

Diabetes Complications Prompt Deck

EDUCATOR GUIDE

Every diabetes educator has a unique and personal approach to conducting their diabetes education sessions. But there's one thing all educators have in common: ***the need for useful, versatile, high-quality teaching tools.***

The Diabetes Complications Prompt Deck is a series of cards that includes questions, discussion topics, and simple activities that will help patients learn about diabetes-related health complications. The prompts in this deck are meant to facilitate learning, and to encourage patients to make the healthy choices and changes today that can prevent or delay the onset of these complications.

The Prompt Deck is organized into 6 categories:

1. Eye Disease
2. Kidney Disease
3. Heart Disease
4. Nerve Damage
5. Other Complications
6. Scenarios

**The categories are color coded
and each includes 3 types of prompts:**



Q&A



Discussion



Activity

The primary purpose of the *Diabetes Complications Prompt Deck* is to provide diabetes educators with a portable, versatile tool to use when discussing potential diabetes complications with patients in one-on-one or group settings.

The **Prompt Deck** can be used in a number of ways:

- Break the deck up into categories for targeted discussions about specific complications.
- Use the Q&A and Discussion cards as a quiz or game to assess learning.
- Draw and read the prompts while displaying a card (i.e., holding it up, placing it on the table, using magnets, tape, or pushpins to affix to a wall) in order to reach both the auditory and visual learners in the group.
- Have participants choose a complication to start learning about, and use the cards to augment your curriculum.

This *Educator Guide* offers some useful commentary, tips, talking points, and notes for the educator. However, it is not meant to be exhaustive, and it does not provide all the answers or cover all the topics that you will address in your diabetes education classes.

It is meant to be a handy resource for you when using the deck, and the answers printed in this booklet are not meant to be read aloud to patients.

**The Diabetes Complications Prompt Deck and Educator Guide were created with the input from diabetes educators currently in practice and reflect the collected wisdom of multiple disciplines.*

Eye Disease

🔍 Q&A:

True or False?

As long as you can see well, diabetes is not affecting your eyes.

False. Diabetes can cause damage in the large and small blood vessels in the body which can result in organ damage. This damage may begin soon after diagnosis or be delayed for several years. In many cases, the only way to know that damage is occurring is from specific tests.

Visual acuity may initially be unaffected because many of the early changes in the eyes related to diabetes (*retinopathy*) do not cause significant changes in vision immediately. Individuals who can still see well may not understand the importance of getting an annual eye exam.

Routine examinations allow for early detection of problems.

Note to Educator: Emphasize the importance of regular examinations by an ophthalmologist to ensure early detection and treatment. Explain the difference between an optician, optometrist, and an ophthalmologist and the need to inform the optician or optometrist that they have diabetes so a proper dilated eye exam can be done. Discuss with the patient how to ask their healthcare provider for a referral to an ophthalmologist.

Also, stress to participants that any changes in vision should be reported to their healthcare provider, including: blurred vision that is not related to blood glucose fluctuations, the sudden appearance of dark spots, floating spots, warped appearance of straight lines, floating “cobwebs” in the visual field, decreased central vision or loss of vision.

Q&A:

Myth or Reality? Insulin causes blindness.

Myth. Uncontrolled diabetes can result in blindness – but insulin does not. In fact, diabetes is the leading cause of new-onset blindness in adults in the US. Individuals with diabetes are 25 times more likely to experience blindness than people without diabetes, regardless of the type of diabetes treatment they receive.

Some people with diabetes might think that insulin causes blindness because of a coincidence of timing when they start to use insulin. In some patients with type 2 diabetes, the healthcare provider and/or patient doesn't want to start insulin to improve diabetes control. Health problems finally prompt the move to insulin therapy. While this change is important to reduce overall complication risk, previously uncontrolled blood glucose levels may have caused permanent eye damage resulting in vision loss, regardless of current therapy.

Note to Educator: Be sure to acknowledge the patient's fears about insulin treatment. A follow-up discussion could include other fears or misconceptions they may have related to insulin, diabetes and/or diabetes treatment.

Also, emphasize that retinopathy is not inevitable. Keeping blood sugar and blood pressure at goal levels is the first step to preventing or delaying eye problems. Tell them that it's very important to get a comprehensive dilated eye exam at least once a year. That way changes can be detected at an early stage and treatment can be started.

❓ Q&A:

True or False? Controlling blood sugar levels can help people with diabetes avoid eye problems.

True. The longer a person has uncontrolled diabetes, the greater the chance for developing diabetes-related eye problems. Keeping blood sugar at goal levels is the first step to preventing or delaying their onset. Clinical studies have demonstrated the importance of maintaining blood glucose levels as close to a healthy blood sugar range as safely possible for all people with diabetes. The Diabetes Control and Complications Trial (DCCT) in individuals with type 1 diabetes and the United Kingdom Prospective Diabetes Study (UKPDS) in individuals with type 2 diabetes demonstrated that risk of microvascular (*small blood vessel*) complications, including retinopathy (*diabetes-related eye disease*), was reduced when blood glucose levels were kept within the recommended range.

Note to Educator: When discussing eye disease, emphasize that any improvement in glucose control can positively impact risk; perfection is not the goal when managing diabetes.

Also, ask patients when they had their last eye exam. If they can't remember, instruct them to ask their healthcare provider for a referral at their next visit. People with diabetes should have at least one dilated eye exam annually.

💬 Discussion:

What symptoms do you think a person with diabetes might have if they have diabetes-related eye disease?

Changes that can occur include the sudden appearance of dark spots, floating spots, “cobwebs” in the visual field, or any loss of vision. Changes that occur more gradually but still require medical evaluation include: blurred vision that is not related to changes in blood glucose levels, blurring of central vision, or the warped appearance of straight lines. Early evaluation of symptoms reduces the chance of permanent vision loss.

However, changes in the eyes due to diabetes may not result in these types of symptoms until the damage is more severe. If sudden changes in vision occur, contact a healthcare provider right away.

Note to Educator: It might be helpful to discuss the impact of fluctuating glucose levels on visual acuity and contrast these changes with chronic changes related to retinopathy. For example: acute changes or blurring of vision can be related to changes in blood glucose levels; floating spots can be normal, related to advancing age, or related to a bleeding blood vessel in the eye; and sudden loss of vision can be related to a bleeding blood vessel or detachment of the retina.

❓ Q&A:

Is diabetes the cause of all eye problems that occur in people with diabetes? What else can cause changes in your vision?

Diabetes increases the risk of eye problems, but it is not the only cause of vision changes in someone with diabetes. Some changes in vision are related to aging, such as cataracts, glaucoma, macular degeneration and retinal tear or detachment. Vision can also be altered by common changes in the shape of the lens over time (*i.e. nearsighted, farsighted, astigmatism*), certain medications, injury (*i.e. corneal abrasion*) or other diseases involving the nerves in the eye.

Note to Educator: Emphasize the importance of continued follow-up for those with history of diabetes-related eye complications.

Also, discuss non-glycemic factors that are important for ensuring eye health, such as controlling blood pressure and cholesterol, smoking cessation, and healthy eating.

