# *About Honoring the Gift of Diabetes Health*

This manual is part of an educational effort to improve the heath of AI/AN communities. The materials were developed with the support of the Robert Wood Johnson foundation Diabetes Self-Management Grant, and through a partnership with the Montana-Wyoming Tribal Leaders Council and Black Hills State University. These materials are patterned after *Honoring the Gift of Heart Health*, a joint effort of HIS and NHLBI that focuses on improving heart health in Native people.

## The Role of Health Educators

Diabetes Self-Management Education *Honoring the Gift of Diabetes Health* community educators play a key role in building healthy communities. They help people learn about diabetes health issues and show them ways to live healthier lives. Without them, many AI/AN might not receive such vital information. The great power embodied in diabetes health educators is that they are committed to work with people and teaching others to make healthful choices.

This curriculum provides individuals the journey to a rebalanced life and helps them keep a strong mine and body.

This product was developed by the Montana-Wyoming Tribal Leaders Council in Billings, MT with support from the Robert Wood Johnson Foundation® in Princeton, NJ.

# How To Use This Manual

### Diabetes Health Educators

This manual is for you! *The Honoring the Gift of Diabetes Health* manual includes the information you need to teach 10 fun and educational sessions and have fun while doing it. These sessions help group members learn about what they can do to prevent diabetes. The manual provides worksheets and handouts for group members to take home to read again and share with family and friends. It also includes teaching tips and how to start a program in your community.

### Diabetes Health Trainers

This manual is also for you! *The Honoring the Gift of Diabetes Health* manual can be used to train diabetes health educators. Conduct your training as if you were teaching the program to community group members. Also, review the structure of the manual and include the special training activities in Sessions 1,3,7, and 9 and food displays that can be used along with the manual. These activities are described in the Appendix beginning on page 175.

## About the Sessions

Each session covers a different topic on diabetes health (see box).

The manual includes extra information in the session to help you answer questions.

Teaching notes help you present the information for each session.

You may want to take your group on a grocery store tour between sessions 3 and 4. Call your local Tribal Health office or HIS clinic. Ask if they have a registered dietitian or nutritionist who conducts tours on shopping for a healthy diet. Check with the manager at a local grocery or call their offices to see if they have dietitians on staff who offer store tours.

***Diabetes Health Sessions***

1. What is Diabetes? (The disease process)
2. Coping and Stress Management
3. Diet: Eating in Balance
4. Moving to stay Healthy
5. Diabetes Medicine
6. Monitoring your Blood Sugar
7. Knowing your numbers-ABCs
8. Acute Complications
9. Long term complications
10. Taking Charge-Review and Graduation

**Note**: The visuals can be presented as overheads or paper copies, if you do not have a computer at your training/education site. Photocopy the handouts for the participants ahead of time.

## Session Length

Most sessions last about 1 hour. The first session (What is Diabetes?) may not last that long. Session 3 (Eating in Balance) could last a little longer.

## Session Outline

Sessions 2 through 9 follows the same structure. Each session of the manual begins with a summary page that explains:

What you want group members to do or learn.

Materials and supplies that you will need.

Worksheets and materials that you will hand out.

The session outline.

## Each session includes five major parts:

### PART 1 – Introducing the Session

Welcome the group.

Spend a few minutes reviewing the information from the last session (Sessions 2 through 10).

Ask the group to talk about their pledges. (See Weekly Pledge—Part 3).

Praise the group members who did well with their pledges.

Encourage members who have a hard time with their pledges. (Please do not overlook those who were unable to keep their pledges, this can be an opportunity to work with the members to problem solve and improve their self-management skills).

Ask members to share what worked and what did not work in meeting their pledges

Try to make sure all members have a chance to share. Sharing helps the members keep their pledges.

Explain what you will talk about in today's session.

### PART 2 – Conducting the Session

Present new information.

Lead the group in fun and educational activities.

Ask the group members questions.

Let the group members ask questions about what they have heard.

### PART 3 – Review of the Key Points

Ask questions to help the group members review what they just learned.

Repeat the important points.

## PART 4 – Weekly Pledge

Help group members come up with a pledge that is specific and focuses on one action.

"I will exercise" is too general. A specific pledge that a member can easily do this "I will walk for 20 minutes three days each week."

Give at least one example before you ask members to make their pledges. Here are some examples:

I will remove my saltshaker from the table

I will take a 20-minute walk after dinner 3 nights a week.

## PART 5 – Closing

Tell the group that you enjoyed holding the session and wish them luck in meeting their pledges. Be positive.

Thank the group for their helpful comments and ask them what they thought of the session.

Tell the group if there is anything they should do before the next session.

### A Few More Things

### Breaks

You should take a short break at the middle of each session. You may want to use the time to do some easy stretches or activities, share a healthy recipe, or tell a story.

### Refreshments

You may want to have a small healthy snack and beverage at the break. Some ideas are salsa with baked unsalted tortilla chips, fruit or vegetables with low fat dip, juices, and water, pemmican, and tea. Or, you can share healthy recipes that are low in fat and sugar for the members to taste. Try to make this a positive social event. Tell them if they are healthy, the community is healthy.

## Getting Started

### At Least 6 Weeks in Advance

1. **Find a place** to teach *Honoring the Gift of Diabetes Health* in your area that people can get to easily. Call local clinics, schools, churches, and community centers. Reserve a room at a time when community members can attend.

2. **Let community leaders and others know** that you are offering the program. **Ask** clinic personnel, clergy, and caseworkers to recommend the program. **Say:**

   The program can help participants and their families lead healthier lives.

   Participants will learn about healthy, low cost cooking, how to become more physically active, how to quit smoking, and ways to prevent heart disease.

3. **Post flyers** at health fairs and in community sites, like clinics, grocery stores, churches, and other places in your community. (See sample flyer on page xxx).

**Note:** A small group (about 10-12 people) is best. Try to get about 15 people to sign up. Several people will not show up, or will drop out.

## Before You Start Session 1:

1. **Read through the entire manual at least once.** As you go along, find the symbols that let you know quickly what comes next.

2. **Begin to call clinics** or hospitals to make a list of where people can get their blood pressure, blood sugar (test for diabetes), or cholesterol checked.

## At Least 1 Week Before Each Session:

1. **Read through the session** two or three times along with the visuals and handouts.

2. **Carefully read the information that you will present to the group members.** Practice what you will say in front of a mirror or to a friend or family member. Be sure to use the visuals. Also practice making a few changes in your own life. (This can be used for discussion during the sessions if you are willing to share.)

3. **Review the instructions for each activity.** Make a list of things you need to do before the session, like displaying items on a table or getting a VCR and TV monitor.

4. **Pay attention to the "More Information" boxes.** This extra information helps you answer questions from the group.

5. **Ask** a health educator, dietitian, nurse, or doctor to explain any information you do not understand. Contact them at your local hospital or neighborhood clinic. (These professionals can be used to supplement your sessions.)

6. **Review** the list of handouts, materials, and supplies you will need for each session. These are described at the beginning of each session.

   Make enough copies of the handouts for all group members.

   Gather all the materials and supplies needed to conduct the session.

## The Day of the Session:

1. **Review** the list of materials, supplies and handouts. Make sure that you have everything.

2. **Arrive at the site ahead of time** so that you can set up the room. Test the VCR, TV monitor, and computer. Allow 30 minutes to an hour to set up.

## Working With Your Group

Leading the Group

**Get to know the members of your group.** They may have different backgrounds, interests, and needs.

Use words and terms that are familiar to the people in your group.

**Encourage** the group to ask questions to:

Help them see how the information applies to their lives.

Help them remember what they learn.

Keep the sessions flowing smoothly so everyone is interested and involved.

Be ready to deal with people who talk too much. Thank the person for sharing his or her opinion. Then, quickly ask if anyone else has something to share.

If members (who do not read or write well) need help, do it in a way that will not bring attention to them.

Offer help. Do not force anyone to accept help.

Change the activity to a group discussion.

Watch for clues from members who do not understand, such as:

Puzzled looks

Wrinkled foreheads

Looking away form you

Being quiet

**Try to give the information in a different way if you see these signs.**

Motivating Group Members

**Praise or reward** members' efforts to keep them motivated.

Give praise when it is deserved. This gives it more meaning.
Praise people in front of others. This can help them stay committed.

**Encourage** the group members to share their opinions.

Show interest in the members and what they have to say.

Be patient. Some people may not speak because they have never been asked to share their opinions in a group setting.

Try to involve everyone in the discussion and activities, but do not force anyone to speak. People will speak up when they become used to the group.

Taking Small Steps Toward Change

People are more likely to develop new habits if you promote small changes, slowly. This brings more success.

**Getting People To Come**

Remind the group members that it is important to come to all the sessions. Tell them that they will:

Learn something new at each session.
Help family members.
Socialize and meet people.

Ask people to team up and call one another as a reminder to attend the session. This encourages people to come.

**Answering the Hard Questions**

Remember that it's okay not to know all the answers! Say that you will have the correct answer by the next session. Call a local health educator, nutritionist, or nurse to find an answer.

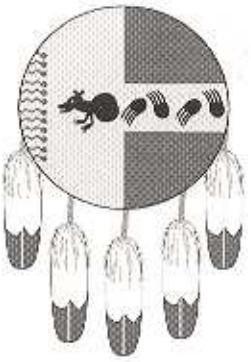
**Keeping People on Track**

Give the group the correct information when a group member gives incorrect or incomplete information. Give the person credit for any part of his or her answer that is correct. Say that people often hear incorrect information and believe it to be fact. Tell the group that this is one important reason why they are in the program – to get correct information.

**And Finally...**

Have a good time. You are doing an important service for your community.

Thank you!



# Session 1
# What is Diabetes?

## Objectives

**By the end of this session, group members will:**

- Know about the *Honoring the Gift of Health* program.
- Know that Diabetes can be controlled with self-management.
- Know that Diabetes Education is one of the best defenses against developing major complications.
- Explain how the body normally uses food.
- Describe the impact of Insulin Resistance on Diabetes.
- Describe two of more symptoms of high blood sugars
- Know other group members.

## Materials and Supplies

To conduct this session you will need:

- Honoring the Gift of Health Diabetes Manual
- Name Tags
- Pancreas cut from pink felt or paper (Use shape on page X to cut pancreas)
- Safety Pins
- Blackboard and chalk or Paper flip chart to write on.
- Refreshments: Sugar free drinks, crackers, cheese, raw veggies, dip.

## Handouts

If you have handouts, hand them out prior to the start of the session.

Introducing the Session

1. **Welcome**
   - **Introduce yourself** as people walk in.
   - **Ask each person** his or her name. Write it on a nametag. Give each person a nametag and a felt or paper pancreas.
   - **Ask group members** to wear the nametags on their shirt. Ask them to place the pancreas where their own pancreas is found.
   - **Welcome** the group members to the session. Tell then that you are very happy they came.

2. **Program Overview**
   - **Congratulate everyone who came** for taking an important step in honoring the gift of health by showing an interest in learning more about Diabetes Self Management by attending today's lesson. Knowledge about the daily care of care of diabetes or self-care is the best insurance against some of the long-term complications of diabetes. When people do not receive diabetes education there is a four fold increased risk of major diabetes related complications.
   - **Introduce the Program,** and the ten sessions that will be shared and an optional grocery store tour. (Show the name of the sessions on the blackboard or flip chart).
   - **Say:** Please come to all of the sessions. I will lead the sessions but need each of you to participate. Please feel free to ask questions, and to share some of your personal experiences. This will make the sessions more fun for all of us.
     Try to stay on the subject. We have a lot of information to talk about in a short time.

3. **Program Rules**
   **Say:**
   Before we begin there are just a few things I'd like to ask of everyone. This program takes time and effort from each person. But we also hope you will learn a lot and gain better self care skills. Each session is about one hour. It is important that you try to attend each session and arrive on time.
   **Ask:**
   (Optional – *if you are able to make changes*)
   - How often do you want to meet? Once a week, twice?
   - Is this a good time to meet?
   - Is this a good place to meet?

   Give members a couple minutes to answer. Help them choose one answer that most people like.

   **Say:** Because you will share your experiences and opinions, we need to agree on a few things.

**Ask:** Do you agree to keep other peoples comments to yourself?
Do you agree not to judge others?

## Conducting the Session

**Ice Breaker –**
**Say:**

- Let's begin by introducing ourselves and getting to know each other a little better.
- Ask participants to give their name and tell one or two things about themselves.
    - To tell why they came to this program and what they hope to learn.

**1. Honoring The Gift of Health** – A Timeline of Our Nations Health

- View "Images of Wellness" - Ancestral Photo's, Depictions
  When we look at these images we see Strong, Robust, Beautiful People who enjoyed superior health and wellness while living a traditional lifestyle. Sadly we no longer enjoy such good health as they once did.
- The Times we live in today are so different from then. Physically our bodies might not be so suited to our new lifestyle, which is much less active than before.
- Just think of all the modern conveniences we enjoy but that make it easy for us to be sedentary. Lets name a few....

(Visual: Change in Activity Slide)

**Restoring Health**

Throughout this program we will encourage looking to the good example of health our ancestors gave us to help guide us in our attempt to restore health for our people today.

**2. Diabetes – A Still Emerging Epidemic**

What is an epidemic? (Definition)
Does Diabetes qualify as an epidemic in our community?
Share Diabetes Rates data for Billings Region.
Diabetes has reached such high levels that some tribes have "Declared War on Diabetes" and passed resolutions to promote more activity and healthy eating for the nation.
*e.g. Zuni Pueblo Nation acted to make P.E. Mandatory in all schools K-12 education. Also acted to remove pop machines.*
*Oglala Sioux Nation acted to allow Tribal employees time during to work day to exercise up to 30 minutes.*

**What things have happened in your community to address Diabetes and Prevention?**

A basic strategy to fighting any battle is to know the enemy. Lets explore the Disease Process of Diabetes so we can better contend with it.

3. **What is Diabetes?**

Diabetes is a complex disorder of sugar, starch, protein and fat metabolism. When you have diabetes, your body is not able to properly use the food you eat for energy. This is because the pancreas is not making enough insulin or the insulin is not working properly. This imbalance happens soon after digestion.

**Normal Food Digestion**

To understand diabetes, you need to know what happens when you eat. In the stomach and intestines food is broken down into it's simplest forms by enzymes (chemicals). Much of the food you eat is broken down into glucose and other simple sugars. After you digest your food, glucose travels through your bloodstream. Your body's cells can now use it for energy. Glucose that is not used right away is stored for later use.

**What is Insulin?**

Insulin is a hormone that is made by your pancreas. Your pancreas is a small gland located behind your stomach. *(Who all pinned their pancreas on close to their stomach?)* As glucose enters the bloodstream, the pancreas releases a hormone called insulin. Insulin works to move the glucose out of the bloodstream and into the cells where it is food for the cell. Because glucose moves out of the bloodstream, your blood glucose levels stay within normal range.

Show Visual: Avandamet CD - Normal Digestion, Insulin Resistance

How Does Your Body Use Insulin?

Insulin fits into special receptors on the body's cell. This starts a process that lets the glucose enter the cells and be used for energy.

Add visual of bloodstream and cell.

4. **Type 2 Diabetes and Insulin Resistance**

Insulin resistance is a major underlying cause of type 2 diabetes. Over 90% of people with Type 2 diabetes are insulin resistant.

Insulin Resistance is the main cause of high blood sugars in early diabetes. Let's look further to understand how insulin resistance can lead to high blood sugars.

**Insulin Resistance**

Insulin Resistance makes it difficult for the glucose to enter the cells. Insulin attaches to the receptor sites on the cell, yet the glucose channels remain closed, giving the sugar nowhere to go. Or fewer receptor sites

for insulin exist on the cells, causing sugar to move into the cell at a slower rate. Either way sugar remains in the blood longer than it should because insulin is less effective at open up glucose channels on the cells.

The resulting high blood sugars cause the pancreas to make even more insulin. Over time, insulin resistance can cause the pancreas to tire out. A tired pancreas cannot make enough natural insulin. A person may eventually need insulin injections when they no longer produce enough of their own insulin.

5. **Symptoms of High Blood Sugar**

A person may have high blood sugars for many years before noticing any symptoms. Even when symptoms are present the type and severity vary with each person. That's why some people are not aware of their diabetes until their blood is tested.

Ask: What symptoms did you have before you learned you had diabetes?

| | |
|---|---|
| Tiredness | Sugar is not getting into the cells to be used for energy. |
| Increased Thirst | The body needs more water to dilute the sugary blood. |
| Urinating Often | The kidneys filter some of the sugar out of the blood to produce sugary urine. The body makes more urine to get rid of the extra sugar. |
| Blurry Vision | Sugar builds up in the lens of the eye, causing the lens to swell and change vision. These changes get better as blood sugars improve. |
| Excessive Hunger | The sugar is not getting into the cells where it can be used for energy. Loss of sugar through the urine means loss of calories. This vicious cycle contributes to increased hunger. Unintentional weight loss can result. |
| Frequent Infections (skin, gums, vagina, or bladder) | High blood sugars feed bacteria and yeast, impairing the body's ability to fight infections. |
| Tingling or Numb-ness in legs, feet, hand. | High blood sugars have damages small blood vessels and nerves in the hands, feet and extremities. |
| Slow healing wounds | Cuts and sores heal more slowly due to decreased circulation. |

6. What are Normal Blood Sugar Levels?

People that do not have diabetes have blood glucose reading within these ranges.

| Time of Day | Glucose Range |
|---|---|
| Fasting | 70-110 mg/dl |
| 1-2 hours after | 70-139 mg/dl |
| Pre-diabetes | 110-125 mg/dl |
| Diabetes | 126 mg/dl or above |

# Session 2
# Coping and Stress Management

## Objectives

By the end of this session, group members will:

- Express feelings about having diabetes.
- Share with the group an example of how diabetes has affected their life, and/or the lives of their family.
- Identify any feelings or behaviors they may have that limit their ability to accept diabetes.
- Understand the physical response to stress.
- Understand a few coping techniques to stressful situations.

### Materials Needed

1. Medicine Wheel as a Symbol of Wellness
2. Feelings Faces
3. Positive Ways to Handle Stress
4. Relaxation Techniques
5. Refreshments: Sugar free drinks, crackers, deli meats or cheese, veggie tray.

## Introducing the Session

### 1. Welcome

- Welcome group members to the session. Tell them that you are happy they came.

### 2. Program Overview

- Introduce yourself as the session's facilitator. Tell them something about you.

## Ice Breaker -

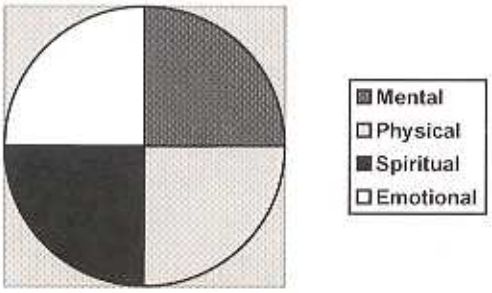
### Say:

- Lets begin by introducing ourselves and getting to know each other a little better.
- Ask the participants to give their name and tell one or two things about themselves.
  - To tell why they came to this session and what they hope to learn.

