

# Nutrition: Diabetes & Other Blood Sugar Disorders - Part 1

Hey, everybody, in this presentation we're going to talk about customizing diet and lifestyle for diabetes and other blood sugar disorders.

Metabolic problems are an epidemic in the industrialized world. In the US, someone dies from diabetes-related causes every 10 seconds. While high blood sugar's more typically the problem, low blood sugar or alternating high and low blood sugar can also be problematic. High and low blood sugar have many causes, including poor diet, lack of physical activity, chronic stress, inadequate sleep, poor gut health, and environmental toxins. Metabolic problems are usually caused by a combination of these factors in our patients.

Let's start by discussing the most common contributor to metabolic disease, and that's diet. The Standard American or Standard British or Standard Industrialized European or Standard Australian Diet—these are all kind of interchangeable at this point—can lead to high glucose levels. These levels can stay high or in those with reactive hypoglycemia cause the excess release of insulin, which causes blood sugar to crash. For those with metabolic issues, a Paleo-type diet is recommended, and most will do better on a lower-carb version of this diet, though that's not always the case. You should have patients monitor their blood sugar at home with a device called a glucometer. These are devices that people with diabetes use to prick their finger, get a drop of blood, and measure their blood sugar. The goal should be attaining the following targets: 140 milligrams per deciliter or lower one hour after a meal and 120 milligrams per deciliter or lower two hours after a meal. This is a really helpful objective way of determining carbohydrate tolerance, so instead of a patient just guessing how much carbohydrate they can tolerate, they can use a glucometer and measure their blood sugar after meals and adjust their carbohydrate intake and see how that affects their blood sugar using the glucometer. And so for example, if they eat a meal that has a large baked potato, and their blood sugar goes up to 180 an hour after a meal, and it does that consistently—we're not just looking for a single reading that's out of range, we're looking for a pattern—then that would suggest that the amount of carbohydrate in that potato is too much for them, and they would reduce accordingly. On the other hand, if they'd been on a really, really low-carb diet and they start to introduce carbohydrates back and they stay within those targets, 140 milligrams per deciliter at one hour and 120 at two hours, then it suggests that they are able to tolerate that amount of carbohydrates, so this is a really, really useful tool. You should know that these glucometers aren't super accurate; they're more for picking up patterns instead of getting precise measurements. One way that you can make them more reliable is you can have the patient get a fasting glucose test at a lab and bring the glucometer in with them, and just before they get their blood drawn to do the lab test, they can prick their finger and get a glucometer reading. Then you'll get the lab test back and you'll see what the difference is between the glucometer and the test, and you can just have them calibrate the glucometer or just mentally add or subtract the appropriate number based on that reading at the lab. That presumes the glucometer returns either

consistently high or consistently low numbers, which isn't always the case, but they're still good for just getting a general idea of what's happening, and that's what we're trying to do here.

Patients should also be encouraged to eat a higher-protein diet. Aim for 20 to 30 percent of calories from protein, probably towards the upper end if blood sugar or weight is a concern, and that would be 125 to 150 grams in a 2,000-calorie diet. High-protein diets have been shown to have a stabilizing effect on blood sugar levels. Now, the caveat or contraindication here would be if the patient already has kidney disease. Higher-protein diets can be an issue for those patients, although protein intake at 25 to 30 percent of calories has never been shown to cause kidney disease if the patient doesn't already have it in the first place, and I've written some articles about this on my blog that we can link to in the resources section.

It's important to focus on gut health in those with metabolic issues, as evidence suggests that poor gut health contributes to metabolic disease. Patients should be assessed for dysbiosis and other digestive system problems like SIBO or pathogens. We'll talk about the diagnosis and treatment of these conditions in another presentation. Patients with metabolic problems should eat fermented foods regularly. They should also focus on getting fermentable fiber in the diet from starchy and non-starchy vegetables. Resistant starch can also be helpful for people with blood sugar issues. That can be obtained from eating cooked and cooled white potatoes. They have to be cooled because the cooling process is what actually forms the resistant starch. Or lentils, if they tolerate lentils, or even cooked and cooled white rice, which will not have the same effect on blood sugar as white rice that's been cooked and not cooled, because it contains this resistant starch. Another option would be green plantains that have been sliced and dehydrated into chips, or now you can purchase green plantain flour or unripe green banana flour or Bob's Red Mill Unmodified Gluten-Free Potato Starch, and that can be used as a supplement. The recommended dose is typically three to four tablespoons per day, but that's much too high of a dose to start with, especially for people with gut issues, because they can react to this pretty strongly—it's a fermentable fiber, so I would start out with something like half a teaspoon. The more serious the gut issues, the lower the dose I would start with, and have them build up very slowly. If patients have high fasting blood sugar in the morning, then I'd recommend them taking resistant starch at night before bed, and I've seen this decrease fasting blood glucose levels by as much as 15 milligrams per deciliter, so it can take someone from being in the diabetic range to the pre-diabetic or the pre-diabetic range to the normal range.

