Treatment for My Diabetes in the Market?

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To improve the health of people living with diabetes

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EmPower, published by the American College of Endocrinology (ACE), the educational and scientific arm of the American Association of Clinical Endocrinologists (AACE), is dedicated to promoting the art and science of clinical endocrinology for the improvement of patient care and public health. Designed as an aid to patients, EmPower includes current information and opinions on subjects related to endocrine health. The information in this publication does not dictate an exclusive course of treatment or procedure to be followed and should not be construed as excluding other acceptable methods of practice. Variations taking into account the needs of the individual patient, resources, and limitations unique to the institution or type of practice may be appropriate.

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ACE is a scientific and charitable medical organization dedicated to promoting the art and science of clinical endocrinology for the improvement of patient care and public health.
Dear Reader,

Spring is well on its way, and with the freshness of new growth that we all welcome, we also begin to anticipate the upcoming closing of the academic year for many students. Graduations are times to celebrate, and in this issue we are highlighting articles from senior fellows (doctors) in training across the U.S. in programs in the medical specialty of endocrinology—the specialty that has advanced training in metabolism, nutrition and hormonal disorders, such as those of diabetes or thyroid.

You have an opportunity to read about the effects of some commonly found, but also artificial, environmental agents on sex hormones, as well as about the not-so-artificial food additive of sodium in salt. Shopping in the grocery for treatments for your diabetes might catch your eye, as might learning more about what it means to not be able to eat wheat-containing products.

Perhaps you have been curious about what exercise really does for bone health, and certainly are curious about what apps can be used to help yourself stay on track with the diet and exercise recommendations you have discussed with your doctor.

We have also included some recent research that you can use to EmPower yourself. And how a young man has truly EmPowered himself to better health. Finally, we highlight the challenges that a doctor in training has learned to manage when helping patients with limited resources, and yet many life issues, attain better health. Her training focused on how to support patients as her patients learned how to help themselves.

Please join us in celebrating the graduations of the trainees in this issue. Perhaps you will be seeing one of them shortly in your town!

Sincerely,

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Salt (also known as sodium) is everywhere! Not limited to the salt shaker, it is already present or, more often, added into many food products we buy or prepare. So if salt is everywhere, why the concerns about salt? Let’s review what is known about salt and its effects on your health.

**WHY WORRY ABOUT SALT?**

Many people think salt is essential to the flavor of food. We crave salty foods because they taste good. Unfortunately, many studies have shown that salt can have toxic effects on the body when taken in levels that are higher than recommended. The biggest impact: salt raises blood pressure. While you may not feel bad when your blood pressure is elevated, high blood pressure increases your risk for heart attacks, strokes and kidney problems over time. This is because it makes the arteries (blood vessels) thick, hard and prone to damage, so the heart must work harder. While there are many medicines for high blood pressure, reducing salt in the diet, in addition to weight loss and reduced alcohol intake, is a side-effect-free way to lower blood pressure. Moreover, blood pressure is typically treated when it is above 140/90 (often even lower for people with additional problems, like diabetes), but there can be increased health risks even when blood pressure is in the “pre-hypertensive” range (120-139/80-89), which is another good reason to watch salt intake.

**WHAT ARE SOURCES OF SALT IN MY DIET?**

We get most of the salt in our diet not from adding it at the dinner table, but from foods that already contain...
Processed foods such as soups, canned goods, preserved meats (lunch meats, sausage, hot dogs, some poultry) and prepared mixes are the biggest sources of sodium in the diet. Additionally, snack foods can be very high in salt—chips, olives, even sauces such as soy that are added to foods. However, breads and grains, cheese and beans also contain more sodium than anticipated. Finally, foods purchased in restaurants, and particularly fast food establishments, are also very high in sodium. For example, a Big Mac at McDonald’s has 1000 milligrams (mg) of sodium, and even a six-inch turkey breast sub on wheat from Subway contains 810 mg of sodium.

SO HOW MUCH SALT IS OKAY?

It is impossible to completely eliminate salt from your diet, nor would that be necessary! The American Heart Association (AHA) now recommends no more than 1500 mg of sodium per day for everyone. The U.S. Department of Agriculture (USDA) dietary guidelines recommend no more than 1500 mg of sodium per day for people at “higher risk” (defined as African Americans, adults>51, or people with high blood pressure, diabetes, kidney or heart problems), with no more than 2300 mg of sodium per day for everyone else. Most of us take in double this amount (3000-4000 mg in most estimates) in our typical daily diet. To put this into further perspective: one teaspoon of table salt or sea salt = 2300 mg of sodium chloride. The good news: within a few weeks on a low-salt diet, people begin to prefer the taste of lower-salt foods. The bad news: given the high quantity of sodium in everyday foods, it may not be easy to keep within the guidelines of safe salt intake.

HOW CAN I CUT THE SALT IN MY DIET?

Some simple rules:

- Eat at home when you can
- Throw away the salt shaker
- Don’t add salt before tasting

When you cook your own meals, you have much greater control over what goes into your food. Surprisingly, some single restaurant dishes contain more than the recommended daily amount of sodium. To support healthier choices, the AHA now certifies that foods in grocery stores meet nutrition standards with a “heart-healthy check mark.” Right now, this means certified main dish/meal products contain 600 mg or less sodium per serving, most other foods (meats, fish, bread, grains and dairy) contain 480 mg or less sodium per serving, and nuts contain 140 mg or less sodium per serving. These requirements will be even lower beginning in 2014. Some canned products are available in a “no added salt” version, and sodium can also be limited by rinsing canned vegetables and beans prior to eating. Further, the salt content of any packaged food is available as “sodium” in “mg per serving” on the food label. Look for this information on any packaged food item.

Recognizing that eating at home isn’t always realistic, there are ways to eat healthy at restaurants, too. For example, try to avoid foods that are fried, pickled, smoked, in broth, or in soy, cocktail or teriyaki sauce. You can also ask that foods be prepared without salt or MSG (monosodium glutamate is another common seasoning that is very high in sodium), and ask for salad dressing “on the side.” Many restaurants and fast-food chains now provide nutrition information on their menus, websites or by request. If this information is available, you can look specifically for the sodium content in a particular dish. The AHA is also beginning to work with restaurants to certify meals.

(Continued on page 18)
TREATMENT FOR MY DIABETES IN THE MARKET?

BY MARTINE DAVID, MD

If you have diabetes you’ve probably been told that you need to watch what you eat. But are there foods or supplements that can actually treat your diabetes? Available reviews and reports suggest there are over 400 foods, minerals and nutrients that are supposed to help, but is that suggestion an “old wives’ tales” or the real deal? Here we look at cinnamon, fenugreek, bitter melon (gourds), alpha lipoic [lī-pō-ik] acid and gymnema to examine the question, “do they really work?”

WHAT ARE SUPPLEMENTS?

