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Intro: You're listening to audio from one of our Third Thursdays Webinars on Parkinson's research. In these webinars, expert panelists and people with Parkinson's discuss aspects of the disease and the Foundation's work to speed medical breakthroughs. Learn more about the Third Thursdays Webinars at michaeljfox.org/webinars. Thanks for listening.

Karen Jaffe, MD: Thank you everyone for joining us. I'm Karen Jaffe, MD and I'll be your moderator today. I was diagnosed with Parkinson's disease in 2007 and I'm a retired OBGYN. I also sit on The Michael J Fox Foundation patient council. Today we're going to discuss what a healthy diet looks like and how you can balance a healthy diet with all that life throws at you, the good and the bad. We're also going to review some specific diets you may have heard of and what we know about their impact on Parkinson's. We will talk about some adjustments for Parkinson's specific medications and symptoms, and finally we'll touch on the use of vitamins and supplements, which we hear a lot of questions about.

Now let's meet our panelists. With me today is Sharon [inaudible 00:01:19], a retired political therapist who was diagnosed with PD eight years ago. She has worked with a dietician in the past year and will share her experience with diet and Parkinson's disease. And coincidentally, since Sharon and I both reside in Cleveland, we'd like to give a shout out today to all of our friends [inaudible 00:01:34] who have tuned in with us today. Sharon, thanks for being here.

Sharon Desatnik: Absolutely. Thank you. Absolutely.

Karen Jaffe, MD: Dr. Puja Agarwal is a post-doctoral research fellow at Rush University Medical Center. She is conducting a research study comparing specific diets for Parkinson's, which we'll hear more about today. Glad you're with us, Dr. Agarwal.

Puja Agarwal, PhD: I'm glad, too. Thank you.

Karen Jaffe, MD: Christine Ferguson is a dietician and a doctoral student in human nutrition at the University of Alabama. Her work is focused on treating brain disease through nutrition interventions. Welcome, Christine.

Christine Ferguson, MS, RD, LD: Thank you for having me.

Karen Jaffe, MD: Great. Let's get started. Christine, I'm going to turn to you first. Let's begin this discussion with a review of the basic components of what makes up a healthy diet. And where do you think most of us fall short?

Christine Ferguson, MS, RD, LD: Absolutely. I think we all can try to follow healthy diet patterns and really I feel like it's not emphasized enough of eating the rainbow, eating our fruits and vegetables. It's something that we all know that we need to do, but still it's something that we can all do a little better. So fruits and vegetables, trying to get the majority of our foods from plants is one of the key components of a healthy diet, including whole grains.

So whole grains, when we're looking at whole wheat, whole wheat breads, we want that first ingredient to be some type of whole grain rather than breads that are made with whole wheat when really it's enriched. So whole grains are going to be ... they have a lot more fiber in it. Fiber is good, especially it's very pertinent to Parkinson's disease and managing any GI issues. But anytime we say we want to increase our fiber, we also want to make sure we're increasing our fluid intake as well. Our lean proteins, so some examples of lean proteins like our poultry, like chicken and turkey or fish, plant sources of protein, like beans and legumes, are definitely components of a healthy diet, and fish as well. Those would be more lean proteins.

Some of our red meats, they can fit in a healthy diet, but we want to consume a little bit less of them. They tend to be a little less heart-healthy. And also healthy fat, our healthy fats are going to come from oils, nuts, seeds, fatty fish. The fats in fish are actually good for us. So those are definitely components of a healthy diet. And then next is limiting processed food. So an easy trick is when you're at the grocery store to shop the perimeter of the grocery store. You typically have your produce, some of your meats, your dairy. Usually those center aisles tend to be a little more processed, so they just tend to have some additives. But being comfortable looking at a nutrition facts label, looking at ingredient lists, is a good first step.

And then last we have these antioxidants. I like the description here. "Some good for you molecules that protect the cells." They are rich in fruits and vegetables especially, but they're also found in grains, nuts, dark chocolate, some beverages such as red wine, coffee, and tea. So we know with Parkinson's and the disease process, there tends to be some chronic underlying inflammation and oxidative stress. And so antioxidants is a way that we can combat that through our lifestyle and through our diet. So trying to consume more of these is definitely something we should all strive for.

Karen Jaffe, MD: Thank you. People come in all shapes and sizes obviously. So where can people find reliable information on how much of these components they should get to meet their individual nutritional needs?

Christine Ferguson, MS, RD, LD: That is a challenge because whenever you look things up online, and even in today's webinar, we're going to talk more general. We all are different and we want to get individualized needs. The Michael J Fox Foundation, they have an excellent Parkinson's disease diet guide which goes even more in depth on some of these topics. So that's a great resource for everyone to refer to. But if you want that true individualized recommendations, find a registered dietician

in your area. We are specially trained on meeting your needs while also making sure we're prioritizing your priorities. So finding that diet guide on the Michael J Fox website and then also trying to get that individual counseling from a registered dietician.