### Explain the Purpose of this Session

- To provide a time for participants to express their feelings related to diabetes and learn ways of managing stress. Participants will have opportunity to practice relaxation techniques.
- Encourage participants to share stories and ask questions to facilitate discussion.

## Introduction to the Medicine Wheel as a Metaphor for Personal Wellness




The Medicine Wheel is a Sacred Symbol known to all Plains Tribes. This Sacred Circle contains many teachings about the balance observed in natural systems including the balance within the human system.

Some examples of balance observed within the Medicine Wheel are:

- The Four Cardinal Directions: North, East, South and West
- The Four Sacred Colors: Red, White, Black and Yellow.
- The Four Seasons: Winter, Spring, Summer and Fall
- The Four Elements essential to living species: Earth, Air, Fire and Water.
- The Four Ages of the Life Cycle: Childhood, Adolescence, Adulthood and the age of being an Elder.
- The Four Components of Human Well-being: Physical Health, Mental (Intellectual) Health, Spiritual Health and Emotional (Heart) Health.

**Discuss the importance of caring for mental, spiritual, and emotional needs as well as physical needs to keep the total self in balance and harmony.**
**In the Medicine Wheel these four aspects of each person is interconnected. If any one of the four is not in balance, it will affect each of the others. For example: If an emotional stressor occurs, such as grieving for the loss of a loved one, this stressor can manifest also on a persons physical health, mental health and spiritual health, so affecting the whole system.**

**Share an example of how you have seen this happen in your own life.**

- **What was the stressor?**
- **How did it affect your Wellness Circle?**
- **How were you able to restore balance and healing?**

## Coping With Diabetes

Learning to live with diabetes can evoke many different feelings. You may feel angry, frustrated, afraid, sad or guilty. You may even deny or block out the fact that you have diabetes. Such feelings are normal and surface from time to time as you and your family learn to adjust to diabetes. Identifying and then accepting these emotions as normal helps the adjustment process to occur.

These emotions can be experienced by anyone at anytime. They are not restricted to those who have diabetes. Nevertheless, taking insulin or other medication, following a food plan and checking your blood sugar can make you feel different than others. Family members can also experience these feelings as they learn to adjust and live with diabetes. Next we will explore some of the feelings you may be experiencing.

## Denial

When diabetes is first diagnosed, some degree of denial occurs for just about everybody. Initially, denial is an important part of dealing with diabetes. It protects and prevents you from being emotionally overwhelmed. Statements you may make include:

"Not me". "The test must be wrong".
"I can't be sick, I look just fine".
"Why me? I don't deserve this".
"What does this mean for my life"?

Ask:
What were your thoughts or feelings when you were first diagnosed with diabetes? What are your thoughts and feelings now about having diabetes? Have participants circle their feelings on Visual 2, *Feelings Faces.*

It is human and natural to avoid unpleasant and scary things. It protects us at first. Denial becomes unhealthy when it interferes with the ability to take care of your diabetes. Family members in prolonged denial can give the message that diabetes is not serious and proper treatment is not necessary.

Keeping a diary of feelings may be helpful.

Feeling sad or "down" now and then is a normal response to learning you have a chronic health condition that will require changes to control the disease. When negative feelings last for too long people may lack the motivation or energy to care for their diabetes. Feeling sad or depressed for two or more weeks may be a sign of clinical depression. Untreated depression can lead to poor appetite, sleeping problems, isolation and can be life threatening. People who feel very sad or depressed need to tell someone (family, friends, etc) and get help right away. Depression is treatable in most cases with medication.

Having diabetes doubles a person's chances of having depression.

How a person feels about diabetes affects how they will care for their diabetes.

## Fear

Learning you have diabetes can be very frightening. It is common to feel a loss of control over your body. Feelings ranging from nervousness to genuine fear can surface. You may wonder:

"What is going to happen to me?"
"Will I eventually lose my limbs?"

Fear can also be healthy. It can motivate you to learn about diabetes self-care and seek control over your life once again. However, fear over a long period of time can lead to hopelessness. Family members who are fearful can become overprotective and may restrict your activities.

## Anger

When you or a family member has diabetes, you may feel angry from time to time. Anger is a normal reaction when we feel we do not deserve what is happening to us and we are not in control. Statements you may make include:

Why me? This isn't fair.
Why do I have to change the way I eat?

Anger becomes unhealthy when it is felt too strongly or directed at another person. Directing anger at ourselves may result in not doing what needs to be done to control diabetes.

## Guilt

Guilt is a feeling that occurs when we believe we are responsible for something bad happening. Guilt may come from not understanding diabetes, from things beyond our control or things that may have happened long ago. Some things you may say to yourself are:

> He must have gotten diabetes from my side of the family.
> If I hadn't eaten so much, I wouldn't have diabetes.
> I really deserve this after what I've done.

Guilty feelings can let us know when we have wandered from our treatment plan. However, what is important is the intensity of this guilt and how we respond to it. Too many guilty feelings can make us feel like a failure and may cause us to become depressed.

## Acceptance

For most people, the time comes when we accept diabetes. We may never enjoy having diabetes but at least we can admit to ourselves and to others that we have diabetes. We may find ourselves saying:

> I don't like testing my blood sugars, but it sure helps me figure out my problem areas.
> I can be well. I have diabetes – it is a part of me.

Remember, it is very important to understand that acceptance may not be forever. Certain things can happen to trigger anger, guilt, sadness, or fear once more. It is not unusual to have these feelings return. At times like these you must "work through" your feelings again until a level of acceptance is reached.

## When Emotions Become a Problem

It is important to remember your response to that feeling; any of these emotions can be normal and healthy. Two things may make an emotion unhealthy: how long you feel it and how strong you feel it. If a feeling is affecting your diabetes control or causing a conflict at work, with family or with friends, it is time to stop and examine your feelings.

Not all problems are related to diabetes. It is important to remember that above all, you are a person and a person has troubles from time to time. Whatever the cause, the first step is to identify what you are feeling. Often just identifying the feeling can change the way you express it.

## Getting the Help You Need

Talking with a family member, friend or someone not involved with the situation helps. Struggling alone with feelings is hard. You need support from other people. Most people find that having a support person helps them live with diabetes.

Support can come from family, friends, co-workers, spiritual advisors, traditional healers and the health care team.

If you find yourself struggling with feelings and nothing seems to help, it may be time for professional counseling. Social workers, counselors and psychologists are all trained in helping people to identify and work through feelings. If professional help is needed, do not look upon yourself as weak or a failure. It takes a strong person to recognize that help is needed.

## Moving On

As you "work through" these emotions and move towards acceptance, taking care of your diabetes will become easier. You will feel more in control of your life and develop a positive self-image. Instead of monopolizing your life, diabetes will only become a part of it.

## The Bodies Response to Stress

**Ask:** "What is Stress?"
Stress is defined by how a person sees a situation, not necessarily the real situation.

How stressful an event is depends on how a person looks at the event and whether he/she thinks it is bad or good. Other things going on in a person's life can change how that person sees stress.

Change of any kind, whether it is positive or negative, is stressful.

Major life stressors, such as illness or death in a family are stressful for everyone. Some major life events, such as graduating from school, marriage, the birth of a child, a new job or retirement, are positive and challenging situations that can cause a stress response.

Minor life stressors are every day events, like being in a traffic jam, arguing with a co-worker or family member, tests, phone calls or doctors visits. Events such as holidays and vacations can be stressors.

The body reacts to stress in various ways:

- Heart Rate Increases
- Blood pressure increases
- Breathing becomes rapid and shallow
- Muscles get tense
- Sweating increases
- Blood sugar may rise

The body gets ready for stress by sending out stress hormones (catecholamines, glucagons, cortisol and growth hormone). These hormones may affect feelings and behaviors.

Ask: What are your feelings when you are stressed?
Have you noticed your blood sugar is affected by stress?

Energy is needed to either fight off stress or run away from it – the fight or flight response.

Stress makes control of diabetes more difficult. Not only can it cause the blood sugar to go high, it can also make it hard for a person to do the things they need to do to take care of their diabetes.

All people feel stress from time to time. Too much stress can lead to health problems and affect diabetes control. Limiting stressful events or handling them in a positive way helps a person stay healthy.

## Come on Six Activity – Tom Jackson's Activities That Teach

Divide the group into teams of five. Give each team one dice, one pencil and a piece of paper for each person. One person starts by rolling the dice. If they get a 6, then they begin to write from one to one hundred on their piece of paper. If they do not get a 6, then the dice is passed to the next person. There is only one pencil, so whenever another person rolls a 6, the pencil is passed to them and they begin to write. The dice continues around the circle skipping the person who is writing the numbers. When a person has started writing and they lose the pencil, after they get it back by rolling another 6 they continue to write their numbers from where they left off. The do not start over again each time. The person with the pencil, who is writing their numbers, must *also* say their numbers out loud for everyone at the table to hear as they write the numbers. The numbers must be written in the correct order, they must be legible and they must be written one number at a time. The winner is the first person in the group to reach 100. Let all the groups have a chance to finish.

To process: The facilitator should be writing down observations of behavior and what people say as they play this game. The closer we get to success (winning the game, getting to 100) the more stress we have. The volume level in the room will increase. Some people may get out of the chairs, get aggressive and grab the pencil, etc. If someone is unlucky and not getting

to write many numbers, many times this person will think this is a stupid game and withdraw or give up.

Ask: are you warmer/hot, did your heart rate increase, etc.

## Relaxation Techniques

# Session 3

## Eating In Balance

### Objectives

By the end of this session, the group members will learn:

- How to plan a balanced meal honoring the four basic components of a traditional Plains food way.
- Understand the role of Carbohydrates, Fats and Proteins in nourishing ourselves and what impact they have on blood sugars.

### Materials and Supplies

To conduct this session you will need:

- Honoring your Health – A Diabetes Health Educators Manual
- Set of Measuring Cups (1 cup, ½ cup, ¼ cup)
- Blackboard and chalk or a flip chart and markers

### Handouts

Give each group member these handouts during the session:

- Four Winds Practice Sheets on CD
- The American Indian Food Guide Pyramid
- Using the Food Guide Pyramid: What Counts as a Serving?
- Pemmican 1-2-3 Recipe.

# Introducing the Session

## 1. Welcome

- Welcome the group members to the session.

## 2. Review of Last Week's Session

Say:

At the last session we talked about Diabetes and a Healthy Mind, Spirit and Emotions.

## 3. About This Session

Say:

What you choose to eat can make a difference in you diabetes self care. During this session you will learn to:

- Choose a variety of foods to balance meals.
- Identify appropriate portions for each of the four food components.
- Recognize the role of Carbohydrate, Fats and Proteins in nourishing ourselves.

# Conducting the Session

## 1. Learning from the Example of our Ancestors.

### The Northern Plains Food Way in Review

Our Ancestors lived in Balance and Harmony with the world around them. The foods they ate reflected that balance. The great grasslands of the Plains supported large herds of game animals: Buffalo, Elk, Deer and Moose. Grandmother Earth also nourished us with an abundance of plants that our ancestors gathered along their migration on the plains. Chokecherries, June berries, huckleberries and others grew in abundance and made our pemmican sweet and good to eat.

Numerous roots: wild turnips, potatoes, arrowroot and leafy greens: lambs quarters, tender shoots and nuts and seeds were gathered at different times during the growing season. Some foods were gained through trade with neighboring tribes. Common trade foods were corn, beans and squash, which might be exchanged for dried meat or other trade goods.

The people gave thanks to the spirits of the plants and animals during the harvest. Not only were they nourished through the nutrients of the plants and animals but also from the spirits of the plants and animals. Food was shared, so no one had too little or too much. People ate many different kinds of foods. This variety provided all the nutrients they needed to live a healthy life.

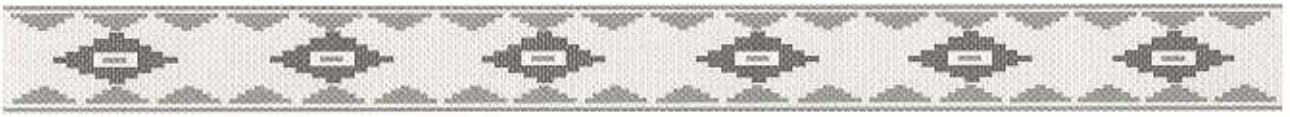
You can apply the same principals to eat in balance for a healthy life today.

## Ask?

Some Plains Indians still enjoy today some of the foods that we have eaten from traditional times. Can we take a couple of minutes to share about some of the traditional foods we still see being used in our community?

Note: Give volunteers about 3 minutes to answer. Add these habits if they do not say them.

- Use of buffalo from our tribal herds: buffalo stew, buffalo roasts, ground buffalo, dried buffalo, and pemmican.
- Use of game from the fall hunting season: Deer, Elk, and Moose and some small game animals too.
- Use of Traditional teas, both as a pleasant beverage, but also as medicines.
- Use of gathered berries and native plants. Eating the berries fresh but also drying the fruits and plants for later use.
- Preparing soups, one of our original dishes. Soups contain a variety of foods to nourish us: Water, starchy vegetables, meat and non-starchy vegetables.
- Cooking methods that reflect our traditional methods: boiling, roasting, baking and drying.



# Four Winds Nutrition Model

We can take steps to eat in a way that is more reflective of our ancestor's food pattern by learning a lesson about food from the Medicine Wheel.

The Medicine Wheel (Sacred Circle) continues to be an important symbol to Plains Indians. Understanding the circle is a sacred gift that can be used to guide us through life. Within the circle, lessons for balance and healing are found.

Symbolism within the Circle:

- Four Directions - East, South, West and North
- Four Seasons – Spring, Summer, Autumn and Winter
- Four Elements – Fire, Water, Earth and Air
- Stages of Life – Childhood, Youth, Adulthood and Elderly
- Personal Wellness – Physical, Mental (intellectual), Spiritual and Emotional (Heart)

Each component within the Circle is essential to create a balanced system.
Imbalance exists within the Circle when the four components are out of proportion. If an area is missing or lacks its place in the circle the other areas are affected and out of harmony.

Strive for balance within the Circle by attending to your body, mind, spirit and emotions to create wellness.

The Medicine Wheel also contains a lesson that describes the traditional food pattern of Plains Indians.

The West wind is associated with the thunder-spirits and rains that the western sky brings. Traditionally all drink came from water or teas (water with an herb) to nourish the people. The lesson from the West is that Water is essential to sustaining life and wellness.

The North wind is associated with the Buffalo Nation. In traditional times, the Buffalo herds would most often come out of the North Direction. Still today when the North wind brings the cold air and snow, the Buffalo will face the North direction and receive the cold face forward.

Buffalo and other game were abundant on the vast grasslands of the Plains. The lesson from the North is that superior quality meats are an

essential part of a healthy diet. Today this includes other good sources of protein.

The East wind is associated with springtime. Spring is a time of renewed plant growth and life. It is in the spring that the gathering process began. New plant growth such as tender shoots, leafy greens and grasses for the four legged gave strength after the hard winter. The important contribution of all gathered plants in supporting our health is the lesson from the East. Today this includes all fruits and non-starchy vegetables.

The South wind is associated with the warm summer wind that comes from the South and brings the summer growing season. During the summer season certain tribes would cultivate crops – corn, beans, squash, and sunflowers. These starchy plants were an important source of energy
and nutrients for the people. These crops were valuable trade items among Plains Tribes. Today starchy vegetables and western grains are included in the contribution of the South direction.

This lesson within the Sacred Circle about how the creator nourishes us with the foods upon grandmother earth is valuable in a time when our people need to relearn how to nourish themselves.

In a balanced plate of food, no one food component should dominate the plate. A healthy drink, lean meat, fruit or vegetable and a starchy food should be represented in balance.

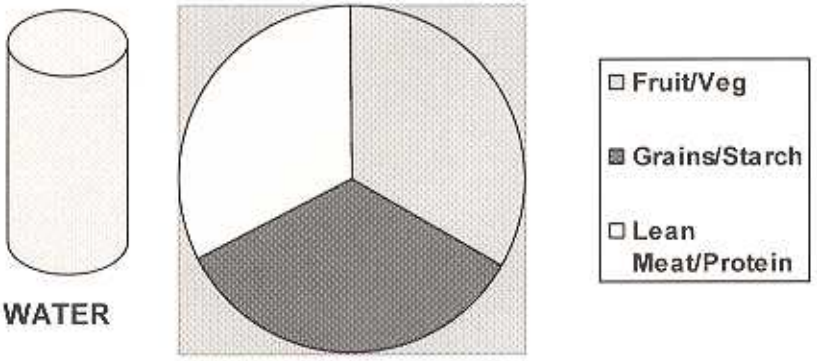
Give each group member a copy of "Four Winds Practice Sheets"

Ask:

Let's see if we can build a balanced meal with the four food components in mind from the Medicine Wheel?

Draw a Medicine Wheel on the Blackboard of Flip Chart and Practice with the participants building a breakfast, dinner and supper using the Four Winds pattern. Pay attention to balance, so no one food group takes up more than a third of the plate.

Portions: Since our drink is not on the plate, the plate is portioned three ways.




What's A Serving?

***East Wind***

Fruit is ½ cup, or 4-5 ounces of Juice
Non-Starchy Vegetable is ½ cooked or 1-cup raw vegetable.
Aim for at least one fruit or non-starchy vegetable. Serving both a fruit and a non-starchy vegetable gives you extra nutrients and fiber.

South Wind

Starchy Vegetables belong with the grains in the starch group & include: Potatoes, Corn, Beans and Peas. These starchy vegetables are nutritionally very similar to breads and cereals. Traditionally our starchy vegetables were minimally processed, meaning they may have been dried and ground, these processes did not change the nutritional content of the food the way modern processing does.

A serving of Starchy Vegetables is ½ cup and a serving of bread is one ounce or one slice. A serving of cereal is one ounce and varies by volume from, ¼ cup to 1 ¼ cup depending on the cereal. Check cereal side panel for the serving size that equals a diabetic exchange.
Typically, most people need two servings of Starchy foods per meal.
For example, this could be 1 cup (½ c + ½ c) of Mashed potatoes or ½ cup of corn with a small (1oz) bread roll.
*Active people and growing youth need more than two servings per meal.*

**Ask: What starchy vegetables or grains did Plains Indians originally have? What new grains do we have today that our ancestors did not have? *Answer: Wheat, Rye, Oats, Barley, White Rice and breads and cereals made from these.***

West Wind

In Traditional times all of our drink was pure water or tea (water with an herb). Today we need about 2 liters or 8 (8oz) cups of sugar free and alcohol free fluids per day. These may include: Water, Tea, Coffee, Low-fat Milk, Iced Tea and other non-caloric drinks.

