



HABITS

We all have habits. These come easy to us. So much so, that we do them without thinking. We eat meals, we sleep, we move about.

In this section of the handout we want to give you information about how your daily habits impact diabetes and vice versa.

It is not hard to do something once it becomes a habit, but getting it to that point is what takes the effort whether it is eating 3 meals per day, getting 7-8 hours of sleep daily, or 30 minutes of exercise daily.

The reason we want healthy habits:

- Blood goes everywhere in our bodies
- If blood glucose, or sugar, is high, it also gets to **every** part of the body.
- Years of exposure to high levels of blood sugar damages blood vessels and nerves (Data on 8 years of A1c 8% or over)
- Well controlled diabetes is the cause of **nothing!**

So here is to getting you the information you need to help keep you free of troubles with diabetes!

SKIN CARE WITH DIABETES IN MIND



Uncontrolled diabetes can lead to dry skin. A dry spot can cause itching. Itching can introduce organisms, and if glucose is high, they will grow faster. Or, in normal glucose, grow slower but can still cause infection. White blood cells, that clear infection, do not work as well in blood that is over 180 mg/dl of glucose.

That is why one of the care measures for diabetes is good skin care. Cleansing when soiled of course, but for a daily routine, groin and feet are the areas that really need soap, the rest of the body, a little gentler care. Antibacterial soaps can strip essential oils (like Dial).

Skin becomes drier with age. Hot showers, hot tubs and strong soaps can strip natural oils away also. If you are troubled with dry skin, here are a few thoughts.

Some non-soap cleansers are Cetaphil or Aquanil, products that dermatologists mention by name. These can be found on pharmacy shelves. You may be able to find their same ingredients in a generic version and pay less. These are very gentle non-soap cleaners for the driest of skin. With dry skin, the super-fatted soaps of Dove or Tone or clear glycerine soaps may work better. Fragrance free may keep you away from some irritation also.

After bathing, be sure to moisturize: The old fashioned brands like Nivea or Eucerin are still good. In fact what works for you is best- not the brand name. In lotions you are looking for no petroleum (think Vaseline), but **petrolatum** is allowed. Go down the isles and you will find this in many products. Many cheaper lotions will qualify. Gold Bond now makes Diabetic Dry Skin Relief with a claim 9 out of 10 people with diabetes saw noticeable skin improvement in one hour.

Anastasia Marie is a company that you can call with your varied oily or dry spots and a product will be recommended for you. AMLaboratories, Inc was started by a Type 1 dietician for her own cares of dry skin. It can be found in local drug isles. Also at <http://www.amlab.com> for many products but especially nice is the Diapedic Foot Cream.

Amlactin lotion is a brand name that comes in several varieties. They make one with pramoxine, a nerve soother found in Neosporin also. This is at the drugstore but is under the counter and needs to be asked for to avoid over use that would mask anything worse.

3M has a product line for diabetic skin care branded NexCare. Some lotions are mixed with medications to decrease fungal infections, like Diabet-x Plus by Norisc. For truly dry skin, the doctor can prescribe LacHydrin lotion. Dr. Kowski, podiatrist, has led patient to Miracle Foot Cream, by Straight Arrow Products Inc. at www.mooremedical.com or Universal Foot Care Co 1-800-323-5110

Persons with acne may find these products are ok or look for a product with 2% salicylic acid. Neutrogena has a line of body scrubs and lotions called Body Clear.

New products are always coming along. Remember, the one that works for you is the best.

Sun block to avoid sunburns is important. SPF (sun protection factor) over 15 is best. But besides the burning, there is the UVA rays that cause aging. For protection from this, the sunscreen use everyday with a sunblock that contains UVB and UVA is needed. The sunscreen with "physical protection" is zinc oxide, titanium oxide. A chemical block like Parsol 1789 is not desired and can lead to more allergic reactions.

INFECTIONS:

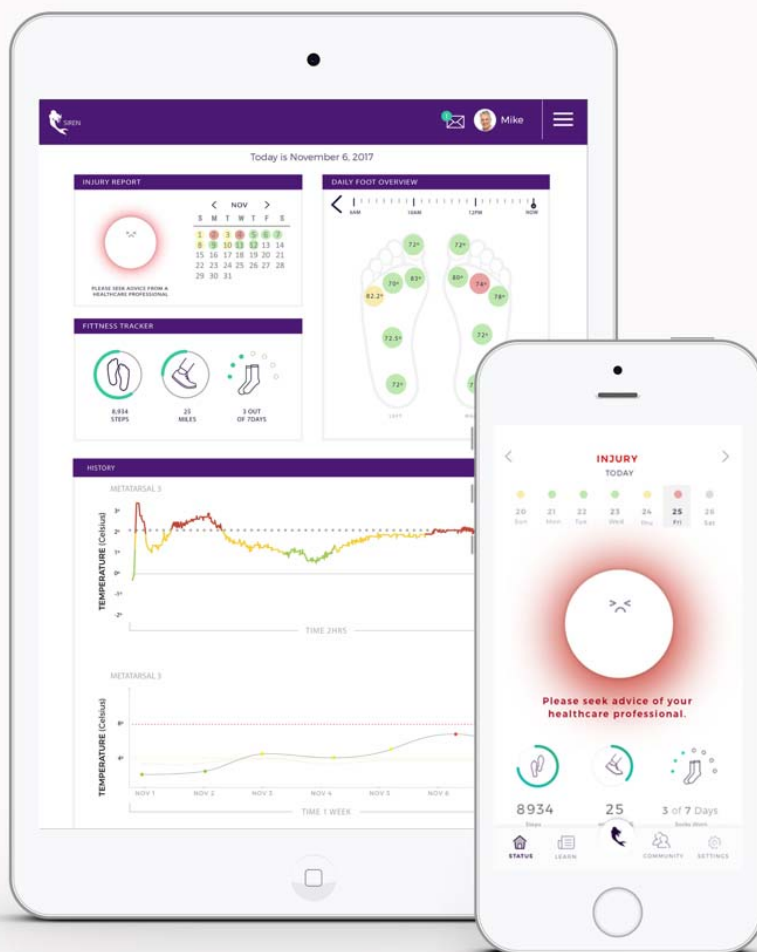
Yeast or fungal infections can often be cured with over the counter preparations, like clotrimazole, a cream sold under brand names of Lotrimin or Mycelex. Even if they are designated for Athlete's Foot, they can be used for jock itch, and vice versa. With the advent of the SGLT'2 drugs, Invokana is the first in the class Farxiga or Jardiance, yeast infections, treatable with over the counter products, are a side effect when first starting the drug. The best advice is to wipe with water after urination for the first two weeks of using these medications to avoid yeast overgrowth.

Fungal infections, which may start as an Athlete's Foot problem, can be treated with terbinafine, sold over the counter as Lamisil. These need to be treated quickly to avoid turning into bacterial infections.

Any wounds, clean, dry and keep clean. Neosporin contains neomycin which may cause allergic problems but helps to keep a wound clean.

The Cupron ProTherapySystem copper containing socks claim to kill 99.9% of Athlete's Foot fungus when worn for 12 hours. The copper helps collagen in skin to keep/ take up moisture also. www.cupron.com Now sold with the Renfro socks. www.renfrosocks.com or call: 855-655-8134

The newest product to help with intact skin is the Siren Sock with a sensor filled sock that works with a smart phone to show any areas on a foot that start to become warmer, meaning infection starting. This would prevent many foot ulcers. Check out <https://siren.care> for this amazing product. The cost seems reasonable at 19.95 for 5 pairs of socks, renewed every 6 months automatically.



Tobacco-Related Mortality

Overview

- Overall mortality among both male and female smokers in the United States is about three times higher than that among similar people who never smoked. The major causes of excess mortality among smokers are diseases that are related to smoking, including cancer and respiratory and vascular disease.^{1,2}
- Smoking cigarettes, pipes, or cigars increases the risk of dying from cancers of the lung, esophagus, larynx, and oral cavity.^{3,4}
- Smokeless tobacco is a known cause of human cancer.⁵ In addition, the nicotine in smokeless tobacco may increase the risk for sudden death from a condition where the heart does not beat properly (ventricular arrhythmias); as a result, the heart pumps little or no blood to the body's organs.⁵

Tobacco use is the leading preventable cause of death in the United States.³

Cigarettes and Death

Cigarette smoking causes about one of every five deaths in the United States each year.^{1,6}
Cigarette smoking is estimated to cause the following:¹

- More than 440,000 deaths annually (including deaths from secondhand smoke)
- 49,400 deaths per year from secondhand smoke exposure
- 269,655 deaths annually among men (including deaths from secondhand smoke)
- 173,940 deaths annually among women (including deaths from secondhand smoke)

Cigarette use causes premature death:

- Life expectancy for smokers is at least 10 years shorter than for nonsmokers.^{2,7}
- Quitting smoking before the age of 40 reduces the risk of dying from smoking-related disease by about 90%.²

Secondhand Smoke and Death

Exposure to secondhand smoke causes nearly 50,000 deaths each year among adults in the United States:¹

- Secondhand smoke causes 3,400 annual deaths from **lung cancer**.¹
- Secondhand smoke causes 46,000 annual deaths from **heart disease**.^{1,8,9}

Increased Risk for Death Among Men

- Men who smoke increase their risk of dying from bronchitis by nearly 10 times, from emphysema by nearly 10 times, and from lung cancer by more than 22 times.^{3,10}
- Smoking triples middle-aged men's risk of dying from heart disease.¹⁰

Increased Risk for Death Among Women

- Women who smoke increase their risk of dying from bronchitis by more than 10 times, from emphysema by more than 10 times, and from lung cancer by nearly 12 times.^{3,10}
- Between 1960 and 1990, deaths from lung cancer among women increased by more than 500%.¹¹ In 1987, lung cancer surpassed breast cancer to become the leading cause of cancer death among U.S. women. In 2000, 67,600 women died from lung cancer.¹¹ In 2009 (latest data available), 70,387 women died from lung cancer.¹²
- Smoking triples middle-aged women's risk of dying from heart disease.¹⁰

So, hard as it is...keep working to become smoke/tobacco free as a goal to be worked on for the sake of your overall health.

Tobacco Tied to Higher Risk of Oral HPV Infection, Study Finds

Researchers say smoking and 'chew' raised odds for the virus, which is linked to mouth, throat cancer



By **Steven Reinberg**

HealthDay Reporter

TUESDAY, Oct. 7, 2014 (HealthDay News) -- Tobacco use in any form appears to be linked to an increased risk of infection with oral human papillomavirus type 16 (HPV16), a virus that can cause cancers of the mouth and throat, according to Johns Hopkins University researchers.

The odds of being infected with HPV16, a sexually transmitted disease, rise as tobacco use increases, the researchers said. As few as three cigarettes a day can increase the risk of infection with HPV by almost one-third, according to the study.

How tobacco use might influence HPV16 infection isn't clear, said lead researcher Dr. Carole Fakhry, an assistant professor of otolaryngology-head and neck surgery at Johns Hopkins University School of Medicine.

"We don't fully understand oral HPV16," she said. "People exposed to tobacco could be more likely to become infected after exposure to HPV16 or less likely to get rid of the infection."

Fakhry cautioned that this study does not prove that tobacco makes it easier to get HPV16, only that the two factors are linked. Since tobacco use is associated with other risky behaviors, it's possible that people who use tobacco engage in more oral sex, which could increase their odds of being infected with HPV16, Fakhry explained.

She added that smoking, chewing or snorting tobacco doesn't cause HPV16 infection, but may make it easier to get the infection. Nonsmokers are also at risk for HPV16, especially those exposed to secondhand smoke, she said.

HPV16, which is transmitted through oral sex, is linked to 80 percent of cancers located in the back of the throat, according to the researchers. Over the last 20 years, this type of cancer has increased 225 percent in the United States, the researchers noted.

This year alone, about 37,000 Americans, mostly men, will get mouth or throat cancer, according to the American Cancer Society (ACS). About 7,300 will die from these cancers, according to the ACS.

For the study, Fakhry and her colleagues collected data on nearly 7,000 men and women who took part in the U.S. National Health and Nutrition Examination Survey. Among the participants, there were just over 2,000 tobacco users. More than 80 percent of tobacco users were cigarette smokers, according to the study. Other forms of tobacco use included chew, snuff and pipe smoking, the study found. Sixty-three of the tobacco users were infected with HPV16, the study reported.

The researchers measured blood levels of cotinine, a by-product of tobacco use, and found an amount equal to three cigarettes a day increased the risk of infection 31 percent, according to the study. When they measured urine levels of another tobacco-related marker, NNAL, the risk increased 68 percent when the levels equaled four cigarettes a day, the study found.

"This study highlights the need to understand the effect of tobacco on HPV16 infection over time," Fakhry said.

The report was published in the Oct. 8 issue of the *Journal of the American Medical Association*. Dr. Norman Edelman, a senior consultant for scientific affairs at the American Lung Association, said, "The connection between HPV and tobacco is probably real."

The question is whether the connection is based in biology or social behavior, he said. Smoking may be a marker of increased oral sex, Edelman said.

"If that is not true, then some of the contents of tobacco promote infection by this sexually transmitted virus, and that's a very important finding," he said.

Edelman added that studies have shown that nicotine increases tumor growth and the same could also be the case for viral infection.

"There is a lot of other stuff in tobacco that causes inflammation," he said. "So it may be that all the other inflammatory components of tobacco allow HPV to attack the tissues of the mouth and grow and stay put."

This is yet another reason not to smoke, chew tobacco or use snuff, because it's the same stuff going directly to the mouth, Edelman said. "Oral cancer is very nasty," he said.

Whatever the reason behind the increased risk of HPV16 infection for people who smoke, a vaccine for HPV -- including HPV16 -- is available for teens and young adults, according to the U.S. Centers for Disease Control and Prevention (CDC). The vaccine is routinely recommended for 11- and 12-year-old children, but can be given up to age 26 for both males and females, according to the CDC.

More information

For more information on mouth and throat cancer, visit the [American Cancer Society](#).

SOURCES: Carole Fakhry, M.D., M.P.H., assistant professor, otolaryngology-head and neck surgery, Johns Hopkins University School of Medicine, Baltimore, Md.; Norman Edelman, M.D., senior consultant for scientific affairs, American Lung Association; Oct. 8, 2014 *Journal of the American Medical Association*

Last Updated: Oct 7, 2014



For more information, Please visit <http://www.diabetes.org/>

Diabetes and Hearing Loss



[Listen](#)

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 numbers are similar — is there a link?

Yes, says the National Institutes of Health (NIH). In fact, the NIH has found that hearing loss is twice as common in people with diabetes as it is in those who don't have the disease. Also, of the 79 million adults thought to have prediabetes, the rate of hearing loss is 30% higher than in those with normal blood sugar.

How does diabetes contribute to hearing loss?

Hearing depends on small blood vessels and nerves in the inner ear. Researchers believe that, over time, high blood glucose levels can damage these vessels and nerves, diminishing the ability to hear.

I don't think I have any problem with my hearing.

Are you sure? For most people, hearing loss happens over time. The symptoms can be hard to notice. Quite often, family members and friends notice hearing loss before the person experiencing it.

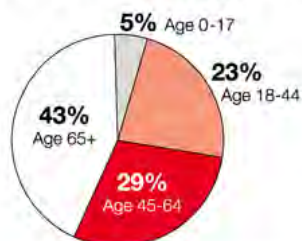
Your doctor may not always screen for hearing loss during a physical. Even if your doctor does check for hearing loss, you may still "pass" the screening test in a quiet exam room. Common signs of hearing loss include:

- Frequently asking others to repeat themselves
- Trouble following conversations that involve more than two people
- Thinking that others are mumbling
- Problems hearing in noisy places such as busy restaurants
- Trouble hearing the voices of women and small children
- Turning up the TV or radio volume too loud for others who are nearby

I'm not even 65 — how could my hearing be bad already?

Most people with hearing loss are younger than 65. Hearing problems can even happen in children.

Who has hearing loss?



Source:
<http://ihcrp.georgetown.edu/agingsociety/pdfs/hearing.pdf>

What should I do if I suspect a hearing loss?

Talk to your primary care doctor. You may then want to seek help from hearing specialist like: an audiologist, a licensed hearing aid dispenser or a doctor who specializes in hearing problems. From a full hearing exam, you'll learn more about your hearing loss. You will also be told what can be done to treat it.

What can be done to treat a hearing loss?

Sometimes the problem is just an earwax build-up and the patient is referred to a doctor to remove the wax. Treatment will depend on the type of hearing loss. The most common type of hearing loss is called "sensorineural hearing loss." This is the kind usually found with diabetes. It cannot usually be cured. However, most cases of sensorineural hearing loss can be treated with hearing aids.

How can I be sure that hearing aids will help?

Hearing aids have changed a lot in the past few years. Instead of making all sounds louder, like the old kind, newer hearing aids are better at making what you want to hear more clear. These hearing aids also have special features. They may have automatic volume control and can reduce background

noise.

But I don't want to be seen wearing hearing aids.

Hearing aids are getting smaller and smaller. It is unlikely anyone will notice when you are wearing them. The truth is, people are more likely to notice your hearing loss. People who don't treat their hearing problems can become depressed and try to avoid their friends. On the other hand, studies show that people who wear hearing aids often have a better quality of life.

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American Diabetes Association, 1701 North Beauregard Street, Alexandria, VA 22311 1-800-DIABETES (800-342-2383)
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HEARING

Sound waves enter your ear canal and set the eardrum vibrating. That starts 3 tiny bones in motion inside the middle ear space. That is what connects the eardrum to the Cochlea - the snail shaped thing. The cochlea is a hollow structure containing three tubes filled with fluid. The last bone in the middle ear chain is connected to a membrane covering a small opening called the oval window at one end of the cochlea, and the vibrations of this membrane cause waves in fluid inside the cochlea. There are tiny hairs at the end of one of the cochlea tubes. The vibration sets those waving. Your hearing nerve picks these up and carries it to the brain stem. The electrical signal travels through a system of nerve pathways, before arriving at specialized auditory centers of the brain, where the message is finally processed. All this in the fraction of a second when all is working good!

So, if there are this many parts to normal hearing, no wonder we can have problems with different parts of the pathway.

- *Conductive Hearing Loss* Happens in the outer and middle ear. Trauma to the physical state of the ear can result in hearing loss, conduct sound less well. Infection in the eardrum, pressure from deep sea diving or blunt force can do this. Otosclerosis is when there is abnormal growth of bone in the middle ear, which can reduce vibrations, requiring more volume
- *Sensorineural hearing loss* and central processing disorders (inner ear and central hearing pathway) Involves the delicate sensory hair cells in the cochlea or the hearing nerve, and sometimes both. When the nerve pathway from the ear to the brain is damaged, this is usually referred to as a central processing disorder. If sound is amplified for this problem, it can result in distorted speech. This may be a person who hears better in one range of sounds than another due to which hair fibers in the cochlea were damaged. Unfortunately for this form of damage, speech is made up of a combination of high and low pitch sounds.
- *Noise induced hearing loss* typically occurs in a very restricted frequency range, creating a gap in the sequence of frequencies that can be heard. The gap is usually in the high frequency range, which can again affect a person's ability to understand speech. Wearing ear protection is key. Noise protection in form of ear plugs, headphones can be used to prevent this.
- *Age related hearing* starts generally with the high frequencies. In general, vowels, which account for the loudness in speech, are in the low frequency range while consonants, which provide clarity of speech, are in the high frequency range. Therefore, high-frequency hearing loss may not affect how loudly sounds are heard, but it can make speech less clear and, as a result, more difficult to understand. You will recognize this as more difficulty with watching TV or listening to the radio, where speech is often fast and where visual cues like body movement and lip movement are not present. Noisy situations cause trouble with this form of hearing loss too.

Age related hearing loss may not be immediately evident to the person whose hearing is damaged, so they may not seek help until hearing loss is significant. They may accuse others of mumbling. Our hearing is connected to blood flow and nerve conduction, which can slow with aging at different levels in us all. Here is where diabetes care is imperative. Good preventive

measures of eating well and physical exercise can help lessen effect or delay onset of hearing loss.

WHERE TO GET HELP!

The HHIE-S form that follows is a hearing self check. If you score in the upper levels of this, bring it to the attention of your doctor. A referral to a hearing specialist for formal diagnostics usually follows. If you need assistive devices, you will be referred. An audiologist is the doctor with hearing specialty. The Hearing Aid Specialist is the one that fits you with a device. Many are small and discreet.

Resources: Check with your provider too.

National Institute on Deafness and Other Communication Disorders

800-241-1044 or for TTY 800-241-1055

www.nidcd.nih.gov

American Academy of Otolaryngology- Head and Neck Surgery

703-836-4444

www.entnet.org

American Academy of Audiology

800-222-2336

www.audiology.org

American Speech –Language-Hearing Association

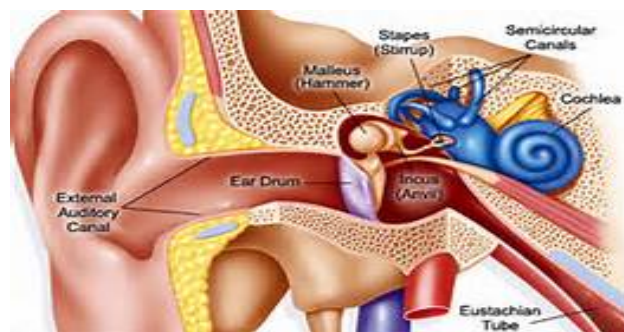
800-638-8255

www.asha.org

National Institute for Occupational Safety and Health

800-356-4674

www.cdc.gov/niosh/topics/noise



[Show](#)

HHIE-S



Yes Sometimes No
(4) (2) (0)

- 1. Does a hearing problem cause you to feel embarrassed when meeting new people?

- 2. Does a hearing problem cause you to feel frustrated when talking to members of your family?

- 3. Do you have difficulty hearing when someone speaks in a whisper?

- 4. Do you feel handicapped by a hearing problem?

- 5. Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?

- 6. Does a hearing problem cause you to attend lectures or religious services less often than you would like?

- 7. Does a hearing problem cause you to have arguments with family members?

- 8. Does a hearing problem cause you difficulty when listening to TV or radio?

- 9. Do you feel that any difficulty with your hearing limits or hampers your personal or social life?

- 10. Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?

Hearing Handicap Inventory for the Elderly

(Screening Version-HHIE-S)

This is a ten-item questionnaire asking about the effects of hearing impairment on emotional and social adjustments. The sensitivity and specificity of this test is reported to be in the range of 70 to 80% for identification of moderate to severe hearing loss.

Note that the range of total points is from 0-40, and interpretation is as follows:

- 0-8 denotes no self-perceived handicap.
- 10-22 denotes mild to moderate handicap.
- 24-40 denotes significant handicap.

SLEEP

Changed brain activity may be a reason why people lacking sleep eat more and gain weight, claims a US study published in "Nature Communications". Patients observed after a night without sleeping showed decreased activity in the area of the cerebral cortex that is responsible for assessing satiety. Conversely, areas associated with feelings of craving were particularly stimulated.

It has long been assumed that there is a connection between the increase in obesity in industrialized nations and the decrease in sleep. But the precise connection of these phenomena remains unexplained.

Researchers from the University of California at Berkeley examined the brains of 23 participants twice using MRI - once after a full night of sleep, and the other time after the patients remained awake the entire night. The patients' brain activity was measured while they were showed pictures with 80 different types of food and discovered the changed brain activity.

"There was another interesting discovery. High-calorie foods were more attractive to sleep-deprived patients," said study co-author Matthew Walker- These findings could "explain the connection between sleep deprivation, weight gain and obesity." **Therefore, one of the key factors to controlling one's weight is to take care to sleep enough!**



How much do you need? Somewhere between 7-9 hours per night. Normal sleep consists of 4 stages that cycle throughout the night. Stage 1 is the lightest and progresses to Stage 4 and into REM or Rapid Eye Movement where we restore and repair and become rested.

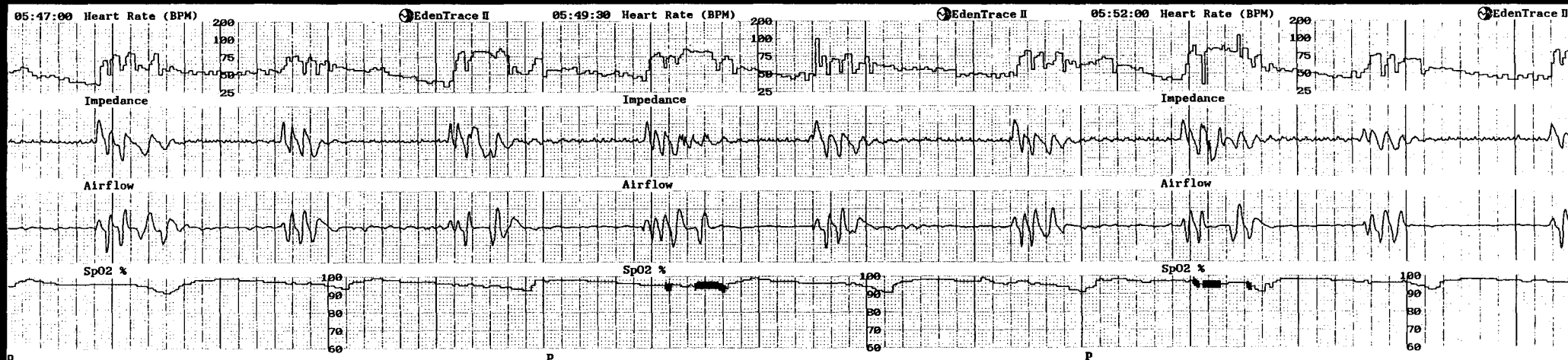
Lack of sleep can have serious consequences for health. Impaired immune system, and increased risk for heart disease. In one study, men were restricted to 4 hours of sleep for 4 nights. These men produced half as many antibodies in response to a flu vaccine as compared to well-rested men. Another study showed that women who slept an average of 5 hours a night or less increased their risk of heart disease by 39% compared with women with 8 hours. For people with diabetes, sleep can affect both diabetes control and complications. A study done at the University of Chicago showed healthy men restricted to 4 hours of sleep for 6 consecutive nights lost 30% of their ability to secrete and respond to insulin!!!! Other hormones shift to effect this and hunger.

THE CONSEQUENCES of TOO LITTLE	STAGE 4 SLEEP
Shifts in hormone levels	The effect on your body
Growth hormone decreases	Impairs regulation of body fat and muscle
Insulin level decreases	Impairs blood sugar metabolism
Leptin level increases	Increases appetite
Cortisol level increases	Linked with weight gain

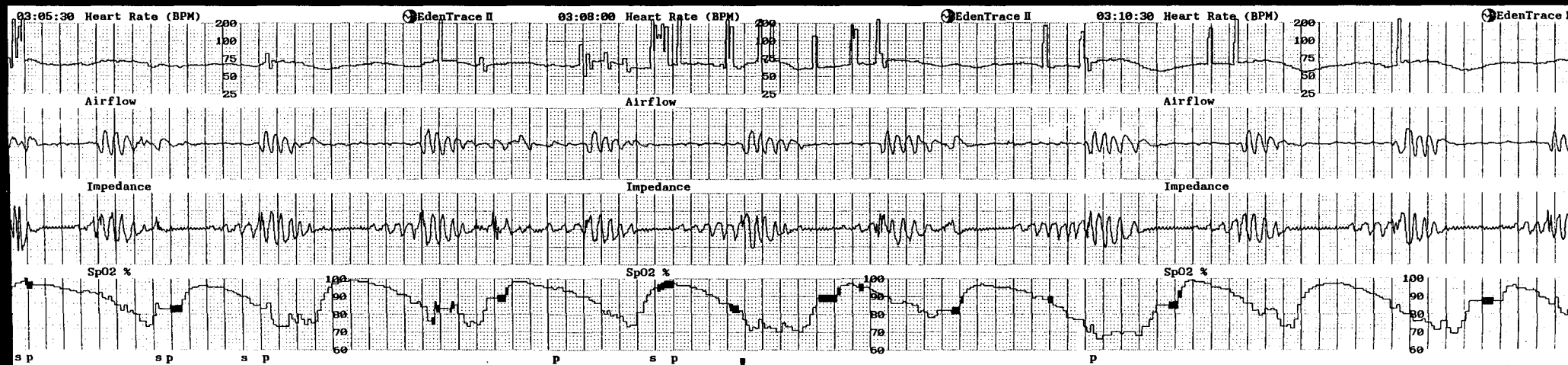
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3. Speigel K., Leproult R, VanCauter E. Impact of sleep debt on metabolic and endocrine function. Lancet. 1999;354:1435-1439.

Central Apnea: A temporary cessation of airflow without any respiratory effort.



Mixed Apnea: Combination of central and obstructive apnea.



Untreated Sleep Apnea May Worsen Markers of Heart Health and Diabetes

By Andrew M. Seaman

June 15, 2017



(Reuters Health) - Properly treating obstructive sleep apnea (OSA) may have benefits for the heart and for blood sugar, a new study suggests.

If people with OSA don't use continuous positive airway pressure (CPAP) at night to help keep the airway open, measures of their heart health and blood sugar worsen, researchers found.

"One of the longstanding debates in our field" is whether sleep apnea actually causes heart issues and problems with blood sugar, "or if they're just associated," said senior author Dr. Jonathan Jun, of Johns Hopkins University in Baltimore.

In the past, researchers have tried to find a direct link between sleep apnea, heart health and blood sugar by comparing patients instructed to use CPAP at night to keep the airway open with patients who were instructed to sleep without using CPAP. But one of the major issues with those studies is that people may not actually use the CPAP machine, Jun told Reuters Health by phone.

For the new study, the researchers recruited 31 people with moderate to severe OSA who were known to regularly use their CPAP machines.

The participants slept two nights in the lab, using their CPAP on only one of the nights. The researchers obtained blood samples while participants slept.

"We are looking at real time changes," said Jun. "We're getting blood every 20 minutes."

As reported online now in *The Journal of Clinical Endocrinology and Metabolism*, on the night without CPAP, patients' OSA returned. On those nights, patients had low levels of oxygen in their blood, poor sleep and an increased heart rate.

Additionally, their blood samples showed increases in fatty acids, sugar and the stress hormone cortisol.

The researchers also saw increases in blood pressure and in arterial stiffness, which has been linked with a risk for heart problems.

"These were obese patients and patients with relatively severe sleep apnea. They also had other medical problems," Jun pointed out. People who fit that description may be experiencing the same changes during the night if they sleep without their CPAP machine, he said.

Glucose and fatty acids rose in the overall group without the CPAP machines, but participants with diabetes may be more vulnerable to the glucose elevation, Jun warned.

He said the study can't say what would happen to people with milder sleep apnea.

Because obesity has been tied to an increased risk of sleep apnea, it's been difficult to know if it's the sleep apnea or the obesity itself that's causing those problems, Jun noted.

The new study, he said, "advances that idea that other conditions and not obesity itself are driver of those levels."

SOURCE: <http://bit.ly/2sXLJaU>

J Clin Endocrinol Metab 2017.

Updated October 17, 2007

Sleep Apnea and Type 2 Diabetes:

A Vicious Circle

by Ralph Pascualy, M.D.



The epidemic of diabetes in the United States is being fueled by multiple medical, social, and demographic forces. Among those forces is sleep apnea, which is now recognized as a major contributor to the development of diabetes. In sleep apnea, people stop breathing for periods of 10 seconds or more while they're asleep, sometimes hundreds of times a night. These periods without breathing, known as *apneas*, both disrupt sleep and lower the level of oxygen in the blood. When breathing restarts after an apnea, it is generally with a loud gasp or snort.

People with sleep apnea are more than twice as likely to have diabetes as those who don't. In addition, 50% of men with Type 2 diabetes have sleep apnea, compared to an estimated 4% of middle-aged men overall. Several recent studies have suggested that insulin sensitivity—the body's ability to respond to insulin—decreases as sleep apnea severity increases.

A high body-mass index (BMI, a measure of body mass that takes both height and weight into consideration) is a risk factor for both sleep apnea and diabetes.

Link to diabetes

A number of mechanisms are thought to be involved in the interaction between sleep apnea and diabetes, including the following:

Stress response. Repeated arousals from sleep and interruptions in the delivery of oxygen to the body's tissues caused by sleep apnea lead to the stress, or "fight or flight," response. In the short term, the stress response causes increased heart rate and increased blood pressure. When it occurs repeatedly over time, it is a risk factor in the development of chronic high blood pressure, insulin resistance (one of the hallmarks of Type 2 diabetes), and cardiovascular disease.

Increased cortisol levels. Sleep deprivation or fragmentation may increase blood levels of cortisol (a stress hormone), which in turn raises both blood glucose levels and insulin secretion.

Inflammatory response. Sleep apnea is associated with both local inflammation of the upper airways and *systemic* inflammation, or inflammation of the endothelium (the lining of the blood vessels) and other organ systems. Similarly, obesity is associated with systemic inflammation, as

well as *dyslipidemia* (unhealthy levels of cholesterol and triglycerides in the blood). Both systemic inflammation and dyslipidemia are associated with atherosclerosis and cardiovascular disease.

Lack of oxygen. Repeated episodes of oxygen deprivation may also cause the release of *proinflammatory cytokines*—proteins involved in the body’s immune response—that are associated with glucose intolerance (higher-than-normal blood glucose levels) and insulin resistance.

Link to metabolic syndrome

Both Type 2 diabetes and sleep apnea have also been linked to the metabolic syndrome, which is also sometimes called syndrome X. The metabolic syndrome is defined by a set of five medical conditions that together double the risk of atherosclerosis and confer a fivefold increase in the risk of diabetes. The five conditions are elevated fasting glucose levels, abdominal fat, high blood pressure, high triglycerides, and low high-density lipoprotein (HDL, or “good”) cholesterol. There is broad overlap between the suspected mechanisms of interaction between sleep apnea and diabetes and the features of the metabolic syndrome.

