulin injections or pills*) to lower blood glucose levels. Keep in mind that diabetes pills are **not** insulin.

Sulfonylurea Drugs - Since sulfonylurea drugs were discovered in the 1940s, several have been used to treat people with type 2 diabetes. Four of the current drugs on the market have been used for about 25 years and are called first generation sulfonylureas. They are chlorpropamide (*Diabinese, Glucamide*), tolazamide (*Ronase, Tolinase*), tolbutamide (*Orinase, Oramide*), and the rarely used acetohexamide (*Dymelor*).

A second generation of sulfonylureas came on the market in 1984. These medicines are glipizide (*Glucotrol*) and glyburide (*DiaBeta, Glynase, Micronase*). These new drugs can be taken in smaller doses than the first generation drugs.

While all sulfonylurea drugs have similar effects on blood glucose levels, they may differ in the following:

- side effects;
- how often they are taken; and
- interactions with other drugs



Biguanides Drugs - Another type of medication used to treat type 2 diabetes is the group of drugs called biguanides. Biguanides were banned in the United States in the 1970s because their use was linked to problems such as lactic acidosis. However, a safer biguanide called metformin works as well as the sulfonylurea drugs. It seems to lower levels of bad (*VLDL*) cholesterol. Also, unlike sulfonylurea drugs, metformin does not cause too low levels of blood glucose (*hypoglycemia*).

How Oral Diabetes Medications Work - Exactly how diabetes pills work is not completely clear. Sulfonylurea drugs seem to improve both problems by:

- boosting the pancreas' production of insulin; and
- making body cells more receptive to glucose.

Metformin may:

- make cells more receptive, and
- decrease glucose production in the liver.

What to Expect - Since pills work with diet and exercise, not in place of them, you can't forget about good eating and exercising habits. Drugs aren't much help if you don't eat right, exercise, and lose weight. Also, diabetes pills don't work for everyone. Diabetes pills lower blood glucose to near-normal levels only in about one-half to two-thirds of the people.

Your chances are low that the pills will work for you if you:

- are underweight;
- have had diabetes for more than five years; or
- already take more than 20 units of insulin each day.

On the other hand, your chances are good if you developed diabetes recently or have so far needed little or no insulin to keep blood glucose under control.

Sometimes for reasons unknown, the diabetes pills sometimes stop working after a few months or years. It could be because you gain weight or get an illness that makes diabetes worse. Switching to another pill, especially from a first generation to a second generation agent, can sometimes help.

Sometimes, even when oral diabetes medicine brings your blood glucose under control, you may still need to take insulin when you have a severe infection, are pregnant, or need surgery. Pills may not be able to control blood glucose during these stressful times, when blood glucose levels shoot up.

Because diabetes pills seem to help the body use insulin better, some doctors use a combination therapy (*insulin shots and pills*) in people with hard-to-control type 2 diabetes to try and make insulin work better.

Most urine tests are performed as follows:

- Get a sample of your urine in a clean container.
- Place the test strip in the sample (*you can also pass the strip through the urine stream*).
- Gently shake excess urine off the strip.
- Wait for the test strip pad to change color according to the product directions.
- Compare the strip pad to the color chart on the test strip bottle to give you a range of the amount of ketones in your urine.
- Record your results.

If the test shows small or trace amounts of ketones, this may mean that ketone buildup is starting and you should test again in a few hours. Moderate or large amounts of ketones are a danger sign since they upset the chemical balance of your blood and can poison the body. Never exercise when your urine tests show moderate or large amounts of ketones and your blood glucose is high. These are signs that your diabetes is out of control and you will need to talk to your doctor or home care nurse at once if your urine tests show moderate or large amounts of ketones.

Again, keeping a written log to track of your test results and related events is important. Your log gives you the information you, your doctor and home care nurse needs to adjust your diabetes care plan.

When to Test for Ketones - Your doctor or home care nurse should tell you when you should test for ketones. However, as a general rule, you will probably be advised to test for ketones if you have any of the following signs:

- your blood glucose is more than 300 mg/dl;
- you feel nauseated, are vomiting, or have abdominal pain;
- you are sick (*for example, with a cold or flu*);
- you feel tired all the time;
- you are thirsty or have a very dry mouth;
- your skin is flushed;
- you have a hard time breathing;
- your breath smells fruity; and/or
- you feel confused or in a fog.

Precose is in a class of prescription drugs called "starch blockers." These drugs work in the intestine as fake carbohydrates, binding for a few hours to enzymes that normally break down carbohydrates. This slows digestion of carbohydrates following meals. However, when too much carbohydrate is passed into the lower intestine it ferments and creates bloating, excessive gas, and abdominal discomfort. The side effects may decrease with use over a period of time.

Although Precose itself doesn't cause low blood sugar, most people using insulin notice dramatic reductions in their insulin dose. It is also important to note that if low blood sugar occurs while taking Precose, many foods used to raise blood sugar will NOT work. Glucose tablets and candy are the best choices to use for an insulin reaction when you are taking Precose.

The drug was approved by the FDA in 1995 in the treatment of type 2 diabetes; however, it has been found effective in either type 1 or type 2 diabetes. Those with type 2 diabetes will see lower readings along with lower blood insulin levels. Those on insulin will usually see a reduction in their insulin doses.

MEDICATION SCHEDULES

It is very important for you to take your medication as ordered by your doctor. It is important to have a system set up that will help you remember when to take your medicine, especially if you have to take medication more than once a day. It is important to know which medicines to take each day; what each medicine looks like; when to take the medicine; and when each medicine was taken.

Your home health nurse will help you or your caregiver set up a system that will work best for you.

MEDICATION SAFETY

It is important to always follow the medication guidelines listed below.

- Ask your doctor or pharmacist about your medicines. Write them all down and show them to your doctor or pharmacist to keep from combining drugs inappropriately. If there are any changes, add them to the list. Follow your doctor's orders for taking all medicines.

Visual Testing - If you are testing by visual reading, you will follow these steps.

1. Place a drop of blood on a test strip (*a piece of paper or plastic with a chemically treated pad*).
2. Wait for the pad to change color (*glucose causes the change*). Each brand of strip will have a certain time for the pad to develop.
3. Match the color of the pad to a color chart on the test strip bottle.

The colors on the chart on the test strip bottle stand for ranges of glucose levels, for example, 60 to 90 mg/dl. If your test strip color matches 60, then your blood glucose is 60 mg/dl. If it falls between 60 and 90, you record it as 75.

Glucose Meter Testing - Blood glucose meters are small computerized machines that "read" your blood glucose and your blood glucose level shows up as a number on a screen (*similar to that on a pocket calculator*).

Picking a Meter - There are many meters to choose from and some meters are made for those with poor eyesight. Some meters come with memory so you can store your test results in the meter itself. Before purchasing a meter, get suggestions from your doctor or home care nurse, since they may have meters they use often and know best. The cost of the meter and ongoing cost of testing supplies should be a factor to consider prior to purchasing the meter. Some insurances will pay for the meter and supplies and some may only pay a portion of the cost or none at all. Many times rebates are offered, so shop around. Get approval from your insurance company before you buy one. Although you do not need a prescription to purchase strips, you may need one to get insurance reimbursement for the test strips.

Glucose Meter Accuracy - Meters have been found to be accurate and precise; however, you must do each step correctly for good results. Your home care nurse or doctor will help you check the accuracy of your skills. If you do a blood test within 5 or 10 minutes of when you've have blood drawn from your vein, and compare your test results with the doctor's blood test, your meter results should not be off by more than 10 or 15%. Your meter may also give a poor reading because the:

- meter is not at room temperature;
- test strips are outdated; and/or
- meter is not calibrated (*set up for*) the current box of test strips.

