

**FLORIDA DEPT. OF HEALTH/BUREAU OF CHRONIC DISEASE**

**Moderator: Natalie Gibson  
October 27, 2004  
11:00 a.m. CT**

Operator: Good day everyone and welcome to Prioritizing Diabetes Nutrition Recommendations conference call. Just a reminder, today's call is being recorded.

For opening remarks and introductions, I would like to turn the call the over to Natalie Gibson, Program Epidemiologist and Evaluator for the Florida Diabetes Prevention and Control Program. Please go ahead ma'am.

Natalie Gibson: Thank you. Good afternoon. Continuing with our series of audio teleconferences, the Florida Department of Health, Bureau of Chronic Disease Prevention/Health Promotion and the Diabetes Prevention and Control Program welcomes Ms. Marion J. Franz, who will discuss the topic of nutrition in diabetes. Ms. Marion J. Franz MS, RD, LD, CDE is a nutrition health consultant with Nutrition Concepts by Franz Inc.

For over 20 years she was a director of nutrition and health professional education at the International Diabetes Center in Minneapolis. She co-chaired the task force to write the American Diabetes Association 1994 and 2002, nutrition principles, and recommendations for diabetes technical review and position statement. And was also the editor of the American Association of Diabetes Educators core curriculum for diabetes education, fourth and fifth edition. We are

honored and delighted to have Ms. Franz with us today. I'm now going to give you some important CEU information related to today's call.

Continuing Education Credit has been approved for the following health care professionals: Nurses and dietitians. Big Bend area health education center have approved this program for 1.5 contact hours, nurse and provider number SBN2654. This is not a national provider. So nurses and health educators in other states, states other than Florida must request approval from the professional boards in their state. All CE credits will be reported to Florida's new CE broker monitoring system. Nurses who want to receive CE credits must complete the appropriate CEU paperwork with the correct license number and legible name and address.

The Commission of Dietetic Registration has approved this program for nationwide dietetic continuing education credit, CPEU level three, 2.0 major session, topic code CL0312. Dietetic practitioners who not in the PB process should sign and return the CBR prior approval CPE reporting form. If there are not RD's and CPR's in attendance, please return the reporting forms and indicate no RD's, DTR's attendant at the top.

Dietetic practitioners who are under the professional development portfolio should not sign the CBR prior approval CPE reporting form. These individuals should sign in on the RD and DTR, PBT, education program sign in with the Florida Diabetes Prevention and Control Program logo at the top. In addition, these individuals should record this activity on their step four learning activity log. Please read the flyer attached to the CBR form for more information.

Attendance certificates will automatically be provided for dietitians, either directly through CBR, or to the dietitian base on the credentialing program. Nurses will receive CEU certificate approximately four weeks from the receipt of complete legible paperwork. Paperwork received after November 3rd, or paperwork with incorrect or illegible names or license numbers will not be

eligible for CEU credit. Nurses should sign in on the participant roster, complete the (ATEC) registration form and the impact survey.

All participants should complete the impact survey for this program. Sign in on the participant roster and complete the posttest. Each site administrator should send in the sign in sheet and completed forms to Natalie Gibson of Florida Department of Health, 4052 Bald Cypress Way, Bin A18, Tallahassee, Florida, 32399. Or fax to 850-245-4391 by October 29th. It is not necessary to fax and mail your forms. CE credit will not be issued to participants who have not signed in, provided their license number and legible address and completed the required forms by that date. Ms. Franz, I'll turn it over to you.

Marion Franz: Thank you. Good morning or good afternoon to all of you. And it really is my privilege to speak to you today. You have a hand out hopefully in front of you, which will cover the different points that I hope to be making with you today. And is a copy of the slides that I would using if I was speaking to you in person.

What I hope to do today is focus – try to answer the question – how do we prioritize nutrition recommendations that we give to people with diabetes? Because I think we'll all very aware that people with diabetes are given many, many, messages. They hear and read a lot about diabetes. And often it's very confusing. And what is often even more confusing is to decide what is the first priority.

And you can see a list of messages that people with diabetes are given. They are told to cut back on fat. Eat only three meals. Lose weight. Eat foods at the low glycemic index. Keep records. Don't eat sugar. Control blood glucose counts, carbohydrates. Eat high fiber foods. Increase physical activity.

Actually had a physician tell me he just said – I just tell my patients not to eat white foods, which didn't seem like very helpful advice. And then of course now people hear that its OK to eat sweets.

So if we were in a lecture hall or in a classroom what I would ask you to do is to look at the list and to check off what you think your first four priorities would be as you are sitting down to help people with diabetes make lifestyle changes.

But at any rate, in the next slide, I would like to share with the priorities that we set as a team of educators at the International Diabetes Center.

And we suggested that the first priority as we work with individuals should be to emphasize that we are really looking at lifestyle changes that will improve blood glucose control. Now we know lipids and blood pressure are also important.

But when people make lifestyle changes, it impacts almost immediately on blood glucose levels. So if we focus on that first, people are more likely to see an immediate reward. Now lipid and blood pressures changes then may take longer to see the effect of lifestyle end.

So having said that, we then ask the question – what is it that effects blood glucose levels? And clearly all of you know the answer. It's a balance between the amount of carbohydrates that people eat in their meals or snacks and the amount of available insulin that determines what their blood glucose levels will be after eating.

So we then thought it was important that people would know what foods are carbohydrates. What are average portions? And how many servings should they select for meals and for snacks if it was their choice?

Now, clearly we all know the important of physical activity. And then what is absolute essential is that people keep food and blood glucose monitoring records so we can determine if the changes they have made in lifestyle have lead to the desired outcomes.

