

# PARKINSON'S WARRIOR



**Guide to Supplements, Natural  
Therapies, and Medical Marijuana**

Nick Pernisco

Parkinson's Warrior: Guide to  
Supplements, Natural  
Therapies, and Medical  
Marijuana

# Parkinson's Warrior: Guide to Supplements, Natural Therapies, and Medical Marijuana

By Nick Pernisco

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Parkinson's Warrior: Guide to Supplements,  
Natural Therapies, and Medical Marijuana  
is dedicated to my wife, Rosaline Bernstein,  
and to all the Parkinson's Warriors who  
fight each day.

## Preface

First things first – I’m not a doctor nor a lawyer, I don’t pretend to be a doctor or a lawyer, and I don’t play one on TV (or YouTube). What I am is a well-informed, engaged Person with Parkinson’s (PWP). My intent is to provide you with information and inspiration to help guide you through your Parkinson’s journey. While you will learn all about natural therapies, and you will be able to speak the “lingo” intelligently with your doctors, your family, and your friends, this is not a medical book, per se. This is one Person with Parkinson’s reaching out to hold the hand of another Person with Parkinson’s.

Always seek your doctor’s advice and follow their instructions before starting any new medication, beginning any exercise routine, or changing anything about your routine. In these pages, I will share my experiences, and give you a lot to think about as you consider when choosing natural therapies. My hope is that you will learn more about these natural ways to ease the symptoms of Parkinson’s, and

that this might change your life for the better. I hope you take this information, do more research on your own, then be informed enough to have a true discussion with your medical team – one in which there is a back and forth of ideas, not one in which your doctor says, “this is how it will be because I’m the doctor.” A good doctor will always welcome your input, and a great doctor will admit when they don’t know enough about a topic and will be open to continue learning. My hope is that you may add a naturopathic doctor to your team, who would give you advice about natural therapies.

Ultimately, the decision is up to you. But as every Parkinson’s Warrior knows, information is power. The more of it you have, the better off you will be. This book is meant to inform, educate, and inspire. After reading this book, you will know the good and the not-so-good about natural therapies. After reading it, take to the internet with questions, speak with doctors, consult with your local Parkinson’s organizations, speak with others who have taken supplements or medical marijuana, or have tried some of the other therapies and see if they are right for you.

I would also like to say up front that I am NOT being sponsored by any company or organization. The only money I

make is through book sales, and perhaps through a few sales of my app, Parkinson's LifeKit, which I mention throughout the book because it has helped me. I have had many profound experiences during my Parkinson's journey, but I will not recommend a specific company, and I will readily indicate any faults I see in any product. By buying this book, we have entered a sacred bond between reader and writer. I am looking to inform, educate, and inspire, not get rich.

One final word about the terminology I use here. Whenever I talk about the treatment of Parkinson's, I'm talking about easing the symptoms. This is the gist of Parkinson's – the disease is a set of symptoms, and there are ways to alleviate symptoms while not curing the disease. Remember, there is no cure for Parkinson's! This is also why I will continually use the term therapy and not remedy. A remedy aims to cure, reverse, or otherwise change the direction of a disease, while a therapy is meant to alleviate symptoms. That is what we intend to do here.

## Acknowledgements

This book could not have been written without the help of so many people. To everyone in the Seattle Parkinson's community, including my friends at the APDA, thank you for your inspiration. To my many naturopaths, physical, occupational, and neuropsychological therapists during my journey, thank you for your support. To my friends and family, thank you for being there and for your love.

## Introduction

Over the years, I have had the good fortune to meet thousands of Parkinson's Warriors at conferences, as a Parkinson's patient advocate, as the moderator of the Parkinson's Warriors Facebook group, and in small, local gatherings around the world. One thing that has been a common thread with all of these new friends, is that they were not happy with the medication-only regimen that most movement disorder specialists continually push, especially early in the disease. Parkinson's Warriors seek something more than what is offered through traditional medicine. Obviously, exercise has a role, reducing stress does as well, but there is also a place for natural therapies, including supplements and medical marijuana.