Karen Jaffe, MD: In regards to the resource guide, which is really an excellent research guide, as you mentioned, it's the practical guide for Parkinson's disease and diet. It was written by the Fox Foundation's own Dr. Rachel Dolan and actually reviewed by you. And it is listed on the resource list on your screen so you can download it from there. And I've looked at through, and it's interesting, as you mentioned, there's a lot of great shopping lists. There's one that actually lists antioxidant containing foods, making it easy for us to try to find the things that we might not usually have in our diet. So Sharon, you consulted a nutritionist. Can you tell us what that entailed and what were some of the things that you learned that you needed to do?

Sharon: Sure. Well, I looked to a nutritionist because I wanted to decrease my Parkinson's symptoms and to decrease my incredible sugar addiction to help feel better and hopefully lose some weight. And I started with a group online program from a nutritionist, dietitian, and a physical therapist, followed by I did about six weeks with a registered dietician. I felt better after about a month of the program. I used a system tracker guide to call attention to what symptoms were better and I had the guidance of a dietician for it.

Karen Jaffe, MD: Great. We'll get back to that in a minute. Before we leave this slide, Pooja, I'm thinking that the benefits of antioxidants may be some new information for some of our listeners. Christine reviewed them a little bit, but is there any PD specific research that tells us what potentially how they or whether they're making a difference in Parkinson's patients themselves?

Puja Agarwal, PhD: Yeah, sure. There are some trials that have been done with vitamin E and vitamin C. The vitamin E trial, vitamin E and vitamin C are type of antioxidants. So there are various types of vitamin A including carotinoids and other betacarotene and stuff, which are construed as antioxidants for our diet, and so is vitamin E and vitamin C and other flavonoids, which Christine mentioned are like polyphenols and stuff, which are rich in all the fruits and vegetables.

So there have been specific studies on vitamin E and C specifically, but the vitamin E study has found some associations that there are still [inaudible 00:08:59] and there's a new study which I'm part of, and actually it's in the review. The article is under review, but we found that people who were eating more antioxidants, including beta carotene or vitamin C, which are rich in oranges and all the citrus foods, and all these vitamin E which is rich in, again, fish and other food sources. People who were eating it had lower Parkinson's symptoms over time. We have followed these people over almost 12 years and looked at their Parkinson's symptoms, and people who are eating foods that were rich in antioxidants had less symptoms overall.

Karen Jaffe, MD: Is there a sense that it's slowing down the progression of Parkinson's in any way or ...

Puja Agarwal, PhD: It slows down the progression of Parkinson's because it improves what [inaudible 00:09:57] your UPRS score. It improved their UPRS score over time. So basically the decline was not that rapid. It was a slow decline of symptoms.

Karen Jaffe, MD: That takes us to the next slide, and that is looking at more specific diet plans. And Pooja, while such programs are not for everybody, can you talk a little bit about these specific diets and what they might offer to a person with Parkinson's disease?

Puja Agarwal, PhD: Yeah, definitely. Right now on the slide you can see main three diets, the Mediterranean, MIND, and ketogenic diet. The Mediterranean diet is basically including more fruits and vegetables and more of whole grains. Again, it includes more fish consumption as well as more legumes and olive oil consumption. So in limiting other processed foods and basically also limiting the red meat is part of the Mediterranean diet, and moderately consuming dairy, eggs and poultry, including chicken and turkey. And studies have found that people who eat more of Mediterranean diet have less risk of developing Parkinson's disease and that's definitely something, as Christine mentioned, you can incorporate in the daily life, that includes more vegetables, more fruits, nuts, olive oil, and add these components to your daily plate.

Then coming onto MIND diet, MIND diet is actually the diet which for [inaudible 00:11:34] has been identified to be very good for brain health. It includes all the food components which are important for brain health, such as all the colored vegetables and specifically green leafy vegetables, and including berries in your diet with nuts and olive oils and whole grains and fish, and also including beans and poultry, red wine. And again, avoiding the high fat foods. And as Christine mentioned, just include the healthy fats, which would come from nuts and olive oils, and exclude the high fat red meat and try to avoid whole fat cheese or whole fat dairy and other fried food and sweets.

So again, the study which was done by our group, we found that both MIND and Mediterranean diet improves the Parkinson's symptoms over time in older adults. And again, we followed them for almost 12 years. This is based on ... just a population based study, so we have older adults enrolled in the study and we followed them over time for 12 years. Those who are consuming high amount of MIND diet or high Mediterranean diet, the components of these diets, those who were consuming in higher proportion when compared to those who were consuming low, had a better outcome for Parkinson's disease.

The third diet on the slide is ketogenic diet. This is getting quite popular diet for the weight loss and other ... like appetite control controlling diet, which is high in protein and heavy fats, but it is low in carbohydrates. So personally as a nutritionist and as a researcher, I believe that the studies done on ketogenic diet are still limited and I have to be very cautious interpreting the results of

these few trials, one or two trials, that which has a small number of people involved, and follow it up for a longer time, because we still don't know if this ketogenic diet can reduce the appetite. And because people with Parkinson's disease or any neurodegenerative diseases are at risk of malnutrition or can lose their appetite, which can be accompanied by the gastro intestine system or some other side effects, we have to be very cautious on such diet unless more research has been done and have shown ... [inaudible 00:14:23] shows the productive side definitely, that can be the ... also. But right now I'd be very cautious for ketogenic diets. But definitely the other two dietary patterns, the Mediterranean and the MIND` diet, I would say are quite studied in various populations.

