



# What Podiatrists Need to Know About Diabetes and Endocrinology

DPMs can benefit from a deeper dive into this insidious disease.

BY JEAN CHEN-VITULLI DPM, MS AND ANASTASIOS MANESSIS, MD

**J**ean Chen-Vitulli, DPM recently sat down with endocrinologist Anastasios Manassis, MD to discuss clinical issues relevant to podiatrists.

**Chen-Vitulli:** *Dr. Manassis, what do you feel are some important principles of endocrinology a podiatrist should know?*

**Manassis:** Podiatrists should be aware of the pathophysiology of the disease, the actual treatments, and how they work. When all members of the medical team are aware of the actual treatment plan and can explain it to a patient, then the chances of patient adherence to treatment increases.

**Chen-Vitulli:** *If a hospitalized diabetic foot ulcer patient has sepsis, and the blood sugar is over 300, the anesthesiologist wants to cancel the surgery. What is your opinion?*

**Manassis:** When we weigh the risks and benefits of surgery, I would recommend proceeding with the surgery. When the patient has an infected foot ulcer, the risk is that the infection will continue to be a source of sepsis and hyperglycemia. You will first need to get the endocrine team on board right away to control the hyperglycemia pre-op as well as help manage the patient's blood sugars

post-op. The concern with post-operative hyperglycemia is that high blood sugars will prolong the time to full healing of the ulcer. If the blood sugars remain elevated, the damage to the patient will remain and possibly progress, no matter what we do. Getting the blood sugars under control is extremely important in the post-op period.

healthcare appointments, missing medication doses, neglecting healthy eating habits. Diabetes burnout is usually accompanied by increased stress, depression, and anxiety.

**Chen-Vitulli:** *In podiatry, it is not uncommon to encounter stress fractures. What endocrinology disorders should we be concerned about when*

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**Chen-Vitulli:** *In wound care, we sometimes see patients with uncontrolled blood sugar. Aside from referring back to endocrinology for better blood sugar control to decrease the chance of infection and improve the chance of wound closure, how do we recognize diabetes burn-out? What can we do to support this individual with diabetes?*

**Manassis:** Some of the signs of diabetes burnout may be—not checking glucose levels as per the patient's usual frequency, not treating persistent hyperglycemia, not reaching out to the healthcare provider if persistent hypoglycemia or hyperglycemia glucose patterns exist, missing

*an individual is younger, such as a teenager versus an elderly adult?*

**Manassis:** In elder adults, we think about osteoporosis, metabolic bone diseases. When we check for osteoporosis, we compare the patient's hip's and spine's bone mineral density to that of healthy individuals. When we encounter an elderly patient with a stress fracture in the foot, we would assess for osteoporosis as a contributing factor. On the other hand, with teenagers, we consider different factors that may contribute to suboptimal bone density and subsequent stress fracture. As body image comes into play in the teenage years,

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we assess for restricted caloric intake and excessive exercise in an effort to achieve a desired body image. Some female teenagers may also play in competitive sports and be training frequently at a high intensity.

**Chen-Vitulli:** *With the 2121 American Diabetes Association Guidelines, GLP-1 and SGLT-2 are the new emphasis in protecting the heart and kidneys. Even cardiologists are showing interest in the SGLT-2 class of medications for congestive heart failure. Please discuss a little bit more about these two classes of medications.*

**Manassis:** Both classes have become very important in diabetes management because of the benefits they can offer. SGLT-2 and GLP-1 have become second in-line treatment after Metformin. SGLT-2 inhibitors as a class have shown cardiovas-

