

# Impact of Nutrition on PD

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## Objectives



- Identify nutritional factors that may influence the risk of developing PD.
- Determine contributors to weight loss and poor nutrition in PD.
- Discuss drug-nutrient interactions in PD.
- Describe pros and cons of supplement use in PD.
- Discuss Mediterranean Diet in PD.

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# Nutrition and Risk of Developing PD

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## Risk of Developing PD

### Possibly DECREASE risk of PD<sup>1</sup>

- Caffeine
- Tea
- High intake of fruits and vegetables
- Mediterranean Diet
- Vitamin B6 supplementation
- Higher dietary consumption of vitamin E
- Omega-3 fatty acids
- Higher levels of vitamin D3

### Possibly INCREASE risk of PD<sup>1</sup>

- Cow's milk
- High intake of animal fat



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## Risk of Developing PD

### Mixed results<sup>1,2</sup>

- Carbohydrate intake
- Vitamin C
- Vitamin B6
- Folate
- Vitamin B12



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## Factors Affecting Nutritional Status



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## Unintentional Weight Loss

### Body Weight<sup>2</sup>

- Weight loss increases risk of malnutrition
- Weight loss may lead to worsening of PD symptoms
- Low BMI increases risk of cognitive decline and is risk factor for mortality
- Weight loss within the first year has been associated with increased mortality

In a study of 125 individuals with PD with 6-year average disease duration, 38% of men and 50% of women experienced unintentional weight loss.<sup>3</sup>



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## Weight Loss<sup>2</sup>

### Energy Expenditure

- ↑ Increased energy expenditure
- Rigidity
- Medication “off” states
- Tremors
- Dyskinesias

### Decreased intake

Decreased ghrelin seen in PD patients with weight loss

### Mitochondrial dysfunction



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## Malnutrition<sup>2</sup>

Prevalence of malnutrition ranges from 0-24%

Risk of malnutrition ranges from 3-60%

Risk factor for sarcopenia

- Malnutrition + low serum 25(OH)D negatively impacts strength and balance, increasing risk of falls
- Osteoporosis and fractures 2x as likely



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## Weight Gain<sup>2</sup>

↓ May have decreased energy expenditure with decreased physical activity

Weight gain observed following DBS surgery



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## Energy Intake<sup>2</sup>

### Compulsive eating

- Up to 25% of PD patients consume excessive calorie intake
- Increased preference towards sweets

### Higher carbohydrate intake

Lower protein, folate, magnesium and phosphorus intake

Lower intake of fruits, vegetables and meat

\*Dopaminergic system is highly implicated in reward and motivation. Dysfunction likely contributes to changes in eating pattern.



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## Gastrointestinal Symptoms<sup>1</sup>

### Dysphagia

- >80% of patients
- Bradykinesia and tongue motor control
- Issues with swallowing reflex and esophageal sphincter contractions
- Complications include malnutrition, dehydration, and aspiration pneumonia

### Constipation

- Up to 80% of patients
- Delayed intestinal transit time
- Decreased GI motility
- Starts between an average of 15.6-24.0 years before diagnosis

### Early satiety & bloating

- Gastroparesis
- Small bowel dysmotility and small intestinal bacterial overgrowth (SIBO)



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# Gastrointestinal Symptoms

## Hypersalivation and sialorrhea<sup>1</sup>

- Occurs in later stages of disease
- Due to decreased swallowing frequency

## Anosmia<sup>2</sup>

- Often occurring before motor symptoms
- Affects up to 90% of PD patients
- Linked to increased risk of weight loss

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# Other Factors<sup>2</sup>

## Self-feeding difficulties

- Dexterity and control of upper extremities impacted
- Spilling food
- Take fewer spoonfuls during a meal