Now, I think often one the problems with us as educators that we're much better at assessment and intervention than we are at looking at outcomes and often we maybe reluctant to act on the outcome.

Perhaps the most important we do is to determine if goals have or have not been met. And if they've not been met, then clearly there need to be some changes made in the medical program.

So having said that, I would like to just take step back and look at where we have been in the field of nutrition therapy. And I think you all probably well aware that really prior to 1994 the attempt was always sort made to identify an ideal nutrition prescription. And the idea was that if we knew how many calories an individual needed, based on theoretical basis, and then we knew the ideal percentages of carbohydrate, protein, and fat, meal plans could be designed that looked perfect on paper.

The problem was that often these meal plans were not very relevant to an individual's lifestyle. And really if we had had someone who was eating 3,000 calories, wouldn't it be great if they ate 2500? What was the likelihood they were going eat 1200 calories for very long?

Or if they were eating 40 percent of their calories from fat, perhaps it would be an appropriate to suggest that they tried to get back to 37 percent. What was the likelihood that would eat 30 percent for long?

And yet we developed these meal plans. Handed them to patients and told them to follow the meal plan. And if we didn't have someone who could design the meal plan, we could usually find one from a pharmaceutical company that we could hand to patients.

And if patients couldn't follow it, then it was clearly their fault because we as health professionals had done the right thing. We had told them what they should do.

Well in 1994, the emphasis really changed. And what we said is that our nutrition recommendations should be focused on the goals of our intervention. And furthermore it should be what we should focus on are known strategies to help people achieve those particular goals. That there was not any ideal percentage for macronutrients. And instead the distribution would be based on assessment of what people were currently doing and most importantly on the changes that they felt that they were able and willing to make.

So that we really needed to focus on negotiating with patients and help them to achieve the metabolicals that most importantly they needed to tell us what were reasonable goals for them and changes they could make.

Well that focus continued in 2002. But one of the problems with previous recommendations, it was often difficult to determine the level of evidence. And you could see the little numbers, reference numbers after a statement. But you didn't know if it was a randomized control trial of 100 or 10. Was it an observational study of one day or five years? How many subjects and so forth?

So you'll all probably all aware the American Diabetes Association is really focusing on evidence based principles. And those were the guidelines that we followed for writing the 2002. And what you can see is that they're graded according to A and B, C, and expert consensus.

And to be an A level recommendation, there have to have been multiple well designed, randomized controlled trials that basically reached similar outcomes. Now some of those may have been classified as B because the numbers of subjects were smaller and the length of the trial may have been shorter.

Then there are some recommendations where there is a lot of evidence that the evidence reaches conflicting outcomes. Yet a particular objection was suggested.

Then there were some recommendations – only one study – obviously that's not enough. And then there are some that are clearly just expert consensus.

And every one of you is also an expert. And you can agree or disagree with the task force expert consensus recommendations.

Now on doing this, it should also help us prioritize our recommendations because hopefully we would focus on the recommendations that have the greatest, strongest amount of evidence available for support.

So we spend – just take a few minutes to look at how we prioritize recommendations for people with type one diabetes. And then we'll spend the majority of the time looking at type two because that's most of the individuals that we deal with.

But clearly what we know today is that we – if we know an individual lifestyle – what time do they like to eat breakfast? What do they like to eat? When do they like to eat lunch? What do they like to eat? When do they like to dinner? What do they like to eat? When do you they like to exercise?

If we know their lifestyle, we know that today we can integrate insulin into their lifestyle. Because as you're all well aware we now have many different options available to us. We have our background, our basal insulins. We have our (bolus), or mealtime insulin's. Or we have insulin pumps that can be used.

Now that isn't what was done historically, is it? Because if you think back historically, what was done is individuals – for individuals was that insulin was planned was set up first and then individuals were told they to eat according to the time action of insulin.

Now fortunately today, we can give people more flexibility. No again what we know is that it's the total amount of carbohydrate in the meals that really determines what happens to blood glucose levels after eating. So that again, begins our first priority. We can't completely ignore protein and fat because we know if we do weight gain can become a concern.

Now what evidence do we use to support this priority? Well the next study is a study done in individuals with type one diabetes who were on an intensive or flexible insulin regimen. And the question they asked is – does the amount of carbohydrate make a difference if people cover it with appropriate amount to mealtime insulin? And the answer was no. The amount of carbohydrate did matter as long as it was covered appropriately.

And what they basically found in this study is that individuals at breakfast needed about a unit and half of lets say a rapid acting insulin for every 10 grams of carbohydrate they planned to eat. And out lunch and dinner they needed about one unit of a rapid acting insulin for every 10 grams of carbohydrate they planned to eat.

So a very useful study for us as clinicians and educators as we look at helping people learn how to adjust insulin's based food that they plan to eat.

And then they asked some other interesting questions. They said – does the amount, or does the glycemic index of the meal, the amount of fiber, fat, or calories – does that influence the mealtime insulin? And the answer was no.

The mealtime insulin was based solely on the amount of carbohydrate that that individual planned to consume.

Now another very interesting study was the dose adjusted for normal eating study that was done Great Britain. And it was done because in Great Britain, traditionally insulin regimens had been set up and people were told to eat accordingly. And there were some professionals that said – we can't give people with diabetes all this freedom. Because if we allow them to adjust their insulin based on what they planned to eat, they'll gain weight. Their hemoglobins will get of control. All the problems of low blood glucose levels and perhaps their lipids will change.