Supplements are available in many forms, such as minerals, vitamins and herbs. Supplements do not need to be approved by the Food and Drug Administration (FDA), in contrast to prescription drugs, which do need FDA approval. But as a result of the Dietary Supplement Health and Education Act of 1994 (DSHEA), concerns about supplement safety were addressed. DSHEA rules and regulations define what is a dietary supplement, place the responsibility for ensuring their safety on manufacturers, identify how literature may be used in connection with sales, specify types of statements of nutritional support that may be made on labels, specify certain label requirements, and provide for the establishment of regulations for good manufacturing practices. However, the specific contents of a supplement are not regulated, so there can be a wide variation in potency of active ingredients, and there can be contaminants. Because supplements are an essentially unregulated industry, careful consideration should be given before undertaking treatment, especially for diabetes, which requires a commitment to long-term therapy.
Just because something is natural does not necessarily mean that it is automatically good for you, nor that it is safe to be consumed at high doses. There are no long-term studies with any of the mentioned supplements. They frequently do have an effect on the body’s metabolism, but because they have not been thoroughly studied, precise effects and knowledge of interactions with other medications is often very limited.

CINNAMON

Cinnamon is a spice that is derived from the inner bark of the cinnamomum plants and is rich in polyphenolics [pä-lē-ˈfē-nō-lēks], natural antioxidants found in plants that may have health benefits for humans. Cinnamon and its effect on diabetes is the most widely studied of the supplements that can affect diabetes blood sugar (glucose) control. Cinnamon’s effects in patients with type 1 and 2 diabetes, as well as on the blood sugar in people without diabetes, has been studied. It is thought to work by reducing insulin resistance: some mechanisms suggested include improved insulin action, increased starch production and better glucose uptake into cells, and it may work by activating other chemical processes in the body that help cells use glucose.

People with type 1 diabetes – the diabetes where antibodies form against the insulin-producing cells of the body – do not show any improvements in blood sugar control, while there is blood sugar-lowering effect in both those with type 2 diabetes (the diabetes that is most common) and healthy volunteers. The dosages studied have been between 0.5g to 6g daily -- hugely different! But the effect on blood sugar is disappointingly little.

Cinnamon can cause thinning of the blood, so if you are taking aspirin, blood-thinning drug warfarin or other blood thinners, watch out—these can all add to more thinning effects than could be safe. There have not been any long-term studies regarding the impact of cinnamon in those with diabetes: the longest was 16 weeks. There is also no safety data available for taking cinnamon beyond a 16-week period.

FENUGREEK

Fenugreek seeds are used extensively in Indian and Asian cooking. You can easily find fenugreek on your grocery store spice shelf. Some of the components of fenugreek seeds are thought to work by increasing natural insulin production, slowing the absorption of carbohydrates from the stomach. It has been studied in both those with type 1 and 2 diabetes, with very weak blood sugar-lowering effects seen in both types of diabetes. Dosages used are 12.5 to 100 mg daily.

The most common side effects from fenugreek seeds are diarrhea and flatulence. More worryingly, fenugreek may cause uterine contractions and, thus, should not be used by pregnant women. Allergic reactions have also been described. Fenugreek potentially interacts with warfarin, so use with caution and only after discussing it with your doctor.

(Continued on page 8)

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Bitter melon or gourd is usually eaten as a vegetable or as an added bitter flavoring in Chinese and Indian cuisine. Besides the gourd form, it can come in a liquid form, as a dried powder and also as an extract. For the extract, dosages of between 100 and 200 mg three times a day have been used. The fruit and juice, but not the seeds, have been used as a treatment for high blood sugar and cholesterol in traditional Chinese medicine. But does it actually work? Most of the research is limited to animal studies. How that relates to humans is unknown. The research that exists in humans is inconclusive at best.

Potential side effects to watch out for with bitter melon include low blood sugar, headache, abnormal liver function tests and diarrhea.

## ALPHA LIPOIC ACID (ALA)

ALA is a potent antioxidant and an important enzyme in many metabolic pathways in the human body, including the combining of sugar with oxygen to release energy. It is made in the liver, but also found in many foods. Spinach, broccoli and liver are all rich in ALAs. It has been studied in those with type 2 diabetes with small, if any, effect on blood sugars. Dosages used are between 600 and 1800 mg a day. It is thought to work as a free radical scavenger (something which removes toxic chemicals that result from normal metabolism) and has been used to treat diabetic neuropathy.

Side effects are usually mild and may include skin rash and stomach upset.

## GYMNEMA

Gymnema [ˈjɪm,nɛ-mə] is an herb that grows in the forests of India. Its name in Hindi means “sugar destroyer” because of the reduced taste of sweet foods after chewing on the leaves of these plants. While the exact mechanism of action is not known, it is thought to work possibly by acting on the taste buds in the mouth or by reducing glucose absorption from the gut while increasing insulin secretion from the pancreas. In small studies of people with both type 1 and type 2 diabetes, reduction in blood sugar and HgbA1C (a form of red blood cell protein that is measured primarily to identify the average blood glucose concentration over time) was seen. But the studies were too small to draw an absolute conclusion from as to whether this herb significantly can treat abnormal blood sugar. Dosage used is usually 400 mg daily. Besides lowering blood sugar, no other side effects or drug interaction is known.

## SO WHAT IS THE TAKE-HOME MESSAGE?

Before starting any herbal supplements, minerals or compounds, it is very important that you discuss with your doctor the effects and potential interactions of any supplement you are considering taking. The potential to cause hypoglycemia, as well as the very real risk of the substance not working and the risk of worsening your diabetes, should be discussed so you are aware of what to look for. Also, some of these traditional remedies can and do interact with prescribed medications. Pregnant women should not use these compounds as effects on the developing fetus are not known, while the effects of poorly controlled diabetes on the fetus and mother can be devastating.

Whether the supplements that have been mentioned could actually work to treat diabetes remains to be seen. But some of the best choices that will affect your diabetes can still be made: choosing healthy options, opting for “good carbs” and watching portion sizes is always good advice and should be part of any diabetic treatment regimen. And that’s the best thing you can do for your diabetes the next time you are in the grocery store.
You are a partner, a friend and a fighter.
And you have a chance to control your blood sugar for yourself and those who depend on you most. Reducing your blood sugar can help reduce the risk of diabetes complications such as blindness, kidney disease, nerve damage and other serious health problems. If pills, diet and exercise aren’t enough, insulin is the most effective way to reduce your blood sugar. And today insulin comes in easy-to-use pens.

**Important Safety Information About Insulin:**
The most common side effect of insulin is low blood sugar. Some people may experience symptoms such as shaking, sweating, fast heartbeat, and blurred vision, while some experience no symptoms at all. That’s why it’s important to check your blood sugar often.

Talk to your doctor about whether insulin is right for you.
Learn more at UnderstandControl.com or call 1.866.766.6415.
Seldom does a life-changing moment happen so early in life. For Luke Castellano, the tide turned at the very tender age of 12 months. However, in his estimation today, a diagnosis of type 1 diabetes was (and is) simply part and parcel of his life’s fabric.

His own words speak volumes about his perspective. In a 2012 class autobiography assignment, he wrote:

“I live every day like it’s my last, because I’ve lived and survived some life-threatening challenges. Diabetes has made me a very strong person, and it also helps me to stay very healthy. I am always trying to stay on a good diet to maintain good blood sugars. I prick my fingers five to six times daily to calculate my blood sugar and inject myself with insulin to cover my food intake. It is hard, but it is a challenge that I overcome every day.”