The problem with this is that, first and foremost, most doctors will look down upon the "nature only" course of action. Since marijuana, even for medical purposes, is illegal in most of the world, most doctors wouldn't want to risk losing their license to practice by recommending you take a

substance that is largely still illegal, especially at the federal level in most countries. And because marijuana is illegal in many places, it is practically impossible to get money for research. Harvard and Yale aren't in the business of giving grants to researchers making new discoveries on what is still called "pot" in many circles of society. However, there is some research, and we will explore the early research in this book.

Another issue is that the promotion of natural supplements as an "alternative" or "miracle cure" can easily fall into the category of quackery. No, I'm not a doctor. No, I do not believe there is a cure out there, "if only you take this supplement." I am going to be very careful in this book about pronouncing something a miracle for Parkinson's Warriors. There is no miracle. Let's keep that in mind. On the other hand, there are supplements and natural therapies that might help with controlling or minimizing many of Parkinson's symptoms. There may even be supplements that alter the course of the disease through neuroprotection.

One final problem with writing this type of book is that everyone with Parkinson's experiences different symptoms on different days with different intensities. If you think about it, Parkinson's has only three symptoms that were originally defined as a part of the disease: tremor, slowness of

movement, and stiffness. But ask anyone with Parkinson's and they'll tell you that's just the beginning of their symptoms. There are physical, mental, and emotional symptoms that we all face each day, and so it becomes difficult to recommend a supplement that will work for any one person. In this book we will explore a huge number of natural therapies, supplements, and medical marijuana, but it will be up to each of you to try, test, and see if a therapy is working for you.

One more word about quackery and promises of health, recovery, and a cure. As much as we want these things, they do not exist. There is currently no cure for Parkinson's. Reversal of symptoms in Parkinson's has been studied, and the only thing that seems to make a difference is exercise. This does not mean that you can't get some relief from symptoms as your disease progresses and as your body plays tricks on you. There are ways to ease symptoms, and we'll discuss those here. There are also types of supplements and foods you can use to improve your overall health, and which should help ease Parkinson's symptoms at the same time, and we'll talk about those as well.

What I do not want is people buying this book believing I have a cure. I promise no quackery here, no miracle cures,

and nothing that is “almost ready” to be released that will cure this illness. What I do want is for you to be an informed patient, caregiver, or loved one so that you or your Parkinson’s Warrior can live their best life and I’ll be sure to back everything up with any existing science. I’ll also share with you my own story of Parkinson’s and of natural therapies and share with you the names of the products I have taken and tell you what the science says, plus what the therapy did for me.

One more word on science. While I promise to stick with the science and not steer you away from it as we go on our journey, I do want to point out that many of the studies out there have been too small to be useful as data points for any therapy. I will point out in most sections that “more research is needed.” This will be the case for almost all the therapies I detail here. Remember, everyone experiences the disease differently, and finding a therapy (pharmaceutical or natural) takes studying thousands of cases, not a few dozen or a few hundred.

Over the years of being a Parkinson’s mega-patient (or: “annoying patient who asks lots of questions”), I have had the opportunity to meet hundreds of other People with Parkinson’s who have told me their stories, and who have

shared their ups and downs with the disease. Meeting these people lead me to the thought, “whoever is struggling day to day with this disease is more than just a Person with Parkinson’s. They are Warriors.” If you’ll forgive the indulgence, I will often use “Warrior” and “Person with Parkinson’s” interchangeably, but not “Parkie,” which is a cute, but ultimately undignified description.