★ **Activity:**

Jane, a person with diabetes for more than 25 years, has noticed that she can't see as well as she used to, and she has been seeing black spots. Is this problem caused by her diabetes? What should she do?

Jane might be experiencing symptoms of diabetic retinopathy and should talk to her healthcare provider immediately. If left untreated, this can eventually cause vision loss. According to the National Eye Institute, individuals can protect their vision by staying on **TRACK**:

- T** Take medications as prescribed by a doctor
- R** Reach and maintain a healthy weight
- A** Add more physical activity to a daily routine
- C** Control ABCs—A1C, blood pressure, and cholesterol levels
- K** Kick the smoking habit

Note to Educator: It might be helpful to discuss the impact of fluctuating glucose levels on visual acuity and contrast these changes with chronic changes related to retinopathy. Suggest using a visual tool to clarify what the person may be experiencing.

★ **Activity:**

Matching game: Match the eye condition on the left with its correct description on the right. Work with a partner or discuss with the group.

Condition	Description
1. Cataracts	A. Spots, webs or strands that “float” or drift across your field of vision
2. Glaucoma	B. Damage to the retina due to diabetes
3. Macular degeneration	C. Fluid leaking into the center of the retina
4. Macular edema	D. Commonly known as pressure build-up in the eye
5. Retinopathy	E. Clouding of lens of eye
6. Floaters	F. Gradual destruction of sharp central vision

ANSWERS:

1. Cataracts: (E) Clouding of lens of eye
2. Glaucoma: (D) Commonly known as pressure build-up in the eye
3. Macular degeneration: (F) Gradual destruction of sharp central vision
4. Macular edema: (C) Fluid leaking into the center of the retina
5. Retinopathy: (B) Damage to the retina due to diabetes
6. Floaters: (A) Spots, webs or strands that “float” or drift across your field of vision

Note to Educator: This exercise can be conducted by asking for the response to each condition or by placing the information on a poster or white board to facilitate group interaction.

As a follow up question to this activity, ask patient(s) to describe any eye symptoms they may have experienced and what treatment, if any, was received.

★ **Activity:**

Matching game: These pictures show how your vision can be affected by different eye problems. Which picture do you think represents these eye conditions?



- A. Cataracts
- B. Glaucoma
- C. Diabetic Retinopathy

ANSWERS:

1.– A. Cataracts – clouding or fogging of the normally clear lens of the eye. Although anyone can get cataracts, people with diabetes get these eye problems at an earlier age than most and the condition progresses more rapidly than in people without diabetes. Cataracts might cause blurred or glared vision.

2.– C. Diabetic Retinopathy – damage to the small blood vessels in the retina. The eyesight of a person with diabetic retinopathy can be damaged due to bleeding, detachment of the retina, or the presence of abnormal blood vessels in the retina (proliferative retinopathy). There may be no symptoms in the early stages of the disease, and vision may not change

until the disease becomes severe. That's why it's critical to find and treat the disease in its early stages.

3.– B. Glaucoma – a buildup of pressure in the eye which can result in changes in vision. There may be no symptoms until the disease is very advanced. Other symptoms can include: headaches, eye aches or pain, blurred vision, watering eyes, halos around lights, and loss of vision.

Note to Educator: This exercise can be conducted by asking the response to each condition or by placing the information on poster or white board to facilitate group interaction.

Kidney Disease

🔍 Q&A:

What do your kidneys do?

- A. Balance body fluids
- B. Produce urine
- C. Remove waste from blood
- D. All of the above

The correct answer is D. All of the above.

Kidneys serve as the body's filter, removing waste products from the blood and keeping the body's fluids in balance. When kidneys are working normally, waste passes through kidneys and leaves the body as urine.

Note to Educator: Using an illustration or metaphor to explain kidney function might be helpful to participants. For example, compare kidney function to coffee filters. When kidneys are working well, it's like using a fine coffee filter that allows the water to pass through, while keeping the coffee grounds in the filter. If the kidneys are damaged and not working well, it's like using a pasta strainer or colander to filter your coffee. The holes are bigger and it does not work as well. Coffee grounds will spill out into the coffee—just like protein leaking into the urine if kidneys are damaged.

Q&A:

If you have kidney damage, what test measures how well your kidneys are working?

- A. Blood glucose (*sugar*)
- B. Cholesterol
- C. Creatinine
- D. Ketones

The correct answer is C. Creatinine.

If protein, or microalbuminuria, is detected in the urine, the next step is to find out how well the kidneys are actually working. To do this, the healthcare provider will test the creatinine levels in the blood, as part of determining the individual's estimated glomerular filtration rate (*GFR*).

Through normal daily activity, muscle cells break down and release creatinine into the blood stream to be eliminated in the urine. Healthy kidneys filter this waste. If the kidneys are damaged, creatinine builds up, indicating that the filter is not working efficiently, and it will show up on a lab test.

Q&A:

Myth or Reality? Eating too much protein causes kidney damage.

Myth. The two main causes of chronic kidney disease are diabetes and high blood pressure.

Treatments for advanced chronic kidney disease (*CKD*) may be confused with causes in some patients. Once kidneys are damaged, a diet moderately low in protein may be recommended, since at that point, eating very high amounts of protein for people with diabetes may be harmful to kidney function. Individuals on dialysis or who have late stage kidney disease may also need to limit how much fluid they consume. Many participants in the group may have experience with family or friends who have been on these

types of restrictions, and this might have resulted in misunderstanding.

Note to Educator: Kidney disease is a highly specialized field, and many educators do not have all the answers that might arise in a discussion of this kind. If detailed questions come up in a class/group session, it might be beneficial to advise individuals to ask their physician for a referral to a specialist (*nephrologist*).

Discussion:

Why are people with diabetes at higher risk for kidney disease?

High glucose levels can damage the blood vessels in the kidneys that filter out waste and keep more useful entities (*like protein and red blood cells*) in the blood. When damaged, these blood vessels can start leaking, letting other substances, such as protein, leave the body through the urine. The presence of protein in the urine is the earliest sign of damage to the kidneys from diabetes. Over time, this damage can lead to kidney disease.

High blood pressure can also damage the small blood vessels in the kidneys. The combination of high blood pressure and high blood glucose levels can increase the rate at which kidney function is lost.

Note to Educator: Stress to the participants that not everyone with diabetes develops kidney disease. By controlling blood glucose levels and blood pressure, they may lower their chance of developing kidney disease.

Discussion:

What are the warning signs of kidney disease?

In the early stages of kidney disease, most people have no symptoms. The kidneys work extra hard to make up for the damage that is occurring, masking early warning signs. Finding protein in the urine is the earliest sign of damage to the kidneys from diabetes. That's why it's important for individuals to get their urine tested for protein once a year. Small amounts of protein are called "microalbuminuria."

Loss of protein from the blood may result in the buildup of fluid under the skin in the feet and ankles (*edema*). The feet and ankles will become enlarged and pressing on them will create a temporary dent in their surface.

Other symptoms of kidney disease can include loss of sleep, poor appetite, upset stomach, weakness, itchy skin and difficulty concentrating. These symptoms often do not show up until kidney disease is in an advanced stage.

Discussion:

If you are told you have protein in your urine, what are the next steps?

