

# **The Diabetes Epidemic: Facts, Prevention and Management**

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Thank you very much for inviting me over to speak about diabetes. It is a personal topic to me; in April I was diagnosed with pre-Diabetes. So, I am struggling, like everybody else who has Diabetes or pre-Diabetes in trying to change my lifestyle. It comes from a personal part of my heart to try to emphasize to you how important it is to make these lifestyle changes, so that we can either prevent Diabetes from occurring in the first place; and if we already have it, we want to get the Diabetes under control. The goal for us today: I do have some objectives that I am going to be addressing. The objectives are to balance healthy eating, physical activities; and some people will need to take medication. So, it is important to know how those medications work, and when to take them if you want those medications to work. The objective and the goal is to learn what and how much to eat, how much exercise, and how those medications will work.

You have some resources at your desks. Everybody should have a green book, titled *Type 2 Diabetes*, and you should also have *The Daily Meal Planning Guide*, which is a large white one. Turn to page 2 of your green booklet. It is talking about “What is Diabetes?” Diabetes is a disease that affects insulin. Insulin is the hormone that you need to convert your food into energy; so when you have Diabetes, the food that you eat cannot be used for energy unless you have insulin. Remember how Dr. Nikravan was talking about sugar is not your enemy. You need to eat sugar, and that comes from the carbohydrates, because sugar feeds every single cell of your body. Your brain and you heart need sugar 24-hours a day. So, if you are not heating carbohydrates, you are not getting sugar to your brain or your heart. Those organs are vital for your life, so don’t think sugar is your enemy; it is very important for your body.

When you eat carbohydrates, they turn into glucose, which is just a type of sugar. A tip for you is when you see “ose” on the end of a word – lactose, sucrose, glucose, fructose - they are all forms of

sugar that are necessary for your body. You eat these carbohydrates, they turn into glucose; and at the same time that is happening insulin will open your cells. So this is your heart cells, your brain cells, your kidney cells, your skin cells, the cells in your teeth – every single cell of your body – opens with insulin. So, once a cell is open, the carbohydrates that have turned into sugar go into the blood. From the blood, that sugar has to go inside the cell; and this is where you are going to feel energy. If you have lack of energy, you might be thinking – if you are a male – that you have low testosterone. For males and females, if you have that lack of energy, it might be lack of insulin. Lack of testosterone, or it could be lack of insulin also; because your food does not turn into energy until it gets inside the cell. The whole problem about Diabetes is the blindness, the amputation, the nerve damage, the heart attacks, the strokes – all of those problems happen because there is too much sugar in the blood. So, all the sugar out here in the blood, you want to get most of it into the cell; but that only happens with insulin. Insulin is what opens up your cells. You want to get that food into that cell, and now you have energy.

If I woke up this morning and felt pretty good, energetic, ready to go – I fixed my breakfast, I ate my breakfast, and feel it have to go back to sleep. Now, why did that food not give you energy? Maybe because your food is still out here in the blood. It has to get inside the cell before it turns into energy. Some people have Type 1, Type 2, Pre-Diabetes, and gestational Diabetes. With Type 1 Diabetes you make no insulin at all. The pancreas is the organ that makes insulin, and their pancreas got destroyed by some kind of infection. They had some kind of infection that attacked the pancreas, destroyed it, and now it can no longer make insulin. So people with Type 1 Diabetes, making no insulin, how is this cell going to open? It's not. They have to take an insulin shot that will open the cell, and now their carbohydrates that turn into sugar go inside the cell. The difference between Type 1 and Type 2 is, Type 1 makes no insulin; Type 2, you do make insulin. There are actually two problems in Type 2. You don't make enough insulin, and the insulin you make doesn't work right. This is how your insulin is supposed to work. Pre-Diabetes means you are still making plenty of insulin, but it doesn't work right. This is called insulin resistant. For some reason, the insulin will not open the door. The most common reason that happens is being overweight. Visually you might think maybe there is just too much layers of fat that is blocking the door. So, we know that if you lose a little bit of weight, that door can open up wider and wider. If the door opens wider, it can take in more sugar. If it takes in more sugar, you have more energy. A little bit of weight loss – we're not talking 50 or 100 lbs. We know that 5 – 20 percent weight loss will make your insulin go from this to this, and the more weight you lose, it gets wider, and wider, and wider. You are already making insulin, you just have to make it work the way it's supposed to. Have you heard that Queen Latifa made a commercial

for Weight Watchers? She keeps talking about “I lost 7 percent weight.” Where did she get that from? It has been proven with a 5 to 10 percent weight loss your insulin will work better, and better, and better. It has been proven that with 5 to 10 percent weight loss your blood pressure goes down, your blood sugar goes down, your cholesterol goes down. So, a little bit of weight loss will make a huge difference in your numbers. For example, say you weigh 180 lbs., 10 percent would be 18 lbs.; 5 percent would be 9 lbs. Now does a 9 to 18 lb. weight loss sound reasonable to you? Would you try to lose about 18 lbs.? Start with 9 lbs. So, as practitioners we tend to look at the scale, and then we try to figure out the ideal body weight. Then we might say, “You know what? You need to lose 68 lbs.” “I didn’t gain 68 lbs. overnight; so you want me to lose it how fast?” It’s not practical; and also when it’s not practical, you are going to throw your hands up in the air and say, “Forget it. I just won’t try.”

My brother was told to lose 75 lbs. If he would lose 100 lbs. it would be even better. He looked at me and said, “My cardiologist won’t let me exercise, because I need a heart transplant.” So, in his mind he is saying, “I’m not even going to try.” Well, then you have a hip problem, and the surgeon says, “I’m not going to take you into surgery unless you lose 50 lbs.” Well, he’s walking with 2 canes now; he’s taking all this pain medicine, his value of life has gone down. He walks up the stairs and pretty much stays in his room because it’s going to hurt too much to come back down. So, he has lost his quality of life, and he was forced to try to lose this weight, and he has lost 45 lbs. on his own. Dr. Nikravan and I run the Weight Management Program. Well, when he saw the cost of it, he said, “I can’t do it.” So we just called a Nutritionist, we talked to him about eating healthier, because he still can’t exercise. So just by eating healthier he lost that 45 lbs., and he is going to be able to be scheduled for surgery.

When you lose a little bit of weight it will make a difference. The more carbohydrates you eat, the higher your blood sugar is going to be. So, if you have Diabetes or pre-Diabetes, cut back on how many carbs you are eating. When you cut back on your carbs, you are automatically cutting down on your calories; which means you are going to lose weight.