# [Table of Contents](#)

[Preface](#)

[Acknowledgements](#)

[Introduction](#)

[Table of Contents](#)

[The Issue with PD and Natural Products](#)

[Therapy vs. Remedy](#)

[Potency](#)

[Placebo effect](#)

[The Story So Far](#)

[Supplements](#)

[Mucuna Pruriens](#)

[Melatonin](#)

[Fish Oil](#)

[Vitamin B6](#)

[Vitamin B12](#)

[Vitamin C](#)

[Vitamin D](#)

[Vitamin E](#)

[Calcium](#)

[CoQ10](#)

[Creatine](#)

[Curcumin / Turmeric](#)

[Ginger](#)

[Ginkgo](#)

[Green Tea](#)

[Lycopene](#)

[Milk Thistle](#)

[Resveratrol](#)

[St. John's Wort](#)

[Natural Therapies](#)

[Meditation](#)

[Yoga](#)

[Tai-Chi](#)

[Acupuncture](#)

[Guided Imagery](#)

[Chiropractic](#)

[Massage](#)  
[Physical Therapy](#)  
[Occupational Therapy](#)  
[Neuropsychological Therapy](#)  
[Polyphenols](#)  
[Medical Marijuana](#)  
[Different Types of Marijuana](#)  
[Medical Marijuana Delivery Methods](#)  
[Edibles](#)  
[Vapes](#)  
[Teas](#)  
[Oils](#)  
[Capsules](#)  
[Glass Pipes \(Bongs\)](#)  
[Parkinson's-related Trials](#)  
[Risks and Benefits](#)  
[Medical Marijuana Legality](#)  
[N of 1](#)  
[Conclusion](#)  
[Citations](#)  
[About the Author](#)

## The Issue with PD and Natural Products

While there are benefits to many supplements and alternative therapies, there are also some pitfalls to avoid. When selecting a natural therapy that you ingest, like foods and supplements, be sure to first speak with your primary doctor or your naturopathic doctor about it before you begin any treatment. When selecting a natural therapy that involves exercise, I give the same advice – speak with your medical team to see if you are healthy enough for the activity you are aiming for. Yoga is one of my favorite activities, but many of us are not healthy enough to begin a regular beginner's class. There are alternative classes for every body out there, so be sure to do research. For example, with my own lower back pain, I have elected to do my yoga in a seated yoga class. Do your research and find the therapies best for you.

Therapy vs. Remedy

Another thing to consider when discussing therapies generally, is the difference between a therapy and a remedy. A therapy is meant to help alleviate symptoms and feel better overall. This is different from a remedy, which seeks to cure an illness or eliminate the threat posed by an illness. While hundreds of therapies exist for Parkinson's, including natural and pharmaceutical interventions, there currently are not any remedies, natural or pharmaceutical, for Parkinson's. Period. End of sentence. If anyone ever presents you with a product that will "reverse symptoms," help you "recover from Parkinson's," or otherwise cure the disease, RUN! This is a scam and they are taking advantage of your vulnerability for ill-gotten profit. Let me explain why.

There is currently no cure for Parkinson's, and only one thing that can slow down symptoms: exercise. No food, no drug, no diet, no intervention of any kind has been found through rigorous research to cure Parkinson's. I wish this wasn't so, but it is. Could there be a cure one day? Yes, I believe there will be a cure sometime in my lifetime (I am 43 years old as of this writing). But when a cure is discovered, it will be front page news on every newspaper in the world. It will be covered on CNN and will be talked about on talk radio. Everyone is waiting for the cure to so many diseases –

Parkinson's, MS, ALS, Cancer – that when it happens it will be huge news for weeks. Commercials for the cure will appear on cable television and between videos on YouTube, since whoever develops a cure will be quick to monetize it. But the cure will not come out of nowhere.

There will be many false positives along the way. A lot of research is being done on so-called animal models. This is when scientists give an animal Parkinson's (usually a rat, but sometimes small worms and sometimes monkeys), then they try some experiment to see if a certain technique works on reversing symptoms or if it cures the animal. Many of these studies have been successful, but when the same experiment is done on humans, they almost never work in people. So, it is good to watch the research, but understand that, unless otherwise noted, most of the studies being conducted are in "animal models." If you hear about a potential cure entering Phase 2 or Phase 3 trials, that is a reason to get excited! That means that several studies have been done on animals, researchers have tried a Phase 1 trial on humans, and it has shown promise, and now they are trying it on more people to ensure efficacy (Phase 2) and it works better than alternatives and placebo (Phase 3). If a cure is discovered, it will make news in Phase 3, if not in

Phase 2 as well. By the time it has been approved for use, we will all know about it already through the news and in our support circles.

