

Nutrition and Parkinson's Disease

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The Significance of Nutrition

- What is optimal nutrition for people with Parkinson's Disease (PD)?
- There is no single answer. PD affects each individual quite differently; some factors that can change your dietary needs include your age, your gender, whether you have any other diagnosed conditions such as elevated blood pressure, food allergies, diabetes, etc.

What is optimal nutrition for people with PD?

There is no single answer. PD affects each individual quite differently; some factors that can change your dietary needs include your age, your gender, whether you have any other diagnosed conditions such as elevated blood pressure, food allergies, diabetes, etc. Also, medications used may have a wide range of side effects that can impact nutritional health. That includes medications for heart disease, blood pressure, and other conditions, as well as PD medications; it also includes many over-the-counter medications.



Canada's Food Guide

- Canada's Food Guide is a good guide to optimal nutrition for those with PD.
- 4 food groups – need to have and enjoy a variety of foods from all groups.
- Each food group has specific nutrients.
- Different people have different requirements.
- Use the serving sizes as a general guide to meet daily requirement.

Canada's Food Guide is a good starting point and a good general guide to optimal nutrition for those with PD. The same general healthy eating practices that apply to the general adult population, also apply to patients with PD.

Canada's Food Guide is composed of 4 groups.

Each group has specific nutrients, but some nutrients overlap groups as well.

Different people have different requirements

People's individual requirements are guided by servings sizes.

NEXT SLIDE



As we can see there are four food groups. Grains: breads, cereals, pasta, rice; fruits and vegetables; milk and milk products; and protein containing foods (ie. meat, and alternatives such as eggs, beans, peanut butter). As I stated already, each food group provides different nutrients so it is important to obtain foods from all four food groups. The food guide's shape as a rainbow is of significance. That is, the foods in the outer ray of the rainbow are the ones that we are supposed to have in larger quantities versus the foods in the inner rays of the rainbow. So what CFG is telling us is that we need more servings of grains (cereal, breads, rice, pasta) and fruits and vegetables in our diet than meats and proteins.

That is not to say that meats and protein are not important, because they are extremely important for a healthy diet. However, we just do not need as many servings in a day.

There are better choices within each food group as well. When choosing foods in the breads and cereals group, it is a good idea to choose the whole grain foods, to add fibre to the diet. We will talk about fibre a little bit later.

When choosing foods from the fruit and vegetables group, remember that the darker the fruit or vegetable, the more vitamins and minerals that it is going to contain. For example, spinach leaves have more nutrients than iceberg lettuce.

If you are watching your weight, choose milk products with a lower % B.F or % M.F label. BF/MF refers to the amount of butter fat or milk fat that the product contains. If you want to increase your weight, choose the higher % ages.

When choosing foods from the meat and alternates section, pick leaner cuts of meat/fish or poultry, especially if you are trying to loose weight.

Recommended number of Food Guide Servings per day									
	Children			Teens		Adults			
	2-3	4-8	9-13	14-18 Years		19-50 Years		51+ Years	
	Girls and Boys			Females	Males	Females	Males	Females	Males
Vegetables and Fruit	4	5	6	7	8	7-8	8-10	7	7
Grain Products	3	4	6	6	7	6-7	8	6	7
Milk and Alternatives	2	2	3-4	3-4	3-4	2	2	3	3
Meat and Alternatives	1	1	1-2	2	3	2	3	2	3

The eating pattern also includes a small amount (30 to 45 mL or about 2 - 3 tablespoons) of unsaturated fat each day.

As I stated already, different people have different requirements. The food guide provides you with a range of suggested servings in each food group. For the most part, as adults, if we meet the minimum requirements in each group, we will have a nutritionally complete diet. Requirements for each food group vary according to age and gender. There are copies of Canada's Food Guide on the Health Canada website or can be requested through the dietitian at the clinic.

For someone who is underweight, it may be suggested that you eat more than the suggested number of servings per day to help meet your needs or higher calorie options within each food group.