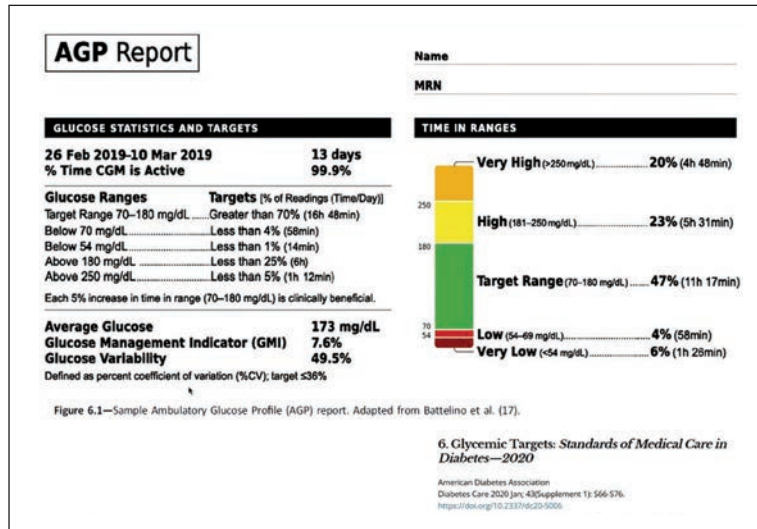


Figure 1: Example of Time in range graph using Continuous Glucose Monitors (CGMs). The green area shows the percentage of time a patient stays in the targeted blood sugar range. Below the green represents percentage of the time the patient is hypoglycemic. Above the green shows the percentage of the time the patient is in hyperglycemia.

cally, you are increasing the patient's life span, possibly by up to 15 years by reducing cardiovascular risks such as heart attack and stroke. Overall, with these two drug classes, we are protecting the heart and kidney from further complications.

**Chen-Vitulli:** *Tell us more about euglycemic ketoacidosis and how it occurs. Should a podiatrist speak to*

high. Therefore, consulting an endocrine team is important to see if the patient needs to be on that class of drugs during the hospitalization.

**Chen-Vitulli:** *Why should a podiatrist not only look at HbA1c but also the time in range principle to understand the control of a person's diabetes?*

**Manassis:** Although HbA1c has been the standard in diabetes care for assessing a patient's glycemic control for the prior three

months, it does have its limitations. The HbA1c does not reveal the extent of a patient's glucose level fluctuations. For example, we can see patients with an HbA1c at goal, but if we were to look at their finger-stick log or continuous glucose monitor (CGM), they may actually be having high variability of glucose levels ranging from hypoglycemic to hyperglycemic levels. These values may average out in the HbA1c and it can appear that the patient is well-controlled when they, in fact, need intervention. Patients who wear a CGM (Figure 1) are receiving a glucose reading every five minutes—that's 288 times per day. Looking at a 14-day snapshot of their glucose readings, a podiatrist can quickly see what percentage of time the patient's glucose readings are in target range—the goal is 70% time in range.

**Chen-Vitulli:** *Do you see stem cells having a role in curing Type 1 diabetes in the future?*

**Manassis:** There's a lot of literature regarding stem cell research and type 1 diabetes. Although I am not entirely familiar with the most recent stem cell therapy for type 1 diabetes, I do believe in stem cell therapy. A key to its success is to be able to prolong the survival of the stem cells in the

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## GLP-1 agonists are a class of drugs that have shown cardiovascular benefits and contribute to satiety, weight loss, and hyperglycemia control.

cular benefits, including cardiovascular reduction and decreased heart failure in hospitalized patients, and recently in trials, they have shown renal protective benefits.

GLP-1 agonists are a class of drugs that have shown cardiovascular benefits and contribute to satiety, weight loss, and hyperglycemia control. This class of drugs can synergistically provide effects such as weight loss, which will not only provide glycemic control, but also alleviate pressure on the cells that produce insulin. This delays the time to the insulin start as well as having a reduced cardiovascular risk. Basi-

*an endocrinologist about having the patient temporarily come off of SGLT-2 inhibitors in both podiatric surgery and treatment of infections?*

**Manassis:** Euglycemic ketoacidosis can occur with the use of SGLT-2 inhibitors. There is a higher incidence of euglycemic ketoacidosis in patients who are taking SGLT-2s. This class of drug causes fatty acid metabolism which contributes to ketoacidosis. A podiatrist should refer the patient to an endocrinologist because SGLT-2 inhibitors cause glucosuria, and sometimes it is very difficult to see if the blood sugar is



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body as well as how the reaction cells work in the body. There needs to be a lot of work to be done on that.