Karen Jaffe, MD: So my question is, is in terms of the Mediterranean diet and the MIND diet, did the studies show both a decrease in developing Parkinson's disease as well as for those already had Parkinson's disease or developed it that it was slower progression? Or they didn't look at both of those things?

Puja Agarwal, PhD: The study looked at Mediterranean diet and Parkinson's disease risk and they found people with the Mediterranean diet have low risk. That's definitely done in American population too. The MIND diet studies have found that people who have Parkinson's symptoms ... so there's a difference between having the actually Parkinson's disease diagnosis versus symptoms. So we follow people with Parkinson's symptoms, like having bradykinesia or any kind of tremors or rigidity, and then followed them over time. So there were improvement in their symptoms over time by those who were on the MIND diet.

Karen Jaffe, MD: That's good information. Christine, we're having some questions about fava beans and whether these are something that people should take, and how and how much should they take.

Christine Ferguson, MS, RD, LD: Yes. I've gotten a lot of questions about fava beans. So the reason why for those who may not be aware, fava beans are a natural source of levodopa. So I can see why so many people may feel inclined to start consuming fava beans on a regular basis. I've actually seen fava beans a little bit more in grocery stores. And so there's my one reservation with fava beans, and so I always have a disclaimer, is ... it's a natural source of levodopa. If you are already taking a prescribed medication with levodopa in it, then there may be some interaction there and it may get in the way of your physician and your pharmacists finding an optimal dose for you.

So there may be some interactions there. So I would be cautious with it. Of course, if it's a very small amount, you may not even see any difference, but more is not necessarily better. So I would be cautious. If you're not on levodopa medications, if you're not taking any pharmacologic medications right now or if it's untreated, that may not hurt anything. So I would be cautious. It's extremely rich in fiber. But as far as the levodopa content and the composition, that will vary pretty significantly. So we don't know how much is in a serving necessarily, and we don't know how much is safe and how much will interact. I haven't seen

any studies that I'm aware of on this particular food. There may be some food medication interaction there, so I would proceed cautiously.

Karen Jaffe, MD: While we're still on this specific diet plan slide, we've had a couple of people ring in about questions about other diets, which would be stuff like the gluten free diet and intermittent fasting. Christine, do you have any recommendations regarding either of those?

Christine Ferguson, MS, RD, LD: Sure. So gluten free diets ... really gluten free diets are meant for people with celiac disease. And so it's becoming somewhat known that there may be some gluten intolerance issues, but there's no real definition of that. And to back up a little bit, so gluten is a protein that's found in wheat, bran, and barley. So people are going to go gluten free. They tend to feel a little better, not because they're cutting out gluten, it's because they're cutting out some of the processed foods. And so they tend to eat a little more healthy, they eat more fruits and vegetables, and so they feel a benefit because of that. But it's not necessarily the gluten. And I personally love bread and I will never go gluten free. But bread is a rich source of gluten, so some people feel the need to cut out bread in their diet. I try to make all foods fit.

But at this point with the research, there's nothing suggesting that a gluten free diet would be beneficial to Parkinson's disease. And again, if someone is feeling some improvement, it may not be because of the gluten. It may be because of more the healthy choices that they're making with more lean proteins, the fruits and the vegetables, which we have definitely emphasize with these other dietary patterns. What was the other dietary pattern you were questioning about?

Karen Jaffe, MD: The intermittent fasting. Intermittent fasting.

Christine Ferguson, MS, RD, LD: Yes, thank you. Intermittent fasting, just as a brief description is ... and it makes sense. There's going to be some fasting during the day. So people tend to eat in smaller windows of time. So that time may vary. Some people may eat from 12:00 PM to 5:00 PM, or 11:00 AM to 4:00 PM.

So they're eating in a small window of time. There's been several research studies looking at this and weight loss. It's kind of difficult to sustain. So I'm not sure how that may impact those with Parkinson's disease. But I have one notion to believe, that we know there's an interaction between protein in some of the Parkinson's medication, which we're going to talk about a little later on.

So people who may have tried intermittent fasting may find a benefit. They may feel a little better. They may feel like their symptoms are being better controlled because they're not having that interaction with the protein.

No diet is perfect, so with intermittent fasting, it's all about timing. It has nothing to do with diet quality. So there's definitely a healthy way to follow it and there's not a necessarily healthy way to follow it.

So especially with intermittent fasting, if anyone has any trouble with blood sugar or diabetes, there are several diseases or conditions that intermittent fasting would definitely not be appropriate for it, because we don't need anybody passing out because they're starving themselves.

I always appreciate intuitive eating, listening to hunger cues. So that's kind of one of my reservations with intermittent fasting. But if you do choose to follow any of these dietary patterns, please talk with your physician, see if you can find a registered dietician in your area. So that's always my go-to statement there.

Karen Jaffe, MD: So Sharon, somebody is looking for advice on how you kicked your sweet tooth.