According to mom Rebecca, Luke’s unexpected diagnosis came after several weeks of particularly messy diapers, vomiting and lots of pleading for more juice—signs that caused the trained nutritionist and new mom (of fraternal twins, no less) concern that was subdued temporarily by a conversation with the family pediatrician. “He diagnosed Luke with a bad stomach virus and directed me to give him ginger ale and juice,” she recalls. Matters came to a head only a few days later.

Seeing no improvement in her first-born, Rebecca rushed Luke to the area emergency room, where doctors discovered the toddler had lost 25 percent of his body weight in two days and was down to 15 pounds. “The doctor expressed concern about being able to draw blood because my son was so dehydrated, and it took
almost an hour because they couldn’t find a vein,” she recalls. “Afterward, the doctor came in and she said, ‘Mrs. Castellano, your son’s blood sugar is 1,200. He needs to be admitted immediately. I can’t guarantee the outcome of this, because your son is very sick.’”

“They told us that if we hadn’t gotten to the hospital that day, he most likely would have slipped into a coma,” she says. “Thank goodness they were able to get it under control.”

Luke stayed in the hospital eight days, but “we experienced a miracle,” says Rebecca and the family returned home to the new normal. “Because I had the nutrition background, I got the carbs down pat and learned quickly how to administer his shots,” she continues. “At times it’s been a rollercoaster ride with 10 finger sticks a day and highs and lows, particularly when he was younger and couldn’t vocalize how he was feeling, but throughout it all, in 16 years of living, Luke has never complained.”

A natural-born athlete, Luke recovered quickly and began to thrive with treatment, taking up football, basketball, baseball and lacrosse – at the early age of 5.

As he matured, options were weighed to enhance Luke’s active lifestyle and the family made the decision to place him on the CoZMonitor®, an “all-in-one” blood glucose monitor and insulin pump. “The monitor worked beautifully for his circumstances for a time, but the only problem is that his body fat was so low, the only place they could put it was his stomach, so we would put it in his thigh or back, where it was too uncomfortable,” Rebecca says.

“He no longer was following the growing curve, and the doctors suggested it might be from his diabetes and problems with malabsorption, plus it was probably genetics as well since both my husband and I are on the short side,” she added. (Rebecca is 5’ 2” and her husband 5’ 10”).

After undergoing growth hormone testing for several years with normal results, Luke was tested for celiac disease (see related story on page 14), a condition in which hypersensitivity of the small intestine to gluten leads to chronic failure to digest food. Although celiac sufferers experience abdominal pain, diarrhea and weight loss, Luke had none of those typical symptoms.

To Rebecca’s surprise the tests came back positive. “The doctor said, ‘Your son has celiac and this is why he was having all these problems.’”

(Continued on page 12)
“Short-stature celiac is what he was diagnosed with – it’s very unusual, the damage was all internal and it was asymptomatic,” she says.

Now dealing with a son with two chronic, autoimmune conditions and a daughter with celiac – Luke’s younger sister Rachel was diagnosed with the condition shortly after Luke – Rebecca sprang into action, hitting the books and educating herself about celiac, creating gluten-free recipes for tasty foods that also would meet the nutritional needs of Luke and Rachel. That effort evolved into a cottage industry with the 2011 launch of Rachel Lu Foods, Rebecca’s gluten-free commercial manufacturing company.

Meanwhile, Luke rebounded again, growing six inches and gaining 20 pounds within one year of his celiac diagnosis. “With Luke, again there was no question of why,” says Rachel. “He just did what he does best and that was to commit to his health, he ate strictly gluten free and within the year his blood sugar improved dramatically.”

“Sure it’s been a challenge, but I just work harder and it takes care of itself,” Luke says.

Now a junior at St. Anthony’s High School on Long Island, he seems like a typical teenager: he is obsessed with video games (“Call of Duty” and “Madden” are favorites), and loves sweets, particularly chocolate chip cookies...in moderation, with artificial sweetener and gluten-free, of course. In other ways Luke’s somewhat atypical.

He’s on the school’s varsity lacrosse travel team and dreams of becoming a Division 1 college player. He is a member of the National Honor Society and carries a 95 grade point average, with the hopes of perhaps one day becoming a doctor or dentist.

And he continues to forge ahead with a positive attitude and can-do spirit.

“I am not the biggest kid on the field, but I have the biggest heart on the field, and I won’t let anyone tell me I can’t do this or I can’t do that,” he says.

“I truly think there is an angel watching over me,” he continues. “Because of my diabetes, I have already in such a short time learned a lot. You should work hard at whatever you’re doing whether it is school work or sports. You have an amazing opportunity to be on this earth; as long as you do something helpful in this world, you are needed. You only live once, so make the best of what you got. I’m young and I am going to try the best I can to make a positive impact on the world. I have diabetes, but diabetes doesn’t have me!”

“I live every day like it’s my last, because I’ve lived and survived some life-threatening challenges. Diabetes has made me a very strong person, and it also helps me to stay very healthy.”
That’s why we created Cornerstones4Care™. This FREE program gives you personalized support to help you follow the care plan your doctor prescribed. Cornerstones4Care™ is packed with tools, tips, and information about the four key parts of a diabetes care plan:

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- **Physical Activity**: Find creative ways to get the activity you need
- **Taking Medicine**: Learn about different treatment options to discuss with your doctor
- **Diabetes Self-Management**: Stay on track with checking and recording your blood sugar

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Celiac Disease: Is It Something I Ate?

BY JEAN JACQUES NYA-NGATCHOU, MD

Hippocrates, the father of modern medicine, said that all disease begins in the gut. For most people, eating a bowl of pasta is part of a normal life, but for someone with celiac (SEE-lee-ak) disease this can have some serious consequences. Although the prevalence of celiac disease is increasing, awareness about the disease continues to remain relatively low, and people with celiac disease suffer silently with symptoms such as abdominal cramps and unexplained diarrhea. Those symptoms, however, are only the tip of the iceberg—below the iceberg there are symptoms that can be “silent” or not obvious and symptoms that can be present, but not recognized as tied to celiac disease.

Celiac disease is generally considered an autoimmune disorder—a disorder of developing antibodies to one’s own tissues. The name celiac derives from the Greek word for “hollow,” as in bowels. Celiac disease is an inflammatory condition of the small intestine set off by eating food that contains a dietary protein called gluten, a protein present in many grains that we commonly eat. The ones we are most familiar with are wheat, barley and rye.

Celiac disease mainly affects the first part of the small intestine, and the disease process is activated when the inside of the intestine comes into contact with eaten gluten. The antibodies formed by gluten attack the small intestine, and this attack process then affects absorption of foods -- those containing gluten, as well as food mixed with gluten foods -- causing rapid passage of food through the gut, frequent bowel movements or diarrhea. In the normal intestinal lining, tiny finger-like projections called villi [vil’i] that enable the small intestine to absorb nutrients from food are present in the intestine and help us absorb nutrients from the food we eat. In celiac disease, they are gone!

For many years, celiac disease was considered a rare childhood disease. With more frequent use of blood tests that include antibody screening, which is reviewed below, and increasing use of biopsy of the inside of the intestine (to look for the presence or absence of villi), there is a clear trend showing celiac disease is on the rise. Celiac can be found in people of any age and any ethnic group and is estimated to be found now between 0.6 and one percent of the world’s population. In the U.S., it is estimated that up to three million people have celiac disease, but only around 40,000 have been diagnosed.