Impotence (*unable to have or keep an erection*) can be caused by physical problems or psychological problems. There are probably over 100 causes of impotence and any one of them can affect a man with diabetes. However, the most common causes of impotence in men with diabetes are physical problems like blood vessel disease and nerve disease. There are tests to find the cause of the problem, and there are treatments for nearly all men who want them.

SECTION XII. Diabetes Self-Testing

To be in control, all people with diabetes have to work to keep the amount of glucose in their blood as near to normal as possible. There are simple blood glucose tests and urine tests you can do yourself to keep track of how your diabetes treatment plan is working and to feel better.

BLOOD GLUCOSE TESTS

The primary tool you have to check your diabetes control is blood testing. This test tells your blood glucose level at any one time. You should keep a written log of your test results and bring this record to your doctor's office when you see the doctor and have it available for your home care nurse to review. This log will present a good picture of your body's response to your diabetes care plan. Blood testing lets you see what works and what doesn't and allows you, your doctor and/or home care nurse/dietitian to make needed changes to your treatment plan.

Who Should Test? Experts feel that all diabetics (*whether taking insulin or not*) will benefit from blood testing. In 1997, Congress approved legislation (*effective July 1, 1998*) that permitted Medicare to pay for glucose testing strips and monitors for non-insulin dependent diabetics.

How Blood Tests Work - There are two ways to test your blood. In both, you first prick your finger with a special needle (*lancet*) to get a drop of blood. To avoid having sore spots on the parts of your finger you use the most, prick the side of your finger by your fingernail.

One method of testing called visual reading, allows you to match a test strip to a color chart. If you have poor eyesight or are color blind, this type of blood glucose test will not work for you. The other method of blood testing requires you to use a blood glucose meter to "read" your blood glucose level.

- Be sure you understand the name of the medicine, why you are taking it, how to take it, potential side effects, and side effects to report to your healthcare provider.
- Take your medications exactly as ordered/instructed.
- Do not stop or change medicines -- even if you are feeling better.
- Do not reduce the medication dose unless ordered to do so by your doctor.
- Do not skip doses of medication.
- Do not take more medication than is ordered by your doctor.
- Keep your medicines refilled at all times.
- Use a chart or container system (*egg carton or medi-planner*) to help you remember what kind, how much, and when to take medicine.
- Take your medicine with a light on so you can read the label.
- Do not drink alcohol when you are taking medicine.
- Read the medicine labels and keep them in original containers.
- Store medications safely in a cool/dry place according to instructions on the label of the medication.
- If you miss a dose, do not double the next dose later.
- Dispose of old medications safely.
- Keep medicines away from children and confused adults.
- Be sure to tell your health care provider about all your other health conditions.
- Tell your health care provider about all other medicines that you are taking (*even non-prescription medicines such as aspirin, antacids, and cold medicines*).

MEDICATION COST

The cost of medication(s) can vary widely. Since the same drug can vary in price from store to store, it is good to call around to find the best price for the medicine(s) you take.



Generic versions of oral medications chlorpropamide and tolbutamide are available and cost less than the brand name products. Most generic brands are reliable; however, you or your doctor may feel better using a medicine that has been made by the same company for many years.

Sometimes your doctor may be able to prescribe a larger tablet strength and it can be broken in half for the dose you need. For example, one 500 mg tablet will often cost less than two 250 mg tablets. Check with your doctor to see if this might be an option for you.

It is not uncommon for patients to have trouble paying for their medicines. Don't hesitate to let your home health nurse know if this is a problem for you. Sometimes financial assistance can be obtained through social services agencies or through different programs provided by drug companies and the home health nurse or social worker can help you apply for any available assistance.

SECTION V. Hyper/Hypoglycemia & Ketoacidosis

Living with diabetes requires learning to cope with some of the problems that go along with having the disease. Two of these problems are hyperglycemia (*high blood sugar*) and hypoglycemia (*low blood sugar*). You must learn to deal with them, since both occur from time to time to all people who have diabetes.

Keeping diabetes in control by testing blood sugar often will let you know when your blood sugar is low and you need to treat it. Your doctor or home care nurse should tell you how often to test and what your blood sugar level should be.

HYPERGLYCEMIA

Hyperglycemia (*high blood sugar*) can be a serious problem without treatment, and is a major cause of many of the complications that happen to people who have diabetes. Therefore, it is extremely important that you know what hyperglycemia is, its symptoms, and how to treat it.

What Is Hyperglycemia? Hyperglycemia is the medical term for high blood sugar and occurs when the body has too little, or not enough insulin, or when the body can't use insulin properly. There are numerous things that can cause hyperglycemia.

- If you have type 1 diabetes, you may not have given yourself enough insulin.
- If you have type 2 diabetes, your body may have enough insulin, but it is not as effective as it should be.
- You could have eaten more than planned.
- You could have exercised less than planned.

- Always treat an insulin reaction as soon as you feel it, since waiting will probably make it become worse.
- Whenever you exercise, you should bring along some raisins or Lifesavers' candy to eat just in case you need to raise your blood sugar level.
- With regular exercise, you will need to test your blood sugar more often.

SECTION XI. Sexual Health



Although your sex life is a private matter, there is no need for you to suffer in silence. Diabetes does not have to threaten your sexual health and treating sexual problems and issues are an important part of health care. Don't hesitate to discuss problems or worries with your doctor.

Women with type 1 diabetes may have some trouble with vaginal lubrication or suffer more frequent yeast infections, if their diabetes is poorly controlled. For women with diabetes, it's important to know that menopause affects your blood glucose levels. The hormones, estrogen and progesterone, keep your menstrual cycle going and also affect your blood glucose levels. They blunt the effect of insulin and encourage the liver to make glucose. As a result, if you take insulin for diabetes, menopause may affect how much insulin you need. As your body makes less estrogen and progesterone, you may need less insulin.

When menopause is complete, you will most likely need about 20% less insulin. If you have type 2 diabetes, you may need lower doses of diabetes pills. On the other hand, you may find that menopause does not change your dose of insulin or diabetes pills. Weight gain and lack of exercise raise insulin needs and these often balance the dropping hormone levels.

Impotence is a common problem for men with diabetes and without diabetes. It is not unusual for the word impotence to spark fear and worry. Don't let fear and lack of knowledge stop you from dealing with this common problem. There are an estimated 10 million men in this country who have impotence, and the number could be much higher since many men keep this problem to themselves. Since you have diabetes, you have a special reason to learn about impotence since it occurs among 50 to 60% of all men with diabetes after the age of 50.

SECTION X. Exercise and Diabetes

Exercise is important in coping with diabetic complications. Diabetes may seem to be dealing you hard blows and exercise may be the last thing you want to think about. However, staying active in your health care is a key aspect of coping well. When you live with a diabetes complication, you may need exercise more than ever. Muscles need to be exercised regularly to stay strong, and if they aren't, they become too weak to even perform simple chores like taking out the trash or making the bed.

Regular exercise will make your muscles stronger and more effective. Regular exercise can be modest and you may have to start slowly if you haven't been exercising. It is important to involve your doctor in your exercise program.

Exercise won't cure the problem, but it can help if you have nerve damage in the hands, legs, or feet. You can help keep your strength, flexibility, and blood flow to those damaged areas with regular exercise. Good glucose control along with regular exercise, over time, may help relieve some of the pain.

EXERCISE PRECAUTIONS

People with type 1 diabetes need to know the following specific exercise precautions.

