PREVENTING LONG-TERM DIABETES
HEALTH PROBLEMS

People with diabetes are at risk for cardiovascular, eye, kidney, and nerve problems. The results of studies were released showing blood glucose control significantly influences development of complications in people with diabetes. The results of two of these studies are listed here.

Lowering blood glucose with tight control reduces the risk of:
- Eye disease (retinopathy) by 76%
- Kidney disease (nephropathy) by 54%
- Nerve disease (neuropathy) by 60%

For each percentage point drop in HbA1c there was a reduction in:
- Eye disease by 35%
- Kidney disease by 35%
- Nerve disease by 35%
- Diabetes-related deaths by 25%

Whether you have type 1 or type 2, everyone with diabetes benefits from keeping their blood glucose levels as close to normal (tight control).

Diabetes Complications

EYE DISEASE (retinopathy)

Blurred vision is a common symptom of poorly controlled blood glucose. When blood glucose are brought under control, the blurring usually goes away. However, this may take up to 6 months to resolve.

Anyone who has diabetes is at risk for diabetic retinopathy that can lead to vision loss. Diabetes damages the small vessels that carry blood to the back of the eye called the retina. When blood glucose levels remain high for a
long period of time, the small vessels can leak, swell, or break. Often there are no symptoms in the early stages of the disease. You may not even notice a change in your vision until the disease becomes severe.

**What can you do to help prevent eye disease?**

1. Maintain good control of your blood glucose levels.

2. Keep your blood pressure well controlled – high blood pressure can cause retinopathy to become worse.

3. See an eye care specialist (ophthalmologist) for a “dilated” eye exam every year. A complete eye exam includes putting drops into your eyes to open up or “dilate” the pupils. People with type 1 should have their eyes examined five years after being diagnosed and then yearly.

4. Be sure to report any sudden vision changes such as: black spots, flashes or floating spots to your doctor.

5. Stop smoking – smoking can damage small blood vessels, especially in the eye.

6. If you are pregnant, and have diabetes, have your eyes checked in the first three months of your pregnancy.

7. Always protect your eyes when eye injury is possible.

8. Wear protective sunglasses when out of doors in daylight.

Early retinopathy can be treated if caught early. Your eye care specialist may suggest laser surgery in which a strong light beam is aimed into the retina to shrink the abnormal blood vessels. Since you usually don’t know when retinopathy is happening it is very **important** to have at least a **yearly eye exam.**
My next eye appointment is: ____________________________

My eye doctor’s name and phone number is: ________________

**KIDNEY DISEASE (nephropathy)**

A person with diabetes is 17 times more likely to develop problems with their kidneys than people without diabetes. The kidneys filter your blood and dispose of the body’s waste in your urine. Millions of blood vessels are part of that filtering system in the kidneys. High blood glucose, high blood pressure, and infections can damage those small blood vessels. When this occurs the kidneys are not able to filter your bodies wastes very well leaving things (protein) in the urine and toxins in the blood (severe kidney disease or late stage kidney disease must be treated with dialysis). This is called nephropathy. There are no early symptoms, but it can be detected and treated by yearly blood and urine tests ordered by your doctor.

**Tips to detect and prevent nephropathy**

1. Keep your blood glucose levels close to normal range. Discuss with your physician what your target range should be.

2. Lower your blood pressure, if it is high. Discuss what is your normal range and how to treat your high blood pressure with your doctor. ACE inhibitors are medications that effectively lower blood pressure and can protect the kidneys too.

3. Have your urine checked for microalbuminuria (small amounts of protein in the urine.) The presence of microalbuminuria is an early indicator of kidney disease. Screening for microalbuminuria allows you to detect nephropathy in its early stages when treatment can slow or even prevent the progression of the disease.

*The American Diabetes Association recommends that type 1 diabetes patient be screened for microalbuminuria starting 5 years after their diagnosis and type 2 diabetes patients be screened yearly as soon as they are diagnosed.*
4. Stop smoking! Smoking is a strong risk factor for kidney damage. It causes damage to the lining of blood vessels and narrowing of the small blood vessels.

5. Get treatment for a bladder or kidney infection right away. Finish all of your antibiotics.

A bladder or kidney infection may cause you to feel or have:
- Pain or burning when you urinate
- The need to urinate often
- Cloudy urine
- Blood in your urine
- A fever
- Low back pain

**NERVES (neuropathy)**

Damage to nerve cells is called neuropathy. Nerve cells are like insulated wires. When blood glucose is high, the glucose causes damage to the insulation of the nerve. After time, the nerves become unable to send signals through the body the way they should.