Sharon: I have a huge sweet tooth. When I started the program, I learned how to get rid of some brain inflammation foods, which sugar is one of them, and substitute some brain boosting foods. It really helped the sweet tooth.

I substituted processed foods, which have sugar in it ... My thing is ice cream and candy and that kind of stuff ... for a lot of fruit. In past diets, I limited fruit because of the sugar, and natural fruit I found is better for you. When I was on the program and following everything and getting in all my water and avoiding the sugar, my sweet tooth really calmed down just from the natural sugar.

Karen Jaffe, MD: So your brain foods were things like fruits.

Sharon: Brain boosting foods are things like organic foods, probiotics and prebiotics. Apple cider vinegar, which I take a tablespoon in water before a meal, which helps balance your blood sugar. It helps treat the gut lining of your stomach.

Because the gut and the brain are connected with Parkinson's, is the thought, and it certainly made a difference for me. When I started eating better, I started feeling better.

Karen Jaffe, MD: Great. That's good to know. So we were having a lot of questions that are coming in regarding specific things like alcohol. They want to know whether that's okay to drink alcohol and how much is an acceptable amount?

I think that the question is, is there some benefits from alcohol and what would that those be? How much would you need to do to get that benefit? Christine, you want to take that one on?

Christine Ferguson, MS, RD, LD: Sure. So there has been some observational studies that look at wine, specifically red wine and development of Parkinson's disease, as well as progression. This goes back to talking about antioxidant rich foods. In that list

that we looking at, red wine was actually listed there because it is a potent source of polyphenols and resveratrol is one of the antioxidants that's in red wine.

Christine Ferguson, MS, RD, LD: That specific antioxidant is more rich in the red wine versus the white wine, so the red wine would be preferable. And this goes in line with the Mediterranean diet, that [Pooja 00:24:19] described. That five ounce glass per day is the recommendation.

As far as going back to just normal dietary guidelines, you really only need one glass per day. Men are technically allowed to have two per day, but as far as to get the benefit, one five ounce glass of red wine per day would be optimal.

There have been studies that also looked at beer and other liquors, and there really hasn't been anything significantly shown there. So, red wine would be the best ... if you're going to consume alcohol, that would be the best choice.

Karen Jaffe, MD: Okay. I think that answers most of the people's questions. Let's move on here. So let's be honest, making changes in one's diet is never easy and old habits die hard. So most of us are motivated, I think at the very least, by the simple notion that we know we can do better, reducing the bad food while increasing the good. But in spite of our good intentions, life does get in the way sometimes.

Sharon, why don't you share your story of how you got derailed because of a life situation.

Sharon: Yeah. I was working really hard on changing my diet and using the brain boosting foods and the water, and I was working really, really hard on exercise. Unfortunately, I suffered an avulsion fracture of my pelvis in November and that ended all the exercise, because for the first two weeks I couldn't even walk. I was in a wheelchair and I'm now on a walker, which I was on nothing.

So it took away my exercise. It also took away my ability to make meals. My husband does not cook. So, we were just eating a lot of things like soy burgers and things that I can ... which are processed foods, and soy is not considered good for the brain or the gut.

So I slowly started getting off the diet and I couldn't put together sales. I couldn't even shop. I was using curbside service. So I was very derailed. I was very depressed, because I was isolated and my sugar addiction had returned with a vengeance.

Karen Jaffe, MD: Wow.

Sharon: So that's what I was doing for the last eight weeks.

Karen Jaffe, MD: So what, if anything, has gotten you back on track and what do you think will motivate you to stay on track with your program?

Sharon: Well, talking in front of all these people today was a big motivation for me to start back on my program. A little peer pressure there. And the desire to be healthy. I felt better when I was on the program and I need to be healthy.

I'm slowly allowed to do a little bit of exercise. Now, I'm allowed to walk in the water. I can't do anything much else that that. So I figure if I'm starting my exercise, I can start my eating better too.

Karen Jaffe, MD: Great. So I know that when you are healthy, exercise has helped you manage your PD. Do you think that your motivation to stay with a healthy diet is linked to your regimen of exercise?

Sharon: Yes. Exercise is social. It has accountability effects because you exercise with people. Or if I exercise by myself also, my husband always asks what I've done that day.

My handwriting, my tremors are better after I exercise. I even have a outside recumbent bike, which I can ride about 25 miles on. So, I'm getting out there more. I'm seeing things I've never seen before, from a bike's point of view versus a car or walking point of view. And it just helps my PD symptoms immensely. I'm looking forward to getting back to all of that.

Karen Jaffe, MD: Do you exercise and do you think that helps keep you motivated to stick with your healthy diet?

Sharon: Yes. Yes. I think they go hand-in-hand.

Karen Jaffe, MD: Great.

Sharon: I do.

Karen Jaffe, MD: So Christine, one of our listeners has asked, "Where do I even begin my quest for best eating practices with Parkinson's?" What can you recommend when a client has been to you and their diet's just a mess, and they want to make some changes? Where do they start?

Christine Ferguson, MS, RD, LD: Yeah, that's a great question because I know all of this can seem very overwhelming, especially if your diet, your day-to-day life is a little ... it's pretty different than this.