If protein, or microalbuminuria, is detected in the urine, it is important to measure how well the individual's kidneys are actually working.

This is done by determining their glomerular filtration rate (*GFR*), which shows how well the kidneys are filtering blood.

GFR is determined by age, sex and race, along with creatinine level. The more damaged the kidneys are, the lower the GFR number will be. There are five stages of kidney disease based on GFR:

Stage	Description	GFR Level
Stage 1	Kidney damage with normal or high kidney function	90 or above
Stage 2	Kidney damage and mild decrease in kidney function	60 to 89
Stage 3	Moderate decrease in kidney function	30 to 59
Stage 4	Severe decrease in kidney function	15 to 29
Stage 5	Kidney failure	Less than 15

A healthcare team will help the individual determine a treatment plan based on their stage of kidney disease. Treatment recommendations may include self-care behaviors (*including tight control of blood glucose and blood pressure*), medications (*such as ACE inhibitors*), and changes to their meal plan (*such as a low-protein diet*).

Note to Educator: It is important to point out that research shows that controlling blood glucose levels and blood pressure will significantly decrease the development and progression of kidney disease in people with both type 1 and type 2 diabetes.

Be sure to emphasize that individuals can substantially reduce their risk of kidney disease by keeping blood glucose (*and A1C*) within the healthy range determined by their diabetes care team, and by keeping a healthy blood pressure under 130/80. High blood pressure is considered 140/90 or higher.

Discussion:

What happens when/if your kidneys stop working?

Once kidneys have failed, something must take over and clean the blood. This process is called dialysis, which serves as an artificial kidney. There are several types of dialysis. A kidney transplant is also an option to consider.

Dialysis cleans the blood, which is what damaged kidneys have difficulty doing on their own. There are two types of dialysis: hemodialysis and peritoneal dialysis. In both types of dialysis, the blood is cleaned of toxins and wastes. Dialysis may be indicated when damage to the kidney reaches end stage kidney failure - when about 85 to 90 percent of kidney function is lost.

Dialysis does the following:

- Removes waste, salt and extra water to prevent them from building up in the body
- Keeps a safe level of potassium, sodium and bicarbonate in the blood
- Helps to control blood pressure

Note to Educator: Many patients will be afraid of dialysis from past experience with friends or family. It is good to discuss these fears and encourage patients to get recommended follow up tests and monitor their diabetes and blood pressure.

★ **Activity:**

Name three things you can do right now to help keep your kidneys healthy.

Keeping blood glucose levels down can delay or prevent diabetic kidney disease. Use of medications called angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) to treat high blood pressure can also slow or delay the progression of diabetic kidney disease. Important things patients can do to prevent or delay progression of kidney disease are:

- Keep tight control of blood glucose and blood pressure
- See their doctor regularly
- Get kidney tests on time
- Take medication as prescribed (*ACE inhibitors or ARB medication may be prescribed to help prevent damage to the kidney.*)

Note to Educator: Remind participants that blood pressure has a dramatic effect on the rate at which the disease progresses. Even a mild rise in blood pressure can quickly make kidney disease worsen.

Four ways to lower blood pressure are losing weight, eating less salt, avoiding alcohol and tobacco, and getting regular exercise. If medications to keep blood pressure controlled have been prescribed, encourage participants to take them regularly as prescribed.

When macroalbuminuria is present, a low-protein diet may be recommended. Dietary protein may increase how hard the kidneys need to work. A lower-protein diet can decrease protein loss in the urine and increase protein levels in the blood. Patients should be encouraged to talk to their health care team and a dietitian before starting a low protein diet.

Heart Disease

❓ Q&A:

Myth or Reality? Women don't get heart disease. It is a man's disease.

Myth. Heart disease is the leading cause of death for both women and men in the United States, and women account for nearly 50% of heart disease deaths.

This myth might have arisen out of the fact that premenopausal women without diabetes have less risk for heart disease than men of the same age. HOWEVER, having diabetes cancels out the cardiovascular protective effect of being a woman. As a matter of fact, women of all ages who have diabetes have an increased risk of heart disease.

Note to Educator: Remind participants that there are many things that can be done to decrease the risk of heart disease, such as keeping their ABCs (A1C, blood pressure, cholesterol) in their target range.

❓ Q&A:

Should people with diabetes take an aspirin a day to reduce the risk of a heart attack?

Taking an aspirin daily may lower the risk of heart attack and stroke, but it isn't for everyone. Individuals shouldn't take a daily aspirin if they have some health conditions that could increase the risk of bleeding or other complications. These conditions include: a bleeding or clotting disorder (bleeding easily), asthma, stomach ulcers, or heart failure.

For people who have diabetes, the American Diabetes Association and other medical associations recommend a low-dose aspirin only for men and women at age 50 and older who have at least one additional risk factor for heart disease, such as smoking, family history of heart disease, high cholesterol or high blood pressure.

Note to Educator: Encourage each participant to ask their healthcare provider if an aspirin a day is safe and helpful for them, and if so, how much they should take.

② Q&A:

If you have diabetes, what are healthy goals for your cholesterol levels?

People with diabetes should aim for

- LDL cholesterol (*“lousy/bad” cholesterol*) under 100 mg/dL
- HDL over 40 mg/dL for men and over 50 mg/dL for women*
- Triglycerides under 150 mg/dL
(*Triglycerides are fat that floats in the blood along with cholesterol. This number is shown in a standard blood fat test.*)

Note to Educator: This is a good time to encourage each member of the group to keep track of their own cholesterol levels. They can keep a card in their wallet to write down the results of their routine blood pressure checks at each physician’s visit and track the results of their blood tests for cholesterol and triglycerides. A simple Internet search will result in several tracking tools and wallet cards.

 **Discussion:****Which of these things puts you at a higher risk for a heart attack?**

- Family history
- Having diabetes
- High blood pressure
- Obesity
- High cholesterol
- Inactivity
- Smoking

Answer: All of the above. There are many risk factors for heart disease. Some cannot be changed (*family history and having diabetes*) but many can be changed, including high blood pressure, obesity, high cholesterol, inactivity, and smoking. Risk for heart disease can be decreased by eating a “heart-healthy” diet, increasing physical activity, achieving a healthy body weight, taking a daily aspirin and with smoking cessation. Though a person cannot get rid of diabetes, they can decrease their risk of heart disease from diabetes by improving blood sugar control and improving the other risks noted above.

Note to Educator: The point of this activity is to identify modifiable risk factors for heart disease. Some of the changes can be achieved by taking medications. Encourage participants to talk to their healthcare provider to discuss possible medications. Other risk factors require behavior change which is what diabetes education is all about.

Discussion:

Heart disease is 2-4 times more common in people with diabetes than in those without diabetes. Does that surprise you?

This may surprise some people, but others may have heard this information.

One reason why people with diabetes are more likely to develop heart disease is that high blood glucose levels signal the liver to increase availability of fat for energy because it believes that the body is not able to use glucose. Increased levels of cholesterol and fat in the blood lead to fatty deposits (*pockets of cholesterol*) in the walls of blood vessels. If the top of one of these fatty plaques breaks away from the blood vessel wall, it creates a tear in the pocket of stored cholesterol. The contents of this pocket spill into the blood vessel and float down to a small, narrow area, clogging up the opening. In the heart this is a heart attack, in the brain it is a stroke.