So please, I beg of you, do not fall for products that offer false hope. All it leads to is disappointment. For many of us, a cure will not arrive soon enough. So, in the meantime, it is worth living your best life now, and do not wait for the mythical cure that will one day arrive. Work to alleviate your symptoms so you can live your best life now. This is the reason I had deep brain stimulation surgery, why I exercise, why I take supplements, and I try to stay as healthy as possible (we can, after all, get other illnesses as well). Live your best life today and do not worry about tomorrow.

As the saying goes (I think), the past has passed, the future is uncertain, the present is a gift, so eat dessert first (or something like that!).

## Potency

Many of us want to delay taking medications, or take as little as possible, so we turn to supplements to give us that extra nutrient that could help us improve our health. Many of these nutrients exist, and this book describes many of them to help you decide whether or not to use them to help

make your life better. But here is the dirty truth about supplements. Not all supplements are created equal, and there is no definitive government body that regulates the contents or potency of the supplement you are about to buy. So if certain supplement says it contains X amount of Vitamin C per tablet, nor the Food & Drug Administration, nor any government body has verified that this is the correct amount. The result is that supplement potencies vary by manufacturer, as well as per lot. I have bought a well-known Vitamin C tablet from the pharmacy, only to later buy a second bottle with contents that looked much different from the first. Did they change the source of their Vitamin C? Did they switch their manufacturing process? Did the potency change? There is no government oversight on these supplements, so there is no way to know.

To add to the confusion, many “white label” manufacturers exist for supplements. This means anyone can create a supplements brand from scratch. Just tell the white label manufacturer what you want (let’s say I want my own line of fish oil), give them the graphics you produced, and they will produce the supplement with your choice of bottle and with your label. So, many of these smaller brands out there do not even control their manufacturing process. I

would not be surprised to walk into a health store and see different brands in different bottles that were made by the same company. This leads to many small supplement companies that present themselves as “premium brands” with a “premium product,” but the contents of the bottle (that often sells for a premium price) is the same as the contents of your pharmacy brand’s supplements selling for \$6.99. This is one of the reasons I am against buying supplements directly from a naturopath, instead of a different brand costing less at a health store. The supplements your naturopath sells were probably manufactured for them or for a small group of naturopaths, and then they turn around and sell their version for 10 times the cost of a market or pharmacy version.

So, what is the best practice for buying a potent supplement that will not cost you more than you can afford? Do your research. Find a brand that you have seen on the shelves for a long time, so no new “boutique” brand of supplements with fancy packaging – trust me, there is nothing boutique about them but the price. Once you have found a brand that has been around for a long time, do research on their manufacturing methods. Do they manufacture their own product, or is it outsourced? Next,

find out if there are any non-profits that have evaluated the potency of the product. None of these methods are sure bets you'll get a good product – a long time brand just means they have sold well for many years without any big potency or safety scandals. The way they manufacture their supplement could still mean inconsistencies between batches. Finally, being verified by a non-profit does not mean much if they pay the non-profit for the stamp of approval, which creates an inherent conflict of interest. However, following these best practices increase the chances that you'll get what you are actually paying for.

### Placebo effect

A placebo effect occurs when a patient is given a placebo (a pill that is inert and does nothing, essentially fake treatment, often meant to look like a medication or supplement), and because the patient is being told that this pill will do something for them or their body, the body reacts as if the pill were real. The use of placebos in medical trials are important because they help determine if a trial medication is “better than placebo,” in its effects, an important standard to meet in trials.