- Before starting any exercise program, check with your doctor since your activity must be planned to fit in with your meal plan and with the action times and amounts of your insulin.
- When exercising more than 1 hour after eating, it's a good idea to eat before you start. Generally, a high carbohydrate snack, such as 6 ounces of fruit juice or one half of a plain bagel, is good before or during mild to moderate exercise such as walking, biking, or golf.
- Always check your blood sugar level before you start exercising. If it is low (*less than 70 mg/dl*), you will need a snack to avoid having low blood sugar (*insulin reaction*) while you exercise.
- An insulin reaction might make you feel faint, sweaty, dizzy, or confused and can occur while you exercise or several hours, even up to 12 hours, later.
- If you feel an insulin reaction coming on while exercising, STOP and IMMEDIATELY and have ½ cup of orange juice, a nondiet soft drink or 3 glucose tablets.



- The cause could be the stress of an illness, such as a cold or flu.
- Stresses, such as family conflicts or school or dating problems, could be the cause.

The Symptoms of Hyperglycemia - The signs and symptoms of hyperglycemia include the following:

- high blood sugar;
- high levels of sugar in the urine;
- frequent urination; and
- increased thirst.



You might ask, how will I know when I have high blood sugar? When you test your blood and find high blood sugar levels early, it's important to treat hyperglycemia as soon as detected. A condition called ketoacidosis (*diabetic coma*) may occur when hyperglycemia is not treated.

Treating Hyperglycemia - You and your doctor must determine the best way to lower your blood sugar. Exercising is often one way to lower your blood sugar level. Always check your urine for ketones if your blood sugar is above 240 mg/dl. It is important to remember NOT to exercise if you have ketones since ketone may cause your blood sugar level to go even higher.

Cutting down on the amount of food you eat might also help. When exercise and dietary changes aren't working, your doctor may change the amount of your medication or insulin or possibly even the time of when you take your medication.

Preventing Hyperglycemia - Prevention is the key to preventing hyperglycemia. Practicing good diabetes control is your best option! It is important to detect and treat hyperglycemia early, before it gets worse.

HYPOGLYCEMIA

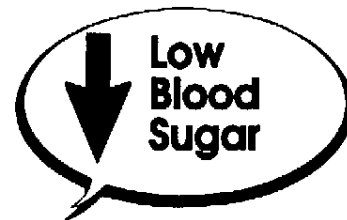
Hypoglycemia (*low blood sugar or Insulin reaction*) is one of those problems that occurs from time to time to all diabetics. Hypoglycemia can occur for the following reasons:

- If you have taken too much insulin;
- If you have not eaten enough food;
- if you have not eaten on time; and/or
- if you have exercised too much.

Hypoglycemia can occur even when you're doing everything you can to control your diabetes. Although you may not be able prevent it, hypoglycemia can be treated before it gets worse. It is important to know what hypoglycemia is, its symptoms, and how to treat it.

Hypoglycemia Symptoms - the signs of hypoglycemia include the following:

- shakiness
- dizziness
- sweating
- hunger
- headache
- pale skin color
- sudden moodiness or behavior changes, such as crying for no apparent reason
- clumsy or jerky movements
- difficulty paying attention, or confusion
- tingling sensations around the mouth



It is also important to check your blood sugar level when you feel an insulin reaction coming on. When the blood sugar level is low, you should treat this condition quickly. Sometimes you may feel a reaction coming on; however, you are unable to test your blood. The rule of thumb is... **When in doubt, treat!**

Treating Hypoglycemia - Your health care team can tell you what is best for you to use for an insulin reaction. It is very important to always have at least one type of sugar with you at all times. The following treatment protocols are generally used.

- For a mild reaction, two cheese crackers or a half of a glass of milk (4 to 6 ounces) is usually enough to treat the reaction.
- For a more serious reaction, the quickest way to raise your blood sugar is with some form of sugar, such as ½ cup (4 ounces) of fruit juice, ½ cup (4 ounces) of regular (not diet) soft drink, 5-6 pieces of hard candy, 1 to 2 teaspoons of honey or sugar, **or** 2 to 3 glucose (sugared) tablets (you can buy these at the drug store). You can also buy a tube of sugared (glucose) gel. The gel is easy to carry and use and can be squeezed right into your mouth (you can buy the gel at most drug stores). It takes about 10-15 minutes for the sugar to help you.

Treatment of Diabetic with Heart Disease - Diabetic patients with heart disease are generally treated the same way as patients without diabetes are treated. Patients are usually advised to:

- follow a meal plan low in saturated fat;
- lose weight if overweight; and
- perform moderate exercise when mild problems are found.

Medications may be utilized to treat heart disease. Some heart medicines have no known effect on blood glucose control while other medicines can affect blood glucose. Diuretics, used to treat high blood pressure, may raise blood glucose levels, so be sure any doctor who prescribes medicine for you knows about your diabetes and all the other medications you take.

DIABETIC NEUROPATHY AND NERVE DAMAGE

A common complication of diabetes is diabetic neuropathy which means there is damage to the nerves that run throughout the body, connecting the spinal cord to muscles, skin, blood vessels, and other organs. Diabetic neuropathy is actually a group of nerve diseases that affect the nerves outside the brain and spinal cord, called the **peripheral nerves**.

Symptoms such as prickling, tingling, burning, aching, or sharp jabs of needle-like pain may be caused by nerves that are damaged or are healing, and are signs of the increased nerve activity that occurs in damaged or healing nerves. It is not unusual for different types of symptoms to occur together and to have pain even though many fibers have been lost.

Neuropathy is more likely to affect people who have had diabetes a long time or in diabetics with poor glucose control. How high does glucose levels have to be before nerve damage occurs, remains unknown.

Some cases of neuropathy can be prevented through:

- tight glucose control;
- avoiding alcohol; and
- avoiding cigarettes.

Neuropathy is diagnosed by describing your symptoms to the doctor and through neurological evaluations where the doctor performs several simple and painless tests.

CARDIOVASCULAR DISEASE AND YOUR HEART

Since diabetes carries an increased risk for heart attack, stroke and complications related to poor circulation, diabetics have even more reason to be knowledgeable of heart and blood vessel disease. You can reduce the risk of heart disease by eliminating or decreasing the number of risk factors for cardiovascular disease (CVD).

Diabetics who have high blood pressure, high blood fat levels, smoke cigarettes, have a family history of premature heart disease, are obese, and are not physically active have a greater chance of heart disease.

What Can You Do to Change? If you have any of the risk factors, work hard to change them. **If you smoke, quit!** If you're overweight, lose some weight. When you do your best to follow a heart healthy lifestyle, you and your whole family will reap the rewards. Your health care team can work with you on the following:



- Keep your blood glucose levels as near to normal as possible since high levels of blood glucose may damage large blood vessels over time.
- Quit smoking!
- Keep your blood pressure under control since high blood pressure can be an early warning sign of blood vessel damage.
- Keep your blood fat levels in the good range since high levels of blood fats can damage your blood vessels.
- See your doctor regularly to keep a close check on your blood pressure, blood fat levels, and overall blood glucose control.
- Eat a heart healthy diet since the foods you eat affect your blood glucose levels and your blood fat levels.
- Exercise regularly! Walking or swimming, which uses your heart, lungs, and large muscles, can improve your blood fat levels and your overall cardiovascular fitness. Discuss your exercise program with your doctor.
- Research shows that taking aspirin may help prevent heart attacks in people with diabetes; however, get your doctor's approval before you start taking aspirin.