Canada's Food Guide

- Suggested number of servings are based on age and gender.
- Examples of serving sizes are: 1 slice of bread; $\frac{1}{2}$ cup cereal, rice, or pasta; $\frac{1}{2}$ cup of vegetables; $\frac{1}{2}$ cup of fruit or fruit juice; 1 cup of milk; $\frac{3}{4}$ cup of yogurt; 2 eggs; 2-3 oz of cooked meat (size of a deck of cards).

Often when people look at the food guide, I hear, “there is no way that I can eat 7 servings of grains”, but when we take a closer look at the **portion** sizes of food, we realize that a large plate of spaghetti for example, can actually be 3-4 **servings**. Add to that 2 pieces of toast in the morning and a sandwich at lunch, and you have 6-7 servings of grains and have met your daily requirements for that group.

NOTE: Serving sizes are not as big as the portions that we eat. Discuss definition of portion vs. serving. Examples of serving sizes are: 1 slice of bread; $\frac{1}{2}$ cup of cereal, rice, or pasta; $\frac{1}{2}$ cup of vegetables; $\frac{1}{2}$ cup of fruit or fruit juice; or one medium fruit; one 8 oz cup of milk; $\frac{3}{4}$ cup of yogurt; 2 large eggs; 2-3 oz of cooked meat (size of a deck of cards).



Canada's Food Guide

- Try to consume 3 of the 4 food groups at each meal.
- Consider a multivitamin if you are unable to meet your minimum requirements.




Water Needs

- Water is considered a nutrient. It is quite possibly the most important nutrient of all.
- Everyone should drink a minimum of 6-8 cups of fluid per day (water, soup, milk, fruit juice, tea, coffee, etc).
- 1 cup = 8 oz
- If you drink alcoholic beverages, be sure to drink extra fluids.

Not everyone realizes that water is actually considered a nutrient. Water it is quite possibly the most important nutrient of all, yet it is easy to forget about it.

Everyone should drink a minimum of 6-8 eight ounce cups of fluid per day (water, soup, milk, fruit juice, tea, coffee, etc).

If you drink alcoholic beverages, be sure to drink extra fluids. Alcohol is a diuretic. This means it encourages the body to lose more water.



Water Needs

- Why is water important?
- 1) water dissolved vitamins and minerals
- 2) helps lubricate the joints
- 3) removes waste from the body
- 4) prevents urinary tract infections
- 5) manage a dry mouth
- 6) prevents dehydration
- **Sip on fluids throughout the day, even when you are not feeling thirsty.**

Water is beneficial for many reasons.

1) First off, water dissolves the vitamins and minerals we get from our food and carries these vitamins and minerals throughout the body via the blood, ensuring all our body cells are nourished.

2) Water also helps lubricate our joints, and acts as a shock absorber inside the eyes and spinal cord.

3) Water is the force that carries these wastes out of the body in the breath, the urine, and the fecal matter.

4) Adequate fluid also helps prevent urinary tract infections.

5) Some people with PD report that they have a dry mouth, thick or sticky saliva, and dry eyes. This may be due to the PD medications; and or other medications used to treat tremors such as Artane or Cogentin. A dry mouth may also be caused by difficulty swallowing, sleeping with the mouth open, or mouth breathing while awake.

A dry mouth can lead to further problems. Without saliva, bacteria can breed along the gums and cause decay and loss of teeth. Be sure you're drinking plenty of fluids to counteract a dry mouth to prevent future problems.

6) Finally, adequate fluid is important for preventing dehydration. Chronic dehydration can cause many hospitalizations and many health problems.

Older adults and people with PD have decreased thirst sensation, in other words, they don't feel thirsty even when they need fluids. Chronic dehydration doesn't always cause a feeling of thirst, so can go unrecognized until its too late. Therefore, it is important to sip on fluids throughout the day, even when not feeling thirsty.