So on the slide, that second bullet point, make small changes one at a time. I feel like that is the key to making sustainable changes, in my experience with patients and that is really ... If you change everything overnight, talking about

those sweets and those cravings that you have, they're going to come back with a vengeance. So, if you can just make some small changes at a time.

I like Sharon's recommendation of having a symptom tracker. Because that way, if there are improvements, they may be so subtle you don't notice them. It may take about a month to kick in or to really notice something, so you need to stick with it.

So when I have a patient come with me, I ask them what they typically eat in a day, and I ask them, "What's one thing that sounds manageable? Is it that you drink a lot of sugar sweetened beverages like sodas? If you drink three a day, can we move to two a day?"

Really, any changes in the positive direction is going to be better than making no changes at all. Adding one fruit to a meal, if you typically don't eat fruit. And pretty much my recommendations with that is, no matter what age we are, be open to trying new things.

If you hated tomatoes 20 years ago, try them again. Give them another chance. Try to prepare them in a different way. That may be a way to add ...

I was talking with a patient this morning, actually, about trying to make vegetables work for breakfast. It's hard to add vegetables to your breakfast. So, I'm talking with them about making a Southwest scramble, with an egg and a egg white, with some bell peppers and spinach and some turkey sausage. That's the way to kind of amp up a breakfast while adding some vegetables.

So try to sneak them in, but make one change at a time. Do it for a week. And once you've kind of checked that box and you feel comfortable, move on to the next one. So setting some goals for yourself and what changes you would like to make and what works for your lifestyle, I feel like is a great first start.

Karen Jaffe, MD: Do you think there's any difference between fresh, frozen and organic fruits and vegetables?

Christine Ferguson, MS, RD, LD: That's a great question. That was one that I meant to mention as well. When we talk about fresh versus frozen, so when we look at frozen fruits and vegetables, if you look at the ingredient list and it's just strawberries or if it's just broccoli, there's no sauces or syrups or anything else added to them, they actually retain their antioxidant content even better than some of the fresh produce.

So don't count off frozen produce, because they're flash frozen at the time of being harvested. And so those antioxidants are frozen as well. So sometimes with the fresh produce, they're great sources of all the antioxidants and nutrients as well, but they tend to degrade over time, so through the transport and processing.

One great way, and going back to that social aspect, see if you have a local farmer's market. Support your local community. Also, that's a great way of accessing some fresh produce.

And then, deciding to make the decision to do organic produce versus not organic produce, I individualize this with my patients. There have been some studies that have shown an association ...

If something's associated with Parkinson's disease onset and progression, it doesn't necessarily mean it causes anything. So associations, there might be something there with pesticides and Parkinson's.

A lot of the studies have shown that it's people with routinely high exposures of pesticides. We don't necessarily know if just consuming a regular apple will do anything, but if you can afford organic produce, that's something that you can try.

Especially if you feel like you're incorporating these healthy tips already, and if you can afford it, there is the Dirty Dozen and the Clean 15. The Dirty Dozen, these are ones where the skins are pretty thin, and so they're really ... they're more permeable so they tend to hold onto the pesticides a little more.

So these are going to be your berries, your apples, spinach. There are plenty of lists online, but for the sake of time I'll just let ... You can reference the Dirty Dozen.

And then the Clean 15, they're okay to buy non-organic. So they tend to have thicker skins that you typically peel. So if you're kind of caught in the middle of, "I would like organic, but it's a little ... it's not cost effective for me," that may be something you would try.

But I will say, blueberries for example, in my area they're are about \$3 for a small container and the organic version is nearly double the price. So, that's just something that ... What I always tell people is, eating fruits and vegetables is going to be better than not eating fruits or vegetables, regardless if it's organic or not. So that's one of my big takeaways for all of this.

Karen Jaffe, MD: That's important to know. Yeah, you have to deal with the situation that you live in and some people don't have access to this kind of produce, or as you mentioned, it can be quite cost-prohibitive for some folks.

Christine Ferguson, MS, RD, LD: Exactly.

Karen Jaffe, MD: Let's talk a little bit about ... While I think that we can safely say that there is no one diet for Parkinson's disease, it is important to know that what we eat may adversely affect how well our medications work.

Karen Jaffe, MD: Pooja, can you address this issue of the levodopa and protein issue and how we manage the competition that happens between the two?

Puja Agarwal, PhD: Sure, definitely. So again, with the medication, and I think Christine knows it better how to ... Maybe she was advising her patients how and when to incorporate protein. But again, as studies have shown, including protein at particular timing of your medication has really improved some of the symptoms really well in patients with Parkinson's.

Christine, can you jump in and add on to the timing or something?

Christine Ferguson, MS, RD, LD: Yeah. Yes, absolutely. Visually, this makes sense to me, the whole interaction with protein and levodopa. So say you're going to consume your medication. Sinemet is one of the most common medications that has the levodopa carbidopa in it. Say you take that medication with a high source of protein, like a piece of chicken. Your medication and that rich source of protein is going to reach your small intestines about the same time.