Celiac disease has no cure, but given the strong evidence linking gluten to the disease, you can control celiac by eliminating gluten proteins from your diet.

In typical celiac disease, the intestinal symptoms seem to follow the amount of injury and inflammation to the small intestine. The typical celiac symptoms can include either a chronic or recurrent diarrhea, abdominal distention, flatulence, weight loss, cramps and vomiting. But this so-called typical picture is really not so typical, as these symptoms are found in only one out of seven people with celiac disease.

The symptoms and findings that are not gut symptoms, yet can be frequently seen, are anemia (low red blood cells) due to lack of iron absorption; a very specific itchy skin rash called dermatitis herpetiformis [har-pe-to-form-iz]; osteoporosis (thin bones); inability to have children (infertility); abnormal liver function tests; anxiety; and even depression. Unfortunately, cancer -- specifically lymphoma or adenocarcinoma of the small intestine -- can be a result of untreated celiac disease.

Your genes play an important role in the potential risk for development of this disease. Celiac disease
Celiac disease has no cure, but given the strong evidence linking gluten to the disease, you can control celiac by eliminating gluten proteins from your diet. When gluten is removed from the diet, the small intestine starts to heal and symptoms begin to go away rapidly.

It can be challenging to follow a strict gluten-free diet for life. Fortunately, there are many gluten-free products on the market. Since 2007, the U.S. Food and Drug Administration (FDA) has been working on rules to govern “gluten-free” labeling and to define a safe gluten threshold. In the future, we may see other treatments such as gluten-digesting enzymes or even genetic modification of wheat that could be tolerated by your gut, even if you have celiac disease.

In addition to a gluten-free diet, an annual visit to your doctor to monitor celiac disease antibody levels and conditions associated with celiac disease such as osteoporosis, anemia and autoimmune thyroid disease is recommended. ☺
Your doctor tells you to watch what you eat, to lose weight, to exercise more. If you are a person with diabetes, your doctor tells you to check your blood sugar, take your pills or insulin injections and monitor your diet. But if you are like most people, you have a busy life and cannot always keep track of these things by yourself.

Luckily, nowadays you no longer have to, as smartphone technology has advanced enough to allow our phones to be useful tools in weight loss and diabetes management. Over 104 million people in the U.S. are smartphone users, and over 40 percent of smartphone users have downloaded a smartphone application (app). Recent behavioral science and medical research has shown that eHealth, or using information and communication technology such as computers, mobile phones, patient monitors, etc., for health services and information, can help patients improve weight loss and diabetes control. This expanding industry offers huge promise to both doctors and patients by providing tools to manage the day-to-day challenges of weight loss and diabetes management. However, reviews and rating of apps can be very biased and unreliable. So how can a person decide which app to use?

Doctors are spending more and more effort to try to answer this question. A 2011 study by University Hospital of North Norway system engineer and research fellow Chomutare and colleagues reviewed over 100 then-current applications for weight loss and diabetes management.
diabetes management and found that though many were comprehensive, very few of these applications included educational tools for patients. In a review of smartphone applications for diabetes management in 2012, Demodowich and colleagues found only three out of 42 applications for Android™ phones were at all comprehensive enough to be recommended for patient use in diabetes management.

Because this industry is changing by the hour, it is hard for doctors to adequately study the newest and latest applications, so most recommendations are made based on anecdotal evidence and personal experience. With that disclaimer in mind, I can recommend the following apps, with the understanding that by the time this article is printed, there may be something even better out there!

**APPS FOR WEIGHT LOSS**

My favorite weight loss apps are MyFitnessPal and LoseIt!, which are both available for Android phones and iPhone® operating systems. The number one advantage of these apps is that they are free to download, so anyone can get them. Both of these applications allow you to put in your current weight, your goal weight and the rate at which you want to lose your weight. You are then given a recommended amount of calorie intake for the day. You can log in every meal or snack you eat and label it as well. Both apps have extensive databases of every food you can think of, including meals offered at popular chain restaurants, and you can even scan in foods using barcodes from packaging! If you don't find the food you are looking for, you can add it into the database or just enter the calorie amount that you have eaten.

These applications also allow you to record exercise activity. You can choose from a variety of exercise activities from “barbell lifting” to “badminton, competitive” and “badminton, social[,]” and the programs will tally the amount of calories burned for the day. Both apps have a social media outlet, so you can post your progress to other users, and they link with Facebook and Twitter as well. They both have an associated website you can visit to track your progress and receive feedback. MyFitnessPal is free, but with LoseIt! you can add even more features by purchasing them.

The biggest difference between these applications is layout: MyFitnessPal is based on more free-text searching, whereas LoseIt! has items listed more in categories. MyFitnessPal also allows you to make notes of your food choices in a “diary” format as well. Which one will you like better? My advice would be to download both, try them out and see what you prefer. The only thing you have to lose is the weight!

**APPS FOR DIABETES MANAGEMENT**

In my personal opinion, there is yet to be a 100 percent comprehensive diabetes management app, but there are plenty of good ones, some free and some more costly. For the iPhone, the three top apps I can recommend are Track 3 Diabetes Planner, Diabetes App and Glucose Buddy. For Android phones, I would recommend Track 3 Diabetes Planner, Glucoool Diabetes or OnTrack Diabetes apps.

Diabetes App for iPhone has a nice layout and allows for glucose and weight tracking, medication tracking, activity and carbohydrate log, and a monthly calendar. You can also link your account to Twitter if you like. It comes in a “lite” version (free) and a full version ($6.99), which offers additional features of blood pressure tracking, unlimited number of logs, charting and emailing of your data.

*(Continued on page 18)*

Dr. Gillian Boyd-Woschinko is an Endocrinology Fellow at The Mount Sinai Hospital in New York, NY. She attended medical school at Jefferson Medical College and trained in internal medicine at New York Hospital-Weill Cornell in New York, NY. She is board certified in internal medicine. She spoke at the 2012 Endocrine Society national conference in Houston, TX on using mobile health in diabetes management and is currently conducting research on the use of smart phone applications for improving diabetic outcomes.
Glucose Buddy for the iPhone is also a very nice application that allows you to track glucose, medications and sync with an online website. This application also allows you to share on Twitter and Facebook. You need to buy add-ons in order to track weight and blood pressure though, and there is also a Glucose Buddy Pro version ($6.99) that is more comprehensive.

Glucool Diabetes Premium for Android phones ($4.99) also has a nice layout with complete data tracking of blood glucose, weight and blood pressure. You can create reports to email to doctors in personalized graphing forms. There is also an insulin calculator and an alarm system to remind about medications.

OnTrack Diabetes for Android phones is one of the nicer free apps, with great tracking and sharing capabilities. It has an easy-to-use interface, and you can also export data into Excel spreadsheets. It does not have an insulin calculator or the extensive food database other apps have, but for a free version is a nice option.

One of my favorite apps for diabetes management is Track 3 Diabetes Planner, which is available for both Android and iPhone users ($5.99). To me, this app is the most comprehensive, as it allows for glucose and medication tracking, including an insulin calculator based on carbohydrate ratios. In addition, it has a great food and exercise database, as well as great graphing features to track your blood sugar and diet. You can also export data through email as well. There is a lite version (free), but it does not include the nutrition database or the insulin calculator, so for those patients who could use those elements, I think it is worth the purchase.