Nerve damage can happen slowly, and you might not even notice that you are beginning to lose feeling in your feet and hands. Ask your doctor to test for loss of feeling in your feet at least once per year (Carville exam). If you have lost some feeling in your feet, you might not notice cuts and infections. This can lead to some serious problems with your feet. Some people also experience sexual problems (men and women).

There are three different types of nerves in the body. Nerve damage can happen to any of the types.

- **Sensory nerves** – carry information to the brain that helps us know how something feels (hot or cold; sharp or smooth). When these nerves are damaged you lose feeling or have pain, tingling or burning sensations. It is most common in the feet and legs. The pain or discomfort is usually worse at night. Because of this loss in feeling, you are more likely to have an injury to the foot and not know it.
Motor nerves – carry information from the brain to the muscles; telling muscles to move. When these nerves are damaged you have muscle weakness.

Autonomic nerves – control many different functions of the body:

- heart rate
- blood pressure
- movement of food through the stomach
- bladder control
- sexual function
- symptoms of low blood glucose
- sweating

The following shows the effects of damage to this type of nerves:

### Diabetic Autonomic Neuropathies

<table>
<thead>
<tr>
<th>Damaged Area</th>
<th>Problem</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart ☀️</td>
<td>Painless heart attack</td>
<td>“Silent” heart attack</td>
</tr>
<tr>
<td></td>
<td>Sudden death</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No increase in rate</td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>Orthostatic hypotension- unable to adjust going</td>
<td>Dizzy</td>
</tr>
<tr>
<td></td>
<td>from lying to standing</td>
<td>Feeling faint</td>
</tr>
<tr>
<td>Bladder</td>
<td>Difficult bladder emptying</td>
<td>Kidney/bladder infections</td>
</tr>
<tr>
<td></td>
<td>Unable to feel the urge to urinate</td>
<td></td>
</tr>
<tr>
<td>Stomach/Intestines</td>
<td>Movement of food through the intestines slows down</td>
<td>After eating:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feeling full, nausea and vomiting, diarrhea, constipation.</td>
</tr>
<tr>
<td>Sexual function</td>
<td>Men-impotency</td>
<td>Impotency</td>
</tr>
<tr>
<td></td>
<td>Women-vaginal dryness</td>
<td>Sexual problems</td>
</tr>
</tbody>
</table>
Unaware of Low Blood Glucose No early symptoms of low blood glucose Without early warning signs, may delay treatment; pass out

Feet Increased dryness and cracking of feet Skin breakdown Infections

Treatment for neuropathy

There are many new treatments for neuropathy including various medications, dietary changes, and tight control of blood sugars. If you have any of the symptoms, tell your doctor so that you can get the help that you need.

Tips to prevent or delay neuropathy

1. Keep your blood glucose levels close to normal range. Discuss your target range with your physician.

2. Lower your blood pressure, if high. Discuss with your physician what yours should be.

3. Stop smoking! Smoking can also damage nerve cells.

4. Exercise daily to improve blood flow to your feet and hands.

5. Report any symptoms to your doctor or diabetes health care team.

6. See your doctor frequently to monitor your diabetes.

7. Avoid alcohol abuse.

SEXUALITY AND DIABETES

Sexuality is a very private matter. Many people find it very difficult to talk about their problems. Men and women face different issues and there are
ways to deal with many of these issues. If you have any of these problems, talk to your doctor about them.

Women can have:
- Dryness and too little vaginal lubrication
- Changes in blood glucose levels at different times during the menstrual cycle
- More vaginal infections when blood glucose levels are high

Men can have trouble having or keeping an erection caused by:
- Damage to the nerves
- Damage to blood vessels
- Medications that are used to treat blood pressure or heart problems

**CARDIOVASCULAR DISEASE (heart and blood vessels)**

Diabetes can also damage the large blood vessels or arteries that surround the heart and carry blood to all parts of your body. The damaged areas of the blood vessels tend to trap cholesterol from the blood. In time, the large vessels become blocked. The heart has to work much harder to pump blood through the clogged vessels.

The three main problems are:

- Heart disease – occurs when the vessels that supply the heart with blood become blocked, causing a heart attack.

- Stroke – occurs when vessels that supply the brain with blood become blocked, causing the brain to be without oxygen and fuel supply.

- Poor circulation in feet and legs – causes leg pain and can lead to ulcers and amputations.

**Symptoms of cardiovascular disease**

- dizzy spells
- chest pain or pressure
- slow healing of cuts and sores
n numbness or weakness in an arm and leg
➢ leg cramps (may go away with rest)
➢ swollen ankles
➢ shortness of breath
➢ irregular heartbeats

**Women and Heart Disease**

- After menopause, women begin to develop and die of heart disease at a rate equal to that of men. 3
- 8% of women who have heart attacks die within a year, compared to 25% of men.
- 63% of women who die from coronary heart disease had no previous symptoms.
- Many women and their doctors do not recognize the early signs of a heart attack.
- Some diagnostic tests and procedures, including the exercise stress test, or stress ECG, might be less accurate in women.