I want to present you some very simple ways to get that weight down. We’re not looking for an exorbitant weight loss. People with Type 1 make no insulin; people with Type 2 have two problems. Your insulin is not working right, so your body is forced to put out more insulin. That’s not good enough either – more insulin, more insulin, and more insulin. Now after your body has been forced to put out more insulin for about 10 or 20 years, eventually you are going to run out of insulin. So, the second problem is a lack of insulin. So, insulin is not working right, and eventually you are going to run out of insulin. The people with pre-Diabetes, your insulin is not working right; so if you try to lose a little bit of weight you will preserve the insulin that your pancreas has the ability to make.

Gestational Diabetes: What happens to some women during pregnancy? Their insulin doesn't work. This is called insulin resistant. The insulin is not working, but it was the hormone of the pregnancy that caused it. Maybe she was overweight when she got pregnant. That could be a reason why your insulin is not working. But the main reason during pregnancy is because of the hormones. The hormones are working against the insulin. Now, just a few minutes after the baby is born, the placenta is born. The placenta is the problem; that's what was causing her insulin to not work. So, once that placenta is out of the woman's body, her diabetes goes away. It goes away temporarily for most of them. In sixty percent who have diabetes during pregnancy it comes back as Type 2 in 5 to 15 years. How old are your children? And you don't have Type 2? Wow! She has staved off that diabetes. You are almost a picture of health – almost. The reason I said almost is the color of her skin. There are certain ethnic groups that will get diabetes, no matter what. Number one is a Native American. The Pima Indians in New Mexico and Arizona – in one of those states every single Indian has diabetes. It's genetic, it's hereditary, it's in their genes. They can't change their genes, so they are forced to live a healthier lifestyle. And that's what we found in the other state – 20 percent did not have Diabetes. Twenty percent of Pima Indians do not have Diabetes, even though they have the same genetic structure. So what do you think they are doing differently? Diet and exercise – they eat healthier, and they are more active. Most of it is labor intensive, but there is the change. The difference between trying to prevent Diabetes, even though you have the genetic structure, is if you are eating healthy and you are being active, you can prevent Diabetes. That was proven in a Diabetes Prevention Program. You will see the YMCA trying to get the Diabetes Prevention Program in every county – wherever there is a YMCA, instilling that program because we know that we can prevent Diabetes through healthy eating and exercise.

Page 4 talks about the symptoms of Diabetes. With pre-Diabetes we have a chance; this is our time to make those lifestyle changes. Like Dr. Nikravan said, it's not that easy at our age to make those changes. It's not easy, but it's possible. Type 1 makes no insulin. Type 2 is more of the adult-onset; more related to obesity, sleep apnea, smoking. There are a lot of reasons for Type 2. The treatment for all of those types of Diabetes is the same. Today you are going to learn how to eat healthy, and those exercise recommendations. If you have Type 2 or Type 1 Diabetes, you are probably familiar with these symptoms. Let's hope some of you with Type 2 don't know these symptoms. When you have high blood sugar, you are usually very thirsty, you urinate a lot, and you are hungry a lot. Those are the classic symptoms of high blood sugar. Some people say to me, "I urinate a lot, but I drink a lot." Who in here really drinks 8 glasses of water a day? Are you doing it because you heard that it is healthy to do that, or are you guys really thirsty? Not thirsty, so hopefully you are purposely drinking those 64

ounces of fluid a day. But if you are thirsty, and are still thirsty, you drink another one. I have patients who drink gallons; I fill up their water pitcher, and they don't pour it into a glass, they just drink it right out of the pitcher, and then they wanted more. That should be a red flag to me. Why are you drinking so much? If the sugar doesn't get inside this cell, it will dehydrate. So, the cells are drying up. That's why you get that thirst mechanism. You get thirsty, because your body is trying to tell you "My cells did not get the sugar inside; I'm now shriveling up. You better drink some more, so I can get some more fluid inside." Really the problem is sugar did not get inside the cell; so you are thirsty – you are dehydrating your cells. Everything that goes in has to come out. You drink more fluid, you're going to urinate more; that makes sense. But why you are drinking so much in the first place, is the question you need to ask yourself. Then the hunger – why are you getting so hungry? It's not your stomach that is hungry – you just finished eating. But if the food didn't get inside here, it's your cells talking, "Feed me!" because it didn't get inside the cell. Remember, only insulin opens up cells.

Symptoms: Do not rely on your symptoms. By the time you have symptoms – you are thirsty, you are urinating a lot, you are hungry all the time – your blood sugar is way too high. So, if you are having symptoms, that's a danger sign. It is too high. So, I don't want you to wait until you are thirsty and urinating a lot before you run to the doctor. But if you feel those symptoms, definitely get your blood sugar checked, because that's an easy way for us to tell if it is blood sugar related.

Numbness and tingling, slow healing of wounds are all symptoms that the blood sugar is too high. Why do you heal slowly? If the blood sugar is above 180, the white blood cells that fight infection are numb; they don't work when your blood sugar is too high. That's why people who have Diabetes, and they get an infection – whether it's a cut on their finger, or they get a cold or pneumonia – tend to be sicker longer; because the body cannot fight that infection if the blood sugar is too high.

What are normal blood sugars? Normal fasting blood sugar is less than 100. So when you wake up in the morning, your blood sugar should be less than 100. If you just finished eating a meal within a couple of hours, it should be less than 130. So, if you don't have diabetes, and if your insulin is working right, you can eat 5 lbs. of candy; you can eat 10 lbs. of candy, and your blood sugar will still be normal. It's insulin that puts that sugar into the cell.

Now, if you have pre-Diabetes, how do we diagnose it? Diabetes, which is a fasting blood sugar of 126 or higher, and normal is less than 100. So if your blood sugar is between 100 and 125, you have pre-Diabetes. Remember, with pre-Diabetes, this is your time to make some changes in your lifestyle, and you can reverse this process. So, if your blood sugars are 125 or lower, but above 100, change your lifestyle; you can reverse this. So actually in pre-Diabetes it's like you are on the onramp to Diabetes. So, you don't want to get on the Diabetes highway – you want to get off. But I tell you, it

is tough work when you take discipline to try to make those lifestyle changes; and I will show you that today. There are some people who have normal blood sugars, but they have Type 2 Diabetes, or they are Type 1. It doesn't mean their Diabetes went away; it just means they are managing their Diabetes very, very well; and it is tough to do. I failed to mention that Type 1s tend to be skinny. Well, one of the reasons why is if your sugar doesn't get in the cell, you urinate it out. Remember in the old days you could check your urine to see how much sugar was in there? If that sugar is in the urine, it didn't stay in their body, that's calories that went out. That's the main reason they are skinny. We put them on the right amount of insulin, and all that sugar goes in here. Now they are holding on to the calories and they tend to gain weight. So, a lot of people think, "I'm not going on insulin because I'll gain weight. It makes me fat." Insulin is not the problem; it's that insulin finally put your food in the cell. It's allowing your body to hold on to those calories, instead of urinating them out. Insulin doesn't make you fat, but now if you hold on to your calories, you're going to gain weight. So you have to change the way you are eating. Before they could eat anything they wanted, and it just went into the toilet; now it stays in their body. Another reason why they are skinny: Most of us went back there and just started eating, and didn't think anything about it. Carbohydrates turn into sugar, so somebody that has Type 1 Diabetes has to figure out how many carbohydrates is in that bar; and then how much insulin do I have to take to eat that bar. See all the math and thinking they have to go through. And then they have to physically go take a shot. The rest of us just picked it up and didn't think anything about it. So, if I want to eat the S'mores thing back there, I have to figure out how many carbs, how much insulin, take a shot. You know what - never mind; I don't want to eat it anyway. So they tend to put it down; less calories going into their body. So there are less calories going into their body. So there are some reasons why they tend to be thinner.