SO MANY OPTIONS...

The above recommendations just scratch the service of what is out there in the world of smartphone applications for weight loss and diabetes management. As the technology becomes even more advanced, and as physicians investigate even more into what elements are best to include in these apps, the number of tools available to patients will increase and improve even further. This is all good news, as allowing people to keep track of their well-being is one of the most important elements for improving their health.

On restaurant menus, a “heart-healthy check mark” means that the whole meal contains 900 mg or less sodium. Foods with the check mark in grocery stores and restaurants must also meet other criteria for fat, cholesterol and other ingredients. The AHA maintains a list of certified foods in the Getting Healthy: Nutrition Center section of its website (http://www.heart.org/HEARTORG/). As always, when interpreting food labels and restaurant nutrition facts, it is important to stick to the recommended serving size because the amount of sodium is linked to that serving size.

Finally, the DASH (Dietary Approaches to Stop Hypertension) diet is commonly recommended for lowering blood pressure. This eating plan is low in fats that are not healthy, sodium and cholesterol and high in fiber. It recommends limiting red meats, sugar-sweetened beverages and sweets, and maximizing whole grains, fish, poultry, nuts, fruits and vegetables. More information on the diet can be downloaded from the National Heart, Lung, and Blood Institute: http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/index.htm.

HOW DO I SEASON FOOD WITHOUT SALT? FOOD JUST DOES NOT TASTE THE SAME WITHOUT SALT!

There are many salt-free seasoning combinations on the market, but even simple spices can be used to add delicious flavor to foods. Examples include rosemary, sage or thyme for meats, lemon juice for fish and vegetables, and cinnamon for fruit. The AHA has a comprehensive list of seasoning alternatives and low-salt recipes available at its website (above) under Conditions: High Blood Pressure: Prevention and Treatment: Reducing salt. Seasoning alternative recommendations are also available from the National Kidney Foundation at http://www.kidney.org/patients/kidneykitchen/content/salt_free_seasonings.cfm.

The bottom line: Use the tips above to aim for 1500 mg of sodium in your diet per day in order to lower your risk for high blood pressure, heart attacks, strokes and kidney problems. And explore the world of alternative seasonings and flavors as you take this step to better health!
Did you know that as you get older, you have a greater chance of getting type 2 diabetes? While type 2 diabetes can occur in younger people, it’s more common among adults over the age of 45. But here’s some good news: you can still take steps to prevent or delay getting the disease. The National Diabetes Education Program (NDEP) wants you to know that it’s not too late to prevent or delay type 2 diabetes.

Diabetes is a condition where your blood sugar, also called blood glucose, is too high. If not managed properly, it can lead to problems such as heart disease, stroke, vision loss, kidney disease and nerve damage. Type 2 diabetes is the most common form of diabetes. According to the Centers for Disease Control and Prevention (CDC), 10.9 million Americans aged 65 and older have diabetes. Many more adults over the age of 65 have prediabetes, a condition where blood sugar levels are higher than normal, but not high enough to be called diabetes. Prediabetes raises a person’s risk for getting type 2 diabetes, heart disease and stroke.

A large NIH-funded study found that people can delay or avoid getting type 2 diabetes by losing weight through being active for 30 minutes a day, five days a week and following a low-fat, low-calorie meal plan. People in this study aged 60 and older who made such lifestyle changes were more successful at preventing or delaying type 2 diabetes than all other age groups. This study also showed that these changes were more effective than the use of diabetes medicine for lowering their chances of getting type 2 diabetes.

If you are overweight, losing five to seven percent of your current body weight by following a healthy meal plan and being more active can help you prevent or delay type 2 diabetes. If you weigh 200 pounds, this means a weight loss of about 10 to 14 pounds. Talk to your doctor about setting safe weight loss goals. Once you set your goals, decide what steps you will take to get started. For example, you might say, “I will walk for 10 minutes after lunch to be more active each day.”

Try these tips to move more each day:

- Catch up with friends during a walk instead of by phone.
- Show your kids the dances you used to do when you were their age.
- March in place while you watch TV.

Find ways to make healthy food choices:

- Choose to eat more veggies, fruit and whole grains.
- Cut back on high-fat foods like whole milk, cheeses and fried foods.
- When your family and friends visit, offer them healthy snacks such as fruit instead of cookies.

These are small steps, but the rewards are big. Remember, you don’t have to make these changes alone. Get your friends and family involved. Talk to your doctor about your chances for prediabetes and type 2 diabetes. Your doctor may have tools to help you learn more about healthy eating and being active.

NDEP offers free booklets, tip sheets and other diabetes prevention tools to help. For more tips on how you can prevent type 2 diabetes, visit YourDiabetesInfo.org to download the “It’s Not Too Late to Prevent Diabetes” or “Choose More than 50 Ways to Prevent Type 2 Diabetes” tip sheets. You can also take the Diabetes Risk Test at http://ndep.nih.gov/am-i-at-risk/diabetes-risk-test.aspx. This tool asks simple questions about weight, age, family history and other risk factors for prediabetes or type 2 diabetes.

To learn more about NDEP, call 1-888-693-NDEP (1-888-693-6337) or visit www.YourDiabetesInfo.org.
There is a lot of information coming out in the news about the dangers of substances in the environment that can have a negative effect on our endocrine or hormone systems. In particular, attention has been focused on bisphenoyl [bis-fe-nōl] A (BPA) and its reported effects on the reproductive hormones, specifically estrogen (the main female sex hormone).

**WHAT IS BPA?**

Bisphenoyl A (BPA) is an industrial chemical that is used to make hard plastics and epoxy resins, which often coat the insides of metal cans. It was first synthesized in 1891, and by the 1930s its use as a synthetic (manufactured) estrogen was being explored, due to its estrogen-like properties. However, at this time diethylstilbestrol [di-eth’il-stil-bes’trol] (DES) also came to the marketplace as a synthetic estrogen, and so BPA fell out of favor. In the 1950s, BPA was rediscovered as a building block of polycarbonate plastics used for food and beverage storage. Today it is one of the most abundantly produced chemicals worldwide. BPA-containing plastics are popularly used due to their clear and shatter-resistant properties for things such as headlights, water bottles, baby bottles, automobiles, sports equipment and coatings on CDs, DVDs, electrical equipment and medical devices. In fact, it would be extremely hard not to come into contact with BPA-containing products.

**WHY IS BPA A HEALTH CONCERN?**

BPA has been linked with a number of health conditions. It is referred to as an “endocrine disruptor,” which means that it can interfere with the function of some of the hormones that your own body produces. This can lead to adverse changes in reproduction, development, neurological function and responses of the immune system. BPA was traditionally considered a “weak” estrogen, because it does not act as strongly as our body’s own estrogen. Estrogen is important in maintaining the function of reproductive organs and is also involved in bone health, protein synthesis, cholesterol metabolism, mental health, sexual desire and many other systems. As we learn more about BPA, we are finding that it may actually be a more potent estrogen mimic than was previously thought.