**Symptoms of Heart Disease for Women**

- Shortness of breath, often without chest pain of any kind
- Flu-like symptoms — specifically nausea, clamminess or cold sweats
- Unexplained fatigue, weakness or dizziness
- Pain in the chest, upper back, shoulders, neck, or jaw
- Feelings of anxiety, loss of appetite, discomfort

**What can you do?**

Discuss with your doctor or diabetes health care team on ways to:

➢ lower blood glucose levels and HbA1c to normal range.
➢ lower your blood pressure, if high, to an acceptable range.
➢ lower your blood fat levels (cholesterol, LDL, triglycerides)
➢ limit salt intake.
➢ exercise daily.
➢ stop smoking—smoking causes the blood vessels to narrow
➢ learn to manage stress in your life.
➢ lose weight to an appropriate range, if needed.
➢ manage alcohol abuse.

Tell your doctor about any problems, such as shortness of breath, chest pains, dizzy spells, etc.

Ask for a yearly EKG (electrocardiogram) to monitor your heart.

**Lipid Testing**

For these results your doctor will order a test called a lipid profile or panel. This test will measure the blood fats (triglyceride and cholesterol) in your blood. High levels of triglyceride and cholesterol are risk factors for heart disease. The results will tell you and your doctor if you need a lower fat meal plan or medication.

<table>
<thead>
<tr>
<th>What Do the Lipid Numbers Mean?</th>
<th>Good</th>
<th>Borderline</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Cholesterol</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 200</td>
<td></td>
<td>200-239</td>
<td>240 or higher</td>
</tr>
<tr>
<td>(HDL) Good Cholesterol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men Higher than 45</td>
<td></td>
<td>35-45</td>
<td>Less than 35</td>
</tr>
<tr>
<td>Women Higher than 55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(LDL) Bad Cholesterol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very High Risk* Less than 70</td>
<td></td>
<td>100-129</td>
<td>130 or higher</td>
</tr>
<tr>
<td>Moderate High Risk Less than 100</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td>Less than 150</td>
<td>200-399</td>
<td>400 or higher</td>
</tr>
</tbody>
</table>

*Very High Risk: Has cardiovascular disease PLUS diabetes, a smoker, poorly controlled hypertension, or multiple risk factors of the metabolic syndrome
Daily care to prevent complications

SKIN CARE

High blood glucose levels can affect your skin in several ways:

❖ Your body loses fluids by making you urinate more often. This loss of fluids (dehydration) can make your skin dry and itchy.

❖ It can damage the nerves that make your body sweat less, particularly in the legs and feet. Your skin relies on sweat to keep it moist. Dry skin cracks easily, letting germs enter.

❖ It can cause blood vessels to become damaged (narrowed) resulting in poor blood flow. When blood flow is poor, an injured area cannot get enough oxygen and nutrients to heal.

❖ Your body’s natural defenses (immune system) are weakened. White blood cells that fight germs are fewer in number and work more slowly. This makes you more prone to infection.

❖ You may notice your skin is extra dry, itchy, cracked or you may have rashes, boils, pimples or other skin changes that do not usually bother you.

How to keep your skin healthy

Cleaning

❖ Use a mild soap that will not rob your skin of natural oils or cause irritation. Some deodorant soap or those with heavy fragrances can be harsh to skin.

❖ Use warm (not hot) water when showering and limit your use of soaps or cleansers. Rinse off well.
Spend only 5-10 minutes in water. Soaking in a bath or shower can cause skin to dry out.

Pat skin dry with a soft towel. Avoid rubbing. Dry between all skin folds such as armpits, and under breasts. Moisture, warmth and darkness in these body areas along with high blood glucose can lead to yeast and bacterial infections.

Moisturizing

Drink at least eight glasses of water or sugar-free fluids a day to give your body necessary fluid.

Apply lotion to your skin after bathing, while skin is damp. Do not use lotion in skin folds such as between toes and under breasts.

Avoid lotions or creams that contain dyes, alcohol, additives, fragrance, and perfume. Read labels for details.

Skin protection from sun and wind

Use a sunscreen lotion with a SPF (sun protection factor).

Avoid PABA as it may irritate your skin. Read labels for details.

Limit time in the sun to avoid sunburn and skin dryness. Remember a sunburn can affect your blood glucose and disrupt your control!

Wear layered clothing to protect you from the sun, cold weather, and wind.