The natural progression of Diabetes: Now you might notice here is the fasting blood sugar: 126. The blood sugar is going up. Here is where you get diagnosed with Diabetes. Notice how about 10 years before the Diabetes diagnosis, your blood sugar already started going up. If you have the same physician, or if you have access to your blood work, look back about 10 years ago, and see if it was 102, 110 – if seems like every year you go back to the doctor that blood sugar keeps creeping up, this is what's happening. The blood sugar is starting to go up about 10 years before diagnosis. What you also find here is here's that insulin resistance. Your insulin is not working, and that's happening about 10 years – maybe 15 – before you get Diabetes that insulin already is not working right. Here you see the insulin secretion is going down. You are running out of insulin. Lots of times you can look at your blood work. If your doctor told you 10 years ago you had a little touch of sugar – they used to call it borderline Diabetes. We don't say borderline any more, because when we said borderline Diabetes,

you said, “Thank God! I don’t have Diabetes yet!” So to you that meant that I don’t have to diet and exercise yet. “I’m going to wait until I have Diabetes.” Now we need to be more proactive. Let’s not wait until we have Diabetes. Let’s try to prevent it.

There are other things that lead up to Diabetes that you may not even be aware of. My son was only 15 years old – he is now 22 – when he was diagnosed with pre-Diabetes. He couldn’t understand it; my husband couldn’t understand it, because he had normal blood sugar. Even today he still has normal blood sugar. So, how come they are telling him he has pre-Diabetes? If your good cholesterol is below 40, and your triglycerides are above 150. – and that’s cholesterol stuff – you already know your insulin is not working. So, my son has tried to change his lifestyle, and we were lucky; he was 15 years old, and we were able to modify what he was eating. We got rid of the juice; we got rid of the soda. He still has cookies and candy in the house, but we don’t buy the 5 lb. bag of candy at Costco anymore. Now what the rule is, if you want candy, 7-11 is right over there. You can walk over and get it; because if it is in your home, it’s too easy to just pick it up and eat it.

There are other things that can lead to Diabetes, not just blood sugar. Cholesterol is a factor, smoking is a risk factor for Diabetes. I have been working with the CDC for about 5 years now. We have some evidence that suggests that second-hand smoke and third-hand smoke makes your insulin not work. If you are smoking, your insulin is not working. If you are breathing in second-hand smoke or breathing in third-hand smoke – third-hand smoke is what is on clothes and on your hair – your insulin may not be working. The reason you haven’t heard that yet from the CDC is we don’t have enough scientific evidence to support that. But, we are seeing a lot of data on that. We have a little bit of headway there. Second-hand smoke, third-hand smoke is a possibility; but definitely smoking. If you are smoking, your insulin is not working.

As of today, there are 24 million people in the United States with Diabetes; not pre-Diabetes. There are something like 14 million who don’t even know they have Diabetes. Because they don’t go to the doctor, their blood sugar hasn’t been checked. The prevalence is increasing, so the time is now to make some changes, so that we can live healthier lifestyles. We are living longer. My parents lived into their 90s. I don’t want to live into my 90s if I’m going to have Diabetes and high cholesterol, hypertension, osteoporosis – all these different medical conditions. Most of those occur because of our weight.

I forgot to mention about the other ethnic groups. Pima Indians are number 1. African Americans are number 2. Hispanic Americans are number 3; and the Asians are number 4. I try to keep it simple. All of those ethnic groups have a little bit of color in their skin. If you have some color in your skin, you have a very high risk of getting Diabetes. Now the Caucasians do a good job. You drop

to number 10. Well, that's where the Asians were. This is not a race we want to win. We want to be down there. We want to be number 10, number 20; not number 4. The Asians in the room may not look overweight, because we hide our fat really well. Most people have a lot of subcutaneous fat around here. This is subcutaneous fat, and this is only one pound. Asians have a different kind of fat, called visceral fat – it is internal around our hearts, around our organs. It is strangling all of our organs. So, Asians have to be even thinner than Caucasians, because we're just hiding our fat. We still have a problem of being overweight – we just can't tell it.

These are the complications that can happen from Diabetes. This is why we all cry or get upset when we get diagnosed with Diabetes. If you take care of your Diabetes, none of this will happen. There is the Joslyn Clinic back East that has a group of people who have had Type 1 Diabetes for 50 years, and have had none of these complications. They are not blind; they do not have nerve damage; they haven't had a heart attack or stroke; their kidneys are working normally; everything is working normally because they kept their blood sugars pretty much in the normal range. That amazes me; because what did we have 50 years ago for Diabetes? Beef insulin; that's it. That's all we had 50 years ago. We didn't have all these pills; we didn't have pig insulin; we didn't have human insulin. So, to me it is amazing that these people made so many changes in their lifestyle that they can keep a normal blood sugar. You might hear that Diabetes is the leading cause of blindness. Is that true or false? You probably think it is true. Think of those people who have had Diabetes for 50 years. They don't have blindness. So, the truth is uncontrolled Diabetes is the major cause of new cases of blindness.

Let's turn to page 5. How are we going to prevent these health problems? Heart disease is the leading cause of death in people with Diabetes. I like to use a lot of visual things, because it helps you to understand. When the sugar is in your blood, it is going to stick to the red blood cells. The red blood cell lives for 100 days. Think about that red blood cell for 3 months. It is getting coated with a lot of sugar. If you have normal blood sugars, your blood moves very, very fast. See how fast your blood moves when you have normal blood sugars. But after 3 months that same blood cell is getting coated with sugar. Now look how slow that blood is moving. Your blood is not thick; it's just that all those cells are coated with so much sugar that it is heavy now. Your poor heart is trying to pump through a blood vessel that is about as thin as your hair. Now can you see why your blood pressure goes up when you have high blood sugar? Your poor heart is working pretty hard. So if that blood is not moving, it's going to clot. The most common cause of a heart attack or stroke is a blood clot.