Note to Educator: If participants are surprised or upset by this fact, tell them that there are many positive things they can do to decrease their risk of heart disease and ask them to name a few.

Discussion:

Being active can help decrease the risk of heart disease...So, why should you talk to your healthcare provider about your heart health before getting more active?

People with diabetes should talk to their healthcare provider to determine the best kinds of activities to do and how much and how hard to do them. People with diabetes are at risk for a heart attack. Moderate physical activity is generally safe, but hard (high intensity) exercise may not be safe for everyone. Individuals should try to be active for at least 30 minutes, most days of the week. Someone who has not been regularly active should see their healthcare provider for a checkup before starting an activity program.

Note to Educator: It is important that people with diabetes choose a type of activity that suits them, at an intensity that is safe for them. They should start slowly and increase gradually. Recommend that all patients check with their healthcare provider before beginning any activity program. Some patients may need a stress test prior to beginning intense activity or exercise.

If a provider does indicate some exercise restrictions, encourage your patient to get it in writing and share it with other members of their healthcare team—including their diabetes educator!

★ **Activity:**

List two things that you can do today that can improve your heart health. Discuss how you could do these with the person next to you (or with the group).

Responses may include: beginning an exercise or physical activity program, stopping smoking, improving blood sugars, having cholesterol and blood pressure checked, taking an aspirin each day, or eating healthier foods.

Note to Educator: Since many of the changes involve behavior change, it is important to let the participants know that it isn't always easy, but it is achievable. Support from their healthcare providers, family and friends may be necessary to achieve these positive changes. Encourage them to seek out support. And remind them that diabetes educators can help people set realistic goals for behavior change.

★ **Activity:**

There are many symptoms of a heart attack. Some are different for people with diabetes. List two possible symptoms.

Symptoms of a heart attack include:

- Chest pain or discomfort*
- Pain or discomfort in the arms, back, jaw, neck, or stomach
- Shortness of breath
- Sweating
- Nausea
- Light-headedness

*Women may not have chest pain or discomfort but may have shortness of breath, nausea, or back and jaw pain, or a feeling of impending doom. People with diabetes may have mild symptoms or no pain during a heart attack. This may be due to nerve damage to the heart muscle.

A common symptom of heart disease is angina, the pain that occurs when blood supply to the heart is reduced. A person may feel discomfort in the chest, shoulders, arms, jaw, or back. The symptoms may increase with exercise and decrease with rest or when taking medication for angina. Having angina does not cause permanent heart damage, but does increase the chance of a heart attack. When a blood vessel to the heart becomes blocked, a person can have a heart attack since there is not enough blood going to a part of the heart muscle. This can cause permanent damage to the heart muscle.

Note to Educator: It is important for people with diabetes to know the possible symptoms of angina or a heart attack. A card with the list may be provided to help them remember the symptoms. Stress that they should call 911 immediately if they think they may be experiencing symptoms of a heart attack.

Nerve Damage

🔍 Q&A:

What is diabetic neuropathy?

Diabetic neuropathy is nerve damage caused by diabetes. Nerve damage and the symptoms of neuropathy can affect most areas of the body. Symptoms may include pain, tingling, or numbness as well as problems in body organs including the digestive tract, heart, and sex organs. About 60 to 70 percent of people with diabetes have some form of neuropathy.

Note to Educator: This may start a discussion about decreasing the risk of neuropathy. The risk of neuropathy increases with age and longer duration of diabetes and in those that have had long term high blood glucose levels, high blood pressure, abnormal blood fat levels (*cholesterol and triglycerides*), and those who are overweight. Controlling blood glucose, blood pressure, and blood fat levels can decrease the onset and progression of diabetic neuropathy. Large studies have shown that good control of blood glucose levels reduced the development of diabetic neuropathy in people with both type 1 and type 2 diabetes.

❓ Q&A:

True or False? Nerve damage only affects your feet.

False. Nerve damage can affect any part of the body. Nerve damage is called neuropathy, and there are four types:

Peripheral neuropathy can cause:

- Numbness, tingling or pain in the toes, feet, legs, hands, arms
- Wasting of the muscles of the feet and hands

Autonomic neuropathy can cause:

- Indigestion, nausea or vomiting
- Problems with bowel and bladder function
- Problems with the nerves that control sweating (*causing an increased or decreased sweat response*)
- Problems with sexual response
- Problems in the heart, lungs, and eyes
- Abnormal response of blood pressure (*including dizziness or faintness when standing up or sitting up*)
- Lack of signals a person experiences when having low blood sugar (*hypoglycemia unawareness*)

Proximal neuropathy can cause pain or weakness in the:

- Thighs, hips, buttocks, or legs

Focal neuropathy can cause:

- Sudden weakness or pain in any nerve in the body including those that go to the eyes, muscles of the face, ears, pelvis and lower back, chest, abdomen, thighs, legs, and feet

Note to Educator: It is important to raise awareness that neuropathy can affect many parts of the body and impacts many aspects of how the body functions. Reviewing the areas affected by neuropathy, and possible symptoms a person may experience, can help raise awareness. Encourage people with diabetes to talk to their healthcare providers about any new or unusual symptoms they are experiencing to help them determine if they are related to neuropathy and explore possible treatments that can help decrease or control the symptoms.

❓ Q&A:

True or False? People with diabetes can help prevent nerve damage by controlling their blood sugar.

True. Keeping blood glucose levels as close to the normal range as possible can help prevent neuropathy, protecting the nerves throughout the body.

Note to Educator: You may want to share ways a person can help control their blood glucose through monitoring, meal planning, physical activity, and diabetes medications including insulin. It is important to note that symptoms of neuropathy may initially worsen when blood glucose control is improved, but that maintaining lower blood glucose levels over time can help symptoms and may prevent or delay the onset of future problems.

💬 Discussion:

What are some of the symptoms that may occur if you have nerve damage in your feet?

Some people with nerve damage in the feet have no symptoms. Others may feel tingling, numbness (*no feeling*), or pain including burning or stabbing pain. Some people may also have muscle weakness and loss of the ankle reflex. This may cause problems with balance and walking.

Note to Educator: You may ask people if they have any of the symptoms or have been diagnosed with neuropathy in their feet. If so, have they found treatments that have helped decrease the problems? This also may bring up the importance of routine foot checks and proper footwear.

Discussion:

Gastroparesis is a nerve problem and can affect people with diabetes. What do you think it means? What might you feel if you have gastroparesis?

Gastroparesis is from neuropathy that affects the stomach. It causes the stomach to empty too slowly after eating. This can cause nausea and vomiting, bloating, and a loss of appetite. It can also cause blood sugar levels to vary after eating since food absorbs differently from the stomach. These problems can lead to weight loss and can increase the risk for low blood sugars.

Note to educator: You may want to discuss some treatment options for people with gastroparesis. They should talk to their healthcare provider if they are experiencing digestive problems or fluctuating blood glucoses. For people using insulin, a change in the type or timing of insulin may help decrease fluctuations in blood glucoses.