## North Wind

In traditional Times all of our game meats were good sources of protein. Today we need to choose meats that are lean, with much more protein than fat. Some examples of these are:

- Lean cuts of beef: >85% lean ground beef, rump roast, round steak, sirloin, tenderloin, lean stew meat.
- Buffalo and Game: all cuts.
- Turkey and chicken: Baked, not fried.
- Lean cuts of pork: Ham, tenderloin, center cup pork chops.
- Fish: Canned tuna, salmon, trout, shellfish and other finned ones.
- Other good sources of protein: Cottage cheese, eggs, tofu, 2 Tbsp. peanut butter or nuts and other lower-fat cheeses.

A serving of lean meat is 3-5 ounces twice a day.

Meats that are not good sources of protein, **but rather are good sources of fat are**: Bologna, hot dogs, spam and potted meat, sausage, bacon, ribs, prime rib, rib eye, salami, pepperoni, summer sausage and commodity cheese. We should try to limit these foods.

## What are some other Nutrition Models?

### Food Guide Pyramid

The official nutrition guide for all Americans is the USDA Food Guide Pyramid. A version was developed for American Indians.
See Handout.
This guide is based on a day's nutrition needs. See suggested servings per day. The Four Winds Model is based on one meal.

Using this guide can you guess how many servings are appropriate per meal for: Starch, Meat and Fruit and Vegetables?

*Look at 'What Counts as a Serving" in this Food Guide.*

## Sweets and Fats: Why are these at the top of the pyramid?

When our Grandparents were young, sugar, fat and salt were only available in small amounts or not available at all. Honey and natural maple syrup were a special treat. These foods are high in calories and contain few nutrients.

## Food Preparation

In traditional time's foods of the Plains were eaten fresh or prepared by drying, boiling, roasting or baking. They were naturally lower in fat. Fat was scarce, and so frying was not a method of cooking then.
We can benefit nutritionally by cooking with the same methods as our ancestors.

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## Blood Sugar Response to Food

When, what and how much a person eats affects how much their blood sugar rises.
Each person's blood sugar response to food varies. Checking blood sugar at home helps a person learn how food affects blood sugar.

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## Key Nutrients in Your Meal Plan

Your meal plan includes the major nutrients needed for optimal health: Carbohydrates, Fats, Proteins, Vitamins, Minerals and Water.

Protein rich foods are represented by the North direction on the Medicine Wheel. Protein has very little effect on your glucose level, as protein is primarily a build block of body tissues rather than a fuel. Your body can use protein as a fuel if no other fuel is available such as during a starving state. 8 to 10 ounces of Protein rich foods such as meat, fish and eggs is adequate for most adults. Eating too much protein, like eating too much fat or starch, will lead to added fat stores. Protein is made up of amino acids and is used to build and repair muscle and skin tissues, organ tissues, manufacture hormones and enzymes. Protein is a part of every cell in the body.

Fat is a nutrient that supplies energy, keeps skin healthy and is needed to carry some vitamins. Your body requires some fat but too much fat can lead to health problems. Three teaspoons each day of vegetable oils meet our needs for essential fatty acids. Fat is high in calories – 1 tablespoon of oil has 120 calories. A diet high in fat can lead to serious weight gain, blood pressure problems heart disease or Cancer. It can also contribute to elevated sugars by increasing insulin resistance. Fats include oils, butter, margarine seeds and nuts and salad dressings.

Carbohydrates (Carbs) are necessary for energy. Carbohydrate is a nutrient and includes starch, sugar and fiber. The body burns carbohydrate for energy and stores carbohydrates in the body as fat and glycogen. Carbohydrate turns into glucose when eaten. This glucose enters the cells through the blood stream. Carbohydrate is digested rather quickly. It is fully changed to glucose within 30 minutes to 2 hours. Excessive carb intake will lead to elevated blood sugars. Foods with carb include starches, fruit, milk and yogurt and sweets and snacks and vegetables.

Vitamins, Minerals and Water

Vitamins and Minerals are substances your body needs in small amounts for normal growth, function and health. Eating a balanced diet is the best way to get the vitamins and minerals you need. Not everyone eats the right combination of foods to satisfy their nutritional needs or may not have optimal absorption of nutrients due to advanced age. In these cases, a supplement may be the answer.

Vitamins and minerals are especially rich in fruits and non-starchy vegetables.

Water is necessary for temperature regulation, electrolyte balance and maintaining cells and tissues. Six to eight glasses of water are optimal per day.

## Combination Foods

Some foods combine many nutrients, such as Soups, Chili, Casseroles, and Pizza.
Can you think of a Traditional food that was common to most Plains Tribes that supplies many of the reviewed nutrients?

Answer: Pemmican  Give Group members a copy of the pemmican recipe and or a sample of pemmican.

## Portion Control

Measuring food for portion control is very important until you are comfortable judging food portions with your eyes. You will need:

- Measuring cups
- Measuring spoons
- Small scale (ounces)

Some Important Tips:

1. Measurements need to be level.
2. Meat is weighed as a cooked portion.
3. It may be helpful to use 4 and 8 ounce glasses to keep beverage portions in control.
4. Fruits are weighted with the skin, rind, and seeds included.

Once your eyes can estimate the portions you will not have to measure everything. The ultimate goal is to be able to make good judgments about the food without having to measure and weigh.

Give group members a copy of "Seven Ways to Size up Your Servings".

## Review of Today's Key Points

- Lets review what we learned today.

Ask:

Q: What is healthy about our traditional Plains food way?
A: Many native foods are nutrient rich and low in fat. The variety of foods hunted and gathered gave us superior health in traditional times. We can learn from modeling our meals on the pattern of the Medicine Wheel.

Q: What are some foods everyone should eat less of or in smaller portions?

A: Higher fat foods such as French fries, fry bread, donuts, chips and processed meats and other highly processed, high fat foods.

Q: How can the Four Winds Nutrition Model or the American Indian Food Guide Pyramid be used to plan balanced meals?
A: The Four Winds Model reminds us to look for the same four food components when planning meals as our ancestors used from Plains foods. This helps to balance nutrients.

## Weekly Pledge

Say: Pledge one thing that you will do to eat a greater variety of healthy foods this week. Tell group members your own pledge. **Note:** Ask the group members to tell what they plan to do.

## Session 4: Moving to Stay Healthy

### Objectives

**By the end of this session, group members will learn that:**

- Physical activity is good for the controlling your diabetes and overall health.
- Adults should be physically active for a total of 30 minutes on most days, preferably daily.
- Children should be physically active for a total of 60 minutes on most days, preferably daily.
- Brisk walking is a simple activity almost anyone can do.
- There are ways to fit more activity into a busy schedule.

### Materials and Supplies

**To conduct this session you will need:**

- *Diabetes Self Management Education* manual and visuals.
- Blackboard and chalk or several large pieces of paper, a marker, and tape.
- Cool drinking water and cups.

### Handouts

**Give group members these handouts during this session:**

- Role-play activity, pages.
- Stretching Exercises, page
- How To Exercise, page
- Make Physical Activity a Habit—My Personal Record, page
- Sample Walking Program, page

### Session Outline

#### Introducing the Session

1. Welcome
2. Review of Last Week's Session on *Eating in Balance*
3. About This Session

#### Conducting the Session

1. Facts About Physical Activity
2. Role-Play activity (*Optional*)
3. Benefits of Physical Activity
4. Types of Physical Activity
5. Getting Started: Important Things to Know
6. Finding Time To Be Physically Active
7. Walking: An Activity For Almost Everyone
   - A. Discussion/Stretching
   - B. Activity/game (*optional*)
   - C. Walking Activity

**Review of Today's Key Points**

**Weekly Pledge**

**Closing**

**Note:** If you have time, include a 30-minute activity (like the walking activity in this session) at the beginning or at the end of the other sessions.

Introducing the Session

**1. Welcome**

Welcome the group members to the session.

**2. Review of Last Week's Session**

**Say:** At the last session we talked about the Eating in Balance and how it affects our health. Who remembers some of the ways we can eat in balance?

**Note:** Give the group about three minutes to answer. Write their answers on the blackboard or a large piece of paper taped to the wall.

**Add these suggestions if they are not said:**

- Point 1.
- Point 2.
- Point 3.
- Point 4.
- Point 5.

**Say:** Who remembers what you can do to keep your diet in balance?

**The answers are**

- Eating in Balance #1
- Eating in Balance #2
- Eating in Balance #3

**Say:**

At the end of the session we pledged to do one thing to improve our balance diet. Share with the group what you did.

### 3. About This Session

**Say:** Today's session discusses physical activity and how important it is to your diabetes health. When the session ends, you will know:

- How physical activity can help you and your family.
- The difference between physical activity and exercise.
- What kinds of activities are good for you and for your diabetes?
- How much activity you should do.
- How you can find time to be active.

## *Conducting the Session*

### 1. Facts About Physical Activity

**Say:** Not getting enough physical activity is a major health risk for people today.

- Being physically inactive puts you at risk for diabetes. The good news is that you can do something about this risk factor.
- Unfortunately, physical inactivity is rising among AI/AN, including men, women, and children.
- As a person gets older, having little or no physical activity can lead to health problems. (Diabetes, CVD, Hypertension)

### 2. Benefits of Physical Activity

**Ask:** How do you think physical activity can help you?

**Note:** Give the group about 5 minutes to answer. Write their answers on the blackboard or a large piece of paper taped to the wall.

**Show visuals 3-1 and 3-2.** Add any of these reasons if they are not said. **Say:** Physical activity can:

- Strengthen your heart and lungs and increase physical fitness.
- Help lower your chance for heart disease, diabetes, and cancer.
- Give you more energy.
- Build and maintain healthy bones, muscles, and joints.
- Help you feel better about yourself.
- Help you control your weight.
- Help lower your blood pressure.
- Help you lower your stress.
- Help reduce feelings of depression and anxiety.
- Help lower your blood cholesterol.
- Help you sleep better.

**Show visual 3.3. Say:**
People feel better when they are active. Physical activity may help you lose excess weight and control your appetite.

**4. Types of Physical Activity**

**Ask:** What do you do to be physically active?

**Note:** Give the group about 5 minutes to answer. Write their answers on the blackboard or a large piece of paper taped to the wall.

**Say:** There are different types of physical activity. Physical activity includes some of the things that you probably do each day, like walking, climbing stairs, playing with your children, or doing household chores. Exercise is a structured activity that has is determined by frequency, intensity, and time.

**Show visual 3-4. Say:** You may want to start with activities like these.

- Walking
- Climbing stairs
- Dancing
- Raking leaves
- Picking berries
- Vacuuming
- Gardening
- Bowling
- Playing traditional games
- Fishing

**Show visual 3-5. Say:** After a while, you will be able to do even more. Activities that you might enjoy include:

- Playing soccer, basketball, or baseball
- Running or jogging
- Doing aerobics or floor exercises (calisthenics)
- Herding cattle
- Hiking
- Sledding
- Skiing
- Bicycling
- Jumping rope
- Rollerblading
- Chopping wood
- Swimming
- Hunting
- Skating

**Say:** All types of physical activity are good for you. Aerobic activities such as brisk walking that speed up your heart rate and breathing help your heart become stronger. Other activities can help improve strength and flexibility.

**Say:** Start slowly. Then move on to higher level activities. For example, when you are comfortable walking for 15 minutes, gradually increase your time. You'll feel great! Don't worry about how hard you are working at first. Walking may be all you need to do for your aerobic activity

**Say:** You don't have to be an athlete to become fit. Just get moving! Find something you like to do and that you have time for.

**Ask:** How much physical activity do you think you need each day to improve your health?
***Answer:*** Adults should accumulate a total of **30 minutes** of moderate physical activity on most days, preferably daily. Children should accumulate at least **60 minutes** of moderate physical activity on most days, preferably daily. Children need to play.

**Show visual 3-6. Say:**
If you can't set aside 30 minutes at one time to be active, you can break your activity into shorter periods of 10 minutes or more. Just make sure it adds up to at least 30 minutes on most days.

**Say:** Here's an example:

| | |
|---|---|
| • Use your stationary bike for 10 minutes before work | 10 |
| • Take a 10-minute walk with your kids after work | 10 |
| • Do aerobic exercises for 10 more minutes later in the day | +10 |
| | 30 |

## More Information

### Just Move It

Physical activity is important in weight management.

Try to set a goal to be physically active for at least 30 minutes a day.

**Here are some examples of how many calories you can burn from various activities for 30 minutes.**

| Activity | Calories burned per 30 minutes* |
|---|---|
| Walking (leisurely), 2 miles per hour | 85 |
| Walking (brisk), 4 miles per hour | 170 |
| Garden work | 135 |
| Raking leaves | 145 |
| Traditional dancing | 190 |
| Bicycling (leisurely) 10 miles per hour | 205 |
| Chopping wood | 205 |
| Ice skating, skiing, or sledding | 240 |
| Swimming laps, medium level | 240 |
| Jogging, 5 miles per hour | 275 |

**For a healthy 150-pound person. A lighter person burns fewer calories; a heavier person burns more.*

## 5. Getting Started: Important Things To Know

**Note:** This session gives information for people who are just starting to be active. It also helps people add more activity to what they already do.

**Say:** There are a few things that you should know before starting to be physically active:

1. Most people do not need to see a doctor before they start a slow, sensible program of physical activity. You should talk with your doctor if you:
   • Have heart trouble or have had a heart attack.
   • Take medicine for high blood pressure or a heart condition.
   • Are over 40 years old if you are a man, or over 50 if you are a woman, and you want to do a harder activity, like jogging?
   • Have one or more risk factor, like high blood pressure, high blood cholesterol, diabetes, overweight, or smoking, and want to do a harder activity.
   • Have a family history of heart disease at an early age (before the age of 45 for men and 55 for women).

2. Start slowly. Build up the time and effort that you put into any activity. You should not be tired the next day.

3. Drink plenty of fluids before and after exercising, even if you are not thirsty. Drink water. Special sports drinks are not needed and they are expensive.

4. Wear comfortable clothing. Wear shoes and socks that give your feet support. You do not need to buy fancy color coordinated outfits.

5. Never wrap your body in plastic or wear clothing that is too heavy. This will not help you lose fat, but it can:
   - Make you sweat too much.
   - Make your body temperature rise.
   - Make your heart beat too fast.
   - Make you sick to your stomach.
   - Cause you to pass out.
   - Cause damage to your organs.

Ask: Does anyone have any questions?
Give the group 2 to 3 minutes to ask questions.

### 6. Finding Time To Be Physically Active

Say: I know that all of you have busy lives. You may be wondering how you will ever find time to be active. Let's look at some ways.

Give each member a copy of the "Say Yes to Physical Activity" handout on pages xxx-xxx. Let's see how to add movement to what you do every day. (Read the suggestions aloud.)

- Take a walk/snowshoe.
- Park your car farther from the store.
- Take the stairs.
- Get off the bus one or two stops early and walk.
- Dance to your favorite music.

Ask: What are some other ways to become more active even when you don't have time?

Note: Give the group about 5 minutes to answer. Write their answers on the blackboard or a large piece of paper taped to the wall. Add these ways if group members do not say them.

Take a 15- to 20-minute walk during your lunch break at work or after dinner with your family.

Jump rope a few minutes each day. Work up to jumping for 10 minutes.

### 7. Walking: An Activity for Almost Everyone

Tips for Preparing for the Walking Activity

Before the start of this session:

Review the "Stretching Exercises" handout (page xxx). Practice until you know each part well enough to teach them to the group members.

(*Optional*) Review an icebreaker in Appendix page xxx. This game can also be used as an icebreaker in other sessions.

Practice a brisk walk. Take long strides and swing your arms.

When leading this activity, remember:

Music can get people in the mood for being active. Use a lively song for the warm up exercises, a faster beat for the walking, and a relaxing song for the cool down period.

Be enthusiastic. Group members will pick up on your enthusiasm and feel good about exercising.

Include everyone. Not a competition, but an activity.

Lead the walk in a circle if you have to do the walking indoors or if space is limited.

A. Discussion/Stretching

Say: Brisk walking is an excellent form of physical activity. It's easy to do, and you do not need special equipment. All you need are shoes for support and socks for cushioning.

Say: Walking can be done outdoors or indoors. If you do not feel safe walking in your neighborhood, a school or churchyard may be a safer place to walk. Walk with a friend, walk with your dog. Find time to walk whenever you have a few minutes.

Say: It's important to spend the time warming up and cooling down each time you exercise. Although the risk of injury from walking is low, the warm-up gets your leg muscles ready for the activity. The cool-down lets your heartbeat slowly return to normal. This keeps your leg muscles from getting stiff. Warm up can be the start of your walk when you walk slowly. After a few minutes, speed up, and then slow down when you are cooling down.

**Optional:**
Ask the group members to stand up and spread out, leaving at least 3 feet between them and the next group member.

Turn on the music.

Say: It is important to warm up your muscles and stretch before you begin physical activity. First we will warm up our muscles and then we will stretch. Let's walk in place slowly for 3 minutes.

Say: Now, I am going to show you some stretching exercises. Watch me and then try doing them yourselves. Some are easier to do than others. With time and practice, you will be able to do them all. If you have a bit of trouble at first, just do your best. You will get a handout that tells you how to do these stretching exercises. Use the handout to help you do them at home.

B. (*Optional*) Game

Lead the group in the game on page xxx.

C. Walking Activity

After the stretching exercises and the game, lead the group members on a 15- to 20-minute walk. Walk slowly for the first 5 minutes. Then show them how to do a brisk walk for 5 to 10 minutes.

During the last 5 minutes, slow your pace. (Model what you want your class to do).

**Say:** We are slowing down now so that our bodies can gradually relax. This is called the cool-down period. It is an important part. It's usually recommended that you gradually slow your pace during the last 5 minutes of an activity. Doing a few stretching exercises to loosen the muscles should also be a part of your cool-down.

**Say:** For instance, runners or joggers may cool down by walking for a few minutes and then stretching their leg muscles before they stop entirely. Walking slowly can be your cool down before you stretch.

**Ask:** How do you feel? Do you think you could continue to walk like this? Why or why not?

**Note:** Give the group about 3 to 5 minutes to answer.

**Say:** If you already walk three or more times a week, add other activities to become more fit. Try running, jumping rope, dancing. Any activity that raises your heart rate for a long period of time.

**Tell the group:** One of the hardest parts of being more active is staying motivated. Many people find that having a partner helps them stay active because:

- You motivate each other. You can set goals together and help each other meet them.
- It makes the time go faster. You will focus on talking rather than on the activity.
- A partner can be a family member, neighbor, or friend.

**Ask:** What are other ways to help you stay motivated to continue being physically active? Where are some safe places in your neighborhood to be active? How can you support each other?