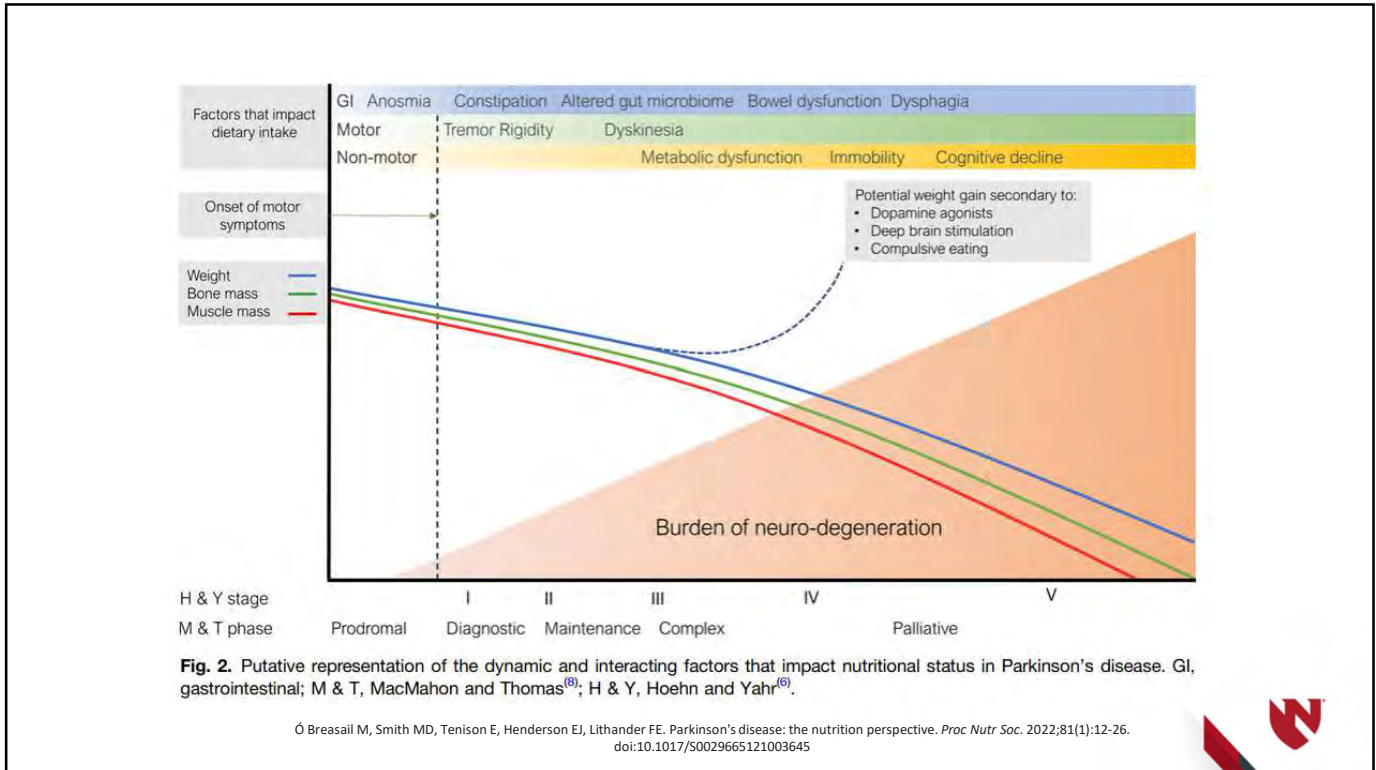
## Cognition

- Less likely to ask for food
- Less likely to be able to physically prepare or access food

## Depression

- Associated with weight loss

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# Optimizing Intake

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## Tips to Encourage Intake

Have frequent meals and snacks

- Breakfast, morning snack, lunch, afternoon snack, dinner, evening snack

Drink beverages with calories

- Milk, fruit juice, vegetable juice, sports drinks, lemonade

Add extra condiments and sauces to foods

- Mayonnaise, salad dressings, cheese sauce, alfredo sauce, gravy

Make smoothies or milkshakes

- Frozen fruit + milk + ice cream

**HIGH CALORIE**



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## Tips to Encourage Intake

Drink pre-made nutrition shakes

- Ensure, Boost, Carnation Breakfast Essentials, Orgain, Muscle Milk

Add fat sources to meals and snacks

- Oils, butter, mayonnaise, salad dressing, peanut butter, cheese, cream cheese, sour cream, heavy cream, coconut cream, and avocados