Smoking will damage the capillaries – tiny, tiny blood vessels. So if they are all blocked up, the blood can't get through there, and it's going to clot. If we talk about the lipids, you can see the cholesterol buildup in your arteries. As the cholesterol builds up, you can't get much blood through

that little tiny opening. Then again you have some blockages that can slow down that blood, and then it will clot.

Eye Problems: Anybody can get cataracts and glaucoma. But when your circulation is moving slowly, they tend to happen faster in people who have Diabetes. The retinopathy is specific to Diabetes, and the retina is at the back of your eye. Your eye is round and filled with fluid. At the back is the retina, and light has to bounce off of this retina for you to see. Your retina is like a camera lens. But if those blood vessels in the retina break and now this is all full of blood, how is that light going to go through the blood? It doesn't. So, light can't penetrate through the blood; so in essence, you are blind. The good news is laser surgery will cauterize a bleeding blood vessel. Once we stop the bleeding, and take the blood out, now the light can get back to your retina again, and you can see again. If there is hemorrhaging in the retina, laser surgery will correct the problem, and you can see again. The problem with the laser is it leaves scar tissue. Once your retina is full of scar tissue, that's it. No more laser surgery for you. That laser surgery is very different from Lasik Lasik is when they are trying to correct your vision. Retinopathy is a different kind of laser surgery. You should have a dilated eye exam annually. We can't see your retina unless we dilate the pupils. When you get those drops put in your eyes, they give you the dark glasses so you can see better. Everything is still blurry because when you look into the light your pupil is going to close up. The eye doctor is shining that bright light in your eye, and we have to dilate your pupils so they stay open for the doctor to see the back of your eye. The nice thing is, at St. Jude we purchased a retinal imaging machine, so it will take a picture of your retina, and we don't have to use those eye drops any more. That's a nice feature.

Kidneys: The kidneys remove the waste products from your body, so anything we put into our body, it will use what it needs; what it doesn't need, the kidneys will get rid of. You have to have good working kidneys. High blood sugars and high blood pressure can damage those kidneys. So, if the kidneys aren't working, they can't get rid of those waste products that are poisonous to us. Thus, dialysis will do it. I don't want to get on dialysis; I want to protect my kidneys. How you do that is keep your blood pressure under control and your blood sugar under control. There is a very simple urine test that we can do once a year to see if there is too much protein in your urine. If there is, that's a very early, early sign that the kidneys are being damaged. So, if we catch it early, we can reverse that damage with medication. Keep the blood sugars under control.

Nerve damage: Some people will have numbness and tingling in their hands and feet, as if they fell asleep, or they feel like they are burning, or it's numb. That is too much sugar irritating the nerves, and it is very painful. Once that blood sugar comes down, there is no more sugar irritating the nerves,

and the symptoms go away. But if you keep that blood sugar up, the damage will be permanent. So, we want to make sure that everybody is aware of the symptoms, so they can relate it to their Diabetes.

Insulin resistance: “My doctor says I have insulin resistance.” What’s that? It means I don’t want to take insulin. People don’t want to take insulin. The main thing is it is a shot. But the needles are so short, so sharp, it is virtually painless. When I’m teaching insulin, if you were afraid to do it, I’ll do it with you. Am I crazy to give myself a shot if it hurts? The point is if they are going on insulin, they have to take that shot; and if it helps that I do it with them – of course, I can’t give myself a shot of insulin; I give myself a shot of salt water, which is already in my body. But the shot is not a big deal any more. It comes in a pen, so we don’t have to use syringes and all that stuff. We dial it; I need 10 units, I dial it up to 10. Woops, I dialed 12; I better turn it back down. So it is so easy to do now. There is not a whole lot of insulin resistance any more, as far as not wanting to take the insulin.

Page 6 and 7 is talking about the medication for Diabetes. Most of them are for Type 2 and pre-Diabetes. We now use Metformin. Metformin works on the liver. It is the American Diabetes Association consensus statement: Start Metformin in pre-Diabetes. Here’s the reason why: remember how I said your heart and brain need sugar all the time – 24 hours a day your heart and brain need sugar? What if you are asleep? How does your heart and brain get sugar – your’re not eating; you’re sleeping? So your heart and brain will get the sugar they need not from eating; it will come from the liver. So, rest assured, if you are not eating, your liver is going to feed your heart and your brain. But here’s the problem: when your insulin doesn’t work right, your liver doesn’t work right either. Is your liver going to give your heart and brain the sugar it needs? Yes it will; and in fact the heart and the brain are the only cells that don’t need insulin to get the sugar in. Let’s say, in Type 1 Diabetes, how is sugar going to get in your heart and your brain – they don’t make insulin? God was very smart – get that sugar into the heart and the brain, don’t rely on insulin; but those are the only two organs that don’t require insulin to open them up. So, what will happen is the liver will give you the sugar you need, but it will give you too much sugar. Now you see the picture of how these numbers are starting to go in the wrong direction; they are not communicating very well. Those of you who already have Type 1 or Type 2, have you noticed when you wake up in the morning that your blood sugar is higher than it was last night? And then your family says, “You must have eaten a snack last night, and you didn’t know it. Otherwise, why is your sugar higher this morning?” The liver gave you too much sugar. So Metformin tells the liver to stop making too much sugar. The best way for Metformin to work is at the beginning of the meal, because when you take Metformin, the liver will stop making sugar. If you are already eating, do you need the liver to feed you too? No. Shut it off. So take that Metformin at the beginning of the meal, so the liver will stop making sugar while you are eating. Some people take