So they did a study in which they randomized 169 adults either to continue the traditional way of doing things which was to set up the insulin first and then eat accordingly. Or to have the dietitians in Great Britain's teach the individuals how to adjust their mealtime insulin based on the amount of carbohydrate they planned to cover.

But they found then obviously in the intervention group – was that A1Z improved by 1 percent without major changes in the amount of insulin. And not surprisingly individuals over all quality of life improved. There was no more problems with severe hypoglycemia. They didn't gain weight. And their lipids were unchanged. So actually people did better when they were given more freedom and flexibility.

Now we also know that we may have individuals who choose not to adjust their insulin. We like to think that everyone would prefer to do that. But if there are individuals – and some of these

maybe individuals with type two diabetes as well who are on insulin. Then the question is – what is important?

And this was a study done, again in which they looked to see what correlated then from the standpoint of food intake and improved A1Z's. And you can see what was important was consistency of carbohydrate intake. So these individuals were taking, like regular NPH at breakfast and regular NPH at dinner. And as I said what correlated was improved control was being consistent in the amount carbohydrate at breakfast, at lunch, and at dinner. And then somebody had to adjust the insulin to cover that amount of carbohydrate.

And again, they asked the question – do variations in calories, protein, or fat, – was that related to A1Z levels? And the answer was no. What was important was being consistent in carbohydrate intake.

So again, a very useful study for us as educators. So we know we can give people more flexibility. That they can learn to use either insulin to carbohydrate ratios, adjusting their insulin based on what they planned to eat, or if they're on fixed doses, then we need to encourage them to be as consistent as they can in carbohydrate intake at meals.

So lets go back to type two. And let's look at the four steps. Looking first at importance of blood glucose control.

Now the first point that I want to make is that the diet doesn't fail. The diet works find when it's used appropriately. Or when it's used in combination with medications. But as you all know what we have learned is that type two diabetes is a progressive disease. And over time the data cells fail.

And what I would like to suggest is again, that then nutrition therapy should emphasize blood glucose control. And that we will know the results of our intervention by six weeks, certainly by three months.

And I think you're probably all well aware that often what happens in the real world is that people go months or even years before anyone looks at the outcome of the intervention. And as you can see and as we'll see later, we will know very quickly if this lifestyle will lead to target goals.

And again, these people also benefit from learning carbohydrate counting because it gives them more flexibility in their food choices.

So what did we say in the American Diabetes Association recommendations regarding caloric intake and weight? The first statement was that in insulin resistant individuals, reduced energy intake, and modest weight loss improves insulin resistance and glucose in the short term.

Now if I could see your faces or in the room with you, I'd ask you – if you'd want to guess why we said short-term? And clearly the answer is because there are no long-term available. We just know that in the short-term modest amount of weight loss – perhaps more importantly reduce energy intake, improves insulin resistance.

But we also said, and I think you're well aware that what does it take achieve that modest amount of weight loss. I'm sure you know the answer. Based on the diabetes prevention program, it takes structured programs that emphasize lifestyle, reduced calories, and perhaps fat, regular physical activity. Perhaps most importantly, regular participant contact. And what were realistic weight loss expectations, individuals could lose about five to seven percent of their starting weight.

Now how much do individuals wished to lose? I think you know the answer. When people have been asked, they said they wanted to a third.

Now when is that weight loss beneficial is a very important question. Because the majority of health professionals I believe, I think, or believe that weight loss is going to be beneficial to persons with type two diabetes because we know the problems obesity associated with. But what I hope to show you is that when weight loss is most beneficial is for prevention or delay of type two diabetes.

And it's modest amounts of weight and exercise that help prevent or delay type two diabetes of which I know you are all well aware.

However, once type two diabetes develops it maybe too late for weight loss to help the individual. And then we need to change the focus of our intervention to focusing on blood glucose control.

So we know modest weight loss is beneficial in the prevention of chronic disease including type two diabetes, lowering blood pressure. But what we also know is that's individuals regardless of the weight loss intervention hit a plateau at between three to six months. And that that is to be expected. Because what happens at that point is compensatory mechanisms take over to prevent the individual against starvation.

So our bodies don't know if we're not eating because food scarce or because it's our choice. And if we lived where food was scarce we'd be very glad our bodies adapted so we wouldn't all starve to death.

So people hit a plateau at six months. And furthermore, you know story. If treatment is discontinued, weight regain occurs.

Now this is a slide from the DPP, the Diabetes Prevention Program, which is the longest weight loss study in the literature. And if you look at the bottom line, this was the intensive lifestyle group. And what do you see happening? Where do you see the greatest amount of weight loss? Clearly peaking at six months. You then see a plateau occurring and then you see a gradual weight loss despite the intensive interventions.

And how much weight loss do you see that individuals were able to lose. Well you'll see it's about seven kilograms which is about 15 to 20 pounds. Again, about five to 10 percent of their starting weight.

Now this may look discouraging. But the good news was that this amount of weight loss decreased the risks or delayed the risks by 58 percent. So people – for prevention or delay, even small amounts of weight loss are very important and beneficial.

But we all know that type two diabetes is a problem with insulin deficiency or insulin resistance first of all. But as long as the body can make enough insulin, blood glucose levels remain normal. It's not until there's insulin deficiency, perhaps in individuals who have inherited a tendency or the genes to develop type two diabetes that blood glucose levels become elevated and type two diabetes occurs.

So it's really insulin deficiency that determines who develops type two diabetes. And this is just a simple drawing. And if you look at the bottom panel you can see insulin resistance occurring. The blue line appears to be maintained through out the course of the disease. The red line as you can see that as long as the body is able to make insulin – in the top panel blood glucose levels remain normal.