**HOW DOES BPA ACT ON THE BODY?**

BPA is considered a xenoestrogen (zē-no-ēs-trō’jin), which means “foreign estrogen.” Xenoestrogens are man-made compounds that mimic the effects of natural estrogens in the body. While BPA was thought to be 1,000 to 10,000 times less potent than estradiol [es-truh-dahy-awl], the main form of estrogen in reproductive years, in some cases it may be just as potent as estradiol. Additionally, the metabolites, or “break down” products of BPA may potentially be stronger xenoestrogens than BPA itself. BPA binds to various cells like an activator switch and triggers many of the same chemical changes as natural estrogen in the body. While it was initially thought that BPA acted only through cellular proteins called estrogen receptors (which act as signaling switches on cells), we have also learned that BPA can exert its estrogenic effects through other receptors as well.

**WHAT DOES BPA EXPOSURE CAUSE IN HUMANS?**

Fetuses, infants and children are most likely to be affected by BPA, even at levels of exposure below the established safety levels. Examples of the effects of BPA during these periods include abnormal pubertal development, behavioral changes, asthma, and impaired immune system, thyroid and adrenal functions. Because BPA exhibits hormone-like effects and acts in a similar
way to estrogen, it can potentially interfere with many different systems in the body. Research into the effects of BPA in the early years of life has shown that exposure to BPA may induce changes that carry on into adulthood, although currently little is known about these effects.

Researchers are now trying to explore the link between BPA and diseases such as breast and prostate cancer, recurrent miscarriages, premature deliveries and abnormal semen production. In addition, they are also exploring the association of BPA with diabetes, cardiovascular disease, obesity and abnormal liver function. A great deal of what we know is based on animal studies, and sometimes attempts to establish the same findings in humans can be difficult. More research in this area is needed and is presently underway to examine how BPA acts and its consequences on our health in all stages of life.

It is also important to be aware that BPA is only one of many endocrine disruptors to which we are exposed. Plastics can often contain many other chemicals with estrogen-like activity. Whether BPA acts independently in exerting its effects, or has additive effects in the presence of these other disruptors, remains to be seen. Therefore, manufacturing “BPA-free” products is unlikely to limit risk entirely.

**HOW DOES EXPOSURE TO BPA OCCUR?**

Despite its durable properties, BPA is prone to leaching out of the very substance it makes. Exposure most often occurs by ingesting BPA from food and drink containers. Residual BPA that does not become bonded with the other compounds that make plastic can slowly seep out over time. This particularly happens when BPA-containing plastics are heated, microwaved or autoclaved. Given how prevalent BPA is in our surroundings, it is not surprising that most people have detectable levels in their bodies. Research has shown that BPA can be measured in 95 percent of urine samples analyzed in the U.S.A.!

**HOW MUCH BPA EXPOSURE IS SAFE?**

In the 1980s, the U.S. Food and Drug Administration (FDA) set the daily safety level for BPA at 50μg/kg body weight, based on prior experiments conducted in rodents. While this amount was based on the lowest levels at which cancer was observed to occur in animals and then divided by a factor of 1000 (to allow for a very large safety margin), other non-cancerous effects of BPA can be seen at levels well below this threshold. Levels of BPA exposure vary throughout life, and the fetal, infant and childhood periods represent more vulnerability to the effects of BPA.

**WHAT SHOULD I BE DOING ABOUT MY EXPOSURE TO BPA?**

Precautions surrounding BPA exposure are most important when it comes to the developing fetus, infants and young children. Tips to help limit BPA exposure include:

- Avoid microwaving polycarbonate plastic food and drink containers
- Use only BPA-free baby bottles
- Decrease consumption of canned foods and beverages with epoxy resins
- Avoid plastic containers with number “7” recycling code on the bottom, as these often contain BPA
- Try to use glass, porcelain or stainless steel containers

**WHAT REGULATIONS HAVE COME ABOUT CONCERNING BPA?**

In 2008, the safety of BPA came into question by the National Institutes of Health, resulting in some retailers withdrawing their polycarbonate products from the market. In 2010, the FDA warned of concern to fetuses, infants and children. That same year, Canada became the first country to declare BPA a toxic substance. Since then, Canada, the European Union and the U.S. have banned BPA in baby bottles. However, in 2012 the FDA decided against a ban of BPA from food packaging, despite increasing evidence of the harmful effects of BPA. While the picture is not completely clear and we need more research to help understand BPA’s effects, be cautious about your choice of food container, of what you use to heat your food in and from what you drink your liquids! 

**In particular, attention has been focused on bisphenoyl A (BPA) and its reported effects on the reproductive hormones, specifically estrogen.**
For my second year of training in the medical specialty of diabetes and metabolism problems (endocrinology), I had the honor of being the recipient of the Bender Fellowship at the University of Washington. This gave me a unique opportunity to focus my training on how to care for people who could not afford the latest and greatest in diabetes care, people who may not have a home to go to at night, people who might have to get their food from the local food bank. Let me share some stories.

The other day I met a very kind older gentleman named Alvin. Alvin lives with HIV and type 2 diabetes, two chronic diseases that could easily overwhelm anyone—but not Alvin! He reminds me constantly that he could not be happier living in Seattle, his dream city, having grown up in Louisiana working hard each day as a janitor.

It didn’t scare him to live with HIV, but when he was diagnosed with type 2 diabetes he feared losing his life. He explained to me that his pastor, whom he greatly admired, lived with uncontrolled diabetes for many years and slowly lost his limbs one by one, then died from his diabetes. This scared Alvin, so he took his diabetes very seriously.

When I first saw him in the clinic, we talked about his life—where does he live? What does he like to eat? What does he like to drink? How does he like to spend his free time? Alvin seemed to enjoy our conversations, particularly when we discussed his food choices and what he could get to eat on his very limited income and what he splurged on as a treat. Unfortunately, Alvin told me that his favorite treat was soda pop! And he had a habit of drinking 40 ounces of regular soda pop rather too frequently. “Alvin, do you know that amount is equal to two pounds of sugar?” Alvin’s eyes widened. I explained to Alvin if he were to drink less soda pop, that may help lower his blood sugars. We came up with an action plan for Alvin to drink less Pepsi and Mountain Dew—his absolute favorites.

A couple of months later, Alvin’s hemoglobin A1c (a measure of blood sugar control) came down to normal without any diabetes medications. “It’s okay to drink a small amount of diet soda, you know,” I said to him so that he didn’t feel completely deprived of his favorite drinks. “Doc, if eliminating this stuff altogether will keep my diabetes away, then I can live without it!” Wow! A limited income, groceries from the food bank, the one treat he could afford and enjoyed—and yet he could give up the regular pop when he realized the damage it could cause, after I provided information and education about the impact of food choices on diabetes.

But it is not easy to make the changes that could have such a huge impact on diabetes. Jenny discovered this when her blood sugars remained high even after starting medicines, which she thought “would take care of the problem.” Jenny was diagnosed with type 2 diabetes at age 18 years. Her body weight and blood sugars were very high, enough to disrupt her normal hormone cycles, zap her energy, and cause her vision to blur. This made it difficult to focus in her college classes as well as being able to take care of her single mother, who was disabled from a stroke. Jenny’s grandmother, who also lived with diabetes, had died recently from a severe infection. Jenny felt overwhelmed and trapped by her diabetes.