That's the area in the GI tract where there's a lot of absorption going on, but there's the competition with the transporter there in the small intestine. We want it to be as absorbed as efficiently as possible, and so levodopa is knocking on the door saying, "Let me in and absorb me." But really, the protein is going to be let in first.

Our small intestine is going to prefer the protein before the levodopa. So, if there's too much protein there, it's not even going to absorb levodopa hardly at all. It's going to be excluded and not used.

So timing is especially important. If you can take your medication that has levodopa in it about 30 minutes prior to your meal, if you can do that without getting nauseous, that's one thing you can do. Some people react differently. Or you can take it two hours after your meal.

If you have to take your medicine with some kind of food or else you feel that nausea coming on, try to take it with a piece of fruit or a piece of bread or something that's more lower in protein.

If you feel that your medication's not effective, you're speaking with your physician and you keep increasing the dosage of it and you feel like it's not being very effective, then one thing you can consider is a protein redistribution diet.

This is specifically for Parkinson's disease and this food medication interaction. I would highly advise doing it under the supervision of a dietician because it is very strict.

Christine Ferguson, MS, RD, LD: What that entails, is consuming the majority of your protein at the end of the day, because normally people want their medication to be most effective during the day. And so during the day, you would just consume more carbohydrates and fats with low protein.

So really, people who have kidney problems, they're advised to follow a low protein diet. So, some of the same recipes and meal plans transfer over there, but you still need your protein. Do not cut out protein because it's essential for muscle mass, lean mass and functionality.

So at the end of the day, you would just consume a very high protein meal. You can do it through food. We promote a food first approach. Anyways-

Karen Jaffe, MD: Christine?

Christine Ferguson, MS, RD, LD: Yeah, sorry. Anyway, if this is their first approach-

Karen Jaffe, MD: Is there any difference between whether it's plant or animal derived protein?

Christine Ferguson, MS, RD, LD: Yeah. That was a question that was submitted in advance, and that's a really good question. So not to get too science-y or technical, but it's the proteins, the amino acids that have a similar structure to levodopa that's going to be interacting it. They're found in both protein and animal ... both animal and plant sources of protein. However, plants tend to have less protein.

Christine Ferguson, MS, RD, LD: There's some better sources of protein in plants, like the beans and legumes, but compared to meat, they have a lot less. So you may find that trying to consume more of the plant proteins, they're a little less in protein compared to the meats and animal protein. So you may tolerate that better.

The additional benefit to the plant proteins, is that you get a ton of vitamins and minerals, antioxidants and fiber. So we know that constipation is definitely an issue in Parkinson's disease. It's even been shown to be present years before diagnosis.

So fiber is our friend, but we also have to subsequently increase our fluid intake as well, or that's going to make a bad problem even worse.

Karen Jaffe, MD: I wanted to just make clear for our audience that we've talked about Carbidopa Levodopa but there's other formulations of Levodopa. Are the other ones impacted in need of protein redistribution diets as well, such as Duopa, [Embresia 00:00:27], Parcopa, Rytary, Sinemet [crosstalk 00:40:31], [Silevo 00:00:32]. Are those products also?

Christine Ferguson, MS, RD, LD: Yes. You wouldn't necessarily... The protein redistribution diet is my last resort because it is pretty restrictive but it's going to interact with Levadopa and

all of those forms of medication. Sinemet is just the most common, but it definitely applies to the other one as well.

Christine Ferguson, MS, RD, LD: I would monitor, just like Sharon does, the symptom tracker. Track your diet over a couple of days, have a symptom tracker and then also a food tracker, and see if you start noticing any patterns there because you know yourself better than any of us. So that could be a way to pinpoint if there's something going on in your diet that's not doing well for you.

Karen Jaffe, MD: There's several questions that are hitting our chat box here that are in response to a comment that Sharon made about soy being bad. Is there a reason that they're all asking me, well, is there a reason for that statement?

Sharon: Yeah, there were six food groups that they listed to that were not as good for you. The idea was to take three food groups and you did a little bit at a time and eliminate them. One of the food groups was soy. I don't know why it's not as good for you, but there was sugar, there was corn, there was grains with gluten in it, there was dairy, and there was soy. I can't remember what the sixth one was, but I had a very soy-based diet before I started this program. Man, it was really hard for me to get rid of it because I like soy and it's easy. I went back to it when I wasn't cooking. But they said no soy, even soy sauce, none of the soy products were good for the brain and the gut.

Christine Ferguson, MS, RD, LD: In my education and training we've looked at soy as a positive thing. Soy has gone back and forth whether is it good, is it not good? I'm not familiar with soy specifically in Parkinson's disease with the gut/brain access, that I'm not quite sure of.

Christine Ferguson, MS, RD, LD: Soy has a lot of plant sterols and stanols, which are good for heart health and removing cholesterol. I wonder if in those six groups that you both tried out since corn was on there as well, I wonder if your dietician had a concern with GMOs, because corn and soy typically tend to be higher. They tend to be the crops that are GMOs the most.

Christine Ferguson, MS, RD, LD: But really for me soy, I don't advise my patients one way or another about soy unless there's some evidence of concern. I'm pretty neutral about soy.