**Chen-Vitulli:** *What can you tell a person living with diabetes re: how to decrease their insulin resistance?*

**Manassis:** There are several ways that a person with diabetes can decrease their insulin resistance. These include: Losing weight (even 5% weight loss can start to make a difference); Increasing physical activity, managing stress levels, getting an adequate 7-8 hours of sleep, decreasing portions of refined carbohydrates and replacing them with high-fiber whole grains, legumes and vegetables; also, consuming less unhealthy fat in the diet. Instead, they should be encouraged to consume a low-fat diet that gets the blood lipids to a healthy level, as

minutes at one time. For example, it can be 10 minutes of walking three times a day. Incorporating strategies such as parking the car further away and climbing stairs instead of taking el-

**Chen-Vitulli:** *Lastly, many podiatrists and primary care physicians have never heard of Type 1.5 diabetes, also known as Latent Autoimmune Diabetes in Adults (LADA). What is*

## For persons with type 2 diabetes who do not require insulin, exercise overall improves glycemic control and most will not experience exercise-induced hyperglycemia.

evators will also help incorporate exercise throughout the day. Taking a walk after a carbohydrate load will decrease the rapid rise in blood sugar as well.

**Chen-Vitulli:** *How do you educate someone with diabetes who is afraid to exercise because they noticed a rise in their blood sugar?*

**Manassis:** People with diabetes who are insulin-dependent would

*LADA? Why should LADA patients be placed on insulin right away?*

**Manassis:** LADA is a form of type 1 diabetes occurring later in life. It is an autoimmune process that slowly makes the patient insulinopenic because the immune system attacks the cells that produce insulin. Patients that typically develop LADA are not obese, are thin, and don't have a family history of type 2 diabetes. These patients typically present as type 1 diabetes in the hospital with DKA. That's why it is important that we diagnose LADA. The extent to which the patient is insulinopenic will determine what medications to start with: whether with basal insulin or no insulin. **PM**

**Authors' Note:** *We want to thank Maria Petruno, RDN, CDN, CDCES a certified diabetes care education specialist at the Endocrine Associates of West Village in New York City for her assistance in this interview.*

## Physical activity of 150 minutes per week (i.e. 30-minute sessions, 5 times a week) is recommended for people with diabetes.

high triglycerides are often associated with insulin resistance. There are also medications such as the SGLT-2s that increase insulin sensitivity.

**Chen-Vitulli:** *How often should a person with diabetes exercise?*

**Manassis:** Generally speaking, physical activity of 150 minutes per week (i.e. 30-minute sessions, 5 times a week) is recommended for people with diabetes. For those who are not routinely active, just walking can provide numerous health benefits including improved glucose control, reducing cardiovascular risk factors, weight reduction, and overall improved well-being.

Doing both aerobic and weight training exercises can help increase insulin sensitivity and promote weight loss. Metabolism is higher for 48 hours post-exercise. Also, research shows that one does not have to do all 30

benefit from a consultation with their endocrinologist and a Certified Diabetes Care and Education Specialist (CDCES) to determine an individualized strategy for preventing exercise-induced hyperglycemia. This will involve assessing the timing of the hyperglycemia and strategy to adjust insulin doses accordingly. Exercise-induced hyperglycemia will vary from person to person and may need continued monitoring and insulin adjustment. For persons with type 2 diabetes who do not require insulin, exercise overall improves glycemic control and most will not experience exercise-induced hyperglycemia.

The same applies to exercise-induced hypoglycemia. Some are advised to carry a snack or glucose tablets. Others also require medication adjustments. By looking at the timing of hypoglycemia, a strategy can be provided to keep the patient safe.



**Dr. Manassis** is an endocrinologist at NYC, and an Assistant Clinical Professor at NYU. He is involved in training endocrinology fellows at NYU and is the Medical Director of the Endocrine Associates of West Village.



**Dr. Chen-Vitulli** is a podiatrist in Fishkill, NY.