- Once you've tested your blood and treated your reaction, wait 15 or 20 minutes and test your blood again. If your blood sugar is still low and your symptoms don't go away, repeat the treatment. When you feel better, be sure to eat your regular meal if the reaction is near your meal time. If not, eat a snack such as 2 cheese cracker or ½ glass of milk to keep your blood sugar level up.

Glucagon Injections - When hypoglycemia is not treated quickly, it can get worse and you could pass out. If you pass out, you won't be able to take sugar by mouth and will require immediate treatment, such as an injection of glucagon or emergency treatment in a hospital.

Glucagon is a prescription that raises blood sugar and it is injected like insulin. Your doctor should prescribe it for you, as well as tell you how to use it. It is important for family members, friends, and even co-workers to learn how and when to inject glucagon, should you ever need it. People should inject glucagon and call for emergency help. Remember, if you pass out, people should NOT inject insulin; NOT give you food or fluids; and NOT put their hands in your mouth. When glucagon is not available, you should be taken immediately to the nearest emergency room for treatment.

It is important to always wear a medical alert identification (*for example a bracelet*) that says you have diabetes!

Preventing Hypoglycemia - Good diabetes control is the best known to prevent hypoglycemia. You must recognize the signs and symptoms of an insulin reaction, and treat low blood sugar before it gets worse.

KETOACIDOSIS

Ketoacidosis develops when your body doesn't have enough insulin. Without insulin, your body is unable to use glucose for fuel. When this happens, your body starts breaking down fats to use for energy. When fats are broken down, waste products called ketones are produced. Your body cannot tolerate large amounts of ketones, so it will try to get rid of them through the urine. Since the body cannot release all the ketones, they build up in your blood and cause ketoacidosis.

Ketoacidosis may occur in people with type 1 diabetes and can be life threatening. **It needs immediate treatment!** Ketones can poison the body and are a warning sign that your diabetes is out of control or that you are getting sick. Hospitalization is generally required to treat ketoacidosis.

Your doctor should tell you how to handle this condition. Symptoms of ketoacidosis include:

- shortness of breath;
- breath that smells fruity;
- nausea and vomiting; and
- a very dry mouth.

Preventing Ketoacidosis - Ketoacidosis usually develops slowly (*when vomiting occurs, this life threatening condition can develop in a few hours*) and can be prevented by learning the following warning signs and testing your urine and blood regularly.

The first symptoms are:

- thirst or a very dry mouth;
- frequent urination;
- high blood-sugar levels; and
- high levels of ketones in the urine.

Then other symptoms appear which include:

- constantly feeling tired;
- dry or flushed skin;
- nausea, vomiting, or abdominal pain (*vomiting can be caused by many illnesses, not just ketoacidosis. If vomiting continues for more than 2 hours, contact your doctor or home care nurse*);
- a hard time breathing (*short, deep breaths*);
- a fruity odor on breath; and
- a hard time paying attention or confusion.

Ketoacidosis is dangerous and serious. If you have any of the above symptoms, contact your doctor or home care nurse IMMEDIATELY, or go to the nearest emergency room of your local hospital.

Testing for Ketones - A simple urine test can detect ketones. A test strip, similar to a blood-testing strip, can be used. Your doctor or home care nurse should tell you when and how to test for ketones.

SKIN CONDITIONS & CARE

The skin may also be affected by diabetes. Fortunately, most skin conditions can be prevented or easily treated if caught early.

Bacterial infections (*stye, boils, carbuncles*) and fungal infections (*jock itch, ring worm, vaginal yeast infections*) are the most common skin conditions that occur in people with diabetes. You will need a prescription medicine to cure them.

Itching (*from dry skin, yeast infections, poor circulation*) is also very common among persons with diabetes. You may be able to treat some itching yourself by limiting how often you bathe (*particularly when the humidity is low*), using mild soap with moisturizer and applying skin cream after bathing.

Good Skin Care - There are numerous ways to prevent skin problems.

- Keep your diabetes well controlled.
- Keep skin clean and dry. Use talcum powder in areas where skin touches skin, such as armpits and groin.
- Avoid very hot baths and showers and if your skin is dry, don't use bubble baths. Moisturizing soaps, such as Dove or Basis may help. Use an oil-in-water skin cream, such as Lubriderm or Alpha-Keri after your bath. Don't put lotion between toes since the extra moisture encourages fungus to grow.
- Prevent dry skin. Scratching dry or itchy skin can open it up and allow infection to set in. Moisturize your skin to prevent chapping, especially in cold or windy weather.
- Treat cuts right away. Wash minor cuts with soap and water. Do not use Mercurchrome antiseptic, alcohol, or iodine to clean skin because they are too harsh. Get your doctor's approval before using an antibiotic cream or ointment. Cover minor cuts with sterile gauze. See a doctor right away if you get a major cut, burn, or infection.
- During cold, dry months, keep your home more humid. Bathe less during this weather, if possible.
- Use mild shampoos and unscented soaps. Do not use feminine hygiene sprays.
- See a dermatologist (*skin doctor*) about skin problems if you are not able to solve them yourself.
- Take good care of your feet. Check them every day for sores and cuts. Wear broad, flat shoes that fit well. Check your shoes for foreign objects before putting them on.

Retinopathy - Diabetic retinopathy is a general term for all disorders of the retina caused by diabetes. There are two major types of retinopathy: nonproliferative and proliferative. The most common, mild form is nonproliferative retinopathy. It usually has no effect on vision and needs no treatment. However, once it is diagnosed, it is important to have your eyes checked at least yearly to make sure it's not getting worse.

In some people, retinopathy progresses after several years to a more serious form called proliferative retinopathy. In this form, the blood vessels are so damaged they close off. In response, new blood vessels start growing in the retina. These new vessels are weak and can leak blood and block vision. Your retina can be badly damaged before you notice any change in vision. Sometimes a person has no symptoms until it is too late to treat them. For this reason, you should have your eyes examined regularly by an eye doctor.

Who Is at Risk for Retinopathy? Whether you get retinopathy will be influenced by several factors: your blood glucose control; your blood pressure levels; how long you have had diabetes; and your genes. People are less likely to have retinopathy or to have milder forms when their blood glucose levels are kept closer to normal.

Retinopathy Treatment - The sooner retinopathy is diagnosed, the more successful the treatments. The best results occur when sight is still normal.

Preventing Eye Problem - Through early prevention and detection, eye problems can be avoided or reduced.

1. First and foremost, keep your blood glucose levels under tight control. High glucose levels may also make your vision temporarily blurry.
2. Bring high blood pressure under control since high blood pressure can make eye problems worse.
3. Quit smoking!
4. See an eye doctor regularly since only a special examination can find the early stages of retinopathy. A skilled eye doctor must dilate your pupils with drops and check your retinas. Only optometrists and ophthalmologists can detect the signs of retinopathy and only ophthalmologists can treat retinopathy.
5. See your eye doctor if your vision becomes blurry; you have trouble reading signs or books; you see double; one or both of your eyes hurt; you feel pressure in your eye; your eye gets red and stays that way; you see floating spots or flashing lights; straight lines do not look straight; and you can't see things at the side as you used to.

As a general rule of thumb, test for ketones:

- every 4 to 6 hours when you are ill (*when you have a cold or the flu, for example*); and
- every 4 to 6 hours when your blood sugar is more than 240 mg/dl, or when you have any symptoms of ketoacidosis.

High Ketone Levels - If your doctor or home care nurse has not told you what levels of ketones are dangerous, then call when you find moderate amounts after more than one test. Often, your doctor or home care nurse can tell you what to do over the phone.