Elevated fasting glucose. Sleep apnea is independently associated with glucose intolerance and insulin resistance, whether or not a person is obese. Impaired glucose tolerance has also been linked with sleep restriction, insufficient sleep, and difficulty maintaining sleep, all of which typically occur with snoring and sleep apnea.

Visceral fat. Excess body fat, particularly in the abdominal area, is a good predictor of sleep apnea. Two-thirds of people who snore or have been found to have sleep apnea are obese. The severity of sleep apnea increases with increasing body-mass index.

High blood pressure. The risk of high blood pressure also increases with increasing severity of sleep apnea, and it has additionally been linked with insulin resistance.

Dyslipidemia. Elevated triglycerides and reduced HDL cholesterol are common among people with Type 2 diabetes, and they correlate with even mild sleep apnea, independent of body-mass index.

Sleep apnea is independently associated with each of the five metabolic syndrome conditions. The metabolic syndrome may be made worse by both untreated sleep apnea and untreated diabetes.

Treatment

When people with sleep apnea and Type 2 diabetes are treated with continuous positive airway pressure (CPAP, a common treatment for sleep apnea), the resulting improvement in their diabetes control leaves little doubt that sleep apnea may play a role in the functional changes that accompany Type 2 diabetes.

A CPAP device consists of a small mask that fits over the nose, or in some instances the mouth, and is connected to a machine that creates a slight air pressure in the throat to keep the airway open. A number of studies have examined its use.

For example, a study published in the *Journal of Clinical Endocrinology & Metabolism* in 1994 used CPAP therapy in a group of men and women who had Type 2 diabetes and sleep apnea. After four months of CPAP therapy, their sensitivity to insulin improved significantly.

A study published in the journal *Respiration* in 2004 measured the effects of CPAP therapy on insulin sensitivity in nine obese people with Type 2 diabetes and sleep apnea. These people had achieved good blood glucose control by means of either medication and diet or diet alone. Nonetheless, after three months of CPAP therapy, their insulin sensitivity improved significantly.

In yet another study, this one published in the *Archives of Internal Medicine* in 2005, use of CPAP therapy for at least four hours a day over one to four months led to improvements in blood glucose levels after meals in 25 people with Type 2 diabetes and sleep apnea. In addition, it led to lower glycosylated hemoglobin (HbA1c) levels in 17 people whose starting HbA1c was higher than 7%. The HbA1c test is a measure of blood glucose control over the previous 2–3 months. A normal, nondiabetic HbA1c level is between 4% and 6%.

In people with both sleep apnea and diabetes, therefore, CPAP therapy is an effective element in a treatment regimen where the objectives are normalized sleep and improved blood glucose control.

Further potential benefits from the treatment of snoring and sleep apnea may include the following:

- Improved control of high blood pressure
- Reduction in inflammatory response
- Reduced risk of fatal and nonfatal cardiovascular events (such as heart attacks)
- Reduced utilization of health-care resources

Improved quality of life is a common but frequently underappreciated benefit of CPAP therapy. People who use their CPAP device regularly experience improved sleep quality and have less fatigue, more energy, and improved coping capability. Depression, a common accompaniment of sleep apnea, may be replaced by a more positive mood. All of these changes enable a person to engage more readily in daily activities. Weight loss and improved fitness then become real possibilities, with their added beneficial effects on glucose tolerance.

Screening

Many health-care providers are unaware of the association between snoring, sleep apnea, and diabetes, and without awareness, treatment opportunities are missed. Everyone with diabetes should be screened routinely for the symptoms of snoring and sleep apnea. When people with diabetes and their sleep partners are asked the following three questions, nearly half will respond positively and can be expected to benefit from a referral to a sleep specialist:

- Do you snore? (While not everyone who snores has sleep apnea, just about everyone with sleep apnea snores.)
- Do you wake up tired after a full night's sleep?
- Do you have high blood pressure?

If you answered yes to any of these questions but your health-care provider has not talked about sleep apnea with you, bring it up at your next appointment. Treating sleep apnea can have remarkable benefits: Not only will you sleep better, but your level of insulin resistance may decrease significantly and you may reduce your risk of cardiovascular disease. *Dr. Pascualy is the Medical Director of the Swedish Sleep Medicine Institute at the Swedish Medical Center in Seattle. He is the coauthor of the book **Snoring and Sleep Apnea: Sleep Well, Feel Better (3rd edition)**, published by Demos Medical Publishing in 2000.*

WEIGHT - About BMI for Adults

What is BMI?

Body Mass Index (BMI) is a number calculated from a person's weight and height. BMI is a fairly reliable indicator of body fatness for most people. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (DXA).^{1,2} BMI can be considered an alternative for direct measures of body fat. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems.

How is BMI used?

BMI is used as a screening tool to identify possible weight problems for adults. However, BMI is not a diagnostic tool. For example, a person may have a high BMI. However, to determine if excess weight is a health risk, a healthcare provider would need to perform further assessments. These assessments might include skinfold thickness measurements, evaluations of diet, physical activity, family history, and other appropriate health screenings.

Why does CDC use BMI to measure overweight and obesity?

Calculating BMI is one of the best methods for population assessment of overweight and obesity. Because calculation requires only height and weight, it is inexpensive and easy to use for clinicians and for the general public. The use of BMI allows people to compare their own weight status to that of the general population.

To see the formula based on either kilograms and meters or pounds and inches, visit [How is BMI calculated and interpreted?](#)

What are some of the other ways to measure obesity? Why doesn't CDC use those to determine overweight and obesity among the general public?

Other methods to measure body fatness include skinfold thickness measurements (with calipers), underwater weighing, bioelectrical impedance, dual-energy x-ray absorptiometry (DXA), and isotope dilution. However, these methods are not always readily available, and they are either expensive or need highly trained personnel. Furthermore, many of these methods can be difficult to standardize across observers or machines, complicating comparisons across studies and time periods.

How is BMI calculated and interpreted?

Calculation of BMI

BMI is calculated the same way for both adults and children. The calculation is based on the following formulas:

Measurement Units	Formula and Calculation
Kilograms and meters (or centimeters)	<p>Formula: $\text{weight (kg)} / [\text{height (m)}]^2$</p> <p>With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters.</p> <p>Example: Weight = 68 kg, Height = 165 cm (1.65 m) Calculation: $68 \div (1.65)^2 = 24.98$</p>
Pounds and inches	<p>Formula: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$</p> <p>Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703.</p> <p>Example: Weight = 150 lbs, Height = 5'5" (65") Calculation: $[150 \div (65)^2] \times 703 = 24.96$</p>

Interpretation of BMI for adults

For adults 20 years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women. For children and teens, on the other hand, the interpretation of BMI is both age- and sex-specific.

For more information about interpretation for children and teens, visit [Child and Teen BMI Calculator](#).

The standard weight status categories associated with BMI ranges for adults are shown in the following table.

BMI	Weight Status
-----	---------------

Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

For example, here are the weight ranges, the corresponding BMI ranges, and the weight status categories for a sample height.

Height	Weight Range	BMI	Weight Status
5' 9"	124 lbs or less	Below 18.5	Underweight
	125 lbs to 168 lbs	18.5 to 24.9	Normal
	169 lbs to 202 lbs	25.0 to 29.9	Overweight
	203 lbs or more	30 or higher	Obese

How reliable is BMI as an indicator of body fatness?

The correlation between the BMI number and body fatness is fairly strong; however the correlation varies by sex, race, and age. These variations include the following examples: ^{3,4}

- At the same BMI, women tend to have more body fat than men.
- At the same BMI, older people, on average, tend to have more body fat than younger adults.
- Highly trained athletes may have a high BMI because of increased muscularity rather than increased body fatness.

It is also important to remember that BMI is only one factor related to risk for disease. For assessing someone's likelihood of developing overweight- or obesity-related diseases, the National Heart, Lung, and Blood Institute guidelines recommend looking at two other predictors:

- The individual's waist circumference (because abdominal fat is a predictor of risk for obesity-related diseases).
- Other risk factors the individual has for diseases and conditions associated with obesity (for example, high blood pressure or physical inactivity).

For more information about the assessment of health risk for developing overweight- and obesity-related diseases, visit the following Web pages from the National Heart, Lung, and Blood Institute:

If an athlete or other person with a lot of muscle has a BMI over 25, is that person still considered to be overweight?

According to the BMI weight status categories, anyone with a BMI over 25 would be classified as overweight and anyone with a BMI over 30 would be classified as obese.

It is important to remember, however, that BMI is not a direct measure of body fatness and that BMI is calculated from an individual's weight which includes both muscle and fat. As a result, some individuals may have a high BMI but not have a high percentage of body fat. For example, highly trained athletes may have a high BMI because of increased muscularity rather than increased body fatness. Although some people with a BMI in the overweight range (from 25.0 to 29.9) may not have excess body fatness, most people with a BMI in the obese range (equal to or greater than 30) will have increased levels of body fatness.

It is also important to remember that weight is only one factor related to risk for disease. If you have questions or concerns about the appropriateness of your weight, you should discuss them with your healthcare provider.

What are the health consequences of overweight and obesity for adults?

The BMI ranges are based on the relationship between body weight and disease and death.⁵ Overweight and obese individuals are at increased risk for many diseases and health conditions, including the following:⁶

- Hypertension
- Dyslipidemia (for example, high LDL cholesterol, low HDL cholesterol, or high levels of triglycerides)
- Type 2 diabetes
- Coronary heart disease
- Stroke

- Gallbladder disease
- Osteoarthritis
- Sleep apnea and respiratory problems
- Some cancers (endometrial, breast, and colon)

For more information about these and other health problems associated with overweight and obesity, visit [Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults](#)⁵.

Is BMI interpreted the same way for children and teens as it is for adults?

Although the BMI number is calculated the same way for children and adults, the criteria used to interpret the meaning of the BMI number for children and teens are different from those used for adults. For children and teens, BMI age- and sex-specific percentiles are used for two reasons:

- The amount of body fat changes with age.
- The amount of body fat differs between girls and boys.

Because of these factors, the interpretation of BMI is both age- and sex-specific for children and teens. The CDC BMI-for-age growth charts take into account these differences and allow translation of a BMI number into a percentile for a child's sex and age.

For adults, on the other hand, BMI is interpreted through categories that are not dependent on sex or age.

References


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⁶[Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults](#)  .



[Adult BMI Calculator](#) at

http://www.cdc.gov/healthyweight/assessing/bmi_english_bmi_calculator/bmi_calculator.html

June 2014 Suggestion that Japanese and Phillipino or Asian persons should use the BMI cutoff of 24 for risk establishment.

Research published in [Diabetes Care](#) showed the diabetes rates of obese whites with a BMI of at least 30 were similar to South Asians whose BMI was at least 22, patients of Chinese descent with a BMI of at least 24 and in blacks with a BMI of at least 26. The findings indicate a need to use lower BMIs to define obesity in different racial and ethnic groups.

View Full Article in:

[Nursing in Practice](#)

Asian Americans, Native Hawaiians and Pacific Islanders are at greater risk for type 2 diabetes at any weight.

YOU COULD BE AT RISK TOO.

If you can check one of these boxes, you are at risk for type 2 diabetes.

- I am of Asian descent
- I am of Hawaiian descent
- I am of Pacific Islander descent
- I am overweight/obese
- I do not exercise regularly
- I am over 45 years old
- I have family members with diabetes

WHAT IS DIABETES?

Diabetes is a disease that affects every part of your body. If untreated, diabetes can lead to heart attack, stroke, kidney disease, blindness, amputations and death.

The good news is you can prevent or delay getting type 2 diabetes by eating healthy and getting regular physical activity.

Ask your doctor if you should be screened for type 2 diabetes.



 American Diabetes Association.



“I couldn’t believe it when I was diagnosed with type 2 diabetes. I was at risk even though I’ve never been overweight.”



The American Diabetes Association is committed to supporting Asian Americans, Native Hawaiians and Pacific Islanders in preventing and living with diabetes.

Call 1-800-DIABETES (1-800-342-2383) or visit diabetes.org for more information about diabetes and to get involved.

Body Mass Index Table

To use the table, find the appropriate height in the left-hand column labeled Height. Move across to a given weight (in pounds). The number at the top of the column is the BMI at that height and weight.
Pounds have been rounded off.

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Height (inches)	Body Weight (pounds)																
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287

Continued

Body Mass Index Table

To use the table, find the appropriate height in the left-hand column labeled Height. Move across to a given weight. The number at the top of the column is the BMI at that height and weight.
Pounds have been rounded off.

BMI	Body Weight (pounds)																			
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	
Height (inches)																				
58	172	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258	
59	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267	
60	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276	
61	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285	
62	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295	
63	203	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304	
64	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314	
65	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	
66	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334	
67	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344	
68	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354	
69	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365	
70	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376	
71	257	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386	
72	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397	
73	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408	
74	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420	
75	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431	
76	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443	

The National Weight Control Registry
has followed ~3000 people who lost
an average of 66 pounds and maintained
this for 5 years. The secret of these "losers"...

- They ate low-fat (<30% of calories from fat), high-carbohydrate meals
- They eat breakfast
- They exercise for at least 30 minutes every day of the week
- They check their weight on a scale once a week

Lifelong patterns rather than going "on and off" a diet is key.

* Cadre's Current Diabetes Practice Vol.2 Issue 2 Spring 2003

Tips for Optimal Oral Health

Brushing Basics



Tilt the brush at a 45-degree angle against the gumline and roll the brush away from the gumline.



Clean all surfaces of the teeth, using short, gentle strokes.



Take a moment to brush your tongue to remove bacteria and freshen your breath.

Flossing Fundamentals



Take 18-inches of floss and wind most of it around your middle fingers until about one inch is left.



Holding the floss between the index finger and thumb of each hand, gently slide the floss between two teeth.



Slide floss up and down, then curve it around the base of each tooth. Never snap or force floss, as this may cut or bruise delicate gum tissue. Use clean sections of floss as you move from tooth to tooth.

Additional Oral Care Tips for those with Diabetes

- Have a dental checkup at least every six months, or as often as indicated by your dental professional.
- Tell your dentist and hygienist you have diabetes and any other medical condition.
- Brush for two minutes twice a day with a toothpaste with an antigingival/antibacterial ingredient to help prevent gingivitis and one that is accepted by the American Dental Association.

Contact your dentist or hygienist if you experience any of these signs of gum disease:

- Gums that bleed or are red, puffy or swollen, or sore
- Gums that have pulled away from your teeth
- Changes in the way your teeth fit together when you bite
- Pus that appears between your teeth and gums
- Constant bad breath or a bad taste in your mouth

DIABETES AND ORAL HEALTH PROBLEMS

Is There an Association Between Gum Disease and Diabetes?

For the nearly 21 million Americans that have diabetes, many may be surprised to learn about an unexpected complication associated with this condition. Research shows that there is an increased prevalence of gum disease among those with diabetes, adding serious gum disease to the list of other complications associated with diabetes, such as heart disease, stroke and kidney disease.

Is There a Two-Way Street?

Emerging research also suggests that the relationship between serious gum disease and diabetes is two-way. Not only are people with diabetes more susceptible to serious gum disease, but serious gum disease may have the potential to affect blood glucose control and contribute to the progression of diabetes. Research suggests that people with diabetes are at higher risk for oral health problems, such as gingivitis (an early stage of gum disease) and periodontitis (serious gum disease). People with diabetes are at an increased risk for serious gum disease because they are generally more susceptible to bacterial infection, and have a decreased ability to fight bacteria that invade the gums.

The Surgeon General's Report on Oral Health states that good oral health is integral to general health. So, be sure to brush and floss properly and see your dentist for regular checkups.

If I Have Diabetes, am I at Risk for Dental Problems?

If your blood glucose levels are poorly controlled, you are more likely to develop serious gum disease and lose more teeth than non-diabetics. Like all infections, serious gum disease may be a factor in causing blood sugar to rise and may make diabetes harder to control.

Other oral problems associated to diabetes include: thrush, an infection caused by fungus that grows in the mouth, and dry mouth which can cause soreness, ulcers, infections and cavities.

How Can I Help Prevent Dental Problems Associated with Diabetes?

First and foremost, control your blood glucose level. Then, take good care of your teeth and gums, along with regular checkups every six months. To control thrush, a fungal infection, maintain good diabetic control, avoid smoking and, if you wear them, remove and clean dentures daily. Good blood glucose control can also help prevent or relieve dry mouth caused by diabetes.

What Can I Expect at My Checkup? Should I Tell My Dental Professional About My Diabetes?

People with diabetes have special needs and your dentist and hygienist are equipped to meet those needs - with your help. Keep your dentist and hygienist informed of any changes in your condition and any medication you might be taking. Postpone any non-emergency dental procedures if your blood sugar is not in good control.

Study Evaluates Periodontal Disease Contributing to Diabetes Risk

May 27, 2008



Researchers have long noted that people with Type 2 diabetes are at higher risk for periodontal disease. The thinking is periodontal disease must be a consequence of Type 2 diabetes. But when one digs deeper, the scientific literature is relatively quiet in building a case for this proposed relationship.

This leaves the door open for another hypothesis: Is it possible that periodontal disease contributes to the development of Type 2 diabetes? The hypothesis builds on two points: Diabetes is now often characterized as a cardiovascular disease, and periodontal disease has long been considered a possible risk factor for cardiovascular disease.

To take a look at this question, NIDCR grantees and colleagues turned to existing data from the first National Health and Nutrition Examination Survey (NHANES I), conducted in the early 1970s. They teased out 9,296 adult participants who reported no history of Type 2 diabetes and categorized them based on the level, if any, of periodontal disease. They then compared the risk of developing diabetes over the next 20 years between people with and without periodontal disease. After adjusting their analyses for other diabetes risk factors, the researchers determined that NHANES I volunteers with intermediate periodontal disease at baseline were twice as likely to develop diabetes as healthy participants. The risk also remained elevated for those with advanced periodontal disease. Moreover, when considering tooth loss as a surrogate for historical periodontal disease, they found that participants with advanced tooth loss had 70 percent greater odds of developing diabetes. Interestingly, for edentulous volunteers, the odds of diabetes were increased by only 30 percent relative to participants with minimal tooth loss.

[Read more about this study by Demmer RT, Jacobs DR Jr, and Desvarieux M, which was published online in *Diabetes Care* on April 4.](#)



POP DRINKING AND TEETH

Exposing teeth to soft drinks, even for a short time, causes dental erosion which in time can lead to enamel loss.

Root beer is a bit less damaging. It is non- carbonated and does not contain the acids that harm teeth.

Diet drinks cut down sugar, but contain phosphoric acid and /or citric acid and still cause dental erosion.

Dental erosion means loss of tooth enamel and at times deeper parts of the tooth. Erosion results in a scooped out, smooth, depression on the tooth surface. This is the cause for hot and cold sensitivities- more pain as more dentin is exposed. Dentin protects the pulp.

Suggestion is to limit soft drinks and to use a straw if able. Regular sugar soft drinks contain 9-12 teaspoons of sugar. They also have the acidity that approaches the level of battery acid.

One type of cola ranked 2.39 on the acid scale.
Battery acid ranked 1.0

Non colas cause a greater amount of erosion than colas. Citric acid is prominent in these. Non colas are especially erosive.

There is a significant difference between sugared and diet colas.

The bottom line- the acidity in all soft drinks is enough to damage teeth and should be avoided.

Recommended Adult Immunization Schedule for ages 19 years or older

UNITED STATES
2020

How to use the adult immunization schedule

- 1** Determine recommended vaccinations by age (**Table 1**)
- 2** Assess need for additional recommended vaccinations by medical condition and other indications (**Table 2**)
- 3** Review vaccine types, frequencies, and intervals and considerations for special situations (**Notes**)

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American College of Physicians (www.acponline.org), American Academy of Family Physicians (www.aafp.org), American College of Obstetricians and Gynecologists (www.acog.org), and American College of Nurse-Midwives (www.midwife.org).

Vaccines in the Adult Immunization Schedule*

Vaccines	Abbreviations	Trade names
<i>Haemophilus influenzae</i> type b vaccine	Hib	ActHIB® Hiberix® PedvaxHIB®
Hepatitis A vaccine	HepA	Havrix® Vaqta®
Hepatitis A and hepatitis B vaccine	HepA-HepB	Twinrix®
Hepatitis B vaccine	HepB	Engerix-B® Recombivax HB® Heplisav-B®
Human papillomavirus vaccine	HPV vaccine	Gardasil 9®
Influenza vaccine (inactivated)	IIV	Many brands
Influenza vaccine (live, attenuated)	LAIV	FluMist® Quadrivalent
Influenza vaccine (recombinant)	RIV	Flublok® Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R® II
Meningococcal serogroups A, C, W, Y vaccine	MenACWY	Menactra® Menveo®
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero® Trumenba®
Pneumococcal 13-valent conjugate vaccine	PCV13	Prennar 13®
Pneumococcal 23-valent polysaccharide vaccine	PPSV23	Pneumovax® 23
Tetanus and diphtheria toxoids	Td	Tenivac® Tdvax™
Tetanus and diphtheria toxoids and acellular pertussis vaccine	Tdap	Adacel® Boostrix®
Varicella vaccine	VAR	Varivax®
Zoster vaccine, recombinant	RZV	Shingrix
Zoster vaccine live	ZVL	Zostavax®

*Administer recommended vaccines if vaccination history is incomplete or unknown. Do not restart or add doses to vaccine series if there are extended intervals between doses. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Report

- Suspected cases of reportable vaccine-preventable diseases or outbreaks to the local or state health department
- Clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or 800-822-7967

Injury claims

All vaccines included in the adult immunization schedule except pneumococcal 23-valent polysaccharide (PPSV23) and zoster (RZV, ZVL) vaccines are covered by the Vaccine Injury Compensation Program. Information on how to file a vaccine injury claim is available at www.hrsa.gov/vaccinecompensation.

Questions or comments

Contact www.cdc.gov/cdc-info or 800-CDC-INFO (800-232-4636), in English or Spanish, 8 a.m.–8 p.m. ET, Monday through Friday, excluding holidays.



Download the CDC Vaccine Schedules App for providers at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html.

Helpful information

- Complete ACIP recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- General Best Practice Guidelines for Immunization (including contraindications and precautions): www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Vaccine information statements: www.cdc.gov/vaccines/hcp/vis/index.html
- Manual for the Surveillance of Vaccine-Preventable Diseases (including case identification and outbreak response): www.cdc.gov/vaccines/pubs/surv-manual
- Travel vaccine recommendations: www.cdc.gov/travel
- Recommended Child and Adolescent Immunization Schedule, United States, 2020: www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html



**U.S. Department of
Health and Human Services**
Centers for Disease
Control and Prevention

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2020

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Influenza inactivated (IIV) or Influenza recombinant (RIV) ^{or}	1 dose annually			
Influenza live, attenuated (LAIV)				
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap, then Td or Tdap booster every 10 years			
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)			
Varicella (VAR)	2 doses (if born in 1980 or later)		2 doses	
Zoster recombinant (RZV) (preferred) ^{or}				2 doses
Zoster live (ZVL)				1 dose
Human papillomavirus (HPV)	2 or 3 doses depending on age at initial vaccination or condition	27 through 45 years		
Pneumococcal conjugate (PCV13)	1 dose			65 years and older
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses depending on indication			1 dose
Hepatitis A (HepA)	2 or 3 doses depending on vaccine			
Hepatitis B (HepB)	2 or 3 doses depending on vaccine			
Meningococcal A, C, W, Y (MenACWY)	1 or 2 doses depending on indication, see notes for booster recommendations			
Meningococcal B (MenB)	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
	19 through 23 years			
Haemophilus influenzae type b (Hib)	1 or 3 doses depending on indication			

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended vaccination for adults with an additional risk factor or another indication

Recommended vaccination based on shared clinical decision-making

No recommendation/ Not applicable

Table 2 Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2020

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 count		Asplenia, complement deficiencies	End-stage renal disease; or on hemodialysis	Heart or lung disease, alcoholism ¹	Chronic liver disease	Diabetes	Health care personnel ²	Men who have sex with men
			<200	≥200							
IIV or RIV or LAIV	1 dose annually										
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	NOT RECOMMENDED		1 or 2 doses depending on indication								
VAR	NOT RECOMMENDED		2 doses								
RZV (preferred) or ZVL	DELAY				2 doses at age ≥50 years or 1 dose at age ≥60 years						
HPV	DELAY	3 doses through age 26 years			2 or 3 doses through age 26 years						
PCV13		1 dose									
PPSV23		1, 2, or 3 doses depending on age and indication									
HepA					2 or 3 doses depending on vaccine						
HepB						2 or 3 doses depending on vaccine					
MenACWY	1 or 2 doses depending on indication, see notes for booster recommendations										
MenB	PRECAUTION	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations									
Hib		3 doses HSCT ³ recipients only			1 dose						

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

 No recommendation/Not applicable

 Recommended vaccination for adults with an additional risk factor or another indication

 Precaution—vaccination might be indicated if benefit of protection outweighs risk of adverse reaction

 Delay vaccination until after pregnancy if vaccine is indicated

 Not recommended/contraindicated—vaccine should not be administered

1. Precaution for LAIV does not apply to alcoholism. 2. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. 3. Hematopoietic stem cell transplant.

Haemophilus influenzae type b vaccination**Special situations**

- **Anatomical or functional asplenia (including sickle cell disease):** 1 dose if previously did not receive Hib; if elective splenectomy, 1 dose, preferably at least 14 days before splenectomy
- **Hematopoietic stem cell transplant (HSCT):** 3-dose series 4 weeks apart starting 6–12 months after successful transplant, regardless of Hib vaccination history

Hepatitis A vaccination**Routine vaccination**

- **Not at risk but want protection from hepatitis A** (identification of risk factor not required): 2-dose series HepA (Havrix 6–12 months apart or Vaqta 6–18 months apart [minimum interval: 6 months]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2/5 months between doses 2 and 3])

Special situations

- **At risk for hepatitis A virus infection:** 2-dose series HepA or 3-dose series HepA-HepB as above
 - **Chronic liver disease** (e.g., persons with hepatitis B, hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice the upper limit of normal)
 - **HIV infection**
 - **Men who have sex with men**
 - **Injection or noninjection drug use**
 - **Persons experiencing homelessness**
 - **Work with hepatitis A virus** in research laboratory or with nonhuman primates with hepatitis A virus infection
 - **Travel in countries with high or intermediate endemic hepatitis A**
 - **Close, personal contact with international adoptee** (e.g., household or regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee's arrival)

- **Pregnancy** if at risk for infection or severe outcome from infection during pregnancy
- **Settings for exposure, including** health care settings targeting services to injection or noninjection drug users or group homes and nonresidential day care facilities for developmentally disabled persons (individual risk factor screening not required)

Hepatitis B vaccination**Routine vaccination**

- **Not at risk but want protection from hepatitis B** (identification of risk factor not required): 2- or 3-dose series (2-dose series Heplisav-B at least 4 weeks apart [2-dose series HepB only applies when 2 doses of Heplisav-B are used at least 4 weeks apart] or 3-dose series Engerix-B or Recombivax HB at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2/8 weeks between doses 2 and 3/16 weeks between doses 1 and 3]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2/5 months between doses 2 and 3])

Special situations

- **At risk for hepatitis B virus infection:** 2-dose (Heplisav-B) or 3-dose (Engerix-B, Recombivax HB) series or 3-dose series HepA-HepB (Twinrix) as above
 - **Chronic liver disease** (e.g., persons with hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
 - **HIV infection**
 - **Sexual exposure risk** (e.g., sex partners of hepatitis B surface antigen [HBsAg]-positive persons; sexually active persons not in mutually monogamous relationships; persons seeking evaluation or treatment for a sexually transmitted infection; men who have sex with men)
 - **Current or recent injection drug use**
 - **Percutaneous or mucosal risk for exposure to blood** (e.g., household contacts of HBsAg-positive persons; residents and staff of facilities for developmentally disabled persons; health care and public safety personnel with reasonably anticipated risk for

exposure to blood or blood-contaminated body fluids; hemodialysis, peritoneal dialysis, home dialysis, and predialysis patients; persons with diabetes mellitus age younger than 60 years and, at discretion of treating clinician, those age 60 years or older)

- **Incarcerated persons**
- **Travel in countries with high or intermediate endemic hepatitis B**
- **Pregnancy** if at risk for infection or severe outcome from infection during pregnancy (Heplisav-B not currently recommended due to lack of safety data in pregnant women)

Human papillomavirus vaccination**Routine vaccination**

- **HPV vaccination recommended for all adults through age 26 years:** 2- or 3-dose series depending on age at initial vaccination or condition:
 - **Age 15 years or older at initial vaccination:** 3-dose series at 0, 1–2, 6 months (minimum intervals: 4 weeks between doses 1 and 2/12 weeks between doses 2 and 3/5 months between doses 1 and 3; repeat dose if administered too soon)
 - **Age 9 through 14 years at initial vaccination and received 1 dose or 2 doses less than 5 months apart:** 1 dose
 - **Age 9 through 14 years at initial vaccination and received 2 doses at least 5 months apart:** HPV vaccination complete, no additional dose needed.
- **If completed valid vaccination series with any HPV vaccine, no additional doses needed**

Shared clinical decision-making

- **Age 27 through 45 years based on shared clinical decision-making:**
 - 2- or 3-dose series as above

Special situations

- **Pregnancy through age 26 years:** HPV vaccination is not recommended until after pregnancy; no intervention needed if vaccinated while pregnant; pregnancy testing not needed before vaccination

Influenza vaccination

Routine vaccination

- **Persons age 6 months or older:** 1 dose any influenza vaccine appropriate for age and health status annually
- For additional guidance, see www.cdc.gov/flu/professionals/index.htm

Special situations

- **Egg allergy, hives only:** 1 dose any influenza vaccine appropriate for age and health status annually
- **Egg allergy more severe than hives** (e.g., angioedema, respiratory distress): 1 dose any influenza vaccine appropriate for age and health status annually in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions
- **LAIV should not be used** in persons with the following conditions or situations:
 - History of severe allergic reaction to any vaccine component (excluding egg) or to a previous dose of any influenza vaccine
 - Immunocompromised due to any cause (including medications and HIV infection)
 - Anatomic or functional asplenia
 - Cochlear implant
 - Cerebrospinal fluid-orpharyngeal communication
 - Close contacts or caregivers of severely immunosuppressed persons who require a protected environment
 - Pregnancy
 - Received influenza antiviral medications within the previous 48 hours
- **History of Guillain-Barré syndrome within 6 weeks of previous dose of influenza vaccine:** Generally should not be vaccinated unless vaccination benefits outweigh risks for those at higher risk for severe complications from influenza

Measles, mumps, and rubella vaccination

Routine vaccination

- **No evidence of immunity to measles, mumps, or rubella:** 1 dose
 - **Evidence of immunity:** Born before 1957 (health care personnel, see below), documentation of receipt of MMR vaccine, laboratory evidence of immunity or disease (diagnosis of disease without laboratory confirmation is not evidence of immunity)

Special situations

- **Pregnancy with no evidence of immunity to rubella:** MMR contraindicated during pregnancy; after pregnancy (before discharge from health care facility), 1 dose
- **Nonpregnant women of childbearing age with no evidence of immunity to rubella:** 1 dose
- **HIV infection with CD4 count ≥ 200 cells/ μ L for at least 6 months and no evidence of immunity to measles, mumps, or rubella:** 2-dose series at least 4 weeks apart; MMR contraindicated in HIV infection with CD4 count < 200 cells/ μ L
- **Severe immunocompromising conditions:** MMR contraindicated
- **Students in postsecondary educational institutions, international travelers, and household or close, personal contacts of immunocompromised persons with no evidence of immunity to measles, mumps, or rubella:** 2-dose series at least 4 weeks apart if previously did not receive any doses of MMR or 1 dose if previously received 1 dose MMR
- **Health care personnel:**
 - **Born in 1957 or later with no evidence of immunity to measles, mumps, or rubella:** 2-dose series at least 4 weeks apart for measles or mumps or at least 1 dose for rubella
 - **Born before 1957 with no evidence of immunity to measles, mumps, or rubella:** Consider 2-dose series at least 4 weeks apart for measles or mumps or 1 dose for rubella

Meningococcal vaccination

Special situations for MenACWY

- **Anatomical or functional asplenia (including sickle cell disease), HIV infection, persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab) use:** 2-dose series MenACWY (Menactra, Menveo) at least 8 weeks apart and revaccinate every 5 years if risk remains
- **Travel in countries with hyperendemic or epidemic meningococcal disease, microbiologists routinely exposed to *Neisseria meningitidis*:** 1 dose MenACWY (Menactra, Menveo) and revaccinate every 5 years if risk remains
- **First-year college students who live in residential housing (if not previously vaccinated at age 16 years or older) and military recruits:** 1 dose MenACWY (Menactra, Menveo)

Shared clinical decision-making for MenB

- **Adolescents and young adults age 16 through 23 years (age 16 through 18 years preferred) not at increased risk for meningococcal disease:** Based on shared clinical decision-making, 2-dose series MenB-4C at least 1 month apart or 2-dose series MenB-FHbp at 0, 6 months (if dose 2 was administered less than 6 months after dose 1, administer dose 3 at least 4 months after dose 2); MenB-4C and MenB-FHbp are not interchangeable (use same product for all doses in series)

Special situations for MenB

- **Anatomical or functional asplenia (including sickle cell disease), persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab) use, microbiologists routinely exposed to *Neisseria meningitidis*:** 2-dose primary series MenB-4C (Bexsero) at least 1 month apart or 3-dose primary series MenB-FHbp (Trumenba) at 0, 1–2, 6 months (if dose 2 was administered at least 6 months after dose 1, dose 3 not needed); MenB-4C and MenB-FHbp are not interchangeable (use same product for all doses in series); 1 dose MenB booster 1 year after primary series and revaccinate every 2–3 years if risk remains
- **Pregnancy:** Delay MenB until after pregnancy unless at increased risk and vaccination benefits outweigh potential risks