**Note:** Give the group about 3 minutes to answer. Write their answers on the blackboard or on a large piece of paper taped to the wall.

**Give each group member** a copy of the handouts "Stretching Exercises," "How to Exercise," "Make Physical Activity a Habit—My Personal Record," and "Sample Walking Program," pages 219-222.

**Say:** Use the "Make Physical Activity a Habit—My Personal Record" handout to track your daily progress.

**Review of Today's Key Points**

**Say:** Let's review what we have learned today.

**Ask: What are some of the benefits of regular physical activity?**

- Strengthen you heart and lungs.
- Build and maintain healthy bones, muscles, and joints.
- Lower your chance for heart disease, diabetes, and cancer.
- Help you lose excess weight, prevent weight gain, and control your appetite.
- Lower blood cholesterol and blood pressure.
- Help you sleep better, reduce stress, increase energy, and reduce feelings of depression.

**Q: What is an activity that just about everybody can do?**

**A:** Brisk walking.

**Q: What are simple ways to become more active throughout the day?**

- Get off the bus early and walk.
- Park farther away and walk.
- Use the stairs.
- Dance to your favorite music.

**Q: What is the minimum amount of activity recommended for you to do every day?**

**A:** A total of 30 minutes for adults and 60 minutes for children on most days of the week, preferably daily.

Weekly Pledge

Say: Pledge one thing you will do to be more active during the coming week. Start by sharing your own pledge. You can write your pledges on the "Say Yes to Physical Activity" handout.

Note: Make sure each member gives details about what he or she plans to do. For example, instead of saying "I am going to walk," have them say "I am going to walk three times a week for 30 minutes." Have them tell you where they will walk. Have them tell you their walking partner. Have them tell you what time of day they will walk.

Closing

Say: Thank you for coming today. What did you think of today's session? I am looking forward to seeing you at the next session. The next session will be about Diabetes Medicine.

Note: Think about today's class. What worked and didn't work? Have you made any changes in your own life that were covered in today's session?

# Session 5

Diabetes Medication Options

**Objectives**: This section will introduce participants to the different medications available to treat diabetes and explain how these medications affect our bodies, including those areas that are targeted by the medication (i.e., liver, muscle), use and possible side effects. Participants will set goals for appropriate administration of their meds.

**Materials and Supplies** -- To Conduct this session you will need:
Honoring the Gift of Health Manual
Name Tags
Safety Pins
Blackboard and chalk or paper flip chart to write-on
Refreshments: sugar free drinks, crackers, cheese, raw veggies, dip

## Introducing the Session

**Welcome**

Introduce yourself as people walk in
Ask each person his or her name. Write it on a nametag or give each person a nametag.
Ask group members to wear the nametags on their shirts.
Welcome the groups as a whole and express thanks for their attendance.

**Program Overview**

Begin by explaining that the purpose of this session is to provide information about diabetes medications, pills and insulin, their proper use and necessary precautions that should be used with each.

During the presentation facilitate group discussion to present materials. Several questions to ask of the group can be found throughout the materials in italics to aid with discussion. You can use these or other questions as they arise. Encourage participants to share the different medications they are on and their own experiences.

Insulin because of the route of administration and because it is often used as the last treatment option, can often create fear among those who have diabetes. Throughout the session, attempt to allay any fears about insulin and explain that this is one of many tools that can be used, alone or in combination with medicines, to control diabetes. Actual insulin injection techniques need to be taught individually.

**Course Outline:**

**1. Balancing your Blood Sugar**

a. When Diet and Exercise are not enough
b. Goal Blood Glucose and $A_1C$ Levels

**2. Diabetes Pills**

a. Describe the five classes of pills (see table #1)
    1. Sulfonylureas
    2. Meglitinides
    3. Biquanides
    4. Alpha-glocosidase inhibitors
    5. Thiazilidinidiones (glitazones)
b. Combination Therapy (see table #1)
c. Over the counter medications

**3. Insulin**

a. Discuss how insulin works
b. Goal of insulin
c. Types of Insulin – Action (see table #2, #3)
d. Methods of delivery – withdrawing and injecting
e. Usability
f. Storage
g. Proper Disposal of Needles and Syringes
h. Injection Sites
i. Mixing Insulins
j. Possible side effects of insulin

4. Traditional Medicines –
This can be a place for traditional medicine. Make sure this is well planned in advance.

## Balancing your Blood Sugar

Blood sugars are best controlled when a person:

- Makes healthy food choices
- Is physically active
- Stays at a healthy weight

Briefly, eating healthy includes watching your portion sizes, eating more fruits, vegetables and whole grains, limiting high fat, high sugar foods and highly processed meats and drinking water instead of sodas or juice. It also means being consistent with your meal pattern with respect to both the timing of meals and the amount of carbohydrate (refer back to section III, Nourishing Ourselves).

To be physically active, you do not have to run marathons. Engaging in any physical activity for 30 minutes, 5 days a week can help. Remember, it is important to choose an activity that you enjoy to ensure that you will exercise regularly.

***Question: What are some activities that you enjoy and think would benefit your diabetes?***

A healthy weight does not mean that you have to lose 100 pounds or more. Losing as little as 10 to 20 pounds, can make a difference in your blood sugar control.

The reason it is important to keep your blood sugars in good control is because it allows you to prevent the long-term complications of diabetes. Long-term complications include damage to the eyes, kidneys, heart and nerves. These long-term complications will be discussed in more detail during session VIII; however, here we describe how good blood glucose control is measured.

A short-term measure of diabetes control is blood glucose levels. Blood glucose levels that remain within desired ranges will allow you to prevent the long-term complications of diabetes. Generally, we look at blood sugar values either before a meal or 2 hours following a meal. A long-term measure of diabetes control is Glycosolated Hemoglobin, or $A_1C$ Levels. The $A_1C$ measures your diabetes control for a 2-3 month period.

***Question: Does anybody know what are desirable blood sugar levels?***

Listed in the table below are desired Blood Sugar and A1C Levels:

| | |
|---|---|
| Before Meals | 70 – 110 |
| After Meals (2 hours) | < 140 |
| Glycosolated Hemoglobin ($A_1C$) | < 7.0 |

Diet and exercise can be used to control blood sugars, but sometimes these are not enough. If your blood sugars are out of target range, or higher than those values described in the table above, then medications may be used to help control your diabetes.

**Diabetes Pills**

***Question: How many of you are taking diabetes medications? Which ones?***

Some reasons that medications may be needed to control your diabetes include:

- Changes in eating, activity, weight or stress
- The body produces less insulin
- Insulin resistance, or cells' responsiveness to insulin, worsens
- Other medications are altering blood sugars levels
- New health problems or illnesses
- Side effects from medicines

***Note:*** Refer to Section I for a review of basic physiology related to diabetes

Remember that in Type 2 diabetes, the following may be occurring:

- Cells in the body may not be receptive to insulin
- The pancreas may not make enough insulin
- For some, both can occur – their body does not make enough insulin and their body's cells are not receptive to insulin.

In either case, the result is high blood sugars when large amounts of carbohydrate foods are eaten.

Diabetes medications are designed to help lower blood glucose levels and they do so by targeting different organs and tissues in the body (see diagram). Medications can:

- Increase the release of insulin from the pancreas
- Increase cells' receptiveness to insulin
- Improve the body's response to insulin
- Reduce glucose production in the liver
- Reduce the digestion and absorption of carbohydrates

How are pills chosen? There are many factors used to determine which medication is the right one for you. Factors that may be considered are:

- Age
- Weight
- Length of time diabetes has been diagnosed,
- Lab values
- Liver, kidney and heart function
- Medications used in the past
- Degree of compliance

Basically, there are 5 categories of drugs which are taken orally and we will review each of these (refer to handout #1).

**1. Sulfonylureas** - these stimulate the pancreas to produce more insulin and are recommended as the first choice of medications to be used with diabetes.

Sulfonylureas can be used alone or in combination with other drugs. These drugs can take two or more days before an effect of the medication is seen.

There are seven drugs in this class with the more common drugs being Glyburide, Glipizide, Glucotrol and Amaryl. These drugs do not all work exactly the same and can have different dose levels. These medications should not be substituted for each other without first speaking with your doctor.

Typically, sulfonylureas are taken once or twice per day, sometimes just before a meal or if it is extended release, it can be taken irrespective of meal times.

Common side effects of sulfonylureas include:

- Low blood sugar/hypoglycemia
- Weight gain
- Rash

These drugs may not be recommended with the elderly because they can cause low blood glucose levels and should be avoided in patients with liver damage. They should also not be used if you have had an allergic reaction to other sulfonylurea drugs.

Your doctor should tell you how much of this drug to take and when to take it. This medication should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose, it is recommended that you:

- Take the missed dose as soon as possible
- Skip the missed dose if it is almost time for you next regular dose
- Do not take two doses at the same time

**Alcohol is not recommended with sulfonylureas**.

***Question:*** **Remember to review treatment of low blood sugars if you are taking this medicine.**

**2. Meglitinides** – help the pancreas to release insulin following a meal.

There are two drugs in this class, Prandin and Starlix, and they can be taken alone or in combination with other drugs. They are different from the sulfonylureas because they

work faster and they require that you eat some carbohydrate when taken to avoid hypoglycemia.

Also unlike sulfonylureas, these drugs are taken 15 minutes prior to **each** meal and/or snack. These pills can work up to two hours.

Common side effects of these medications can include:

- Low blood sugars/hypoglycemia
- Headaches

Your doctor should tell you how much and when to take this medication. This drug is typically taken 15 minutes prior to eating, but in some instances it may be recommended that you take it 30 minutes prior to eating. Tablets should be stored at room temperature away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose, it is recommended that you:

- Skip that dose -- do not try to make it up.
- Take the next dose as planned
- Do not take two doses at the same time.

**3. Biguanides** – Decrease liver glucose production

The common name for this drug is glucophage (metformin) and has the added benefit of possibly decreasing blood lipid levels. Glucophage can be used alone or may be combined with other medicines.

Common side effects of glucophage include:

- Nausea
- Diarrhea
- Metallic taste
- Lactic acidosis

Side effects for this drug may be decreased by starting the medicine at a low dose and increasing the dose slowly, or by taking Glucophage with meals.

This drug is not recommended if you have diabetic ketoacidosis or if you are taking medication for congestive heart failure.

***Note:*** Lactic acidosis is a buildup of lactic acid in the blood. It is rare but can be very serious. Lactic acidosis is more likely to happen when you drink alcohol or have liver or kidney disease. Also, patients having surgery or medical tests with contrast dyes will need to stop their metformin. Patients should discuss these situations with their doctors.

Over consumption of alcohol can make people sick when they are taking metformin.

People with liver or kidney damage or heart failure should not take metformin.

Your doctor should tell you how much and when to take this medication. If taken with a meal, GI upset can be avoided. Tablets should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose, it is recommended that you:

- Take the missed dose as soon as possible
- Skip the missed dose if it is almost time for your next regular dose
- Do not take two doses at the same time

**4. Alpha-Glucosidase Inhibitors** – slow down carbohydrate digestion in the intestine, which slows the absorption of carbohydrates and keeps blood sugar levels from rising.

Common names for this drug include Precose and Glyset. These two drug need to be taken with the first bite of food at all meals because they work immediately. These can be used alone or in combination with other drugs.

Common side effects of the alpha-glucosidase inhibitors include:

- Nausea
- Diarrhea
- Gas

These tend to decrease in intensity and frequency with time, usually within 1-2 months.

***Note:*** Hypoglycemia is not a risk if taken alone. If a patient takes an alpha-glucosidase with a sulfonylurea, which can cause low blood sugars, then they should be careful not to treat the low with foods that contain sucrose. Milk or glucose tablets should be used. Patients should make a plan for treating low blood sugars if they are on an alpha-glucosidase inhibitor.

Your doctor should tell you how much and when to take this medication. Take this medicine with the first bite of you meal. Tablets should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose while you are still eating or right after you finished your meal, take the dose right away. Otherwise, wait until your next meal to take your medicine. You should not take two doses at the same time.

These drugs are contraindicated if you have kidney disease with a creatinine level greater than 2.0 mg/dl, inflammatory bowel disease, colon ulceration, partial intestinal blockage, chronic intestinal disease, and liver problems such as cirrhosis.

**5. Thiazolidinediones (Glitazones)** – these drugs improve insulin sensitivity in muscle and fat cells.

Common names for this drug include Actos and Avandia, and these drugs can take 2-6 weeks to start working to lower blood sugars. Glitazones can be used alone or may be combined with other diabetes medicines.

Common side effects of Actos and Avandia include:

- Liver problems
- Leg swelling/Edema
- Shortness of breath
- Anemia

If any of these side effects are noted, they need to be reported immediately. For those taking Thiazolidinediones, a blood test for liver function should be considered when beginning the medication or if there is a concern related to liver function. Follow-up liver function tests may be advised as well.

Your doctor should tell you how much and when to take this medication. This medication can be taken with or without food. Tablets should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose:

- Take the medicine as soon as possible
- Skip the missed dose if it is almost time for your next regular dose
- You should not take two doses at the same time

# Combination Therapy

Because the different diabetes medications affect different sites in the body, if blood sugars cannot be controlled with one drug, you may be placed on more than one diabetes medication to aid with your control. Be sure to be aware of the affect of both drugs and the appropriate precautions that should be taken with each.

Because nobody likes to take multiple pills, there are drugs available in which two of the previously mentioned groups of drugs are combined. Taking one pill, instead of two can be less expensive and can increase compliance because only one pill is needed instead of two. These include:

Glucovance = Glyburide + Glucophage (Metformin)
Advandamet = Avandia + Glucophage (Metformin)
Metaglib = Glipizide + Glucophage (Metformin)

**Glucovance**

Glucovance is a combination of the sulfonylureas and biguanides, so it stimulates the pancreas to produce more insulin and also causes the liver to decrease glucose production.

Your doctor should tell you how much and when to take this medication. Take this medicine with the first bite of you meal. Tablets should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose:

- Take the missed dose as soon as possible
- Skip the missed dose it if is almost time for your next regular dose
- You should not take two doses at the same time

You should not use this medication if you have kidney disease, congestive heart failure or acute or chronic metabolic acidosis.

Common side effects include:

- Gas
- Metallic taste in your mouth
- Nausea, vomiting or diarrhea
- Headache
- Sensitivity to sunlight
- Skin rash or itching

**Avandamet**

Avandamet includes a thiazolidinediones and glucophage, so it works to decrease the production of glucose by the liver and improves insulin sensitivity in muscle or fat cells.

Your doctor should tell you how much and when to take this medication. This medicine should be taken with meals. Tablets should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose:

- Take the missed dose as soon as possible
- Skip the missed dose it if is almost time for your next regular dose
- You should not take two doses at the same time

It is recommended that alcohol use be limited with this medication. More specifically, do not binge drink for short periods or drink a lot of alcohol on a regular basis.

Common side affects of this drug include:

- Possible liver dysfunction
- Anemia
- Edema
- Nausea
- Diarrhea
- Metallic Taste
- Lactic Acidosis

If you are considering Avandamet, you should have a liver function test prior to beginning and liver function should be monitored after the drug is begun.

**Metaglib**

Metaglib is a combination of Sulfonylureas and Biguanides, like Glucovance, so it stimulates the pancreas to produce more insulin and also causes the liver to decrease glucose production.

Your doctor should tell you how much and when to take this medication. Take this medicine with the first bite of your meal. Tablets should be stored at room temperature, away from heat, moisture and direct light. Keep all medicine out of the reach of children.

If you miss a dose:

- Take the missed dose as soon as possible
- Skip the missed dose it if is almost time for your next regular dose
- You should not take two doses at the same time

You should not use this medication if you have kidney disease, congestive heart failure or acute or chronic metabolic acidosis.

Common side effects include:

- Gas
- Metallic taste in your mouth
- Nausea, vomiting or diarrhea
- Headache
- Sensitivity to sunlight
- Skin rash or itching

**Over the Counter Medications**

*Note:* Have samples of common over the counter medications available.

**Question: Have any of you ever noticed a change in blood sugars because of medication you purchased at the drug store?**

Over the counter drugs are those that you do not need a prescription to buy. Both legal nonprescription drugs and illegal 'street' drugs can have effects that you do not want. They may interact with each other or with your prescription medicines.

Be careful when using over the counter medications when you have diabetes. Many products, including liquid medicines, contain sugar and/or alcohol. Always read the label and check for warnings, particularly warnings related to diabetes. High sugar medicines could cause increases in blood sugar values and alcohol can block the action of diabetes medicines and/or stay in the body for a long time ultimately causing low blood sugars. This is more common if you are using insulin. There are many sugar and alcohol-free products now available, which are recommended for use with diabetes. Ask your doctor and/or pharmacists.

A good way to determine if an over the counter medication is affecting your blood sugars is to monitor your blood glucose values often. If you are using an over the counter medication for more than 3 days, then it is a good idea to contact your health care provider.

**Insulin**

*Question* Ask who is using insulin?
Ask what they know about insulin and if they have fears related to insulin use?

People who are diagnosed with Type 1 diabetes require insulin therapy at the time they are diagnosed. Type 2 diabetes does not require insulin for management of blood sugars. In fact, insulin can be avoided if patients follow their meal patterns, regularly exercise and take their medications, if any, as instructed.

For some patients with type 2, however, blood sugars cannot be controlled with diet, exercise and medications alone. In these instances, insulin is required. About 40-60% of those with type 2 diabetes will be on insulin at some time.

## How Insulin Works

Insulin is a hormone that is released by the pancreas. In people without diabetes, the pancreas releases a steady amount of insulin throughout the day. This is referred to as basal requirements. Then when a person eats, an additional amount of insulin is released into the blood stream to allow for the glucose from that meal to enter the body's cells. This is referred to as a bolus. Once released by the pancreas, insulin travels through the blood stream and allows glucose to enter into the body's cells.

Most people with type 2 diabetes still make some insulin, but they may not make enough or their cells may not be sensitive to the amount being produced by their pancreas. In these instances, additional insulin may be needed to move glucose into the cells.

## Goal of Insulin Therapy

The goal of insulin therapy is good control, i.e. getting your blood sugars to within those ranges previously described. Insulin treatment plans are individualized to meet an individual's needs. The amount of insulin you need to inject depends on:

- How much insulin your pancreas may or may not be making
- Your degree of insulin resistance
- Body weight
- Body shape (how much muscle vs. fat on your body)
- Food intake
- Level of physical activity
- Other medications
- General health – usually we require more insulin during illness or stress

**Types of Insulin -- Action**

There are many types of insulin (see handout #2). Some peak very quickly after injecting, whereas others do not peak at all and work over a 24-hour time frame (see handout #3). Different kinds of insulin try to mimic either the basal or bolus release of insulin by the pancreas. Types of insulin include:

1. Short acting
2. Intermediate acting
3. Long Acting
4. Premixed Insulins

1. Short Acting Insulin – includes very fast acting insulins, humalog and novalog, and the fast acting insulins, humilin and novolin. Very fasting acting insulins can be taken just before a meal is eaten as compared to fast acting insulins that should be taken 30 minutes prior to the meal.