Puja Agarwal, PhD: I agree with [crosstalk 00:00:43:37].

Karen Jaffe, MD: Christine, how do you feel about dairy?

Christine Ferguson, MS, RD, LD: Dairy, yes and thank you, you reminded me of all the things I wanted to say on one of the first slides. There has been more research being done with dairy and Parkinson's disease specifically. There is another webinar that really is great and detailed, the gut/brain access and the gut microbiome. So I'm not going to re-talk about everything that they discussed. There has been some

associations with dairy and Parkinson's disease, not only in the onset of it but also the progression. Now they're trying to figure out why. What is it about dairy? It may be that it's increasing this bacteria in our gut known as Bifidobacterium, which has been shown to not be very helpful in Parkinson's disease.

Christine Ferguson, MS, RD, LD: That may be one of the reasons why. It increases some inflammation. It's been associated with more disease severity. If you feel compelled, and this is why I leave it to my patients because I, as a dietician, I don't like cutting out entire food groups. That's just something that I get very cautious with. However, if I have someone who wants to cut dairy out of their diet, dairy is a great source of calcium and vitamin D and we already know that those with Parkinson's disease already are at an increased risk of osteoporosis. So we want to maintain that bone health.

Christine Ferguson, MS, RD, LD: If you want to reduce your dairy intake, that is fine, but you need to make sure that you're getting enough calcium otherwise. If you can try to do it, for example, spinach is a rich source of calcium, vitamin D, you can go outside, for anyone who's over like about 65 years old, you have decreased vitamin C metabolism from being in the sun, so you need to be in the sun a little longer. Make sure to wear your SPF of course. Try to get that from there. Talk with your physician. You may be qualified to maybe take a supplement, but we're going to talk about supplements on one of the other slides as well.

Karen Jaffe, MD: Great. So despite the fact that we have to adjust our medications because of our diets, the good news is that our diets can play a significant role in helping us to manage some of the more troublesome non-motor symptoms such as constipation, low blood pressure. As you mentioned, constipation is one of those non-motor symptoms that can precede the motor symptoms by 20 years or more. Sharon, I'm curious whether your nutritionist addressed this issue with you and if so, what has worked for you?

Sharon: Oh yes. This was a big thing for me. I didn't know I was constipated beyond normal before I started getting better, I had thought I had to deal with it because it's a Parkinson's symptom. So many people with Parkinson's have it and that's just it. But after a month in the program, which is when I finally started to feel better, my two to three times a week, elimination became two to three times a day and it was pain-free then. I felt much better and not so bloated. I didn't realize the severity of the constipation I had until it was successfully treated.

Sharon: [crosstalk 00:00:47:05], I think the apple cider vinegar helped a lot. Increasing water to the ounces of half your body weight. I don't know if this affects people with high blood pressure because I don't have high blood pressure, but they did say to put in a quarter of a teaspoon of Celtic sea salt into a liter of water and it helps the absorption of the water. I don't have high blood pressure, so it didn't bother me. I do that. And just using the probiotics and prebiotics I think help my gut so that my digestion was better. I started using kimchi and kombucha which

is a that helps with digestion, and just eating the rainbow. I think that all helped me.

Karen Jaffe, MD: Christine, what are some of the other steps that you recommend that a person with Parkinson's can take to combat this really overwhelming problem in a lot of people?

Christine Ferguson, MS, RD, LD: I think Sharon explained it very well, so especially getting her perspective on that. Fluids and fiber. There are different types of fiber as far as insertable and soluble fiber, so trying to get it from both sources. So not only are you going to get that from fruits and vegetables, but oatmeal in the morning. I have people who just consuming oatmeal in the morning, it increases bulk and it helps things move a little better, but you have to increase your fluids as well.

Christine Ferguson, MS, RD, LD: With the probiotics and prebiotics, as far as supplementation goes, there's not a firm recommendation on the composition and the amount of the probiotics and prebiotics that would be helpful for anybody, especially those with Parkinson's. But if you can be like Sharon and get it from food sources, the kombucha, the fermented tea, that's one of my favorites personally. And then kefir, yogurts, kimchi, which is the fermented vegetables, they have some prebiotics which are good for feeding the healthy gut bacteria. You're going to find that in a lot of onions and garlic, things like that, so I would try to get it, of course, again, we do the food first approach, try to get it from food sources before just automatically a dietary supplement. It's not going to act the same way.

Christine Ferguson, MS, RD, LD: That would be my recommendation. And physical activity. That really helps with getting things regular, helping with constipation. So getting up and moving, let gravity do its work. That will also really, really help.

Karen Jaffe, MD: This is great. This is great information. Great advice. I have one more question before I want to move on to our last slide, which is going to talk about supplements and vitamins. There's been several people asking about how to fight the weight loss that Parkinson's patients sometimes have.