Pneumococcal vaccination

Routine vaccination

- **Age 65 years or older** (immunocompetent—see www.cdc.gov/mmwr/volumes/68/wr/mm6846a5.htm?s_cid=mm6846a5_w): 1 dose PPSV23
 - If PPSV23 was administered prior to age 65 years, administer 1 dose PPSV23 at least 5 years after previous dose

Shared clinical decision-making

- **Age 65 years and older** (immunocompetent): 1 dose PCV13 based on **shared clinical decision-making**
 - If both PCV13 and PPSV23 are to be administered, PCV13 should be administered first
 - PCV13 and PPSV23 should be administered at least 1 year apart
 - PCV13 and PPSV23 should not be administered during the same visit

Special situations

- (see www.cdc.gov/mmwr/volumes/68/wr/mm6846a5.htm?s_cid=mm6846a5_w)
- **Age 19 through 64 years with chronic medical conditions (chronic heart [excluding hypertension], lung, or liver disease, diabetes), alcoholism, or cigarette smoking:** 1 dose PPSV23
 - **Age 19 years or older with immunocompromising conditions (congenital or acquired immunodeficiency [including B- and T-lymphocyte deficiency, complement deficiencies, phagocytic disorders, HIV infection], chronic renal failure, nephrotic syndrome, leukemia, lymphoma, Hodgkin disease, generalized malignancy, iatrogenic immunosuppression [e.g., drug or radiation therapy], solid organ transplant, multiple myeloma) or anatomical or functional asplenia (including sickle cell disease and other hemoglobinopathies):** 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later, then another dose PPSV23 at least 5 years after previous PPSV23; at age 65 years or older, administer 1 dose PPSV23 at least 5 years after most recent PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)

- **Age 19 years or older with cerebrospinal fluid leak or cochlear implant:** 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later; at age 65 years or older, administer another dose PPSV23 at least 5 years after PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)

Tetanus, diphtheria, and pertussis vaccination

Routine vaccination

- **Previously did not receive Tdap at or after age 11 years:** 1 dose Tdap, then Td or Tdap every 10 years

Special situations

- **Previously did not receive primary vaccination series for tetanus, diphtheria, or pertussis:** At least 1 dose Tdap followed by 1 dose Td or Tdap at least 4 weeks after Tdap and another dose Td or Tdap 6–12 months after last Td or Tdap (Tdap can be substituted for any Td dose, but preferred as first dose); Td or Tdap every 10 years thereafter
- **Pregnancy:** 1 dose Tdap during each pregnancy, preferably in early part of gestational weeks 27–36
- For information on use of Td or Tdap as tetanus prophylaxis in wound management, see www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm

Varicella vaccination

Routine vaccination

- **No evidence of immunity to varicella:** 2-dose series 4–8 weeks apart if previously did not receive varicella-containing vaccine (VAR or MMRV [measles-mumps-rubella-varicella vaccine] for children); if previously received 1 dose varicella-containing vaccine, 1 dose at least 4 weeks after first dose
 - Evidence of immunity: U.S.-born before 1980 (except for pregnant women and health care personnel [see below]), documentation of 2 doses varicella-containing vaccine at least 4 weeks apart, diagnosis or verification of history of varicella or herpes zoster by a health care provider, laboratory evidence of immunity or disease

Special situations

- **Pregnancy with no evidence of immunity to varicella:** VAR contraindicated during pregnancy; after pregnancy (before discharge from health care facility) 1 dose if previously received 1 dose varicella-containing vaccine or dose 1 of 2-dose series (dose 2: 4–8 weeks later) if previously did not receive any varicella-containing vaccine, regardless of whether U.S.-born before 1980
- **Health care personnel with no evidence of immunity to varicella:** 1 dose if previously received 1 dose varicella-containing vaccine; 2-dose series 4–8 weeks apart if previously did not receive any varicella-containing vaccine, regardless of whether U.S.-born before 1980
- **HIV infection with CD4 count ≥ 200 cells/ μ L with no evidence of immunity:** Vaccination may be considered (2 doses, administered 3 months apart); VAR contraindicated in HIV infection with CD4 count < 200 cells/ μ L
- **Severe immunocompromising conditions:** VAR contraindicated

Zoster vaccination

Routine vaccination

- **Age 50 years or older:** 2-dose series RZV (Shingrix) 2–6 months apart (minimum interval: 4 weeks; repeat dose if administered too soon), regardless of previous herpes zoster or history of ZVL (Zostavax) vaccination (administer RZV at least 2 months after ZVL)
- **Age 60 years or older:** 2-dose series RZV 2–6 months apart (minimum interval: 4 weeks; repeat if administered too soon) or 1 dose ZVL if not previously vaccinated. RZV preferred over ZVL (if previously received ZVL, administer RZV at least 2 months after ZVL)

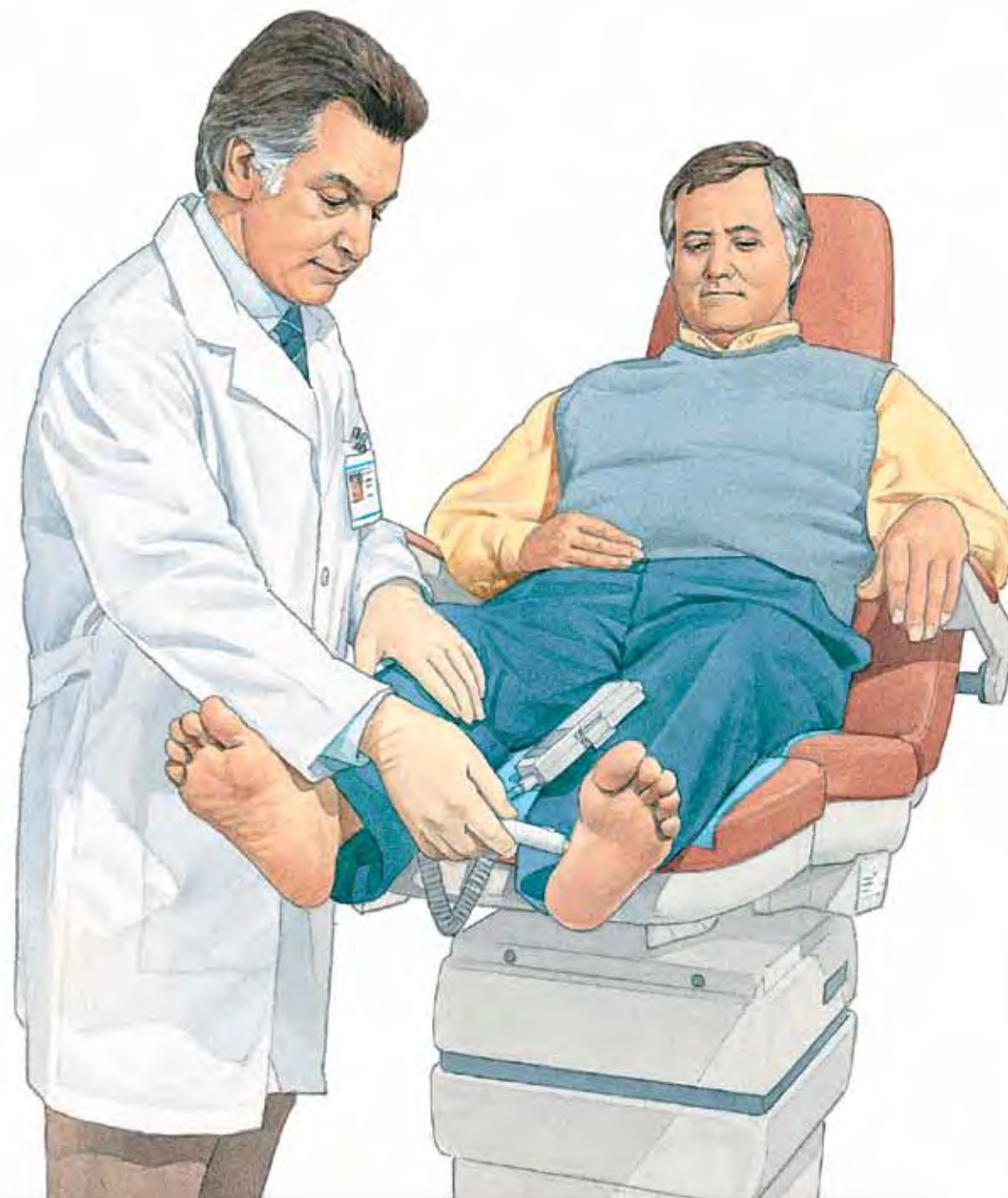
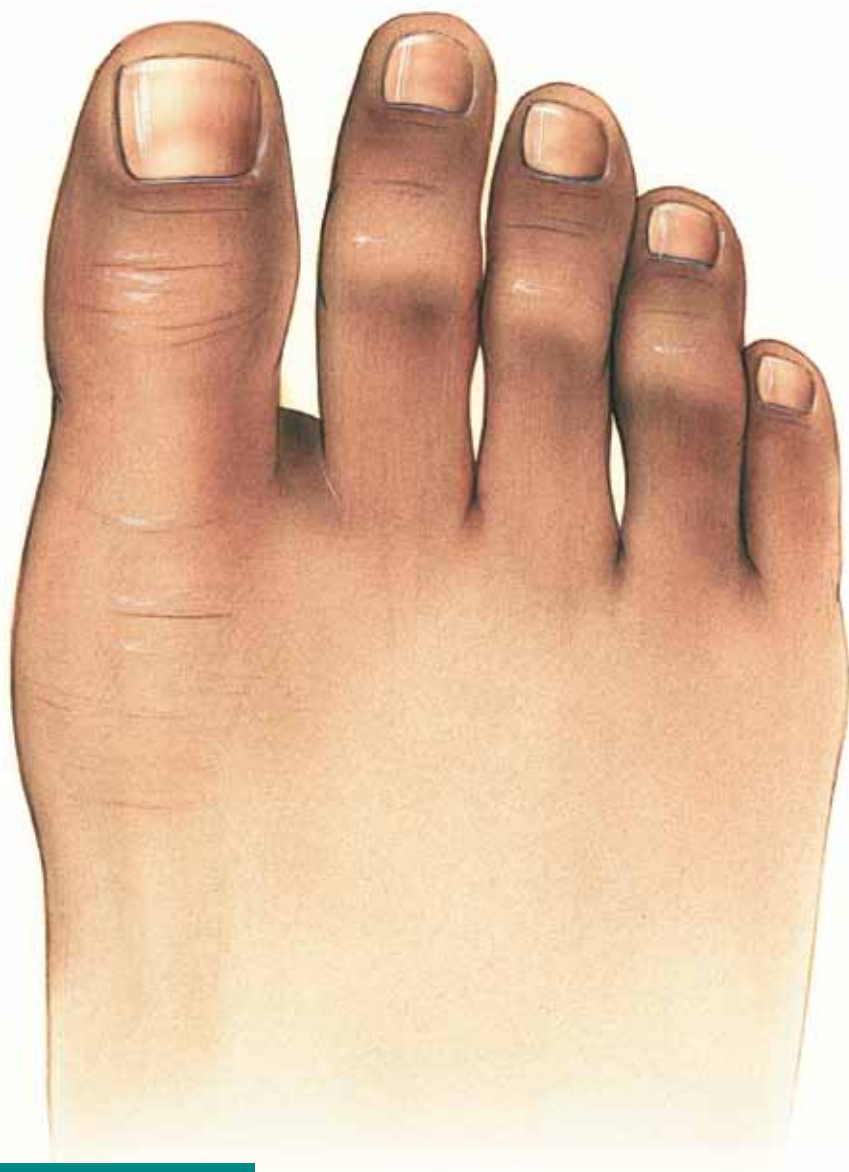
Special situations

- **Pregnancy:** ZVL contraindicated; consider delaying RZV until after pregnancy if RZV is otherwise indicated
- **Severe immunocompromising conditions (including HIV infection with CD4 count < 200 cells/ μ L):** ZVL contraindicated; recommended use of RZV under review

Do You Have DIABETES?



Take Off Your Shoes & Socks



TODAY:

Ask Your Healthcare Provider To Check Your Feet:

Report any changes in how your feet look or feel

EVERY DAY:



- 1 Wash your feet thoroughly
- 2 Dry your feet thoroughly (between the toes)
- 3 Apply moisturizer to your feet (not between the toes)
- 4 Wear moisture resistant socks
- 5 Never walk barefoot
- 6 Wear shoes that fit well

ALSO:

- Check your feet for sores, cuts, blisters, corns and redness
- DO NOT soak your feet
- DO NOT smoke

Support of these resources made possible by



**Stop Diabetes[®]
from Knocking
You Off
Your Feet**

Self Testing Instructions

(You may screen your own feet or ask a relative, friend, or neighbor to do it for you)



Step 1

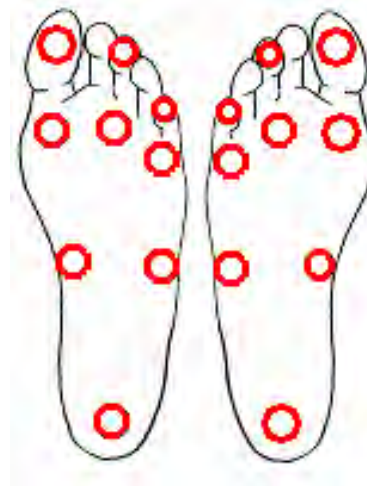
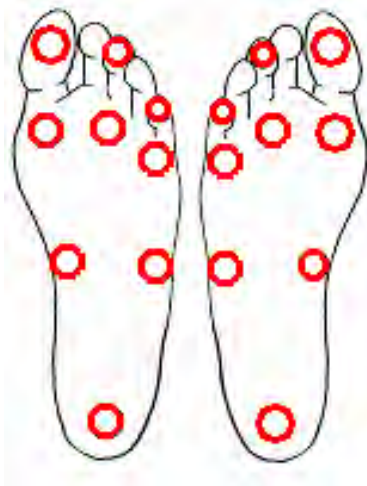


Step 2

1. Hold the red filament by the paper handle, as shown in Step 1.
2. Use a smooth motion to touch the filament to the skin on your foot. Touch the filament along the side of and NOT directly on an ulcer, callous, or scar. Touch the filament to your skin for 1-2 seconds. Push hard enough to make the filament bend as shown in step 2.
3. Touch the filament to both of your feet in the sites circled on the drawing below.
4. Place a (+) in the circle if you can feel the filament at that site and a (-) if you cannot feel the filament at that site.
5. The filament is reusable. After use, wipe with an alcohol swab.

Diabetic Foot Screen Test Sites

If you have a (-) in any circle, take this form to your health care provider as soon as possible.



Date _____

Date _____

Place
Filament
Here

Your Annual Comprehensive Foot Exam

by Timothy K. Fisher, DPM, and David G. Armstrong, DPM, MD, PhD

People with diabetes face the possibility of developing a variety of [diabetic complications](#), with the risk of each dependent on a number of factors including, first and foremost, blood glucose control. One area in which complications can occur is the feet. It is estimated that as many as 25% of people with diabetes develop a foot ulcer at some point in their lives, and ulcer risk tends to increase with age. The major contributing factor to this risk is loss of sensation in the feet, usually caused by [peripheral neuropathy](#), or nerve damage in the feet and legs. This common complication can change or reduce the sensation of pain, heat, and cold in the feet. For example, if someone with neuropathy were to walk on hot pavement, he might not be able to feel the heat, so there would be an increased likelihood of burns or blisters — which, in turn, could easily go unnoticed and untreated due to the lack of sensation.

Add to the mix another common diabetic complication: reduced blood circulation in the limbs, or [peripheral arterial disease](#). Blood is the main source of oxygen and other nutrients essential to healing, as well as immune defense, so when circulation is impaired, wounds tend to take longer to heal and are more likely to become infected.

Thus, for feet, the combination of reduced sensation and poor circulation can spell major trouble. While these two factors tend to play the largest role in the development of foot complications, other factors can also increase the level of risk, including foot deformities, loss of eyesight, kidney disease, chronic or frequent high blood glucose, previous ulcers or amputation, and cigarette smoking.

There is good news, however. Through early identification, diagnosis, and treatment of potential problems, the vast majority of foot-related complications can be avoided. The best way to accomplish this is through an annual comprehensive foot examination, as recommended by the American Diabetes Association. This article describes what to expect during such a foot exam, and what its results may indicate in terms of further examinations and treatments.

The foot exam

A diabetic foot exam should be conducted by someone experienced in the procedure, who may be either a doctor or another medical professional. The examiner should ask several questions on behalf of your feet; these questions guide the procedure, and are outlined below.

What have I been through?

Your medical history is important when it comes to evaluating your risk of foot complications. Any previous ailments or medical conditions should be discussed, both general and foot-specific. Key items to note include any previous ulcers or amputations and any abnormal feelings in the feet. More general risk factors such as circulation problems, impaired vision, kidney problems, previous surgeries, pain in the feet or legs, and smoking should also be discussed with the foot specialist. This information will help the examiner tailor a plan of care to your individual needs.

Am I in good shoes?

Once your socks and shoes are removed, the foot exam can begin — yet an important part of the exam involves inspecting your shoes and the effect they're having on your feet. Your feet should be examined for any irritation that might result from a poor shoe fit, and the shape of your feet should be compared with that of your shoes. Improper shoes may be too constrictive, too small, too large,

too rigid, or too worn, all of which can result in irritation that may lead to a blister and possibly an ulcer.

Is my skin tough enough?

The examiner should proceed to inspect the surface of your entire foot: the heel, the bottom of the foot, the top of the foot, between the toes, and the nails. Important things to notice include any breaks or cracks in the skin, especially between the toes. Such cracks can act as entry points for bacteria and lead to infections. Areas of redness may indicate infection or pressure from a poorly fitting shoe. Typically, the temperature of both feet should be about the same, with maybe a degree difference here and there. If an area on one foot has a higher temperature than the same area on the other foot, this could be an indication of skin breakdown or infection.

Callused areas of the foot can be a sign of abnormal pressure, and if there is evidence of blood under a callus, this may indicate an underlying ulcer. As calluses become larger, they will typically cause pain in people who have intact sensation and may change the way they walk. For people who have lost the “gift of pain,” the pressure on these areas can be great enough to cause an ulcer underneath. It has been shown that if a callus is trimmed, this pressure can be reduced and an ulcer can often be avoided. However, check with your doctor first before attempting to trim your own callus.

The examiner should also take a good look at the toenails, with any nail polish removed. Trauma, fungus, and age can alter the way nails grow and look. Curvature of the nails toward the skin can cause them to become ingrown, which can be painful and lead to infection if not remedied. By avoiding trimming the nail corner when trimming nails can help prevent this condition.

Dry skin on the feet can be a cause for concern, both because it may indicate poor circulation and because it can lead to cracks that can become infected. Dry skin, nail problems, or extreme redness may be grounds for referral to a podiatrist or a nurse foot-care specialist.

Am I mechanically sound?

The biomechanics of feet — how they move, and what shape they are — often indicates whether future problems may be likely, as deformities can lead to pressure points and breakdown of the skin. Foot deformities can exist in several different forms, some of which require nothing but caution and accommodation — but some of which may require correction through either physical manipulation or surgery. Common deformities include bunions (in which the big toe angles toward the second toe, causing the joint at the base of the big toe to protrude), hammertoes or claw toes (which become arched in either direction), and Charcot foot (in which the foot can become red and swollen and the arch of the foot can collapse). Charcot foot, in particular, is a serious problem and in some instances can require surgery.

Sometimes calluses may indicate reduced joint mobility in an area of the foot. An example is the big toe: When a person walks, a certain amount of motion needs to occur at its main joint. If this motion is reduced for some reason such as arthritis, the body compensates by sliding the toe against the shoe or the ground. This friction can lead to callus buildup and eventually ulceration. Therefore, it may be best for a specialist to evaluate joint motion when there are calluses present on certain areas of the foot.

Am I feeling all right?

One critical part of a comprehensive foot exam is checking the sensation in the feet. People with long-standing diabetes, or those with persistently high blood glucose levels, often experience nerve damage in the legs and feet as a result. This peripheral neuropathy often causes loss of protective sensation, or reduced feeling in all or part of the feet. As many as 60% of people with diabetes will develop this complication, which is the largest single factor resulting in foot ulcers, according to several studies. There is currently no cure for numbness or loss of sensation due to neuropathy. However, being aware of reduced sensation is vital to protect the feet from injury and check for sores that might otherwise go unnoticed.

There are a number of tests that can be done to check for loss of sensation in the feet. Because these tests measure different forms of sensation, it is recommended that the examiner perform at least two during the foot exam. One test, preferred by many doctors, uses a vibration perception threshold device, or *biothesiometer*. This device, the use of which is painless, contains a vibrating probe that is placed on certain areas of the foot. On each area, the intensity of vibration is raised from zero volts until the person feels the vibration, or up to 50 volts. If the person does not begin to feel vibration until 25 volts or higher, this is a strong indication that the foot has lost protective sensation.

Another common test uses a 10-gram nylon monofilament, which looks a bit like a tiny piece of fishing line. The filament is pressed against certain areas of the foot until it bends, which indicates that 10 grams of force is being applied. The examiner asks whether the person feels this pressure at each site; failure to feel it may indicate loss of sensation. Other tests for loss of sensation include checking ankle reflexes, applying a vibrating tuning fork to the foot, giving non-piercing pinpricks, and alternately placing a cold then a warm object on the same area of skin to see if the person can perceive a temperature difference.

How is my circulation?

Peripheral arterial disease — which results in inadequate blood flow to the feet and legs — has been shown to significantly increase the time it takes for wounds to heal, and thus is often a factor in recurrent foot wounds. It also often leads to muscle cramping (especially in the calf) and pain while walking, symptoms you should mention to the professional examining your feet if they happen to you. Many treatments, both surgical and nonsurgical, are available for peripheral arterial disease.

The easiest way to test for adequate circulation in the feet is to check for pulses in the feet and ankles. If a pulse is felt at both locations, then adequate blood flow to the feet is likely. However, if only one location or neither one has a discernible pulse, a further test should be done. This might mean using a Doppler device to listen for pulses, or doing an *ankle-brachial* index test, in which a series of blood pressure cuffs are placed on the leg, as well as on one arm (the brachial artery is the major blood vessel in the upper arm). The resulting blood pressure readings are then compared; a lower reading in the leg is an indication of reduced blood flow in that area.

The results

At the end of a comprehensive diabetic foot exam, you can expect the examiner to assign you a risk factor number of 0–3. People who fall in category 0 usually require only an annual exam. Those who fall in category 3 should have their feet examined every 1–3 months, and those in categories 2 and 3 are likely to receive instructions about monitoring their feet regularly for any changes. No matter

what category you fall in, however, you should see a doctor if you notice any changes in how your foot looks or feels.

Foot problems — and, specifically, foot ulcers — are a common complication of diabetes that should be taken very seriously, since an untreated or treatment-resistant infection can severely impair mobility and eventually lead to amputation. However, the vast majority of problems can be stopped in their tracks through proper attention and medical treatment. Just as many of us have our cars serviced on a regular basis, we should also get our bodies checked out as often as is recommended. For people with diabetes, a comprehensive foot exam every year — with follow-up care as needed — can help ensure that your most important means of transportation runs, or at least walks, smoothly.



Diapedic® Foot & Leg Treatment

Healthy Skin Every Step You Take

Your feet support your body...and your life. If your feet feel good, you feel good. Dry skin causes the skin to crack, tear or fissure, opening the door to bacteria, fungi and infection. All persons with diabetes are at risk of developing skin-related problems on feet and legs. That's why daily foot and leg care is critical to good health and comfort.

Diapedic® Foot & Leg Treatment will help your feet, legs — and you — feel your very best. Your feet and legs will feel massaged and invigorated when used on a daily basis.

KEY BENEFITS

- Physician recommended
- FDA approved-OTC topical for pain relief
- Helps support nerve function
- Instant relief in seconds
- Relieves discomfort of Restless Leg Syndrome, arthritis, shingles, heel spurs, foot and leg pain
- Clinically superior to other topical creams
- **Safe to Use Between the Toes**
- Promotes healing of cuts and minor wounds
- Improves appearance of skin color and tone

- Exfoliates severe dry skin, cracked heels, calluses and corns
- Instantly moisturizes and softens dry skin
- Aids blood flow
- Helps reduce swollen ankles
- Safe for all skin types
- No adverse side effects

ADVANTAGES

- Absorbs instantly
- Rich silky smooth
- Clinically-proven skin healing ingredients
- Natural soothing components
- Mucopolysaccharides, bio-actives, essential fatty acids, botanical oils and extracts, anti-oxidants, vitamins
- Exclusive antioxidant-liposome moisturizing complex
- Hypo-allergenic
- Anti-microbial, anti-fungal, anti-bacterial agents
- No artificial fragrances
- No added water
- No steroids
- No skin irritants
- No animal testing
- Paraben-free
- Eco-friendly

WHERE TO USE

- Feet
- Legs
- Hands
- Back
- Neck
- Shoulders

DIRECTIONS FOR USE

Use **Diapedic® Foot & Leg Treatment** generously on all surfaces of the feet, heels and legs, massaging upwards from toes to knees. For maximum results apply twice a day every day –morning and bedtime. **Safe to Use Between the Toes.** For external use only. One jar, one month supply. Avoid contact with eyes.

Copper Oxide Socks: Are They A Safe Way To Prevent Diabetic Onychomycosis?

October 28, 2013

Studies show that diabetics are up to five times more susceptible to fungal infections than people without diabetes, says the [Richmond Times Dispatch](#). These infections can lead to secondary bacterial infections, blood infections, tissue damage, gangrene, and even amputation. Yet, are the new copper-oxide socks from Cupron really the answer in preventing diabetic onychomycosis?



Image Source: Knoji.com

What Are Cupron Socks?

It's premature to speculate on the impact that Cupron socks can have on diabetic foot care, but the initial reports seem promising. Last January, Virginia-based Cupron received the [2013 Governor's Award for Science Innovation](#). Unlike many other new brands launching, this company is [science-based](#) and has focused much effort on conducting studies that will persuade hospitals, diabetes educators, and podiatrists to consider their groundbreaking product. This was much the same approach we used when developing the SteriShoe UV Shoe Sanitizer.



Image Source: Cupron.com

What Does Science Say?

A small, 56-person pilot study published in [Podiatry Today](#) concludes: "Based on the strong in vitro data and some in vivo data, the Miami VA Healthcare System is currently involved in an

IRB-approved multicenter study to provide evidence-based medicine on the possible efficacy and safety of using copper oxide impregnated socks as a preventative measure for diabetes-related lower limb and foot ulcers.”

[A 2004 study](#) found that copper products did not irritate the skin and could serve a wide variety of applications — used in antiviral gloves and filters to deactivate HIV; in fabrics to kill antibiotic-resistant bacteria; in socks to alleviate symptoms of athlete’s foot fungus; and in mattress covers to kill dust mites.

In April, a study published in the [SHEA Journal of Infection Control and Hospital Epidemiology](#) stated that antimicrobial copper surfaces in hospital rooms can reduce healthcare-acquired infections (which affects 1 in 20 patients) by 58%. The study reported that “antimicrobial copper is the only strategy that works continuously, has been [scientifically proven to be effective](#), and doesn’t depend on human behavior.”

So far, Cupron-Enhanced EOS Surfaces have received the US EPA Public Health certification to treat tough-to-kill pathogens such as E Coli, MRSA, VRE, Enterobacter Aerogenes, and Pseudomonas Aeruginosa. In the coming year, the company expects to have many other official registrations backing their claims.



Image Source: NPIC.Orst.edu

The Bottom Line: Can Copper Oxide Prevent Diabetic Onychomycosis?

We feel hopeful about the possibility of copper oxide socks having an impact on diabetic onychomycosis. However, it could be a while before we see Cupron socks on the market. More rounds of testing are being done to sway large players, according to the *Times Dispatch*.

Also, the company doesn’t actually manufacture the socks — they only develop the technology. They hope to partner with recognizable brands like Reebok, who can use the materials in their

CrossFit line. The antimicrobial diabetic sock market is estimated to be in the tens of thousands, if not the millions, so we're likely to see a flood of activity in the coming year.

Until then, there is always another clinically-proven method of keeping your feet free from microbes: [The SteriShoe UV Shoe Sanitizer](#). In just 45 minutes, UVC light kills up to 99.9% of the bacteria, fungus, viruses, and harmful pathogens in your shoes. This technology can be used alongside the antimicrobial copper socks to reduce the spread of diabetic onychomycosis, athlete's foot and bacterial infections.

Tags: athletes foot on toenail, diabetes and foot infections, diabetes foot care, diabetes foot infection, diabetic foot ulcers, diabetic onychomycosis, foot fungus symptoms, itchy feet and diabetes, laser foot fungus removal, remedy for skin fungus, SteriShoe, treating fungal infections

Can now be found at the Renfro site, Cupron's science is being used by many manufacturers now in 2016.

2019 available through RENFRO Socks online at www.renfro.com

Could Wearing This Smart Sock Prevent Painful Foot Ulcers, Amputations?

A high-tech sock designed to help people with diabetes avoid diabetic foot ulcers that can lead to amputations has arrived. Could it be right for you?

Written by [Rosemary Black](#)



A new supply of Siren Socks is delivered every 6 months. In the meantime they can be laundered at home.

Marc Fairman, who was in his late 30s when he was diagnosed with type 1 diabetes, developed diabetic peripheral neuropathy about 15 years ago. The condition, which affects between 60 and 70% of individuals who have diabetes, can cause pain, tingling, or numbness in the toes, ankles, and legs, and very occasionally in the fingers. On numerous occasions in the years that followed, the 72-year-old retired engineer got painful foot ulcers that kept him bedridden for weeks at a time.

“I have no sensation in my feet, so didn’t even realize when I stepped on a paper clip and it went through my toe,” Fairman says. “Another time, an infection spread in my foot and I had to have that foot opened up. It was a 16-month long recovery time.”

But since Fairman, who lives in Northern California, began wearing a pair of the new Siren Diabetic Socks a few months ago, his feet are healthy. Each sock, made of Siren's Neurofabric™ is embedded with six sensors that enable continuous monitoring. Whenever an area of the bottom of his foot becomes warmer than it should be, Fairman gets an alert on his phone (*the data is also sent to the Siren Hub which is included as part of the system so you can get the information if you don't have a smartphone.*)

Fairman says the socks, which look and feel like ordinary socks have been “a lifesaver.” “I had one alert,” he says. “I stayed off my foot for a day and it was a normal temperature the next day.”

Smart Sock Alerts You When Foot Temperature Rises

The Siren Diabetic Socks monitor foot temperature continually, and if a certain area of the foot becomes four degrees warmer than the same spot on the opposite foot, the alert is sent to the user. A rising temperature signals inflammation, which can be the precursor to diabetic foot ulcers.



You don't have to have a smart phone to access the Siren Sock information but many users find the feature convenient.

The fact that someone's foot becomes warmer during inflammation is not new knowledge and occurs when the body is fighting injury or disease, says Alexander Reyzelman, DPM, co-director of the UCSF Center for Limb Preservation, associate professor at the California School of Podiatric Medicine in the Bay Area and a Siren Sock advisor. “We have known this for awhile, but until now we have not had a wearable sock that could detect these temperature increases,” Dr. Reyzelman says.

The socks look like any other socks and come in various colors. “It feels like any other sock,” Fairman says. “When you run your fingers over the sock, you don’t feel any of the wiring in the fabric.” The sensors are embedded directly into the fabric, and the socks are machine-washable and dryable. The socks are seamless, non-binding, and moisture-wicking; it’s recommended that they be worn all day.

Monitoring the temperature of the bottom of your feet is up to 87.5% more effective at preventing foot ulcers than standard foot care, says Ran Ma, the biomedical engineer who developed the Siren sock technology. Since the average cost of treating a foot ulcer is \$24,000 and an amputation costs more than \$100,000, the socks make great economic sense, she says.



Ran Ma, CEO and co-founder of Siren Socks was inspired to create the technology after working on a fabric to regenerate facial skin for war veterans and burn victims when she was a college student.

Ms. Ma formerly worked in the wound lab at Northwestern University as a biomedical engineer. While there, she saw a lot of diabetic foot ulcers. “This really stuck with me,” she says. “I found out that temperature monitoring could be effective in reducing diabetic foot ulcers, and I also knew that there were no tools that people could use at home to detect this.”

Three years ago, she founded Siren and recruited a team. “I was determined to come up with a device that you could use at home,” she says. “You can’t go to a podiatrist every single day but you could get an injury to your foot every single day.”

Sock Benefits and Peripheral Neuropathy

For individuals with peripheral neuropathy, the Siren socks are an amazing invention. Fairman, for instance, had struggled with the condition for some time. In 2013, he developed a small ulcer on his foot, for which he was prescribed antibiotics. When the foot was x-rayed, doctors saw a small fracture. Three weeks later, his foot was swollen and painful. He needed an operation in which a plate was inserted into the foot and he was bedridden for nearly six months. Then a subsequent surgery took 14 months to heal. “I was able to walk during part of that time because the foot wasn’t broken, it was healing from the incision,” Fairman says. “But all of this could have been prevented if I’d had this sock.”

Can these new Siren socks actually reverse diabetic neuropathy in patients? “This is a prevention mechanism,” Dr. Reyzelman says. “They don’t do anything to reverse the neuropathy. They are

an alert system to the patient to detect a problem early and, if needed, have an intervention by their treating physician.” The physician may order special footwear or braces, or maybe just tell the person to stay off their feet, he says.

Frequent visits to the doctor are important for an individual with peripheral neuropathy, Dr. Reyzelman says. “We would like to see them before the tissue injury occurs, not after it develops,” he says. “It is much harder to treat a foot ulcer than to prevent it.”

