WHAT YOU SHOULD KNOW ABOUT

Weight-Loss Drugs

ALSO IN THIS ISSUE:
• All Carbs Are Not Created Equal
• ABCDs of Adiposity: A New Way of Thinking About Weight and Health
• Can Spices Help Curb Your Appetite?
• How to Talk to Kids About Weight
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This Issue’s Contributors

What You Should Know About Weight-Loss Drugs
It can be difficult to keep off unwanted pounds over the long-term, even with proper diet and exercise. But the FDA-approved weight-loss medications currently available can, when used properly, give you a much-needed boost in your battle of the bulge.

All Carbs Are Not Created Equal
If you’re having difficulty losing weight to improve your diabetes, or keeping it off if you do, the actual make-up of your food choices – known as the glycemic index and glycemic load – can play a significant role in succeeding at your efforts.

ABCDs of Adiposity: A New Way of Thinking About Weight and Health
While the number of people medically classified as obese continues to rise in the U.S., the term “obesity” continues to be stigmatic. The American Association of Clinical Endocrinologists and the American College of Endocrinology aim to change that with a new diagnostic term that helps diagnose, categorize and treat excess body weight as a chronic disease with indisputable complications.

Can Spices Help Curb Your Appetite?
In recent years, Americans have embraced all sorts of exotic spices and herbs in a quest to jump-start the flavor of their food. Studies suggest some may even help aid weight loss.

Surgery for Weight Loss: Am I Too Old to Benefit?
Bariatric surgery has become an increasingly popular procedure for those who are severely obese, especially since the introduction of minimally invasive techniques. Still, some concerns exist about the surgery’s safety in older patients.

How to Talk to Kids About Weight
Navigating parenthood is never easy. That can be particularly true when it comes to trying to help an overweight or obese child. Here are some helpful tips from the Academy of Nutrition and Dietetics for parents concerned about what – and what not – to do.

A Doggone Brilliant Prescription for Improved Health
At the time of his early retirement, Neil Wright was fit as a fiddle. But it didn’t take long for the Seattle resident’s cholesterol to creep up to concerning levels. With a little help (and a whole lot of love) from a special furry member of the family, he has returned to optimal health.

Diabetes Care in My Part of the World — Rural America
A practicing clinical endocrinologist for more than four decades, Dr. Anne Leddy shares her experiences and insights about caring for in-need diabetes patients as a volunteer in her rural Virginia community’s clinic for the “working poor.”

When Cancer Treatments Affect Endocrine Function
Research into more effective chemotherapies has produced groundbreaking drugs that are boosting the battle against cancer, but not without side effects that specifically affect the body’s endocrine functions.
AACE adopted the universal endocrine logo design (left), which is intended to serve and be recognized by the scientific community and the public at large as an international symbol of recognition of all areas of the specialty of endocrinology (academic/research/clinical).

In its simplest form, the logo represents a continuous loop that conveys the concept of endocrine science, education, communication, safety, and overall good endocrine health; lay focus groups identified "balance" and endocrinologists identified "feedback loop"—both are desired interpretative attributes.

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AACE is a professional medical organization with more than 7,000 members in the United States and more than 90 other countries. Founded in 1991, AACE is dedicated to the optimal care of patients with endocrine problems. AACE initiatives inform the public about endocrine disorders. AACE also conducts continuing education programs for clinical endocrinologists, physicians whose advanced, specialized training enables them to be experts in the care of endocrine diseases such as diabetes, thyroid disorders, growth hormone deficiency, osteoporosis, cholesterol disorders, hypertension and obesity.

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you have adiposity you are not alone. The disease of obesity affects more than 93 million Americans, and the numbers continue to increase. Plus, a number of other conditions associated with obesity such as type 2 diabetes, high blood pressure, sleep apnea, arthritis, heart, lung and liver disease and more are on the rise. These conditions greatly impact a person’s quality of life and overall health, both physically and mentally.

However, treating obesity can be a challenge. If you are overweight or obese, you probably know how difficult and frustrating weight loss efforts can be.

It is very difficult to achieve long-term weight loss from diet and exercise alone. In fact, most patients who lose weight on a diet gain back most or all the weight within a few years. Even with intensive exercise, long-term weight loss is difficult to maintain. What few understand is that weight regain occurs because of adaptive changes in the hormones that regulate appetite and metabolism. When you lose weight, your hormones change to increase appetite and lower metabolism, driving weight back up. These metabolic changes persist for years.
The hormonal regulation of appetite is very strong. Willpower alone is not sufficient to overcome these biological drives. Thus, medications are increasingly being used because they can help overcome some of the biological changes that drive appetite. And there are more obesity medications available today than ever before.

This can be empowering, but also intimidating and confusing. Therefore, here are important things you need to know about prescription weight-loss medications and their role in helping you succeed in losing weight.

**Weight-Loss Medications Require a Healthy Lifestyle**

Taking a medication for weight loss means committing yourself to long-term lifestyle changes. Lifestyle modification is the cornerstone of any weight-loss program and includes:

- A healthy, reduced-calorie meal plan
- Physical activity
- Self-monitoring

For most people, weight loss can be achieved with a 1,200-1,400 calorie-per-day meal plan. You can work with your physician or dietitian for more precise calorie recommendations based on your individual requirements. Studies have shown that the makeup of the diet is less important than sticking to the diet, so it is recommended you follow a common-sense, reduced-calorie meal plan that you can stick to for the long term. For example, a strict vegan diet may work for some people, but for others, the rigidity of the diet can cause feelings of deprivation and rebound cravings or even binge eating. Try to have regular meal times and make meals a family affair — socialize, discuss the day’s events, make the shared meal an enjoyable activity for all.

Physical activity is also a critical component of any weight-loss program. Without physical activity, you can still lose weight on a low-calorie meal plan, but for every 10 pounds you lose, three will be muscle. However, with regular physical activity, for every 10 pounds you lose, only one is muscle. A minimum of 150 minutes of moderate intensity physical activity is recommended each week. Resistance training with weights or bands may be added in. Start slow and gradually, and increase the duration and the intensity of the activity. Schedule physical activity on your calendar like you would other important tasks. And ask a friend or your spouse to exercise with you.

Examples of moderate intensity physical activity include:

- Brisk walking
- Bike riding
- Swimming
- Active play with children
- Housework
- Yardwork

Self-monitoring with food and exercise logs, regular self-weighing and using tech gadgets such as pedometers and activity monitors can help modify behaviors that contribute to weight loss. Even though weight loss is more complicated than calories in and calories out, these gadgets are useful tools that help you better understand your own body.

Adequate sleep is also crucial to achieve effective weight loss. You should aim for seven to nine hours of restful sleep each night. If you have excessive daytime sleepiness, you should discuss the possibility of having sleep apnea with your physician. Effective sleep apnea diagnosis and treatment aids in weight loss, which then improves sleep apnea symptoms.

Stress reduction is also an important component of any weight loss program, so don’t be afraid to ask for help. Support from friends and family is vital for helping you stay on track. The more support you have the more likely you’ll succeed.

It’s important that you don’t expect to change your behaviors overnight by keeping focused on long-term results, making small but gradual changes to improve your daily routine. It will take time, but as you stick with your lifestyle changes, you will see your weight and health improve. This can be highly motivating to keep the weight loss going.