Discussion:

Why is it important to take off your shoes and socks at your diabetes care visit?

People with diabetes are at increased risk of foot problems due to decreased sensation from neuropathy and decreased circulation which can increase the risk of infections and foot ulcers. Many amputations in the United States occur in people with diabetes. Careful foot care can decrease the risk of amputations to a large extent. A physician or foot doctor should perform a complete foot exam each year, including checking the skin, muscles, bones, circulation, and sensation of the feet. It's important to check sensation in the feet because if an individual loses feeling, they might be at risk for developing foot sores and other problems.

Note to Educator: This may bring up a discussion about proper foot care.

People with diabetes should:

- Clean their feet daily with warm water and mild soap
- Avoid soaking their feet
- Carefully dry feet with a soft towel, including the areas between the toes
- Inspect feet and toes each day, looking for cuts, redness, swelling, calluses, blisters, or anything else that doesn't look normal. Some people may need to use a mirror or get help from another person to do their daily foot checks. If the person sees anything that doesn't look normal, they should contact their healthcare provider right away.
- Moisturize feet with lotion, avoiding the area between the toes
- Carefully file corns or calluses with a pumice stone*
- Cut toenails to the shape of the toes and file the edges*
- Wear proper shoes or slippers and thick, soft, seamless socks
- Inspect shoes including feeling inside with the hand prior to putting them on

**If people need help with their foot care, they should routinely see a podiatrist (foot doctor).*

★ Activity:

Draw a picture of a human body (stick figures are OK!). Circle the parts of the body that can be affected by nerve damage related to diabetes.

Nearly all parts of the body can be affected by neuropathy. Here's a review of the four types and what they cause:

Peripheral neuropathy can cause:

- Numbness, tingling or pain in the toes, feet, legs, hands, arms
- Wasting of the muscles of the feet and hands

Autonomic neuropathy can cause:

- Indigestion, nausea or vomiting
- Problems with bowel and bladder function
- Problems with the nerves that control sweating (*causing an increased or decreased sweat response*)
- Problems with sexual response
- Problems in the heart, lungs, and eyes
- Abnormal response of blood pressure (*including dizziness or faintness when standing up or sitting up*)
- Lack of signals a person experiences when having low blood sugar (*hypoglycemia unawareness*)

Proximal neuropathy can cause pain or weakness in the:

- Thighs, hips, buttocks, or legs

Focal neuropathy can cause:

- Sudden weakness or pain in any nerve in the body including those that go to the eyes, muscles of the face, ears, pelvis and lower back, chest, abdomen, thighs, legs, and feet.

Note to Educator: This activity is meant to visually reinforce the idea of neuropathy affecting all areas of the body. This will appeal to visual learners and will further engage participants in the discussion.

★ Activity:

List 3 things people with diabetes should consider when buying shoes.

Responses may vary. Proper footwear should:

- Provide proper support
- Have a wide and deep area for the toes to avoid irritation, cuts, blisters, or calluses at the toes
- Be comfortable for daily wear
- Be made of material that can breathe to prevent dampness/sweating in the foot
- Be comfortable from the start to avoid needing to “break them in”
- Not have a pointy toe or high heel since these can put pressure on the toes

Note to Educator: Many people are concerned about what their shoes look like. When they think of a therapeutic shoe, they may think of big, clunky, out of style shoes. Fortunately, there are many shoes made for people with diabetes that are not big and clunky and are, in fact, quite stylish. It may be helpful to provide the person with resources for shoes that would be acceptable to them. Another concern is cost. Many therapeutic shoes are very costly. Medicare and many other insurance companies do cover special footwear for people with diabetes who are at risk for foot problems. They may need to contact their insurance company, their podiatrist, or a shoe vendor that specializes in footwear for people with diabetes.

Other Complications

❓ Q&A:

True or False? Both men and women with diabetes can experience problems with sexual function.

True. Diabetes can affect both women's and men's sex lives.

Erectile dysfunction (*ED*) is very common among men with diabetes, ranging from 9% in those age 20 to 29 years, up to 95% on those 70 years and older. ED may develop in men with diabetes as early as 10 years after being diagnosed. ED is defined as the inability to achieve or maintain an erection sufficient for successful intercourse.

Over time, blood vessels and nerves in the penis can become damaged by high levels of blood glucose. Some men can retain the ability to achieve satisfactory erections through elevated systemic blood pressures; however, high blood pressure eventually causes more damage. Certain medicines for high blood pressure or depression may worsen ED, but often just lowering blood pressure by any means will reveal the underlying vascular damage. Men who experience ED should be counseled on the need for effective blood pressure control and the availability of effective ED treatments. Medications often prescribed for treatment of ED may not work in men with diabetes. Other treatments that may be successful include vacuum pump therapy, injections and implants.

Low testosterone is another common condition for men who have type 2 diabetes. They are twice as likely to suffer from low testosterone as a man without diabetes.

The symptoms of low testosterone can include diminished interest in sex, erectile dysfunction (*ED*), reduced lean body mass, depressed mood and lack of energy. Low testosterone can be easily identified and treated.

For more information on sexuality and diabetes go to diabeteseducator.org/sexuality

Some women with diabetes have less interest in sex because of depression or a decreased or absent sexual response. Some may also experience painful intercourse due to vaginal dryness. Problems with having sex aren't a normal part of getting older and don't happen to all women who have diabetes.

Both depression and anxiety can take away from a desire for sex. Medicine or counseling can help with both depression and anxiety disorder.

Note to Educator: Patients may be reluctant to discuss these issues in group settings. Encourage patients to approach the topic during a one-to-one session or with their physician. Reinforce the fact that these are common complications for many people with diabetes and without diabetes.

❓ Q&A:

True or False? Depression affects many people with diabetes.

True. Depression is more common in people with diabetes. People with diabetes are twice as likely as the average person to have depression.

Diabetes increases the risk for depression, and may make symptoms of depression worse. The stress of managing diabetes every day and the effects of diabetes on the brain may contribute to depression. Some symptoms of depression may reduce overall physical and mental health, not only increasing risk for diabetes but making diabetes symptoms worse. Fatigue or feelings of worthlessness may cause patients to ignore self-care behaviors. Studies have shown that people with diabetes and depression have more severe diabetes symptoms than people who have diabetes alone.

Note to Educator: This is an opportunity to focus on healthy coping strategies such as physical activity, meditation, enjoyable hobbies, joining a support group or faith-based activities. Also, working with a mental health professional might be beneficial.

❓ **Q&A:**

Myth or Reality? If you have one complication related to your diabetes, you will probably have them all.

Myth. Having diabetes does increase the risk for developing a number of health complications.

However, it is possible to prevent or delay these types of complications with continuing medical care and ongoing self-management education and support.

❓ **Q&A:**

John has diabetes and his feet are numb all of the time. Today, he complains of a corn on his right foot. What advice would you give John?

- A. Tell him to rub alcohol on his feet twice a day
- B. Tell him to soak his feet in warm water and use a knife to cut away the dead skin
- C. Encourage him to see a podiatrist (*foot doctor*)
- D. Tell him to go to the self-care aisle of the pharmacy to select a corn remover

The correct answer is C.