2. Intermediate Acting Insulin – Here we have NPH, (Humulin and Novulin), and Lente (also Humulin and novulin). Usually these are injected once in the morning and the evening and/or before bedtime. With intermediate acting insulins, it is important to be consistent with meal times and carbohydrate amounts each day to prevent low blood sugar reactions. This is because once the insulin is injected, the insulin will peak 4 to 6 hours later and if a meal is skipped there will not be enough glucose available.

3. Long acting insulin – There are two types of long acting insulins. Ultralente, attempts to mimic basal insulin, but it does have a peak action. Here, the action of the insulin can last 18 to 24 hours, with a peak seen 8 to 14 hours after injection. Lantus insulin is meant to meet basal insulin needs and does not have a peak action. With lantus, there is a decreased risk of having a low blood sugar. Lantus is generally only administered once a day and the same time each day.

4. Premixed Insulins – These are insulins in which short acting and intermediate acting insulins are mixed for you. This can minimize the number of insulin injections needed, because the short acting insulin will work on the immediate meal, usually breakfast, and the intermediate acting insulin will be available for lunchtime. In this manner, pre-mixed insulins usually only require two injections per day.

In addition to premixed insulins, different types of insulins can be mixed by individuals to decrease the number of injections each day. Be cautious though, not all insulins can be mixed together. Ask your healthcare provider if the insulins you use can be mixed.

Some plans call for a consistent amount of insulin, other plans allow you to adjust the insulin based on what you will be eating for meals or what you will be doing for exercise, and still other plans also allow you to adjust for your current blood sugar level. All of these factors need to be considered when choosing the type of insulin used. Be sure you know the peak action of your insulin because this will affect your meal times.

# Methods of Insulin Delivery

*Question*: Ask how those on insulin inject themselves?

There are three different methods of insulin delivery:

1. **Vials of insulin and syringes** – amount of insulin must be drawn up from a vial into a syringe (needle) to allow for administration.
2. **Insulin pens** – generally easier to determine the amount needed; insulin is already loaded in a pen like apparatus
3. **Insulin pumps** – allow for basal, or 24-hour, insulin needs and a bolus, or mealtime, needs. Tubing is injected into the skin and is connected to a pump, which can be programmed to deliver insulin. The tubing is generally changed every 2 to 3 days.

## Usability

Short acting insulins should appear clear. Do not use if the insulin is cloudy, colored or has solid particles in it.

Intermediate and long acting insulins should appear uniformly cloudy after gentle mixing. Do not use if there are clumps in the insulin, if the bottle appears frosted or if the insulin stays at the bottom of the bottle after gentle mixing.

## Storage

***Question:*** Ask participants if they know how to properly store insulin?

Insulin is a protein and like all proteins it is sensitive to extremes in temperature. Think of an egg. If you fry an egg, the white of the egg changes in color and texture with increased heat. Likewise, if you leave your insulin in a warm car or by a windowsill, insulin will change in color and texture and it will no longer perform its function of allowing glucose into the cells.

Unopened bottles of insulin or insulin pens should be kept in the refrigerator. Keep open bottles or pens of insulin away from heat and light. Do not expose to temperatures above 86 degrees F. Likewise, never let insulin freeze.

Open bottles of insulin are usually stable at room temperature for one month and up to 3 months if stored in the refrigerator. If you see a change in your glucose levels, despite using the prescribed amount, this may be a sign that your insulin is no longer working. If this occurs, discard the bottle.

Insulin pens must be kept at room temperature after opening. Refer to the package insert for the number of days your pen may be used. This time varies based on the type of insulin and the manufacturer.

**Selection and Rotation of Insulin Injection Sites**

***Question:*** Ask where folks inject and if it hurts?

Adults and children who have enough abdominal area should use the abdominal sites only. This area provides the most consistent absorption. Those who do not have enough abdominal area will need to use arms, thighs and/or buttocks in addition to the abdominal sites. These sites are used because they have fewer nerves and a pad of fat under the skin. Insulin should not be injected where there is not enough fat. Nerve endings and blood vessels are closer to the surface and these areas will be painful to inject.

Injection sites within an area should be changed each time. This will prevent the site from getting to thick which can occur if the same site is used repeatedly. If a site does become thickened, insulin will no longer work well if insulin continues to be injected into the thickened site. This includes scar tissue.

Injecting insulin that is at room temperature is more comfortable than injecting cold insulin. Insulin at room temperature may cause fewer skin irritations.

It is common to be afraid or feel anxious about insulin injections, but with time, injections become routine. When beginning insulin injections, set a time and stick to it. This will help to establish the routine and overcome the anxiety associated with injections.

## Proper Disposal of Syringes and Other Sharps

***Question***: Ask how they would feel if they were mistakenly stuck by a needle of a friend or family member?

Do not throw needles in the trash. This could lead to somebody else getting stuck by your needle. Place used needles in a thick plastic container with a screw top (for example, bleach, detergent or fabric softener bottle).

Needles and syringes may be used more than once if necessary, but should be discarded after 24 hours to decrease risk of infection because needles will get dull with use. Do not wipe needles with alcohol. This removes the coating on needles and can make injections more painful. Also, replace the cap on needles when not in use.

# Possible Side Effects of Insulin

There are a couple of side effects of taking insulin that you should be aware of. First, when taking insulin is possible that a low blood sugar may occur. This is likely to happen when a person:

- Takes insulin and skips a meal or snack.
- Takes too much insulin
- Is more physically active than usual

***Question:*** Ask participants how they treat low blood sugars?

To treat a low blood sugar, we generally recommend the 'Rule of 15'. If you feel as though your blood sugar is low, use your glucometer to test your blood glucose. This is important because often the signs and symptoms of high and low blood glucose are the same. If you test and your blood glucose is below 70 mg/dL, then it is recommended that you take 15 g of quickly digested carbohydrate, such as 4oz of juice or 3 to 4 glucose tablets, wait 15 minutes and re-test your blood sugar. If your blood sugar is still below 100 mg/dL continue these steps until your blood sugar is above 100 mg/dL.

**REMEMBER:** Test – take 15 g of Carbs – wait 15 minutes -- Re-test, repeating process until BG values >100 mg/dL.

Another side effect of insulin is weight gain. One of insulin's many roles in the body is fat deposition, or the storing of fat. So the more insulin you use, the more likely it is that you will gain weight. That is why diet and exercise also play a role in managing diabetes. The more consistent you are with your meal plan and the more you exercise, the less insulin you will need. This should result in weight maintenance. So remember, insulin should be used in conjunction with diet and exercise.

# Traditional Medicines

***Question:*** Are any of you interested in traditional medicines?

Alternative therapies including herbal and natural products do exist. These treatments, however, if not used correctly my cause blood glucose values to go too high or too low. It is also possible that they could negatively interact with other medications and cause harm.

If you are interested in using traditional ways to treat diabetes it is important to discuss these methods with a health care provider so they can be used together with 'western' medicines to properly control your diabetes.

## Session 6 Monitoring Blood Glucose

**Objectives**: Participants will:

- understand the importance of monitoring blood sugars
- know how often to check their blood sugars
- be able to recognize blood glucose patterns
- be able use blood glucose monitoring to manage their diabetes

Materials Needed:

- Honoring the Gift of Health Manual
- Name Tags
- Safety Pins
- Blackboard and chalk or paper flip chart to write-on
- Refreshments: sugar free drinks, crackers, cheese, raw veggies, dip
- A variety of meters for demonstration
- A variety of log books/sheets available to participants

Outline

1. Why is blood glucose control important?
2. Methods for monitoring blood glucose
    a. Daily glucose testing
    b. Glycosolated Hemoglobin -- $A_1C$
3. When should I test?
4. Target Ranges
5. Record Keeping
6. Factors affecting glucose test
7. Quick tips for obtaining accurate results
8. Factors to consider when obtaining a glucose meter

### Why is blood glucose control important?

Blood glucose monitoring is one of the tools, in addition to your meal plan, medications and exercise, which allow you to manage your diabetes. Managing your diabetes helps you to feel better and reduce your risk of complications. Your body works best and you feel best when your blood sugar level is in your target range. Also, keeping your blood sugars in their target range helps you to avoid the long-term complications of diabetes (see section IX).

### Methods for Monitoring Blood Glucose

There are two methods for blood glucose monitoring, daily glucose testing and the glycosolated hemoglobin or $A_1C$ test. The first, glucose monitoring, gives you the information you need to make decisions regarding your diabetes care each day. We will teach you how to identify blood glucose patterns so that you can determine how a

certain food or activity affects your glucose levels. The second, $A_1C$ testing, is preformed every 2 to 3 months. Hemoglobin is one part of the red blood cell. Glucose in your blood can attach to hemoglobin where it stays for the life of the red blood cell. Because of this, $A_1C$ values can be correlated with an average blood sugar value (see Long Term Complications, section IX for further discussion). Listed in the table below is $A_1C$ levels and their corresponding average blood sugar.

| A1C | 5.7 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Glucose | 104 | 114 | 147 | 180 | 214 | 247 | 280 | 314 | 347 | 380 | 414 |

**When should I test?**

Individuals may have different testing regimens based on their treatment plan and blood glucose goals. Generally, most individuals test at least twice a day, testing first thing in the morning, also known as fasting blood glucose, and at supper or bedtime. Your healthcare provider may ask you to test more frequently to determine the effect of a particular medicine or the effect of meals on your blood sugars. Some possible testing regimens are listed below:

- Twice daily, fasting and at bedtime
- Fasting and 2 hours after each meal
- Before and after each meal
- Once daily, alternating time tested

It is important to remember that blood glucose monitoring done after meals should be done 2 hours after the meal. If done before this, an elevated number is a reflection of the food just eaten and is not a true measure of how effectively your body and/or medications are able to clear glucose from your blood stream. If you wait too much longer than 2 hours, then the measurement may be falsely suggesting that your body and/or medications are effectively clearing glucose from the blood stream.

To get a complete picture of your blood glucose levels, it is important to get some glucose readings at all times of the day. Sometimes you may even be asked to test your fasting and bedtime blood sugars, as well as before and after each meal, for a short period of time, particularly if you are newly diagnosed, or there has been a change in medicine to ensure that blood sugars are in their target ranges. The number of times you test can then be lowered once blood sugar values are determined to be in their target ranges.

You may also be asked to rotate your blood glucose testing, so that the number of times you test does not increase, but your blood glucose values at different meals or snacks are being examined. Samples of different rotation testing regimens are found in the tables below.

| Pre B'fast | Pre Lunch | Pre Dinner | Bed-time |
|---|---|---|---|
| X | X | X | X |
| X | X | X | X |
| X | X | X | X |
| X | X | X | X |

| Pre B'fast | Pre Lunch | Pre Dinner | Bed - time |
|---|---|---|---|
| X | | X | |
| | X | | X |
| X | | X | |
| | X | | X |

| Pre B'fast | Pre Lunch | Pre Dinner | Bed - time |
|---|---|---|---|
| X | | | |
| | X | | |
| | | X | |
| | | | X |

**Target Ranges**

So now that I am measuring my blood sugars and $A_1C$ values, where should they be? Three different organizations, the American Association of Diabetes Educators (AADE), the American Association of Clinical Endocrinologists (AACE) and the American Diabetes Association (ADA), have made recommendations with respect to blood glucose monitoring targets. The first two are recommending very strict control as detailed under Ideal control in the table below. Ideal control attempts to keep blood glucose targets as close to normal as possible in order to avoid the long term-complications of diabetes (see section IX). You should ask your doctor which recommendations you should be striving for because there are a number of variables that may need to be taken into account.

Factors that help determine your target blood glucose range include your:

- Personal goals and the changes you are willing to make
- Diabetes management plan
- Medications
- Health status
- Life expectancy

Target Blood Sugar and A1C levels

| | **Ideal** | **Acceptable** |
|---|---|---|
| A1C | < 6.5 | < 7.0 |
| Fasting or pre-meal | 7 – 110 | 90-130 |
| 2 hours after a meal | <140 | <180 |

When comparing your numbers to these target ranges, do not think of you numbers as good or bad, but rather as a guide which can help you and your healthcare team know what changes need to be made with your management plan.

Also, you will learn to manage your diabetes better, the more experience you have evaluating your own numbers.

## Record Keeping

It is important that your test results be written down, for your benefit and the benefit of your healthcare team. Written blood sugars allow us to look at the patterns in your blood sugars and determine what changes, if any, need to be made to, food, medications or exercise patterns. If you do not write your blood sugars down and simply leave them in your meters memory, this can make determining patterns more difficult. You may also have to wait while your healthcare provider writes these numbers down and this can take up valuable time.

There are several logbooks available and you can always keep track of your blood sugars in a small notebook. Make sure it is clear when the blood sugar is being taken, i.e. before or after meals. In the comment section, make notes of anything that may have affected your blood sugar, such as eating a large meal, stress or increased exercise levels. Be sure to bring this log to each of your doctor's visits. (A sample log sheet can be found at the end of this section).

***Exercise:***

An example blood sugar records is shown below. Circle those values, which are above target ranges. Can you find any patterns or areas that need to be addressed?

| Date | Breakfast | | Lunch | | Dinner | | Bedtime |
|---|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After | |
| 4/1 | 90 | 218 | 101 | 125 | 87 | 113 | 146 |
| 4/2 | 86 | 197 | 95 | 116 | 110 | 92 | 163 |
| 4/3 | 106 | 183 | 98 | 136 | 98 | 133 | 190 |
| 4/4 | 128 | 205 | 84 | 93 | 111 | 116 | 156 |

***Note to Instructor:*** Generally, the above blood sugar patterns are well controlled. We see consistent elevated blood sugars, however, following breakfast meals and at bedtime. With respect to breakfast, because blood sugars are elevated following the meal and not before, this pattern suggests that this individual is eating too many carbohydrates for breakfast. The bedtime blood sugars, which are elevated whereas the dinnertime blood sugars are not, also suggest that this individual is eating too many carbohydrates for a bedtime snack. Further, it also appears that on the morning of 4/4, the large bedtime snack and elevated bedtime blood sugar, resulted in an elevated AM blood sugar.

This patient would likely be instructed to first cut back on their carbohydrate amounts at these two meals. If blood sugars remained elevated despite a lower carbohydrate intake, then adjustments to exercise, such as encouraging the patient to walk following breakfast, or adjustments to medications would need to be made.

***Note to Instructor:*** At this time, patients should use their logbooks, or transfer their readings to a glucose record sheet so that they can work to evaluate their own blood sugar patterns.

**Factors affecting glucose test results include**

Listed below are factors that can affect your blood sugars. Be sure to troubleshoot and make notes for yourself and your healthcare provider as they happen, so that blood sugars can be accurately evaluated.

- Food and beverage intake
- Diabetes medicines
- Other medicines
- Exercise
- Stress
- Timing of foods and medicines
- When you test
- Outdated Test Strips
- Inadequate blood sample
- Meter not calibrated to strips
- Meter not clean

**Quick tips for obtaining accurate results**

These tips are designed to help you ensure that you are obtaining accurate results blood glucose testing results. If you feel that you are getting results that are wrong, use this list to troubleshoot possible causes of errors.

- Calibrate meter according to manufacturer's directions
- Do quality control testing as recommended
- Check expiration date and code number on bottle
- Keep test strips tightly sealed in bottle
- Obtain adequate drop of blood
- Use a lancing devise that allows for a deep enough puncture
- Wash hands vigorously with warm water before finger prick
- Dangle fingers at your side for 30 seconds before finger prick
- Prick the sides of fingertips
- Do not expose meter or strips to extreme heat or cold
- Clean meter frequently and properly

**Factors to consider when obtaining a glucose meter**

Today's meters can have many bells and whistles, or special features, but purchasing the most expensive meter may not be necessary and it may not be the best choice for you. Follow these suggestions when trying to determine which meter you should use.

- Which meter is allowed by your insurance/health care plan (insurance companies may reimburse for the meter, strips, etc but only if you buy a particular meter – contact your insurance company first before obtaining a meter)
- Recommendations from your health care provider
- Accuracy
- Ease of use
- Meter size
- Testing time
- Blood sample size requirements
- Expense (ask about special offers and rebates)
- Service from the manufacturer (use the toll free number on the back of the meter)
- Cleaning and maintenance requirements
- Meter memory and data management systems

## **Session 7** Knowing your numbers-

**Objectives**:
This section will introduce participants to the different terms and conditions that impact their health. Understanding these concepts will improve your ability to take care of yourself, and ask questions concerning your own treatment when seeing your physician.

**Materials and Supplies**
To conduct this session you will need:
Honoring the Gift of Health Manual,
Name Tags & Safety Pins,
Blackboard and chalk or paper flip chart to write-on.
Refreshments: sugar free drinks, crackers, cheese, raw veggies, dip

**Introducing the Session**

**Welcome**
Introduce yourself as people walk in
Ask each person his or her name. Write it on a nametag or give each person a nametag.
Ask group members to wear the nametags on their shirts.
Welcome the group, and express thanks for their attendance.

**Program Overview**
Begin by explaining that the purpose of this session is to provide information about blood pressure, hemoglobin A1C, cholesterol, and body fatness. All of these factors are associated with diabetes and the complications that arise from diabetes. Understanding and controlling these factors will improve our health.

**Course Outline:**
1. Blood Pressure
   - Systolic
   - Diastolic
   - Blood pressure as a risk factor
   - Blood pressure and diabetes
2. Hemoglobin A1C
3. Serum Lipids
   - Total Cholesterol
   - HDL-cholesterol
   - LDL-cholesterol
   - Triglycerides
4. Body Fatness
   - Overfat and obese
   - Risk associated with over fatness
   - Methods of assessment
   - Maintaining a healthy weight

**Blood Pressure**
Blood pressure is the force exerted against the wall of the blood vessels by the blood. This is a routine clinical measurement taken every time you visit your physician, and an indication of health.

We measure and report blood pressure by systolic and diastolic pressure. Systolic pressure is the pressure during the contraction phase of the heart, and diastolic pressure represents the pressure during the relaxation phase of the heart.

Optimal blood pressure is <120 for systolic, and <80 for diastolic. A blood pressure of 110/70 would be ideal. Hypertension is a relative term. The higher our blood pressure, the higher our risk for cardiovascular disease and micro vascular diseases associated with diabetes. We generally consider a blood pressure reading of 140/90 to be high. As the pressure climbs, so does the risk.

Lifestyle intervention has been shown to have a positive impact on our blood pressure. It may be necessary to take medication to lower our blood pressure. However changes in many of our health habits can reduce the risk associate with high blood pressure.