The Siren Diabetic Sock and Foot Monitoring System are only available online. At a cost of \$19.95 per month, Siren will ship five new pairs of socks to the user every six months. The user will also receive continuous monitoring, alerts, and reports as part of the system. For more information, visit siren.care.



Massage Your Feet While You Walk

Wear MindInsole Massaging Insoles And Feel Better With Every Step

Mindinsole Customer Service Team

United



Found on Amazon the cheapest. Work for some, not as much for others.

Homocysteine What You Should Know...

You don't often hear people talking about **homocysteine**, yet a high level of this amino acid in the blood is an independent risk factor for heart and vascular disease. This means that even when your cholesterol and other health markers are within normal ranges, elevated homocysteine levels raise your risk.

Evidence suggests that excess homocysteine promotes plaque buildup in the walls of blood vessels and causes damage to the inner linings of arteries, increasing the likelihood of blood clots.

What's Your Risk?

If you have type 2 Diabetes, elevated homocysteine levels significantly increase your mortality risk, whether or not you have any other cardiovascular risk factors and regardless of your overall health.

How to Lower Homocysteine Levels

As processed and refined foods have crowded out whole foods in our diets, our intake of **Vitamins B6, B12 and folate** has dropped. These nutrients are vital for keeping homocysteine levels in check. Dark leafy greens, whole grains and legumes are some of the best sources of folic acid and vitamin B6; meat and dairy provide B12. ***If you eat proteins, whole grains, legumes and green vegetables, your homocysteine levels probably reflect that healthful diet.*** Check with your physician for his or her thoughts on vitamin supplementation.

High Blood Pressure

You have the power to lower your blood pressure and live a healthy, full life. High blood pressure, also called hypertension, raises your risk for heart disease, stroke, kidney disease, and damage to your eyes. This worksheet will give you tips on how to eat less salt, check your blood pressure at home, and learn about your medicines.

Know your blood pressure numbers

What do these numbers mean?

157 / 98

Systolic (upper):

This is the amount of pressure it takes for the heart to squeeze blood to the body.

Diastolic (lower):

This is the amount of pressure when the heart is relaxed and filling with blood.

Normal blood pressure	Less than 120 and less than 80
At risk for high blood pressure	120-139 and 80-89
High blood pressure	140 or higher or 90 or higher

Write your recent numbers here: ____ / ____

Eat less salt

Eating less salt can help lower your blood pressure. Salt is also called sodium on food labels. Try to eat less than 1500mg of sodium a day. 1 teaspoon of salt has 2300mg of sodium. Don't add salt to food while cooking or eating.

How to read a food label:

1. Look at the serving size and servings per container. This can has 2 servings.
2. Look at the mg of sodium. In this can, a 1 cup serving has 400mg of sodium. This whole can has 800mg of sodium.

Nutrition Facts	
Serving Size 1 cup (246g)	
Servings Per Container 2	
Amount Per Serving	
Calories 90	
Total Fat 2g	
Saturated Fat 0.5g	
Cholesterol 25mg	
Sodium 400mg	
Total Carbohydrate 11g	
Dietary Fiber 1g	

✓ Check off the things you will do:

- Eat more fresh fruits and vegetables.
- Cook with fresh herbs and spices or use vinegars and lemon juice for flavor.
- Rinse canned foods like vegetables, beans, and tuna with water to remove salty liquid.
- For salads, choose oil and vinegar. When eating out, ask for dressing on the side.
- When shopping, choose reduced sodium, low sodium, light sodium, or sodium free foods.

Foods to avoid:

- Fast food like pizza, tacos, burritos, cheeseburgers, fries, and fried chicken
- Ham, bacon, corned beef, hot dogs, sausage, salt pork, packaged meats, and cheese
- Salty foods in cans and jars like pickles, sauces, dips, salad dressings, soups, and broths
- Packaged foods like salty snacks and chips, mixes for sauces, rice and noodle meals
- Frozen meals and foods that contain soy sauce or are marinated, smoked, or cooked in broth

Check your blood pressure at home

Checking your blood pressure at home will help you and your doctor or nurse see if your numbers are normal or high. Ask your doctor or nurse to help you find a home blood pressure monitor. Don't use finger or wrist monitors.

The first time you take your blood pressure at home, do it on both arms. After that, use the arm that had the highest numbers.

How to check your blood pressure:

1. Use a cuff that fits your arm (example: adult, large, or extra large). Ask your doctor or nurse what size to use.
2. Rest for 5 minutes before you take your blood pressure.
3. If you drink alcohol, smoke, or exercise, wait for 30 minutes before you take your blood pressure.
4. Sit with your back against a chair and both feet on the floor. Rest your arm on a table at heart level. Don't cross your legs.
5. Take your blood pressure 2 times a day at the same time for 7 days. Save your numbers on the machine or write them down. Show these numbers to your doctor or nurse.



View product ratings of blood pressure monitors at www.pcna.net/patients

Learn about your medicines

Most people with high blood pressure need 2 or 3 medicines to lower blood pressure.

Your doctor or nurse may need to change your medicines to find what works best for you. This is normal.



✓ Check off the things you will do:

- Ask your doctor or nurse if there is a best time to take your medicines, like before or after a meal, in the morning, or at night.
- Always use a pill box, even if you only take 1 medicine each day.
- Ask your family or friends to remind you to take your medicines.
- Write down your medicines and always carry this list with you. Show it to your doctor or nurse at each visit.
- At the pharmacy, ask for bottles with large print and tops that are easy to open.
- If you feel bad after taking a medicine, talk with your doctor or nurse right away.
- Don't stop taking your medicines until you talk with your doctor or nurse.



PCNA
Preventive Cardiovascular
Nurses Association
www.pcna.net

Your Complete **Blood Pressure Meds** Reference Guide From *Diabetes Health*

Category	Brand Name	Generic Name	Manufacturer	Minimum Daily Dosage (mg)	Maximum Daily Dosage (mg)	Special Considerations
Angiotensin Converting Enzyme (ACE) Inhibitors	Mavik	trandolapril	Abbott	1	8	May cause cough. May increase potassium levels. Do not use potassium or salt substitutes without talking to your doctor. Do not use if you are pregnant. May prevent diabetic kidney disease.
	Altace	ramipril	Monarch	1.25	20	
	Capoten	captopril	Apothecon	25	450	
		captopril	Various generics	25	450	
	Univasc	moexipril	Schwarz	7.5	60	
	Monopril	fosinopril	Bristol-Myers Squibb	10	80	
	Lotensin	benazepril	Novartis	5	80	
	Prinivil	lisinopril	Merck	2.5	80	
	Zestril	lisinopril	AstraZeneca	2.5	80	
		lisinopril	Various generics	2.5	80	
	Vasotec	enalapril	Merck	2.5	40	
		enalapril	Various generics	2.5	40	
	Accupril	quinapril	Pfizer	5	80	
Aceon	perindopril	Solvay	2	16		
Angiotensin II Receptor Blockers (ARBs)	Cozaar	losartan	Merck	25	100	May cause dizziness and upset stomach. Do not use if you are pregnant. Do not use potassium or salt substitutes without talking to your doctor. May help prevent diabetic kidney disease.
	Benicar	olmesartan	Sankyo	5	40	
	Diovan	valsartan	Novartis	80	320	
	Avapro	irbesartan	Bristol-Myers Squibb	75	300	
	Atacand	candesartan	AstraZeneca	2	32	
	Micardis	telmisartan	Boehringer-Ingelheim	20	80	
	Teveten	eprosartan	Biovail	400	800	
Calcium Channel Blockers (CCBs)	Sular	nisoldipine	AstraZeneca	10	60	May cause constipation, dizziness, upset stomach and flushing. Call your doctor if you are short of breath, have an unusual heartbeat or if your feet or hands start to swell.
	Adalat CC	nifedipine	Bayer	30	90	
	Procardia	nifedipine	Pfizer	30	120	
	Procardia XL	nifedipine	Pfizer	30	120	
		nifedipine	Various generics	30	120	
	Cardene	nicardipine	Roche	60	120	
	Cardene SR	nicardipine	Roche	60	120	
	DynaCirc	isradipine	Roche	5	20	
	DynaCirc CR	isradipine	Reliant	5	20	
	Plendil	felodipine	AstraZeneca	2.5	10	
	Cardizem	diltiazem	Biovail	120	360	
	Cardizem CD	diltiazem	Biovail	120	360	
		diltiazem	Various generics	120	360	
Dilacor XR	diltiazem	Watson	180	540		

Your Complete **Blood Pressure Meds** Reference Guide From *Diabetes Health*

Category	Brand Name	Generic Name	Manufacturer	Minimum Daily Dosage (mg)	Maximum Daily Dosage (mg)	Special Considerations
Alpha Blockers	Minipress	prazosin	Pfizer	2	40	Use caution when standing up to prevent sudden dizziness, especially with the first few doses.
	Minipress	prazosin	Various generics	2	40	
	Hytrin	terazosin	Abbott	1	20	
	Hytrin	terazosin	Various generics	1	20	
	Cardura	doxazosin	Roerig	1	16	
		doxazosin	Various generics	1	16	
Combined Alpha and Beta Blockers	Trandate	labetalol	Faro	200	2,400	Use caution when standing up to prevent sudden dizziness. Take with food to avoid stomach upset. May mask signs of low blood glucose.
	Normodyne	labetalol	Key	200	2,400	
		labetalol	Various generics	200	2,400	
	Coreg	carvedilol	GlaxoSmithKline	6.25	50	
Direct Vasodilators	Apresoline	hydralazine	Novartis	50	300	May cause headaches, fluid retention or fast heart rate.
Central Alpha-Agonists	Catapres	clonidine	Boehringer-Ingelheim	0.1	2.4	Do not discontinue drug suddenly without consulting your doctor.
		clonidine	Various generics	0.1	2.4	
	Catapres TTS (patch)	clonidine	Boehringer-Ingelheim	0.1	0.6	
	Aldomet	methyldopa	Merck	125	2,000	
		methyldopa	Various generics	125	2,000	

Your Complete **Cholesterol Meds** Reference Guide From *Diabetes Health*

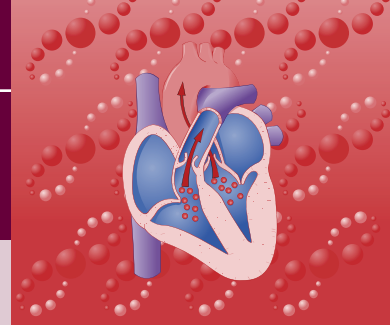
Category	Brand Name	Generic Name	Manufacturer	Minimum Daily Dosage (mg)	Maximum Daily Dosage (mg)	Special Considerations
HMG-CoA Reductase Inhibitors (statins)	Lipitor	atorvastatin	Pfizer	10	80	Main action: Lowers LDL ("bad") cholesterol. Notify your doctor immediately if you experience muscle pain. Should have lab blood tests to check liver enzyme levels. Monitor both liver and kidney function when Crestor is used at the highest approved dose (40 mg). Use caution if combining with fibric acid derivatives or bile acid sequestrants (described below).
	Lescol	fluvastatin	Novartis	20	80	
	Lescol XL	fluvastatin	Novartis	80	80	
	Mevacor	lovastatin	Merck	10	80	
		lovastatin	Various generics	10	80	
	Altocor	extended-release lovastatin	Aura Labs	20	60	
	Pravachol	pravastatin	Bristol-Myers Squibb	10	80	
	Crestor	rosuvastatin	AstraZeneca	5	40	
	Zocor	simvastatin	Merck	5	80	

Your Complete **Cholesterol Meds** Reference Guide From *Diabetes Health*

Category	Brand Name	Generic Name	Manufacturer	Minimum Daily Dosage (mg)	Maximum Daily Dosage (mg)	Special Considerations
Cholesterol Absorption Inhibitors	Zetia	ezetimibe	Merck & Schering-Plough	10	10	Main action: Lowers LDL cholesterol. This new class of drugs selectively inhibits the intestinal absorption of cholesterol. Can be used as stand-alone therapy or in combination with statins. Take once daily with or without food. If used with a statin, the two can be taken together. If used with a bile acid sequestrant, it should be taken two hours before or four hours after the bile acid sequestrant.
Nicotinic Acid (niacin)	Niaspan	nicotinic acid (extended-release)	Kos	500 (starting dose)	2,000	Main action: Lowers LDL cholesterol, increases HDL ("good") cholesterol, lowers triglycerides. May cause flushing. Take with food. May increase blood glucose levels. Should have lab blood tests to check liver enzyme levels. Long-acting forms may be more likely to cause liver malfunction.
		nicotinic acid	Various generics	500	6,000	
Lipid Combinations	Advicor	lovastatin/niacin	Kos	20/500	40/2,000	See information for individual components.
	Vytorin	ezetimibe/simvastatin	Merck	10/10	10/40	
Fibric Acid Derivatives	Lopid	gemfibrozil	Pfizer	1,200	1,200	Main action: Lowers triglycerides, increases HDL cholesterol. Notify your doctor immediately if you experience muscle pain. Should have lab blood tests to check liver enzyme levels.
		gemfibrozil	Various generics	1,200	1,200	
	Tricor	fenofibrate	Abbott	48	145	
Bile Acid Sequestrants	LoCholest	cholestyramine	Warner Chilcott	4 grams	24 grams	Main action: Lowers LDL cholesterol. May cause constipation and stomach upset. May need to be taken at a different time than other medications to avoid drug interactions. May increase triglycerides.
	LoCholest light	ezetimibe/simvastatin	Warner Chilcott			
	Questran	cholestyramine	Par Pharmaceuticals	4 grams	24 grams	
	Questran light	cholestyramine light	Par Pharmaceuticals			
	Prevalite	cholestyramine	Upsher Smith	4 grams	24 grams	
		cholestyramine	Various generics	4 grams	24 grams	
		cholestyramine light	Various generics			
	Welchol	colesevelam	Sankyo	1,875 (3 tabs)	4,375 (7 tabs)	

Chart prepared by Chad Randall, PharmD, Silverdale, Washington; Cindi Poe, PharmD, Lewiston, Idaho; Cindy Onufer, RN, MA, BC-ADM, CDE, San Mateo, California; and Joanne Hayashi, PharmD, Monterey, California. Reviewed by R. Keith Campbell, RPh, CDE, Professor, Pharmacy Department, Washington State University, Pullman, Washington.

Triglycerides and HDL



High Triglycerides Increase Your Risk for Heart Disease

Triglycerides (mg/dL)	Level of Risk	My Numbers
Less than 150	Normal	TG _____
150–199	Borderline High	HDL _____
200–499	High	
500 or greater	Very High	

When blood is drawn to test TG, fasting is required (water and medications only) for 10–12 hours prior to the appointment.

Data adapted from ATP III Final Report. *Circulation*. 2002

Low HDL Cholesterol Levels Increase Your Risk for Heart Disease

HDL (mg/dL)	Risk Level
Less than 40 is considered low in men	High Risk
Less than 50 is considered low in women	High Risk
60 or greater is optimal for both men and women	Low Risk

Data adapted from ATP III Final Report. *Circulation*. 2002

Lifestyle Factors of High Triglycerides and Low HDL

- Overweight/obesity
- Sedentary/inactive lifestyle
- Diet high in refined carbohydrates
- Poorly controlled diabetes (high blood sugar)
- Smoking cigarettes (lowers HDL)
- Family history (genetics) may also play a role in high triglycerides/low HDL

NOTE: Some medications may affect TG and HDL. Be sure your healthcare provider is aware of all medications and dietary supplements you take.

What are Triglycerides and HDL?

Triglycerides (TG) are fats found in the blood. They are affected by weight, lifestyle, diet, and family history.

↓ **Lower is better.**

HDL is called the “good cholesterol” because high levels of HDL can help protect against heart disease.

↑ **Higher is better.**

Why are they important?

High triglycerides and low HDL increase your risk for heart disease.

This worksheet shows you how to reduce your risk by lowering triglycerides and raising HDL.

How to Lower Your Triglycerides

Nutrition



Limit Simple Sugars

- Limit simple sugar intake to 1–2 servings/week
- 1 serving = 100 calories

Simple Sugars include:

- Corn syrup, honey
- Sweetened soft drinks
- Candy/baked goods
- Jam/jelly

Eat Fruits and Vegetables

- 4–6 or more serving of fruits and vegetables/day
- Better choices are fresh or frozen with “no added sugars”
- 100% fruit juices (Limit 1/2 cup/day)

Serving size:

- 1 medium apple = 1 serving
- 1/2 cup steamed vegetables = 1 serving
- 1 cup raw vegetables = 1 serving

Choose “Good” Fats

Use monounsaturated fats—canola, olive or peanut oil. Examples of one serving:

- 1 tsp oil
- 1 TBS walnuts, almonds, peanuts
- 1 TBS reduced fat peanut butter or 2 tsp regular peanut butter

Avoid:

- Saturated Fats—coconut oil, palm oil, hydrogenated fats, animal fats
- Trans Fats—used in baked goods and some margarines

Add:

- Omega 3 Fatty Acids
Eat 2–3 servings per week of “cold water” fish—salmon, albacore tuna, mackerel; one serving = 3 ounces after cooking
- Ground flax seed, flax seed oil, nuts and fish oil capsules

Choose High Fiber Carbohydrates

Avoid refined grains such as white bread, white rice and pasta, which can raise triglycerides more than whole grain and high fiber products.

- Choose whole wheat products and include oat bran for fiber

How to Lower Your Triglycerides

Activity Level, Weight, and Lifestyle Changes

Activity Level

Regular aerobic exercise at moderate to high levels helps to lower TG, raise HDL and maintain ideal body weight. Ideally, one should exercise 5–7 days per week for 30 minutes per day; or 60 minutes per day to achieve weight loss. Activity can be broken into segments throughout the day. Pedometers can help quantify activity level; gradually increase to a goal of 10,000 steps per day.

Weight

Excess weight can contribute to elevated TG. Losing 5–10 lbs can improve your TG. 3,500 calories = 1 pound weight gain or loss. *Example:* To lose 1 lb per week, reduce calories by 500 calories/day or eat 200 fewer calories and increase activity by 300 kcal/day.

Alcohol

Alcohol can raise TG. If your TG are very high (over 500 mg/dL), it is best to completely avoid alcohol. For mild to moderate increases in TG, it is recommended that women limit their alcohol intake to no more than 1 drink/day and 3 drinks/week, men to no more than 2 drinks/day and no more than 5 drinks/week. According to the American Heart Association, the serving sizes of alcoholic beverages are:

- 5 ounces of wine
- 12 ounces of beer
- 1 1/2 ounces alcohol



Smoking

Smoking cigarettes contributes to low HDL. If you smoke, you should stop.

Examples of Moderate* Physical Activity in Healthy Adults†

- Brisk walking (3–4 mph) for 30–40 minutes
- Swimming—laps for 20 minutes
- Bicycling for pleasure or transportation, 5 miles in 30 minutes
- Volleyball (noncompetitive) for 45 minutes
- Raking leaves for 30 minutes
- Moderate lawn mowing (push a powered mower) for 30 minutes
- Home care—heavy cleaning
- Basketball for 15–20 minutes
- Golf—pulling a cart or carrying clubs
- Social dancing for 30 minutes



* Moderate intensity defined as 4–7 kcal/minute or 3–6 METS. METS (work metabolic rate/resting metabolic rate) are multiples of the resting rates of oxygen consumption during physical activity. One MET represents the approximate rate of oxygen consumption of a seated adult at rest, or about 3.5 mL per min per kg.

† This table was adapted from the recommendations of the Surgeon General's Report on Physical Activity and Health³⁸ and the Centers for Disease Control and Prevention and American College of Sports Medicine.⁷⁷

Data adapted from ATP III Final Report. *Circulation*. 2002, and ATP III 2004 & 2005 Updates.

Medications Used to Lower TG and Raise HDL Cholesterol



Your health care provider may prescribe one or more medications to treat high Triglycerides or low HDL

* Ask your health care provider before taking any over the counter products

Fibrates

- By prescription: fenofibrate, gemfibrozil (generic names)
- Primary action is to lower TG, can also increase HDL

Niacin

- By prescription: Niaspan
- Over the counter (vitamin B3)*
- Raises HDL and lowers TG

Omega 3 Fatty Acids

- By prescription: Lovaza
- Over the counter (fish oil capsules)*
- Primary action is to lower TG, can also increase HDL

Taking Niacin can result in flushing of the skin (a warm, prickly feeling). This side effect is not dangerous but can be uncomfortable.

To minimize flushing:

- Always take Niacin/Niaspan with food
- Avoid hot beverages, foods spiced with hot chili pepper, or alcohol
- Take an aspirin 30 minutes before taking Niacin/Niaspan
- Take prescription Niaspan at bedtime; if you flush, you will usually sleep through it
- Prescription Niaspan is less likely to cause flushing than over the counter products* which need to be taken 2-3 times daily

Taking fish oil capsules can cause some stomach upset as well as gas or belching up a fishy taste. These symptoms can be minimized by refrigerating or freezing your fish oil capsules. Always take fish oil capsules with meals. When purchasing fish oil capsules over the counter,* add up the active ingredients DHA and EPA to get the dose recommended by your health care provider (usually 2–4 grams/day to lower triglycerides).

Your Guide for Lowering TG and Raising HDL

Name: _____ Date: _____ Health Care Provider: _____

Dietary Goals: _____

Activity/Exercise Goals: _____

Weight Loss Goals: _____

Medications Recommended: _____

Provider's Signature: _____

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Dedicated to preventing cardiovascular disease through assessing risk, facilitating lifestyle changes, and guiding individuals to achieve treatment goals.

Triglycerides and HDL

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www.pcna.net



PCNA

**Preventive Cardiovascular
Nurses Association**

www.pcna.net

Lack of Co-enzyme 10 May Increase Risk of Diabetes with Statin Use

Possible use of co-enzyme 10 to reduce this risk is being considered....

New labeling and warnings regarding statin-induced diabetes is a huge concern, especially the higher dose statins. The use of a statin increases the risk of type 2 diabetes by 9%.

Reduced expression of GLUT4, which helps control blood glucose levels, can be caused by statin use and contributes to insulin resistance and the onset of type-2 diabetes.

Statins reduce cholesterol production therefore lowering cholesterol levels and some statins also seem to reduce the levels of coenzyme 10 in the body. Coenzyme 10 is necessary for cells to create energy and perform functions.

Supplementation of coenzyme 10 in a laboratory analysis found that it prevents the reduction in GLUT4 due to the statins.

The reduction in GLUT4 are found more with the lipophilic statins i.e., simvastatin, atorvastatin and lovastatin. The higher doses of these statin are linked with the statin induced diabetes. Statins are extremely useful drugs in reducing cardiovascular events.

Metabolic Syndrome and Related Disorders April 10, 2013

Diabetes likelihood declines for statin users who control their weight

March 23, 2014 / Author: Don Rauf / Reviewed by: Robert Carlson, M.D Beth Bolt, RPh

(dailyRx News) Research has shown that popular cholesterol-lowering medications may increase the chances of developing type 2 diabetes. Weight control, however, may keep the [diabetes](#) away.

Atorvastatin (brand name [Lipitor](#)) is one of the most popular statins. Statins block an enzyme in the liver responsible for cholesterol production. Using [atorvastatin](#), however, may increase the risk of getting new onset diabetes, according to a study in BMJ last year.

A more recent investigation supported this association between atorvastatin and diabetes, but it also found that weight loss could fend off the disease.

"Talk to a doctor about losing weight to reduce diabetes risk."

Kwok-Leung Ong, PhD, a postdoctoral research fellow at the Centre for Vascular Research at the University of New South Wales in Sydney, Australia, and his colleagues followed 7,595 patients with heart disease but no indication of diabetes at the start of the study.

Patients were randomly assigned to receive either 10 mg or 80 mg of atorvastatin daily.

After an average of about five years, 659 patients developed new onset diabetes — 308 in the 10 mg group and 351 in the 80 mg group. The difference was not statistically significant.

All men and women in the study experienced an average weight gain of close to two pounds after a year, but those who eventually got diabetes had an average weight gain of 3.5 pounds.

After adjusting for other elements that could bring on diabetes, scientists observed that weight gain remained a significant risk factor.

Based on the results, the authors noted that weight control can be used as a lifestyle measure to prevent statin-related new-onset diabetes mellitus (NODM).

Dr. Ong told dailyRx News, "A small weight loss [for example, two pounds], which can be achieved readily, can result in substantial reduction of NODM risk in both men and women."

Although statins have been recently shown to slightly increase the risk of diabetes, the beneficial effects of statins on lipid levels (fats in blood) and cardiovascular disease risk outweigh their slightly adverse effect on blood sugar levels, according to Dr. Ong.

More than 29 million people in the United States have been prescribed Lipitor. Along with a low-fat diet, the medication has been shown to effectively lower LDL ("bad") cholesterol by an average of 39 to 60 percent.

“My advice is that statin-related NODM could be prevented by the usual lifestyle interventions, especially weight loss,” he told dailyRx News. “We are not sure why statin users gain weight in the trial over one year after randomization. As there is no concurrent control data from a parallel group comprising patients without any statin therapy, it is not known whether the weight gain is really related to statin use or other factors.”

The study was published online in March in *The American Journal of Cardiology*. The patient trial was funded by Pfizer, Inc.



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[Return to article](#)

Adjust Font Size : Four square icons representing font size adjustments: a small 'A', a medium 'A', a large 'A', and a very large 'A'.

URL: <http://www.diabetesselfmanagement.com/articles/general-diabetes-and-health-issues/thyroid-disorders-and-diabetes/print/>

Thyroid Disorders and Diabetes

Thyroid disorders are very common in the general U.S. population, affecting up to 27 million Americans, although half that number remains undiagnosed. It is second only to [diabetes](#) as the most common condition to affect the endocrine system — a group of glands that secrete hormones that help regulate growth, reproduction, and nutrient use by cells. As a result, it is common for an individual to be affected by both thyroid disease and diabetes.

Since the thyroid gland plays a central role in the regulation of metabolism, abnormal thyroid function can have a major impact on the control of diabetes. In addition, untreated thyroid disorder can increase the risk of certain [diabetic complications](#) and can aggravate many diabetes symptoms. Luckily, abnormal thyroid function can easily be diagnosed by simple blood tests, and effective treatment is available. For all of these reasons, periodic screening for thyroid disorder should be considered in all people with diabetes.

What is the thyroid?

The thyroid is a butterfly-shaped gland located in the neck, just below the Adam's apple and above the collarbone. It produces two hormones, thyroxine (T4) and triiodothyronine (T3), which enter the bloodstream and affect the metabolism of the [heart](#), liver, muscles, and other organs. The thyroid gland operates as part of a feedback mechanism involving the hypothalamus, an area of the brain, and the pituitary gland, which is located within the brain.

First, the hypothalamus sends a signal to the pituitary through a hormone called TRH (thyrotropin-releasing hormone). When the pituitary gland receives this signal, it releases TSH (thyroid-stimulating hormone) to the thyroid gland. Upon receiving TSH, the thyroid responds by producing and releasing the two thyroid hormones (T3 and T4). The pituitary gland “monitors” the level of thyroid hormone in the blood and increases or decreases the amount of TSH released, which in turns regulates the amount of thyroid hormone produced.

Function of the thyroid

Thyroid hormone regulates the way the body uses energy. It works by attaching to specific proteins called receptors that are present in cells throughout the human body. Therefore, thyroid hormone exerts wide-ranging effects in regulating the function of virtually every organ. Consequently, any changes in the blood level of thyroid hormone can affect many body systems and cause a wide range of symptoms.

The extent to which each organ is affected varies widely between individuals, which is why thyroid dysfunction causes very different symptoms in different people. In general, the severity of symptoms of abnormal thyroid function depends on the severity of the actual condition, the length of time it has been present, and the person's age. As a result, it is difficult to correctly diagnose thyroid disorder based only on symptoms. Fortunately, precise measurement of thyroid function is now possible with the TSH blood test, a test that directly measures the amount of TSH produced by the pituitary gland.

Common disorders of the thyroid

There are two basic disorders of the thyroid: hypothyroidism, or an underactive thyroid gland, and hyperthyroidism, or an overactive thyroid gland.

Hypothyroidism. The most common disorder of the thyroid is an underactive thyroid gland, or hypothyroidism. Some studies have shown that up to 10% of women and 3% of men in the United States have hypothyroidism and receive thyroxine replacement therapy. Although hypothyroidism can occur at any age and in either sex, it is most common in older women. It is estimated that up to 1 in 5 women over the age of 65 may have hypothyroidism. At the other end of the age range, 1 out of every 4,000 babies in the United States is born without a properly functioning thyroid (congenital hypothyroidism). (For more information about populations in which thyroid disorders are more likely, see [“Who’s At Risk?”](#))

The symptoms and effects of hypothyroidism can vary greatly depending on the age and sex of the affected individual. The lack of thyroid hormone in an infant with untreated congenital hypothyroidism may cause cretinism, a condition resulting in severe growth delay and mental retardation. Routine screening for hypothyroidism in all newborns by a heel prick blood test has decreased the incidence of cretinism.

In older children, signs of hypothyroidism can include unexplained daytime fatigue, changes in school grades, difficulty concentrating, and inattentiveness in school. Sometimes, however, an unexplained change in growth rate is the only evidence of thyroid failure in children.

In women of reproductive age, hypothyroidism can impair fertility and increase the risk of miscarriage during the second trimester. Other symptoms may include a goiter (an enlarged thyroid gland), fatigue, weight gain, mood swings, [depression](#), dry skin, brittle hair, fluid retention, muscle weakness, and constipation.

In the elderly, the symptoms can be very vague and are often mistaken for depression or dementia, since thyroid failure can cause sleep disturbance and poor memory.

Worldwide, the most common cause of hypothyroidism is dietary iodine deficiency. However, since iodine has been added to salt and other foods in the United States, hypothyroidism caused by iodine deficiency is very rare among Americans. The most common cause of hypothyroidism in the United States is an inherited autoimmune condition called Hashimoto thyroiditis, which affects up to 14 million people.

Autoimmune disorders are caused when the body's natural defenses against “foreign” or invading organisms begin to attack healthy tissue for unknown reasons. These natural defenses use proteins called antibodies. Hashimoto thyroiditis produces antibodies that damage the thyroid tissue, resulting in thyroid failure.

Other common causes of hypothyroidism include the surgical removal of the thyroid, exposure to radiation such as radioactive iodine therapy, or external radiation used to treat some forms of cancer.

Certain drugs such as lithium carbonate (for treatment of bipolar disorder) and amiodarone (brand name Cordarone, a drug prescribed for certain heart conditions) can cause hypothyroidism. Rarely, abnormalities of the hypothalamus or pituitary gland may result in hypothyroidism.

Hyperthyroidism. Overactive thyroid, or hyperthyroidism, is less common than hypothyroidism. It tends to affect all age groups equally, but it is nine times more common in women. Like hypothyroidism, the symptoms of hyperthyroidism are varied and can be vague, particularly if the disease progresses slowly over a prolonged period. In children, it can result in accelerated growth, hyperactivity, loss of concentration, poor handwriting, and short-term memory loss. In young women, it may result in absent or irregular periods, recurrent miscarriages, and infertility.

In older women, hyperthyroidism can cause hot flashes, mood swings, sweating, and weight changes, symptoms that may be confused with signs of menopause. Other typical symptoms of hyperthyroidism include irritability, fast heart rate, weight loss despite increased appetite, frequent bowel movements, insomnia, decreased energy level, and shaky hands. In addition, a goiter may be present. (To learn more about symptoms of thyroid disorders, see [“Symptoms and Signs.”](#))

The most common cause of hyperthyroidism in people under age 40 is Graves disease, a type of autoimmune thyroid disease. In this case, the antibodies stimulate the thyroid to enlarge and overproduce thyroid hormone. Some people with Graves disease develop eye problems that can cause the eyes to protrude and that may threaten vision. Other causes of hyperthyroidism include thyroid nodules, which are overactive (usually noncancerous) growths in an otherwise normal thyroid gland, and thyroiditis, or inflammation of the thyroid gland. (See [“Suggested Reading”](#) for more information about thyroid disorders.)

Thyroid disorder and diabetes

People with diabetes have an increased risk of developing thyroid disorder. In the general population, approximately 6% of people have some form of thyroid disorder. However, the prevalence of thyroid disorder increases to over 10% in people with diabetes.

Since people with one form of autoimmune disorder have an increased chance of developing other autoimmune disorders, people with Type 1 diabetes have a higher risk of autoimmune thyroid disorder. Up to 30% of women with Type 1 diabetes have some form of autoimmune thyroid disease. Postpartum thyroiditis, a form of autoimmune thyroid disease that causes thyroid dysfunction within a few months after delivery of a child, is three times more common in women with diabetes.

Although Type 2 diabetes is not an autoimmune disorder, there have been many reports showing a higher occurrence of thyroid diseases, particularly hypothyroidism, among people with Type 2 diabetes. The association between Type 2 diabetes and thyroid disorder, however, remains unexplained.

Effect on diabetes control

Since normal thyroid function is essential to regulate energy metabolism, abnormal thyroid function may have profound effects on blood glucose control in diabetes. Both hyperthyroidism and hypothyroidism can affect the course of diabetes, but their effects are somewhat different.

Hyperthyroidism. Hyperthyroidism is typically associated with worsening blood glucose control and increased insulin requirements. The excessive thyroid hormone causes increased glucose production in the liver, rapid absorption of glucose through the intestines, and increased [insulin resistance](#) (a condition in which the body does not use insulin efficiently). It may be important to consider underlying thyroid disorder if a person has unexplained weight loss, deterioration in blood glucose control, or increased [insulin](#) requirements. Sometimes hyperthyroidism may even unmask latent diabetes.