Provide new meal and snack ideas

Eat with others when possible

**HIGH CALORIE**



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## Constipation Tips & Tricks

### Slowly increase fiber intake

- Whole grain bread, whole grain pasta, brown rice, bran cereal, oatmeal, fruits, vegetables, beans, nuts, seeds
- Must also increase fluid intake at the same time

### Increase fluid intake

- Minimum of 64 fl oz a day of non-caffeinated beverages (water, milk, juice, sports drinks)
- Try warm liquids

### Probiotics

- Yogurt, kefir, kombucha, sauerkraut

### Regular physical activity

### Stool softeners/laxatives

#### Oats, Prune Juice, and Applesauce Constipation Remedy

Ingredients: 2/3 cup old fashioned oats  
1/2 cup prune juice  
1/2 cup applesauce

Instructions: Mix together all ingredients and store in the refrigerator. Have 2-4 Tablespoons a day or more as needed.

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## Probiotics and Constipation<sup>4</sup>

### Beneficial for improving constipation symptoms

- Fermented milk with probiotics improved constipation after 4 weeks.<sup>5</sup>
- Improves stool consistency and bowel habits.<sup>6</sup>
- Taking a multi-strain probiotic for 8 weeks improved transit time and bowel frequency.<sup>7</sup>
- Probiotics treatment resulted in increase in bowel movements.<sup>8</sup>

### Possible benefits of reducing gut inflammation and improving gut bacteria

Unknown which probiotic strains or formulations is best

No serious side effects reported in studies evaluating probiotics in PD

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# Drug-Nutrient Interactions

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## Carbidopa-levodopa (Sinemet/Parcopa/Rytary)

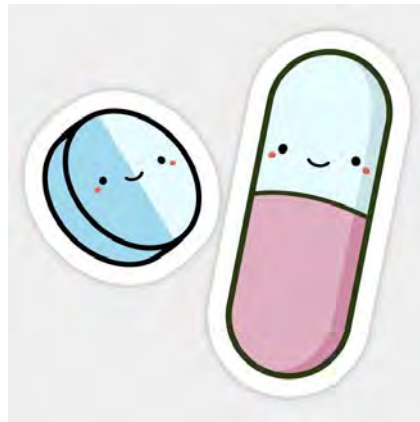
Protein competes for absorption of levodopa

High protein intake may **decrease** the effectiveness of medication

Take carbidopa-levodopa on an empty stomach 30 minutes before a meal with protein  
OR 60 minutes after a meal with protein

If it causes nausea, take carbidopa-levodopa with a carbohydrate (crackers, bread, or fruit)

Do NOT eliminate protein completely from diet



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# Vitamin/Mineral/Herbal Supplements

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## Supplements<sup>9</sup>

### Coenzyme Q10

- Recent research does not show clinical benefits
- Found naturally in tuna, salmon, organ meats, and whole grains

### Vitamin E

- Mixed results
- Found naturally in vegetable oils, whole grain cereals, butter, and eggs

### Omega-3 fatty acid supplementation

- Showing some benefits
- Found naturally in salmon, fish oils, walnuts, seeds, and flaxseed oil

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## Supplements<sup>9</sup>

### Vitamin D3

- Important to maintain sufficient serum level
- Found naturally in cod liver oil, tuna, carp, salmon, and mushrooms

### Flavonoids

- May protect neurons against oxidative stress and suppress neuroinflammation
- Found naturally in parsley, onions, berries, black tea, green tea, all citrus fruits, Ginkgo biloba, red wine, and dark chocolate

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## Eating Patterns

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## Mediterranean Diet<sup>10</sup>

Associated with lower risk of developing PD and better PD progression

May improve cognitive function

- Those that followed the Mediterranean diet for 10 weeks saw improvements in scores of executive function, language, attention, concentration, active memory, and the total cognitive assessment score.