So what you see happening over time is that the beta cell fails. And as the beta cell fails you find blood glucose levels increasing. And you'll notice that the first blood glucose value that's effected

is the post meal value, followed later by fasting. So when we look at treatment we see that for many individuals, some can control their blood glucose levels very well initially just lifestyle. But as the beta cell fails, many people will need oral medications. And as they progress longer into the duration of their disease many, many, many, individuals will require insulin.

And it's not their fault. It's clearly the fact that the beta cell is failing. And what we know today is that the only evidence at this stage as to how we can keep the beta cell functioning longer is to control blood glucose levels. With the theory being that the more normal the blood glucose levels is the less hard the pancreas has to work and perhaps will be able to continue working longer.

So the focus should be on blood glucose control. And we shouldn't threaten patients by saying – well if you would lose weight, you probably wouldn't need insulin. Because you can see that is not true. As people become insulin deficient, weight loss is not going to help them. They are going to need insulin.

Now here – this is a slide from the United Kingdom perspective diabetes study. And you can see that individuals were diagnosed with a hemoglobin A1Z of nine percent. Again, after three months of intensive lifestyle intervention, they were randomized with A1Z's of seven percent. Did the lifestyle intervention work? Of course it worked. It lowered their A1Z by two percent. But the investigators did not realize it was a progressive disease. And that to keep hemoglobin A1Z's at seven percent, medications needed to be combined with lifestyle.

That's not to say that lifestyle isn't important. Because of course it is. People can out eat almost any medication.

Now what did the investigators say? They said that interestingly, the greatest reduction in A1Z during the whole trial was this two- percent decrease during the first three months. And they asked the question– what caused, or what was the reason for that improvement?

And their response was that they felt that this improvement was more due to decreased energy intake. That is people ate less food. They made better food choices than to weight loss and that the weight loss was a just a secondary response to the fact that they ate less.

So what is important then is that we should focus on the food choices and the amounts that people are eating. And this is what they said – the real problem is a progressive decrease in beta cell function. We are now duty bound to explain this to the patients at the onset and not to castigate them because they failed to diet. A very powerful statement.

This was the retrospective study that was done where they asked the question – how much weight do people have to lose to improve blood glucose control? And what you find is that these individuals have lost 20 pounds. So they wanted to know when did blood glucose levels improve? Well first of all, they found to their amazement that 59 percent of the individuals – despite the fact that they had lost 20 pounds, their blood glucose levels weren't improved. 41 percent had improvement. The biggest improvement again occurred after a weight loss of five to 10 pounds.

And they suggested that if blood glucose levels– that once they were less than 180– and if blood glucose levels had not improved at that point, additional weight loss was not going to help the individual.

So here are the two different groups. You see the green line – the biggest improvement occurred at about five to 10 pounds at which point their blood glucose levels were under 180, 10 millimoles or 180.

You see the yellow line– the top line, I guess probably black on your hand out – the top line with no improvement in blood glucose levels. Now the investigators speculated that the individuals in

the bottom line were probably insulin resistant early in the course of their disease. The top line individuals were obviously insulin deficient. They cleared needed medications combined with lifestyle to meet their target goals.

So what we have learned is that type two diabetes is a progressive disease. Which I think also means in our nutrition therapy has to change over the course of the continuum of type two diabetes. Just as medical therapy change.

So if we look at early in the continuum where we have individuals who are overweight. There the goal would be obviously to prevent over obesity or to stop weigh gain. And you're probably aware that there's a CDC program, which is encouraging individuals to eat a few less calories each day and increase the number of steps that they take each day.

We know that as we go across – move on to metabolic syndrome, the goal is to improve the insulin sensitivity. Perhaps the best evidence there is for increased physical activity. Again reducing energy intake, minus food intake, or reducing food intake minus weight loss.

Then as we move on to pre-diabetes, we have the evidence from the diabetes prevention program. The intervention that was used with modest weight loss. Accumulating 150 minutes per week of physical activity.

But once type two diabetes develops, then we need to change the focus to help people attain metabolic control. So there perhaps we need to switch and take the emphasis weight loss. Help people learn carbohydrate counting. Certainly increasing physical activity. And helping them understand that when medications are necessary it's not the diet that failed. It's not – more importantly it's not they who have failed. It's really their pancreas who have failed.

In fact one of our main focuses then at this point is actually preventing weight gain with the use of medications.

So having said that, let's focus for a minute on carbohydrate content. And what was that A level evidence. Again the first statement we made was that foods containing carbohydrate are important part of a healthy diet. And I would suggest that people with diabetes deserve the right to eat healthfully. The secondly, we said the most important thing was total amount of carbohydrate, not the source or the type.

The sucrose could be substituted for starch. And I know that you are all aware of that. And that the non-nutritives sweeteners were safe.

There are now 22 studies in the literature similar to the one that is next. And in the study the took individuals with type one and type two diabetes, kept the carbohydrate the same. For six weeks all the carbohydrate came from starch. For six weeks 18 percent came from sucrose. And what you see in the next slide is as long as the total carbohydrate was kept the same, the responses were identical.

As I said, there are now 22 studies in the literature showing this, which is why we focus first on the total amount of carbohydrate.

Now when we look at the acceptable daily intake, we know that it's the amount the FDA determines an individually could use safely over a lifetime. And it's based on one, one hundredth of what's been shown to be safe in animal studies.