Having diabetes increases a person's risk for heart disease, and many people with diabetes have a heart condition such as coronary heart disease or heart failure. Since hyperthyroidism causes rapid heart rate and increases the risk of abnormal heart rhythm, it may also bring on angina (chest pain), worsen heart failure or interfere with the treatment of heart failure, as well as further increase the risk of other heart problems.

Prolonged, untreated hyperthyroidism can cause excessive bone loss, leading to [osteoporosis](#), or bone thinning. Osteoporosis raises the risk of bone fractures, making falling much more dangerous. People with diabetes who have peripheral [neuropathy](#) are at an increased risk for falls due to poor foot sensation and sometimes loss of *proprioception*, or loss of the stimuli that tell the brain where a body part is in space, in relation to other objects. Therefore, the combination of hyperthyroidism and diabetes, particularly when neuropathy is present, increases the risk of fractures that may result in disability, especially in the elderly.

Hypothyroidism. Hypothyroidism rarely causes significant changes in blood glucose control, although it can reduce the clearance of insulin from the bloodstream, so the dose of insulin may be reduced. More important, hypothyroidism is accompanied by a variety of abnormalities in blood lipid levels. This includes increased total [cholesterol](#) and LDL (low-density lipoprotein or "bad") cholesterol levels, and increased [triglyceride](#) levels. The abnormal lipid pattern typical of Type 2 diabetes (low HDL, or "good" cholesterol; high triglycerides; and a high proportion of small, dense LDL particles) is usually worsened by hypothyroidism. These changes further raise the already high risk of cardiovascular diseases such as heart disease and [stroke](#) among people with diabetes.

Pregnancy, diabetes, and thyroid disorder

Pregnancy-related thyroid dysfunction is three times more common in women with diabetes and should be anticipated in every pregnant woman with Type 1 diabetes. Postpartum thyroiditis may cause fluctuating thyroid hormone levels in the months following delivery. In addition to symptoms such as fatigue, depression (the "baby blues"), irritability, and heart palpitations, blood glucose control and insulin requirements may be affected during this period of thyroid dysfunction and profound reproductive hormonal changes. Continued monitoring of thyroid function is necessary in all women who experience postpartum thyroiditis, since roughly one-third will develop permanent hypothyroidism within three to four years and will require thyroxine replacement.

Women who have diagnosed hypothyroidism and already take thyroxine before pregnancy often need to increase the dose of thyroxine during pregnancy. Adequate thyroxine replacement is vital for the baby's neurological development. Women with active Graves disease may enter a period of remission during pregnancy, when the disease becomes less active, but they can expect a recurrence following delivery.

If hyperthyroidism is poorly controlled during pregnancy, the risk of maternal complications such as preeclampsia (a serious condition characterized by high blood pressure) and fetal problems such as prematurity increases. The maintenance of normal thyroid function and [tight blood glucose control](#) is therefore of utmost importance during pregnancy to ensure a successful outcome.

Diagnosis of thyroid disorder

As mentioned earlier, the diagnosis of abnormal thyroid function based solely on symptoms can be difficult. In people with diabetes, it may be even more difficult because of the complex interrelationships of thyroid function and diabetes. Both chronically high blood glucose and hyperthyroidism can cause weight loss despite good appetite, weakness, and fatigue. Likewise, severe [diabetic kidney disease](#) can produce symptoms such as swelling, weight gain, and hypertension, which may be confused with hypothyroidism.

The most reliable method used to diagnose thyroid disease is the simple, relatively inexpensive, yet highly sensitive TSH blood test. This test measures directly the amount of TSH produced by the pituitary gland. Since the pituitary is the first organ to recognize abnormal thyroid function, testing its function is the most sensitive way to monitor thyroid function. In addition to diagnosis, the TSH test is also used to monitor and adjust the dosage of thyroxine therapy.

Before the introduction of the TSH test in the late 1960's, blood tests for thyroid function measured only the levels of the thyroid hormones, T3 and T4. However, these hormone levels can appear relatively normal even when the thyroid is not functioning normally, because the pituitary gland will compensate for thyroid dysfunction. When the thyroid starts to fail (a sign of early hypothyroidism), the pituitary responds by producing higher levels of TSH to stimulate the thyroid to produce more thyroid hormones, thereby maintaining normal circulating T3 and T4 levels. Conversely, when the thyroid gland produces too much thyroid hormone (a sign of early hyperthyroidism), the pituitary responds by producing less TSH, thereby reducing T3 and T4 production from the thyroid.

Therefore, prior to any changes in the thyroid hormone levels, there is a detectable change in the TSH level, which indicates abnormal thyroid function. A normal TSH level ranges from 0.4 mU/ml to 4.0 mU/ml (microunits per milliliter). A below-normal TSH level indicates hyperthyroidism, and an above-normal TSH level indicates hypothyroidism.

An elevated TSH level accompanied by normal thyroid hormone levels is known as subclinical hypothyroidism. People with subclinical hypothyroidism often do not have any symptoms. However, they do face the increased risks of cardiovascular disease associated with hypothyroidism, due to the abnormalities in blood lipid levels. Some doctors have even suggested that a TSH level in the upper-normal range (2.5–4.0 mU/ml) should be considered as evolving thyroid failure.

Thyroid antibodies that are produced in autoimmune thyroid diseases can also be measured by blood testing. The presence of these antibodies can help determine the underlying cause of thyroid disorder. The most specific antibody test is called the anti-TPO antibody test.

Treatment of thyroid disease

Nearly all thyroid diseases are treatable. Hypothyroidism and hyperthyroidism often require long-term or lifelong treatment, depending on the specifics of the diagnosis.

Hypothyroidism. The treatment for hypothyroidism is to replace the missing thyroid hormone. The most common form of thyroid hormone is a synthetic derivative, levothyroxine, which is usually taken as one pill daily. This is a simple yet very effective treatment of hypothyroidism. Once the treatment is started, TSH testing every two or three months is necessary to adjust to the correct dose. When a stable dose is achieved, annual TSH testing is generally adequate for monitoring purposes.

The symptoms of hypothyroidism may take several months of therapy to resolve. Often, lifelong treatment is necessary. Natural thyroid extract derived from animal sources is a less commonly used form of thyroid replacement and has the disadvantage of inconsistent dosage that varies from one batch of pills to another.

Certain supplements, including [iron](#) supplements, calcium supplements, and [multivitamins](#) that contain iron or calcium, can interfere with the absorption of thyroxine. For this reason, these pills should be taken at least two hours apart from thyroxine. In addition, it's a good idea to let your physician know of any supplements or other medicines you take in addition to levothyroxine.

Hyperthyroidism. There are several options for treatment of hyperthyroidism, with the choice dependent on the cause of the disorder; it must be individually determined. Long-term oral antithyroid

medicines such as methimazole (Tapazole) and propylthiouracil (PTU) are effective in controlling the production of thyroid hormone. Regular blood test monitoring is necessary throughout the course of treatment.

Radioactive iodine therapy is the most common treatment used in the United States for hyperthyroidism. It has a very high cure rate but often results in permanent hypothyroidism. Surgery offers an alternative, particularly in people with very large goiters. All these treatments are effective in controlling or curing hyperthyroidism.

Importance of screening

Abnormal thyroid function can have a major impact on diabetes control and increase a person's risk of developing diabetic complications. Because of the complications that can result from untreated thyroid disorder, regular screening is recommended to allow early detection and treatment. For people with Type 1 diabetes, annual screening is advisable. For people with Type 2 diabetes, screening should be done at the time of diagnosis and then repeated every five years thereafter. The frequency of screening should increase with advancing age, since the incidence of thyroid disorder increases with age. For people over the age of 60, annual screening is recommended.

Dr. Wu is an endocrinologist with the Southern California Permanente Medical Group in San Diego, California, and Assistant Clinical Professor of Medicine at the University of California, San Diego.

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Checklist for Traveling with Diabetes

PLANNING & PREPARATION

Master Checklist

- Research vacation logistics
- Consult doctor before trip
- Make booking agents aware of your diabetes
- Request hotel/motel room with refrigerator

Research Vacation Logistics

- Where to do I want to go? _____
- How am I going to get there? _____
- Do I plan to keep things tight? Loosen up a bit? _____

Consult Your Doctor/Healthcare Practitioner

- Appointment made for _____ with _____
- Make sure to get:
 - Letter of medical history
 - Medications and supplies
 - Written prescription(s)
 - Discuss adjustments, if needed _____
- Health Insurance
 - Contact numbers _____
 - Where to obtain medication/care _____
- Vaccines

Reservations

- Booked with _____
 - Confirmation _____
 - Insurance for trip? _____ Cancellation Policy? _____
 - Passport _____ Visa _____
 - REFRIGERATOR IN ROOM AT NO COST? (health related)



Checklist for Traveling with Diabetes

PACKING

<u>Master Checklist</u>	
Diabetes supplies and medical ID	<input type="checkbox"/>
Doctor's note	<input type="checkbox"/>
Labeled medication	<input type="checkbox"/>
Extra prescription forms	<input type="checkbox"/>
Extra batteries	<input type="checkbox"/>
Food and water	<input type="checkbox"/>
Comfortable footwear	<input type="checkbox"/>

Wear ID at All Times

• Type of ID _____

Foot Care

- Wear/bring comfortable, worn-in shoes
- Inspect feet at least daily for changes

TRAVELING BY PLANE OR TRAIN

<u>Master Checklist</u>	
Book reservation early and reserve aisle seat	<input type="checkbox"/>
Get up and stretch	<input type="checkbox"/>
TEST! DON'T GUESS	<input type="checkbox"/>
Bring snacks	<input type="checkbox"/>
Drink lots of water	<input type="checkbox"/>
Check for in-flight meal/bring healthy foods	<input type="checkbox"/>

Check with Transportation Security Administration (www.tsa.gov)

- Notify security screener that you are carrying your supplies
- One carry-on limit and one personal item does not apply to medical supplies and equipment

Checklist for Traveling with Diabetes

TRAVELING BY CAR

Master Checklist

- | | |
|---|--------------------------|
| TEST! DON'T GUESS | <input type="checkbox"/> |
| Pull over to test | <input type="checkbox"/> |
| Keep fast-acting glucose handy | <input type="checkbox"/> |
| Don't drive with blood glucose under 100mg/dL | <input type="checkbox"/> |

TRAVELING BY BOAT

Master Checklist

- | | |
|-------------------------------------|--------------------------|
| Make early reservations | <input type="checkbox"/> |
| Be prepared for motion sickness | <input type="checkbox"/> |
| Check-in with medical staff | <input type="checkbox"/> |
| Avoid the buffet; control portions | <input type="checkbox"/> |
| Check insurance/cancellation policy | <input type="checkbox"/> |
| Bring extra food | <input type="checkbox"/> |

DON'T FORGET...

Master Checklist

- | | |
|--------------------------------|--------------------------|
| Eat healthy | <input type="checkbox"/> |
| TEST! DON'T GUESS | <input type="checkbox"/> |
| Always carry good and supplies | <input type="checkbox"/> |
| Expect delays | <input type="checkbox"/> |
| Good control = more fun | <input type="checkbox"/> |

Remember... when it comes to traveling, be safe, have fun, and enjoy!

Fact Sheet – Air Travel and Diabetes

1. How does the American Diabetes Association help travelers with diabetes?

The American Diabetes Association continues to advocate for the rights travelers with diabetes. We work with the Transportation Security Administration (TSA) to ensure that passengers with diabetes have access to their diabetes supplies and equipment, especially during those times when the nation's security threat level rises and screeners must react quickly to changes in security checkpoint screening protocol. While we hope that you will not encounter any problems in travel because of your diabetes, we depend on you to keep us aware of any difficulties so that we can provide feedback to TSA. If, at the end of your travels, you wish to report problems to us, please contact us at 1-800-DIABETES (342-2383).

2. What are some general tips as I prepare to travel?

- Arrive at the airport 2-3 hours prior to flight
- Review TSA's website for travel updates at www.tsa.gov
- Download [My TSA Mobile App](#)
- Whenever possible, bring prescription labels for medication and medical devices (while not required by TSA, making them available will make the security process go more quickly)
- Pack medications in a separate clear, sealable bag. Bags that are placed in your carry-on luggage need to be removed and separated from your other belongings for screening.
- Keep a quick-acting source of glucose to treat low blood glucose as well as an easy-to-carry snack such as a nutrition bar
- Carry or wear medical identification and carry contact information for your physician
- Pack extra supplies
- Be patient with lines, delays, and new screening procedures

3. Am I allowed to bring my diabetes supplies with me on the plane?

Yes. TSA specifically states that diabetes-related supplies, equipment, and medication, including liquids, are allowed through the checkpoint once they have been properly screened by X-ray or hand inspection. Passengers should declare these items and separate them from other belongings before screening begins. Some of the things you can bring include, but are not limited to:

- Insulin and insulin loaded dispensing products (vials or boxes of individual vials, jet injectors, biojectors, epipens, infusers, and unlimited numbers of unused syringes when accompanied by insulin).
- Lancets, blood glucose meters, blood glucose meter test strips, alcohol swabs, meter-testing solutions
- Insulin pump and insulin pump supplies when accompanied by insulin
- Glucagon emergency kit
- Continuous blood glucose monitors
- Urine ketone test strips
- Unlimited number of used syringes when transported in sharps or similar disposal container
- Liquids (including water, juice, or liquid nutrition) or gels over 3.4 ounces

4. Can I speak to anyone at TSA before I travel?

Yes. TSA recently launched [TSA Cares](#), a new helpline number designed to assist travelers with disabilities and medical conditions. Travelers may call TSA Cares toll free at 1-855-787-2227 72 hours prior to traveling with questions about screening policies, procedures and what to expect at the security checkpoint. TSA Cares serves as an additional, dedicated resource specifically for passengers with disabilities, medical conditions or other circumstances or their loved ones who want to prepare for the screening process prior to flying. The hours of operation for the TSA Cares helpline are Monday through Friday 8 a.m.-11 p.m. EST, and weekends and holidays 9:00 a.m.-11 p.m. EST. Travelers who are deaf or hard of hearing can use a relay service to contact TSA Cares or can e-mail TSA-ContactCenter@dhs.gov.

5. Can anyone help me at the airport?

More than 2,600 Transportation Security Officers (TSO), Lead TSOs, and Supervisors now have a dual role as [Passenger Support Specialists](#) (PSS). In addition to their regular checkpoint duties, these individuals support passengers who may be in need of assistance. A traveler who needs assistance or is concerned about his or her screening can ask a checkpoint officer or supervisor for a Passenger Support Specialist at the respective checkpoint. Or, if TSA personnel recognize someone is having difficulty, a PSS could be called to ask whether assistance is needed. They receive enhanced training directly from experts in the field of a variety of disabilities and from individuals with disabilities themselves. This training includes additional instruction in civil rights for individuals with disabilities and medical conditions, and strategies for providing assistance with dignity and respect. TSA tries to have a PSS available during all screening checkpoint operating hours. If a traveler believes he or she may need to request the assistance of a Passenger Support Specialist, he or she is encouraged to arrive at the airport early and immediately ask an officer or supervisor for a PSS.

6. How do the full-body scanners and patdowns impact me?

Currently, both traditional metal detectors and Advanced Imaging Technology (AIT) scanners are in use at most airports and you may be directed to either one by an officer. If AIT is available, you can request to use it instead of a metal detector. If you choose a full patdown or if you are subjected to additional screening because you alarm a metal detector, you have a right to have this screening done in private and with a witness of your choice. For more information on these screening procedures, see www.tsa.gov/approach/tech/ait/index.shtm and www.tsa.gov/traveler-information/pat-downs.

7. Are there additional screening procedures for individuals who use pumps and continuous blood glucose monitors?

TSA's published policy on insulin pumps is the following:

If a passenger uses an insulin pump, he or she can be screened without disconnecting from the pump. However, it is important for the passenger to inform the officer conducting the screening about the pump before the screening process begins.

Passengers who have insulin pumps can be screened using imaging technology, metal detector, or a thorough patdown. A passenger can request to be screened by patdown in lieu of imaging technology.

Regardless of whether the passenger is screened using imaging technology or metal detector, the passenger's insulin pump is subject to additional screening. Under most circumstances, this will include the passenger conducting a self patdown of the insulin pump followed by an explosive trace detection sampling of the hands.

www.tsa.gov/traveler-information/passengers-diabetes. If you go through an AIT scanner and the image shows an irregularity, the type of additional screening you receive will depend on how many irregularities appear and where they are located on your body.

If you have questions about the safety of wearing your devices through scanners, you should contact your manufacturer. Some manufacturers recommend that you not go through AIT scanners with your devices, while others have no such contraindications. Travelers who use insulin pumps and/or continuous blood glucose monitors have the right to decide whether to be screened by AIT scanners or to request a patdown. Because recommendations for devices are different, TSA does not have a blanket policy for screening all insulin pumps in the same way. TSOs should never tell you to take off your devices, tell you that you need to keep them on and go through AIT scanners, or tell you that you can't go through the AIT scanners—it is your choice.

The Association sometimes receives reports from travelers who are subject to overly intrusive screening because they use insulin pumps and CGMs. If you believe that you have been treated unfairly on account of your diabetes, please contact 1-800-DIABETES and ask how you can speak with a legal advocate.

8. Do my diabetes supplies need to go through the X-ray baggage scanner?

No. TSA states that "if the passenger does not want a liquid, gel, or aerosol X-rayed or opened for additional screening, he or she should inform the officer before screening begins. Additional screening of the passenger and his or her property may be required, which may include a patdown." Keep in mind that you must request an alternative inspection before the screening process begins otherwise your supplies will undergo X-ray inspection. You should separate your supplies from your other property in a pouch or bag.

To prevent contamination or damage to medication and associated supplies and/or fragile medical materials, you should be asked at the security checkpoint to display, handle, and repack your own supplies during the inspection process. Any medication and/or associated supplies that cannot be cleared must be submitted for X-ray screening. If you refuse, you might not be permitted to carry your medications and related supplies into the sterile area.

9. What if my insulin, liquids, and gels are more than 3.4 ounces?

Despite the general rule prohibiting passengers from bringing most liquids and gels through security, people with diabetes may take their insulin, other medications such as Smylin, Byetta, and Glucagon, and other liquids and gels, including juice and cake gel, through TSA checkpoints, even if they are in containers greater than 3.4 ounces. All medical liquids in containers greater than 3.4 ounces must be removed from your carry-on luggage and declared to TSA. They should not be placed in the quart-sized zip-top bag used for non-medical liquids, and they will receive additional screening. Although TSA does allow multiple containers of liquid or gel to treat hypoglycemia, as a practical matter you may want to consider alternative forms of carbohydrates, including glucose tablets, hard candy, or raisins.

Under normal conditions, insulin can safely pass through X-ray machines at airport terminals. If you have concerns about X-rays, you can request hand inspection. However, insulin never should be placed in checked baggage. It could be affected by severe changes in pressure and temperature. Inspect your insulin before injecting each dose. If you notice anything unusual about the appearance of your insulin or you notice that your insulin needs are changing, call your doctor.

10. What can I do if I have a problem?

If you have an immediate problem while being screened, you should ask for a Passenger Support Specialist or supervisor. If your problem is not resolved, you can ask for the TSA's Customer Service Manager for that airport. You can also call the TSA Contact Center at 1-866-289-9673.

After your trip concludes, you may also want to make a complaint. If you believe you have been subject to unfair treatment because of your diabetes, please call us at 1-800-DIABETES to find out how you can speak with a legal advocate.

[Complaints](#) about discriminatory treatment by TSA personnel can be directed to TSA's Office of Civil Rights and Liberties (OCRL), Ombudsman and Traveler Engagement Multicultural Division. You can fill out an online form or submit an email to TSA-CRL@tsa.dhs.gov. You can also send in a complaint with [My TSA Mobile App](#).

TSA accepts complaints by mail, although there may be a delay of 4 weeks because of security:

Transportation Security Administration
Civil Rights & Liberties, Ombudsman and Traveler Engagement
(TSA-6) Multicultural Branch
701 S. 12th Street
Arlington, VA 20598

11. What if I have been treated unfairly by someone other than a TSA employee?

If you think you have experienced discriminatory treatment by air carrier personnel (pilots, flight attendants, gate agents or check-in counter personnel), you should contact your air carrier and you may also make a complaint with the Department of Transportation's Aviation Consumer Protection Division (ACPD). You may call the ACPD at 1-202-366-2220 or see its informational page at airconsumer.ost.dot.gov/problems.htm. More information on where travelers may file complaints for travel service problems is available here: airconsumer.ost.dot.gov/DiscrimComplaintsContacts.htm.

Important Note: This fact sheet describing the legal rights of individuals with diabetes is for your general information and review only, and is not to be construed as a substitute for the advice of legal counsel.

DRIVING WITH DIABETES

Driving safely is an important part of good diabetes care. Some simple driving tips can help you manage this challenge.

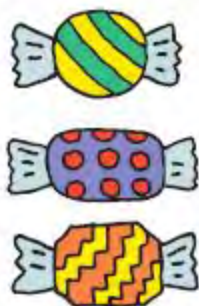


Always:

- Check your blood sugar before you get behind the wheel and every two hours on long trips
- Carry 15-gram fast-acting sugar snacks in case of a low blood sugar problem
- Pull over immediately if you have any signs (symptoms) of low blood sugar
- Treat a low blood sugar right away and wait 15 minutes to test your blood sugar before driving (if your blood sugar is still low, "treat and wait" again)
- Get regular eye exams to make sure you are a safe driver with good vision

Never:

- Drink and drive
- Drive if you are ill, under a lot of stress, or very upset
- Continue driving if you have a sudden low blood sugar problem while driving (talk to your doctor right away)
- Drive after you treat for a low blood sugar problem until your blood sugar is at or near normal



You are never alone when you drive. Other drivers (and passengers in your car) are counting on you to drive safely and to take good care of your diabetes.

Have Diabetes. Will Travel.

By the [National Diabetes Education Program](#)

Heading out of town? Leaving your troubles behind? Off on an important business trip? Whenever you travel, your diabetes comes along with you. And while having diabetes should not stop you from traveling in style, you will *need* to do some careful planning. Here are some helpful diabetes travel tips from the National Diabetes Education Program.

Plan ahead. Make sure you:

- Get all your immunizations (shots). Find out what's needed for where you're going, and make sure you get the right shots, on time.
- Manage your ABCs: [A1C, Blood pressure, and Cholesterol](#). See your health care provider for a check-up four to six weeks before your trip to check your ABC numbers. Discuss if you need to make any changes in your diabetes plan to get them in a healthy range before you leave.
- Ask your health care provider for all prescriptions and a letter explaining your diabetes and all other medicine, supplies, and any allergies. Carry this with you at all times on your trip. The prescriptions should be for insulin (IN-suh-lin) and any other medicine that could help in case of an emergency.
- Carry or wear identification that explains you have diabetes. The identification should be written in the languages of the places you are visiting.
- Plan for time zone changes. Make sure you'll always know when to take your diabetes medicine, no matter where you are. Remember: eastward travel means a shorter day. If you take insulin, less may be needed. Westward travel means a longer day, so more insulin may be needed.
- Find out how long the flight will be and whether meals will be served. However, you should always carry enough food to cover the entire flight time in case of delays or schedule changes.

Pack properly.

- Take twice the amount of diabetes medicine and supplies that you would normally need. Better safe than sorry.
- Avoid storing insulin at extreme temperatures.
- Keep snacks, glucose gel, or tablets with you. In case your blood sugar gets too low. If you use insulin, make sure you also pack a glucagon (GLOO-kuh-gon) emergency kit.
- Make sure you keep your health insurance card and emergency phone numbers handy.
- Don't forget to pack a first aid kit.

Some things to keep in mind if you are flying:

- Plan to carry all your diabetes supplies in your carry-on luggage. Don't risk a lost suitcase.
- Have all syringes and insulin delivery systems (including vials of insulin) clearly marked with the preprinted pharmacy label that identifies the medicine. The airline industry recommends that patients travel with their original pharmacy labeled packaging. Keep your diabetes medications and emergency snacks with you at your seat – don't store them in an overhead bin.
- If the airline offers a meal for your flight call ahead for a diabetic, low fat, or low cholesterol meal. Ask when the meal will be served so you know when to take your insulin.
- If no food is offered on your flight, bring a meal on board yourself.

- If you plan on using the restroom for insulin injections, ask for an aisle seat for easier access.
- Don't be shy about telling the flight attendant that you have diabetes – this is really important if you are traveling alone.
When drawing up your dose of insulin, don't inject air into the bottle (the air on your plane will probably be pressurized).
- For more information about traveling with diabetes, visit the Transportation Security Administration website (TSA): <http://www.tsa.gov/traveler-information/passengers-diabetes>.
- For more information about managing your health abroad, visit the U.S. Department of State website: <http://travel.state.gov/content/passports/english/go/health.html>.

Some things to keep in mind on a road trip:

- Don't leave your medicine in the trunk, glove box, or near a window – they might overheat. If possible, carry a cooler in the car to keep medicine cool. Bring extra food with you in the car in case you can't find a restaurant.

General traveling tips:

- Lower your risk for blood clots by moving around every hour or two.
- Always tell at least one person traveling with you about your diabetes.
- Protect your feet. Never go barefoot in the shower or pool.
- Check your blood sugar (glucose) often. Changes in diet, activity, and time zones can affect your blood glucose in different ways.

You may not be able to leave your diabetes behind, but you can manage it and have a relaxing, safe trip. To learn more about managing your diabetes or to order free resources, visit the National Diabetes Education Program at www.YourDiabetesInfo.org or call 1-888-693-NDEP (1-888-693-6337), TTY: 1-866-596-1162.

The U.S. Department of Health and Human Services' National Diabetes Education Program is jointly sponsored by the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) with the support of more than 200 partner organizations.

Updated May 2014

NO REASON YOU CAN'T ENJOY SEEING THE WORLD – YOU JUST NEED TO PLAN AHEAD

HAVE DIABETES, WILL TRAVEL

Just because diabetes is your constant companion doesn't mean you can't enjoy traveling, whether traversing America in an RV or flying to the far reaches of the globe. Ensuring you stay healthy and keep your glucose levels on an even keel does require a little bit of organization and planning ahead.

The American Association of Diabetes Educators suggests a plan of attack for ensuring your next travel adventure is safe and successful.

- **Over-pack your medications** – Gone for a week? Pack two weeks' worth of your diabetes medications in case of travel delays or misplaced supplies (insulin, syringes, testing strips, extra batteries for your pump, a first-aid kit, glucagon emergency kit, etc.). If you use a pump, ask the company if you can bring a backup in case yours fails. Have a prescription from your doctor for insulin or oral medication in case of an emergency.
- **Protect your supplies** – Keep your medications and supplies close at hand and don't put them in checked luggage or in the trunk, where they can be exposed to harmful extreme temperatures (too hot or too cold). If you're flying, keep them in the original packaging (so no one questions they're yours) in a bag separate from your toiletries, as requested by the Transportation Security Administration (TSA), which manages airport security. Don't worry, the TSA allows you to go over the 3.4 liquid-ounce carry-on limit for diabetes medications and supplies.
- **Identify yourself** – Wear your medical bracelet or necklace that notes you have diabetes and take insulin (if you do). Bring a doctor's note that explains you have diabetes and lists your medications, as well as a prescription in case you need more. Carry a health card that includes your emergency contact and doctor's name and phone number. Learn how to say "I have diabetes," "sugar," and "orange juice, please" in the language of the country you are visiting.
- **Carry snacks and low blood sugar treatment** – Low blood sugar (hypoglycemia) can strike any time and food access during travel is unpredictable, so be sure to bring plenty of snacks such as peanut butter crackers, granola bars and trail mix as well as glucose tablets or gel.
- **Simplify flying** – Tell the TSA folks that you have diabetes (they're used to accommodating people with health issues). Visit www.tsa.gov/traveler-information/passengers-diabetes before your trip to learn about current screening policies. If you plan to inject insulin while flying, be forewarned – the pressurized air can make it more challenging to draw up your insulin, when using a vial and syringe, so be extra careful not to inject air into the bottle.
- **Test often** – New foods, increased activity and different time zones can throw your glucose levels out of whack, so be sure to test frequently, including before and after meals. If you take insulin, keeping your levels steady can be tricky when changing time zones, so make a plan to adjust your schedule for injecting. Before your trip, see a diabetes educator, who can help you with this challenging process.
- **Favor your feet** – Wear comfortable well-fitting shoes and socks at all times – never go barefoot. Check your feet frequently, especially after a hike or long walk. Feet and ankles often swell during flights so consider wearing light knee-high compression stockings (20-30 mm Hg) or bring thinner socks to change into if your feet swell. Wear a shoe that can be loosened if that occurs. Pointing and flexing your ankles during a flight can improve blood flow in your calf muscles and decrease swelling as well as lower the risk of blood clots.
- **Prepare for a health emergency** – If you need medical treatment, ask your hotel to recommend a local doctor who treats diabetes. Prior to an overseas trip, get a list of local English-speaking doctors through the International Association for Medical Assistance to Travelers at www.iamat.org.

The secret to any successful trip is to take plenty of time and plan far in advance of your departure – and that goes double when you have diabetes. For more information about how a diabetes educator can help you plan your next trip, visit www.diabeteseducator.org.



5 Tips for Traveling with Diabetes

From the *Loop Blog*

For 15 years, MiniMed Ambassador [Jonni Lightfoot](#) has traveled all over the planet with diabetes as the bass player and bandleader for the band, Air Supply. You may remember him from previous guest blogs such as [Rock N Roll Road Trip With Diabetes](#) and [A Little Help from a Friend: How I Started Insulin Pump Therapy](#). Today, Jonni joins us again, this time to share his 5 best diabetes travel tips he's learned over the years.



Traveling with diabetes and an insulin pump can be daunting at times. Traveling over 200+ days a year for the past 15 years with diabetes and my insulin pump, I've learned a few tips you may find helpful.

1. Packing

My mentality is “better to have more of what you need, than not enough,” so I pack extra of everything. Inside a multi-fit case, I pack at least 3 infusion sets, reservoirs, insulin, batteries, Tegaderm tape, alcohol swabs to keep things clean, and a package of syringes in case I go through all of my Quick-sets. The last thing I put in my case (and always carry with me) are hard candies, just in case I go low or the [SmartGuard technology](#) on my pump alerts.

2. Insulin

You may be thinking why would I forget to bring insulin? But it’s not about packing a bottle of insulin, it’s about packing at least two full bottles in different bags (I always put my insulin in my carry-on bags, never my checked-bags). I cannot tell you how many times my insulin has been lost, misplaced, and even stolen while on the road. Having that extra vial packed in a different bag has helped me avoid having to locate a pharmacy on the road, or trying to communicate my needs in a foreign language.

3. Storing insulin

While on the road, many hotels provide you a mini fridge free of charge or at very low cost to store your insulin. I typically ask the front desk while checking in if they have any available or you can call ahead of time, too. Through my travels I’ve found the majority of hotels have no issue supplying a mini fridge, as long as they’re available. Keeping your insulin refrigerated reduces the chance of it getting too warm and becoming unusable or spoiling.

4. TSA and Airport Security

A few years back, [TSA](#) was not very familiar with insulin pump technology and they didn’t know how to process a person with diabetes through security with one. I am happy to say that it has gotten a lot better in recent years and that is due to organizations like the [American Diabetes Association](#) who have worked with the TSA to help educate them. But for those of you who have not traveled yet with your insulin pump, I have a few tips from my experience:

- Explain to the TSA agent that you are wearing a medical device before walking into a body scanner.
- You do not need to remove your insulin pump or CGM if you’re going through common security systems like a [metal detector](#).
- You do need to remove your insulin pump and CGM if you’re going through one of the airport body scanners. Never send your pump and CGM through an x-ray machine or body scanner as it may damage the part of the pump that regulates insulin delivery.
- Once you are done with the body scan they will have you put your insulin pump in your hands and then swab your hands. This process only takes a few extra seconds to complete.
- If you do not want to go through the TSA body scanner you can always request a visual inspection and pat down of your person and insulin pump.
- Finally, never go bare foot, always protect your feet and be sure to wear socks.

5. Travel Companion/Medical Bracelet:

If you travel for your job (like I do), it's always good to let someone you travel with know you have diabetes, the signs of high and low blood glucose, and what to do in both scenarios. There are a couple of people I often travel with who know what to look for and what to do when my BG goes too high or too low. They check up on me from time to time and make sure I'm feeling okay. It's really nice to know someone is also looking out for you. If you travel alone, I recommend wearing a medical bracelet or ID necklace so people can assist you in case of an emergency. Be sure the medical bracelet or ID necklace has your Name, Address, Phone Number, a friend or loved one's Name and Phone Number, and of course that you are diabetic. There are many online outlets where you can buy custom Medical ID's.

To finish up....

The most important thing is to get out and travel. Don't feel like you can't, the world is a very amazing place with so many beautiful things to see. Enjoy life to its fullest! Diabetes is not a death sentence nor is it a reason to just stay home. If I can travel all over the world several times a year with diabetes and an insulin pump then you can too. Get out and enjoy your life and the world. Yes, we have diabetes but remember we control it, it does not control us.

Medical emergency card

I am wearing a required medical device prescribed by my physician.



Medtronic

In an emergency, please contact:

physician name:

phone number:

family member:

phone number:

I have diabetes.

If my behavior is peculiar (appear intoxicated) or I am unconscious, it may be a result of severe low blood sugar.

I am not intoxicated.

Call a medical team for assistance.

If I am able to swallow, give me a source of sugar, (examples: juice, candy, non-diet soft drink).

Healthcare Professionals

I am wearing an external insulin pump.

- The pump is delivering fast-acting insulin at a constant rate.
- To stop insulin delivery, press ACT, use down arrow button to select Suspend, press ACT. Follow instructions on the screen.
- Do not remove the pump battery.
- Do not remove the pump without medical consent.
- If the pump is alarming, follow the instructions on the pump screen or call the local Medtronic Diabetes representative listed below.