Encourage him to see a podiatrist (*foot doctor*).

Calluses and corns are thickened areas of skin that are created by pressure and friction on parts of the feet, and are commonly caused by poorly-fitting shoes. Thick calluses and corns can be painful, and some people might seek to treat them with over-the-counter or home remedies.

Callus and corn home treatments (*even the acid-free ones*) are not recommended for people who have diabetes. These products often contain acid, which can eat away at live skin, and may create a wound that may take months or even years to heal for a person with diabetes.

Also, knives or sharp blades should not be used on the feet because of the risk

of injury. Individuals with diabetes who are experiencing problems with their feet should ask their healthcare provider for a referral to a podiatrist.

❓ Q&A:

How can high blood glucose levels cause problems with your teeth and gums?

If you have diabetes, you are at higher risk for gum problems. Poor blood glucose control makes gum problems more likely.

After a meal, snack or beverage that contains sugars or starches, bacteria release acids derived from dietary sugars. These can attack tooth enamel. Repeated attacks can cause the enamel to break down and may eventually result in cavities.

High glucose levels in saliva help bacteria thrive and can cause an accelerated build-up of decay-causing plaque.

Plaque that is not removed can eventually harden (*calcify*) into calculus, or tartar. When tartar collects above the gumline, it becomes more difficult to thoroughly brush and clean between teeth. This can create conditions that lead to chronic inflammation and infection in the mouth. Because diabetes reduces the body's resistance to infection, the gums are among the tissues likely to be affected.

Patients with poor blood sugar control develop periodontal disease more often and more severely, and they lose more teeth than persons who have good control of their diabetes.

The most common oral health problems associated with diabetes are:

- Tooth decay
- Periodontal (*gum*) disease
- Salivary gland dysfunction
- Fungal infections
- Lichen planus and lichenoid reactions (*inflammatory skin disease*)
- Infection and delayed healing
- Taste impairment

Discussion:

Did you know that diabetes can affect your skin? What types of skin problems could be related to diabetes?

People with diabetes are susceptible to skin problems. These include bacterial infections, fungal infections, and itching. Some skin problems happen mostly or only to people with diabetes. These include diabetic dermopathy, necrobiosis lipoidica diabetorum, diabetic blisters, and eruptive xanthomatosis.

To prevent or manage skin complications, people with diabetes can reduce their chances of these infections by practicing good skin care.

Steps to keep skin healthy:

- Wash with a mild soap, rinse and dry well. Check places where water can hide, such as under the arms, under the breasts, between the legs, and between the toes.
- Keep skin moist by using a lotion or cream after washing.
- Drink lots of fluids, such as water, to keep skin moist and healthy.
- Wear all-cotton underwear.
- Check skin after washing. Look for dry, red or sore spots that might lead to infection.

Itching: Localized itching is a common condition with diabetes. It can be caused by a yeast infection, dry skin, or poor circulation. When poor circulation is the cause of itching, the itchiest areas may be the lower parts of the legs.

To treat itching, patients should limit how often they bathe, particularly when the humidity is low. They should use mild soap with moisturizer and apply skin cream after bathing.

Discussion:

What are some common symptoms of depression?

Common symptoms of depression can include:

- Ongoing sad, anxious, or empty feelings
- Feeling hopeless
- Feeling guilty, worthless, or helpless
- Feeling irritable or restless
- Loss of interest in activities or hobbies once enjoyable, including sex
- Feeling tired all the time
- Difficulty concentrating, remembering details, or making decisions
- Difficulty falling asleep or staying asleep, a condition called insomnia, or sleeping all the time
- Overeating or loss of appetite
- Thoughts of death and suicide or suicide attempts
- Ongoing aches and pains, headaches, cramps, or digestive problems that do not ease with treatment.

Symptoms of depression may make self care behaviors hard to complete, and worsen control of diabetes. Patients should seek help from a doctor and a mental health professional if they are experiencing symptoms of depression, especially if the symptoms last for more than two weeks.

It's also important to note that many anti-depressant medications may interfere with diabetes control. Patients should talk with their doctor or pharmacist about their medications and interactions.

★ **Activity:**

What do you do each day to take care of your teeth? Name 2 things you can do to reduce your risk of gum disease.

Responses may include: Maintain good glucose control, eat a well-balanced diet, good oral care at home, regular dental checkups and periodontal examinations (*even with dentures*), brushing twice daily with fluoride toothpaste, and daily flossing.

High blood glucose levels can lead to oral health problems including inflammation of the gums (*gingivitis*), bacterial infections along the teeth below the gums (*periodontitis*), tooth abscess and tooth loss. Tooth and gum infections may make blood glucose control more difficult. Treatment of periodontal (*tooth and gum*) disease has been shown to improve diabetes control.

Dental exams should be used as opportunities for prevention, early detection, and treatment of periodontal disease. Dental cleaning improves glucose levels in people with poorly controlled diabetes.

Note to Educator: Emphasize 4 simple ways to protect teeth: keep blood glucose in target range, see your dentist twice a year, brush at least twice a day, and floss daily.

Patients may lack full insurance coverage for dental health. Suggest local dental training programs, which may offer service for a reduced cost.

Discussion:

What other types of health problems affect people with diabetes?

While not an exhaustive list, some other problems can include:

Peripheral Arterial Disease (PAD)

- PAD increases the risk of heart attack and stroke.
- Many people don't recognize the warning signs or get the treatment they need.
- PAD can be treated with physical activity, medication, and surgery.

Eating Disorders

Girls and young women with type 1 diabetes have about twice the risk of developing an eating disorder as those who do not have diabetes.

The two most common eating disorders are anorexia nervosa and bulimia nervosa. If untreated, these can lead to poor glucose control, increased risk of diabetes complications, and could result in hospitalization.

As many as 40% of young women with type 1 diabetes will manipulate their insulin doses to keep their weight down. They may omit or take a lower dose so that glucose levels rise, and glucose spills into the urine. This results in calories that are not used and stored by the body. This can lead to rapid weight loss and poor nutrition status, in addition to elevated blood glucose levels.

Hearing Loss

Diabetes and hearing loss are two of America's most widespread health concerns. Nearly 26 million people in the U.S. have diabetes, and an estimated 34.5 million have some type of hearing loss. The National Institutes of Health has found that hearing loss is twice as common in people with diabetes as it is in those who don't have the disease. Among the 79 million adults thought to have pre-diabetes, the rate of hearing loss is 30% higher than in those with normal blood sugar.

SCENARIOS

Meet Debbie

Debbie is a 56 year old woman who was diagnosed with type 2 diabetes three years ago. Her A1C is 8.2% and she is taking three different oral diabetes medications. Debbie has been waking up at night with “pins and needles” in her feet. She works in retail, and is on her feet a lot, but she regularly gets pedicures at her local beauty salon with hopes that that will help her foot pain.

Questions:

1. Is her foot pain related to diabetes?
2. What should she do?
3. What type of healthcare provider would you recommend that she see?