Call your doctor or home care nurse at once if:

- your urine tests show large ketones;
- your urine tests show large ketones and your blood sugar level is high; and/or
- you have vomited more than twice in 4 hours and your urine tests show high ketones.

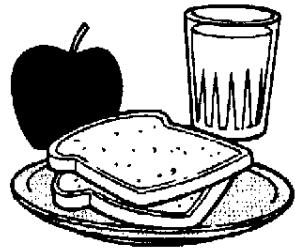
Do NOT exercise when your urine tests show ketones and your blood sugar is high. High levels of ketones and high blood sugars can mean your diabetes is out of control and exercise can make the levels go even higher.

Causes of Ketoacidosis - There are three basic reasons for moderate or large amounts of ketones.

1. Not getting enough insulin. Maybe you did not inject enough insulin or your body could need more insulin than usual because of illness. If there is not enough insulin, your body begins to break down body fat for energy.
2. Not enough food. When people are sick, they often do not feel like eating and high ketones may result. High ketones may also occur when someone misses a meal.
3. An insulin reaction (*low blood sugar*). When blood-sugar levels fall too low, the body must use fat to get energy. If testing shows high ketones in the morning, the person may have had an insulin reaction while asleep.

The flu, a cold, or other infections may sometimes also bring on ketoacidosis.

SECTION VI. Nutrition and Diabetes



Today, there is no one specific diet or "ADA" diet. Your diabetes meal plan is a guide that will tell you how much and what kinds of food you can choose to eat at meals and snack times and is based on your nutrition assessment and treatment goals. Like everyone, you should focus on eating less fat, fewer sugary foods, and a variety of fresh fruits, vegetables, lean meats, and fish.

Medical nutrition therapy is important to total diabetes care and management. Your specific eating habits and lifestyle factors should always be taken in consideration. Your nutrition recommendations will be developed to meet your treatment goals and desired outcomes.

Following your nutrition and meal planning guidelines may be one of the most challenging aspects of your diabetes care. However, nutrition therapy is a very important if you are going to be successful in managing your diabetes.

GOALS OF NUTRITION THERAPY

There are five specific goals of your meal plan.

1. Maintaining as near normal blood glucose levels as possible by balancing food intake with insulin or glucose lowering medications and activity levels.
2. Achieving optimal serum blood fat (*lipid*) levels.
3. Providing adequate calories necessary for maintaining or achieving reasonable weights for adults, normal growth and development rates in children and adolescents, increased metabolic needs during pregnancy and lactation, or recovery from illnesses.
4. Preventing and treating acute complications of insulin treated diabetes such as hypoglycemia, short-term illnesses, and exercise related problems, and of the long term complications of diabetes such as renal disease, autonomic neuropathy, hypertension, and cardiovascular disease.
5. Improving overall health through optimal nutrition.

Visiting the Dentist - When you schedule your visit to the dentist:

- Tell your dentist you have diabetes. Also, say if you have problems with infections or trouble keeping your blood glucose under control;
- Eat before you go to see your dentist. The best time for dental work is when your blood glucose level is on the high side and your insulin action is low. If you take insulin, a morning visit after a normal breakfast is best;
- Take your normal medications before your dentist visit, unless your dentist or doctor tells you to change your dose for dental surgery (*Your dentist should consult with your doctor to decide whether you need to take an antibiotic before surgery to prevent infection.*); and
- Stick to your normal meal plan after dental work. If you can't chew well, plan how to get the calories you need.

Other Mouth Problems - Diabetes also makes you prone to other mouth problems. Infections can make your blood glucose hard to control. Other mouth problems include: oral infections; fungal infections; poor healing after dental surgery; and dry mouth. If you have a dry mouth, try:

- drinking more fluids;
- chewing sugar-free gum or sugar-free candy to help keep the saliva flowing; and/or
- purchasing saliva substitutes from the drugstore.

EYE CARE AND RETINOPATHY

People with diabetes do have a higher risk of blindness than people without diabetes. However, early detection and treatment of eye problems can save your sight. Most people who have diabetes have nothing more than minor eye disorders and you can keep minor problems minor with good care.




Eye Examinations - Regular eye examinations are the key to early detection and treatment of eye problem.

Diabetics are 40-60 % more likely to develop glaucoma and/or cataracts than people without diabetes.

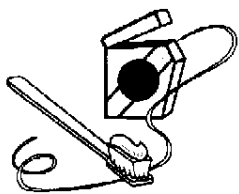
- If you are 30 or older, you should have an eye exam, with dilated pupils, every year, no matter how short a time you have had diabetes. More frequent exams may be needed if you have eye disease.
- See a doctor right away if you have any unusual vision problems.

Deformities of the feet and toes may also result from neuropathy. Your toes may curl up and you may not be able to wear regular shoes. Should this occur, ask your doctor or foot doctor about special therapeutic shoes.

Poor Circulation - Your foot may be less able to fight infection and to heal due to poor circulation. Blood vessels of the foot and leg narrow and harden due to diabetes. Doctors can often prevent amputation by vascular reconstruction, an operation that improves blood flow in your feet.

 **Smoking, Diabetes, and Your Feet** - One of the biggest threats to your feet is smoking. Smoking affects small blood vessels, causes restricted blood flow to the feet and make wounds heal slowly. A high percentage of people with diabetes who require amputations are smokers. **DO NOT SMOKE!**

MOUTH AND GUM CARE



When germs settle into your gums, you've got gum disease. Diabetics are at higher risk for gum problems and tend to have more severe gum disease. Poor blood glucose control makes gum problems more likely.

However, fighting gum disease is LESS work than you think.

- Learn how gum problems start.
- Brush at least twice a day and floss at least daily to clean away plaque.
- Spot warning signs of gum trouble early.
- See your dentist at least twice a year.

Your best weapon against gum disease is regular dentist visits and watching for warning signs, since gum disease may be painless and you may not know you have it until serious damage is already done. See your dentist if you have any of these signs:

- bleeding gums when you brush or floss;
- red, swollen, or tender gums;
- gums that have pulled away from teeth (*part of the tooth's root may show, or your teeth may look longer*);
- pus between the teeth and gums (*when you press on the gums*);
- bad breath;
- permanent teeth are loose or moving away from each other;
- changes in the way your teeth fit when you bite; or
- changes in the fit of partial dentures.

Your dietician and/or home care nurse will work with you to develop a healthy eating plan that includes your favorite foods (*cultural, ethnic and those you can financially afford*), the number of calories you should eat each day, and the proper amount of fat for your diet. They will teach you how the food you eat changes your blood glucose level and how to coordinate your diabetes medications and eating.

WEIGHT LOSS AND DIABETES

Weight loss helps people with diabetes since it lowers insulin resistance and allows your natural insulin (*in people with type 2 diabetes*) to do a better job lowering blood glucose levels. Weight loss also improves blood fat and blood pressure levels.

If weight loss is part of your care plan, you will probably not want to lose more than one pound a week. When you lose more than a pound a week, you are denying yourself the water and nutritious foods your body needs. Keep in mind, the faster weight comes off, the faster it comes back on. A slow steady weight loss is the key to keeping lost weight off.

THE FOUR BASIC FOOD GROUPS



Good nutrition means eating a variety of foods since there is no single food that will supply all the nutrients your body needs. The four main groups are listed below.