Metformin once a day in the morning; some will take it at night; some will take it morning and night. It all depends on those blood sugars. But the main reason for Metformin is it will shut off the liver from making excess sugar. It also causes a little bit of weight loss, but there is a really bad side effect - gas, bloating and diarrhea. But it is temporary. Part of your weight loss is because you are having diarrhea; but it should go away in about 2-4 weeks. Let your intestines get used to it. So if your doctor puts you on Metformin, "1 tablet per day, and I'll see you next month;" next month he puts you on 2 tablets a day, "I'll see you next month." He puts you on 3 tablets a day, and you're thinking, "Am I getting worse each month?" No, we're just trying to prevent more diarrhea. Your body has to get used to it. That's why we gradually increase your Metformin. Metformin also protects the heart, and there is a direct link between Diabetes and heart disease. Ruby and I worked together at St. Jude's for many, many years, and guess what our unit was called; The Cardiac Metabolic Unit, because there was a direct correlation between heart and Diabetes. Glimepiride, Glipizide all tell the pancreas to make more insulin. Now, if your pancreas isn't working, such as in Type 1, the pills won't work for you. So these pills tell the pancreas to make more insulin; and in 30 minutes you have more insulin. In 30 minutes this is what your cell looks like. You better be eating in 30 minutes, because once that cell is open, it is going to take all that sugar in the blood, put it in here, and if there is no more food coming down the pike, you are going to get too low on your blood sugar. With too low blood sugar you start shaking, sweating, your heart starts beating really fast, because adrenalin noticed it is getting way too low. Adrenalin gets kicked out - and guess what adrenalin does to your blood sugar. It makes it go up. Your body is trying to help you. Now that shaking thing, if there is not enough sugar in the brain, it turns into a seizure. People who have had low blood sugar intuitively, without even checking their blood sugar - know they need sugar. I need candy. It is an emergency, so give it to them. The amount of sugar they take is very important. Actos and Avandia make your insulin work better, specifically on the muscles. The muscle cells store your sugar. This is what the athletes do. Michael Phelps eats 10,000 calories a day. Why does he eat that much? Because he burns it all off. Really what we mean by burning it off is it is going in his cells. He doesn't have Diabetes either. People who have normal working insulin, all that extra food they eat gets stored as glycogen in the muscles. But the muscle cells don't want to open. The muscles use this too. So guess what opens these muscle cells naturally? Exercise. Exercise is the natural way to "open up that cell. So I tell my patients, "I'm not giving you free rein to cheat on your diet, but if in case you do eat more carbohydrates than you should have eaten, you had better exercise. Get that cell open, so once that food turns into sugar, it can go in the cell." Into the muscle cells? It's not going to happen that easily, because the muscles do this. But exercise will open it up, and so will Actos and Avandia. So Actos and Avandia make the muscles use

the insulin better, but it costs \$160 a month, if your insurance doesn't cover it. It causes weight gain; fluid retention. So, if you have congestive heart failure, you can't take these medicines. Who wants to exercise to open up their muscle cells, and who wants to take Actos and Avandia at \$160? The medicines have more uses than opening up the cell. They actually protect your heart. But if for some reason you can't take Actos and Avandia, you have to exercise to get those muscle cells open.

New Medication: It's only been out a year or a year-and-a-half is called Januvia. There is a hormone down here in our small intestine that tells our liver to make the right amount of sugar – don't make too much. It tells the pancreas make the right amount of insulin, but not too much. It tells the digestive system to slow down how fast that carbohydrate turns into sugar; and that hormone also tells your brain, which is your satiety center, to stop eating; that's enough, you've had enough to eat, stop eating. It is a hormone down here in our small intestine called GLP-1 that does that. When you are developing Diabetes, or already have it, you are very low in that hormone. So, it is not all our fault that we keep eating. If we don't have that hormone tell us to stop eating, we're going to keep on eating. There is an enzyme that breaks down GLP-1, and Januvia is the medicine that helps to prevent you from losing that hormone. Let's say you have already lost the hormone; now you have to take Byetta. Byetta is the synthetic of that hormone. It is a shot, but there are people knocking on the door. "I want on Byetta." Why? Right now it's only FDA approved for Diabetes, because it tells the liver to stop making sugar, too much sugar; it tells the pancreas to make the right amount of insulin, slow down how fast that food is going to turn into sugar, and tells me to stop eating. Byetta causes weight loss – a lot of weight loss. So they get their Diabetes under better control, they're losing that weight, the needle is ¼ of an inch. I can't see the needle with my glasses on, it's that tiny; and it is very, very sharp. You barely feel it at all. It is not painful. You feel the needle going in, but it doesn't hurt. It's another shot, but I'll do it with you. It really does help. I had one man – see the man always loses more weight – 40 lb. weight loss in 4 months on Byetta. So, it really is a great medication, but here's the thing: it does prevent you from losing that GLP-1 in the first place, and insulin – if your body is not making any more insulin or not enough, you have to take an insulin shot.

As they say, when life gives you lemons, make lemonade. So, when we're told that we have pre-Diabetes or Diabetes, we can either sit down and do nothing about it, or you can learn more about this disease and try to take care of it by learning how to eat, how to move a little bit more.

Speaking of healthy eating, let's look at pages 8 through 11. They talk about healthy eating. Sugar is not your enemy. It will feed every single cell of your body. Your body prefers to get its energy from sugar, and that comes from a carbohydrate. I'm not going to take away any food, but we're going to cut down, because we live in an affluent society. We have plenty of food here, and we eat a lot, but

we don't exercise a lot. Our weight comes from how many calories we are eating, and how much are we exercising out. I had to laugh at my own self, because I realize I do eat 3 meals a day, usually 2 -3 meals a day. Do I exercise every day? No. So, am I going to have a weight problem? Yes. I chose my clothes very carefully. Plus, I'm Asian – you can't see my fat anyway. But you know, I don't exercise every day. So am I going to gain weight? Yes. I'm eating every day, but I'm not exercising every day. If there is only one thing that you get out of this lecture, it is to exercise every day. People that exercise every day can get away with more calories. So if you can't exercise – physically you can't exercise, then don't eat that much. You don't need to eat that much; and you're going to see your body doesn't need that much. The divided plate method. I want you to start thinking of the paper plate. I'm just amazed that somebody marketed the divided paper plate as the Idaho Plate, and they are making millions of dollars off of that plate. All they decided to do was help make sure that people know that a 4<sup>th</sup> of your plate should be starch. Are you visualizing the divided plate? One fourth of your plate should have starch, a fourth of your plate should have protein, and the other half of the plate should be non-starchy vegetables. Does that look like quite a bit of food? Yes. This is a healthy plate – a little bit of starch, a little bit of protein, lots of fruits and vegetables. The colorful colors tell you that it has vitamins and minerals. You want your food to be colorful, because then you know that you are getting the nutrients that your body needs.

I talked about the 64 oz. of water already. Or it could be non-caloric fluid. Dr. Nikravan and I run the Healthy Concepts Weight Management Program, and we've noticed that people are drinking Crystal Light, diet soda, ice tea as opposed to water. The ones that are drinking water are losing more weight. We are not quite sure what it is – there are no calories in diet soda, so why aren't they losing as much weight? We're not quite sure. That's just something we are seeing in the program. We have only had our weight program a year in April. That's what we tend to see – those that are drinking pure water are losing more weight than those who are drinking the diet sodas. Your urine is a really easy way to tell if you are dehydrated. If your urine is yellow, you are either taking some vitamins, or you are dehydrated. So, if you are not taking any vitamins, and your urine is yellow, or like an amber color, you need to drink more water. Your urine should look like water with a little hint of yellow. Why does the last bullet point say “wait 20 minutes?” It takes 20 minutes for your stomach to recognize it is full. It takes 20 minutes for that brain to get the message that you are full. If you are wolfing down your food in 5 or 10 minutes like us nurses used to do, afterwards if you haven't been eating for 20 minutes, you're going to be hungry. You wolfed it all down in 5 or 10 minutes and what's your brain saying? Feed me; I'm hungry. Because it will take 20 minutes for it to get up here to say stop eating. If you don't have GLP-1, are you getting the message? No. So, slow down.