Signs of Dehydration

- Urinary tract infections
- Lower back pain
- Mental confusion
- Dizziness
- Fatigue
- Dry tongue, dry mouth
- Cracked lips

There are some signs of dehydration that you can watch for:

Urinary tract infections; lower back pain; mental confusion; dizziness; fatigue; dry tongue; dry mouth; cracked lips.



Signs of Dehydration

- Sunken eyes
- Dark urine, infrequent urine
- Difficulty swallowing liquids
- Difficulty speaking
- Upper body weakness
- Weight loss

Other signs of dehydration are: sunken eyes; dark urine; infrequent urine; difficulty swallowing liquids; difficulty speaking; upper body weakness; and weight loss.



The Significance of Nutrition

- Why is nutrition of special importance for those with Parkinson's Disease (PD)?
- Answer: PD can impact many aspects of health:
- appetite lose
- decreased intake of food and fluid
- weight loss and muscle wasting
- weight gain
- nausea

So I've talked about general nutritional and fluid needs for patients with PD. But why is nutrition of special importance for those with PD?

Answer: PD can impact many aspects of health. PD medications can lead to appetite lose and therefore decreased intake of food and fluid. Some patients loose weight as a result of inadequate food and fluid intake. Other patients with PD notice weight gain. Nausea is also a concern for some patients.



The Significance of Nutrition

- Bone thinning
- Drug-nutrient interactions
- Loss of smell and taste
- Slows the gastrointestinal tract
- Causes constipation
- Slows stomach emptying
- Decreased ability to self feed

Other ways that PD can effect health are: bone thinning, drug-nutrient interactions, loss of smell and taste. Some PD medications can cause a dry mouth which can lead to decreased taste sensation. PD causes movements in the gastrointestinal tract to slow down and causes slow stomach emptying.

PD patients often experience tremors, involuntary movements, or freezing, making it difficulty to hold cups and utensils and making it difficult to get food to the mouth.



Weight Loss

- There are many reasons why people with PD experience unintentional weight loss:
- Chewing or swallowing difficulties
- Difficulty manipulating a fork and knife due to tremors and dyskinesia
- Tremors and dyskinesia burn up extra calories.

All too often, people with PD lose weight, sometimes a critical amount of weight, unintentionally. There are many possible reasons for this.

- 1) First of all, PD can lead cause chewing and swallowing difficulties which make it hard to eat at a normal rate and to eat enough food.
- 2) As stated before, difficulty with self feeding related to tremors and dyskinesia (involuntary movements).
- 3) Tremors and dyskinesia (involuntary movements) can also burn up extra calories. These people may be burning off more calories than they are getting from their food, and therefore loose weight.



Weight loss

- Medications can cause a loss of appetite.
- Lose of sense of smell and ability to taste
- Depression can cause lack of appetite and desire to eat.
- Weight loss can be gradual over a period of several years. In other cases, weight loss can be sudden, occurring over a period of months or even weeks.



Weight loss

- When your oral intake is poor:
- Small frequent meals can be helpful.
- Foods and beverages should be high in calories and protein, especially if you are burning up many calories with tremors.
- Oral supplements can also help meet calorie and protein needs (ie. Ensure, Boost).
- Changes in diet texture may be necessary for those who have trouble swallowing.



Weight gain

- Reasons for weight gain:
- PD medications can increase appetite.
- Edema (fluid retention), often in the feet and or lower legs.
- Decreased mobility and physical activity.
- Weight gain after Deep Brain Stimulation surgery.

While some patients loose weight, others gain weight. There are several possible reasons why people with PD gain weight;

- 1) PD medications can increase appetite.
- 2) Some PD patients retain fluid, often in the feet and or lower legs. This extra fluid can lead to extra weight. Salt intake should be limited if edema is a problem.
- 3) Many patients with PD are not able to move as fast or complete as much physical activity as they were able to in the past, but continue to consume the same number of calories. Less calories are being burned off as a result of decreased mobility and thus weight gain occurs.
- 4) A procedure called Deep Brain Stimulation is sometimes used to control tremors. One possible side effect of this procedure is weight gain. This weight gain is likely associated with less calories being burned as the tremors have subsided. Nutritional counseling prior to the procedure may be beneficial in preventing or minimizing weight gain.