1. Fruits and vegetables (*such as oranges, apples, bananas, carrots, and spinach*)
2. Whole grains, cereals, and bread (*such as wheat, rice, oats, bran, and barley*)
3. Dairy products (*such as whole or skim milk, cream, and yogurt*)
4. Meats, fish, poultry, eggs, dried beans, and nuts

In order to make sure that your body has all the nutrients it needs to work right and to grow, it is important to eat foods from each group every day. The main nutrients in food are carbohydrates, proteins, fats, vitamins, and minerals.

Sources of the Four Main Food Groups

- Carbohydrates from dried beans, peas, and lentils; whole grain breads, cereals, and crackers; and fruits and vegetables, give you energy.
- Protein from lean meats and low fat dairy products, for example, is needed for growth and is a good back up supply of energy.
- Foods high in fiber are healthy. Fiber comes from plants and include bran cereals, cooked beans and peas, whole grain bread, fruits, and vegetables. Fiber may lower blood sugar and blood fat levels.
- Fat is a nutrient that is found in many foods such as red meat, dairy products (*whole milk, cream, cheese, and ice cream*), egg yolks, butter, salad dressings, vegetable oils, and many desserts. You need some fat in your diet; however, too much fat isn't good for anyone and it can be very harmful to people with diabetes.

SUGAR AND DIABETES

The percentage of calories from carbohydrate will vary and is based on an individual's eating habits and their blood sugar (*glucose*) and lipid (*fat*) goals. One of the most common questions is, "Can a diabetic eat any foods with sugar in them?" The answer is yes, for almost every person with diabetes. The truth is, sugar has gotten a bad reputation and people with diabetes can and do eat sugar.

For most of this century, the most widely held belief about the dietary treatment of diabetes has been that "simple" sugars should be avoided and replaced with complex carbohydrates. There is very little scientific evidence to support this belief other than it appears to be based on the assumption that sugars are more rapidly digested and absorbed than starches, therefore, they would aggravate hyperglycemia more. Although various starches do have different glycemic responses, it is much more important to look at the total amount of carbohydrate eaten instead of the source of the carbohydrate.

Of course, there are still reasons why sugar is not a smart food choice since your body depends on the nutrients supplied in the foods you eat. Sugary foods often contain empty calories that provide no nutrients and your body depends on the nutrients supplied in the foods you eat.

- Never walk barefoot in order to prevent injury, cuts, and burns to your feet. Wear slippers at night when you get up.
- Don't smoke!
- At the first sign of infection or inflammation, SEE YOUR DOCTOR!
- Receive a thorough foot examination by a physician **at least yearly**. Diabetics having neuropathy should have a visual inspection of their feet at **every visit** with a health care professional.



Skin Changes - Diabetes can cause changes in the skin of your foot. Your foot may become very dry and the skin may peel and crack. The nerves that control sweating no longer work and cause this to occur. Take care of dry, scaly feet as follows:

- After bathing, dry your feet, and seal in the moisture that remains with a thin coat of a lubricant. Use plain petroleum jelly, unscented hand creams, or other similar products;
- Do not put oils or creams between your toes because the extra moisture can lead to infection; and
- Do NOT soak your feet unless ordered to do so by your doctor.

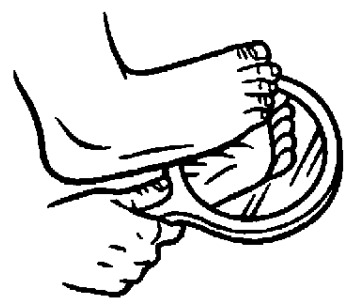
Calluses - Diabetic patients are more likely to develop and build up calluses faster than others. If calluses are not trimmed they become thick, break down, and may turn into open sores (*ulcers*). In order to help keep calluses under control:

- Use a pumice stone daily;
- Don't try to cut calluses or corns yourself;
- Never try to remove calluses and corns with chemical agents since these products can burn your skin; and
- Let your doctor or foot doctor cut your calluses.

Foot Ulcers - When ulcers occur they are generally over the ball of the foot or on the bottom of the big toe. When diabetics get ulcers on the sides of the foot they are usually caused by shoes not fitting properly. It is important to see your doctor immediately with every ulcer, even if the ulcer is not painful. When an ulcer is neglected, the diabetic patient is at risk for infections. This can lead to gangrene and amputation. Remember, amputation occurs 15 times more often in diabetics.

Neuropathy and Foot Complications - Diabetic nerve damage (*neuropathy*) can hurt or can lessen your ability to feel pain, heat, and cold. You may not feel a foot injury until it becomes ulcerated and/or infected due to loss of sensation.

PREVENTIVE FOOT CARE AND DIABETES



Diabetic patients can develop many different foot problems. It is important to know that common problems can get worse very rapidly and lead to serious complications. When blood flow is poor or when there is nerve damage in the legs and feet, problems often develop. You can protect your feet by following some basic guidelines.

- Wash your feet every day and dry them carefully, especially between the toes.
- Check your feet by looking between the toes, at the toe webs, and on the bottoms (*use a mirror if necessary*). If you cannot see well, have a friend or relative check your feet every day. Look for blisters, cuts, redness, hard skin, breaks, swelling, and scratches and feel the temperature of your feet. If they feel hot or cold, something could be wrong.
- Don't put your feet into hot water. Test water before putting your feet in it just as you would before bathing a baby.
- If your feet are cold, wear socks. Do NOT use heating pads, electric blankets or hot water bottles, since you can burn your feet without knowing it.
- Don't cut off blood flow to your feet. Don't wear garters! Exercise is good for poor circulation. It stimulates blood flow in the legs and feet.
- Don't use over-the-counter chemicals on corns, calluses, or warts since they are often too strong for use by diabetics and can burn your feet.
- Don't cut corns or calluses yourself (*have your medical or foot doctor do this*).
- Cut your toenails straight across and file the edges. Do not rip off hangnails. If this cannot be done safely, let your doctor or foot doctor do this.
- Wear flat comfortable walking shoes as much as possible that fit your feet, shoes that are comfortable when you buy them, and when necessary, break in your new shoes slowly.
- Be sure and check inside your shoes before wearing them to make sure there are no pebbles, nails, or other sharp objects in them. Also check to make sure the shoe itself is not rough and the lining is not torn.
- Select your socks very carefully and make sure they do not have seams or other bumpy areas that can cause pressure and irritation. Padded athletic socks protect your feet and make walking more comfortable. Avoid wearing mended socks and pull your socks on gently to prevent ripping a toenail.

There is no reason to avoid table sugar in favor of other sweeteners, such as fructose (*the sugar found in fruit*), corn sweeteners, corn syrup, fruit juice or fruit juice concentrate, honey, molasses, dextrose, and maltose. On the other hand, there is no reason for people with diabetes to avoid foods that naturally contain sweeteners, such as fructose (*fruits and vegetables*) or lactose (*dairy products*).

Keep in mind that eating a piece of cake made with sugar will raise your blood glucose level but so will eating corn on the cob, a tomato sandwich, or lima beans. Sugar becomes glucose in your body, but so do the other foods mentioned above. The key is moderation when it comes to sugary foods. If you eat too much, you will raise your blood glucose level up higher than you expected; you'll fill up but without the nutrients that come with vegetables and grains; and you'll gain weight. You may not have to pass up on a slice of birthday cake but you will have to eat a little less bread or potato at the next meal.

FAT AND DIABETES

It is important to cut the fat in your diet. A healthy diet includes less than 30% of calories from fat, with less than 10% of these from saturated fat. There are a lot of nonfat or low fat food selections on the market today to choose from, but remember to stick to the correct portion size.