Some of the lifestyle changes that can positively impact blood pressure are:

- Increased physical activity.
- Decreased dietary sodium.
- Weight loss.
- Stop smoking.
- Stress Management
- Reduced alcohol consumption

If none of the above mentioned lifestyle interventions work, medication may be required to bring your blood pressure into a safe range. Of course lifestyle modification or increasing the number of health habits is beneficial even if we are taking medication.

**Hemoglobin A1C**
Hemoglobin A1C (HbA1C), also known as glycated hemoglobin or glycosylated hemoglobin forms when glucose attaches itself to hemoglobin. HbA1C is an indication of how well you have been controlling your blood sugars over the past 2-3 months. Three months or 120 days is the normal life span of a hemoglobin molecule. Glucose binds irreversibly to Hb and HbA1C levels only change when the old cells are replaced.

HbA1C values are not subject to the fluctuations that are seen with daily blood glucose monitoring. When glucose levels are high, the glucose will bind to Hb thus raising the HbA1C levels. Hb does not have glucose attached to it when the red blood cells are first formed. People with diabetes have high levels of blood sugar, and the higher blood sugar levels over time attach the extra glucose to the Hb molecule. Thus the HbA1C levels indicate how high your blood sugar levels have been over the life of the red blood cells that is 120 days.

The amount of Hb that has become glycosylated or bonded with glucose depends on the blood glucose levels. An average person will have approximately 6% glycosylated, and the diabetic hopes to keep their values under 7.0.

The American Diabetes Association recommends that a person's A1C be tested two to four times a year. Reasons for testing include:

- First A1C test when you're diagnosed with diabetes or when you start initial treatment
- Two times a year if you have type 2 diabetes (formerly called adult-onset or noninsulin-dependent diabetes) and don't use insulin, and your blood sugar is well controlled with diet and exercise or oral medications
- Every 3 months if you have type 1 (formerly called juvenile or insulin-dependent diabetes) or type 2 diabetes and use insulin
- Every 3 months if you change treatment, such as starting a new medication, or if your blood sugar isn't well controlled

Your A1C testing schedule may vary depending on your individual situation and how your diabetes changes over time.

The HbA1C test does and cannot replace self-testing of your blood sugar. The HbA1C reflects how well you are controlling your blood sugar over time (2-3 months) not what your blood sugar is at that time of day. Daily self-testing must continue to tell whether you are facing an emergency, or need to adjust your medications.

**Serum Lipids**

Heart disease is a serious risk for diabetics, and an unfavorable serum lipid profile is a significant risk factor for heart disease. The risk for heart disease is even higher when an unfavorable serum lipid profile is combined with another risk such as diabetes, hypertension, physical activity, and obesity, smoking or family history.

Cholesterol has many components. The serum lipid components that are of interest are: total Cholesterol (TC), Low-density lipoprotein (LDL-C), High-density lipoprotein (HDL-C) and Triglycerides (TG). The total cholesterol level that is reported is the sum of the cholesterol components such as LDL-C and HDL-C. Triglyceride is another lipid. There are numerous other classifications of serum lipids, but these four will satisfy our initial discussion.

Cholesterol can be obtained either from the food we eat, or manufactured by the liver. Cholesterol is an important component in our body for the formation of hormones such as testosterone, Vitamin D, bile acids that allow use to digest fats, and adrenal hormone such as cortisol. Heart disease risk increases when the level of cholesterol circulating in our blood is elevated.

We get our dietary cholesterol from animal products. Any food that comes from an animal source such as meat and milk has cholesterol. We usually find that the higher

the fat content of the food, the more cholesterol we can manufacture in our body. We do not need to eat foods high in cholesterol to elevate our cholesterol levels. So if is generally recommended that we eat a diet low in fat to keep our cholesterol levels down in the safe range.

The ideal cholesterol profile is where our HDL-C is high, and our LDL-C level is low. We cannot eat LDL-C, or HDL-C, so these important components of cholesterol represent the cholesterol manufactured in our body by our liver.

LDL-C represents the cholesterol that is going to our arteries to form the plaque. The higher the LDL-C levels, the higher our risk for developing heart disease. The higher our LDL-C level, the more plaque we form, and the less blood flow we have to the heart. It is generally recommended that our LDL-C levels be below 125 mg/dl.

HDL-C represents the cholesterol that is being transported to liver to be broken down and excreted. The higher the HDL-C levels, the more protection we are thought to have from heart disease.

Triglyceride is a blood fat that we can also eat. In fact most of the fat we eat is in the form of triglyceride. We also can manufacture TG from excess food energy such as carbohydrates (especially sugar), protein and alcohol. Any food that we eat and which our body cannot use at that time is converted to TG for storage. We can store a lot of TG. We also wish to keep our TG levels in our blood low.

**What are some health habits to improve our serum lipid profile?**
There are a number of things we can do to change our serum lipid profile.

Regular exercise has been shown to decrease our TC, LDL-C, and TG while raising our HDL-C. The great thing about exercise is that it does not need to be highly intense to be beneficial. Low intensity aerobic exercise that is done regularly is the best form of exercise for changing our serum lipids.

Smokers tend to have less favorable serum lipid profiles than do nonsmokers, so it is best if we stop smoking. Smokeless tobacco is also not recommended.

Diets should be low in fat and high in fiber. The lower the fat content, the less fat and cholesterol we provide for the manufacture of these serum lipids that raise our risk. We also need to include some of the essential fatty acids such Omega-3, and Omega-6 fatty acids, which have a positive impact on our lipid, profile by lowering the LDL-C, and raising the HDL-C. The increase of fiber in our diet binds the bile in our bowels, and slows down the absorption of fat into our body. High fiber diets have been shown to improve our cholesterol.

Weight loss has also been shown to be beneficial to serum lipids. Without changing any of the other risk factors, a person should see a decrease in their cholesterol if they lose weight and keep this weight off.

**Body Fatness**

Obesity is second only to tobacco use as the leading cause of preventable death in the United Sates. Over fatness and obesity impacts the health of over 50% of adults in the United States today and is becoming an increasing problem for our young people.

The progression of obesity has increase since the early 1900s, and if the progression of obesity continues as its present rate, 75% of adults will be obese by 2025. We may see an entire adult population who is obese by the time our grandchildren have children. Obese children tend to have greater health problems as adults than do children who were not obese.

The medical cost is in excess of $125 billion dollars yearly. The health cost increases as we age, and women are more severely impacted than men. According to a study by the University of Michigan, an obese woman between the ages of 57 and 67 has a net worth 60% less than her non-obese peer.

Obesity is a significant risk factor for many chronic diseases. Chronic diseases that are impacted by obesity are: diabetes, heart attack, stroke, high blood pressure, hyperlipidemia, several types of cancer, osteoarthritis, sleep disorders, eating disorders, gout, gallbladder disease, and mood disorders.

**How do I know I am overfat?**

Over fatness and obesity is not simply weight according to height. So stepping on the scale can be a first step is finding out if you are overfat, but weight alone is not the best method. Many people can be physically active and heave a high amount of muscle mass compared to their total body weight.

The easiest method of determining or classifying over fatness and obesity is Body Mass Index (BMI). BMI us weight/height2 (kg/m2) and a BMI of 25-30 is classified as overfat, and >30 is classified as obese. As your BMI increases, your health risk increases.

Waist to hip ratio is another method of determining body fatness. The higher the ratio the greater the risk. Women should have a waist/hip ratio less than .80, and men should have a waist/hip ratio less than .95.

Other methods of measurement are skinfolds or fatfolds. As our body fatness increases, so does the sum of our skinfolds. A person who has a skinfold thickness (three site) of 90 mm has a higher percentage of body fat than someone with a skinfold sum of 60 mm.

Girth measurements are another reliable measurement tool for determination of body fatness. Our body girth in selected sites such as the abdomen, upper arm, and thigh tend to increase as overall body fatness increases.

Other methods of determining body fatness include underwater weighing using water displacement, and air displacement known as BodPod. Fat has a lower density than muscle, and therefore takes up more space. An average body fat person weighing the same as an obese person will wear smaller size clothes, and will displace less space in the water or air. Another way to look at this is that fat floats. Fat is less dense than water, so fat floats.

**Does it make any difference where I store my fat?**
Health risk associate with body fatness is increased if we store this body fat in our abdomen. Health risk is higher for those people that store their fat in the abdomen. Fat that is stored in the abdomen is associated with an altered metabolic profile and increased risk for chronic disease.

**How do I manage my weight?**
Programs that assist people to lose weight typically are unsuccessful. Out of 100 people who lose weight on any weight loss program, only 5 people have successfully kept the weight off five years later. Short-term weight loss is not a long-term benefit to our health.

We have been gaining weight steadily over the past 100 years. This weight gain is generally the combination of increased food consumption, and a decrease in our physical activity. We do not have to expend as much physical energy today to prepare meals and hunt game as we did over 100 hundred years ago. Successful weight loss programs use a combination of decreased kcalorie intake and increased energy expenditure, or eat a little less and work a little more.

The National Weight Loss Registry has evaluated the programs of people who have reported successful weight loss and maintenance over a year. Those that have been successful in losing weight and keeping it off generally tend not to use fad diets. Calorie reduction either comes from removing one or two high calorie foods from the diet or simply eating smaller portions. This is combined with the equivalent of walking 4 miles seven days each week.

## Session 8: Acute Complications

**Objectives:**
By the end of this session, participants will:
- Be able to identify signs and symptoms of hypoglycemia.
- Be able to treat hypoglycemia
- Be able to identify signs and symptoms of hyperglycemia.
- Be able to treat hyperglycemia.
- Manage your blood glucose during an illness.

**Materials and Supplies** -- To Conduct this session you will need:
Honoring the Gift of Health Manual
Name Tags
Safety Pins
Blackboard and chalk or paper flip chart to write-on
Refreshments: sugar free drinks, crackers, cheese, raw veggies, dip

**Introducing the Session**

**Welcome**

Introduce yourself as people walk in
Ask each person his or her name. Write it on a nametag or give each person a nametag.
Ask group members to wear the nametags on their shirts.
Welcome the group and express thanks for their attendance.

**Program Overview**

Begin by explaining that the purpose of this session is to provide information about diabetes and the acute complications, i.e. the immediate health outcomes that result when your blood sugar is not well controlled.

During the presentation facilitate group discussion to present materials. Several questions to ask of the group can be found throughout the materials in italics to aid with discussion. You can use these or other questions as they arise. Encourage participants to share their thoughts, experiences with friends and family members and fears about the acute complications of diabetes.

**Outline**

Hypoglycemia
Hypoglycemia
Illness and Diabetes

**Hypoglycemia**
Hypoglycemia (low blood sugar), occurs when your blood glucose (blood sugar) level drops too low to provide enough energy for your body's activities. It is the most common complication you will have when managing your diabetes. It is very important to know about low blood glucose and how to treat it. Hypoglycemia can come on quickly and cause you to pass out or not be able to help yourself.

**Ask: What causes hypoglycemia?**
Hypoglycemia (low blood sugar) can be caused by eating too little food, eating food too late, exercising too much (exercise uses up a lot of glucose), or taking too much diabetes medicine.

Glucose, a form of sugar, is an important fuel for your body. We use glucose for most activities like work and play, and it is the major energy source for our brain.

Carbohydrate rich foods are the main dietary sources of glucose. Rice, potatoes, bread, tortillas, cereal, milk, fruit, non-diet pop, and sweets are all carbohydrate-rich foods. After a meal, glucose molecules are absorbed into your bloodstream during the digestion of food and carried through the blood to the cells, where they are used for energy. Insulin, a hormone produced by your pancreas and secreted into your blood, helps glucose enter cells. If you take in more glucose than your body needs at the time, your body stores the extra glucose in your liver and muscles in a form called glycogen. Your body can use the stored glucose whenever it is needed for energy between meals. Extra glucose can also be converted to fat and stored in fat cells.

When blood glucose begins to fall, glucagon, another hormone produced by the pancreas, signals the liver to break down glycogen and release glucose, causing blood glucose levels to rise toward a normal level. If you have diabetes, this glucagon response to hypoglycemia may be impaired, making it harder for your glucose levels to return to the normal range.

Symptoms of hypoglycemia include
- hunger
- nervousness and shakiness
- perspiration
- dizziness or light-headedness
- sleepiness
- confusion
- difficulty speaking
- feeling anxious or weak

Hypoglycemia can also happen while you are sleeping. You might
- cry out or have nightmares
- find that your pajamas or sheets are damp from perspiration feel tired, irritable, or confused when you wake up

**Think you have low blood glucose?**
If you think you have low blood glucose, check it and see if you need to eat something. If you do not have a glucose monitor with you and you think you have low blood glucose, assume it is low and treat it.

**How low is too low? Less than 70**

If your blood glucose is below 70 mg/dl, treat immediately.

- Glucose 50-69, take 15 grams of carbohydrate
- Glucose less than 50, take 30 grams of carbohydrate
- If you are taking Precose®, use blood glucose tablets to treat hypoglycemia.

Treatment of low blood glucose requires you to eat some carbohydrate rich food. This food should provide approximately 15 grams of carbohydrate, and be absorbed quickly. Several easily accessible foods that provide readily absorbed carbohydrates are:

| Food Choices | Amount of Food to be eaten |
|---|---|
| Glucose tablets | 3-4 tablets (depending on brand) |
| Apple Juice | ½ cup |
| Non-diet pop | ½ cup |
| Honey or Sugar | 1 tablespoon |
| Life savers | 6-7 (chew/crunch them) |
| Milk (skim) | 1 cup |

**What do I do after I treated my low blood sugar?**
You have eaten the carbohydrate rich food. It will take some time for this food to be digested, and absorbed into your blood stream. Wait 15 minutes and test your blood glucose again. If your blood glucose reading is still less than 70 mg/dl, take another 15 grams of carbohydrate and wait another 15 minutes. If this is just after exercise, or right before bed treat until you get your blood glucose up to 100 mg/dl.

Remember: All food taken to treat low blood sugar is in addition to your regular meals. Do not decrease the amount of food you eat without advice from your health care team.

It is important to record your blood glucose and try to determine what caused your low blood glucose. You may need to talk to your physician about getting a prescription for glucagon that can be administered by your family or friends.

**What happens if I do not have any symptoms?**
Sometimes people with diabetes do not know they have low blood sugar. This can be dangerous, so check your glucose frequently. If this persists, talk to your doctor.

**Do not drive with low blood glucose.** This is dangerous and you could pass out. Be sure to carry some fast acting glucose with you or in your car at all times.

**Prevention:**

- Eat your meals and snacks on time.
- Take your diabetes medicine as directed.
- Learn to adjust food or medicine for changes in exercise or physical activity.
- Check your blood glucose frequently.

**Hyperglycemia**

Hyperglycemia (high blood glucose) is a classic sign of diabetes. The blood glucose is high, but unable to enter the cells that can use or store the glucose. This abnormally high blood glucose can go higher when the starving cells signal the liver to release more glucose from storage.

**What causes hyperglycemia?**
Hyperglycemia can result from eating too much, not getting enough exercise or physical activity, illness, stress, or not enough diabetes medicine.

**What are the symptoms of hyperglycemia?**
Symptoms of elevated blood glucose levels can be:

- Extreme thirst
- Frequent urination
- Dry skin
- Hunger
- Blurred vision
- Drowsiness
- Nausea

Some people may not show any signs or have any symptoms of high blood glucose.

Hyperglycemia can come on suddenly, or over a matter of several days. High blood glucose levels over a long period of time can lead to complications of diabetes.

**What can I do?**
Try to find out why your blood glucose levels are high?
Have I eaten too much?
Have I eaten too much carbohydrate?
Have I not exercised lately?

**Treatment: Follow your plan.**

- Follow your meal plan
- Follow your exercise plan
- Take your diabetes medicine as directed
- Learn to deal with the stress you may have in your life

If you follow all of these guidelines and your blood glucose levels are still high, call you doctor. You may need to adjust or change your medication.

**Call your doctor if:**

- More than 1 of 4 glucose readings is out of your target range.
- Most of your readings in the last 2-3 days are over 240, or over 300 for one day.

Monitoring and controlling your blood glucose levels will significantly reduce your risk for developing complications of diabetes.

**Management During Illness**

We often do not feel like eating when we are ill. We still need energy to fight off the illness, and if we do not eat and drink we become weak.

**Objectives During Illness.**

- Keep blood glucose as stable as possible by replacing the carbohydrate portion of your drinks and balancing with your medicine.
- Prevent dehydration by drinking plenty of liquids.
- Prevent sever complications by frequent monitoring and following the guidelines for glucose control.

We also find that our metabolism rises when we are ill, so we must find a way to nourish our bodies to become well again. Our blood glucose levels often are higher when we are ill. Our bodies fight off the illness by releasing hormones that elevate glucose to fight the disease or infection.

Take your medicine even if you are not eating as much as normal. Monitor your glucose levels and take your insulin if you are on insulin.

Minor illnesses such as colds, the flu, or even an upset stomach can be a problem.

Follow these guidelines.

- Check your glucose every 4 hours
- Follow guidelines on eating during an illness
- Drink liquids every hour when awake to prevent dehydration and fight the fever.
- Check your ketones every four hours.
- Check your temperature every four hours.
- Follow the guidelines for calling your doctor.

It is important to eat the same amount of food when we are ill. Our bodies need the energy to fight infection and fever. It is important to eat the same amount of carbohydrate even if we do not have an appetite. Follow your regular diet if possible, and if you have a hard time swallowing, choose softer foods with the same carbohydrate content.

Difficulty swallowing, nausea, or vomiting can cause us problems. Try liquids to ease your discomfort and fulfill your carbohydrate requirement. Carbonated liquids such as pop may need to sit for a few minutes to stand at room temperature to allow the fizz to disperse. You can speed this up by poring into a glass and letting the carbonation or fizz disperse.

Most adults need 150 grams of carbohydrate every day. If you blood glucose levels are higher than 240, you may not need as much as you normally eat. Be sure to check you glucose levels regularly to maintain your correct levels.

Drink a glass (8 oz) of liquid every hour when you are awake to prevent dehydration.