It is believed that the placebo effect affects the reward

system in the brain, which pumps dopamine throughout our bodies when we have an expectation that something good is about to happen to us. Guess whose bodies react to dopamine being released in the brain? That's right: people with Parkinson's. The result is that, if we are told that something is good for us, our bodies will think it is because of the placebo effect. This can have many consequences, not the least of which is clinical trials for therapeutic drugs with good potential could be affected by patients who received placebos and feel as if they had received the real medication.

The placebo effect is also why there are so many therapies for Parkinson's that people swear by. They may take CoQ10 because some doctor on TV mentioned it works for people with Parkinson's (the latest research shows it does not), so that person goes out and buys CoQ10, takes it with the expectation that it will help their symptoms, and low and behold, it does – at least for a little while. The placebo effect only lasts for a short time, so after two or three weeks, the placebo effect wanes and the dopamine production goes back to normal. Now CoQ10 fails to have the same effect as it did at first. Some people swear the non-effective supplement keeps working when it really does not, and some people realize it was a waste of money and stop taking it. This is

how misinformation and confusion spread.

Researchers have begun studying the placebo effect to see if it could serve a therapeutic purpose in the long term for people with Parkinson's. One 2007 study showed that "placebo-induced expectation of clinical improvement may activate endogenous dopamine in the striatum, and that placebo effectiveness is thus achieved by endogenous dopamine supplementation," essentially saying, yes, the placebo effect works and helps alleviate symptoms by pumping the patient full of dopamine. The study concludes, "There have been accumulating findings that suggest a functional relationship between dopamine and the expectation of clinical improvement (reward). Further basic studies are required to clarify the complex link between dopamine and the reward system, but such findings will contribute to a better understanding of the pathophysiological mechanism underlying the placebo effect in PD." <sup>1</sup>

One more recent (2014) study said, "Significant placebo effects have been observed in clinical trials for medications as well as more invasive surgical trials including deep-brain stimulation and stem-cell implantation. In addition to placebo effects occurring as a byproduct of randomized

controlled trials, investigation of the placebo effect itself in the laboratory setting has further shown the capacity for strong placebo effects within this patient population.” Perhaps the placebo effect has a place as a therapy itself, but more research must be done. <sup>2</sup>

## The Story So Far

I always aim to include some of my own story with my own experiences in my books. This shows you that, yes, I've been through what you're going through. I know how it feels to be told to take a dozen different supplements, just to not feel any different, except for a belly ache from so much "therapy." Let me tell you how it all started, and I'm sure you will be able to relate to at least part of it.

I was diagnosed in 2011, after two years of trying to figure out what was wrong with me. My Parkinson's started with stiffness on my left side, and doctors could not believe a then-31-year-old could have Parkinson's. After a battery of tests, and excluding other diseases like MS and ALS, the doctors were finally convinced I had Parkinson's.

Right away the doctors wanted to put me on medications. They said Sinemet, also called Carbidopa/Levodopa (often abbreviated online as C/L), was the gold standard medication for Parkinson's. Besides the

meds they also mentioned that some supplements could help me as well, and so could exercise.

For reasons that reflected the science of the time, my wife, Rosaline, and I wanted to avoid for me to start taking medications right away, since at the time it was believed that the medication lost its efficacy over time, and by delaying taking it, you could “save” the meds for when your body really needed it later. Now it is known that this is not true, and that your body determines when it has had enough of medications, not when you started taking it.

Instead of taking medications, we asked for recommendations about natural therapies instead. Every doctor we spoke to thought they had the magic cure through herbal supplements, and every doctor ended up “prescribing” different supplements to take instead of medications. I took everything, from fish oil and B-12 supplements to resveratrol and creatine. At the time, I was not tracking my progress on any of these supplements. Had I had an app like Parkinson’s LifeKit, which I later created to help me track my symptoms, I would have had a better idea of what was working and what wasn’t.