**The Lowdown on Medication-Assisted Weight Loss**

Medications for weight loss can be considered when lifestyle modification does not produce acceptable weight loss or medical complications are not adequately controlled. Anti-obesity medications (AOMs) are indicated for patients with obesity defined as a body mass index (BMI) above 30 kg/m² or overweight with a BMI above 27 kg/m² with at least one complication of excess weight such as diabetes, high blood pressure or abnormal blood lipids.

Before you decide on any weight-loss medication, it is important to work with your healthcare team to decide which option is best for you. Prescription weight-loss medications work by helping you eat fewer calories. These medications work on the appetite and reward centers of the brain to reduce hunger and cravings and to increase the feeling of fullness as you eat.

(Continued on page 6)
Currently, there are eight medications approved by the Food and Drug Administration (FDA) for weight loss. They are:

- Phentermine (Adipex-P®, Suprenza®)*
- Phendimetrazine (Bontril®)*
- Benzphetamine (Regimex®, Didrex®)*
- Orlistat (Xenical®, alli®)†
- Phentermine and Topiramate ER (Qsymia®)†
- Lorcaserin HCL (BELVIQ®)†
- Naltrexone HCl and Bupropion HCl (CONTRAVE®)†
- Liraglutide injection (Saxenda®)†

*Approved for short-term use
†Approved for long-term (chronic) use

Although everyone hopes for a magic weight-loss pill, medications only work when combined with a reduced-calorie meal plan and increased physical activity. These medications are not a substitute to lifestyle modification, but rather a tool to enhance these measures. Taking a medication without lifestyle changes does not result in successful weight loss. It should also be noted that none of the AOMs should be taken while pregnant.

**Weight-Loss Medications for Short-Term Use**

Approved for short-term use several decades ago, phentermine, phendimetrazine and benzphetamine are weight-loss medications that contain a mild stimulant that is like an amphetamine and work on chemicals in the brain to decrease appetite. These medications can be taken once or several times a day depending on the formulation. Tolerance usually develops after a few months, resulting in an increased appetite and cessation of weight loss. Thus, it is prudent to have a plan for ongoing weight loss or weight maintenance, such as changing to an AOM approved for chronic use, as regaining weight is typical once these medications are discontinued.

These older AOMs are typically used for 12 weeks, although some patients may experience increased weight loss by prolonging the treatment by taking the medication every other day for 24 weeks. Side effects of these AOMs can include an increase in blood pressure and heart rate as well as insomnia, dry mouth, anxiety and agitation. These medications cannot be used if you have certain heart conditions, uncontrolled high blood pressure, a history of stroke, glaucoma (increased eye pressure), or an overactive thyroid. Consequently, you must be monitored closely by a healthcare professional who has experience prescribing these medications.

**Medications for Long-Term Use**

Since obesity is a chronic disease, the up-to-date approach to AOMs is to treat them like any other medication used to treat a chronic disease. This means that AOMs are intended for long-term chronic use.

The newer anti-obesity medications result in an average weight loss of 5 to 15 percent from the patient’s starting body weight over 6 to 12 months, with weight maintenance if the medication is continued. If the AOM is discontinued, patients tend to gain back the weight that was lost while taking the medication.

Weight loss should be assessed after taking the full dose of an AOM for 12 weeks. It is recommended that the medication be discontinued if at least a 5 percent weight loss has not been achieved at this point, as additional meaningful weight loss is unlikely. An alternative AOM can be substituted, as a person’s response to one AOM may not predict the response to another due to different mechanisms of action. Due to lack of data, combining AOMs is not recommended, with some exceptions discussed below. If a 5 percent weight loss has been achieved and there are no unacceptable adverse reactions, then the same AOM should be continued long-term.

**Orlistat (Xenical®, alli®)**

Xenical® and the lower potency over-the-counter version alli® contain the medication orlistat. This medication comes as a capsule that is taken before each meal and works by blocking the absorption of about one-third of fat in the meal. This fat gets passed out of the digestive tract in the stool. Orlistat is the only AOM that does not work by decreasing appetite. Side effects of orlistat include oily diarrhea, fecal leakage, cramps and gas discharge that can be avoided by consuming a high-fiber diet that contains less than 30 percent fat. People who take orlistat should take a daily multivitamin as there is potential for a deficiency of some fat-soluble vitamins.

**Phentermine and Topiramate ER (Qsymia®)**

The combination of phentermine and topiramate in an extended release capsule was approved by the FDA in 2012 as the first new AOM in over a decade. Topiramate is a medication that has been approved to treat seizures and migraine headaches. Weight loss is a common side effect of topiramate. Phentermine is an AOM as described above that helps to decrease appetite as well. This is an exception where two medications used in combination at relatively low doses are effective for long-term weight management.

Side effects of phentermine-topiramate ER include a metallic taste in the mouth, dry mouth, a feeling of pins and needles in the
extremities, constipation, insomnia, memory loss and fatigue. This medication also has an interesting side effect of making soda taste flat due to the chemical properties of topiramate. Women of childbearing age must use at least one reliable form of contraception and should have a negative pregnancy test before starting the medication and should have monthly negative pregnancy tests while continuing phentermine-topiramate ER, as it is known to cause birth defects.

**Lorcaserin HCl (BELVIQ®, BELVIQ XR®)**
Lorcaserin is known as a selective 5-HT2C (serotonin) receptor agonist that works on brain chemicals to decrease appetite and help you feel full while eating less. Side effects of lorcaserin include headache, dizziness, fatigue, dry mouth and nausea. Among all the AOMs, lorcaserin has the lowest incidence of side effects and is thought to be the safest for patients with a history of heart disease. Because lorcaserin is a serotonin medication, other serotonin medications such as SSRI antidepressants (fluoxetine, sertraline, citalopram, etc.) and triptan migraine medications should not be combined with lorcaserin, or should be used with very close supervision due to a theoretical risk of a severe side effect known as serotonin syndrome, which occurs when you take medications that cause high levels of the chemical serotonin to accumulate in your body. Symptoms can range from mild (shivering and diarrhea) to severe (muscle rigidity, fever and seizures). Severe serotonin syndrome can be fatal if not treated.

**Liraglutide injection (Saxenda®)**
Liraglutide is an injectable medication that is a synthetic version of a hormone that works in the brain to reduce appetite and make you feel full. Liraglutide is also marketed at a lower dose under the name Victoza® for the treatment of type 2 diabetes. Liraglutide increases natural production of insulin and decreases release of the anti-insulin hormone glucagon in response to food intake. The most common side effects are nausea, vomiting, abdominal pain, diarrhea and constipation.

**Medication Follow-Up**
When on an AOM, frequent visits to your physician (every four weeks) are recommended for the first 12 weeks and every three months thereafter. Frequent visits with a healthcare professional provide better weight-loss results through increased support, accountability and individualized medication management. Since obesity is a chronic, lifelong problem, continued periodic follow-up is advised.

The best weight-loss results are achieved when AOMs are combined with intensive lifestyle modification. The major benefit of weight loss is improvement of diseases caused by obesity such as diabetes, high blood pressure, abnormal blood lipids and heart disease, which can be seen with as little as 5 percent weight loss.