And the next slide you just simply have some examples of the ADI, which is remember, one, one hundredth of what's been tested. It's based on the milligrams of the non-nutritive sweetener per kilogram. If you look at look at (Aspartain), which is NutraSweet, you can see that one, one

hundredth of what has been tested and shown to be safe. To get to that level an adult would have to consume 15 cans of diet soft drink everyday over a lifetime or use 86 packets of equal every day. That's one, one hundredth.

Now people look at sucrose and say maybe it's not as safe because the amount of cans is less. The reason that it's less is that the animals wouldn't consume very much because it was so sweet. So it's based on the largest amount they could get animals to consume. So they're all basically safe.

When we look at fiber we know that 50 grams is probably beneficial. What we don't know is that people can consume that much over the long term. But we know that fiber is part of a healthy diet.

And then the next slide you just see some studies where they compared 56 to 14 grams in type one. There's no benefit. Compared 50 to 15. Did report some benefit. In type two, a well control study compared 27 to 10 per 1,000 KRE's. Again about 50 to 20 with no benefit from either. And then again 50.

So it takes a lot fiber to really have a benefit on blood glucose control. And you'll remember average intake is less than 20 grams per day. So fiber is a part of healthy diet. Will it improve blood glucose levels? Well, if individuals can consume 50 grams, the evidence maybe yes. In amounts that might reasonable, it may not have much effect.

What about the glycemic index? Again, we couldn't find evidence of long-term benefit. And you're probably aware that there was a recent Med analysis in which low versus high glycemic index were compared.

Now remember most people are going to have one that is in between the two. So you have to manipulate the diet to get low or high. And then low did lower the A1Z by 0.4 of a percent and from baseline by about 0.3 of a percent.

However, know from other studies that we can lower hemoglobin at C by one to two percent. And our point was, the point was then made that hopefully we being with interventions that we know will be most effective. And we have intervention studies which is carbohydrate counting and so forth that show we can lower A1Z by one to two percent.

These are just some studies and you can read them at your leisure comparing type one. And you can see there is one that showed improvement in A1Z. Four did not. In type two, one showed improvement on A1Z, four did not.

So I think most of you are familiar with carbohydrate counting. So I don't want to focus, take much time to look at that. But basically it's become simpler for diabetes because we can now divide all food into basically only three groups: carbohydrates, meats and fats.

And our sources of carbohydrates, starches, fruit, milk, and deserts. And one serving is the amount food that's supplies us with 15 grams of carbohydrates.

Now what we do – many places do is that we suggest that people start with three to four carbohydrate servings per meal for women and that men start with four to five. And that they do that consistently. Test their blood glucose, perhaps fasting and pre and post, their largest meal to see if goals are being met.

And then we can – they can really give us some feedback so that we can individualize to see if its meeting the target goals or if changes need to be made in the meal plan.

Now labels are very helpful, but there's so much information that people do not often know where to start. So what we often tell people to do is first look just at the total – at the serving size and the total grams of carbohydrate. To ignore everything else on the label.

So in this case of an individual eight one-cup, the total grams of carbohydrate is 31. And obviously that would be two servings. That the sugars are included in the total carbohydrate and that should be ignored.

This is just looking at a program that we did at the International Diabetes Center where individuals began with hemoglobin A1Z of 8.5, 8.2. Where we emphasize carbohydrate counting. To the focus off weight loss. And you can see that we could lower hemoglobin A1Z by about two percentage points to 6.5 percent. And interestingly when we took focus off nagging people about weight loss, they also had small amount of weight loss.

One minute, just on protein then. What we've said is that ingested protein does not increase plasma glucose concentration but it's just a potent, a stimulant of insulin secretion as carbohydrate. Something that the proponents of the low carbohydrate, high protein diet seems to have forgotten.

So some evidence – in this study individuals were given either 50 grams of protein alone, 50 grams of glucose, or the two were combined. And if you look at the next slide where you see the two panels, you'll see that the bottom line is the effect on blood glucose when individuals were given 50 grams of protein. And you can see their blood glucose levels remain remarkably level and then begin to drop over the five-hour period.

When the were given 50 grams of glucose, you can see the peak. When protein was combined with the peak is identical. Protein does not slow the absorption of carbohydrate.

Then they looked at the amount of insulin secreted. And you can see gram for gram glucose and proteins stimulated equal amount of insulin. When the two were combined it was double.

In the next study, they gave individuals either 50 grams of protein or water. And they measured the amount glucose that appeared in the general circulation. And you can see then in the next slide, which looks at the results, that there is no glucose appearing or a very minimal amount appearing in the general circulation for eight hours after the ingestion of protein. It's very similar to the effect of water. Now why?

We do know that protein under goes gluconeogenesis. So that about a 50 to 60 percent of protein is changed into glucose. What happens to that glucose though today is unknown. It's just known that it doesn't appear in the general circulation. It's speculated that that's stored in the liver as glycogen. And then when glycogen breaks down to glucose, the body doesn't know if their original source of glycogen was protein or if it was carbohydrate.

And then in the next panel, again, you can see the insulin response – the bottom-line is water. And then the response of insulin to protein. So we know that protein, even though it does not effect blood glucose levels, does require insulin to be metabolized.

This was a study done where they made people hypoglycemic. And then they treated them with either carbohydrate or carbohydrate plus protein. And basically what you see is that when they treated them with either 15 grams of carbohydrate or 15 grams of carbohydrate plus 14 grams of protein, the response was identical. And they began hypoglycemic at identical rates.

And the investigators concluded that adding protein to the treatment of hypoglycemia only added unnecessary and usually unwanted calories. And basically what we know is that 15 grams of carbohydrate can raise blood glucose levels at around 50 about 40 to 50 milligrams per deciliter

for about 40 minutes or so. And then blood glucose levels begin to fall again regardless of what the initial treatment has been.