Local Medtronic Diabetes Representative

name:

phone number:

Airport information

I am wearing a required medical device prescribed by my physician.



Medtronic

This continuous glucose monitoring (CGM) feature on your pump is safe for use on U.S. commercial airlines. If questioned by airline personnel about use of your Medical-Portable Electronic Device (M-PED), show them this card. If the airline flight crew still request that you turn it off, you must comply.

The transmitter is an M-PED with emission levels that meet RTCA/DO160, Section 21, Category M. Per FAA Advisory Circular #91-21.1B, dated 8/25/06, any M-PED that meets this standard in all modes “may be used onboard the aircraft without any further testing by the operator”.



This device can withstand exposure to common electrostatic (ESD) and electromagnetic interference (EMI), including common security systems such as an airport metal detector. During exposure, it can remain connected and powered on.

Medtronic has conducted official testing on the effects of the **full body scanners at airports** with Medtronic medical devices. Some of the new scanners may include x-ray. **To avoid removing your devices, you may request an alternative screening process.** If you choose to go through a full body scanner, you must remove your insulin pump and CGM (sensor and transmitter). Do not send your devices through the x-ray machine as an alternative.

Patient information

my name:

my address:

home phone number:

Medical Device Information

medical device type:

device serial number:



Medtronic

Medtronic MiniMed
Northridge, CA 91325
USA
800 646 4633
818 576 5555

Menopause

What to Expect, How to Cope

by Pat Dougherty, C.N.M., M.S.N., and Joyce Green Pastors, M.S., R.D., C.D.E.

For most women, menopause—the cessation of menstrual periods—is a normal, natural occurrence. The average age at menopause is 51, although any time after 40 is considered normal. The years leading up to the menopausal transition—a time known as the perimenopause—may be characterized by changes in the menstrual period, hot flashes (a sudden feeling of warmth, sometimes accompanied by sweating), emotional ups and downs, sleep disturbances, and vaginal dryness. Some of these symptoms may continue after menopause. The severity of symptoms varies dramatically from person to person, ranging from barely noticeable menstrual changes to an experience described as debilitating. Women who experience menopause abruptly because of the surgical removal of their ovaries (called *surgical menopause*) typically have much more severe symptoms than women who experience a natural menopause.

Both the perimenopausal and postmenopausal periods may present additional challenges for women who have [diabetes](#). For one thing, the hormonal fluctuations that are common to perimenopause can affect blood glucose levels. For another, some symptoms of menopause are the same as or easily confused with the symptoms of high or low blood glucose levels, so the cause must be determined before corrective action can be taken. In addition, both diabetes and menopause raise a woman's risk of osteoporosis, so women with diabetes must be proactive about taking steps to keep their bones strong. Lack of sleep, whether related to menopause, stress, or something else, can disrupt diabetes control. And menopause is often associated with weight gain, which can make blood glucose control more difficult.

The menopausal process

A woman is said to be postmenopausal one year after her final menstrual period. Menstrual periods may be very irregular in the years leading up to the final period, sometimes with only one to three cycles occurring per year in the late perimenopause. A small percentage of women stop having periods abruptly without any cycle fluctuation. Although fertility declines sharply after age 40, perimenopausal women can become pregnant, so contraception is necessary for sexually active women who do not wish to become pregnant until menopause is confirmed. Once a woman has gone a year without a period, she can no longer become pregnant.

As the ovaries age, they become less responsive to the hormonal messengers on which they rely for regular function, and greater amounts of estrogen and progesterone are required for ovulation and menstruation to occur. The perimenopausal years are characterized by fluctuating, although not necessarily low, levels of these hormones. The unstable levels of estrogen and progesterone contribute to menstrual cycle irregularities and perimenopausal symptoms. They can also contribute to unstable blood glucose levels. While the effects of estrogen and progesterone on diabetes control are not entirely understood, in general, it appears that higher levels of estrogen may improve [insulin](#) sensitivity, while higher levels of progesterone may decrease insulin sensitivity. When insulin sensitivity decreases, more insulin is needed to get glucose into the cells.

The changes associated with perimenopause commonly begin about three to five years before a woman's final menstrual period, although some women notice subtle changes as early as their late

30's. Eventually, the ovaries become unresponsive and unable to ovulate (release eggs). Once the ovaries cease ovulating altogether, estrogen levels decline, and menstrual periods stop. However, hot flashes, night sweats, sleep disturbances, and mood fluctuations may continue for several years. Vaginal dryness due to low estrogen levels may persist if not treated.

Is it menopause or my diabetes?

One of the challenges for menopausal women who have diabetes is distinguishing between the symptoms of the two conditions. It is not uncommon to mistake menopause-related hot flashes or moodiness for symptoms of low blood glucose. Night sweats—hot flashes that occur at night—can interrupt sleep and lead to excessive daytime fatigue, which can also be mistaken for low blood glucose. If this leads to eating extra calories to raise a low blood glucose level, it could lead to high blood glucose and, over time, weight gain, if repeated on a regular basis.

The reduced estrogen levels that occur with menopause can directly cause or can raise a woman's risk of vaginal dryness, vaginal infections, and urinary tract infections—but so can high blood glucose levels. While all of these conditions are treatable, the cause of the problem must be determined for proper management. Regular blood glucose monitoring can help women figure out whether low or high blood glucose levels may be causing their symptoms. Any woman who is experiencing chronically high blood glucose levels should address that issue first, with the help of her diabetes team, if needed.

Dealing with menopausal symptoms

But what if the symptoms are related to menopause and not high or low blood glucose levels? How does a woman with diabetes successfully treat the most common symptoms of the menopausal phase, including hot flashes, night sweats, moodiness or irritability, weight gain, and vaginal dryness? The answer depends on the severity of symptoms, as well as the degree of control the woman has over her diabetes. Women with poorly controlled diabetes are at increased risk of cardiovascular complications associated with hormone therapy, and are therefore less suitable candidates for this type of treatment.

Lifestyle changes are always the first step to help reduce the discomforts of menopause. The following changes can help make the menopausal transition easier:

- Remain (or become) physically active. Regular physical activity or exercise can help increase energy levels, improve mood, and combat weight gain.
- Substitute whole grains and fresh fruits and vegetables for processed and refined foods, both to help control blood glucose (and blood pressure) levels and to increase overall energy level.
- Use alcohol and caffeine in moderation or not at all, since they can trigger hot flashes and decrease sleep quality. If spicy foods have a similar effect, reduce your intake or avoid them altogether.
- Consume more legumes (beans and peas), soy foods, and flaxseed. These foods contain *phytoestrogens*, or chemicals found in plants that may act like estrogen in the body. Some women report that increasing the amounts of these foods in their diet decreases the frequency and severity of their hot flashes, although scientific studies have not confirmed this. (Phytoestrogen pills and powders are not recommended at this time because of safety concerns).

- Get adequate amounts of vitamins and minerals. To keep their bones strong, women going through menopause who are not receiving hormone therapy should be getting 1,200–1,500 milligrams of calcium and 800 international units of vitamin D each day (which can be provided by three to four 8-ounce servings per day of low-fat milk or yogurt). Women receiving hormone therapy should aim for 1,000 milligrams of calcium per day. Vitamin E and the B vitamins have also been suggested as beneficial for reducing menopausal symptoms, but the research does not currently provide strong support.
- Use of herbal teas or supplements may be helpful for treating hot flashes and night sweats. Research is limited, but herbal preparations such as black cohosh, garden sage, and motherwort are used in many Asian and European countries. However, you should speak with your doctor before beginning any sort of herbal regimen.
- If you are a smoker, stop smoking.

Coping with hot flashes

In addition to the lifestyle changes already described, there are many simple techniques that may help to relieve minor to moderate episodes of hot flashes. These include the following:

- Avoid heat around the face area from devices such as hair dryers and curling irons.
- Avoid using hot tubs, and keep baths and showers tepid or cool.
- Drink cold water or water with ice.
- Wear layers of clothing so you can take off some clothing, if needed.
- Sleep with a light blanket or other covering and with the windows open or a small fan blowing directly on you.
- Use a ceiling fan or air conditioner if you have one.
- Place cold compresses on your face when you experience hot flashes or sweating.
- Practice deep abdominal breathing—count to 10 while inhaling slowly, then exhale slowly while counting to 10. Repeat 10 times.
- Try to identify and avoid your own personal hot-flash triggers.
- Remind yourself that your symptoms will eventually lessen or abate.

Treatment for severe symptoms

Hormone therapy (HT) can be used to alleviate severe menopausal symptoms, especially unrelenting hot flashes, night sweats, and vaginal dryness. Estrogen therapy (ET) is appropriate only for women who have had a hysterectomy (removal of the uterus) because estrogen alone increases the risk of uterine cancer. Women who wish to use hormone therapy who have not had a hysterectomy must use a combination of estrogen and progestin together, called estrogen-progestin therapy (EPT).

Hormone therapy is the only FDA-approved medicine for the treatment of hot flashes and night sweats. Many women report that other menopausal symptoms such as insomnia, mood instability, and lack of concentration are also improved when taking HT, although scientific data has not confirmed these claims.

However, the benefits of HT must be weighed against the risks, such as those recently documented in the Women's Health Initiative, a large scientific study looking for ways to prevent a variety of conditions in postmenopausal women. According to the results of this study, there is a slightly increased risk of heart attack (7 more cases per 10,000 women per year), [stroke](#) (8 more cases per

10,000 women per year), and potentially life-threatening blood clots to the lungs (8 more cases per 10,000 women per year) for women taking EPT. In addition, dementia risk appears to double, increasing from 22 cases to 45 cases per 10,000 women per year.

For women with a hysterectomy taking ET, the risk of heart attack did not increase, but the risk of stroke did increase (13 more cases per 10,000 women per year). In women taking EPT, but not those taking ET, breast cancer increased by 8 cases per 10,000 women per year.

Because women with diabetes already have an increased risk of heart disease, it is especially important for women with diabetes to discuss the benefits and risks of HT with their health-care provider. Heart disease is the leading cause of death of American women.

On the plus side, HT use was associated with 5 fewer hip fractures per 10,000 women per year and with 6 fewer cases of colorectal cancer per 10,000 women per year in the Women's Health Initiative. HT is approved for the prevention of osteoporosis.

There have been some studies suggesting that taking estrogen promotes insulin sensitivity, which may in turn lead to a lowering of blood glucose levels. (The combination of estrogen and progestin, however, does not seem to have this effect on blood glucose control.) However, this benefit alone is not considered a reason to use estrogen, since there are other, safer options for the prevention and treatment of insulin resistance (namely weight loss and increased physical activity).

Some women should not take HT or should only take it with extreme caution. Hormone therapy is not considered an option for women who have a personal history of breast cancer, although a family history alone does not prevent most women from being candidates for HT. Estrogen therapy is usually not appropriate for women with a history of severe blood clotting disorders or other medical conditions that are exacerbated or complicated by supplemental estrogen, such as liver disease and certain cancers.

Some nonhormonal medicines have been shown to improve hot flashes for some women and are most often used in women with severe symptoms who cannot or choose not to use hormones. These medicines include certain [antidepressants](#), blood pressure medicines, and neurologic medicines.

Vaginal and urinary symptoms

The decrease in estrogen levels that accompanies menopause can make the tissues of the vulva, the lining of the vagina, and the urethra thin, dry, and less elastic and can cause shortening of the urethra. These changes can lead to decreased lubrication, vulvar burning, pain, and sometimes bleeding with sexual activity. They can also increase the likelihood of developing vaginal infections, noninfectious vaginitis (inflammation of the vagina not caused by infection), and urinary tract infections.

Topical, nonprescription lubricants can provide temporary relief from vaginal dryness and assist with sexual activity, although they do not reverse the long-term tissue changes that result from estrogen loss. Over-the-counter vaginal moisturizers can help relieve the symptoms of vaginal dryness such as itching and burning, but such products do not supply estrogen to the tissues and therefore do not treat the underlying cause of the vaginal dryness. A prescription vaginal estrogen product such as a

cream, tablet, or ring administered directly to the vagina, on the other hand, can cause genital and urethral tissue to become thicker, more elastic, and moist. Vaginal estrogen is not thought to carry the same risks as systemic hormone therapy (therapy that affects the entire body, such as HT administered in pill or patch form) because vaginal estrogen probably does not get into the bloodstream in any significant amounts.

While replacing vaginal estrogen can decrease the risk of urinary tract infections and also tends to decrease the need to urinate frequently that often accompanies estrogen loss, an existing urinary tract infection should be treated with antibiotics.

Weight gain

For a number of reasons, women are prone to accumulating excess body fat, whether or not they have diabetes. Unlike male hormones, which keep muscle mass high, female hormones promote fat formation. The fat is typically deposited first on the thighs and buttocks, then the stomach, followed by the upper body and arms. Women with Type 2 diabetes or the metabolic syndrome, however, typically accumulate fat in the abdominal region.

In addition to biological factors, certain lifestyle choices can also lead to increased body fat. Skipping meals and following “crash” diets can actually lead to weight gain in the long term by causing the body to slow down its metabolism and use calories more efficiently. The key to weight loss, therefore, is to eat regularly scheduled meals, choose healthful foods containing whole grains, fruits and vegetables, reduce your fat intake, and consume smaller portions.

Losing even 10 to 20 pounds can help you control your blood glucose levels more easily, as well as improve your circulation, blood pressure, and heart health. Increasing your level of physical activity can help with all of these goals, and it’s good for your diabetes control and heart health even if you don’t lose weight. The following are some strategies for putting an exercise plan into action:

- Set small goals. If you are currently not physically active, start out by walking for 5 to 10 minutes, three days a week. Increase your time and distance gradually.
- Do an activity you enjoy. Try walking, swimming, water exercises, using an exercise bike, or taking yoga or Pilates classes. Doing more than one type of physical activity works different parts of your body and can keep your exercise routine from becoming stale.
- Exercise with other people who keep you motivated.
- Keep a log of your activities, both for motivation and to see how physical activity affects your blood glucose levels.
- Become more active in your daily life. Small steps such as taking a walk during your lunch hour and taking the stairs instead of the elevator can add up.
- Exercise one to two hours after eating. This will help control blood glucose levels.

A unique journey

Perhaps the most important thing a perimenopausal woman can do is to listen to and respect her body. Just as each person’s diabetes requires an individualized plan for control, so is each woman’s experience with menopause unique. Because it’s common to experience some changes in blood glucose control as you go through menopause, it helps to maintain a regular schedule of blood glucose monitoring, as well as good exercise and eating habits. Using relaxation techniques to

reduce stress and trying to get adequate sleep can help, too. Consult your medical provider if your symptoms are severe and are dramatically affecting your quality of life.

If you are interested in trying hormone therapy or taking other medicines to control your symptoms, talk to your health-care provider about the benefits and risks as they relate to your personal health. This article and [“Resources for Readers”](#) can help you to formulate a list of questions or concerns to bring up at your appointment. The goal of balancing diabetes control and menopause symptoms should be to remain strong and vital so you can maximize the quality of your life.

New Contraception Options

by Monica J. Smith

Given that approximately half of all pregnancies in the United States every year are unplanned, birth control is an important consideration for all sexually active women at risk of becoming pregnant. In the case of women with diabetes, however, precision in family planning is even more crucial because of the effect of high blood glucose on the developing fetus.

“There’s a very close correlation between blood sugar level and the incidence of birth defects in the offspring of women with diabetes,” says Jo M. Kendrick, MSN a clinical instructor at the University of Tennessee Graduate School of Medicine’s Department of Obstetrics and Gynecology and author of *Diabetes in Pregnancy* (a guide for nurses). According to Kendrick, “Anytime you have a [n HbA_{1c}] level of 7% or greater, there’s an increased risk of birth defects in the offspring or, as it rises even higher, an increased risk of miscarriage.” The HbA_{1c}, or glycosylated hemoglobin, test gives an indication of average blood glucose control over the previous 2–3 months. People who don’t have diabetes generally have an HbA_{1c} level between 4% and 6%.

Because of these risks, women with diabetes are advised to bring their blood glucose levels as close to normal as possible before attempting to conceive. In addition, any woman with diabetes who is considering having a baby should have a physical exam and a laboratory assessment to look for any evidence of vascular (blood vessel) disease, since pregnancy can put a great deal of stress on the vascular system. Having eyes and kidney function assessed is another important part of preconception care for women with diabetes.

According to Kendrick, “We very strongly encourage women to get an eye exam to make sure that they don’t have any *retinopathy*, an EKG [electrocardiogram] if they’ve had diabetes for more than 10 years [to check for heart disease], and a 24-hour urine test to assess renal function.” A psychosocial evaluation is also recommended. “Pregnancy in women with either Type 1 or Type 2 diabetes can be very stressful, not only because of the demands of pregnancy, but also because of the additional demands of diabetes control” says Kendrick.

All women considering pregnancy — with diabetes or without — should start taking a daily prenatal vitamin supplement that includes 400 micrograms of folic acid before conception occurs. This level of folic acid intake has been shown to help prevent the types of birth defects called neural tube defects.

For women who do not wish to become pregnant, reliable birth control is a must. “I certainly think that some methods are better than others, but that’s a decision that a woman and her partner should make in conjunction with a health-care provider,” Kendrick says. “I wouldn’t encourage natural family planning if a woman’s glycemic control weren’t excellent, and I’d be concerned about methods with a higher failure rate, such as barrier methods. But if a woman is maintaining good glycemic control and she prefers these methods, there’s no reason why she shouldn’t be able to use them.”

Kendrick is a proponent of methods that require infrequent administration, such as the NuvaRing, the Mirena intrauterine device, the Ortho Evra patch, and Depo-Provera contraceptive injections. “With all the other things that women have to think about when they have diabetes, contraception should be easy.” She also encourages women with diabetes to keep a current prescription for

emergency birth control, as long as they do not have any special conditions, such as unexplained vaginal bleeding, that make the use of emergency contraception unsuitable.

Since 1998, a number of new birth control options have come on the market (although by mid-2004, some were being taken back off). The majority of these contain a hormonal component that prevents pregnancy by halting ovulation and by thickening cervical mucus, which makes it difficult for sperm to penetrate the uterus. The new methods differ from their predecessors in the means by which they deliver the hormones or, in the case of some of the latest oral contraceptives, in the way they affect a woman's menstrual period. The side effects and possible complications are similar in most cases to those associated with other low-dose oral contraceptives: nausea, weight gain, fluid retention, breast tenderness, and headaches and, more seriously, blood clotting and hypertension. Hormonal methods should not be used by heavy smokers over the age of 35, because these women are at a higher risk of serious side effects. Women with diabetes must make sure their health-care provider is aware of their diabetes before taking any form of birth control.

To date, the best protection against sexually transmitted infections, short of abstinence, is still a latex condom used with each act of intercourse. However, condoms are not 100% reliable, and they are less effective at preventing transmission of viral infections such as herpes or genital warts that are passed from one person to another through skin-to-skin contact.

Seasonale

Unlike most oral contraceptives, which are taken for 21 days followed by seven days of placebo pills, Seasonale tablets are taken for 84 days (12 weeks) followed by seven days of placebo pills. This dosing regimen results in fewer menstrual periods (one every three months). The four yearly periods are no heavier or longer than the period of a woman taking a typical birth control pill and, in most cases, they are lighter than those experienced by women not taking oral contraceptives. Like conventional birth control pills, Seasonale is more than 99% effective when taken as directed. There is a higher incidence of irregular bleeding between periods with Seasonale than with conventional oral contraceptives, but such bleeding tends to decrease with time. It is still unclear what the long-term effects of absent periods may be, and there is some concern over the increased estrogen exposure from extra active pills. Women who have vascular complications are advised not to take Seasonale.

Yasmin

Yasmin contains a unique progestin, known as drospirenone, along with estrogen. Like other birth control pills, Yasmin is over 99% effective, but its special drug combination also cuts down on water retention and symptoms associated with premenstrual disorder, such as mood swings and weight gain. This form of birth control may not be the best choice for women with diabetes, however. Yasmin may increase potassium levels in some women, so it should be avoided by women who have kidney, liver, or adrenal disease. Women taking potassium-increasing drugs, including NSAIDs such as ibuprofen, potassium-sparing drugs, or potassium supplementation should also steer clear of this contraceptive. In addition, women taking [ACE inhibitors](#), heparin, or angiotensin-II receptor antagonists such as irbesartan (brand name Avapro) or valsartan (brand name Diovan) should avoid taking Yasmin. This contraceptive is available by prescription and costs about \$35 to \$38 a month.

Emergency contraception

At this time, emergency contraception is available in the United States by prescription only, except in Washington, California, Alaska, New Mexico, and Hawaii, where it is available directly from a pharmacist. In May 2004, the Food and Drug Administration (FDA) voted against making the drugs available over the counter, citing concerns that women would be unable to properly use the drugs

without a doctor's supervision, as well as fears that increased availability would lead to risky sexual behavior among young people, although studies have shown this to be untrue. At the time of the FDA decision, there were two drugs available for emergency contraception: Plan B, a progestin-only pill, and Preven, an estrogen–progestin pill. However, Preven was later taken off the market.

Emergency contraception works by stopping or delaying ovulation, by preventing fertilization, and by keeping a fertilized egg from attaching to the uterus, but it will not end an existing pregnancy. Emergency contraception should be taken within 72 hours of unprotected intercourse — the sooner the better — and can decrease the likelihood of conception by as much as 89%. Plan B is available at pharmacies and family planning clinics with a prescription from a health-care provider. Because there is a risk of nausea and vomiting with Plan B, some doctors may also prescribe an anti-nausea medicine. Progestin-only contraceptives such as Plan B may cause a slight deterioration in glucose tolerance, so women with diabetes who have taken this contraceptive should be monitored by their health-care provider.

Ortho Evra patch

The first transdermal contraceptive, the Ortho Evra patch is worn for three weeks (each individual patch lasts a week) on the lower abdomen, buttock, or upper arm, where it delivers a continuous level of progestin and estrogen through the skin. Each three-week interval is followed by a patch-free week during which a woman has her period. The Ortho Evra patch is about 99% effective if used correctly. If a patch comes off before the week is over, a new patch should be applied as soon as possible for the remainder of the week. If more than 24 hours go by before a new patch can be applied, backup birth control must be used. This method is less effective in women who weigh more than 198 pounds and it should not be used by women with diabetes who have vascular complications. The Ortho Evra patch is available by prescription and costs about \$30 a month.

NuvaRing

A novel concept in contraception, the NuvaRing is a flexible polymer ring worn in the vagina. It is approximately two inches in diameter and contains low levels of hormones. The ring is inserted by a woman on or before the fifth day of her period by pinching the sides of the ring together and gently pushing it into her vagina where it releases low levels of estrogen and progestin for 21 days. Because NuvaRing is not a barrier method, precise placement is not essential. Efficacy is compromised, however, if the ring slips out of the vagina and is not replaced within three hours, or if it is left in for more than four weeks or removed before the three weeks is up. In clinical testing, NuvaRing has shown to be 99% effective, the same as the pill. This method should not be used by women with diabetes who have kidney, eye, nerve, or vascular complications. NuvaRing is available by prescription and costs about \$30 a month.

Mirena intrauterine device

Although they are very popular worldwide, intrauterine devices (IUDs) have had a bad reputation in the United States since the Dalkon Shield scare of the 1970's. (This brand of IUD was linked to an increased risk of pelvic inflammatory disease, attributed to the wicking effect of the multifilamented string.) In spite of the negative associations caused by this episode, the risk of pelvic inflammatory disease related to IUDs is actually quite low, and they provide a highly effective, easily reversible birth control option for women who have had one or more children and who are in a monogamous relationship. The latest IUD to come on the market, Mirena, consists of a small, flexible, T-shaped plastic frame that releases small amounts of levonorgestrel, a type of progestin. This device does not contain estrogen, so it does not cause estrogen-related side effects and complications such as headaches and breast tenderness. Progestin-related side effects are kept to a minimum as well because all of the hormone released, about one-seventh of the amount released by birth control

pills, goes directly to the uterine lining rather than through the bloodstream. There may be cramping and dizziness at the time of insertion, so it's not a bad idea to take a painkiller such as ibuprofen prior to the office visit. There may be spotting or light bleeding between periods for the first three to six months, after which periods usually become lighter — in contrast to most IUDs, which tend to cause heavier periods. Mirena, which is over 99% effective, can stay in the uterus for up to five years, at which time a new Mirena can be inserted. The device costs about \$475, plus the cost of insertion.

Today Sponge

Introduced in 1983, the Today Sponge was once the most popular over-the-counter female contraceptive choice. It was taken off the market in 1995 because of problems that were found at the factory where it was made, but the rights to the sponge were bought by another company, and the sponge was re-released in 2005. The Today Sponge, which is about 89% to 91% effective, consists of polyurethane foam with spermicidal nonoxynol-9. Once moistened and inserted into the vagina, where it works as a physical barrier to the cervix and as a sperm killer, the sponge protects against pregnancy for 24 hours even with repeated intercourse. It is currently available at some retail and online pharmacies and at www.thetodaystore.us for around \$30 for a 12-pack. Women who are allergic to nonoxynol-9 should not use the Today Sponge. In addition, women who use barrier methods such as the sponge, a diaphragm, or a cervical cap are at an increased risk of urinary tract infections.

It should be noted that use of nonoxynol-9 has not been shown to reduce the risk of transmission of HIV. In fact, in some studies, it has been associated with a higher HIV infection rate.

Permanent birth control

Until fairly recently, permanent birth control for women — tubal ligation — required surgery and general anesthesia. The Essure system, however, requires no incision and can be put into place in as little as 35 minutes, and it requires only local anesthesia, intravenous sedation, or, in some cases, no anesthesia at all. The system consists of small metal and polyester-fiber coils that are threaded into a woman's Fallopian tubes through the vaginal opening via catheter. Scar tissue eventually forms over the coils, blocking the Fallopian tubes so that fertilization cannot take place. The scarring process takes about three months, during which a backup birth control method must be used. Clinical studies have shown the Essure System to be 99.8% effective after two years (data for more than two years is not yet available). The method should be used only by women who are certain that they do not wish to have children (or more children). Although information is not available on the safety or effectiveness of reversal, it is clear that an attempt would require major abdominal surgery and would likely be ineffective. The Essure system itself costs \$980, but there may be other, associated costs.

Natural family planning aid

The necklace-like CycleBeads were developed by the Institute for Reproductive Health at Georgetown University to be used in conjunction with the Standard Days Method, a natural family planning method that grants a fairly wide window for conception possibility. CycleBeads consist of a string of 32 color-coded beads that correspond with levels of fertility throughout a woman's cycle, and a ring to keep track of the passing days. Since this method is more calendar than contraception, there are no side effects. It should be used only by women whose regular cycles are 26 to 32 days long, and who are willing to abstain from intercourse or use a reliable contraceptive during their fertile days. CycleBeads cost about \$13 and are available at retailers and pharmacies, as well as online at www.cyclebeads.com.

Vasclip

Women are not the only ones for whom new methods of birth control are being developed. A small polymer mechanism known as Vasclip now offers men who desire permanent birth control an alternative to a vasectomy. This device, which is about the size of a grain of rice, locks around each vas deferens, the vessel that transports sperm from the testes to the urethra, thereby preventing the passage of sperm to the urethra and out of the body. The procedure to insert the Vasclip devices involves making a small incision in the scrotum to access the vas deferens and then positioning the clips. The entire process takes only about 15 minutes from start to finish, and because there is no cutting or cauterizing of the vas deferens, complications such as swelling and infection are generally reduced. After the procedure, a couple still must use a backup form of birth control until it is confirmed by a doctor that the man no longer has any sperm in his semen; as with a vasectomy, it is expected that the majority of men who undergo the procedure will achieve infertility within three months. Because the operation is considered permanent, only men who are sure they do not want any (or more) children should consider having it. (In the future, the company that makes Vasclip intends to conduct studies to explore the possibility of reversing the procedure.) The device generally costs \$400 to \$500, plus the cost for insertion, which varies.

Hormonal male birth control

Although they are a long way from being commercially available, there is a possibility of some hormone-based forms of male birth control in the future. The most promising method so far involves a combination of testosterone implants that are replaced every four or six months with injections of progestin every three months. This combination effectively turns off sperm production for the duration of its use, and is completely reversed within six to 12 months after the treatment is discontinued. In a recent study, 55 couples used this method as their only form of birth control for a year and no pregnancies resulted.

Expanding options

Choosing whether and when to have a baby is a major decision. Having a reliable method of birth control lets you make that decision when you're ready. The growing number of contraceptive choices on the market should make it easier to find one that meets your needs. If you choose to use a method that requires a doctor's prescription, make sure the prescribing doctor knows about your diabetes, how you treat it, any other medical conditions you may have, and any drugs you may take. Women with diabetes who feel they are ready to start a family or have another child should talk to their health-care provider about preconception planning to make sure they are ready physically as well as emotionally.

[John Schieszer, MA](#)

August 18, 2016

Addressing Female Sexual Dysfunction in Diabetes



Female sexual dysfunction in diabetes remains a challenge.

Female sexual dysfunction has recently received more attention than in the past. New treatments are available, and clinicians now have a much better understanding of the pharmacologic and non-pharmacologic management of female sexual dysfunction, according to Charmaine Rochester, PharmD, CDE, associate professor at the University of Maryland School of Pharmacy, Baltimore, Maryland.

At the [American Association of Diabetes Educators \(AADE\) 2016 Annual Meeting](#), Dr Rochester, along with Lisa Meade, PharmD, CDE, associate professor at Wingate University School of Pharmacy, Wingate, North Carolina, told clinicians that female sexual dysfunction is a multicausal, multidimensional problem combining biological, psychological, and interpersonal elements.

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They said that female sexual dysfunction is a long neglected condition. However, that is now changing. The disorder is age-related, progressive, and highly prevalent, according to Dr Meade. Initially considered only psychological in nature, she noted, it is now recognized as an important part of quality of life impairment in postmenopausal women and women with [diabetes](#).

“Exploring sexuality and sexual well-being with women is part of the holistic nature of care, and the complexities of sexual dysfunction relating to living with diabetes need recognition within the practice. In addition, the World Health Organization (WHO) has begun to recognize female sexuality as an important aspect of women's health and declared this as a basic human right,” said Dr Rochester. “Although female sexual dysfunction is not linked with reproduction like male sexual dysfunction, it is an important area for women.”

Unfortunately, there is a paucity of information in the literature, she explained. Consequently, clinicians may be reluctant to discuss it with patients. However, effective treatments for female sexual dysfunction are available, including local and systemic estrogen, testosterone, and biomechanical devices. Dr Rochester said a sex therapist may be consulted in more difficult cases.

“Endocrinologists can work with their educators to teach them the interviewing techniques needed to open the conversation with women about female sexual disorder, and when to consider triaging them to a therapist or when to consider therapy,” Dr Rochester told *Endocrinology Advisor*.

She said the normal sexual response model in both males and females can be categorized into 4 phases. It begins with excitement, which leads to a plateau, then an orgasm followed by a resolution. Female sexual dysfunction may be affected in any one of these areas. For instance, diabetes can affect blood supply and clitoral erectile function. Additionally, Dr Meade said other biological factors may include medical and psychiatric diseases such as depression, neurological diseases, and urogenital diseases. Others may include hormonal changes, menopausal status, pharmacological treatment (antidepressants), substance abuse, and medical therapies.

Estrogens may be prescribed for patients with depletion of estrogen, Dr Rochester said, and transdermal testosterone may be prescribed for patients with depletion of androgens. She noted that sildenafil (Viagra, Pfizer) was studied for female sexual arousal disorder but was not approved by the Food and Drug Administration (FDA). She explained that there have been a wide variety of studies on sildenafil therapy in women for a variety of female sexual disorders with many conflicting results.

Flibanserin (Addyi, Sprout Pharmaceuticals) has been approved by the FDA for women with hypoactive sexual desire disorder (HSDD). It is a serotonin 1A receptor agonist and a serotonin 2A receptor antagonist. However, Dr Rochester said the mechanism by which the drug improves sexual desire and related distress is not known. This oral agent is a nonhormonal therapy. It increases dopamine and noradrenalin while reducing serotonin in the brain. This in turn, according to Rochester, seemingly has a positive effect on a woman's sexual craving.

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Flibanserin was originally studied as an antidepressant but turned out to be a poor treatment. During the clinical trial, however, many women reported more sexual interest and overall satisfying sexual experiences than before, according to Rochester. Prior to approval of flibanserin, there were no FDA-approved treatments for sexual desire disorders in men or women, she noted.

However, now that there are more treatment options and a greater awareness, it should be easier for clinicians to address this issue with their patients.

“I want to encourage endocrinologists to utilize interviewing techniques to assess female sexual dysfunction in diabetes patients and consider therapy for suitable patients as part of the holistic care for the female diabetes patient,” said Dr Rochester.

Reference

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Say Yes to Intimacy

Treatment Options for Erectile Dysfunction

by Donna Rice, BSN, RN, CDE

It is a well-known fact that chronic illness can cause problems with sexual function. Today, erectile dysfunction, also called impotence, affects an estimated 30 million men in the United States. It is a problem that often leads to frustration, embarrassment, loss of self-esteem, isolation, and depression. It can also lead to strain in a relationship, particularly if a man withdraws from his partner rather than communicating openly about what he is experiencing. Men with [diabetes](#) have a higher incidence of erectile dysfunction, yet it is often ignored and left untreated.

Men willing to seek help, though, find that erectile dysfunction is treatable. Today, there are many options that work well and have restored erectile function to many men.

Erectile dysfunction

Erectile dysfunction has a variety of definitions and forms, but the one discussed in this article is “the persistent inability to get or maintain an erection sufficient for sexual intercourse.” It is usually caused by disease, injury, or a drug and is not a normal part of the aging process.