Constipation

- Constipation is defined as having fewer than three bowel movements per week.
- Possible reasons for constipation in PD are:
 - PD slows the movement of the colon
 - Medications used to treat PD
 - Inadequate fluid and fiber intake
 - Decreased physical activity

Constipation is defined as having fewer than three bowel movements per week. There are many reasons why people with PD are at risk of constipation:

- 1) PD may cause some degeneration of the nerves of the GI tract. These nerves control “peristalsis”—the rhythmic movement of the GI tract, including the colon. When they are affected, peristalsis slows down. Slowed peristalsis of the colon means that the stool moves very slowly, becoming dry and hard.
- 2) Medications used to treat PD (levodopa, Sinemet) can also cause constipation.
- 3) Both adequate fibre and fluid are important in preventing constipation. Fibre helps to form the bulk of the stool and speed peristalsis. Fluids keep the stool soft. Sometimes people with PD crave sweets, which contributes to constipation because the sweets replace high-fibre foods.
- 4) Decreased physical activity can also be a risk factor for constipation.



Constipation

- To prevent constipation:
- Consume enough fiber and fluid. Foods that contain fiber are fruits and vegetables, whole grains, beans, lentils, dried peas, wheat bran.
- 1-2 tbsp of ground flax per day provides extra fiber.
- Some available fiber supplements are: Metamucil, Benefiber.



Constipation

- Be sure to increase fiber intake gradually to avoid bloating and gas.
- If you are increasing your fiber intake, be sure that you are getting enough fluid. Without fluid, fiber particles remain dry and harden, actually making constipation worse.
- 6-10 cups of fluid (water, milk, juice, etc) are necessary.



Bone thinning

- Studies have shown that both men and women with PD are more likely to have lower bone mineral density, and greater incidence of osteoporosis, falls, and bone fractures.
- Recovery from a hip fracture takes longer with PD.



Bone Thinning

- What can you do to prevent fractures?
- Avoid unplanned weight loss; stay within a healthy weight.
- Get enough calcium and vitamin D.
 - 1000 mg calcium per day for adults up to 50 years of age.
 - 1200 mg calcium per day for adults 50 years of age or older.
 - 1000 IU of Vitamin D per day for adults

Above and:

These are general guidelines. Patients who are at increased risk of falls should especially be consistently taking a vitamin D supplement of 1000 IU per day.



Calcium

- To ensure that you are meeting your calcium requirements:
- Consume 3-4 servings of milk or milk products per day (ie. 8 oz of milk, $\frac{3}{4}$ cup yogurt, 2 oz of cheese).



Vitamin D

- Food sources of Vitamin D are: fortified foods (such as milk), fatty fish (such as salmon, fish liver oils), liver, eggs.
- Most people with PD, especially those over the age of 50, will need a vitamin D supplement.



Vitamin D

- If you are in the sunlight during the summer months with your hands, face and arms exposed for one hour per week, it is easy to get enough vitamin D.
- However, if you live in a northern area like Canada (in the winter) or you are mostly indoors, you will not get enough vitamin D.

Above and:

As you get older though, your body does not produce as much vitamin D from sunlight, so a supplement may be warranted.



Protein and Levodopa

- One of the most important medications used to treat PD is levodopa (or Sinemet).
- On-off motor fluctuations can be experienced by patients who have taken levodopa for several years.
- When the levodopa begins to take effect and there is a good dopamine response, the person is said to be “on,” functioning or moving well. As the levodopa begins to lose its effect and movement becomes more difficult; the person is said to be “off”.

At this time, levodopa is considered to be the gold standard in treatment of PD because it decreases most parkinsonian symptoms. Sinemet is a combination of levodopa and a decarboxylase inhibitor such as carbidopa.