It’s important to keep in mind that AOMs are not a magic bullet, but simply a tool to help you sustain common-sense lifestyle changes. There is no perfect medication for obesity. A medication that may work for a family member or a friend may not be the ideal medication for you. Treating obesity can be complicated, so it is best to work with a knowledgeable healthcare professional who is dedicated to working with you over the long term.
If you have type 2 diabetes, which occurs when your insulin does not work as well as it should to help cells take in glucose for energy, accompanied by a decrease in production of insulin by your pancreas, you might have been advised that weight loss is an important part of managing the condition. Losing weight means you need to increase your physical activity while also decreasing your calorie intake. This is when the dreaded “diet” enters the picture.

There’s certainly a huge variety of diets, ranging from low-fat to very-low-carbohydrate regimen. So, why don’t all (or some) diets result in weight loss and weight-loss maintenance?

One explanation for the difficulty of keeping weight off may be the challenge of sticking with a diet plan. Telling yourself to eat less and making informed choices with every morsel you choose to eat (or not) is challenging — especially in a country with readily available, highly caloric foods. And when one is bombarded by ads everywhere that make foods look delicious and imply that you can eat and not have to account for calories, that makes dieting even more difficult.

When you’re not able to lose weight, or keep it off if you do lose weight, a crucial factor to consider is the actual make-up of your meal choices, not just total calorie count alone. This is where the concept of the glycemic index of food comes into play.

Just what is the glycemic index and how does it impact you as a patient with diabetes?

The glycemic index (GI) is a relative ranking of carbohydrates in foods according to how they affect blood glucose (sugar) levels. Foods that are low on the glycemic index scale tend to release glucose slowly and steadily, while foods high on the index release glucose more rapidly. This is important to know because if you’re getting too much glucose, it leads to high blood sugar that your body can’t break down quickly enough, which it subsequently stores as fat.

People with type 1 diabetes (the diabetes that results from loss of the ability of the pancreas to produce insulin), as well as some with type 2 diabetes, cannot produce enough insulin or produce and release it fast enough, so they are likely to have high blood glucose after a meal. Although short-acting insulins are relatively fast-acting after injection, they are not as fast as your own body’s ability to produce and get insulin into the body. Thus, you can help better control your blood glucose levels through the slow and steady release of glucose found with low-glycemic-index foods.

Diets with a lower glycemic index and higher protein content tend to improve diet success and weight-loss maintenance compared to those diets with a higher glycemic index. An important note: foods that are close to how they’re found in nature tend to have a lower glycemic index than refined and processed foods.

But the glycemic index is only one part of the equation. To understand a food’s complete effect on blood sugar, you need to know not only how quickly the food you’re eating causes glucose to enter the bloodstream, but also how much glucose it will deliver. This is a separate value called glycemic load.

The glycemic load (GL) gives a more accurate picture of a food’s impact on blood sugar and is determined by multiplying the grams of carbohydrates in a serving of food by the food’s glycemic index, then dividing that number by 100. A glycemic load of 10 or below is considered low, while 20 or above is considered high.

Confused? Let’s look at some examples. You can find the grams of carbohydrate of many foods on the product label, or use many good apps on your phone, tablet or computer to help with this exercise (one good source is CalorieKing.com). Melon, for example, has a glycemic index of 70, but a small, cup-size serving has so few carbohydrates in it that its glycemic load is actually low. On the other hand, orange juice has a glycemic index of 50, but a serving size has more calories and carbohydrates, so it has a slightly high glycemic load of 12. Portion sizes matter too, when you try to decide how a food will affect your blood glucose. Please check out the next page for other examples.

As mentioned earlier, the addition of protein or substitution of carbohydrate with protein could help you feel fuller and give a better sense of satiety. Some now even recommend a small amount of fat to a diet — but be cautious, as one gram of protein and one gram of carbohydrate each contain only 4 calories, while a gram of fat contains 9 calories. Make your choices wisely. And remember, the fat should be a good fat, not saturated fat.

So, if you want to lower your weight as well as achieve better control of your diabetes, in addition to lowering your total daily calories, try:

- More whole grains, nuts, legumes, vegetables without starch, limit ripe fruits
- Fewer foods with a high glycemic index, like potatoes, white rice, and white bread
- Less sugary foods, including candy, cookies, cakes, and sweet drinks
- More foods with slow release of sugars and starches like old-fashioned oats and tart berries

Eat in moderation and be choosy about what you choose to eat.
<table>
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<tr>
<th>Food</th>
<th>Glycemic Index</th>
<th>Serving Size</th>
<th>Glycemic Load Per Serving</th>
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<td>Spinach</td>
<td>0</td>
<td>1 cup</td>
<td>0.0</td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>54</td>
<td>1 cup</td>
<td>12.4</td>
</tr>
<tr>
<td>Tomato</td>
<td>38</td>
<td>123 grams (medium)</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>BEANS and NUTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baked Beans</td>
<td>48</td>
<td>1 cup</td>
<td>18.2</td>
</tr>
<tr>
<td>Chickpeas (boiled)</td>
<td>31</td>
<td>1 cup</td>
<td>11.3</td>
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<tr>
<td>Kidney Beans</td>
<td>27</td>
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</tr>
<tr>
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<td>29</td>
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<tr>
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<tr>
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<tr>
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<td>Plain Yogurt</td>
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<td>1 cup</td>
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<tr>
<td><strong>BAKED GOODS</strong></td>
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<tr>
<td>Bagel</td>
<td>72</td>
<td>89 grams (1/4 inch)</td>
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<td>White Bread</td>
<td>70</td>
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<td>70</td>
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<tr>
<td>Pita Bread</td>
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<tr>
<td>Hamburger Bun</td>
<td>61</td>
<td>30 grams</td>
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<tr>
<td>Brown Rice</td>
<td>50</td>
<td>1 cup</td>
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<td>89</td>
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<td>80</td>
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<tr>
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he world is bigger. Not that the planet itself has grown, but rather, people everywhere weigh more and body shapes and fatness are changing. In fact, the New England Journal of Medicine recently reported that more than 2 billion adults and children globally are overweight or obese, a number that includes obesity in 35 percent of the U.S. adult population. This is a critical problem since these body changes impact health, wellness and lifespan.

The challenge, despite all that has been learned from medical research, is that doctors and other healthcare professionals have not been able to help individuals significantly reverse unhealthy changes in body fat to improve health.

Many people still firmly believe that becoming overweight or obese is a lifestyle choice – faulting the individual for making poor choices in meal content, meal frequency and minimal physical activity. However, science is now clear that obesity is a disease due to interactions between the genes we have inherited, the environment we live in and our behaviors, some elements of which we clearly can change, but some of which we certainly cannot, such as genetics.

As a first step to advance the conversations surrounding excess weight, and because the word “obesity” is so loaded with negative associations, a new term has been developed by endocrinologists who are members of the American Association of Clinical Endocrinologists (AACE) and its educational arm, the American College of Endocrinology (ACE). (Endocrinologists are doctors who specialize in disorders of hormones and their glands and have a very special interest and expertise in problems caused by excess body fat.)

This new term is “Adiposity-Based Chronic Disease,” or ABCD for short. The ABCD term focuses on the parts of the body that contain fat (or “adiposity,” which does not carry the stigma that “obesity” does) and the concept of chronic disease, which means that the condition can be serious, far-reaching and needs to be managed throughout one’s lifetime.