No matter what I took, I would never have a scientific view of everything surrounding my supplement intake

because I never did anything scientifically. If a doctor said, “add curcumin to your diet,” I would start on it that very day, without stopping other supplements or taking other causes and effects into account. I just expected that if the supplement was good for me, I would start feeling better. In that case, I wouldn’t care if it was the new supplement or something I had already been taking.

Hopefully, what is painfully obvious here is that the correct way to try new supplements is one at a time, giving a break of a day or two in between each so that you can get the last one out of your system. In addition, you will want to track how you are feeling on each day using common metrics that can be comparable to each other no matter the supplement.

After a lot of trying different supplements, it was my naturopath at the time who recommended I take a C/L to see how I would feel on it. The change was instant. I felt so loose and limber, not to mention mentally clear, that I immediately wanted the meds and I dropped all the supplements. This was going well until dyskinesias overtook my body in a difficult way. Dyskinesias, involuntary “extra” movements caused by the medication, were expected, but they came on strong and left me nearly unable to walk anymore.

This is around the time I considered having deep brain stimulation surgery, which was one of the best things to happen to me, but which left me with non-motor symptoms to deal with. For those symptoms not related to movement, I turned to medical marijuana – edibles specifically. I quickly learned all about the differences in types of marijuana, and I thought I had found a panacea for Parkinson's wellness. The only problem is finding scientific proof, since marijuana is usually studied as something bad, and research tends to focus on its negative effects. The truth is, there are all kinds of marijuana to try, and I'm going to explain it all as we go along.

This is where I am at in 2021, with the pandemic still in full swing, but feeling good physically, and still experimenting with a combination of pharmaceutical and non-pharmaceutical therapies. As with everything Parkinson's related, every day is a moving target, and finding the right mix of anything is still a challenge. But if you are willing to put in the time and effort needed to try different therapies, like I did, you may just find something that works for you.

Now let's get started!

## Supplements

Supplements are (usually) unregulated nutritional supplements that you can buy over the counter at any pharmacy or supplement store. If you find yourself needing more vitamin D because you live in a region that has little sunlight during the winter months, you can buy a vitamin D supplement that is meant to replace the D that you do not get from the sun.

It is important to highlight the word “usually” above. In most cases, the ingredients in supplements are not guaranteed for potency and are not guaranteed for efficacy. Many bottles of supplements carry the warning that the claims on the packaging have not been verified by the Food & Drug Administration (in the United States). So how do you know what to trust and what to leave on the shelf?

Most people depend on brands as their guide to quality. This is a big mistake. The problem is that not all products of a particular brand could have the same efficacy or be made to the same exacting standards. The fact is, many

supplement companies do not produce their own products. Small brands usually hire a manufacturer to make, bottle, and label their products, and many times they will choose one set of vitamins from one so-called white labeler, and choose a different company for their fish oils. This means that while the bottles in a company's lineup all look the same, what's inside may vary in quality significantly. You may end up buying a high-end brand's fish oil for \$100, while the pharmacy brand contains the exact same product from the same white labeler with different packaging for \$10. So if you cannot depend on a particular manufacturer, what else is there?

The next option consumers have for choosing quality supplements is user ratings on websites such as Amazon.com. Typically, but not always, supplements with a higher number of reviews and a higher average rating mean that enough people trust the product to merit a higher review. This average rating does not reflect quality, it does not reflect efficacy of the supplement in your situation, and it does not reflect the potency of the product. It simply reflects what people perceive the product's value to be. Value does not equal quality. In fact, lately Amazon has been cracking down on fake reviews, and eliminating entire product lines or

even barring some companies from selling their products due to fake reviews. Yes, there are independent review sites for supplements, but the way they make their money is by linking to products on Amazon.com, and many times these links are to high-profit products that will help the review site make money more so than recommend a high quality product. So, are consumers stuck when deciding on supplements? Well, there is another way people use to determine quality.