Understanding the pressures of being a full-time student and a caretaker while grieving the loss of
her grandmother, Jenny needed help to know how to care for herself. We discussed her daily schedule and activities. Jenny mentioned she lived just a few blocks from school but usually took the bus. A McDonald’s was near the bus stop, so often she would stop there on her way home to buy dinner for her mom and herself. I asked Jenny if she felt her neighborhood was safe enough that she could walk to school instead of taking the bus. “Yah, it’s safe and I could try walking on days it doesn’t rain.” So Jenny set a goal to walk to school on non-rain days in addition to taking her medications and checking her blood sugars.

We reviewed the meal choices she was buying and what other types of food were available, but lower in carbohydrates (sugar), salt and fats. Several weeks later, when I saw her in the clinic, Jenny was still just as busy as she had been, but she was several pounds lighter with normal blood sugars, normal hormone cycles and way more energy. “How do you feel?” I asked. “Great!” she said with a smile. “You’re looking happier, what’s changed?” I asked again. “Well, I started walking like we talked about and that helped me clear my mind of all my stress, so I started to walk more and that gave me energy. I’ve been walking now every day for at least half an hour, sometimes an hour, to and from school, sometimes around my block. It’s been good.” And I thought to myself--this feels good to me, too!

Sandra had had type 2 diabetes for many years and thought checking her blood sugars by fingerstick once a day was plenty. But one day she decided to check her blood sugars throughout the day. She came to the clinic with her blood sugar log and showed me that something was off. “My blood sugars are high in the afternoon!” she said. Sandra was on a single injection of long-acting insulin before bedtime. I had asked Sandra to check her blood sugars more often so we could better understand her sugar patterns throughout the day. Her morning sugar levels were on target (the only time of day she was checking), but something was missing, as her hemoglobin A1c was high. But despite many months of encouragement, today she showed me she had done what I had recommended! And she was amazed to see much higher blood sugars, particularly after eating tortillas. We discussed adding a short-acting insulin shot before her biggest meal of her day. She was hesitant to take more insulin because she did not want to gain weight. After discussing the benefits of short-acting insulin as protection from very high blood sugars after meals and the importance of eating tortillas in moderation to avoid excess sugar and weight gain, Sandra agreed to this change in her diabetes regimen. Weeks later, Sandra returned with a more detailed log of her blood sugars, foods that she was eating and her exercise routine. I was happy to see Sandra with more confidence about her diabetes treatment and self-care. She had discovered she has the ability to lower her blood sugars by changing her food choices and using insulin, and she now felt more in control of her diabetes.

Listening to Alvin, Jenny and Sandra helped me learn that diabetes is not just about pills or injectables, but learning how to find out what can help someone with limited income, limited food choices and much daily stress deal with and manage a chronic condition from day to day. Every day is different, and there are incredible challenges in life! Understanding how Alvin, Jenny and Sandra lived each day with diabetes provided opportunities to ease fears, clarify confusions, learn new facts, set important goals and provide support. I am humbled by these teachers--my patients--and am grateful to have been supported by the Bender Fellowship in my journey to become an endocrinologist!

Dr. Luisa Duran is a Senior Fellow in Endocrinology, Diabetes and Metabolism at the University of Washington Medical Center in Seattle. She is the recipient of the Benders Fellowship which supports diabetes care for underserved communities. She is a graduate of Brown University, Brown Medical School and completed her internal medicine residency at Santa Clara Valley Medical Center in her hometown, San Jose, CA. Dr. Duran is board certified in internal medicine and is interested in all aspects of clinical endocrinology, particularly management of type 2 diabetes.
We are starting a feature series that will highlight news that can truly EmPower you to a healthier life. Science is moving ahead at an incredible pace—the challenge is keeping up without feeling overwhelmed and being able to look at what can be personally helpful. So what has hit the presses recently?

“Active Lifestyle Appears as Beneficial as Structured Exercise”

(American Journal of Health Promotion, 2013;27:143-51)

Exercise, exercise, exercise! We have all heard this advice, that physical activity keeps us healthy, helps manage chronic conditions such as diabetes, helps prevent heart disease. But just what type of exercise is the best, or how much should one do, for how long? Surprisingly, scientific data to answer these questions is sparse! A recent study by Loprinzi and Cardinal suggests that short and small amounts of physical activity that add up to 30 minutes per day may be just as beneficial as a more defined or structured physical workout. Using data from the NHANES (National Health and Nutrition Examination Survey) 2003-2006, the researchers looked at results including 6,321 people, ages 18-65 years. The researchers defined a “bout” as 10 minutes of activity or more and a “non-bout” as less than 10 minutes of activity. “Non-bout” included activities such as walking or pacing while speaking on the phone, or taking the stairs rather than the elevator. Analysis of results based on NHANES data and a questionnaire on current health status showed that an accumulation of “non-bout” short bursts of physical activity totaling 30 minutes daily can be as beneficial as “bouts” or structured activity, with respect to health.

So what can you do to get those 30 minutes accumulated?

• Take the stairs, skip the elevator
• Dance while you talk on the phone
• Stand and march in place while you check e-mails
• Get up at each commercial break while watching TV, then bend over and try to touch your toes, stand and repeat, until the commercial break finishes
• Pack your groceries to just half full in bags, then just take in two bags at a time, so you make more trips from car to kitchen

It all adds up!

“Myths, Presumptions, and Facts About Obesity”

(New England Journal of Medicine 2013;368:446-54)

Myths are what we believe and have no facts to support the beliefs. Presumptions are what we assume, with no facts to support. And facts, well, facts—at least in science—have some backing. This article on myths, presumptions and facts about obesity focused on whether we really know what we think we know.

The seven myths reviewed included that small but persistent lifestyle changes will, over time, result in

(Continued on page 28)
What do you call kids who don’t let type 1 diabetes stand between them and their dreams? At Lilly, we call them every day heroes.

It takes a special type of kid to handle the rigors of high school, manage the daily demands of type 1 diabetes, and grow into great young adults. That’s why at Lilly, we’re proud to support the Diabetes Scholars Foundation, offering scholarships to help them pay for college.

To learn more about these scholarships, visit diabetesscholars.org/Lilly. And take this page to discuss with your healthcare provider. For more information about all the helpful programs Lilly offers families with type 1 diabetes, visit lillydiabetes.com.
Osteoporosis is a disease in which bones become more fragile and the person with osteoporosis then becomes at greater risk for getting a bone fracture. It is estimated that more than 10 million Americans have osteoporosis. It is a silent disease as no one “feels” osteoporosis until a fracture occurs, and fractures in those with osteoporosis can occur with only minimal trauma. These fractures are common, with the most frequent sites being the spine, hip and wrist.

About one out of every two Caucasian and Asian post-menopausal women will experience an osteoporosis-related fracture at some point in her lifetime, as will approximately one in five men. While osteoporosis is less frequent in African-Americans, patients in this group with osteoporosis have an increase in fracture risk similar to those of a Caucasian patient.

Osteoporosis is detected by using a special imaging technique called dual-energy x-ray absorptiometry, otherwise known as a DXA scan. This x-ray detects how dense the bones appear (also known as the bone mineral density). An individual with osteoporosis has thinner bones with more holes or pores in them, similar to a sponge, making the bone less resilient to physical stress and trauma.