In the proposed model for ABCD, the risk, presence and severity of adiposity complications are presented in three distinct stages:

STAGE 1: The person is carrying extra weight, but has no identifiable health complications from it.

STAGE 2: The person has mild or moderate complications as a result of excess body weight.

STAGE 3: The person has severe complications due to excess weight.

ABCD is not just related to having too much fat in the body, but also having an unhealthy distribution of fat (for example, too much fat in the belly or various organs, such as the liver, muscle, or around the heart), and/or having abnormal fat that produces unhealthy proteins that cause problems with other parts of the body (leading to diabetes, increased blood fats [such as cholesterol], high blood pressure, or heart disease).

So, how should we manage health problems associated with abnormalities in body fat? Let’s review four basic parts of the answer.

First, we have become familiar with the term “obesity” as referring to too much body fat. Scientifically, we define obesity based on the relationship of weight and height. This is known as the “body mass index” or “BMI” and is calculated by first multiplying the height in centimeters by itself (“squaring”) and then dividing this number into the weight in kilograms. (There are 2.54 centimeters in an inch and 2.2 pounds in a kilogram.) Or you can find easy-to-use, automatic BMI calculators on
the internet that allow you to plug in your weight in pounds and your height in inches — EASY! A normal BMI is 18.5 to 24.9, an overweight BMI is 25.0 to 29.9, and an obese BMI is 30 and over.

However, there are problems using these classic definitions:

- People have different body shapes, musculature and genetics. Thus, BMI does not apply to all people in the same way;
- Certain types of body fat (abdominal [or “belly”] fat or fat inside liver or muscle cells) can have negative effects even if the total amount of body fat is normal;
- Some people may have an increased BMI and yet do not have obesity-related problems or complications, and;
- Using the word “obesity” is not acceptable to many people who have a weight problem, and it can have a negative meaning or confer a bad impression of the person, rather than just talking about the amount or effects of fat in the body.

Since ABCD is a chronic disease, it is best addressed by changing lifestyle in a way that lasts a lifetime, not just simply “dieting” to lose weight over a short time only to put it back on again when the diet is over. Lifestyle medicine embraces all the different ways you and your healthcare team can work together to treat chronic disease that do not use medicines or medical procedures such as bariatric surgery.

This does not mean there is no role for medicines or procedures to help with ABCD, but lifestyle change is very important by itself or as an addition to other recommended treatments.

Examples of lifestyle changes to manage ABCD include:

- Proper nutrition – eating foods that are healthy and in such a way that the amounts are just right – not too little and not too much. For weight loss, the meal plan must focus on fewer overall calories;
- Physical activity and strength training – making a special effort every day to move around, exercise, play sports and avoid sitting in one place for too long, either at work or at home;
- Adequate sleep amount and quality – making sure there is enough time (usually about 7 hours) to sleep at night with minimal interruptions or disturbance;
- No tobacco – this includes smoking, chewing, or any other ways tobacco is used;
- Avoiding excessive alcohol – generally less than two drinks a day for men and one drink a day for women, but even less is better;
- Developing a positive attitude and behaviors – focusing on positives in life, reducing stress, and socializing and engaging with family, friends and people in one’s community; and
- Monitoring – keeping track of what is eaten, how much physical activity (such as steps) is done in a day, and setting goals for lifestyle changes to be made, as well as acknowledging the changes that have been made.

To completely manage ABCD will ultimately require that schools, employers, hospitals and governments emphasize and support healthy lifestyles for everyone, from cradle to grave.

The ABCD strategy includes recognition of the negative effects of abnormal adiposity on health — referred to as “complications.” Some of the most important ABCD-related complications include the following:

- Type 2 diabetes mellitus – this is related to problems with the body’s insulin production and insulin action, resulting in higher than normal blood sugars, which in turn potentially affect the function of the kidneys, heart, eyes, brain, nerves and liver;
- Hypertension – when blood pressure is too high, in turn it potentially affects the function of organs such as the heart, kidneys and brain;
- Arthritis – this is when the joints wear down, become inflamed and cause pain. It is no surprise this is worse with increased body weight;
- Depression – feeling sad is a complication in many people with ABCD, and it can be even worse when the person is bothered by their body shape and even teased by others;
- Sleep problems – many people with ABCD have problems breathing at night, a condition called sleep apnea, which decreases the amount and quality of sleep, making them even more tired and even hungrier during the daytime; and
- Additional health problems – ABCD is associated with increased risk for cancer and heart disease.

(Continued on page 12)
Recognizing and treating complications from abnormal adiposity is important. But the key to staying healthy and living a longer and happier life is not just to treat the complications from abnormal adiposity, but to prevent or lessen them.

**Tactics** are how strategies are turned into actions. ABCD tactics ideally should be personalized, taking into account unique individual factors such as family history and health risks, each person’s medical history and medications, likes and dislikes, and even ethnicity and culture. Examples of ABCD tactics proposed by AACE/ACE include the following:

- **Health messaging** – using media and other public service announcements about the importance of comprehensive lifestyle changes and seeing your doctor about ABCD;
- **Education** – informing everyone, including healthcare professionals, employers, government officials, and those in the health care industry and medical insurance industry about ABCD;
- **Programs** – setting up specific activities in schools, workplaces, universities and communities to bring healthy and comprehensive lifestyle change directly to individuals;
- **Individual planning** – to work with your “likes and dislikes” for meal/snack choices, for types of activity and exercise, for support/activity/social groups and other personalized features;
- **Medical research** – to support the need to learn more about how ABCD affects the body and how specific lifestyle changes affect ABCD; and
- **Management protocols** – to develop very specific guidelines, algorithms and other tools to help your doctors and healthcare team deliver the best ABCD care possible, using lifestyle medicine as well as drugs and procedures where appropriate.

AACE and ACE hope that the new **Adiposity-Based Chronic Disease** terminology and ABCD medical care plan will significantly contribute to improving individual health for you and those around you.

For more information about ABCD, health, endocrine care and healthy lifestyle change, visit [www.aace.com](http://www.aace.com) or [www.empoweryourhealth.org](http://www.empoweryourhealth.org).
Free educational resources featuring expert content curated by our own member endocrinologists to further patient understanding of endocrine-related health issues.
It may come as no surprise that Americans love spices. In fact, a recent U.S. Department of Agriculture report revealed that the U.S. imports and consumes more spices than any other nation. While some of this consumption can be attributed to the country’s growing ethnic population, other signs point to more globally adventurous palates and the use of spices to compensate for lower salt and fat levels in foods.

And surprisingly, some spices are associated with less food intake. Select spices not only add extra flavor and aroma to your food, they also heighten senses and can suppress hunger or make you feel full as they may stimulate release of satiety hormones.

And polyphenols present in many aromatic plants used to flavor foods hold antimicrobial effects, changing the gut bacteria or function of the bacteria in nutrient absorption. A practical example of this is the decreased energy from nut calories that result from eating nuts with skins on (typically rich in polyphenols) versus eating the nuts with skins off. Although this produces a modest difference — perhaps a 5-to-15 percent energy difference — this is still a natural approach to decreasing calorie intake.

Below are some examples of spices that may impact weight management.