Certainly, we can't forget physical activity. We know that it improves insulin sensitivity independent of weight loss. It does this by activating glucose transporters. The thiazole Deen deions increase the number of transporters. Exercise activates transporters. It's suppresses the release of glucose from the liver. Has a short-term effect. And we know it's important in type two diabetes.

People with type two diabetes tend not to be as fit. They have a lower VO<sub>2</sub> Max, which means they need a more gradual training program. They may have autonomic neuropathy or they may be taking blood pressure meds that will not allow their heart rate to increase. So they need to use perceive exertion. Rest periods of fine.

This is I think a very important study, because they ask the question – is it more important to prevent chronic disease to be thin or fit? And they've also done this study in men with type two diabetes. And you can see that they enrolled 25,000 men in this study. And they measured they percent body fat. Divided them into lean, normal, and obese. They measure their fitness levels based on a maximal stress test on the treadmill

And if you look at the orange line which are the fit individuals and you compare the obese fit to the lean fit, you'll see their risk of dying of all chronic disease is virtually the same. There is no statistical significance.

And if you compare the obese fit men to the green unfit men in the lean, the lean unfit, you will see that their risk is actually less. So it seems clear that it is more beneficial to be fit than to be thin.

Now as I said, this group in Houston has done the same type of studies in men with type two diabetes and women as well and found exactly the same thing.

So we may not be able to make individuals thin. Hopefully, we can encourage them to become fit. And as you know, people can become fit by accumulating 30 minutes of physical activity in a day. And that should be our goal.

Now, finally then, people have to use food and blood glucose monitoring records to see if the goals have been achieved. What do we know? Well, we have studies that suggest that in people as you saw in the U.K. PDS, that in newly diagnosed people with type two diabetes, lifestyle can lower A1Z by about two percent. That in the study we did in which individuals had an average duration of type two diabetes, just changes alone could lower A1Z by about one percent. It's a progressive disease.

In people newly diagnosed with type one diabetes or where they were adjusting their insulin to cover their carbohydrate intake, about a one- percent. So we know that lifestyle, independently can lower A1Z levels by about one to two percent, which is incidentally about the effect of many of the oral medications.

And furthermore as I said earlier, well know the effect at six weeks to three months. And in the red line again, you can clearly see that we could tell at six weeks, if changes in lifestyle had been effective. Certainly, we knew by three months. So if goals have not been met then we – something needs to be done to change the medical therapy. Perhaps medications have to be adjusted or added.

Incidentally, the studies also suggest that lifestyle interventions reduces LDL cholesterol again by about 15 to 25 milligrams. And that the effect is known is at about the same time that we see the effect on A1Z. So, I think as educators it's important to know what the expected outcomes of our

interventions maybe. It is also important to know when to evaluate the outcome of our intervention.

So these were our four points. As we sit down with patients we suggest that we would like to work with them to look at what type of lifestyle changes are they willing and able to make the will improve their blood glucose control. At subsequent sessions we can focus also on lipids and blood pressure. Hopefully, we can help them make some changes in carbohydrates and better understand carbohydrate counting. Certainly encourage physical activity. And then look at outcomes.

So the bottom line is that for prevention we do know that small amounts of weight loss and are very beneficial, as is physical activity. But I hope that I've convinced you also that people with type two diabetes, that improving blood glucose control should be our first priority. And that as the disease progresses then, many times medications will have to be combined with lifestyle. Doesn't mean that lifestyle isn't important. It continues to be important.

So we have our old versus our new nutrition paradyme. Previously medical nutrition therapy was always a calculated a ADA diet. We talked about individualizing this type of prescription. Well, I think you all know that there is absolutely no way you can individualize that type of a nutrition prescription. Individualizing it was actually an oxymoron.

We now know there is no longer any ADA diet – that these ADA diet sheets were really not very effective. They didn't really help people change any habits. And that we need to negotiate with patients on the changes that they are willing and able to make.

Weight loss was always essential. Well, weight loss can typically be helpful. And certainly I think we all would like to help people to be able to lose weight. But it's not essential for improving blood glucose control. Blood glucose control can be improved by changing food habits.

Ideal body weight was always the goal. Well, hopefully, again, I think you are all well aware that even small amounts of weight loss improve insulin resistance. It's certainly small amounts of weight loss that also improves blood pressure and lowers the need for blood pressure medication.

What's not none clearly today is what happens as – long-term. Sugars and sweets as you all know were forbidden. And we now know that it's really total amount of carbohydrate that's important. We told people that protein would slow the absorption of carbohydrate. That if they ate protein it would prevent blood glucose levels from dropping too low in the middle of the night.

You know the old story. You have an ounce of meat before you go to bed at night to prevent hypoglycemia. Well, I just tell people, you know, think about that. One ounce of protein, seven grams of protein, even if half got changed in to glucose and into the general circulation, it would only be three and half grams of glucose. Personally, I find it hard to believe that three and half grams of carbohydrate ingested at 10 o'clock is going to prevent hypoglycemia in the middle of night. But we certainly told patients that was true.

So what we know is that doesn't slow absorption. That it doesn't prevent late onset hypoglycemia. Doesn't assist in the treatment of hypoglycemia. And then we often thought that when people moved onto medications that diet was no longer important. But I hope also that what I've convinced you off is just as type two diabetes is a progressive disease, that we also need to change our nutrition therapy over the progression of the disease. And that it should always be a part of diabetes care plans. And that the message that we need to give to patients is it's not they who have failed. It's not their diet that's failed. It's their beta cells that have failed.