Patients who use levodopa successfully may find that motor fluctuations appear after several years, due to changing levels of levodopa in the blood. Patients experience what is called “on-off” fluctuations in their mobility or tremor control. When the levodopa begins to take effect and there is a good dopamine response, the person is said to be “on,” functioning or moving well. As the levodopa begins to lose its effect and movement becomes more difficult; the person is said to be “off”.



Protein and Levodopa

- Protein in a meal can interfere with levodopa absorption.
- Adjusting the timing of the levodopa can help control “on-off” fluctuations.
- If you spend a great deal of time in an “off state”, particularly after meals, it may be best to take levodopa, Sinemet or Sinemet CR, 30-60 minutes before eating a meal, to allow time for the medication to work.

These motor fluctuations may be as a result of the protein interfering with levodopa absorption. On that note, simply adjusting the timing of the levodopa can help control these ‘on-off’ fluctuations. If you spend a great deal of time in an “off state”, particularly after meals, it may be best to take levodopa, Sinemet, or Sinemet CR 30-60 minutes before eating a meal, to allow the medication to be absorbed and to start working before you have a meal. If you are unable to adjust the timing of your medications, adjust the time that you eat your meals so that your meals are timed at least 30-60 minutes after your levodopa or Sinemet. You should always discuss changes in the timing of your medications with your doctor first.



Protein and levodopa

- Research indicates that a protein adjusted meal plan can also help decrease on/off motor fluctuations.
- There are three ways to adjust protein intake:
 - 1) Balanced Protein Plan (**best plan**)
 - 2) Evening Protein Plan
 - 3) High carbohydrate Plan
- Plant proteins (ie. beans, nuts, tofu) are good choices sometimes for meeting your protein needs.

In addition to changing the timing your medications, a protein-adjusted meal plan may also help improve levodopa absorption and therefore decrease on/off motor fluctuations. There are basically three ways in which protein intake can be adjusted:

- 1) First is the balanced protein plan. This plan consists of equal amounts of protein at each meal, to ensure that an excessive amount of protein is not consumed at any one meal and to allow for consistent levodopa absorption. For most people, the balanced protein plan will result in less protein than the typical western diet provides.
- 2) Second, there is the evening protein plan. High protein foods are eaten only in the evening, so that mobility is improved during the day. There are some serious drawbacks to the evening protein plan. First of all, the plan does not allow for a wide variety of protein foods. The evening protein consumption may block levodopa absorption and thus decrease mobility throughout the night. In turn, the individual may have difficulty adjusting bedclothes, turning over in bed, getting out of bed to use the bathroom, and so on.
- 3) Third, there is the high-carbohydrate plan. With this plan, one eats meals that consist of a ratio of five-to-seven parts carbohydrate to one part protein. In the small intestine, carbohydrate breaks down into glucose, and enters the bloodstream. A high ratio of carbohydrate to protein causes a large amount of insulin to be released into the blood. Insulin removes some of the protein from the blood. There are some drawbacks to the high carbohydrate plan as well. It is difficult to understand, as well, it requires patients to eat a lot of food to get the right ratio. For some patients, this amount of food is too much.

In view of the problems associated with the evening protein plan, and the high carbohydrate plan, the balanced protein plan is recommended over the other two plans. The balanced protein plan is the easiest to follow, and it is more nutritious and palatable.

We get protein from plant products (ie. Dried beans, nuts, tofu) and animal products (ie. Chicken, beef, fish, milk, cheese). Plant proteins contain a higher amount of carbohydrates to protein, whereas meat, fish, poultry and other animal proteins contain little or no carbohydrate. Therefore, some people experience less “on/off” fluctuations with plant proteins compared to animal proteins.



Protein and Levodopa

- **Not everyone experiences “on-off” fluctuations related to protein-levodopa interaction.**
- Sometimes “off” periods can be related simply to the medication wearing off before the next dose. Unless the “off” periods are more obvious after meals, a protein adjustment may not be necessary.