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## Mediterranean Diet

- Eat plenty of **plant-based foods** (fruits, vegetables, whole grains, legumes, nuts, seeds)
  - 7-10 servings a day of fruits and vegetables
- Replace butter with **olive oil**
- Use **herbs and spices** instead of salt to flavor foods
- Eat **fish** at least twice per week
- **Limit red meat** to a few servings or less per month
- Sweets are rarely eaten
- Drink **red wine** in moderation (optional)
  - Females: up to 1 glass/day (5 oz)
  - Males: up to 2 glasses/day (10 oz)



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## The Bottom Line

- Good nutrition is crucial for the body to function at its best!
- Aim to get nutrients from food first.
- The majority of dietary findings in PD studies are based on either epidemiological or meta-analyses, with little information on how diet impacts on an individual level.

### Quick questions

- How are you eating?
- Are you eating any less than normal?
- Have you had any weight changes?
- Is anything affecting your ability to eat?



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## Resources

1. Yemula N, Dietrich C, Dostal V, Hornberger M. Parkinson's Disease and the Gut: Symptoms, Nutrition, and Microbiota. *J Parkinsons Dis.* 2021;11(4):1491-1505. doi:10.3233/JPD-212707
2. Ó Breasail M, Smith MD, Tenison E, Henderson EJ, Lithander FE. Parkinson's disease: the nutrition perspective. *Proc Nutr Soc.* 2022;81(1):12-26. doi:10.1017/S0029665121003645
3. Sheard JM, Ash S, Mellick GD, Silburn PA, Kerr GK. Malnutrition in a sample of community-dwelling people with Parkinson's disease. *PLoS One.* 2013;8(1):e53290. doi:10.1371/journal.pone.0053290
4. Mirzaei H, Sedighi S, Kouchaki E, et al. Probiotics and the Treatment of Parkinson's Disease: An Update. *Cell Mol Neurobiol.* 2022;42(8):2449-2457. doi:10.1007/s10571-021-01128-w
5. Barichella M, Pacchetti C, Bolliri C, et al. Probiotics and prebiotic fiber for constipation associated with Parkinson disease: An RCT. *Neurology.* 2016;87(12):1274-1280. doi:10.1212/WNL.0000000000003127
6. Cassani E, Privitera G, Pezzoli G, et al. Use of probiotics for the treatment of constipation in Parkinson's disease patients. *Minerva Gastroenterol Dietol.* 2011;57(2):117-121.
7. Ibrahim A, Ali RAR, Manaf MRA, et al. Multi-strain probiotics (Hexbio) containing MCP BCMC strains improved constipation and gut motility in Parkinson's disease: A randomised controlled trial. *PLoS One.* 2020;15(12):e0244680. Published 2020 Dec 31. doi:10.1371/journal.pone.0244680
8. Tan AH, Lim SY, Chong KK, et al. Probiotics for Constipation in Parkinson Disease: A Randomized Placebo-Controlled Study. *Neurology.* 2021;96(5):e772-e782. doi:10.1212/WNL.0000000000010998
9. Ciulla M, Marinelli L, Cacciatore J, Stefano AD. Role of Dietary Supplements in the Management of Parkinson's Disease. *Biomolecules.* 2019;9(7):271. Published 2019 Jul 10. doi:10.3390/biom9070271
10. Paknahad Z, Sheklabadi E, Derakhshan Y, Bagherniya M, Chitsaz A. The effect of the Mediterranean diet on cognitive function in patients with Parkinson's disease: A randomized clinical controlled trial. *Complement Ther Med.* 2020;50:102366. doi:10.1016/j.ctim.2020.102366

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