And that we really want to focus on how – what lifestyle will help improve their metabolic abnormalities. So with that, I think we only have just a minutes. I'd be happy to answer questions.

But before we do that let me say, because I know our time is short and many of you may have to leave. If you do have some questions, please feel free to email the questions to me. My email is very simple. It's just marionfranz@aol.com. So with that I'll turn it back to the moderator.

Operator: And thank you Ms. Franz. The question-and-answer session will conducted electronically today. If you would like to ask a question, please press star one on your touch-tone telephone. I'd like to remind everyone if you're using a speakerphone today, make sure that your mute function is disengaged so that your signal may reach our equipment. Once again that is star one and we'll go first to Carole Treat.

Carole Treat: Good morning.

Marion Franz: Good morning, Carole.

Carole Treat: Marion, I had a question. You mentioned about using medications for appetite or weight control. What medications would you recommend?

Marion Franz: No, I didn't – what I meant is that when medications for blood glucose control are important, then what we actually focus on is prevention of weight gain. So I don't think at this point, our evidence for the weight loss medications – in fact when I reviewed the literature, people can do just as well with lifestyle as they can with medications for appetite or for weight loss. So what I meant is that as people add in diabetes medications, then our focus becomes on prevention of weight gain.

Carole Treat: OK. Thanks.

Marion Franz: Yes, thank you for the question so I could clarify it.

Operator: And once again I would like to remind our audience, if you do have a question or a comment at this time to please press star one. And Holly Martin, please go ahead.

(Sheila Blare): Hi, my name is (Sheila Blare).

Marion Franz: Hello, (Sheila).

(Sheila Blare): How are you?

Marion Franz: Fine.

(Sheila Blare): Thank you for the program. And my question is on the slide RD, RN consults program, the group versus individualized education using the carbohydrate counting.

Marion Franz: Yes.

(Sheila Blare): That is a tremendous drop.

Marion Franz: Yes this is a – the program that has been done at the International Diabetes Center. It's called a basics curriculum. And these are people – again remember these are either newly diagnosed or they are people who have not had previous education. And I think that's why the two percent drop. It's like the United Kingdom perspective diabetes study. Remember that was a two-percent drop too in people newly diagnosed.

So, I think, you know, that is some evidence that when people are newly diagnosed – and one of the problems I think you all share and agree with is that often as educators we see people too late. That what lifestyle has its biggest impact either in pre-diabetes or when people are usually diagnosed. Now it's not to say that it's not important throughout the whole course, but the impact on glucose is either in pre-diabetes or with insulin resistance.

(Sheila Blare): So you're saying that you just feel like too, that – would you also say that a group – there's more collaboration between them and they learn easier or ...

Marion Franz: ... yes, I would – thank you for that comment, too. When they compared the individuals versus the groups if anything people tended to do a little bit better in-groups. Although it was not statistically significant. And I can tell you as the educator, certainly enjoyed working together with the people in-groups. And the groups were always done with an RN and RD working together. And they were a series of four sessions.

And so when the RD was in the classroom, then the RN might be doing some things in the background like group of monitoring records and so forth. When the RN was in the classroom, the RD might looking at food records and that type of thing. So the first session is generally about two hours and then subsequent sessions were about half and hour.

(Sheila Blare): I appreciate that so much. Thank you.

Operator: And our next question is from Jeanne Hutson.

Marion Franz: Hello, Jeanne.

(Heidi Beard): Hi, this is (Heidi Beard). Can you hear me?

Marion Franz: Yes I can.

(Heidi Beard): I'm a RN. I have a question about type one diabetics.

Marion Franz: Yes.

(Heidi Beard): ((inaudible)) currently I still see children being advised or type one's being advised to have protein with their evening snacks with carbohydrate.

Marion Franz: Right.

(Heidi Beard): The information about carbs and proteins, does that also pertain to type one's?

Marion Franz: Yes. It is – thank you for that question because it allows me to clarify two points. The protein in type one has not been as well studied. There is one study though, again where they added like seven ounces of protein to a lunch and they found that again, the peak was identical and at five hours the blood glucose values were identical as well. So I think it also holds true in type one.

But I think there is also another important point to make. And that is there maybe a reason that kids might select a protein at bedtime. And the reason would be that lets say they have like two carbohydrate choices or three or whatever it might be. And they're still hungry. And then question will be well what might – you encourage them to eat if they were still hungry. That wouldn't effect their blood glucose levels.

And the answer would might be a protein. So I think there are reasons why people might have a protein. I think it's not our usual traditional reasons. The same thing is true in gestational

diabetes. Women often have a very small breakfast and they might still be hungry. So we know that the carbohydrate is limited if they're still hungry.

Again what might they eat that might not – that wouldn't effect their blood glucose level? And again, it might some food that contributes carbohydrates, or contributes protein. So again, I think there might be – there maybe benefits from the protein foods but they are not the benefits that we traditionally ascribe to them.

(Heidi Beard): And a follow-up question to that, again with type ones. I often hear that carbohydrates would that include a fat are longer acting and ...

Marion Franz: ... right. And yes, thank you for that question too. In that same study where they added 50 grams of fat, it basically just delayed the peak. So it blunted the peak. But again at five hours it was the same. So again, I think it definitely is true that a high fat meal will slow gastric emptying. It probably will blunt the peak. But according to the limited research we have today, by five hours that effect is probably no longer in effect. But again, fat has been even less well studied than protein.

(Heidi Beard): Thank you.

Operator: Our next question is from Aimee Donaton.

Marion Franz: Hello?

Operator: And ma'am, please check your mute function. Your line is open.