**Saffron**

Saffron is a very expensive spice that typically is available in what looks like red pieces of thread. These threads are the stamens from *Crocus sativus*, a plant that grows primarily in the Mediterranean region, southwest Asia and southern California. The plant is high-maintenance, and yields have been described as “fickle.” Each flower, which blooms for one week of the year, produces about three stamens, which must be picked by hand. And 150 flowers are needed to produce a single gram of saffron, or about 80,000 flowers to make one pound — which can cost as much as $10,000!

What about its effects on appetite? It appears that this spice might decrease snacking. A randomized controlled trial in which one group had saffron added to their food, while the other did not, specifically targeted snacking. Adding saffron to the diets of 60 overweight women for eight weeks resulted in a significant decrease in snacking frequency and hunger and a trend towards lower body weight (with a mean difference of about 2.5 pounds between the two groups).

A few words of caution are in order. Beyond its cost, there are other precautions to keep in mind when using saffron. Large amounts of saffron can make the uterus contract and might cause a miscarriage, so it should not be ingested by a woman who is pregnant. And not enough is known about
the safety of saffron during breast-feeding, so — again — its use should be avoided if nursing. Saffron can affect mood. It might trigger excitability and impulsive behavior (mania) in people with bipolar disorder, so avoid the spice if you have this condition. And saffron might affect how fast and how strong the heart beats, so it might worsen some heart conditions. Also, taking saffron might make blood pressure become too low in people suffering from low blood pressure. Finally, allergies to any spice can occur, so be cautious when using saffron, even in affordable amounts.

**Chili peppers**
Capsaicinoids are found in chili peppers. In a large review of published studies, intake of capsaicinoids was found to increase energy expenditure (or energy burn) by approximately 50 kilocalories per day. While not a large amount, this by itself could produce significant levels of weight loss over one to two years. A capsaicin-containing breakfast has been reported to significantly reduce study participants’ rating of their hunger and their desire to eat before lunch. In another study questioning feelings of fullness, increased satiety was reported after a capsaicin-rich meal. And interestingly, it has been also been reported that regular intake of chili peppers significantly reduced abdominal fatty tissue levels and reduced appetite and energy intake.

Again, a note of caution: Too much hot pepper can result in nausea, vomiting, abdominal pain, diarrhea and a burning sensation when ingested. It is one of the most food-associated complaints received by poison centers. If you eat enough chili peppers, capsaicin can even kill you. In fact, it is so strong that it is used as a paint stripper and in pepper spray used by police forces.

**Ginger**
Ginger is a member of the same botanical family that includes cardamom and turmeric and has been valued for its aromatic, culinary and medicinal qualities for centuries among many cultures. In regard to its effectiveness as an appetite suppressant, a small study in men suggested that ginger reduced feelings of hunger and also resulted in more calorie burn. While it has been reported to decrease appetite in some studies, and has become a popular tea advertised as a weight-loss agent, it can also stimulate appetite according to other research, so results about this spice’s weight management potential are contradictory. Side effects can include mild heartburn, diarrhea and irritation of the mouth. Because there is a possibility that ginger may affect blood-clotting ability, if you are taking anticoagulants (blood thinners) such as warfarin (Coumadin), discuss the use of ginger with your doctor so your bleeding time can be checked. This effect is seen only with high doses of ginger and not what might be contained in your sushi tray selection, for example.

**Garlic**
Garlic has been used as both food and medicine for thousands of years. During both World Wars, soldiers were given garlic to prevent gangrene. Garlic was also used to prevent infection in skin wounds. Although frequently promoted as a weight-loss food, evidence of its effectiveness remains scant. In one study, it was part of a combination of several spices including chili peppers, ginger and others, so it was unclear if there was any distinct role for garlic itself being beneficial.

Unfortunately, there is no simple answer to whether a specific spice or supplemental food is clearly beneficial to weight loss. And there is sufficient data that suggests that large amounts of these substances can actually be toxic and dangerous to one’s health. While some nutrition studies suggest that making food more spicy can generally decrease appetite and perhaps help decrease food cravings, make sure you use spices in moderation when adding them to your meals.
The problem of obesity, which is defined by having a body
mass index (BMI) – calculated as weight (in kilograms)
divided by height (in meters) squared – equal to or greater
than 30, is increasing around the world. In the U.S. alone,
approximately one-third of the population fit the definition
of being obese.

And age in no way protects from being obese: the obesity
rate is also increasing in adults aged 65 or older, with a
prevalence that is similar to the general population.

Obesity is a major health problem and a well-known risk
factor for type 2 diabetes mellitus, high blood pressure and
high cholesterol, with a resultant decrease in quality of life
as well as life expectancy.

Obesity increases the chance of developing heart disease,
as well as the risk of developing many cancers. Beyond
physical disease, mood disorders are also more likely to be
present in someone who is obese: research studies suggest
that those who are obese are about 25 percent more likely
to have issues such as depression when compared to those
who are not obese. And low self-esteem and self-image are
common in the obese, as is social isolation.

Given the negative impact of obesity in health and quality
of life, weight loss is medically recommended to reverse
the negative impacts. In addition to lifestyle modifications
with diet control and increased physical activity, other
therapeutic options include weight-loss medications (see
story on page 4) and bariatric (weight-loss) surgeries.

What is bariatric surgery?

Bariatric surgery is one of the fastest-growing surgical
procedures performed in the U.S., with an estimated 196,000
operations performed in 2015 alone. There are several
different types of bariatric surgeries available including,
but not limited to:

- **Adjustable gastric band**, in which a band
  containing an inflatable balloon is placed around
  the upper part of the stomach, which creates a small
  stomach pouch above the band, with a very narrow
  opening to the rest of the stomach. The procedure
  is intended to slow consumption of food and thus
  reduce the amount of food consumed.

- **Sleeve gastrectomy** is the most commonly performed
gastric bypass surgery, and involves part of the stomach
being separated and removed from the body, with the
remaining stomach shaped into a tube or sleeve-like structure. Patients are unable to eat as much food, so fewer calories are absorbed into the body.

- **Bypass surgery** is achieved through several different surgical methods. During this type of bariatric surgery, the stomach is divided into two parts, with the outside section of the stomach being removed permanently. Then the GI tract is reconstructed to bypass some of the small intestine, which leads to less absorption of calories and nutrients.

Regardless of the type of procedure used, bariatric surgeries continue to produce greater weight loss and improvement in weight-associated medical conditions when compared to non-surgical interventions.

But in older individuals, concerns regarding the possibility of increased surgery complications have often led to a reluctance on the part of doctors to offer the surgery to those over 65 years of age even though the National Institutes of Health (NIH) removed age limitations on the surgery in 2006. That reluctance, in turn, has resulted in a lack of information regarding the true risks vs. benefits of these surgeries in the elderly.

**When is bariatric surgery indicated in adults, especially the elderly?**

In adults, candidates for bariatric surgery include those with a body mass index (BMI as kg/m2) greater than or equal to 40, or a BMI of 35.0 to 39.9 kg/m2 with at least one additional medical condition present, such as type 2 diabetes mellitus, obstructive sleep apnea (OSA) or high blood pressure. Individuals with a BMI of less than 35 typically require additional criteria for coverage of weight-loss surgery.