An erection normally occurs when sexual stimulation causes nerves in the penis to release certain chemicals that start a cascade of reactions, resulting in the widening of blood vessels entering the penis and a narrowing of vessels leaving the penis. The increased blood flow allowed by the widened arteries fills the spongy tissues of the penis, causing the penis to thicken and lengthen. The engorged tissues compress the veins that take blood out of the penis, further narrowing them, which limits blood outflow and maintains the erection. ([Click here](#) for more information about how an erection occurs.)

There are many [complications](#) associated with diabetes; however, the two complications that have a direct effect on erections are blood flow problems and nerve problems ([neuropathy](#)). High blood glucose levels can contribute to blockages or narrowing of blood vessels. Better known for causing problems such as [atherosclerosis](#) and [peripheral artery disease](#) (narrowing of the blood vessels supplying the legs and arms), this process can also affect blood vessels that supply blood to the penis.

Diabetic neuropathy also contributes to erectile dysfunction. Nerves are involved in signaling the blood vessels of the penis to widen or narrow (dilate or constrict). Over time, high blood glucose levels damage nerves, and as a result, they cannot properly signal the vessels to open and close, making an erection difficult to achieve.

Most often, erectile problems in men with diabetes are a result of problems with both blood flow and nerve function. However, getting regular [exercise](#), controlling one’s [blood pressure](#), and controlling one’s blood glucose, in addition to being good for controlling one’s diabetes, can prevent or delay neuropathy and vascular problems and help improve sexual function. For men already experiencing erectile difficulties, though, there are several treatment options.

The three main categories of treatment are drugs, mechanical devices, and surgery. Drugs can be taken orally, as a suppository, or as an injection. Mechanical devices cause more blood to enter the penis (vacuum devices), prevent blood from leaving the penis (constriction bands), or support the

penis to make it more rigid (splints). Surgical treatment involves implanting a device into the penis. Some men have to try several of these options before finding the one that works best for them and their partners. (See [“For More Information”](#) to learn more about treatments for erectile dysfunction.)

Throughout this process, communication is key. The man and his partner need to talk about the pros and cons of each option to find a mutually satisfying solution. Health-care providers can give information, advice, and options, but ultimately it is the couple who must use and be satisfied with the treatment they choose.

Medicines

Although they are taken differently, the drugs described here are all basically vasodilators that increase the amount of blood that can enter the penis. They mainly differ in side effects, time to onset of action, and convenience.

Pills. Sildenafil (Viagra) took the market by storm several years ago, bringing sexual dysfunction out of the closet and getting men into doctors’ offices to deal with it. The overwhelming response to sildenafil and the increased awareness of erectile dysfunction as a real problem for millions of men enticed two new contenders into the market: vardenafil (Levitra) and tadalafil (Cialis). The introduction of these new drugs increases the choices for treating this problem.

The main difference between the three drugs is that tadalafil can last up to 36 hours compared with 4 hours for sildenafil and vardenafil. However, it has not been studied whether a man can achieve multiple erections per dose of tadalafil, and tadalafil may have a greater potential for drug interactions because of its longer period of effectiveness.

The actions of all three drugs are similar in that they increase blood flow to the penis. They work by stopping the degradation of the vessel-widening chemicals that are produced in response to sexual stimulation; with their degradation stopped, the chemicals are free to continue allowing more blood into the penis. Because these drugs don’t produce vessel-widening chemicals themselves, the user must have some sexual stimulation to start the release of such chemicals and achieve an erection. The three drugs all start to work in as little as 30 minutes. (See [this table](#).)

Each medicine can be taken daily and each has the following possible side effects: headaches, flushing, upset stomach, visual disturbances, and prolonged erections. (Prolonged erections lasting more than four hours require immediate medical attention to prevent permanent damage to the penis.) Tadalafil may also cause muscle aches or back pain while its competitors don’t, but it is also less likely than its competitors to cause so-called “blue vision,” a condition in which users temporarily experience a blue tinge to their vision while using the drug. Sildenafil has been around longer than its competitors and therefore has a more proven safety profile. Sildenafil should be taken on an empty stomach or with a light (low-fat) meal; the others can be taken with food or on an empty stomach. Alcohol may be used in moderation with any of these medicines.

All three drugs have similar precautions. You should not use these drugs if you are taking a drug that contains nitrate or an alpha-blocker (with one exception for tadalafil), which is used to treat high blood pressure or an enlarged prostate gland. Tadalafil may be taken with 0.4 milligrams of once-daily tamsulosin (Flomax).

Again, it's important to note that erections won't happen automatically with these drugs. Sexual stimulation is a must for these medicines to be effective, so if the mood isn't right, a man may not get an erection, even if he has successfully used the pill before.

Urethral suppository. A urethral suppository containing the drug alprostadil (MUSE) hit the market a year before sildenafil. Like the oral medicines, the alprostadil suppository is a vasodilator that allows blood to enter the penis. About the size of a grain of rice, the suppository is placed into the urethral opening at the tip of the penis. (The urethra is the tube in the penis that allows urine to flow out of the body.) It dissolves inside the urethra where it is then absorbed into the blood. Proper insertion of the suppository is important; education and practice are critical to obtain the desired results. An erection that lasts for about one hour will usually occur in about 5–15 minutes. A man first takes the drug in his doctor's office for instruction, safety, and determining the proper dose for him.

Potential side effects of the alprostadil suppository include mild dizziness, a burning sensation in the urethra, prolonged erection, and aching and pain in the penis and testicles. Minor urethral bleeding or spotting due to improper administration can occur. Sexual stimulation will enhance the effect of the drug.

Penile injections. Alprostadil can also be injected into the penis to treat erectile dysfunction. Penile injection therapy was introduced in 1995. Although it is a highly effective therapy, fear or reluctance to give an injection into the penis and the convenience of taking a pill have allowed the oral drugs to dominate the market. Men using penile injections have reported that this therapy gives good results and very natural looking erections (alprostadil, whether injected or used as a urethral suppository, often enables a man to achieve a firm head to his penis, while other therapies can result in a soft head). Unlike the other medicines listed before, penile injections require very little sexual stimulation to result in an erection.

The drug is injected with a syringe and needle (similar to [insulin](#) injections), causing blood vessels to dilate, which brings more blood into the penis. An erection occurs in about 5–20 minutes and can last up to an hour. This treatment requires practice to correctly administer the medicine. As with the alprostadil suppository, a man's first dose is taken in the doctor's office to ensure safety, learn proper technique, and find the proper dose. Penile injection therapy can be used three times per week, with at least 24 hours between each dose.

Potential side effects include pain, infection, and scarring. Too large of a dose can cause prolonged, painful erections, but education and careful dosing can prevent this problem.

Mechanical devices

Before there were drugs, mechanical devices were the main treatment for erectile dysfunction. Although drug companies have the financial muscle to advertise the latest medicines, these little-heralded devices are still useful and effective.

Constriction bands. Some men, especially men with diabetes, are able to get an erection but are unable to maintain it because of venous leakage. The blood flows out as fast as it comes in. With position changes or with penetration, men with leakage can lose their erections. This is where a constriction band can help. There are a number of bands on the market made in a variety of materials, sizes, and shapes. A man uses a band by placing it at the base of the penis after an

erection is attained to prevent blood from leaving the penis. Some men use constriction bands in conjunction with alprostadil or the oral erectile dysfunction treatments.

To prevent tissues from becoming oxygen-starved, the constriction band should be left on for no more than 30 minutes, and there should be about an hour's time between applications. In some cases, the band may also compress the urethra, blocking the emission of ejaculatory fluids (although a constriction band is not — and should not be used as — a contraceptive device). A man who has a reduced ability to sense pain in his penis should not use a constriction band because pain is a warning that the device needs to be removed.

Vacuum devices. An external vacuum device was once the only treatment available for men with erectile dysfunction. Today, it is a tried and true treatment used by many men. It is relatively inexpensive and does not require injections or medicines to be successful. These devices can be bought over the counter or with a prescription, and they are often covered by insurance plans, including Medicare.

The device consists of a plastic cylinder, a pump (either handheld or battery-operated), a set of constriction bands, and a water-soluble lubricant. The lubricant is applied to the base of the penis to help form an airtight seal. Then the cylinder is placed over the flaccid penis and held tight against the pelvis. The pump is activated to create a vacuum within the cylinder, drawing blood into the penis. Once the penis is engorged with blood, a constriction band is rolled off the cylinder to near the base of the penis. The cylinder is removed, and the penis is left erect. The constriction band must be removed within 30 minutes.

Some possible side effects include a bluish color to the penis (from bruising or the tourniquet-like effect of the band), discomfort or pain (from pumping with too much pressure or from a constriction band that is too tight), coolness of the penis, and wobbliness of the penis near the base (the portion of the penis beyond the constriction band is still soft, so to minimize this problem, the band should be applied as far toward the base of the penis as possible). These problems can be lessened with practice and education.

Vacuum therapy is very effective, but it takes time and patience to use with ease. Statistics show that with practice, all men can find a level of success. Your physician or health professional can help with understanding and effectively applying the technique.

Penile splint. The penile splint (Rejoyn Support Sleeve System) is a relatively new and inexpensive treatment for men with erection problems. It allows men to have intercourse with a flaccid or semi-erect penis. The penis is placed in a tubular “splint” and a condom is applied over the penis. Penile splints allow for insertion and can produce a satisfying experience for both partners. These products can be purchased over the counter and can be used as frequently as you choose.

Surgery

Penile implants are considered a last resort, both because surgery is necessary to place them and because the surgery permanently changes some internal structures of the penis. As a result, if removal of the device becomes necessary for some reason, other erectile dysfunction treatments will not work. Those who choose penile implants, however, find they can create a natural-looking erection. There are several different models on the market, but the most common and most effective is the three-piece inflatable implant. (Other varieties include a two-piece inflatable implant and a

noninflatable implant.) It consists of two cylinders placed in the penis, a pump placed in the scrotum next to the testicles, and a fluid reservoir placed in the abdomen. Squeezing the pump transfers the fluid from the reservoir to the cylinders, creating an erection. Because this is a surgical procedure, it usually involves an overnight hospital stay. Recovery is complete in about six weeks and involves some pain, bruising, and tenderness. As with any surgery, infection is a possibility, but measures are taken before, during, and after surgery to minimize the risk.

There is a reported high satisfaction rate among men and their partners with implants. Because the penis does not become engorged with blood, it can stay erect all day with no harm, and lovemaking can be prolonged as long as desired. It is important to be aware that any mechanical device can fail due to wear. The statistics show about a 10%–12% failure rate over about 10 years. If a mechanical failure occurs, the implant can usually be replaced. Be sure to discuss all of these issues with your doctor before having surgery.

Getting help

Today, men who have erectile problems do not need to accept them as permanent. There are options that address a variety of needs and circumstances. If you're one of those men, speak to your doctor about what might work well for you, and bring your partner in on the discussion. Couples who work together tend to have the best success with treatment. Depending on the cause of your erectile dysfunction, your doctor may be able to treat you himself or may refer you to a urologist or other specialist. But you can only get the help you need by asking for it, so the sooner you take that first step, the sooner you'll be saying yes to sexual intercourse.

DSME NOTE:

Diabetes is a condition where there is a high rate of low testosterone nearly 50% is suspected in diabetes. Obesity promotes low testosterone. If levels are low, it leads not only to sexual function, but muscle strength and feeling good. For men that are deficient in testosterone, replacement is available as gels placed on less hairy areas of the body according to your prescription. Talk with your primary provider or your endocrinologist if you suspect low testosterone is a problem for you.

SEXUALITY AND DIABETES

Sexuality is one of the greatest gifts we have as humans. When it works it can be wonderful and when it doesn't work it can be confusing and tremendously frustrating.

As sexual beings we are energetic and excited to test out the possibilities. If we are healthy, sex is exciting and fun and baring any anxieties, things work out and we continue to enjoy playing.

WHAT'S NEEDED FOR GOOD SEX?

Good sex requires the right circumstances so those participating can be both excited and feel safe. We need "arousal" which requires good nerve conduction, blood flow, and the right balance of hormones. We also need our preferred stimulation which requires touch of various types. And we need the capability to respond, which again, requires all of the above. It seems simple, but we are not simple and sex is also not so simple. The most difficult aspect of this cycle is how diabetes can affect it and unfortunately it can affect all aspects of sexual pleasure.

WHAT DOES DIABETES AFFECT?

There are two answers to this question.

Not much if it is well controlled.

Everything if it is not well controlled.

Unfortunately we don't stay young forever and life may begin to take a toll with stress, aging, illness, relationship difficulties, anxiety and depression. Particularly when we throw the long term effects of diabetes in the mix, sex can become quite complicated.





ISSUES AFFECTING MEN

Effects of long term diabetes are somewhat dependent on length of time having the disease and how the control has been over time. The sexual issues that we see associated with diabetes for men are the following:

Erectile dysfunction: This is associated with complications associated with reduced blood flow and poor nerve conduction (neuropathy). It may also be associated with certain medications for high blood pressure.

Low testosterone: This is the hormone associated with sexual arousal and sexual energy (Libido). When it is low it usually means interest in sex is lower.

Delayed ejaculation or orgasm: This is associated with neuropathy sometimes associated with anti-depressants.

Retrograde ejaculation: This condition is associated with neuropathy and is when the ejaculate backs up into the bladder rather than being ejected out the penis.

Peronies disease: This condition which causes a painful curvature of the penis is caused by plaque build up in an artery of the penis.



ISSUES AFFECTING WOMEN

For women the effects of diabetes are similar; they can be:

Lack of lubrication: Similar to men this is associated with neuropathy or reduced blood flow.

Increased difficulty achieving orgasm: This is associated with neuropathy.

Increased risk for yeast infections: This is due to elevated glucose levels.

For both men and women there are other factors that can have an effect on sexuality that are associ-

ated with having diabetes. Those who have diabetes run an increased risk for developing problems with depression and anxiety. These two conditions affect interest and performance with sex.

WHAT ELSE AFFECTS SEX?

Diabetes is not the only issue that affects your ability to have sex. Here is a brief list to check before you assume the cause is not if related to your diabetes.

Your relationship: Do you talk, touch, play, laugh and feel safe?

Your aging process: Are you healthy, happy with your body, how's your weight?

Health care in general: Do you smoke, drink, exercise, eat well, sleep well and manage stress?

Sex education: Do you know enough?

Medications: What do you take and can they have an effect?

If you run through this list and feel reasonably good about what you are doing to take care of yourself and you are still having any of the symptoms listed above then it may be time to see the doctor or your diabetes educator.

sexuality and diabetes



NEXT STEPS

There are different specialists who may treat sexual issues; the list below gives examples of some of those professionals you might see.

Diabetes educator

Primary Care Provider

Urologist

Obstetrician/Gynecologist

Sex therapist

Relationship therapist

As you can tell each of these will have a different set of ideas of how to go about the treatment process, so you may want to start with your diabetes educator or primary care provider to get the direction for whom to see next or what kind of treatment they might recommend.

Be assured there are treatments that can be helpful. Some will help restore functioning and some may simply help you identify a different way to play in this adult playground. Sexuality is such a special way to play, don't simply give up without knowing what might be useful and giving it a try.

QUESTIONS TO ASK YOUR HEALTHCARE PROVIDER

The visit to your healthcare professional will likely require some courage and a little reflection before you go. Here are some questions that might help them identify what is happening to you. These questions are hard because most people are not used to talking about sex, but to get the help you want it will be important to be this clear.

What is the nature of your problem? For example, do you not get an erection any time, ever? Or do you get good erections when you're alone, but none with a partner. Or do you get no erections with partner stimulation but get occasional morning erections. As you can see the more specific the better.

- ★ When did this start?
- ★ How has the problem changed since it started?
- ★ When does it happen? Every time, only some of the time, when you are stressed?
- ★ What makes a difference? More stimulation, different stimulation, more time in foreplay?
- ★ Do you have enough foreplay?
- ★ Does it matter how well your diabetes is controlled?
- ★ How is your interest in sex? Has this changed?
- ★ Do you receive the stimulation you would like? Does this make a difference?



ENJOYING A HEALTHY SEX LIFE: TIPS FOR PEOPLE WITH DIABETES

Take care of your diabetes. There is evidence to suggest that sexual problems for both men and women with diabetes are similar to other complications caused by prolonged, elevated blood sugar levels. So be mindful of what you eat and drink, test regularly, and take your medications as prescribed. This will assure you are doing your part to protect this aspect of your health. In the short term make sure your blood sugar is in your target range before you start sexual play. Nothing is worse than having low blood sugar during sex, or having it be so high that it interferes with your current arousal.

Stay fit with regular exercise.

Having an interest in sex and being able to engage in such a strenuous activity requires you and your heart to be in good shape. So in addition to being sexual, get some other physical activity during your week. Spend some time working your core muscles too. These muscles are very important in enhancing your sexual experience.

Use it or lose it. One of the most effective ways to maintain an interest in sex is to have sex. This old adage holds true because when we have sex certain hormones are produced that make us feel good at the time and also increase our desire to engage again sooner. If we stop having sexual play we begin to lose interest and interest may fade from both our mental and physical memory.



Keep your sexual play interesting.

For most couples they learn what works to meet their sexual needs and then they use this activity forever. This becomes so familiar it can lead to boredom. Couples may benefit from a discussion that explores new interests or activities. This doesn't mean you get kinky, although that is a possibility, but does mean you discuss trying a different position or a different type of foreplay. Something new may restore some freshness and improve both interest and function.

Make sure you are having fun.

Sex is adult play and if you are not having fun perhaps you need something to change. If sex creates anxiety, or functionally you are having a hard time getting things to work, it might be time to talk with your diabetes educator, doctor or a sex therapist. If you have enjoyed sex **don't give up hope**, go see someone who might help.

Take time to connect with your partner.

Have a date night, have exercise time together, turn off the TV sit with each other and talk and touch. Too often our lives become too busy and we're always doing something. We forget that connection requires intention and attention. Have a relationship with each other on purpose. Plan it and do it because it is good for the relationship and ultimately it will be good for your sex life too.

Redefine sex, have a lot of foreplay, take your time. Because the sexual difficulties with diabetes may be primarily associated with arousal, foreplay activity may be helpful for lubrication and for erections. It can also be very pleasurable. Do not just jump into intercourse, unless you are in agreement and things work for you this way. Take time for play time, outer-course, before intercourse.

If you are having difficulty with any aspect of your sex life, see a professional to get some direction of how you might be helped. There are many treatments that can be helpful, but having someone to talk with about your concerns may be all you need. If you require more at least you have started the process. Even if you decide to not use the treatments, at least you will have the information and understand your choices.

*Written by Joseph Nelson,
MA, LP, CST*

Is Diabetes Hurting Your Love Life?

By Janis Roszler, MSFT, RD, CDE, LD/N

Once diabetes enters your life, it goes with you wherever you go...even into the bedroom.

About half of all adults with diabetes develop diabetes-related sexual complications. The most common male problems are erectile dysfunction (ED), low testosterone, and premature ejaculation. The most common female problems are vaginal dryness, reduced sexual interest and pain during intercourse. The following slides share information that can help women, men, and couples.

Men: If you are a man and have diabetes, you are three times more likely to have difficulty achieving or maintaining an erection that is firm enough for intercourse. This problem is called erectile dysfunction or “ED.” If it happens once in a while, don’t worry. That is normal. If it happens often, contact your health care provider. There are many effective treatment options.

ED Treatments: First, improve your blood glucose control. The higher your A1C value, the more likely you are to develop ED. Also, try to keep your blood pressure in a healthy range—erections require good blood flow. The ED pills advertised on TV only work in 50-60% of men with diabetes. So, if you tried them and they didn’t work for you, you’re not alone.

The good news is that there are many other effective treatments to choose from, including vacuum pumps, constriction rings, penile injections and suppositories, penile sleeves, sex therapy, and penile implants. If your testosterone level is low, which happens often in men with type 2, it is easy to treat. A topical testosterone gel or other form of treatment can improve your sexual performance.

If you have ED and smoke, your erection may start to improve within 24 hours after you quit smoking. If you drink alcohol, do so in moderation. Too much alcohol can negatively affect your libido and sexual performance.

(Next)

Women: Vaginal lubricants can help you deal with vaginal dryness and may also help reduce or eliminate any pain you experience during intercourse. If the pain continues, ask your health care team about hormone suppositories and other hormonal treatment options.

Women with diabetes tend to take longer to get aroused, so allow yourself time to get in the mood. Connect with your partner often to build romance and sexual interest – take walks, hold hands, talk, etc.

Use reliable birth control. If you worry about becoming pregnant you may tense up during intimacy.

Physical activity may help prevent sexual complications in women with diabetes. Move!

Both men and women: Sex therapy and couples counseling can help you and your partner enjoy a more meaningful intimate relationship and resolve many sexual issues.

Remember, sexual activity is a form of exercise. Check your glucose level before you start and keep a snack handy in case your glucose level drops too low.

Sexual complications and depression are often linked. If you become depressed, seek help. If your depression medication causes your sexual interest to change, ask your health care provider to switch you to a different medication; there are many to choose from.

Check out the Mediterranean diet. If you are a man or woman with type 2 diabetes, newer research shows that this way of eating may help lower your risk of developing sexual complications.

Don't give up! If one treatment doesn't work, try another. Don't let diabetes rob you of a meaningful sexual relationship.

(Next)

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Our mission:
**TO PREVENT BLINDNESS AND
PRESERVE SIGHT.**



Protecting Eyes from Ultraviolet Rays May Help Save Vision Today and in the Future!

Milwaukee, WI (May 12, 2014) – Exposure to ultraviolet (UV) rays can be very harmful to the body. According to the [Centers for Disease Control and Prevention](#), skin cancer is the most common form of cancer in the United States. Yet the most preventable cause of skin cancer is exposure to UV light.

And, the [Environmental Protection Agency](#) states that basal cell carcinoma is the most common type of skin cancer to affect the eyelids and may appear on the lower lid, in the corners of the eye and under eyebrows. Many people may also not be aware of the damage that UV rays can have on the eyes and vision as well.

Prevent Blindness, the nation's oldest eye health and safety organization, has declared May as UV Awareness Month to help educate the public on the dangers of UV and steps that can be taken to protect vision today and in the future. Because UV damage to the eyes can be immediate and cumulative, it is important to learn how to protect sight today.

Eye problems that UV rays can cause include:

Cataract- UV rays, especially UV-B rays, may cause some kinds of cataracts. A cataract is a clouding of the eye's natural lens, the part of the eye that focuses the light we see.

Corneal Sunburn- Corneal sunburn, called photokeratitis, is the result of high intensity, short-term exposure to UV-B rays. Long hours at the beach or skiing without proper eye protection can cause this problem. It can be very painful and may cause temporary vision loss.

Macular Degeneration- UV rays may lead to macular degeneration, a leading cause of vision loss for older Americans.

Pterygium- This is a growth that begins on the white of the eye and may involve the cornea. Eventually, the growth may block vision. It is more common in people who work or spend extended periods of time outside in the sun and wind.

Skin Cancer- Skin cancer around the eyelids is also linked to prolonged UV exposure.

There are different types of UV. UV-A radiation has lower energy and penetrates deep into the eye which may injure the macula, the part of the retina responsible for sight in the center field of vision. UV-B

radiation is presumably more dangerous and is mainly absorbed by the cornea and lens of the eye and can damage those tissues.

Prevent Blindness strongly recommends that both adults and children always wear both a wide-brimmed hat or cap and the proper UV-rated sunglasses. Wrap-around sunglasses are best as they protect the eyes and the skin around the eyes. There are also many types of sports eye protection glasses that offer UV protection as well. Ask an eye doctor for his or her recommendations.

“It is so important for us to always remember to protect our eyes from UV rays when headed outdoors and to consistently provide a good example for our children,” said Barbara Armstrong, Executive Director of Prevent Blindness Wisconsin. “By demonstrating the importance of protecting our vision, we can hopefully help save sight for ourselves and for generations to come.”

For more information on the dangers of UV exposure and how to choose the best UV protection, please visit the Prevent Blindness Wisconsin dedicated Web page at <http://wisconsin.preventblindness.org/protect-your-eyes-sun> or call (414) 765-0505.

About Prevent Blindness Wisconsin

Prevent Blindness Wisconsin is a non-profit volunteer organization, founded in 1958, and an affiliate of Prevent Blindness. Our mission is

to prevent blindness and preserve sight in Wisconsin. We serve the state by promoting healthy vision and eye safety through free vision screenings, information and referral services, and public and professional education. <http://www.preventblindness.org/wi>.

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Mobile apps: Powerful data, at your fingertips

A mobile app can be an extremely useful tool, helping you manage your day-to-day life with diabetes.

There are a lot of apps out there, but here are some of the ones we found that had high ratings, were free or affordable, and had an easy-to-use format.

One we really endorse is the **Conversation Mapp App**. It offers continued support of our education efforts spent in group class. Once you install this app, there is a coaching code that you enter to start the ball rolling. The coaching code for Chris is **23570**

Fooducate tells you what's really in your food. Simply scan a barcode, and this app exposes the story behind the label—like hidden sugars and trans fats—in more than 200,000 items. It's free, and available for [iPhone/iPad](#) and [Android](#) users.

The **ACCU-CHEK® 360° diabetes management app** provides a full-featured logbook that gives you a complete view of your readings, carbs, insulin and more. The 3-Day Profile is your electronic version of the [ACCU-CHEK 360° View paper tool](#), and the Testing in Pairs feature helps you look at 1 event (like a meal or an activity) so you can see before and after effects on your blood sugar. You can also easily e-mail reports to your healthcare team. It's free, and available to [Android](#) users.

Glooko Logbook records your blood glucose numbers by syncing them to your glucose meter. Connect your iPhone to your meter (Glooko is compatible with 11 different ones), and all of your readings are charted in a logbook on your phone. You can even track readings from more than 1 meter. It's free, and available for [iPhone/iPad](#) and [Android](#) users.

Diabetic Audio Recipes Lite keeps diabetes-friendly recipes at your fingertips. The app is frequently updated, and it even reads cooking directions to you while you cook. It's free, but only available for [Android](#) users.

Glucose Buddy ensures that you never forget to check your blood sugar, thanks to constant reminders and push notifications. It also functions as a log, tracking your blood sugar levels, A1Cs, carbs, medicines and more. It's free, and available for [iPhone/iPad](#) and [Android](#) users.

Diabetic Connect is your entry to the largest online diabetes community. Whether you post your own question or search topics already being discussed, it's a fast and easy way to seek support or find advice. It's free, and available for [iPhone/iPad](#) and [Android](#) users.

Calorie Counter Pro takes the mystery out of counting carbs. With more than 475,000 foods in the database, just scan a bar code or do a search, and the app tells you exactly what you're eating, whether you're buying it at the supermarket or sitting at a restaurant. You'll also get access to the My Net Diary community, and registered dietitians. This one costs \$3.99, and is available for [iPhone/iPad](#) and [Android](#) users.

The **Diamedic** app can record a lifetime of blood glucose readings, injections, lab results, carbs, weight fluctuations, medications and workouts. Everything is customizable, there's a wealth of easy-to read charts and you can even email reports to your doctor. This one costs \$5.99, and is only compatible with [iPhones/iPads](#).

These choices change daily – which do you like? Share them with me on the app and we will let everyone know!

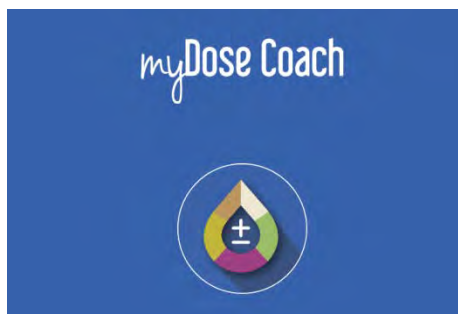
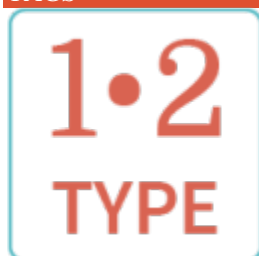
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FDA Clears “My Dose Coach” App to Optimize Basal Insulin Dosing

4/26/17 - NEW NOW NEXT

TAGS



By Lynn Kennedy and Adam Brown

Sanofi’s My Dose Coach app joins other insulin dosing apps recently cleared by the FDA, and new dosing tools from Novo Nordisk/Glooko and others are also in the works

Sanofi’s *My Dose Coach*, a new, under-the-radar mobile app for adjusting basal insulin doses for those on injections, received FDA clearance in late March. Similar to Sanofi’s *MyStar Dose Coach* blood glucose meter (BGM) launched last year in Europe, a healthcare provider prescribes and sets up the *My Dose Coach* mobile app so that it can suggest optimized basal insulin injection doses for people with diabetes. The app will use fasting blood glucose and hypoglycemia data and recommend changes in doses if readings are too high or too low.

The short [FDA letter](#) leaves many key details about the product unanswered: When will it launch? Will it be easy to use for people with diabetes and their healthcare providers? Will glucose data be manually entered into the app by the user or will it

be automatically uploaded from a wireless blood glucose meter (e.g., Sanofi's partner, [AgaMatrix, has a new Jazz 2 Wireless BGM](#))? And will it only work with Sanofi's basal insulin, Toujeo (known as Lantus XR outside the US), or will it work with a wider array of basal insulins?

Another question is whether people with diabetes will follow the recommendations provided by such apps. We believe they could offer more informed and safer insulin dosing guidance, but this won't be known until they launch. Cost is also an unknown: will insurance pay for these prescribed apps? Based on currently available information, *diaTribe* thinks the value will be very high, but it's always hard to predict.

There are a number of other insulin dosing apps in development or coming to market soon. Given that a majority of people taking insulin are not at their A1c target, and given that insulin is so challenging to dose (especially mealtime or "snack" insulin), it is hoped that emerging tools like these will make it easier to use insulin:

- **Voluntis' *Insulia*** was cleared by the US FDA for adjusting basal insulin doses (with Lantus and Levemir only) in December 2016. It is expected to launch in the US this year, assisted by partnerships with Sanofi and Livongo.
- In January, **Novo Nordisk and Glooko** [announced a partnership](#) to develop digital diabetes tools together, including insulin dose titration. The first product launch is hoped for this year.
- **Lilly's Go Dose** app for adjusting Humalog (mealtime) insulin received FDA clearance in January; launch timing has not been announced.
- Earlier this month, **Livongo and Glytec** announced a partnership to launch their own insulin dose adjustment software for healthcare providers (who would then relay the new doses to their patients). The first organization will begin using it this summer.
- **Glooko** is also developing its own (non-partnered) app for adjusting basal insulin: Mobile Insulin Dosing System (MIDS). The company has said that it is progressing nicely, but there is nothing public to share yet.

It is very exciting to see more and more companies focusing on new and enhanced tools for optimizing insulin doses – especially for those on injections. As *diaTribe* continues to watch and listen for news on these emerging digital diabetes tools, please [let us know](#) of any feedback you have on them, and stay tuned for more updates!

Apple picks 13 apps for people with diabetes

By: [Jonah Comstock](#) | Jul 2, 2014 116 168 14

Tags: [Apple](#) | [AppStore](#) | [Diabetes](#) | [iOS diabetes apps](#) | [iPhone diabetes apps](#) | [iPhone medical apps](#) | [iTunes store](#) | [Type 1 Diabetes](#) | [type 2 diabetes](#) |

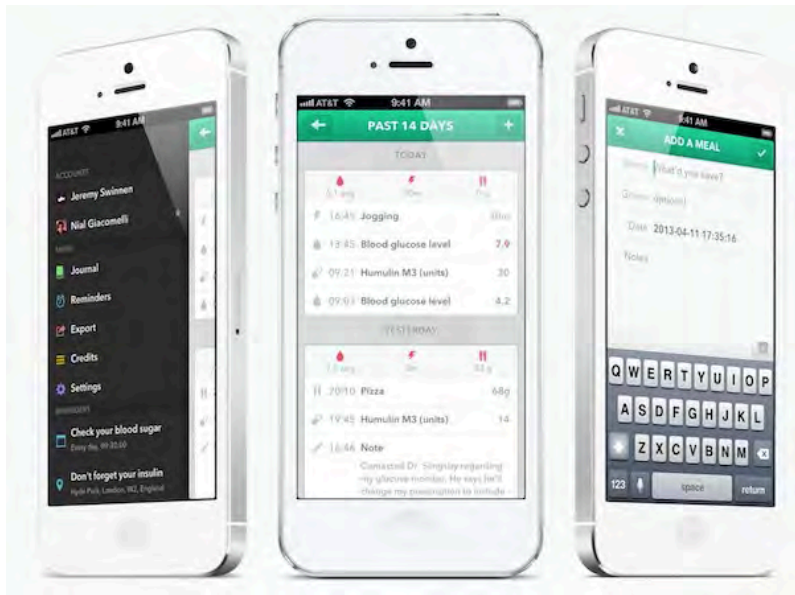


Apple periodically updates its app store with lists of apps for particular groups of people. Even as the new iOS 8, with a built in Health app, goes into beta, Apple has added a new list: “Apple’s Apps for Diabetics.” According to the CDC’s 2011 fact sheet, diabetes affects 25.8 million people, or 8.3 percent of the US population.

The apps on Apple’s list aren’t all from the US, and they don’t all target diabetes specifically. While many are tracking and management apps for blood glucose and insulin levels, others are more general purpose apps for eating specific diets, which people with diabetes could benefit from. The list includes mostly consumer-facing apps but one app for doctors, as well as one for kids and one for pregnant women with diabetes.