**WHAT IS THE PURPOSE OF DIAGNOSING AND TREATING OSTEOPOROSIS?**

When a fracture occurs, it may be followed by a full recovery. Alternatively, it can result in long-term pain, difficulty participating in daily activities or even death. If an older person has a fracture, it can often mean that person cannot return home, as the loss of ability to get around to care for oneself can result in having to move to an assisted living or nursing home for care. People can also experience loss of self-esteem, depression, anxiety, or fear of future fractures. Osteoporosis can be diagnosed and treated before any fracture occurs. However, if a fracture does occur, there are treatments which can decrease the risk of future fractures.

**WHAT DOES EXERCISE HAVE TO DO WITH OSTEOPOROSIS?**

Much of the focus on treatment of osteoporosis includes adequate intake of calcium and vitamin D,
avoidance of tobacco, avoidance of excessive alcohol intake (more than two alcoholic beverages per day for women or three alcoholic beverages per day for men), treatment of other risk factors such as poor vision, and use of prescription medications. In addition, exercise and fall prevention are part of the mainstays of treatment. It is well known that physical fitness is an important element of maintaining a healthy lifestyle. The benefit of exercise is also seen in prevention and treatment of osteoporosis. While exercise may increase the bone mineral density, much of the benefit of exercise is thought to be related to fall prevention. Regular weight-bearing and muscle-strengthening exercise can improve one’s strength, posture, balance and agility, all of which may decrease the risk of falls.

**WHAT, EXACTLY, IS WEIGHT-BEARING EXERCISE?**

Weight-bearing exercise is activity in which the bones and muscles work against gravity, while the feet and legs support one’s own body weight. High-impact weight-bearing exercises include jogging, running, high-impact aerobics, dancing, tennis or stair-climbing. Low-impact weight-bearing exercises may also help to keep bones strong, offering a safe alternative if you are unable to perform high-impact exercises. Examples include low-impact aerobics, stair-step or elliptical machines, and walking. Walking for 30 to 40 minutes three to four times per week may provide the benefit needed. While swimming can provide good cardiovascular exercise, because the water places an individual in a “weightless” environment, it is not considered to be a weight-bearing activity. Even children have been shown to benefit from exercise to strengthen their bones: one study showed that just jumping up and down increased their leg bone density. The National Osteoporosis Foundation (NOF) strongly recommends that individuals participate in lifelong physical activity at all ages.

Muscle-strengthening exercises include weight training or resistance training such as those using resistance bands, free weights or even use of weight machines—that last under supervision! Maintaining muscular strength can slow the loss of bone. And better muscle strength may help prevent falls that in turn increase the chance of fracture. Examples of muscle-strengthening exercises include standing and rising on your toes and lifting your own body weight. Experts recommend performing strength-training exercises two to three days per week.

Balance exercises such as Tai Chi can strengthen your leg muscles and help you stay steadier on your feet. Posture exercises can improve how you stand, reduce the “sloping” shoulders associated with osteoporosis, and decrease your risk of fractures, especially in the spine. Balance and posture exercises should be performed daily.

Even yoga and Pilates can improve strength, balance and flexibility if you have osteoporosis. But some of the movements associated with these programs—including forward-bending exercises—can increase the risk of fracture. These should only be participated in after you discuss this with an expert, your endocrinologist, who may in turn have you see a physical therapist to help check out what you can safely do.

**WHERE DO I START?**

Certain high-impact activities may not be appropriate for patients with prior fractures or those at high risk for breaking a bone. If you have osteoporosis and are looking to start a vigorous exercise program, it is recommended you discuss this with your primary care physician or endocrinologist before beginning.

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**About one out of every two Caucasian and Asian post-menopausal women will experience an osteoporosis-related fracture at some point in her lifetime, as will approximately one in five men.**

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large, long-term weight loss; that setting small goals for weight loss is more successful than setting large goals; that rapid, large weight loss is more likely to be associated with weight being regained; that a sense of feeling ready to lose weight is associated with better success at weight loss; that participation in physical education as is currently available in schools will prevent weight gain in childhood; that breast feeding prevents obesity; and that sexual activity can burn a significant amount of calories.

Surprised? The authors note that with weight loss, the energy requirements of the body change, so continued lifestyle changes are required to adapt to the changing energy requirements with weight loss. In setting goals of weight loss, actually there are studies that suggest that more ambitious weight loss goals may actually be linked to better success at weight loss! Looking at comparisons of rates of weight loss, there have been no differences noted with regard to keeping weight off, whether the loss has been fast or slow. Diet readiness might seem like a “no brainer”- losing weight should be more likely to occur if we feel ready to lose weight, but this does not seem to make a difference. The authors state that the explanation might just be that people who start a weight loss program are, by definition, ready. Physical education classes do not prevent childhood obesity, at least as currently provided in schools. Breast feeding does not act as a prevention of childhood obesity. And finally, sexual activity, although calorie burning, is not a significant calorie-burning activity. The example given is that a 154-pound man might burn the same amount of calories per minute in sexual activity as he would walking a moderate pace—2.5 miles per hour. Left to the reader is preference of activity!

Presumptions noted in the article include that eating breakfast is protective against obesity—not supported by the two studies reviewed, which showed no effect, whether breakfast is eaten or not. However, one of these studies might have been biased by assigning people to either the breakfast eaters or non-eaters group by whether they already ate or did not eat breakfast—not a true random set-up that, by definition, is needed for a study to be considered a good study. Additionally, there is no data to support that what we learn in early childhood as to habits of exercise and eating cannot be changed as we age. And while fruits and vegetables are recognized as being part of a healthy diet, they do not by themselves protect against weight gain. We have all heard about “yo-yo” dieting, but it is not at all clear that this is bad. Although there are reports linking this weight variation with higher risk of death, it has been difficult to separate the dieting from other health conditions present. So, is it the diet or illness?

And surprisingly, no study has clearly shown that snacking is an automatic way to gain weight. Finally, does having ready access to parks in the neighborhood guarantee less obesity? Certainly not, if they are there but not used!

Discouraged? Do not know what to believe or not believe? Has science failed us in providing any solid information about weight management and, more specifically, about weight loss? The authors do come through with helpful information!

The authors review studies that suggest changing one’s lifestyle can make a big difference and weight loss can be achieved—we are not prisoners of our genetic make-up. Reducing food intake and increasing physical activity works! Physical activity in particular is needed, and to lose weight, a substantial amount of it, beyond just that for good health maintenance. Obesity needs to be accepted as a chronic condition needing ongoing attention, just as does having a chronic condition such as high blood pressure or diabetes. For children who are overweight, not just school or out-of-home places need to be supportive of and emphasize how to develop a healthier lifestyle, but support in the home and active involvement in the home is critical to success in weight loss and weight management. Finally, pre-prepared meals, meal replacements, weight loss drugs and weight loss surgery are options that can and do work in helping to lose and maintain weight loss. They are not for everyone. There are costs and potential side-effects to consider.

So what should you take away from this article, if you want to lose weight?

- Be aware of how many calories you eat (and eat less if you want to lose weight)
- Increase physical activity to use up those calories (and be even more active, if you want to lose weight)
- Be aware that achieving and then maintaining weight loss will be an ongoing challenge (but one that you can win!)
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