Bake, broil, or roast vegetables and meat (*avoid fried foods*). Some fats are healthier than others. Monounsaturated fats are the healthiest for your body. Almonds, cashews, hazelnuts, peanuts, and avocados contain this type of fat. Choose olive or canola oil for cooking. Polyunsaturated fat is the next healthiest fat. This is found in margarine, corn oil, safflower oil, soybean oil, and mayonnaise. Avoid saturated fats like butter, lard and meat fat, bacon, and shortening and eat more fish and poultry (without the skin). Choose lean cuts of meat and remove extra fat. Liver should only be eaten every now and then. Use lower fat versions of saturated fats like sour cream and cream cheese. Use a diet margarine instead of butter and drink low fat or skim milk. Use fat free, cholesterol free real egg products (*no egg yolks*) and limit the number of "whole" eggs you eat to three or four a week.

It is very easy to over eat, especially high fat foods, on holidays. When you over eat, the best thing you can do is walk 30-45 minutes once or twice a day to lower the blood glucose level.

ARTIFICIAL SWEETENERS AND DIABETES

The American Diabetes Association approves the use of three artificial sweeteners in moderate amounts.

1. **Saccharin** which can be used in both hot and cold foods to make them sweeter.
2. **Aspartame (NutraSweet)** which is a newer artificial sweetener and because it is 180 times as sweet as sugar, you need only a tiny amount to sweeten food. One problem with aspartame is that it loses its sweetness when heated and as a result, you cannot use it in baked goods, such as cakes. You can use it when cooking foods on top of the stove (*not oven*) like pudding, by adding it at the very end of cooking.
3. **Acesulfame-K (Sweet One)**, is the newest artificial sweetener on the market. This sweetener can be used in baking and cooking because it does not break down when heated; however, the texture of baked goods is not the same with acesulfame-K as with sugar. To get a good texture, you might need to add some sugar.

Artificial sweeteners are generally safe for everyone. However, pregnant or breast-feeding women should not use saccharin and people with phenylketonuria should not use aspartame. Calorie free sweeteners like aspartame, saccharin, and acesulfame-K won't increase your blood glucose level. The sugar alcohols such as xylitol, mannitol, and sorbitol have some calories and may increase blood glucose level slightly and may cause gas and diarrhea.

ALCOHOL AND DIABETES

Diabetics are generally permitted to drink alcohol, but only in moderation. Moderation is defined as two drinks a day for men and one drink a day for women. A drink is a 5 ounce glass of wine, a 12 ounce light beer, or 1½ ounces of 80 proof distilled spirits. Check with your doctor or home care nurse before drinking alcohol and make sure your medications don't require avoiding alcohol.

If alcohol is consumed by people using insulin or sulfonylureas, it should only be ingested with a meal. When calories from alcohol need to be calculated as part of the total caloric intake, alcohol is best substituted for fat exchanges (*1 alcoholic beverage = 2 fat exchanges*) or fat calories.

make your health care practitioner aware of cuts and blisters; do not smoke; and control your blood pressure and cholesterol level (*blood fats*) as ordered by your doctor.

- Get a flu shot each year and decrease your risk of exposure to the flu.
- Get vaccinated against pneumonia. Generally only one pneumonia shot is enough for people without diabetes; however, many doctors feel people with diabetes should get a pneumonia shot every five or six years.

COPING WITH COMPLICATIONS

When you become aware that you now have a complication, don't stop caring for your diabetes. Yes, it is "bad news" and you may be feeling hopeless and even angry. However, keep in mind the good care you have taken of yourself in the past may very well have delayed the complication for years and the complication may be milder, as a result. Also, remember a healthy body definitely is able to fight back.

There are many new treatments available today for many complications. For example, damage to the eyes can be repaired and blindness can be prevented by laser surgery. There are also numerous surgical procedures available that have made it much easier to treat blockages of the arteries. Kidney transplants have grown more successful for people with kidney disease. New methods of treating blocked blood vessels and wounds may help prevent amputation.

SECTION IX. Preventive Care and Diabetes

It is felt that good blood sugar control is the key to preventing the problems and complications associated with type 1 diabetes. The onset of type 2 diabetes may be prevented or delayed by reducing lifestyle risk factors, weight loss and increased physical activity.

Patient/caregiver education is critical. Risk for complications can be reduced when:

- Patients/caregivers are educated about the disease;
- Patients/caregivers learn and practice the skills necessary to better control blood glucose levels; and
- Patients receive regular checkups from their health care team.

- **Heart Disease and Stroke** - People with diabetes are 2 to 4 times more likely to have heart disease and suffer strokes. Heart disease death rates are also 2 to 4 times as high as adults without diabetes.
- **Nerve Disease and Amputations** - About 60% - 70% of people with diabetes have mild to severe forms of diabetic nerve damage. Severe forms can lead to lower limb amputations. In fact, diabetes is the most frequent cause of non-traumatic lower limb amputations. The risk of a leg amputation is 15 - 40 times greater for a person with diabetes. Each year, 56,200 people lose their foot or leg to diabetes.
- **Diabetic ketoacidosis (DKA)** - DKA is one of the most serious outcomes of poorly controlled diabetes, and primarily occurs in type 1 individuals. DKA is marked by high blood glucose levels along with ketones in the urine.
- **Impotence** - Impotence in diabetes is generally due to diabetic neuropathy or blood vessel blockage.
- **Dental disease** - Periodontal disease, a type of gum disease that can lead to tooth loss, occurs more often and is more severe in persons with diabetes.
- **Complications of Pregnancy** - Newborn deaths are almost three times higher in woman with diabetes.

PREVENTION: THE KEY TO AVOIDING DIABETES COMPLICATIONS

Prevention is the key to avoiding the complications associated with diabetes. Things you can do to avoid the complications of diabetes include:

- **First and foremost, get regular checkups** and keep your appointments even though you may be feeling fine.
- Know the warning signs of complications (i.e., blurriness and spots are signs of vision problems; tiredness; pale skin color; being 20 pounds or more overweight; numbness or tingling feelings in hands or feet; recurrent infections or slow healing of wounds; chest pain; vaginal itching; and constant headaches that could indicate high blood pressure), and report them immediately to your doctor.
- Make good diabetes control you practice. Keep your blood sugar levels as close to normal as possible; control your weight; eat a healthy, well-balanced diet; get regular exercise; have regular checkups; check your feet every day for minor cuts or blisters and

PROTEIN AND DIABETES

There is very limited information available to support what the protein intake of a person with diabetes should be, or whether the protein intake should be higher or lower than an average protein intake for the general population. Therefore, people with diabetes should acquire about 10% to 20% of their daily caloric intake from protein. Dietary protein should come from both animal and vegetable sources.

If nephropathy has been diagnosed, protein is generally restricted to no more than 10% of your daily caloric intake. Restricting protein may cause a nutrition deficiency in some people and may be associated with muscle weakness. Therefore, any protein restricted diet should be designed by a registered dietitian familiar with all components of the dietary management of diabetes.

FIBER AND DIABETES

Dietary fiber may be beneficial in treating or preventing several gastrointestinal disorders, including colon cancer, and large amounts of soluble fiber have a beneficial effect on serum lipids. There is no reason to believe that people with diabetes would be more or less prone to these effects than those persons without diabetes. Therefore, the fiber intake recommendation of 20 to 35 grams of dietary fiber a day is the same for people with diabetes as for the general population. The effect of dietary fiber on glycemic control is felt to be insignificant.

SODIUM AND DIABETES

The effect of sodium on blood pressure is specific for each person. Therefore, sodium intake recommendations for people with diabetes are the same as for the general population.