**Carbohydrate free**

- Diet pop
- Herbal tea
- Broth or bouillon
- Water

**Foods with 15 grams of Carbohydrate**

- ½ cup regular pop
- ½ cup chicken noodle soup
- 1/3 cup grape juice
- ½ twin popsicle
- ½ cup ice cream**
- 6 soda crackers
- 1 cup milk**
- ½ cup ginger ale
- ½ cup sugar free pudding**
- ¼ cup regular gelatin
- ½ cup orange or apple juice
- 1 cup plain (non-sweetened) yogurt
- ¾ cup sport drink
- ¼ cup sherbet
- 1 piece toast
- 1/3 cup cooked cereal
- ½ cup cream soup**
- ¼ cup regular pudding

** Watch milk products if you have diarrhea

## Session 9: Long Term Complications of Diabetes

### Objectives

By the end of this session, participants will:

Know the long-term complications of diabetes
Be able to state how long term complications can be avoided and/or stabilized

**Materials and Supplies** -- To Conduct this session you will need:
Honoring the Gift of Health Manual
Name Tags
Safety Pins
Blackboard and chalk or paper flip chart to write-on
Refreshments: sugar free drinks, crackers, cheese, raw veggies, dip

### Introducing the Session

### Welcome

Introduce yourself as people walk in
Ask each person his or her name. Write it on a nametag or give each person a nametag.
Ask group members to wear the nametags on their shirts.
Welcome the group and express thanks for their attendance.

### Program Overview

Begin by explaining that the purpose of this session is to provide information about diabetes and the long-term complications, i.e. the health outcomes that result with time, particularly when diabetes is not well controlled.

During the presentation facilitate group discussion to present materials. Several questions to ask of the group can be found throughout the materials in italics to aid with discussion. You can use these or other questions as they arise. Encourage participants to share their thoughts, experiences with friends and family members and fears about the long-term complications of diabetes.

# Outline

1. Native Americans and diabetes-related complications*
2. How does high blood glucose cause complications?
3. What factors contribute to the development of complications?
4. Long term complications
    - Eye Disease
    - Kidney Disease
    - Heart Disease
        a. Poor Circulation
        b. Stroke
5. Infections
6. neuropathy
    a. Peripheral Neuropathy
    b. Autonomic Neuropathy
        i. Sweating
        ii. Gastroporesis
        iii. Impotence
        iv. Neurogenic Bladder
        v. Orthostatic Hypotension
        vi. Autonomic Cardiac Neuropathy
7. Foot Care
8. General Guidelines for controlling long-term complications

**Native Americans and diabetes-related complications***

***Question:*** Are any of you familiar with the long-term complications of diabetes, or what can happen when you do not control your blood sugars?
Do you know any one personally who is affected by any diabetes complications?

The long-term complications of diabetes can lead to eye, kidney, heart, and nerve damage. These complications are associated with high blood sugar levels and are often avoided if blood sugar levels are kept within target ranges. Among native populations the serious complications of diabetes are increasing in frequency. Most concerning are the increasing rates of kidney failure, amputations and blindness. Following are some statistics most relevant to Native Americans:

- Heart disease strikes people with diabetes twice as often as people without diabetes. People with diabetes are five times more likely to suffer strokes, and once having had a stroke, are two to four times as likely to have a recurrence. Deaths from heart disease in women with diabetes have increased 23% over the past 30 years compared to a 27% decrease in women without diabetes. Deaths from heart disease in men with diabetes have decreased by only 13% compared to a 36% decrease in men without diabetes.

- Ten to 21% of all people with diabetes develop kidney disease. In 2000, 41,046 people with diabetes initiated treatment for end-stage renal disease (kidney failure), and 129,183 people with diabetes underwent dialysis or kidney transplantation. Among people with diabetes, the rate of diabetic end stage renal disease is six times higher among Native Americans.

- Diabetes is the most frequent cause of nontraumatic lower limb amputations. The risk of a leg amputation is 15 to 40 times greater for a person with diabetes. Each year 82,000 people lose their foot or leg to diabetes. Amputation rates among Native Americans are 3 to 4 times higher than the general population.

- 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. Diabetic retinopathy occurs in 18% of Pima Indians and 24.4% of Oklahoma Indians.

* Information adapted from the American Diabetes Association, http://www.diabetes.org/diabetes-statistics/native-americans.jsp

The long-term complications described above, however, do not have to occur if your blood sugars are well controlled. In order to understand better why the emphasis on good blood sugar control is recommended, a discussion of how these long term complications develops follows.

**How does high blood glucose cause complications?**

When blood glucose levels are elevated, this 'extra' glucose in the blood stream can attach to proteins in the blood. One of these proteins, hemoglobin, is part of the red blood cell. The amount of glucose attached to hemoglobin can be measured with a test called the Glycosolated Hemoglobin $A_1C$ ($A_1C$), which can be loosely interpreted as 'sugared hemoglobin'. To explain further, because excess sugar or glucose attaches to this protein found in hemoglobin, this is also known as glycosolation, and because this protein has a ½ life of 3 months, we can use the $A_1C$ as a yard stick to measure high blood sugars values for a 2 to 3 month period. $A_1C$ values can then be correlated with an average blood sugar. For people with diabetes, it is recommended that their $A_1C$ stay below 7.0, which corresponds roughly to an average blood sugar of less than 150. For people who do not have diabetes, $A_1C$ values generally range from 4 to 5.7, or an $A_1C$ of less than 120 approximately.

**What factors contribute to the development of complications?**

***Question:*** Can any one tell me what causes the long-term complications? Why would we want to control our blood sugars?

The following risk factors contribute to the development of diabetic complications:

- Length of time with diabetes
- Blood glucose levels
- Genetic factors
- High blood pressure
- High cholesterol
- Smoking

The single most important factor contributing to complications is high, or uncontrolled blood sugars over time. If you have had diabetes for some time you may be aware that glucose values ranging from 150 to 200 rarely cause symptoms. Most people do not feel symptoms until blood glucose is elevated to well above normal.... at 240 or more.

In the 1980's, doctors and patients asked the question: Is it necessary to lower blood glucose levels to 80 to 120, normal ranges for people without diabetes, if people felt alright when their blood sugar levels were 200 or above? A study, the Diabetes Control and Complications Trial (DCCT), was conducted to answer this question.

During this trial, one group of participants kept their blood glucose as close to normal as possible, with goal ranges of 80 – 140. This was the tight control group. The other group, known as the conventional treatment group, followed the standard treatment at that time. As long as patients were feeling good, they did not worry about their glucose readings. Glucose readings for this group ranged from 150 to 180 and sometimes higher.

At the end of 10 years, the results were remarkable. Comparing the two groups showed that the tight control group had a:

- 76% reduction in eye damage
- 56% reduction in kidney damage
- 60% reduction in nerve damage

The tight control group had an average $A_1C$ of 7.2% as compared to the conventional treatment group with an $A_1C$ of 8.9%.

Because of this study, doctors and caregivers changed their approach to diabetes care and became more aggressive at keeping blood sugars in the normal range.

Another study, the United Kingdom Prospective Diabetes Study (UKPDS), conducted in Britain and published in 1999 confirmed the findings from the DCCT. This study looked at high blood glucose and high blood pressure as risk factors in type 2 diabetes. Again it was found that when patients lowered their $A_1C$ from 7.9 to 7.0 they had a:

12% decrease in any diabetes related complications
16% decrease in cardiovascular complications
25% decrease in eye and kidney complications

Poorly controlled blood sugars over time can lead to eye, kidney, heart and nerve disease. Below a discussion of each of the possible long-term complications of diabetes can be found. Included in these discussions, are the recommendations for avoiding these complications, early symptoms or warning signs if any, and treatment options.

***Question***: How do you feel about these long-term complications? Does knowing that if you control your blood sugars motivate you to keep your blood sugars in range? Why or why not?

**Eye Disease or Retinopathy**

Retinopathy is damage to the small blood vessels lining the eye, which can develop over a long period of time, anywhere from 5 to 10 years. Vessels may become blocked, fragile and leak material into the eye. Sometimes vessels break and bleed. There can also be an overgrowth of new blood vessels to compensate for the old weaker vessels, but these blood vessels are more prone to break.

There no early symptoms of eye disease, which is unfortunate because this is when, eye disease, or retinopathy can be treated. The only way for eye disease to be detected is with regular eye exams. Later symptoms may include blurred vision, floaters in the eye or loss of peripheral vision.

In order for retinopathy to be prevented, it is recommend that:

- Blood glucose levels stay within target ranges with $A_1C$ levels at 7.0 or below
- Blood pressure levels should be controlled below 130/80
- Regular eye exams (dilated) should be undergone yearly

If retinopathy does occur, treatment options include:

- Laser surgery – tiny pin point laser burns on damaged vessels to prevent more serious bleeding
- Vitrectomy – this surgery is done following a bleed into the eye. The bloody fluid in the eye is replaced with clear fluid to restore sight.

***Question***: Do you all get your eyes examined every year?

**Kidney Disease or Nephropathy**

***Question:*** Who can tell me what a microalbuminurea test is for?

Kidney damage may occur slowly with diabetes. If it occurs, it usually develops about 15 to 20 years after diagnosis in non-native populations. In native populations depending on the tribe of origin, however, the onset of kidney disease may be accelerated.

If symptoms of kidney disease are found in the early stages, progression may be slowed. High blood sugar levels causing damage to the small blood vessels in the kidney cause these symptoms in the kidneys like the eyes. When this condition occurs waste products are kept in the body instead of being excreted in the urine. The first sign of change in the kidneys is leakage of protein in the urine. The most sensitive test to check for this protein leakage is a urine test for microalbumin. This test can reveal changes in kidney function 5 to 10 years before serious kidney problems develop. If this test finds that protein levels are elevated it is recommended that you get a repeat test to confirm the results. If test results are confirmed, your doctor or healthcare provider may put you on medications to protect your kidneys from further damage as well as attempting to control your blood pressure, which affects kidney function as well.

There are no early symptoms of kidney disease in type 2 diabetes. Test for microalbuminuria and blood pressure levels greater than 130/80 are indicators that kidney dysfunction may be occurring. Advance symptoms of kidney disease may include edema or fluid overload, nausea and poor appetite.

In order to prevent or delay onset of kidney disease, it is recommended that:

- Blood glucose levels stay within target ranges with $A_1C$ levels at 7.0 or below
- Yearly microalbumin urine test be performed
- ACE Inhibitors may be used
- Salt use be limited
- Bladder infections be treated promptly

To treat kidney disease, the following may be used:

- Special diet, initially decreased protein
- Medications
- Dialysis – here a machine is used to filter the blood
- Kidney transplant

**Heart Disease**

***Question***: Who here also has heart disease?

Diabetes can affect the heart in several ways, including atherosclerosis, cardiomyopathy and congestive heart failure (CHF). This occurs because diabetes can result in a faster rate of hardening of the arteries.

Atherosclerosis occurs when fatty deposits clog up blood vessels and the vessels become narrowed or blocked. When a blockage happens in the heart it can cause chest pain. Sometimes the small blood vessels in the heart become clogged causing a more chronic condition called cardiomyopathy in which the heart muscle becomes scarred and as a result does not pump well. Sometimes fluid will collect in the legs and

feet and a person may have difficulty breathing or chronic fatigue. This is congestive heart failure.

Risk factors for heart disease include:
- Diabetes
- Heredity
- Gender
- Stress
- Obesity
- High blood pressure
- Smoking
- Inactivity
- High cholesterol

Controlling your blood sugars, watching calorie and fat intake and exercising regularly can modify some of these factors.

In order for heart disease to be prevented, it is recommend that:
- Lipid Levels be controlled
  - Cholesterol levels be kept below 200
  - LDL levels below 130
  - HDL levels above 45 in men and 55 in women
  - Triglyceride levels less than 150
- Blood glucose levels stay within target ranges with A1C levels at 7.0 or below
- Blood pressure levels be controlled below 130/80
- Fat intake levels remain below 30% with 10% of fat calories from saturated fats
- Aspirin Therapy be initiated – check with your doctor
- Smoking be stopped

To treat heart disease, the following may be used:
- Daily medications
- Lower fat and salt intake
- Activity
- Smoking cessation
- Decreased caffeine intake

*Poor Circulation*
Poor circulation is another heart related long-term complication of diabetes. Usually, poor circulation occurs in the lower legs and feet and can be hard to treat. Both small and large blood vessel disease can cause it. The feet can develop sores or ulcers. Without good blood supply, healing is slowed and the body is unable to fight infection, repair wounds and help healthy tissues grow back. Sometimes there is swelling in the lower legs, caused by damaged veins no longer able to push fluid back up the leg and to the heart.

Signs of poor circulation include cramping while walking, slow healing cuts or sores, redness of feet when sitting, whiteness when feet are raised and lack of normal skin, hair or nail growth.

Treatment options for poor circulation may include:

- Using knee high socks which do not cut off circulation
- Wearing shoes that fit
- Avoiding the use of garters
- Use of support stockings as directed by MD
- Use of diuretics as directed by MD
- Avoid crossing legs
- Walking and foot exercises
- Avoid smoking
- Medications
- Surgery to improve circulation

*Stroke*

Large and small blood vessel disease can occur anywhere in the body and when the blood supply to a part of the brain is reduced or stopped a stroke can occur.

Signs of a stroke are marked by the sudden onset of symptoms and may include:

- Suddenly feeling weak or numb in your face, arm or leg
- Sudden blurriness, loss or dimness of sight
- Inability to speak or understand someone talking to you
- Sudden, severe headache
- Dizziness or falling
- Loss of bladder control
- Passing out

Do not ignore these symptoms. It is important that if a stroke occurs that your doctor be called immediately so that medicines can be given right away to prevent or reduce potential damage. If the loss of blood supply is brief, a person may only have temporary symptoms. This is a called a TIA or Transient Ischemic Attack. Sometimes surgery is done to prevent strokes by opening up narrowed blood vessels in the neck that supplies blood to the brain.

**Infections**

High blood sugar levels and poor blood flow due to loss of circulation can reduce the body's ability to fight off many kinds of infections. Just two examples include the flu and periodontal disease. Because of the body's inability to fight off infection when blood sugars are elevated, it is often recommended that folks with diabetes receive flu shots. Periodontal disease, a major cause of tooth loss, is also believed to occur because of elevated blood sugar levels and increased infection rates in folks with type 2 diabetes. Signs of periodontal disease include red, swollen, bleeding gums, bad breath and

drifting teeth. Prevention of tooth loss can be achieved by regular dental visit every 6 months, regular flossing and brushing of teeth and controlling blood sugar and lipid levels. Gum surgery and good care to gums and teeth are the treatment options for periodontal disease.

**Neuropathy**

*Question:* Does anybody here have nerve damage and if so, how did you find it?

Nerve damage from diabetes can affect nerves all over the body. The nervous system, in addition to allowing us to touch and feel pain, controls a variety of basic body functions including regulation of heart rate, blood pressure, digestion, bladder and sexual function. High blood glucose levels over time can cause a breakdown of nerve linings and result in the loss of some of these functions because nerves will have lost the ability to send signals through the body. Generally, nerve damage is classified as either peripheral or autonomic neuropathy.

*Peripheral Neuropathy*
The most common type of nerve damage seen in diabetes is peripheral neuropathy. It can be as minor as a slight decrease in feeling on the tip of a toe, or result in the complete loss of sensation in the foot or lower leg. Your health care provider should check your feet for any nerve damage in your routine exam. If you are aware that you have some loss of sensation, take precautions with your feet to prevent injury as directed in the foot care section below. Hands may be similarly affected.

Signs of neuropathy include:
- Pain, numbness or loss of sensation
- Painless sores, such as a blister or cut, that do not heal
- Poor weight bearing
- Muscle wasting in hands or feet
- Loss of balance when walking

Treatments for pain associated with neuropathy include:
- Walking
- Analgesic balms (gloves should be used to apply)
- Medications
- Relaxation, hypnosis, biofeedback
- Pain clinics

*Autonomic Neuropathy*
Autonomic nerves control the automatic functions of the body, such as breathing, sweating and gastrointestinal tract function. Autonomic neuropathy is usually seen after you have had diabetes for a number of years. This type of nerve damage may affect an individual's ability to notice the symptoms of hypoglycemia. Treatment for problems

associated with autonomic neuropathy is very individualized and is usually managed by a diabetes specialist. Conditions caused by autonomic nerve damage are briefly described below.

Sweating. Damage to the sweat glands, which are controlled by autonomic nerves, can increase or decrease your tendency to sweat. You may have increased sweating when you eat or at night. Decreased sweating can cause you to become overheated when exercising which could lead to heat stroke.

Gastroparesis. Nerve damage to the gastrointestinal tract can result in another autonomic nerve disorder known as gastroparesis, which causes food to stay in the stomach longer than normal. Symptoms include feeling full, delayed stomach emptying, nausea and problems with low blood sugar. Gastroparesis is seen in roughly 25% of people with diabetes and is often associated with a long history of poor control. Treatment options include a low fat, low fiber diet, multiple small liquid meals and medications.

Impotence. Another form of autonomic neuropathy, impotence, occurs due to a combination of poor circulation and nerve damage. Symptoms include difficulty attaining or maintaining an erection, difficulty with arousal or difficulty having an orgasm. Treatment options include a medical workup to rule out other possible causes, referral to an urologist, devices, implants and medications.

Neurogenic Bladder. Persons with frequent urinary tract infections (UTI) who also have diabetes may benefit from testing for nerve damage to the bladder. A neurogenic bladder will cause incomplete emptying of the bladder. When this occurs, urine stays in the bladder too long and may lead to urinary tract infections. Methods for helping people with neurogenic bladders to urinate can be taught. Symptoms include chronic bladder infections and overflow incontinence. Treating UTIs promptly and referral to an urologist are the treatment options.

Orthostatic Hypotension. Characterized by dizziness with changing from a sitting or lying position to a standing position, general dizziness, shortness of breathe and chest pain with exercise. Treatment options include treatment by a specialist and medications.

Autonomic Cardiac Neuropathy (CAN). CAN is caused by nerve damage to the heart. Autonomic nerves are responsible for raising heart rates when exercising, or when the body is subjected to stress. When the nerves are damaged, heart rates may not rise in response to exercise and the heart muscle may be deprived of the needed blood supply. This deprivation of blood can lead to what is known as a silent heart attack. This attack is described as silent because it occurs without pain.

## Foot Care

***Question:*** **Who checks their feet daily?**

Poor circulation, trouble fighting infection and nerve damage can make foot problems very serious. If a wound occurs on your feet and you do not know it is there or do not feel it because of nerve damage, a serious infection could result. This infection can then spread throughout your body and result in amputation and even death. To prevent this outcome your feet should be checked regularly, at least once per year, for loss of feeling by a health care provider.