Protect your skin from injury

If an injury does occur:

Wash minor breaks in the skin with antibacterial soap and water.

Do not squeeze injury.

Cover with a non-stick sterile pad.
Hold in place with a gauze bandage and paper tape.

Do not use Betadine®, iodine, or products containing alcohol or peroxide as these can be too strong for the skin.

Do not use cloth or adhesive tape or Band-Aids® directly on the skin. Skin can be damaged when these are removed.

Do not disturb a blister; it is a natural sterile protective cover. When it breaks open, care for it as you would any other break in the skin.

Check the injured area everyday to be sure you are healing.

**I will call my doctor immediately if I notice any of the following:**

- Very dry, itchy, irritated cracked skin.
- Skin that is red, swollen, feels warm or hot, has pus or bad smelling drainage.

**FOOT CARE**

If you have nerve damage you may not feel pain (such as stepping on a sharp object), heat (hot beach sand or cement), or cold.

Once you have an infection, it can be difficult to heal, even with antibiotics because there is poor blood supply to the affected area. Having poor blood flow, nerve damage, and/or dry cracked skin can lead to damage to your feet. It makes it difficult for the feet to receive needed oxygen and nutrients.

Dry cracked skin makes it easier for germs to get into the skin and cause an infection.

**How to protect your feet**

- Check your feet everyday – Look at the bottom of your feet and between toes. Check for cuts, calluses, scratches, bruises, swelling rashes and for color changes. Feel for hot or cold areas. Use a mirror to inspect the bottom of your feet.
Wash your feet everyday – Water should be lukewarm, you may not be able to feel how hot the water is with your feet, so test it with your elbow. Always dry your feet with a soft towel after bathing, especially between the toes! Wetness between your toes will allow the growth of fungus, which may lead to a more serious infection.

Apply lotion if your feet are dry and cracked – Avoid putting moisturizing cream between your toes.

Trim your toenails carefully – File or clip your toenails straight across. Never cut or dig into the corners of the nail, this could lead into an ingrown toenail. Injuries from cutting your toenails can lead to infection, foot ulcers, and amputations.

Do not attempt to remove calluses – Do not apply corn pads or use commercial corn or callous products as these can cause a chemical burn. Careful when using pumice stone on your feet. It can cause problems especially of you have no feeling in your feet.

Wear a clean pair of light colored stockings or socks each day – Make sure they fit and are not too tight. Don’t wear knee high stockings as they may decrease blood flow to your legs.

Avoid going barefoot – Even in your own home. Injuries occur more frequently if your feet are not protected with shoes.

Wear shoes that fit well – Your shoes should be both wide and deep to help prevent bunions and other problems. You should not have to “break in” new shoes. Check your feet often while wearing them.

Check the inside of your shoes before putting them on – Rough and worn edges (sand, even things that accidentally find their way into your shoe) can cause irritations and ulcers very quickly.

Be sure your shoes cover your feet. Open toe or open heel shoes can cause skin to dry out and crack.
Avoid crossing your legs – Crossing legs can decrease blood flow to your feet.

Take your socks and shoes off at every doctor visit – Make sure your doctor, nurse, or foot care specialist (podiatrist) looks at your bare feet during each visit. These health care specialists are trained to see even small areas of infection, irritations, or deformities.

Be careful not to burn your feet – Don’t place feet near a heat source (heater, heating pad, hot water bottles). If feet are cold wear socks.

Wash a cut or sore with soap and water – Do not use peroxide, iodine, Merthiolate®. An antibacterial cream may be used.

Make sure your doctor, nurse, foot care specialist (podiatrist) checks circulation in your feet at least once a year.

Common signs of poor circulation in your legs:

- Pain in your legs when walking or lying down.
- Ulcers that don’t heal.
- Feet that feel cold to the touch.
- Lack of hair on your feet.
Report to your doctor any cuts, blisters, or sores immediately even if you feel they are minor problems!

DENTAL CARE

If your diabetes is in poor control, you increase your risk for tooth and gum disease. Also, your body’s ability to fight infection is lowered. Periodontal disease more than doubles the risk of death from cardiovascular and renal diseases in patients with diabetes.

Tips for good oral care:

- Keep blood glucose in control.
- Visit your dentist every 3-6 months.
- Tell your dentist that you have diabetes.
- Brush after each meal with a soft toothbrush.
- Floss teeth daily.
- Quit smoking! Smoking increases the formation of dental plaque.

I will call my dentist if I notice any of the following signs:

- Bleeding gums when I eat or brush my teeth.
- Painful teeth when I eat or drink anything cold.
- Any loose teeth, sores, patches, or ulcers in my mouth.
- Dentures that don’t fit properly.