While the diet recommendations remain the same for both high and low blood sugar, the timing of meal intake differs between the two, so with blood sugar, you'd want to make sure that the patient is not snacking in between meals, and you may even want to suggest they try intermittent fasting. We've already talked about intermittent fasting in a separate presentation, so if you need to revisit that, please do.

I mentioned snacking on the last slide. There's several studies that show that eating between meals can worsen blood sugar for people with high blood sugar. If a patient needs to eat a little bit more at meals, especially protein, to reach the protein targets to make up for lost snack calories, that's

fine, but for many patients, snacking is a habit that is more related to stress and psychological or emotional factors and doesn't necessarily come out of an increased need for calories, so you may need to help your patient, to provide HPA axis and stress management support and lifestyle support for your patient to help them address that issue rather than just telling them not to snack, because for many people it's habitual. And then you can encourage them to swap snacks for things like herbal tea, non-caloric things at first to help them get used to not having something to eat.

Those with low blood sugar, on the other hand, often do better eating more frequently throughout the day, sometimes as often as every two to three hours, having a little bit of protein just to keep the blood sugar from dropping too much and keep it balanced. This could look like three regular meals plus a snack in between, or some people prefer to have six smaller meals throughout the day. You can have the patient experiment, see which option works best for them. But each meal or snack should always contain a little bit of protein or fat, never carbohydrate alone, because that can actually exacerbate the problem.

Patients with low blood sugar should also eat within 30 minutes of waking up. This is sometimes difficult for them, because these are the patients that often don't feel hungry in the morning, but after doing this for a few days, they'll tend to not only adjust, but they'll start waking up feeling hungry, and they'll usually feel much better and much more stable throughout the day when they have breakfast early. And then the other thing would be to make sure that their breakfast contains at least 30 grams of protein, as that can really help stabilize their blood sugar throughout the day, and note that eggs, while they're excellent food in general and a source of protein, the amount of protein in a couple of eggs is only about 14 grams, I believe, so that won't reach the 30-gram target; they'd have to add some kind of breakfast meat or eat some fish in addition to the eggs, or steak with the eggs, or just eat fish or meat in general rather than having eggs, in order to meet that target.

Patients who experience low blood sugar may also be having low blood sugar episodes overnight. So if you're doing an intake, and you see something like this where a patient wakes up with a racing heartbeat or feeling anxious or hungry, with their heart pounding and they're wide awake, these are signs of low blood sugar typically. So what can happen is that when blood sugar drops overnight, cortisol is the hormone that is typically recruited to raise blood sugar back to a normal level. It's a glucocorticoid, and that spike of cortisol in the middle of the night can cause these kinds of symptoms, or if the patient has low cortisol, the next hormones that would be recruited to raise blood sugar back up would be the catecholamines, epinephrine and norepinephrine, also called adrenaline and noradrenaline, so obviously if the patient's having an adrenaline surge in the middle of the night, that's going to wake them up with these kinds of symptoms as well. So in these situations, it can be really helpful for patients to eat a snack before bed, within 30 to 60 minutes of going to sleep, and in extreme cases they can even keep a snack by their bed in the event that they're waking up during the night, and again, these snacks should probably have a little bit of protein and fat for the blood sugar-stabilizing effect. Now, if the patient is significantly overweight, this may not be ideal because then they're snacking between meals, and that might

affect their weight in an adverse way, so this can be a tricky situation to deal with, but you have to address it patient by patient.

It's important for all the reasons we just talked about on the last slide to assess patients with low blood sugar for HPA axis dysregulation. This is also known as adrenal fatigue, and in many cases, low blood sugar symptoms are caused by HPA axis dysregulation because of failure of glucocorticoids like cortisol to regulate blood sugar, and improving HPA axis function will help stabilize glucose levels. So we're doing an entire unit, of course, on HPA axis dysregulation in the ADAPT training, and we're going to go into a lot more detail about it there.