Aimee Donaton: Hi, is that better?

Marion Franz: Yes.

Operator: Yes, go ahead, thanks.

Aimee Donaton: In the information on, I think it's the ninth slide on type one diabetes. You spoke about the consistency in carbohydrate intake. And the fact that – I guess this is to put this slide couple before that total carbohydrate intake with type one – does it not matter at all? Do you not have to control carbohydrate intake at one if they are adjusting insulin? Do we need to – can we totally eliminate that need to control carbohydrates if they just take more insulin to cover it?

Marion Franz: Well, – and that's certainly what the study suggests. So if we're just – if the focus is on blood glucose control the answer would be yes. They can obviously take as much insulin as they want to cover the mono-carbohydrate. Now having said that, I need to qualify it. Because I think you would agree that if people over eat on anything including carbohydrate and take too much insulin, then the problem is really weight gain isn't it.

Aimee Donaton: Yes.

Marion Franz: I mean no one can do that as much as they – with or without diabetes as much as we might all like to. And then secondly, I mean I think I always tell people with diabetes as well that, you know, we need to look at what is a healthy diet and what are healthy food choices.

So again, I think if we look at like regular soft drinks. Well, yes, I guess you could take enough insulin to cover a regular soft drink. Would I recommend that people with diabetes use a regular soft drink? I don't think so. A twelve ounce can with nine to 10 teaspoons of sugar, you know doesn't seem like a very good use of carbohydrate servings.

Aimee Donaton: Thank you.

Operator: And moving on, we'll go next to Linda Barrett.

Linda Barrett: Yes, one moment please. Hi, Marion.

Marion Franz: Hello.

Linda Barrett: Hello, I would like ask a question about treatment of woman with the polycystic ovary syndrome as far as metabolic syndrome. How do you go about treating those type of individuals?

Marion Franz: Yes, well I think they fall into that same category as pre-diabetes. And that would be our best evidence today. That they would be in the same class – and so what we again I think focusing perhaps on reduced energy intake. We often find that even teaching them some carbohydrate counting is useful. And even though I think modest weight loss for them is probably more important as well.

But the reason I suggest that often teaching some carbohydrate counting is useful is that most individuals know they need to lose weight. And many of them have tried some many times and may or may not have been successful. The public does not understand carbohydrate very well. And so often that is a new approach and is more of a positive message than lose weight. You know it's some general guidelines as to what people should eat instead of they shouldn't eat.

Linda Barrett: Do you recommend any type of medications regimen?

Marion Franz: Well, I think ...

Linda Barrett: ... like the weight loss. Because that's often been difficult for a lot of woman that have this condition.

Marion Franz: Right. Yes and that's an interesting question. I think if there's the one medication that's often considered is (Metformin) because it improves insulin sensitivity and it does seem to if any thing have a modest benefit on weight loss. So that might be a medication that a physician or a nurse practitioner or somebody may have considered for somebody with polycystic ovary syndrome.

Linda Barrett: OK. Thank you, Marion.

Operator: And our next question is from Sheree Scudder.

(Lubie Garza): Yes, good morning. This is (Lubie Garza), Texas Diabetes program.

Marion Franz: Oh, hello, (Lubie).

(Lubie Garza): Hi, good to hear from you. Excellent presentation. I need to get the reference on your latest article that came out from the Diabetes Care Journal on this specific topic. Can you quote that for us? ((inaudible)).

Marion Franz: And which specific topic?

(Lubie Garza): It was your new nutrition recommendations for 2004. You have it I believe in the Diabetes Care Journal. It came out within the last six months.

Marion Franz: No, (Lubie), why don't you send me an email. Because I'm not quite sure I know what reference you're referring to.

(Lubie Garza): OK. Thank you.

Marion Franz: Yes.

Operator: And just a final reminder to our audience today, if you would like to ask a question at this time to press star one. And we'll take a follow-up from Carole Treat.

Marion Franz: Right. Hello?

Carole Treat: Hi, actually you already answered my question.

Marion Franz: OK. Thank you.

Carole Treat: OK. Bye.

Operator: And there are – and Nina Clark, please go ahead.

Marion Franz: Hello?

Nina Clark: Hi, I have a question because we have a number of gastric bypass patients who have surgery for morbid obesity. Do you have any specific recommendations for assisting them with their meal planning since they're allowed very small amounts of anything.

Marion Franz: Right. Yes, that's a very interesting question because there haven't been any studies done in people with diabetes to suggest that what we recommend would be any different than what you would recommend for anyone else who had had gastric surgery.

So I think what applies to one applies to the other. And if you've worked with that group you probably know if there – that they are a group in which when they lose this large amount weight of

loss you really often do find that if they have had diabetes, that their blood glucose levels are normal. So I don't – there's nothing I think that's specific to them because they have diabetes.

Nina Clark: Thank you.

Operator: And there are no further questions at this time. Ms. Franz, Ms. Gibson, I'll turn the program back over to you for any additional or concluding remarks.

Natalie Gibson: Thank you. Thank you for participating in today's call. We appreciate Ms. Franz for giving us her time and expertise. These insights will be useful in improving diabetes care nationwide.

I want to remind nurses and dietitians who would like CEU credit for this program – you need to mail or fax all completed forms and roster to me by October 29th. The fax number is 850-245-4391. And I'll repeat that one more time. The fax number 850-245-4391. Thank you to everybody. I hope that you all have a wonderful day. I will now turn it over to the operator for call conclusion.

Operator: And that does conclude today's conference. I would like to thank everyone for joining us today. Please have a good day. You may now disconnect.

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