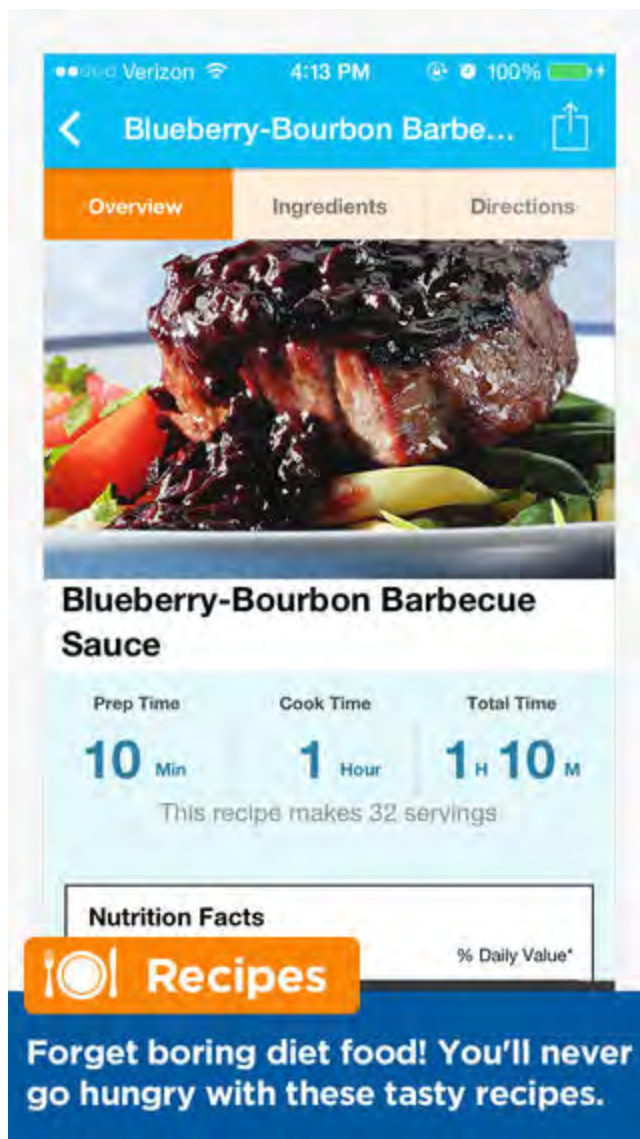
The list has some overlap with the list of top-grossing diabetes apps [Research2Guidance released](#) in March, but app developer Azumio, which Research2Guidance identified as the market leader, has no apps on Apple’s list. Read on for 13 apps Apple has highlighted for its users with Type 1 or Type 2 diabetes.

Diabetik by [UglyApps](#) (free)



This British-made diabetes app **raised \$11,600 on Kickstarter** in February 2013. It's a free app for diabetes management that focuses on quick data entry and aesthetically designed interactive charts, as well as reminders that can trigger either at a particular time or in particular location. The app helps people with both type 1 and type 2 diabetes monitor how much and how often they're eating, their blood glucose levels, and whether they've taken their medication.

Diabetes in Check by **Everyday Health** (free)



Diabetes in Check, from **the recently-IPO'd** Everyday Health is a type 2 diabetes management app that features a wide range of tools. It includes diabetes coaching designed by a certified diabetes educator, trackers for blood glucose and medication, reminders, and tools for healthy eating, including a food tracker with a barcode scanner and a recipe database. For a \$3.99 subscription, users can get daily personalized food recommendations.

Diabetes Companion by mySugr GmbH (free)



Diabetes Companion is one of two apps on the list by mySugr, an Austrian company that **raised money earlier this year**. The company adds a little bit of gamification to the traditional diabetes management app. “The Companion is a charming, sometimes outspoken diabetes manager that focuses on making your diabetes data useful in everyday life,” the app store description says. “Adding elements of fun, gamification, and immediate feedback (with attitude!) through a diabetes monster to help keep you motivated and involved in your therapy.” The app works with Sanofi-Aventis’ iPhone-connected IGBStar meter and is a registered class I medical device.

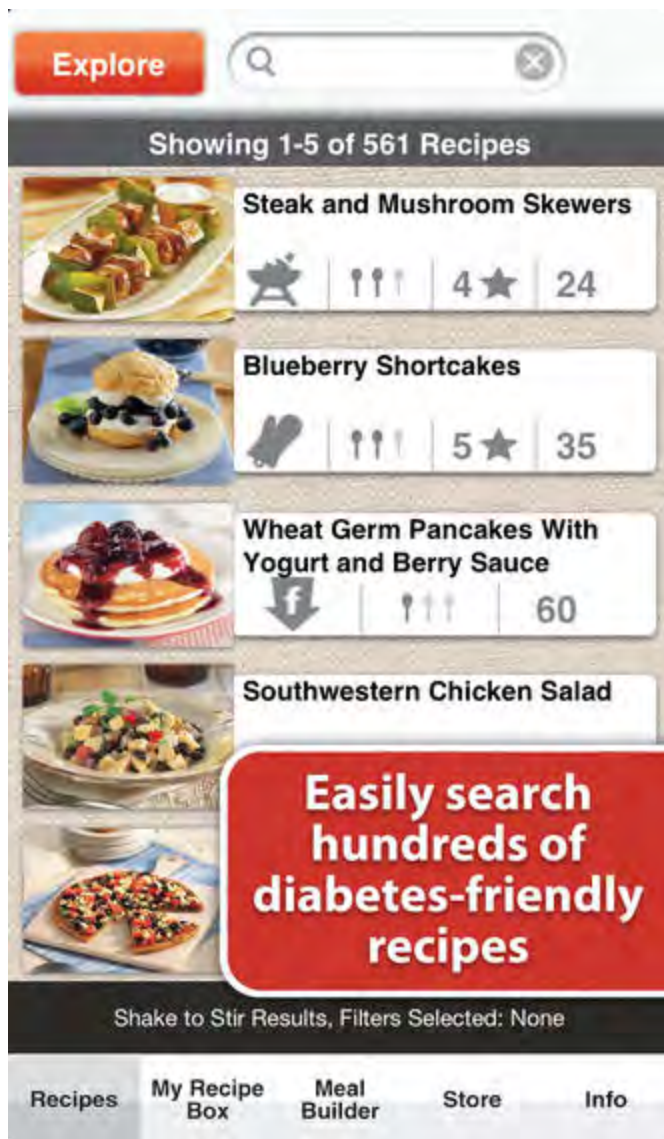
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Apple picks 13 apps for people with diabetes

By: [Jonah Comstock](#) | Jul 2, 2014 116 168 14

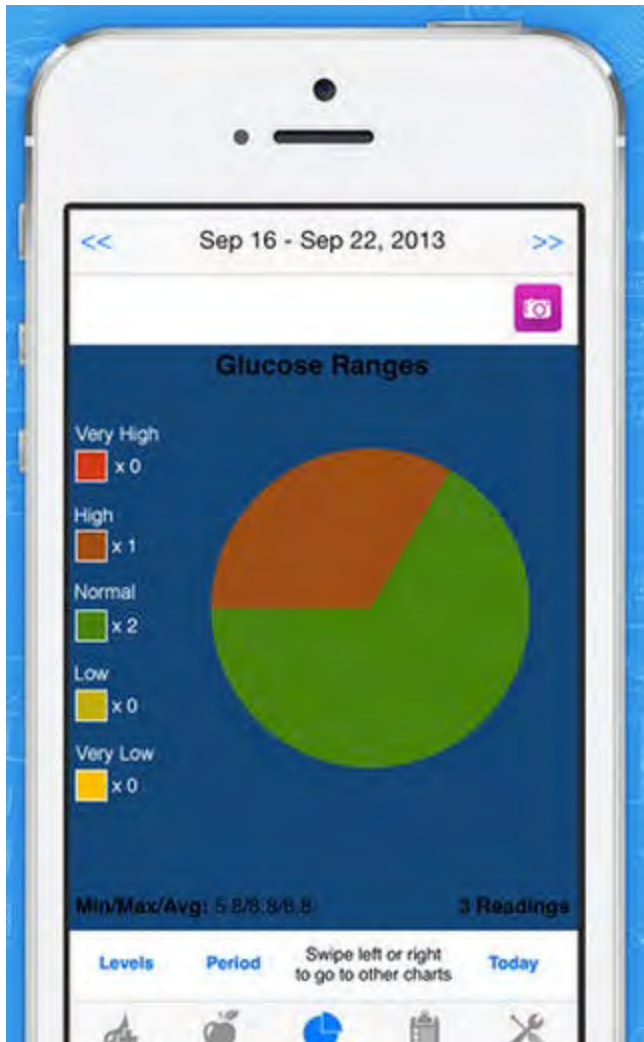
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iCookbook Diabetic by **Publications International** (free)



This is a special edition of the iCookbook app just for people with diabetes. The app delivers new, free diabetes-friendly recipes every month. It also has built-in kitchen tools like conversion charts and timers and voice activation, so the user can proceed through a recipe even with messy hands. The user can save and share recipes or even pull up a random one by shaking the phone.

Track3 by Coheso (\$5.99)



Track3 Diabetes Tracker & Logbook App tracks an impressive number of health factors for people with diabetes, including food, blood glucose, insulin, medications, exercise and weight. Food tracking can be done out of a built-in database, or users can program their own foods and create shortcuts for quick inputs. When the user works out, they can enter calories burned right from a cardio machine or estimate them for a workout. Tracking metrics can be displayed on multiple mobile devices or on the web.

mySugr Junior by mySugr GmbH (free)



MySugr's second entry on the list is their app for kids. Here's the app store description:

"The mySugr Junior App was developed to make managing diabetes easier for kids. It also enables parents to keep control over the therapy, even when they're not around and their child is at school or out with friends. The app resembles a game in which the children get points for every entry. The goal is to score a particular amount of points every day. This encourages kids to take care of their diabetes regularly.

"A little diabetes monster accompanies the kids through the app and gives feedback on their entries. The child can enter data such as blood glucose levels, food and insulin or take a picture of his meals, but they can also request help whenever the parents are not around. All entries can be sent as a push

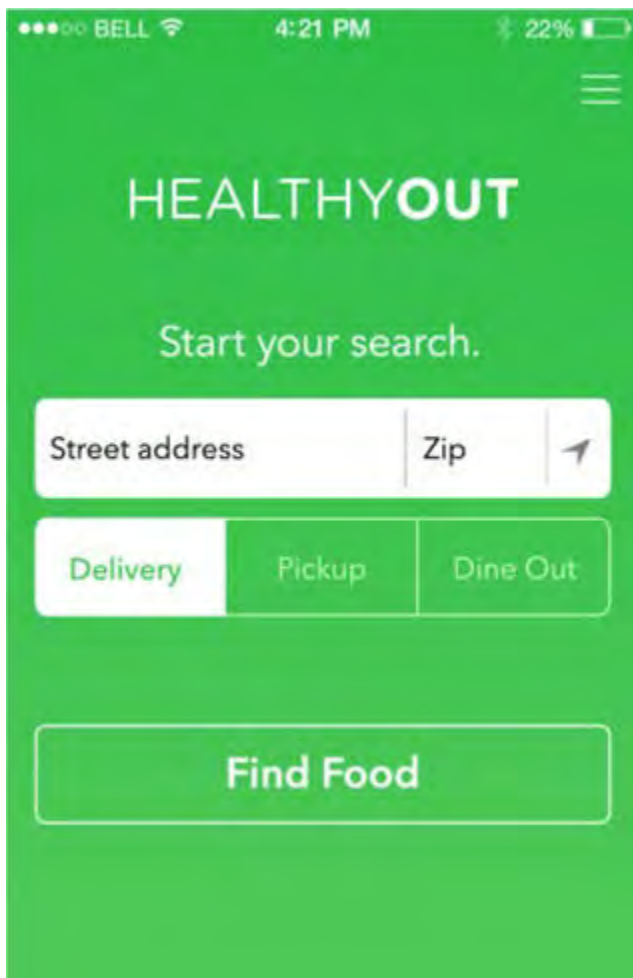
message or email from within the app to the parents' phone. This way, the child can ask for feedback on calculating carbs or the insulin dose."

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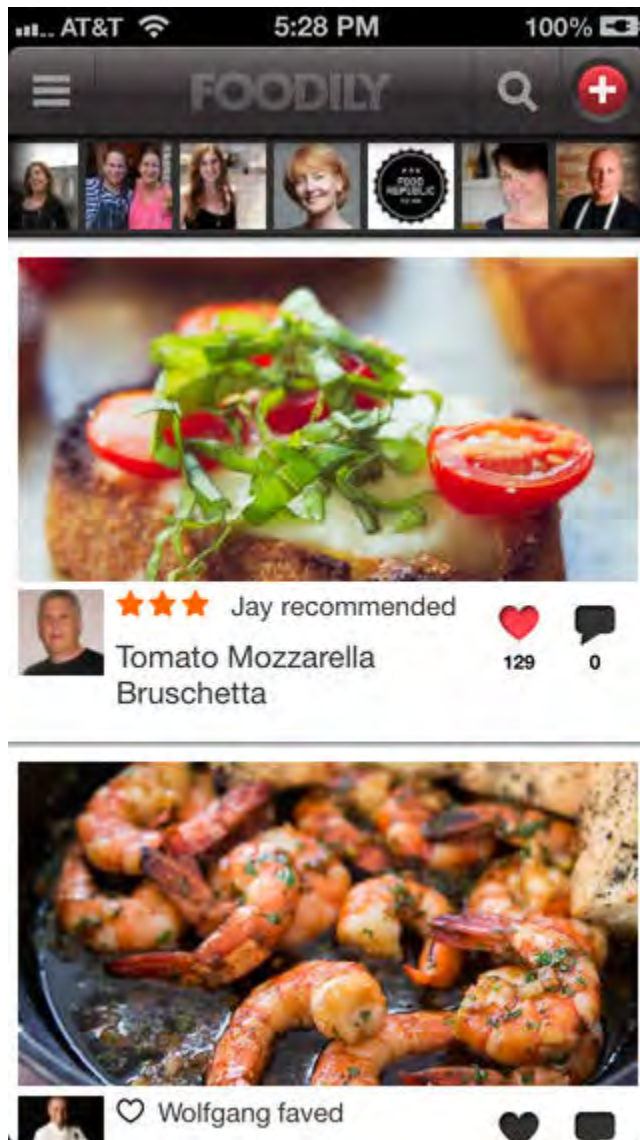
HealthyOut by **HealthyOut** (free)



A lot of diabetes apps are geared toward helping people with diabetes cook the best food for managing their condition. While not geared exclusively at people with diabetes, HealthyOut is about helping people eat at and order from restaurants while maintaining a diabetic-friendly diet. The user searches

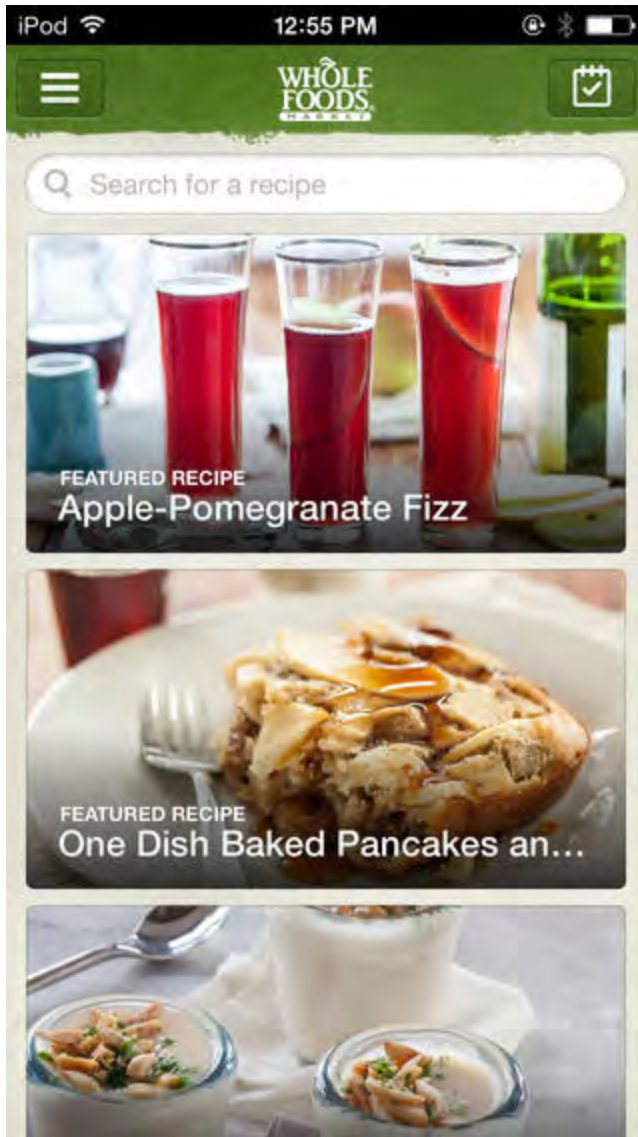
local restaurants with filters like “Low Carb,” “Low Fat,” and, their most popular filter, “Not a salad.” According to the company, HealthyOut dishes have half the calories and half the fat compared to the average restaurant meal.

Foodily by Foodily (free)



Foodily is another popular app Apple has included on the list that doesn't have a specific diabetes application. Rather, the app helps users find, keep track of, and share recipes. As a “food social network” that lets people with similar tastes share recipes, though, the app could be helpful in creating a community of people with specific dietary needs and calorie requirements.

Whole Foods Market Recipes by Whole Foods (free)



Similarly, Whole Foods Market Recipes is a general meal planning app that doesn't court specific disease populations. However, its 3,000 recipe database can be searched by several filters including "special diets".

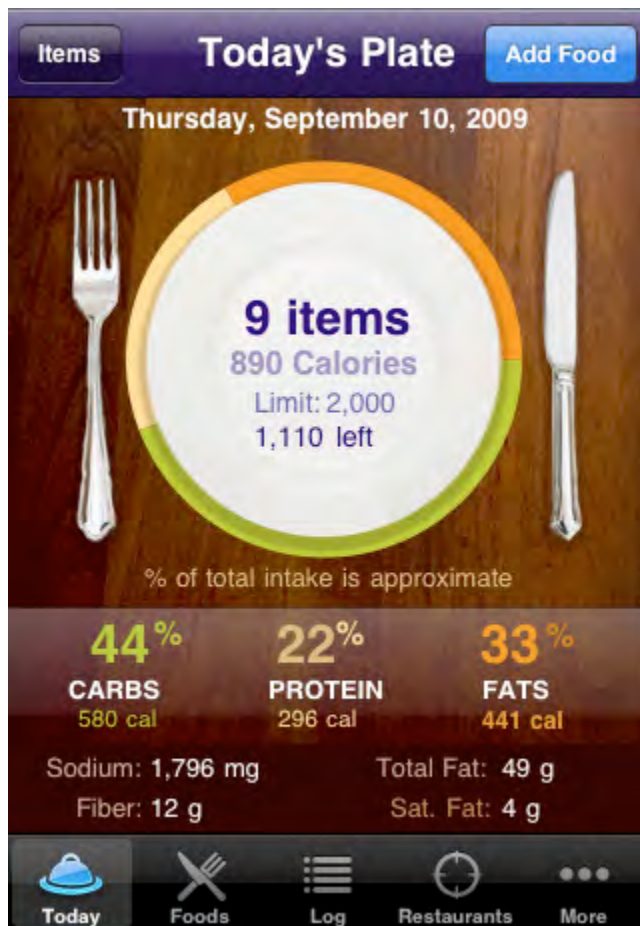
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GoMeals by Sanofi-Aventis (free)



GoMeals, by Sanofi-Aventis, is designed to help people living with diabetes make healthy food choices, but can be used by anyone who is interested in tracking the nutritional content of their meals. The app includes access to CalorieKing's nutritional database, which contains more than 25,000 common food items and more than 200 restaurant menus.

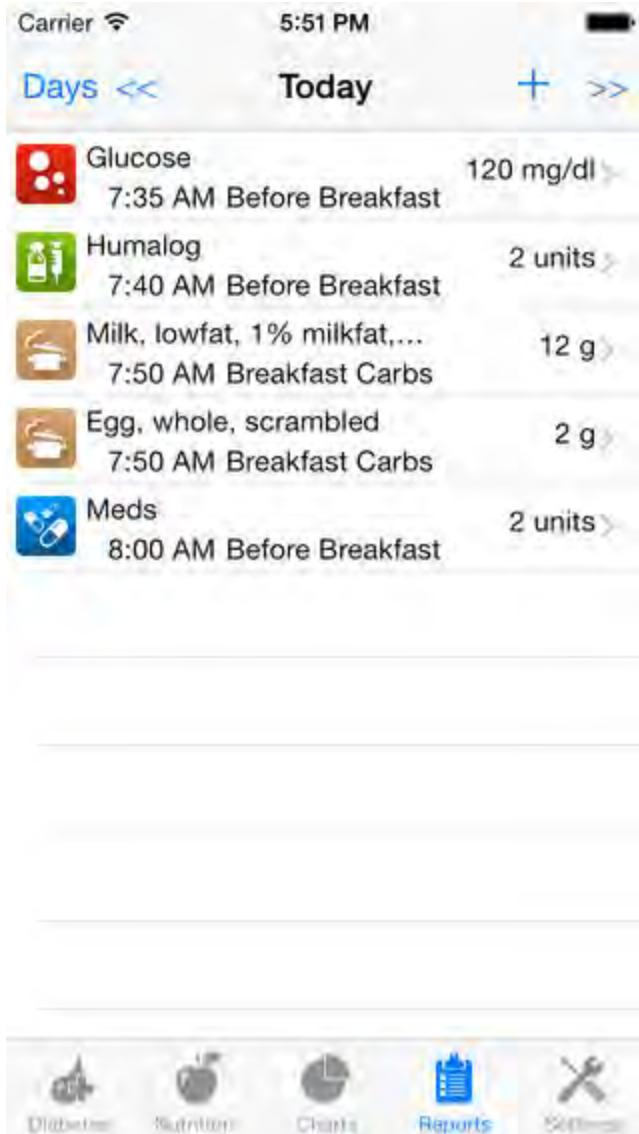
The GoMeals "Today's Plate" feature helps monitor each day's calorie intake, as well as the distribution of carbohydrates, fats and proteins. These three nutrient categories are also represented in a pie chart on the touch screen. A restaurant locator feature helps users locate restaurants based on their current location and the type of cuisine they prefer, as well.

CarbsControl by Coheso (\$2.99)



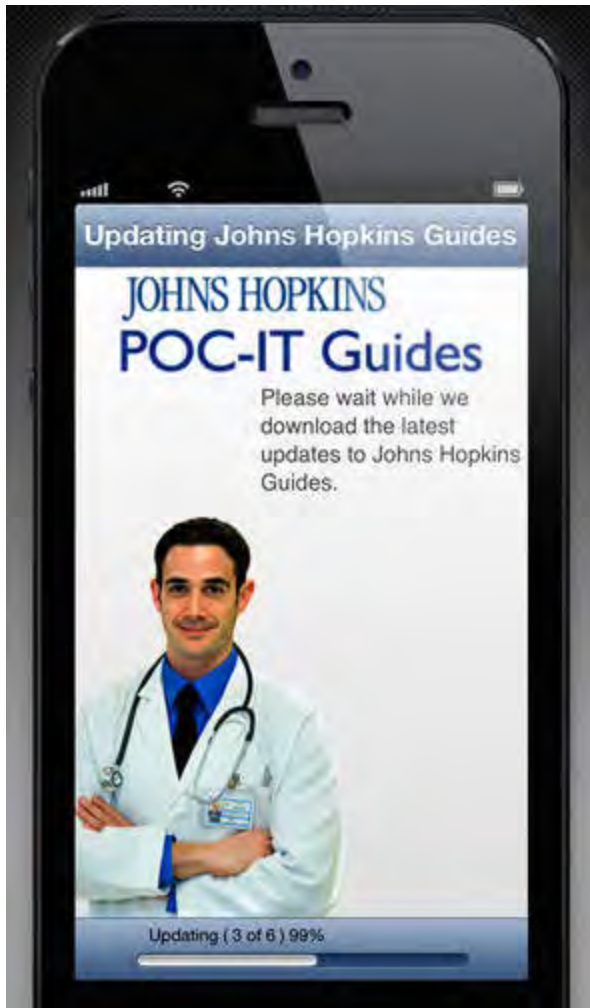
Coheso is the most prolific developer on Apple's list, with three entries. The second, CarbsControl, is a food logging and carb counting app built for anyone, not just people with diabetes. Its database contains carbohydrate and other nutrition details for over 100,000 foods, including 500 specific food brands and 300 popular fast food and casual dining restaurants.

Diabetes in Pregnancy by Coheso (\$5.99)



Coheso also has an app specifically for pregnant women with gestational diabetes. "This Diabetes in Pregnancy App helps you track all of the factors that keep your blood sugar balanced during and after your pregnancy," the app description reads. "The app makes it a snap to log food (nutrition), blood sugar levels, exercise, oral medications and insulin. You can email the logbook as a PDF file or a spreadsheet that you can share with your doctor."

Johns Hopkins ABX, HIV, Diabetes Guides with Updates (free, but with a \$29.99 in app purchase)



This is the only app in the list designed for doctors, one of a series of Johns Hopkins Guides on different diseases. The diabetes guide, which is a \$29.99 in-app purchase “contains the essential diagnosis, classification, and management information needed for diabetic care” and enables physicians to “answer questions with recommendations for complications, drugs, and other treatments,” according to the app store description.

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Wearable Health Tech

A look at some recent technological releases, and a few on the horizon

By Dr. David Greuner MD, FACS, FICS

Current:

Jawbone Up2 – This device is a discreet, wearable band that is capable of tracking your activity for the day, and even your sleep cycles and regimen. It syncs with an app on your smartphone, and can even wake you up with a smart alarm during the phase of sleep that is the lightest to ensure that you gain maximum rest from your slumber.

FitBit Flex – Similar to the Jawbone device, the FitBit Flex aims to use regular activities throughout your day as an incremental way to improved fitness without going to the gym. It uses 20% increments to alert you on regular increments to your goal. If you are more interested in using your daily activities to reach your exercise goals, this may be the device for you.

Skulpt Aim – This is a niche wearable device. Different than the rest, it tracks your body fat and muscle composition, and even stratifies your muscle quality based on separate muscle groups. For those aiming to strengthen specific muscle groups or gain muscle while losing fat, this may be the device for you.

Vigo – Vigo is a device that measures alertness and concentration ability based on your blinking patterns. It can use the movement of your eyelids, which are an accurate depiction of concentration, to tell you when you are very alert or need to take a break. It's meant to be used to keep you focused on the task at hand, and tell you when you are not ready for the job.

On the horizon:

Accurate glucose monitoring is an extremely difficult task without an actual blood sample, which is invasive. Newer technologies using ultrasound, electricity, and spectral analysis, however, are emerging and on the horizon. While these prototypes are still in development, they are exciting, and will be considered revolutionary technology should they be met with success.

Google smart contact lenses – This new technology is almost ready for release and will apparently use tear fluid to analyze a variety of physiologic measures, including blood glucose, to minimize the need for finger sticks in this population. If this proves to be a reliable measure, there should be a lot of happier patients out there!

Pancreum Genesis – A totally artificial pancreas, this device has a glucose sensor and secretes glucagon and insulin as needed to maintain blood sugar appropriately. It is still not available, but if it does indeed make it to market, it will truly be a game changer for the millions of people with diabetes out there.

Last Modified Date: July 21, 2015

Helo by World will be coming with a wearable that follows heart rate, pollution rating, glucose trends, and about 10 other readings per this device.

Microbiome modulator improved glucose tolerance in patients with diabetes

- June 24, 2014

CHICAGO — An experimental microbiome modulator, NM504, appears to improve glucose tolerance when altering microbial populations in the gastrointestinal tract, according to research presented at the joint meeting of the International Congress of Endocrinology and the Endocrine Society.

In a pilot study of the drug, **Mark Louis Heiman, PhD**, chief scientific officer for MicroBiome Therapeutics, and colleagues found NM504 — the first in a class of gastrointestinal (GI) microbiome modulators — to be safe and effective in patients with pre- and type 2 diabetes.

“We look at food, particularly a meal, as a dose to the [ecosystem](#) of the intestinal tract,” Heiman said during his presentation. “Some of us dose three times a day. People with obesity and type 2 diabetes may overdose three times a day.”

Because these ‘overdoses’ saturate the body’s digestive mechanisms, Heiman said more partially digested food is getting into the GI microbiome and causing imbalances. NM504, which is comprised of bioactive ingredients isolated and purified from foods, is designed to shift GI microorganisms. The drug ingredients include inulin (from the agave plant), beta glucan (from oat) and polyphenolic antioxidant compounds (from blueberries).

The scientists recruited 28 participants with prediabetes or diabetes for a 4-week double-blind, randomized, placebo-controlled trial. They were evenly divided and assigned to NM504 treatment two times daily, prior to either breakfast or lunch and prior to dinner. Oral glucose tolerance tests (OGTT) were given at baseline and the end of the study; a meal tolerance test was also administered.

Compared with placebo, the therapeutic improved serum glucose levels at both 120 and 180 minutes during OGTT ($P < .05$) and was well-tolerated, Heiman said; insulin levels were similar between groups. NM504 also increased insulin sensitivity during the tests.

Improved glucose tolerance correlated with decreased circulating levels of alkaline phosphatase ($P = .06$), high sensitivity C-reactive protein ($P = .012$) and total cholesterol ($P = .01$).

Treatment with NM504 also decreased patients’ desire to eat ($P = .03$), increased stool immunoglobulin A levels ($P = .03$) and decreased stool pH ($P = .03$). Patients reported mild increase in flatulence.

Researchers attributed the drug’s effects to absorption of glucose and bile salts, but indicated that other mechanisms of action could include maintaining the mucosal barrier, exposing the lumen to more antioxidants or higher viscosity levels of the lumen. They noted changes in microbiota abundance and production of short chain fatty acid, but there were no significant differences.

Trends toward increased GLP-I levels and decreased octanoyl ghrelin levels were observed in response to a meal tolerance test at week 3.

“We believe that over the next 10 years, there will be many more innovative signaling molecules produced by these microorganisms that will help regulate the immune system and the brain,” Heiman said. “That will lead to new treatments and new therapies.” — *by Allegra Tiver*

For More Information: Heiman ML. Abstract OR40-5. Presented at: The joint meeting of the International Congress of Endocrinology and the Endocrine Society; June 21-24, 2014; Chicago.

Disclosures: Heiman is the Chief Scientific Officer for MicroBiome Therapeutics.

Program identifies risky diabetic drivers and helps them improve

By [Will Boggs MD](#)

(Reuters Health) - A short questionnaire can identify drivers with type 1 diabetes who are at high risk of future driving mishaps, and an online intervention can help them avoid these mishaps, according to a U.S. study.

“Like pilots who have to go through a pre-flight checklist to ensure all systems are a go, drivers with diabetes should go through a check list, asking themselves whether they have had more physical activity, taken more insulin, eaten fewer carbohydrates than usual, feel any unusual symptoms and judge whether they are low or likely to go low during the drive,” said lead author Dr. Daniel Cox from the University of Virginia Health System and Virginia Driving Safety Laboratory in Charlottesville.

“If the answer is yes, then they should take appropriate steps to avoid hypoglycemia while driving,” Cox said by email.

Drivers with type 1 diabetes have a greater risk of collisions than their spouses without diabetes, and those mishaps correspond to the use of insulin pumps, a history of collisions, severe low blood sugar (hypoglycemia) and previous hypoglycemia-related driving mishaps, the study team writes in *Diabetes Care*.

The researchers developed an 11-item questionnaire to screen drivers with type 1 diabetes for a high risk of driving mishaps and developed an online intervention intended to help high-risk individuals avoid future mishaps.

Their Risk Assessment of Diabetic Drivers (RADD) scale included questions about past experiences while driving, like “have you had an automobile accident or received a moving vehicle violation in the last 2 years?” and diabetes-specific questions like, “have you had low blood glucose in the past 6 months?” and “was it a hassle trying to hide dizziness or other symptoms of low blood glucose?”

Based on answers to 11 questions, around 35 percent of individuals with type 1 diabetes could be classified as high-risk drivers whose mishap rate was nearly three times higher than that of people in the low-risk group.

High-risk drivers who went on to participate in the online intervention at DiabetesDriving.com had a driving mishap rate of about 2.5 per year in the following 12 months, compared with about 4.25 mishaps per year among high-risk drivers who did not participate in the intervention. Still, the mishap rate of high-risk drivers who did the intervention remained higher than that of low-risk drivers.

“Driving is a privilege, not a right,” Cox said. “Whether we have type 1 diabetes, sleep apnea, narcolepsy, slowed reaction times due to aging, or some other chronic or acute condition (e.g., excessive sleepiness or intoxication), we all have a responsibility to ourselves, our families, and others on the road to ensure we are a safe driver.”

People with diabetes should realize they should never drive when their blood glucose is below 70, because it is too easy to slip from mild hypoglycemia to moderate hypoglycemia that impairs judgment, information processing speed, and general reaction time, Cox added. “As soon as hypoglycemia is detected or suspected, the driver should immediately safely pull off the road, treat it, and not resume driving until the hypoglycemia resolves.”

“Diabetic patients have a tendency not to disclose their driving mishaps or near miss events due to fear of losing their driving licenses,” said Dr. Thinzar Min from Swansea University in the UK, who was not involved in the study.

In the UK, drivers are allowed only one severe hypoglycemic episode in 12 months to retain Group 1 license (cars and motorcycles) and no severe hypoglycemic episodes for Group 2 licenses (trucks and busses), Min noted.

“I think the RADD scale would be more accurate if the patients can use it to assess themselves if they are high-risk or not,” she said. “Online interventions should be aimed at all diabetic patients who are taking insulin.”

Dr. Eitaro Nakashima from Chubu Rosai Hospital in Nagoya, Japan, wrote recently about the pitfalls of tightening driving regulations for diabetic patients in Japan and Europe. “In my opinion, each patient should understand the degree of risk of driving mishaps and prepare sugar in their car. For general public, education and individual customized treatment are important for good outcome instead of tightening of driving regulations,” he told Reuters Health by email.

SOURCE: bit.ly/2oJgxvQ Diabetes Care, online April 12, 2017.