For older individuals, guidelines should be clearly followed when weight-loss surgery is being considered. Recommended guidelines typically include:

- Body mass index equal to or greater than 40, with additional medical conditions present, such as: uncontrolled blood sugars in the setting of diabetes mellitus; high blood pressure; high cholesterol; severe to moderate sleep apnea; venous stasis disease, a condition in which there is slow blood flow in the veins, usually from lower leg venous varicosities; and reflux esophagitis, an inflammation that damages the tube running from the throat to the stomach (esophagus).

- BMI 35.0 to 39.9 kg/m2 with more severe conditions such as uncontrolled diabetes despite aggressive medical therapy; severe high blood pressure, despite maximum medical therapy; and moderate to severe sleep apnea.

Thus, given that we tend to have more medical issues and problems as we age, and consequently are at increased risk of complications after surgery, each person considering undergoing weight-loss surgery should be considered individually—both in terms of benefits as well as risks. Understanding which surgery is going to be performed, what to expect during recovery and ongoing follow-up, the amount of weight loss to expect, and what could be the short-term and long-term complications related to the planned procedure should all be discussed with your treatment team, including your surgeon, your surgeon’s support team, your endocrinologist and you endocrinologist’s support team. Make sure that you know who you will be seeing after the procedure, as weight-loss surgery requires lifetime, ongoing medical care.

**What should be expected after surgery?**

As stated previously, there is a lack of information about outcomes of weight-loss surgery in elderly patients as compared to younger patients. In the few studies that exist, younger patients tended to have better results when looking at the impact the surgery had on their health, losing more weight and showing more improvement in specific, weight-loss-associated conditions as well as overall health. However, elderly patients did benefit from the surgery: select studies showed that weight loss and improved health in those older than 55 might be just as good as in younger patients who underwent gastric surgery.

In a study published in 2011, data was culled from more than 48,000 adults in a national registry who had open or laparoscopic bariatric surgery procedures performed between 2005 and 2009. The research found that adults over 65 were not at a significantly greater risk of a major adverse event as compared to those in their 30s and 40s. While seniors were more likely to face longer stays, they did not appear to be at any increased risk of having surgery-associated heart attacks, strokes, or serious infections following their weight-loss surgery.

Thus, age alone should not be an absolute deterrent to bariatric surgery. Indications should be carefully evaluated in the light of routine preoperative tests and discussed with the patients knowing that there are some risks, and that the results might not be as good as they might expect.
Two Founders
Two Companies
One Goal

To improve the health of people living with diabetes

Boehringer Ingelheim and Eli Lilly and Company are committed to researching and developing innovative treatments that make a difference for people affected by diabetes.
In today’s culture, weight can be a sensitive subject, especially for children and teens. The desire to be thin is reaching school-aged children, as girls as young as 6-year-old express concerns about their body image and gaining weight.

Deciding how to approach weight issues with young people deserves careful attention; how you handle the topic can have serious and lifelong implications. Here are some tips for discussing weight with kids, and what to do if a child brings up the topic.

**Encourage open dialogue.** Go ahead and talk with your children about weight and encourage them to share their thoughts and feelings about body image whenever they arise. When children discuss feelings about weight with you, be sure to listen and acknowledge that the feelings are real. If you have had similar experiences, it may help to share them. Explain that people come in all different shapes and sizes and you love your child no matter what.

**Don't make negative comments.** Judging your own body or your child’s can result in lasting detrimental effects to your child’s body image and relationship with food. Set a good example for children in the way you talk about your own body as well as others’. Skip the lure of fad dieting yourself.

**Take action.** Children learn fast, and they learn best by example. Teach children habits that will help keep them healthy for life. In general, if your child is elementary age or younger and you have some weight concerns, don’t talk about it; just start making lifestyle changes as a family. The best thing you can do is make it easy for kids to eat smart and move often. Serve regular, balanced family meals and snacks. Limit the time your child spends watching television or playing video games. Look for ways to spend fun, active time together.

**Avoid the blame game.** Never yell, scream, bribe, threaten or punish children about weight, food or physical activity. If you turn these issues into parent-child battlegrounds, the results can be harmful. Shame, blame and anger are setups for failure. The worse children feel about their weight, the more likely they are to overeat or develop an eating disorder.

**A united front.** As with any other important issue, make sure both parents and other important relatives are on the same page. Mixed messages about weight can have unhealthy consequences.

**Talk with your healthcare provider.** If a health professional mentions a concern about your child’s weight, speak with the professional privately. Discuss specific concerns about your child’s growth pattern and ask for suggestions on making positive changes in your family’s eating habits and activity levels.

**Seek advice.** For kids and teens, check out local programs and professionals who specialize in youth. Look for a registered dietitian nutritionist with a specialty in pediatric weight management. Many hospitals and clinics have comprehensive programs with education and activities for both kids and adult family members. Some of these options may be covered by your health insurance plan.

**Focus on health over weight.** The key is to consider your child’s overall picture of health, not weight. If your family starts eating better and moving more, your children may “grow into” their weight as their height increases. Compliment your children on lifestyle behaviors, such as choosing to play outside over playing video games inside, rather than on the loss of a few pounds.

**What to Do if Your Child Says, "I'm So Fat."**

Learn where the thoughts about feeling fat came from. Did a friend or classmate tease your child about weight? Did another relative mention the size of your child’s belly or thighs? Is your child feeling embarrassed from having snug-fitting clothes? Was there something on television or online about overweight kids? Maybe some sports are difficult for your child, or perhaps they are chosen last for teams. These frustrating and painful issues are common among children of all sizes.

If another child or an adult is bullying your child, confront the situation directly and as soon as possible. If your child’s weight, eating and activity are normal and age-appropriate, reassure your child and don’t focus on weight.

**If Your Child is Overweight**

Weight loss among children can interfere with their growth and negatively impact their body image and relationship with food, so it’s important to work with your pediatrician and a registered dietitian nutritionist. Choose a few specific changes that you can make in your family’s eating and activity habits, then set realistic goals.

Be mindful that every family is different and change occurs slowly, so be patient and remember there is much more to health than weight.

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Editor's Note: In the Fall 2014 issue of EmPower® Magazine, we featured an article about Zeke the Cat, who shared his experiences with diabetes and dispelled some myths and misconceptions about the condition in humans (and animals). Here, LaRue the Dog – with a little help from his human guardians – “talks” about how he helped his dad improve his health following retirement.

Dear Zeke,

I was really impressed by your tale of your journey to better health after developing diabetes, so much so that I’d like to share my own tale with you.

Let me introduce you to Neil. A 62-year-old guy with a great sense of humor, he loves life and his family (that includes me, of course). Before he retired early some eight years ago, he was always very active, stayed in good shape and was pretty happy with his annual physical check-ups. He would regularly share his lab results: HDL cholesterol levels (“h” for “healthy” or good cholesterol) readings in the upper 40s (mg/dL) while the goal level for men would be over 40mg/dL, and LDL cholesterol in the lower 100s mg/dL (LDL is the “bad” cholesterol, “l” for “lousy”). I learned an optimal LDL level goal depends on how many risk factors for heart and blood vessel disease might be present, for example, whether one has had a heart attack previously, whether one smokes and the family’s medical history, among other factors. When factoring in his risk factors, Neil had optimal levels for a man his age.

Then retirement started.