For the Educator:

- Debbie likely has symptoms suggestive of peripheral neuropathy. Ask these follow up questions:
 - What other symptoms are often associated with this condition?
 - Can peripheral neuropathy be cured — or symptoms reduced?
- Improvement in overall glycemic control could improve symptom severity. Discuss possible changes that could be helpful.
- Review the rationale for daily foot inspection and routine care.
- Discuss areas of expertise for different healthcare providers, using local examples. Discuss which type of provider may be most appropriate choice for follow-up for this patient in the local setting.

Meet Jerry

Jerry was diagnosed with type 2 diabetes 10 years ago. He has been taking twice daily insulin injections for the past 5 years and has gained 15 pounds during that time. He weighs 250 pounds. Jerry thinks he's going to die early of heart disease since both of his parents had heart disease. He thinks his blood pressure is fine, and he recently learned that his LDL (*"bad"*) cholesterol is 120 mg/dL.

Questions:

1. Is Jerry going to have heart disease just because his parents did?
2. What can he do to lower his risk of heart disease?
3. What else can Jerry start doing to improve his overall health?

For the Educator:

- Review the importance of blood glucose, blood pressure and lipid management in reducing risk.
- Review lifestyle strategies that could positively impact risk, such as dietary and physical activity modifications.
- Review overall medication adherence. Are side effects or other barriers interfering with regular use?
- Discuss glycemic control strategies: SMBG frequency and timing, A1C target, medication adherence and adjustment strategies.
- Discuss possible reasons for weight gain including starting insulin.

Meet Sam

Sam has had type 1 diabetes for 25 years. He recently found out he has Stage 1 Kidney Disease. What can he do to prevent progression of the disease and avoid dialysis? What advice would you give him?

Questions:

1. **What would you say to Sam?**
2. **What role does blood sugar play in delaying the progression of kidney disease?**
3. **Who should he turn to for help?**

For the Educator:

- Stress to participants that it is not too late to make at least some difference in the progression of existing problems or preventing new problems.
- Discuss the value and importance of comprehensive medical and self-care for the future.
- Emphasize that any improvement in glucose control can reduce the risk of progressing to dialysis.

Meet Sharon

Sharon goes through phases in her diabetes management. Sometimes she's good about testing her blood sugar regularly and taking her medications as prescribed, but then sometimes she forgets or just lets it slide. Her A1C over the past 4 years has been above 10%. She knows she needs to take care of her diabetes all the time, but it's hard to stay motivated. What would you tell Sharon?

Questions:

1. **How can Sharon improve her glucose control?**
2. **What are some things that Sharon can do to help her stay motivated?**
3. **Is there anyone Sharon can turn to for help?**

For the Educator:

- Discuss barriers that could be interfering with healthy self-care behaviors, including depression, other life events, and family/work demands.
- Solicit suggestions to address barriers.
- Review possible strategies and tools for improving overall glycemic control; discuss approaches that may be helpful for Sharon.
- Acknowledge the burdens associated with caring for diabetes, emphasize the importance of not giving up, discuss do-able next steps.
- Discuss all of the people Sharon can turn to for support: family, friends, diabetes educators, etc.

Meet George

George has type 2 diabetes and knows that his cholesterol is high, but he is concerned about all of the side effects that he sees on the TV commercials for the different cholesterol and diabetes medicines. He is getting older and generally feels well, so he doesn't want to start taking medications, even though his doctor says he should. He's thinking about just getting the medications and only taking them if he starts feeling sick.

Questions:

- 1. What would you tell George about the risks and benefits of taking medications?**
- 2. What other changes could George consider that may help reduce his cholesterol levels and help him manage his diabetes?**

For the Educator:

- Discuss possible barriers or fears that are associated with taking medications.
- Ask participants why it is important that George takes his medication as prescribed.
- Review lifestyle changes that could help reduce CV risk and the seven self-care behaviors that can help individuals manage their diabetes.
- Review cardiovascular risk factors; differentiate modifiable risk factors (i.e. blood pressure, glycemia, lipids, smoking) and un-modifiable risk factors (i.e. gender, age, diabetes, family history).

Meet Mike

Mike is 57 years old and has had type 2 diabetes for 20 years. He and his wife have been married for 34 years and have three grown children. Mike and his wife are enjoying their time together and travel often. Lately, Mike has noticed that he is unable to achieve an erection capable of having intercourse with his wife. He still wants to have sex, but is unsure of what he should do to address the problem. He is embarrassed to talk about it with his female doctor.

Questions:

1. **Could Mike's problem be associated with his diabetes?**
2. **What advice would you give Mike?**

For the Educator:

- Acknowledge that this is a difficult topic for many people to discuss.
- Discuss the potential causes of erectile dysfunction.
- Discuss that there are various treatment options available
- Discuss local referral options to facilitate evaluation and determine treatment options.
- Solicit suggestions from patient(s) regarding approaches that could help them feel more comfortable talking about this issue.

Meet Cindy

Cindy is a 28 year old woman who has had type 1 diabetes for 10 years. She went to the doctor today complaining of nausea, bloating, and abdominal cramping. She says that her appetite has decreased recently and that she gets full after eating only a few bites. She also feels tired all of the time, constantly drinks water and gets up at night to go to the bathroom. She generally only checks her blood glucose when she feels like it is high. Recent laboratory tests showed fasting plasma glucose of 224 mg/dL and A1C of 10.3%.

Questions:

1. **What could be causing Cindy's complaints?**
2. **What could she do to decrease the stomach symptoms?**
3. **What are some other complications that Cindy might have if her blood sugar levels stay so high?**

For the Educator:

- Chronic hyperglycemia can cause several of the symptoms Cindy is experiencing. Discuss the importance of and strategies for improving overall glycemic control.
- The GI symptoms may be associated with hyperglycemia – or could be a form of autonomic neuropathy called gastroparesis.
- Other medical conditions or medications could be contributing to or causing these GI symptoms.
- Diagnosis of gastroparesis is based on the results of a stomach-emptying test. This is usually performed after other possible causes have been ruled-out.

Meet Mary

Fifteen years ago, Mary's doctor told her she had "a touch of sugar" and prescribed her a pill to take every day. Since then, she hasn't paid much attention to her diabetes because she didn't think it was serious. Today, Mary noticed a small sore on the bottom of her foot that isn't healing.

Questions:

1. **What should Mary do now?**
2. **Why is her sore not healing? Is it because of her diabetes?**
3. **What steps should she take to start managing her diabetes?**

For the Educator:

- Assessment of glucose control and self-care practices will help determine the contribution of hyperglycemia to delayed wound healing.
- Discuss strategies for increasing self-care efforts and improving glycemic control.
- Suggest Mary make an appointment with a podiatrist.
- Review other symptoms that may be associated with peripheral neuropathy.

References:

American Dental Association.
Oral Health Topics. Diabetes.
Available at: <http://www.ada.org/2650.aspx#associated>
Accessed on November 23, 2011.

American Diabetes Association.
Choose to Live: Your Diabetes Survival Guide—2004. Pg. 24

American Diabetes Association.
Diabetes and Hearing Loss.
Available at: <http://www.diabetes.org/living-with-diabetes/seniors/hearing-loss>
Accessed on December 20, 2011.