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Sometimes “off” periods can be related simply to the medication wearing off before the next dose. Unless the “off” periods are more obvious after meals, a protein adjustment may not be necessary.



Protein and Levodopa

- Slow stomach emptying can affect how well the levopoda/Sinemet works.
- Symptoms of slow stomach emptying: bloating, belching, heartburn, feeling full quickly, nausea after meals.

PD causes movements in the gastrointestinal tract to slow down and causes slow stomach emptying. Medications to treat PD, can also lead to delayed stomach emptying. Levodopa and/or Sinemet has to be absorbed into the bloodstream quickly. Delayed stomach emptying can slow down absorption of levodopa and/or Sinemet. Therefore, if the medication is working as well as it should, we need to consider slow stomach emptying as a possible cause. Symptoms that may be associated with slow gastric emptying are bloating, belching, heartburn, feeling full quickly, nausea following meals. If a slow stomach emptying is a concern, a gastric motility agent may be beneficial.



Vitamin B6 and Levodopa

- Vitamin B6 also interferes with the absorption of levodopa.
- Now, however, many PD medications commonly combine benserazide or carbidopa with the levodopa (Sinemet). These “protect” the levodopa, so that vitamin B6 in reasonable amounts is no longer thought to be a problem.

In addition to protein, vitamin B-6 can also interfere with the absorption of levodopa. PD patients taking levodopa were previously instructed to avoid foods high in vitamin B-6 and to refrain from use of supplemental B-6.

More recently, however, many PD medications now commonly combine benserazide or carbidopa with the levodopa (Sinemet). These decarboxylase inhibitors such as carbidopa inhibit the action of vitamin B-6. The decarboxylase inhibitors in a way “protect” the levodopa so that vitamin B6 in reasonable amounts is no longer thought to be a problem. Patients using Sinemet no longer need to avoid foods rich in vitamin B-6 and can take oral supplements of B-6 as well.



Vitamin B6 and Levodopa

- Vitamin B6 supplements containing more than 25 mg, can pose a problem for levodopa absorption.
- In more sensitive people, as little as 10-15 mg of B6 can be a problem
- Supplements or multivitamins are appropriate for most patients using Sinemet as long as it contains no more than 10-25 mg of B6 daily.
- B6 supplements containing more than 10-25 mg (especially more than 25 mg) should be taken 2 hours apart from levodopa/Sinemet.

Vitamin B6 in amounts over 25 mg, however, can still overwhelm the carbidopa/levodopa combination. In other words, vitamin B6 supplements in amounts over 25 mg per day, can pose a problem. In more sensitive people, as little as 10-15 mg can be a problem. Therefore, supplements containing more than 10-25 mg of vitamin B6 are not advisable for most people. If you find that you are sensitive to vitamin B6, or if you need to take larger amounts of B6 (over 10-25 mg), it is best to take the B6 supplement at least two hours apart from the levodopa or Sinemet.



Nausea

- Many people experience nausea when they first begin to use Sinemet or levodopa.
- Solution: Take the Sinemet along with some foods that contain little or no protein. Ginger tea is good choice as it often “settles the stomach.” Other options are graham crackers, soda crackers, ginger ale.

Many people experience nausea when they first begin to use Sinemet. This usually disappears after a few weeks, although some people continue to feel nausea as long as they use Sinemet.

One solution is to take the Sinemet along with some foods that don't contain protein. Ginger tea is a good choice for many people, because it often settles the stomach. Graham crackers or soda crackers along with the ginger tea or ginger ale may also help—and these are very low in protein, and should not interfere with the absorption of the Sinemet if that is a concern of yours. If your nausea is not relieved after a few weeks, discuss this with your doctor, who may wish to prescribe an anti-nausea medication.



Conclusion

- People with PD are at increased risk for malnutrition; yet, with attention to diet, you will feel better, ward off nutrition-related diseases, and prevent hospitalization.
- If you are experiencing any of the nutritional issues presented today, our interdisciplinary team can refer you to see a registered dietitian.