Neil became less active, spending more time around the house and back yard, and less time out and about as he used to do while working. He remained busy, for sure, but not what one could call really “physical.” Oh sure, he did not exactly sit — no way! He repainted the entire interior of our house.
He installed new flooring. He updated all of the cabinet and door hardware throughout the house...and on and on. But he didn't really “move” regularly or consistently.

Work would progress and then there would be a break before the next project, sometimes days, sometimes weeks and sometimes months. His diet was the same as before, but ow wow (bow-wow), his LDL shot into the 150s. When I saw his results, I was pretty alarmed and decided it was time to take action. Since very little else had changed in Neil's life, I figured more and consistent “moving” exercise was the answer!

I started the process by taking Neil for daily walks around the neighborhood. These short walks then turned into longer walks. It was not easy. We would come to a corner, he would look at me and I would have to put my paw down — we weren't done yet! Fortunately, he agreed to keep on walking. More progress was made when our daily walks turned into twice-daily walks. This gave both of us an opportunity to get out and see the always-changing Seattle neighborhoods surrounding us. And, we met a few furry friends along the way...some a bit too friendly, if you ask me (ahem!).

But in Seattle (where we live), with the past year being the rainiest ever recorded in history, there were temptations to stay indoors — oh yes, what temptations! Even though I really, really just wanted to snuggle in my warm and dry pad at times. But, NO. I insisted we get out or else “an accident” would be imminent. At times, I had to drag Neil out — that sure was easier after the new flooring was put in.

I'm proud to share that Neil's LDL cholesterol has dropped back to his previous levels, and I'm ready to take the credit for it. Because of me, I honestly feel that Neil is a happier, healthier and more loving human being. I know his wife Lorena feels that way too. A measure of that fact is that my treat numbers have gone up, but not too much. After all, I have a physique to maintain.

Thanks for listening to my story. Oh, I didn’t introduce myself...I’m LaRue, a let's-go-for-a-walk, exercise-inspiring, rescued-from-the-shelter pooch. And to be completely honest, I think my humans and I make each others’ lives better in our own special ways.

A note from my humans:

Our companion animals play multiple roles in our lives with a direct effect on the health of humans. In the 1980s, after research first showed an association between pet ownership and a very significant decrease in death one year following a heart attack, the value of animals in promoting health has been studied increasingly. For example, a study from Australia showed that pet owners had significantly lower plasma cholesterol and triglyceride levels compared with non-owners.

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A Doggone Prescription for Improved Health

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Additional studies have shown a positive effect in lowering blood pressure. The evidence led the American Heart Association (AHA) to publish this statement in May 2013: “Pet ownership, particularly dog ownership, may be reasonable for reduction in cardiovascular disease risk (CVD).”

The AHA backed up this statement by posting points summarized from multiple studies:

- If you adopted a pet, you were more likely to have lower blood pressure, particularly systolic (the higher number of a blood pressure reading).
- If you owned a pet you were more likely to have lower cholesterol and/or triglyceride (sugar fat) levels.
- If you did not own a companion dog, you were more likely to have diabetes and smoke.
- If you owned a dog, you were more likely to be more physically active.
- If you owned a dog, you were less likely to be obese. The factors for weight management were felt to go beyond the obvious of increased physical activity. Factors such as social encouragement to walk, perhaps even feeling more safety being out walking were felt to play a role in better weight for those sharing their home with a dog.
- And if you owned a dog, you were more likely to have improved mood and emotional well-being, which affects chemical body signals that result in improved blood vessel function and, in turn, results in more appropriate blood pressure and reduced cardiac arrhythmias. Interestingly, in some studies pets showed more positive effects on owners’ health than medication. And independent of the severity of cardiovascular disease, dog ownership in one study decreased the death from a repeat cardiovascular event by about four-fold.

With this very good news, particularly for dog lovers, the potential benefits of pet ownership continue to receive considerable attention. But the American Heart Association adds to their 2013 benefits statement that pet adoption, rescue, or purchase should not be done for the primary purpose of reducing cardiovascular risk.

Before adopting a dog, you should take into consideration many different factors, including time, space and resources, as owning a pet is an important decision that carries many responsibilities. Owning a pet requires feeding, access to fresh water, providing love and attention and much more. Make sure that your lifestyle allows for this. And if you decide a companion pet is an enhancement to your life, consider adopting from rescue organizations, your local shelter or your community’s humane society.
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I officially entered retirement on December 31, 2012 at 11:59 p.m., when I closed my medical office. Having practiced endocrinology for over 40 years, I felt a bit peculiar not heading off to my office every morning. Within a short time, however, I found a new place to do what I have always loved, serving as an endocrinologist at the Gloucester-Mathews Care Clinic in my rural county in Virginia.

One characteristic shared by the patients seen at our clinic is that they have all had very bad luck. They are not eligible for Medicaid in our state and cannot afford health insurance. Eligibility for care is based on income, and patients are rechecked for eligibility every six months.

More than 90 percent of my clinic patients have diabetes. Many have co-existing conditions such as obesity, hypertension, heart disease, stroke and complications of long-standing high blood glucose (blood sugar): nerve, kidney and eye damage. Because of their circumstances, many of the people I see live on “the edge” of serious illness. Hearing stories such as them losing their job because of illness or an accident and then losing health insurance is common. Before finding their way to our clinic, some of our patients with diabetes have not had adequate insulin or other medication for diabetes in over a year. Their blood sugar control is often reflected in their hemoglobin A1C (a measure that reports a person’s average blood sugar in the past three months) of eight or nine or higher when they first come to the clinic for medical treatment; a person with no diabetes would typically show a value of under six. (The American Association of Clinical Endocrinologists considers an A1C level of ≤6.5 percent as optimal if it can be achieved in a safe and affordable manner, but higher targets may be appropriate for certain individuals.)
Keeping Patients Healthy by Managing Costs Creatively

The clinic staff works to lower drug costs for our patients through the pharmaceutical industry’s patient assistance programs, so with a lead time of about six weeks we can obtain many drugs still on patent. The clinic policy is to provide the people we see with as many glucose meter test strips as needed for appropriate testing. This is a great expense for the clinic, but is recognized as a priority.

The clinic is part of what is considered a “safety net” of medical care. Although the administrator of the clinic is skilled in securing grant support for clinic operations, there are still limitations on who can be seen as a patient. A patient may become disqualified from continued clinic eligibility because of even a slight increase in income; for example, a painter who gets a few more jobs during the summer or a house cleaner who adds another customer.

To help with insulin costs, we have had to reacquaint ourselves with NPH (neutral protamine Hagedorn) insulin and regular insulin. These insulin preparations first became available in the 1980s and represented a great advance at that time. Made synthetically, they are much less likely to cause an allergic reaction than insulins derived from the pancreas glands of animals. In my state, NPH and regular insulins can be purchased at pharmacies without a prescription. And although not cheap, their price ranges from $25 to $100 a vial, while newer types of insulin are priced much higher, from about $250 to over $500 for a vial (an average month’s supply).

NPH insulin has an “intermediate” duration of action. It begins to take effect at about two hours and builds to peak activity between four and eight hours. The effect then wears off by 12 to 18 hours. If continuous 24-hour action is required, then two injections of NPH insulin are used, one in the morning (usually before breakfast), and one in the evening at dinnertime or before bedtime. Many diabetes specialists prefer giving the second injection at bedtime to focus the peak effect of the medication on the following morning at breakfast time. This lessens the possibility of a hypoglycemia (low blood sugar) episode during the night when the person is sleeping, which can be very dangerous.