American Diabetes Association.
Diabetes and Oral Health Problems.
<http://www.diabetes.org/living-with-diabetes/treatment-and-care/oral-health-and-hygiene/diabetes-and-oral.html>
Accessed on November 8, 2010

American Diabetes Association.
Erectile Dysfunction.
Available at: <http://www.diabetes.org/living-with-diabetes/complications/mens-health/sexual-health/erectile-dysfunction.html>
Accessed on December 20, 2011.

American Diabetes Association. *Gum Disease.*
Available at: <http://www.diabetes.org/living-with-diabetes/complications/gum-disease.html>
Accessed on November 23, 2011.

American Diabetes Association.
Kidney Disease.
<http://www.diabetes.org/living-with-diabetes/complications/kidney-disease-nephropathy.html>
Accessed 11.23.11

American Diabetes Association.
Low Testosterone.
Available at: <http://www.diabetes.org/living-with-diabetes/complications/mens-health/sexual-health/low-testosterone.html>
Accessed on November 23, 2011.

American Diabetes Association.
Peripheral Arterial Disease.
Available at: <http://www.diabetes.org/living-with-diabetes/complications/peripheral-arterial-disease.html>
Accessed on December 20, 2011.

American Diabetes Association.
Sexual Health.
Available at: <http://www.diabetes.org/living-with-diabetes/women/sexual-health.html>
Accessed on November 23, 2011.

American Diabetes Association.
Skin Complications.
Available at: <http://www.diabetes.org/living-with-diabetes/complications/skin-complications.html>
Accessed on November 23, 2011.

American Diabetes Association.
Standards of Medical Care for Diabetes – 2011. Diabetes Care 2011, 34(suppl 1):S11-61

American Diabetes Association. (2016). *American Diabetes Association Standards of Medical Care in Diabetes - 2016. Diabetes Care 39, (Suppl1), S1-S112.*

Centers for Disease Control and Prevention.
February is American Heart Month.
Available at: <http://www.cdc.gov/Features/HeartMonth>
Accessed on December 20, 2011.

Centers for Disease Control and Prevention.
2011 National Diabetes Fact Sheet.
Available at: <http://www.cdc.gov/diabetes/pubs/estimates11.htm#13>.
Accessed on November 29, 2011.

Congdon N, O'Colmain B, Klaver CCW, Klein R, Muñoz B, Friedman D, et al. Causes and prevalence of visual impairment among adults in the United States. *Archives of Ophthalmology* 2004; 122: 477-485

Diabetes and Eating Disorders.
Diabetes Spectrum April 2002 vol. 15 no. 2 106
<http://spectrum.diabetesjournals.org/content/15/2/106.full>

Diabetes Control and Complications Trial Research Group: The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 1993, 329:977

Diabetic Neuropathies. In C. Mensing (Ed.). *The Art and Science of Diabetes Self-Management Education Desk Reference*. Third Edition. pp.799-838. Chicago, IL: American Association of Diabetes Educators.

Diabetes Self-Management.
Foot Care. Drug Store Do's and Don'ts.
Available at: http://www.diabetesselfmanagement.com/articles/foot-care/foot_care/all
Accessed on December 28, 2011.

Effect of intensive blood-glucose control with metformin on complication in overweight patients with type 2 diabetes UKPDS 34. *Lancet* 1998 Sep 12;352(9131):837-53

The Effect of Intensive Treatment of Diabetes on the Development and Progression of Long-Term Complications in Insulin-Dependent Diabetes Mellitus. *N Engl J Med* 1993; 329:977
<http://www.nejm.org/doi/full/10.1056/NEJM199309303291401>

Gibbons C, Freeman, R. Treatment Induced Diabetic Neuropathy – A Reversible Painful Neuropathy *Ann Neurol*.
2010 April; 67(4): 534–541

Levin ME, Pfeiffer MA (editors).
The Uncomplicated Guide of Diabetes Complications, 3rd edition.
American Diabetes Association, 2009
Mayo Clinic.

Heart Disease, Daily Aspirin Therapy.
Available at: <http://www.mayoclinic.com/health/daily-aspirin-therapy/HB00073>
Accessed on December 28, 2011.

Matricciani, L., & Jones, S. (2015). Who cares about foot care? Barriers and enablers of foot self-care practices among non-institutionalized older adults diagnosed with diabetes: An integrative review. *The Diabetes Educator*, 41(1), 106-117.
Vinik, A.I. & Vinik, E.J. (2014). Chapter 28:

National Diabetes Education Program.
Take Care of Your Feet for a Lifetime.
Available at: <http://www.ndep.nih.gov/publications/PublicationDetail.aspx?PubId=67&redirect=true#Footwear>
Accessed on November 28, 2011

National Diabetes Information Clearinghouse.
Diabetes, Heart Disease and Stroke. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/stroke>
Accessed on November 28, 2011.

National Diabetes Information Clearinghouse.
Diabetic Neuropathies. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/neuropathies>
Accessed on November 28, 2011.

National Diabetes Information Clearinghouse.
Prevent Diabetes Problems: Keep Your Feet and Skin Health. Available at: http://diabetes.niddk.nih.gov/dm/pubs/complications_feet/index.aspx#skin
Accessed on December 20, 2011.

National Eye Health Education Program.
Diabetic eye disease: an educator's guide.
http://www.nei.nih.gov/diabeteseducation/materials/DED_Flipchart_ENGLISH.pdf

National Eye Institute.
Facts about diabetic retinopathy.
<http://www.nei.nih.gov/health/diabetic/retinopathy.asp>

National Institute of Mental Health. How are Diabetes and Depression Linked? Available at: <http://www.nimh.nih.gov/health/publications/depression-and-diabetes/how-are-depression-and-diabetes-linked.shtml>
Accessed on November 26, 2011.

National Institute of Mental Health. Depression and Diabetes. Signs and Symptoms of Diabetes. Available at: <http://www.nimh.nih.gov/health/publications/depression-and-diabetes/signs-and-symptoms-of-depression.shtml>
Accessed on November 26, 2011.

National Kidney and Urologic Diseases Information Clearinghouse. Available at: <http://kidney.niddk.nih.gov/kudiseases/pubs/yourkidneys>
Accessed on December 20, 2011.

National Kidney Foundation.
Chronic Kidney Disease (CKD).
Available at: <http://www.kidney.org/kidneydisease/ckd/index.cfm>
Accessed on December 28, 2011.

National Kidney Foundation.
Diabetes and Chronic Disease, 2007.
Available at: <http://www.kidney.org/atoz/pdf/diabetes.pdf>
Accessed on December 20, 2011.

National Kidney Foundation.
Glomerular Filtration Rate.
Available at: <http://www.kidney.org/kidneydisease/ckd/knownGFR.cfm>
Accessed on December 28, 2011.

National Kidney Foundation.
Hemodialysis.
Available at: <http://www.kidney.org/atoz/content/hemodialysis.cfm>
Accessed on December 20, 2011.

UK Prospective Diabetes Study Group:
Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33).
Lancet 1998, 352:837–853

UK Prospective Diabetes Study Group:
Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes (UKPDS 34).
Lancet 1998, 352:854–865

© 2016. American Association of Diabetes Educators.
All rights reserved.