Page 9, Eating on the Run: Avoid it if it says “jumbo, super-sized, fried, creamy dressing.”

These are all some buzz words. And if it says, “batter-dipped,” they’re going to fry it. Do you think they are using olive oil to fry it? When you are choosing your meat, look for lean meats. All that white marbling, that’s saturated fat. The skin on the chicken, fat saturated pork skin – I don’t care what kind of skin it is, it’s saturated fats plugging up your arteries. It tastes really good. So the key is, if it tastes really good, you probably better limit how much you are eating of that. Be very careful with Chinese Chicken Salad. You’re thinking, salad, chicken salad. Okay, it’s the dressing and the fried wontons in it. That’s the culprit. So if you can get rid of the fried wontons, that would be good. The dressing is loaded with sugar. It’s got honey and molasses. I buy the Chinese Chicken Salad at Costco all the time, but I trick my family. Fibre. Fibre is very important. That’s a whole different class. Fiber cleans out your colon, lowers your blood sugar, lowers your cholesterol. Fiber doesn’t taste that good though. So I bought the Fiber One cereal. Have you ever used that? It kind of looks like twigs – really sweet cardboard is what it tastes like. We’re kind of frugal, and I thought, what am I going to do with it? I had the Costco salad, and to this day I throw away the wonton noodles and put in Fiber One. My husband figured it out, and he said, “Ooo, nice try. This is the Fiber One cereal, isn’t it?” I said, “Yeah, but don’t tell anybody else, because they are eating it.” Now, because the Fiber One cereal is so sweet, I didn’t use all the dressing. So just by making some simple changes you make a meal healthier.

All cheese is high fat, so limit your pizza. Why do you think Bambi got you string cheese? It has fat, but it’s the lowest out of all your cheeses. Mozzarella cheese is the lowest in fat, unless of course you are using Alpine Lace. That’s even better, but the best choice for cheese is mozzarella.

Smart shoppers on page 10, talks about the healthier food choices to make. I’m going to go through this fast, because I want to go to some hands-on what to eat. I love to salsa; it’s the chips I miss. What are they doing? They are dancing. They are moving their muscles, so while they are dancing it is good. If you plan to eat more than what you are supposed to, I personally exercise first, because my cells are already open. When the spaghetti turned into sugar, it went in here. Instead of if I exercise afterwards, I won’t do it. None of us will; so if we exercise first, then we can be a little bit more liberal with what we are eating.

Exercise: Exercise, I mentioned, opens the cells, so that’s how it lowers your blood sugar.

When we say your blood sugar is going down, what we really mean is it is going down in the blood because it is going in here. This is where you want it to be. You want the sugar in there. Exercise also increases your good cholesterol; and those of you with Diabetes look at your blood work – your HDL is probably under 40. Going back to my son, his was only 28. Now why would a young kid, who plays every sport every single day, have such a low HDL? It’s genetic. So you say he’s kind of doomed. So

what are you going to do, sit on your butt and do nothing? No! We have to keep trying to make our lifestyle as healthy as can be. Exercise lowers the blood sugar, increases your good cholesterol, and burns off some of that fat; so you are automatically going to lose some weight. How much exercise should you do? The American Heart Association, American Dietetic, Diabetes, National Educational Program for Diabetes and Cholesterol – everybody recommends that adults do 30 minutes daily. Children should do 60 minutes daily. I do have asthma, so 30 minutes of exercise is a little hard on my lungs. It was proven in a clinical trial that if you exercise 10 minutes 3 times a day it actually lowers the blood sugar and triglycerides better than 30 minutes in a row. I didn't get to see the whole study, but my guess would be if you only have 10 minutes to exercise, like let's say on your morning break, you're moving kind of fast. You walk 5 minutes this way, turn around; walk 5 minutes going back, and we're done. There's your ten minutes. What we try to practice is to walk for 10 minutes before breakfast, lunch and dinner; or after breakfast, lunch and dinner. If you are working – your morning break. You need a cup of coffee? Take that coffee with you and do that walking. Walk and talk, get out. We're all vitamin deficient now because we've been using sun block for so long. Get out in the sun for 5 or 10 minutes to do your walking. Break down your exercise into a time frame that works for your body. Try to get that 30 minutes in most days of the week. That's what the actual recommendation is – 30 minutes most days of the week. I tell my patients, "Just do it every day, because on Saturday and Sunday we slack off. We still hit 5 days a week most weeks. I figure you have to take a bath or shower every day and brush your teeth – start adding that exercise in. Remember, if there is only one thing you are going to do after this lecture, exercise every single day. It could be walking, mowing the lawn, golfing, dancing – find something you like to do. This is kind of cute: "I play my low blood sugar readings in the lottery."

Home blood glucose testing: We have meters. But if we do give you a meter, we have to teach you how to use it. So, at the end of the session we have the meters here. They are free-style meters, and they are really easy to use. You put the test strip in, apply the blood. That's it. No coding whatsoever. And these are what the blood sugar should be if you have Diabetes Type 1 or Type 2. If you have gestational Diabetes the numbers are even lower, so if somebody is pregnant they should not follow these numbers. How often should you test? Before and after. If you have an HMO insurance and do not take insulin, your insurance is only going to let you test once a day. Once a day doesn't really give you a whole lot of information - especially if you are only testing in the morning. What's happening after you eat? The only way you know if that food was the right amount is to check the blood sugar after you eat. I would suggest you test one day a week before and after breakfast; another day, before and after lunch; another day, before and after dinner; a 4<sup>th</sup> day of the week test before you go to bed. That

way, at the end of the week, your doctor will love this, because you only tested for one week, and he knows what your blood sugar is before breakfast, lunch and dinner. He knows what it is after breakfast, lunch and dinner. He knows what it is at bedtime. So, now he has like a 16-hour span of blood sugars; and if we see a trend, why is it always high after dinner? Maybe we're eating more for dinner? Maybe we're not exercising after dinner. Most of us are going right to that couch, which is very practical for us to do that. But if we see that trend, wherever the blood sugars are high, then we have to think what kind of medicine and what time should we give that medicine. It will make a big difference. That's where your blood sugar should be. Normal is less than 100; less than 130 if you just finished eating a meal. But if you have Diabetes Type 1 or 2, 80 to 120 is the goal before you eat, and less than 140 after you eat. I just went to a seminar, and we were always taught the blood sugar should go up about 50 points or less. Well these were Endocrinologists, like Dr. Nikraban; and I asked, "I heard one of you doctors say it should only go up more than 40 points. Is that what we should be teaching?" I think there were 4 Endocrinologists there, and one of the other doctors said, "We're making it a little bit too strict for people. If we make everything too tight, it's too hard for us to do, and we throw up our hands and don't do it." So, if it goes up more than 30 points, look at what you were eating. If you didn't eat too much, then we know we need to use some medicine. It is unethical for us to let these blood sugars run high, because we know what will happen. But ultimately it's your choice where you want those blood sugars to be. So, if you choose to let them run high, just know that all of those ugly things are going to happen.