Regular insulin has a “short” duration of action. It is used to manage the glucose increase that occurs at mealtimes and to correct when the glucose is over target. Because the onset of action is in 30 minutes to two hours, regular insulin should be injected 20 to 30 minutes before eating. Peak action occurs at about four hours after injection, and the effect wears off over the next two to four hours. Regular insulin can be mixed in a syringe with NPH insulin. This must be injected immediately after mixing to avoid loss of insulin potency. Our clinic diabetes educators teach our patients how to mix NPH and regular insulin. No other insulin preparations can be mixed.

NPH and regular insulins are also available in a premixed form, 70/30, i.e., 70 percent NPH and 30 percent regular at a price per vial similar to a vial of NPH or regular alone. There is also a premixed 50/50 combination, i.e., 50 percent NPH and 50 percent regular. 50/50 is more expensive than the 70/30 combination.

Two combined injections of NPH and regular insulin can provide 24-hour coverage with insulin action peaks at breakfast, lunch and dinner. One needs to follow a consistent meal schedule to avoid hypoglycemia. This is different than what occurs with the long-acting insulins, such as glargine (Lantus®) and detemir (Levemir®), which do not have a peak action time. When using the long-acting insulins, there is relative freedom to eat at convenient times, covering the nutritional glucose rise with an injection of rapid-acting insulin at mealtime. However, these patients can’t afford to buy any of the long-acting insulins. And when a patient no longer qualifies, I teach them how to make the transition to more affordable insulin before their last visit.

Safety First

The dosage requirements of different insulin preparations are not the same for all people, so it is important to get the advice of your diabetes medical professional when making the change from the newer, and more expensive, insulin preparations to NPH and regular insulin. A larger dose of NPH insulin might be needed to replace one of the long-acting insulins. As with all diabetes care, each person with diabetes needs a personalized care plan. No two people with diabetes have the same requirement for treatment.

Doing well with diabetes requires more than medication alone. We emphasize a healthy lifestyle for all our clinic patients: proper nutrition, regular exercise, weight control and no smoking. Diabetes education and nutritional counseling is provided at our community hospital.

It has given me enormous pleasure to work at the Care Clinic and help patients return to good glucose control and good health. It is a privilege to participate in the care of this deserving and very appreciative group of neighbors with diabetes.
You can become an active participant in protecting your well-being by visiting www.thyroidawareness.com.

The site features in-depth content about thyroid disease risk factors, symptoms and treatment options, as well as downloadable flyers about the range of thyroid conditions.
The incidence of cancer is increasing, particularly some cancers such as melanoma. In response to the evolving need for more effective treatments for these cancers, research into chemotherapy used to treat cancer has accelerated over the past few decades. The result is that now there are many new cancer treatment drug classes. One of these new drug classes, used in the treatment of cancers such as melanoma and certain lung cancers, is known as immune checkpoint inhibitors.

These drugs have shown some spectacular benefits and successes in their use against several cancers, stopping the disease in its tracks and even decreasing the amount of cancer in the body. But like the traditional chemotherapy that has been used in the past, the newer immune checkpoint inhibitors come with the risk of potential side effects.

While more common side effects such as nausea can be present, other potential side effects of this drug class are quite a bit different from what typically has been seen in patients: they include consequences that are specific to the hormonal (endocrine) functions of the body which can be very serious, even life-threatening or permanent.

**What are immune checkpoint inhibitors and how do they work?**

Checkpoint receptors are the body’s way of preventing the immune system from attacking its own cells. When immune cells detect checkpoint receptors on the cell surface, the immune cells are able to identify that cell as “self” and avoid destroying those cells. Cancer cells and tumors have developed the ability to hide from the body’s immune system by placing these checkpoint receptors on their own surface. As a result, the immune system identifies these cancer cells as “self” and avoids destroying them as well.

The development of medications that mimic immune checkpoint inhibitors prevents these cancer cells from tricking the immune system. Immune checkpoint inhibitors (i.e., nivolumab, ipilimumab, pembroluzimab) work by alerting immune cells to attach to the cancer “self” receptors to destroy the cell. Unfortunately, this effect is not limited to the receptors on cancer cells only. Therefore, both normal cells and cancer cells may be destroyed by the immune system.

**What are some of the potential side effects of these medications?**

Many commonly seen side effects of these agents are likely due to the destruction of normal cells and can include skin rashes (dermatitis), irritation of the liver (hepatitis), inflammation of the large and small intestinal tracts (colitis) and inflammation of lung tissue (pneumonitis).

But changes in the body’s endocrine systems, referred to as “endocrine-related complications,” have been found to be fairly common. These changes include the development of new diabetes mellitus, which often responds only to insulin administration; thyroid gland function abnormalities; and pituitary gland function abnormalities.

Unfortunately, it is not clear who is at risk of developing these complications. Studies are being done to find out who might be at higher risk based on blood tests or medical history and, hopefully, identify those requiring closer monitoring for the development of these complications. But as yet, there are scarce clues.

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When Cancer Treatments Affect Endocrine Function
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Figure 1. Immune cells attach to self receptors on self cells and prevent destroying them. Cancer cells that have learned to display these receptors also avoid destruction. Those that do not have these receptors are destroyed by immune cells.

Figure 2. Immune checkpoint inhibitors attach to self receptors on both cancer cells and immune cells. This prevents the cancer cells that display self receptors from tricking the immune cells into thinking they are self cells. By not detecting these "self" receptors, the immune cells destroy the cancer cells.

How can these endocrine complications be avoided?
Since the benefit of cancer control or remission often outweighs the risk of side effects (especially treatable endocrine complications), these cancer therapies — while unique in their possible side-effects — can be lifesaving. Regular blood testing and physical exams can prevent the life-threatening situations that can develop as a result of untreated, unidentified conditions such as diabetes. Informing individuals, their family members and healthcare support team about the possible symptoms can help catch these conditions before they become dangerous.

All patients on these cancer drug treatments should get lab tests done regularly to insure the thyroid and pituitary are not showing any signs of dysfunction and that blood sugars are not elevated. Monitoring can be spaced out to longer intervals after 6 to 12 months on treatment.

What happens if endocrine system side effects occur?
When diabetes develops, insulin is the most appropriate treatment and can prevent a life-threatening condition called diabetic ketoacidosis (DKA) that occurs when your body produces high levels of blood acids called ketones.

Although many patients are apprehensive when faced with the prospect of starting insulin, the often-rapid improvements they experience are an undeniable benefit. Similarly, if thyroid tests show changes in normal hormone levels, treatment with thyroid medication can prevent thyroid-related medical emergencies. If signs of pituitary dysfunction are revealed in lab testing, it is important to start adrenal hormone replacement, then other hormone replacements as needed. Unfortunately, most of the endocrine side-effects will be permanent and require lifelong treatment and monitoring.

While immune checkpoint inhibitors have given many patients with cancer new hope for a longer survival, the side effects are many, and regular monitoring is needed to prevent dangerous conditions. If endocrine-related side effects develop, they are easily treatable with standard medications. Being aware of the symptoms related to these side effects and following up regularly with your healthcare team can help prevent a medical crisis and ensure optimal health.
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