Christine Ferguson, MS, RD, LD: Yes, there's a review article that I have that's in review that's about the risk of malnutrition in Parkinson's disease. Just because you're losing weight doesn't mean you're malnourished, but that is definitely a concern. There's not enough research out there to look at foolproof method, but just in my clinical experience, paying attention to what you're eating. Keep a little food log. Looking at foods that, so this supports why maybe ketogenic diet is not the optimal diet for Parkinson's disease, because high fat foods are going to make you feel full quicker. If you're having an issue with weight loss, you need to consume more calories and more protein especially.

Christine Ferguson, MS, RD, LD: The timing of the protein may vary, but if you're losing weight, you may also be losing that lean mass. And so that's going to affect your ability to get up and get moving. So consuming foods that are dense in calories, consuming those first before some low calorie foods would be like lettuce and celery and things like that. And cooking in a strategic way to add more calories. If you're cooking rice for example, you can add broth, or depending on what you're doing with the rice, you can add milk to it. If you're doing in your coffee, adding some, if you want to do some protein powder or some coffee creamers, it's kind of the opposite of weight loss recommendation. So adding some margarine to your foods, just increasing the calories.

Christine Ferguson, MS, RD, LD: You still need to be physically active, but that also increases your calorie demands. So just trying to be strategic in consuming those energy dense foods, the ones that are dense in calories, before the ones that don't have a lot of calories.

Puja Agarwal, PhD: Also I would like to add, and Christine you can jump in if you disagree, but adding in between the meals, some snacks or sometimes it's long gap in between the meals. So adding some calorie snack in between, like crackers with maybe low fat cheese or hummus, because then it adds on to your protein, and some bean salads, the quinoa salads in between the meals, help to increase the overall intake of the healthy food.

Christine Ferguson, MS, RD, LD: Yes, [crosstalk 00:53:14] concur with that.

Karen Jaffe, MD: We're going to move on to our last slide here. [Clushia 00:13:17], I'm going to have you take this one on. We've had lots of questions submitted about vitamins and supplements, their efficacy and their safety. So please give our listeners an overview if you can on this topic.

Puja Agarwal, PhD: Again, this vitamin and supplements, I would say there is, again, we lack in the literature on the amount of studies that have been done looking specifically at the supplements. There are studies on CoQ10 and the combination of CoQ10 and vitamin E which have shown improvement with Parkinson's progression.

Puja Agarwal, PhD: In the recent analysis which we did, and again, the study I mentioned before, the vitamins like vitamin E, C, and carotenoids coming from food were much more helpful to improve the Parkinson's symptoms, but overall vitamin supplements, I did not find anything in our study improving the symptoms at all.

Puja Agarwal, PhD: So again, it is a very specific area because if you are deficient in any vitamin or mineral, I mean definitely you need a supplement. You have to talk to your physician and it will show up in your blood work and then you definitely need a supplement to improve on the levels. But then other than that, adding any vitamin or specific supplements, that may not be improving your Parkinson's symptoms as such, if you're not deficient.

Puja Agarwal, PhD: As Christina also mentioned, I would again reinforce and say try to get these vitamins and minerals from your food sources because again, the food is a complex thing and the way we absorb and process in our body is very different the way we absorb the supplements, because when these supplements get in, the absorption is so very different than when we are eating the foods and directly getting other minerals and vitamins along with that particular one we need. The interaction of nutrients are also important.

Puja Agarwal, PhD: Any vitamins or supplements if recommended by doctor, then you have to take it. But then again it can interact with your medication, it can worsen your symptoms. So you really have to talk to your doctor before adding any pills in.

Karen Jaffe, MD: That's good advice. Christine, do you think that it's fair to say that at the end of the day what works for one person may not work for another and so that the best advice is to discuss the pros and cons of any new diet that you want to take on with your doctor or a registered dietician?

Christine Ferguson, MS, RD, LD: Absolutely. I really appreciate it on the website where the slides are, there's also a resource list. You can click on it and it's a link to find a dietician near you. That's a great website to try to find a dietician. So exactly, it comes to your own blood work, what your eating. Dietitians, we're trained to individualize it. So at this point with the vitamins and supplements, there's nothing to support a general recommendation for Parkinson's disease at this time. That's why we're pretty cautious with our statements and try to get it from food first. That's definitely the best route to go.

Karen Jaffe, MD: Do you think that the dietician needs to have some experience with Parkinson's disease or that's not necessarily the case?

Christine Ferguson, MS, RD, LD: Obviously if they have experience with people with Parkinson's disease of course, but a lot of it's symptom management as well. A lot of the symptoms are specific to Parkinson's disease, like the non-motor symptoms, especially the constipation and trying to follow the Mediterranean diet and the mind diet.

Christine Ferguson, MS, RD, LD: Dieticians are trained so don't count them out yet. Give them a chance. The dieticians, I've had a lot of people reach out to me because there's not a lot of dieticians in our area, but they have a lot of training, a lot of knowledge to pass on. If they feel that they may not be the right dietician for you, they may point you in a direction to someone who is. So I would definitely try to connect with one first.

Karen Jaffe, MD: Great. Well that wraps up this session. I want to thank everyone for joining us today and a big thanks to our panelists for sharing your expertise. This was really great information sharing. We'll be sending a link to the webinar on demand to listen again or to share as you'd like. We hope you find it helpful. Have a great day.

Michael J Fox:

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