The Daily Meal Planning Guide: I want you to switch to the big white one, and we're going to do some actual meal plans. When you open it up, and it's not numbered, you'll see the divided plate method on the left-hand side. And you will also see some hand measurements. When you go to the restaurant, you're not going to bring your measuring cup and your measuring spoon, but I'll help you guesstimate how much that is. Your fist is about a cup, and your hand is about a half a cup. Notice your teaspoon is the tip of your thumb, and the tablespoon is the whole thumb. So, you just kind of guesstimate how much food you are eating in a restaurant. If you are at home, I would suggest you use your measuring cups and measuring spoons, because I was guessing how much rice – I was way off. What I thought was a cup, was more like 2 ½ - 3 cups. Then I wonder why my blood sugar is so high. So don't guess.

On the right hand side it has the starches, carbohydrates can be starch or sugar. So we have the starches labeled there. It says a 4 oz. bagel – everything listed under the starch group has 15 grams of carbohydrates. But notice the serving size. If your serving size is bigger, you have to add more carbs. If you are eating half of the bagel, you're not eating 15; you're eating 30 grams of carbohydrates. That's

how that works. Under the fruit groups, everything listed there has 15 grams of carbohydrates. Under the milk group, everything listed there has 12 grams of carbohydrates. If you turn the page, it's sweets, desserts, and other carbohydrates. A small, unfrosted brownie – can we eat this? Yes, if it's this size! This has 15 grams of carbohydrates. Is it okay to eat? Yeah. It is all about quantity and portion sizes. Non-starchy vegetables, everything listed there if it's a half a cup, it only has 5 carbohydrates. If it's raw, it's a cup, and it only has 5 carbohydrates. So, your non-starchy vegetables have very little carbohydrates, lots of vitamins, lots of minerals, lots of fiber. That's why you want half of your plate to be non-starchy vegetables; very good nutrient food. The meat group has no carbohydrates. So what is a carbohydrate, to make it easy? Everything is a carbohydrate except meat and fat. Meat and fat do not turn into sugar. Everything else does.

Turn the page again; and we need to learn how to read the labels. Everything you buy in a package, including your meat, has a food label except the bakery section. The bakers are not required to tell you the ingredients, or how much salt, or carbs are there. They don't have to have labels. The first thing you need to look at is the serving size. This example says 8 crackers, so all the numbers you see there are based on 8 crackers. If you eat 16 crackers, you have to double everything. Here is what is very misleading about the label. All carbohydrates turn into sugar. So for the 8 crackers, what is the total of carbohydrates? Twenty-two. Total carbohydrates turn into sugar, so shouldn't that be 22 sugar? Where does it say sugar? It says 7. That 7 sugar is included in the total. So it just means that 7 out of the 22 came from sugar. The carbs can be sugar or starch. Seven is sugar, and 15 is starch. Where is the other 15 coming from? Starch. They don't list starch here. Why not? All carbs turn into sugar. So, when it says total carbs 22, it really should say 22 sugar. So I now want you to ignore what it says for sugar. Whatever it says for total carbohydrates, is total sugar. So, 8 crackers has 22 grams of sugar. You are going to get a budget. How much sugar should you be eating for carbohydrates? Women should eat 30 to 45 grams of carbohydrates per meal. Grams is just the measurement. If you think better in dollars, you only have 30-45 dollars for breakfast; thirty to 45 for lunch. Just forget about the grams – just how they measure it; thirty to 45 grams per meal for women; forty-five to 60 grams for men. For both men and women, if you are going to eat a snack, it should be 15 – maximum 20 grams for that snack.

Now let's do an actual meal. Three-fourths of a cup of unsweetened cereal, such as Cheerios is going to be under the starch group on page 2, bottom left: cereals and grains. How many carbohydrates are in that  $\frac{3}{4}$  of a cup of Cheerios? Fifteen. Look at the milk. How many carbs are in one cup of milk? Twenty-seven. How many carbs are in 4 oz of orange juice? Fifteen. What about black coffee? Zero. If you were writing it down there's your answer: 57 grams of carbohydrates. The women are eating 30 to

45 grams of carbohydrates, so this meal is a little bit too much for the ladies to eat. So how can we make this work for the ladies? Maybe take away the orange juice? Do it later? We really have to have that orange juice, which I don't recommend. Exercise! Here's a pedometer for you, Sir. This is a book called *Diabesity* comes from obesity and Diabetes. Excellent book about Diabesity; it's really, really interesting. How are we going to make this work for the ladies? Take the orange juice out; because orange juice is only 4 oz. I can drink this in one sip, and it's gone. This is 15 grams of carbohydrates, so if we take this out of that breakfast, we have 42 grams. Okay, that will work. One simple change. Remember these are general guidelines. If this is just plain orange juice it has 15 carbohydrates. Has anybody read Sunny Delight? You have to read the label. This orange also has 16 grams of carbohydrates – I'm choosing this, because this is going to take me longer to eat; I'm going to get more satisfaction; and it still has the fiber. When they ground this all down in that juice, we lost the fiber. Fiber makes you feel full, slows down how fast that juice is going to turn into sugar. You want to eat the fresh fruit as opposed to the juice. Fiber supplements help; they will make you feel full. You won't eat as much, and it will slow down how fast that food turns into sugar. Carbohydrates turn into sugar in 2 hours; so if you are only eating carbs, you're going to be hungry every two hours. Protein will last 3 hours. So if you eat carbs and protein, you will be full for 3 hours. Fat will make you feel full for 4 or 5 hours. Doesn't protein usually have some fat in it anyway? If you are eating the right balance of carbohydrates, protein and fat, you should be full for about 4-5 hours. If you eat the right amount at breakfast at 8 o'clock; and at 12 o'clock you are hungry, you should be. If you are like my husband who only eats one meal a day – he says, "I don't understand why you need to eat 3 meals; I only need one." I said, "I do." I knew why he could only eat one, so I had him add up the calories. Now have you ever noticed on the food label, the percentages mean nothing to us; they are based on a 2,000 calorie a day diet. If you are eating 2,000 calories a day, and you eat 8 crackers, you just ate 5 percent of your fat for the whole day. You have 6 percent of your sodium for the whole day - if you are eating 2,000 a day. Now, why do you think the DFA chose to use 2,000 calories as the example? You probably don't need more than that a day. I had my husband add up his calories for that one meal he eats a day, and it was 4,000 calories. So, my son started to laugh. I said, "No wonder you only eat once a day." My son said, "Dad, you better eat only every other day then." It made him realize how many calories he was eating, and then he lost all of his weight. Then he realized you don't need that much; he's an engineer that sits at a computer all day long. He doesn't need 4,000 calories. Most of us do not need 2,000. If you are riding bikes like Nikravan and this guy do, you need more calories, because they are more active.