Here are things you can do to keep your feet in good condition:

- Check your feet daily for redness, swelling, corns, calluses, ingrown toenails or skin breakdown. If you cannot see the bottoms of your feet ask somebody to check your feet regularly or use a mirror. Report any problems to your doctor immediately.
- Do not go barefoot, even indoors
- Cut your toenails straight across, not into the corners, and smooth with a nail file
- Wear only comfortable, well-fitting shoes. If your shoes are uncomfortable and cause rubbing, bruising or blisters, get rid of them
- Check inside your shoes for rough spots and foreign objects every time you wear them
- Be especially careful with your feet when weather is very hot or cold

## General guidelines for controlling long term complications

As you may have noticed, several of the long-term complications, weather they be heart, kidney, eye or nerve related, can be controlled through the same efforts. That is why it so important for you to control your diabetes and follow your healthcare teams recommendations. These include:

- Keeping blood sugars within target ranges and maintaining an A1C below 7
- Follow plans for meals and exercise
- Taking medications as prescribed
- Quitting smoking
- Maintaining blood pressures below 130/80
- Maintaining lipid levels below 200 and LDL levels below 100
- Losing weight and maintaining a healthy weight
- Annual eye exams
- Annual microalbumin checks
- Check your feet and skin every day

# Final Session-Taking Charge

**Review and Graduation**

**Objectives:**

This last session is a time to:

- Review what you have covered in sessions 1-9.
- Celebrate the group's efforts, commitment, and accomplishments.
- Talk about where you go from here.

**To conduct this session you will need:**

**Handouts**

Give each member of the group these handouts during this session.

- Game activity cards
- A letter to myself (sample)
- Certificate

**Session Outline**

Introducing the Session
- Welcome
- Review of last week's session
- About this session

Conducting the Session
- Diabetes Trivia Games
- Letter to yourself activity

Recognition for Completing Honoring the Gift of Diabetes Health

Meal/Snacks

Closing

Introducing the Session

Welcome

Welcome everyone to the final session. This is a good time to talk about all that you have covered and where you plan to go.

Review of last week's session

If there was a special activity that you did last week, review that, otherwise review *Chapter 9 Long Term Complications*.

During the last session we talked about Long-term complications of Diabetes and how it can harm you. Who can name some of the long-term complications?

Give the group 3-5 minutes to answer. Write their answers on the board or tag board.

Add these complications if they are not provided by the group.

**Ask:** How did you do with your pledge to do one thing to reduce your risk of long-term complications this past week? Did anything work very well? Did anyone have any problems?

Note: Give the group 5 minutes to answer. Review some goals if possible. Talk about problems people had. Discus some obstacles to success so people can problem solve on their own.

Conducting the Session

1. Games

2. Letter to Yourself activity.

Goals are important. Goals that are personal and realistic are much more likely to be achieved than if the goal is not one that the person chooses, or if it is unattainable.

Bring a stamped envelope and pen for everyone. If some members of the group do not write well, help them compose their letter. Have them tell you what they wish to achieve, and write it down for them. They can sign their own letter.

**Give each person** a pen, a letter to myself handout, and a stamped envelope. Show or read to them a sample to give them ideas. A sample is in the appendix.

Ask the members to use the handout to list healthy changes they plan to make. Remind them that these positive health behavior changes take time and effort to make a habit.

Have the members address and seal the envelopes with their letters inside. Collect the envelopes.

Tell the members that you will mail the envelopes with their personal health goals in three months as a reminder of what they have worked so hard on for the past ten weeks.

**Recognition for Completing *Honoring the Gift of Diabetes Health***

Certificates for participants are optional, however they are a nice gesture for completing the program.

Community leaders may be invited to participate in this closing ceremony to show how important it is for all of us to be healthy in order to have a healthy community.

Tribal Health Director, Spiritual Leaders, Tribal Chairman or Council Members may wish to participate in the ceremony.

**Certificate of completion:**

Call each member's name, and hand him or her his or her certificate. (If you have gift, this is a good time to hand them out. This is also a good time for a group picture

**Reflection:**

After handing out the certificates you have a time to share in a meal, snacks, and fellowship. You may ask the members of the class if they have any stories to share about how their families have reacted to the new information they have learned, or their new pledged healthy activities.

Closing:

Thank everyone for coming and completing the program. Wish them good health.

- Appendices

*Diabetes Medications*

| Trade Name | Generic Name | When to Take | Doses | Potential Side Effects |
|---|---|---|---|---|
| **Sulfonylureas** - stimulate the pancreas to produce more insulin | | | | |
| Diabeta or Micronase | Glyburide | With or without meals | 1.25, 2.5, 5mg: Maximum: 20 mg | Hypoglycemia Weight Gain Rash |
| Glynase | Glyburide-press tab | With or without meals | 1.5, 3 mg: Maximum: 12 mg | |
| Glucotrol | Glipizide | With or without meals | 5, 10 mg Maximum: 40 mg | |
| Glucotrol XL | Glipizide | With or without meals | 5, 10 mg Maximum: 20 mg | |
| Amaryl | Glimepiride | With or without meals | 1, 2, 4 mg Maximum: 8mg | |
| **Meglitinides** – stimulate the pancreas to produce more insulin after a meal | | | | |
| Prandin | Repaglinide | 15 min before meals | .5, 1, 2 mg Maximum: 16mg | Hypoglycemia Headaches |
| Starlix | Nateglinide | 5-30 minutes before meals | 120 mg | |
| **Biguanides*** – decrease liver glucose production | | | | |
| Glucophage | Metformin | With or without meals | 500, 850 mg Maximum: 2550 mg | Nausea, Diarrhea, Metallic Taste, Lactic Acidosis |
| **Alpha – Glucosidase Inhibitors**** – slows down carbohydrate absorption in intestine | | | | |
| Precose | Acarbase | Take with first bite of meal | 50, 100 mg Maximum: 300 mg | Nausea, Diarrhea, Gas |
| Glyset | Miglitol | Take with first bite of meal | 25, 50, 100 mg Maximum: 300 mg | |
| **Thiazolidinediones***** – Improves insulin sensitivity in muscle and fat cells | | | | |
| Actos | Pioglitazone | With or without meals | 15, 30 mg Maximum: 45 mg | Possible liver dysfunction, Anemia, Edema, Shortness of Breath |
| Avandia | Rosiglitazone | With or without meals | 2, 4, 6, 8, mg Maximum: 16 mg | |

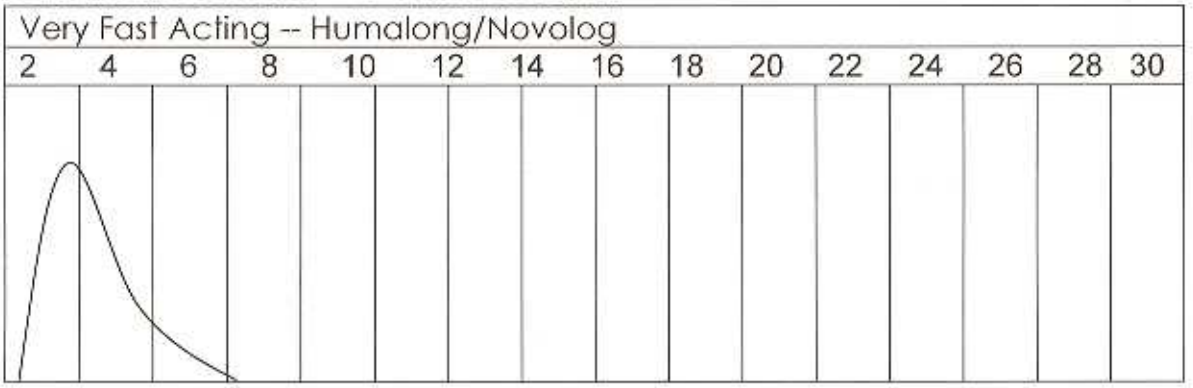
| Combination Pills | | | | |
|---|---|---|---|---|
| Glucovance | Glyburide & Metformin* | With or without meals | 1.25/250 mg<br>2.5/500 mg<br>5/500 mg | Nausea, Diarrhea, Metallic Taste, Lactic Acidosis, Hypoglycemia, Weight gain |
| Metaglib | Glypizide & Metformin* | With or without meals | 2.5/250 mg<br>2.5/500 mg<br>5/500 mg | |
| Avandamet | Avandia*** & Metformin* | With or without meals | 4/500 mg | Nausea, Diarrhea, Metallic Taste, Lactic Acidosis, Possible liver dysfunction, Anemia, Edema, Shortness of Breath |

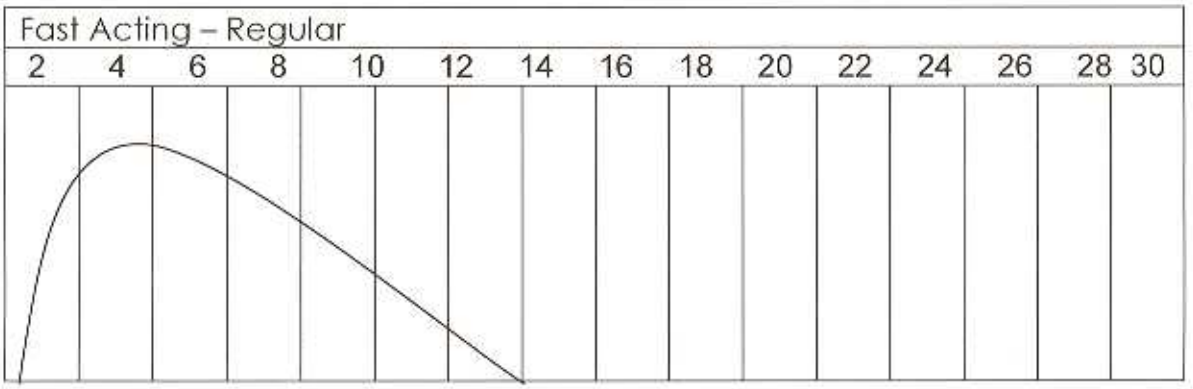
***Note: Stop if kidney dye study: check creatinine & liver function; need good oxygenation of blood**
****Note: If low blood sugar, use honey or glucose gel/tablets; do not use table or brown sugar**
*****Note: May take 3 months to work best; need liver function studies before starting and liver function should be monitored regularly; watch use in heart failure; may decrease effectiveness of birth control

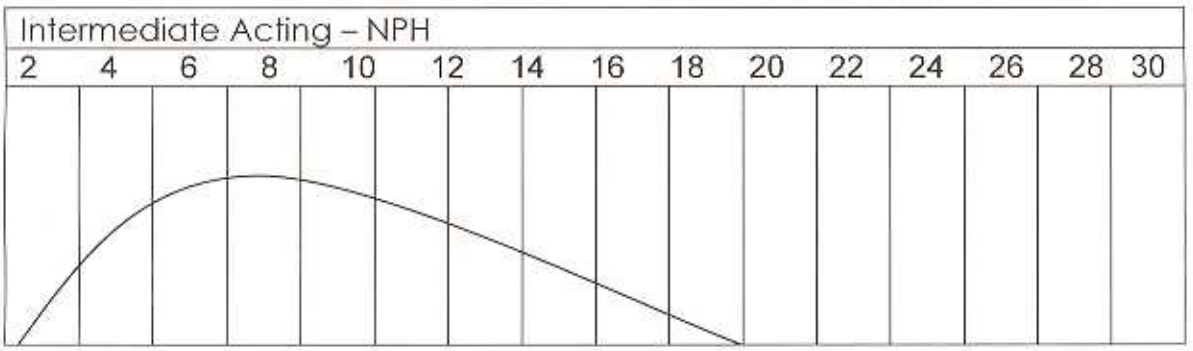
*Insulin*

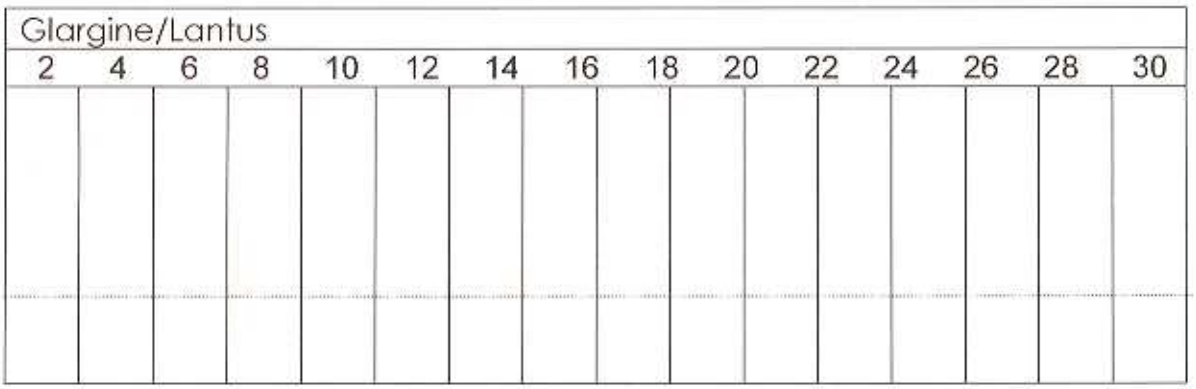
| Type | Onset | Peak | Effective Duration |
|---|---|---|---|
| **Short Acting -- Very Fast Acting** | | | |
| Humalog LisPro | 5-10 minutes | 1-2 hours | 3.5 hours |
| Novolog – Aspart | 5-10 minutes | 1-2 hours | 3.5 hours |
| **Short Acting -- Fast Acting** | | | |
| Humulin R | 15-30 minutes | 2-3 hours | 6-8 hours |
| Novolin R | 15-30 minutes | 2-4 hours | 6-8 hours |
| Regular | 15-30 minutes | 2-4 hours | 6-8 hours |
| Ilentin II R | 15-30 minutes | 2-4 hours | 6-8 hours |
| Velosulin | 15-30 minutes | 2-4 hours | 6-8 hours |
| **Intermediate Acting -- NPH** | | | |
| Humulin N | 2 hours | 6-8 hours | 10-12 hours |
| Novolin N | 2 hours | 6-8 hours | 10-12 hours |
| NPH | 2 hours | 6-8 hours | 10-12 hours |
| Ilentin II N | 2 hours | 6-8 hours | 10-12 hours |
| **Intermediate Acting -- Lente** | | | |
| Humulin L | 2 hours | 8 +/- | 14-16 hours |
| Novolin L | 2 hours | 8 +/- | 14-16 hours |
| Lente | 2 hours | 8 +/- | 14-16 hours |
| Ilentin II L | 2 hours | 8 +/- | 14-16 hours |
| **Long Acting** | | | |
| Humulin U | 8 +/- | 12 +/- hours | 24 hours |
| Glargine/Lantus | | No peak | 24 hours |
| **Premixed – Mixture of Regular (R or fast acting) and NPH** | | | |
| Humalog 75/25 | R: 30 minutes NPH: 2 hours | R: 2-3 hours NPH: 6 +/- hours | R: 6 hours NPH: 10-12 hours |
| Humulin 70/30 | | | |
| Novolin 70/30 | | | |
| Humulin 50/50 | | | |

# Insulin Action – Peak Actions



# Where the Action Is – Targets of Medication

Biguanides
- Metformin

Decrease liver glucose production

Sulfonylureas
- Gluctrol
- Amaryl

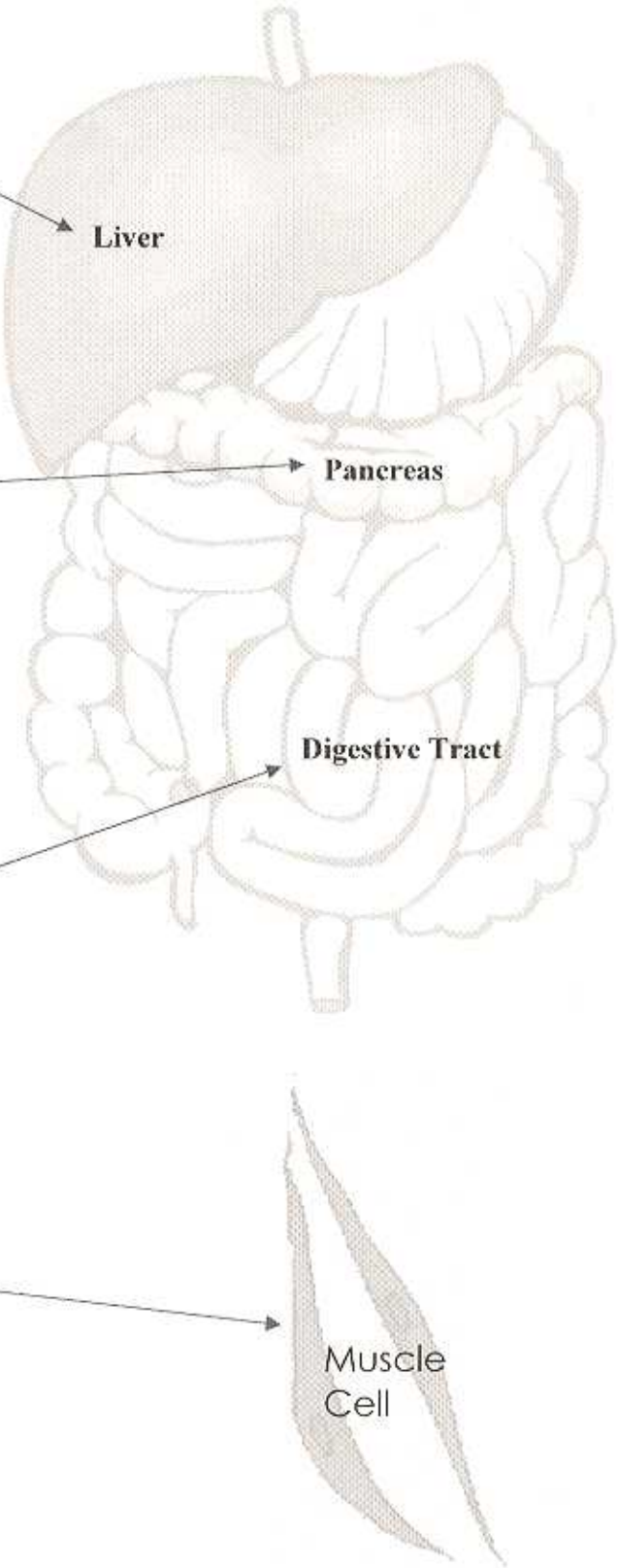
Stimulate the pancreas to secrete more insulin

Alpha Glucosidase Inhibitors
- Precose
- Glyset

Slow the digestion & absorption of carbohydrates

Thiazolidinediones
- Avandia
- Actos

Improves insulin sensitivity in muscle and fat cells



# A letter to Myself

I have learned that there are many things that I can do to improve my health and lower my chances of developing diabetes or complications from diabetes. I can also help my family make healthy choices to improve their health. During the next 3 months, I will try to do the following things to improve my health.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

_____

Signed _____

Date _____

Sample

# A letter to Myself

I have learned that there are many things that I can do to improve my health and lower my chances of developing diabetes or complications from diabetes. I can also help my family make healthy choices to improve their health. During the next 3 months, I will try to do the following things to improve my health.

1. **I will take a walk for 20 minutes with my family after dinner two nights each week.**
2. **I will drink 2 glasses of water each day instead of pop with my meals.**
3. **I will get my eyes examined to see my eye health is good.**
4. **I will check my feet daily for redness, swelling and calluses.**
5. **I will quit smoking.**

Signed _____

Date _____