Different medical authorities recommend no more than 2,400 to 3,000 mg. of sodium a day for the general population. When mild to moderate hypertension has been diagnosed, 2,400 mg. or less per day of sodium is recommended. If a person has been diagnosed with hypertension and nephropathy, 2,000 mg. or less per day of sodium is recommended.

Too much salt can make your high blood pressure worse and many foods contain salt. Although you can taste obvious salt in foods such as in pickles or bacon, there is hidden salt in many foods, such as cheeses, salad dressings, and canned soups.

VITAMINS, MINERALS, HERBS AND DIABETES

If you have a vitamin or mineral deficiency, it could be causing problems with your glucose control. However, if you eat a well balanced diet, it is uncommon that you will have a deficiency of vitamins or minerals.

Discuss vitamin, mineral and/or herbal supplements with your doctor since they may interact poorly with your diabetes medication.

NUTRITION SELF MANAGEMENT

One of the keys to nutrition is eating a variety of foods each day. By testing your blood glucose about an hour after meals, you can learn how different foods affect you. Over time, you will be able to predict how foods, and combinations of foods, will raise your blood glucose level.

Monitoring of glucose and glycated hemoglobin, lipids, blood pressure, and renal status is essential to evaluate nutrition related outcomes. If goals are not met, changes must be made in the overall diabetes care and management plan.

TYPE 1 DIABETES AND NUTRITION THERAPY

For people with type 1 diabetes, food is one tool you can use to treat your diabetes. A meal plan based on your usual food intake should be determined and used as a basis for including insulin therapy into your usual eating and exercise patterns. It is recommended that diabetics taking insulin eat at consistent times and coordinate meals with the time-action of the insulin being used. Plan your meals at consistent times so that you eat when your insulin is working the hardest. It's especially important for you to monitor your blood glucose levels. This will help in changing your insulin dose to match the amount of food you usually eat.

Also, you will need to monitor blood glucose levels and adjust insulin doses for the amount of food usually eaten, as ordered by your doctor. Intensified insulin therapy, such as multiple daily injections or use of an insulin pump, allows considerable flexibility in when and what you can eat.

As a general rule, you should be consuming 50 grams of carbohydrate every three to four hours. Your doctor may tell you to drink sugared (*not diet*) soft drinks or other high carbohydrate liquids or almost liquids such as juice, frozen juice bars, sherbet, pudding, creamed soups, and fruit-flavored yogurt. Broth is also a good choice. To prepare for sick days, keep a small supply of nondiet soft drinks, broth, applesauce, and regular gelatin in the home at all times.

SECTION VIII. Complications of Diabetes

Medical problems that occur more often in people with diabetes than in people without diabetes are called diabetes complications. Diabetic complications most often occur due to changes in the blood vessels or the nerves. While no one can tell who will have diabetic complications, experts think good control of blood sugar may help delay and prevent some complications and that high blood sugar levels over time and poorly controlled diabetes may speedup the onset of complications or increase their severity.

Diabetes has often been called a silent killer since many people first become aware that they have diabetes when they develop one of its life-threatening complications. Due to its complications, diabetes is the sixth leading cause of death by disease in the United States. Diabetes can cause trouble with the eyes, legs and feet, kidneys, nerves, and blood flow. Complications include but are not limited to the following:

- **Blindness due to diabetic retinopathy** - Diabetic retinopathy is a term used for all abnormalities of the small blood vessels of the retina caused by diabetes, such as weakening of blood vessel walls or leakage from blood vessels. Diabetes is the leading cause of new blindness in people 20-74 years of age and each year 12,000 to 24,000 people lose their sight because of diabetes. Diabetic retinopathy is a more important cause of visual impairment in younger-onset people than in older-onset people.
- **Kidney Disease due to diabetic nephropathy** - 10% - 21% of all people with diabetes develop kidney disease. Diabetic nephropathy is the most common cause of end stage renal disease (ESRD), a condition where the patient requires dialysis or a kidney transplant in order to live.
- **High Blood Pressure** - An estimated 60% to 65% of people with diabetes have high blood pressure.

SICK DAYS AND MEDICATION

When you are sick, you will still need to continue medicine for your diabetes, even if you are throwing up. DON'T stop your medicines. You need them because your body makes extra glucose when you are sick.

When you have type 1 diabetes, your doctor may have you take extra insulin to bring down the higher glucose levels. If you have type 2 diabetes, you may be able to take your pills, or you may actually have to use insulin for a short time. In either case, make sure you understand your doctor's instructions for what to take and how much.

Make sure you check the label of all over-the-counter medications you may want to take when you are sick. Many medications contain sugar and while small doses may be fine, you should always check with your doctor or pharmacist to be on the safe side. Ask what sugar free medications are available.

Even medicines that don't contain sugar can affect your blood glucose levels. Aspirin in large doses can lower blood glucose levels and some antibiotics lower blood glucose levels in people with type 2 diabetes who take diabetes pills. Decongestants and some products for treating colds will raise blood glucose levels.

SICK DAYS AND FOOD

When you are sick, eating and drinking can be a big problem; however, it is important to stick to your normal meal plan if you can. It is easy to run low on fluids when you are vomiting or have a fever or diarrhea. In order to prevent dehydration, drink lots of noncaloric liquids (*for example, water and diet soft drinks*), in addition to your normal meals. Extra fluids will also help get rid of the extra glucose (*and, possibly, ketones*) in your blood.

Your sick day plan should contain a meal plan if you are unable tolerate your normal diet. It is important for you to take in your normal number of calories. In order to do this, you may have to eat foods that are easy on your stomach, such as regular (*nondiet*) gelatin, crackers, soups, and applesauce. If these mild foods are too hard to eat, you might have to drink liquids that contain carbohydrates as an alternative.

TYPE 2 DIABETES AND NUTRITION THERAPY

The main emphasis for medical nutrition therapy in persons with type 2 diabetes should be placed on achieving glucose, lipid (*blood fat*), and blood pressure goals. Weight loss and low calorie diets will usually improve glucose levels, as well as improve long term metabolic control and lipid goals. Weight loss is most effective when there is a moderate decrease in calories (*250 to 500 calories less a day*) and an increase in exercise. Mild to moderate weight loss of even 10 to 20 pounds has been shown to improve diabetes control, even if desirable body weight is not achieved. You can cut out 250 calories per day by walking briskly for 20 minutes three times a week.

PREGNANCY AND DIABETES

Nutrition recommendations for women with pre-existing and gestational diabetes mellitus should be based on a nutrition assessment. Monitoring blood glucose levels, urine ketones, appetite, and weight gain can be a guide to developing and evaluating an appropriate individualized meal plan and to making adjustments to the meal plan throughout pregnancy to ensure desired outcomes.

DIABETES AND EATING OUT

When able to do so, eating out can be one of life's great pleasures. With the right choices, you can enjoy yourself and take good care of your diabetes at the same time.

We are seeing more and more restaurants offer healthy choices to meet the special dietary needs of the customer. Many now have "heart healthy" menu items with foods higher in fiber and lower in cholesterol, fat, and sodium. The majority of restaurants offer sugar substitutes and diet drinks and most have fruit juice and decaffeinated coffee. It is now common to see reduced calorie salad dressings (*light or fat free*), low fat or fat free milk, and salt substitutes. It is easy to find salads, fish, vegetables, baked or broiled food, and whole grain breads on menus.

When you eat out, order only what you need and want and know how to make changes in your meal plan in case the restaurant doesn't have just what you want. Remember it is very important to eat your meals on time due to the time-action of your diabetes pills or insulin shots. Plan ahead to avoid problems.