Let's do another meal. Two 6-inch tortillas – how many carbs? Go back to the starch group. Six-inch tortilla – flour or corn? How many carbs is in two? Fifteen in 1, so 2 tortillas have 30. What about 2 oz. of chicken? Any carbs? No, zero. This is 3 oz, so you should probably eat a little bit less. We don't really need that much protein. But protein doesn't raise our blood sugar, so we can eat more protein. A quarter cup of shredded cabbage; shredded implies that it is raw. Cabbage would be a non-starchy vegetable. It is raw, so 5 grams in 1 cup of raw. So, this ¼ cup of shredded cabbage is maybe 1 or 2. What about a ¼ cup of tomatoes? Tomatoes is also listed under non-starchy. It is only going to be a couple of carbs too. Two tablespoons of sour cream. Are there any carbs in sour cream? Very little. Half a cup of pinto beans, that's going to under the starches – 15. Diet soda – any carbs? No. So, if you were to add it up, the total carbohydrates is 47 grams. So is that okay for the ladies to eat? It is only 2 extra. If they are eating a little bit extra carbohydrates, and they really want to eat this, what are they going to do afterwards? Exercise. But, look at the fiber. Fiber lowers the blood sugar. You cannot digest fiber, so you are going to subtract it. In ½ cup of pinto beans there are 6 grams of fiber, so you subtract it. So your net carbs is 41 grams of carbohydrates. I advise you to eat more fiber. If you don't eat the fiber, take the fiber supplements. It will make a big difference. Vegetarian refried beans – are they fried in good oil? Probably not, so when I make beans I boil them in plain old water. I soak them in water first, and discard all that starch that accumulates at the top. I rinse it about 3 times to remove most of that starch. Then just boil it and I mash them. That's it. I do not fry my beans; boil them, mash them, serve them, and tell them it's refried beans. They eat it. As long as it tastes good, they will eat it. There are a couple of examples of meals and how to figure out the carbohydrates.

Glasco/Smith/Kline provided the green books. Lilly provided the big white one. They make insulin. And they have also provided you with other things. There are some log books here. There is a carbohydrate counting book. And this is kind of nice. It fits in your purse or your backpack, and it has a list of carbohydrates. it tells you how to read the labels, tells you how to use the divided plate method. It also tells you how much carbs you should be eating. So, it is a nice summary of what the whole talk was about. This book, *Nutrition in the Fast Lane* has Jack-in-the-Box, Del Taco, Taco Bell, Burger King – all of those places are in there. You can see how many carbohydrates are in that food. Try to do it before you get there. Once you get there, you'll forget what it says in this book, because you smell the French fries. It doesn't mean you can't have the French fries. You might have to share it; and I'd advise you to share it. All the places give you way too much food to eat.

In summary: If there is only one thing to do, it's to be active every single day. Try to eat as healthy as you can. Learn about the different foods. Lose weight if you need to. Not everybody needs to lose weight; and maybe not everybody wants to lose weight. But we want to lose a little bit of

weight so we make our numbers go down. Enjoy sweets occasionally. You can still have brownies and cake. I wouldn't take the end piece with all the icing and the flowers, but you take a small piece of cake and enjoy yourself. Stop smoking. If you are smoking, ask for help. You don't have to be embarrassed. People are testing their blood sugar and taking their insulin right there at the restaurant. It's not that big of a deal any more. Make sure that you enjoy your life. Be happy about things. I thank you for your attention, and hopefully the information given to you was in a practical sense. Feel free to call me or e-mail me.

#### Questions and Answers:

A: You cannot digest fiber; so in essence you can subtract it. But if you really want to make an impact on your blood sugar, don't subtract it unless it's 5 grams or more. Look for food that has 5 grams of fiber or more; and then definitely subtract it, and you will see a change in your blood sugar.

A: Notice on your Quick Reference sheet the amount of protein – 4 to 6 ounces a day. Not that much. The body only needs this much protein per day. Protein is necessary, because it builds muscle, repairs broken bones, builds teeth. So the body does need protein, but not that much. So, when you are eating extensive protein, you are putting more work on your kidneys. You have to be really careful about how much protein you are eating. You don't need that much; so if you are eating excess of it, you are getting extra calories that your body doesn't really need. If you are body building, and are exercising a lot, you need the extra calories. But if you are not doing a lot of activity, do not eat that much protein. If you have high blood pressure, or your kidneys are being damaged by the diabetes, you should back off on the protein. The first time I saw a low-protein meal, I was wondering who ate off the plate. I took the lid off that patient's plate, and said, "Who ate off this already?" not realizing that that person was having kidney problems, and we had to cut them down to 2 ounces a day. Too much protein makes the body work harder, and specifically the kidneys. As far as preservatives and MSG, you don't know. The restaurants don't tell you the list of ingredients. Some restaurants will put a sign up "No MSG." That's a good thing, but other wise you don't know. Restaurants are not required to tell you what is in there. It is voluntary. Trans-fats are very unhealthy for the body. In New York, no restaurant can serve trans-fats. They are way ahead of the game. In Hollywood, no restaurant can serve trans-fats. But that is the only state and the only city I know of that have actually put a restriction on trans-fats. They are too dangerous for the body. That's why the recommendation for trans-fats is zero.

A: If you stop smoking, the nicotine is out of your body in about 3 days. That's why in those first 3 days they are so irritable, is because the nicotine level is starting to drop. There are still some long-term effects; but the benefit of stopping smoking is greater than not. To stop smoking is the best thing you can do for your health. There is no good reason to smoke. I'm a former smoker, so I know. But

once I got it through my thick head that smoking wasn't good for my body, I stopped. I stopped because I had a child, and I was giving him asthma. That third-hand smoke – after I stopped smoking, not another asthma attack. We didn't know about third-hand smoke then.