Consumers can use “approved by” labels to help them make decisions on supplement brands. You will usually see these bottles of supplements at the local supplement store, and they state that the efficacy, quality, and potency have all been verified by some council or some non-profit whose job it is to make sure consumers are protected from products that do not meet certain standards. The problem here may not be so obvious. These organizations with their special logos and “approved by” statements are usually funded by the same companies who have requested approval, causing a conflict of interest. In other words, though it may seem like the supplement companies and labeling organizations are trying to protect consumers, it looks as though the labeling organizations have an incentive to give their stamp of

approval, since that will mean more money for the organizations giving their approval.

The issue of trust looms large over the supplement industry, and there is no clear way to distinguish quality products from products there just to take your money. Pretty packaging and branding do not equal quality. Neither do reviews from Amazon.com and their affiliates. And neither does labeling that indicates that the supplement has undergone testing and has received a stamp of approval. So, what should a consumer do when researching which supplements to buy? There is only one thing to do: research recommendations, and then test. Consumers should research which supplements come recommended by doctors, are used and recommended by friends, and then try those supplements and measure for improvements. This is the only way someone can tell if something is working. I recommend either using a notebook to measure and record different metrics that the supplement is supposed to help with or use an app like Parkinson's LifeKit to track multiple metrics at once.

One final note on selecting your supplements – If you have a naturopath, that is great news; their advice is worth its weight in gold. However, never buy supplements from

your naturopath. They are usually overpriced and a brand that only they carry and often claim is “extra strength” or “prescription strength” (there is no such thing for supplements). Supplements are simply an extra way for them to make money on a regular basis and smooth out their revenue. It is not the best option, especially if you can only buy that brand from their office. Save your money, do your research, and find out what works for you.

### [Mucuna Pruriens](#)

One of the most common questions we receive on the Parkinson’s Warriors Facebook group is whether Mucuna Pruriens works for Parkinson’s. Let us break down the question first, and then we will talk about the positives and negatives of using Mucuna Pruriens for Parkinson’s. So, the question, “does mucuna pruriens work for Parkinson’s” is very vague. The question comes from the fact that the mucuna pruriens plant produces beans that contain levodopa. To many people, especially the recently diagnosed, this plant can seem like a good alternative to taking Sinemet (carbidopa/levodopa), as this medication is the gold standard for treating Parkinson’s, but it also leads to side effects which become intolerable after many years of use.

When we are discussing whether mucuna pruriens works for Parkinson's, we are really asking, "could we take mucuna pruriens beans (or the powder that is made from the beans) to replace Sinemet in the early treatment of Parkinson's?" The answer is maybe, but unlikely. While some see the levodopa in mucuna pruriens as the ingredient our body needs to move, to eliminate tremor, and to feel generally better, it also has some issues that brands selling the supplement fail to acknowledge, or at minimum choose to ignore.

Let us discuss briefly how Sinemet works in the body, and how it works to alleviate the symptoms of Parkinson's. Sinemet is taken by the person with Parkinson's and it is broken down in the stomach, where it enters the blood stream. Sinemet is two drugs in one – four parts levodopa, and one part carbidopa. The carbidopa swims through your blood stream with the levodopa, and when it reaches the blood-brain barrier, the carbidopa sacrifices itself so the levodopa can cross that barrier and make it inside the brain, where it works to alleviate the symptoms of Parkinson's.

The difference between mucuna pruriens and Sinemet, is that there is no carbidopa in the supplement, which means that none of the levodopa is making into the brain –

none of it! Well, if you take enough of the supplement, some will make it in, but not enough to alleviate symptoms and there is no telling how much you will need compared to C/L. The other part of mucuna pruriens is the fact that, just like any supplement, the potency cannot be guaranteed. Even among different batches, the potency and quality cannot be guaranteed, since if it comes from a natural source, it will certainly have variations in potency, based on how it is grown, how it is processed, and how it is packaged.

So back to the age-old internet question, does mucuna pruriens work for Parkinson's? Unfortunately, the answer is no, at least not by itself. Since we are not talking about being prescribed a bit of carbidopa so we can take it with our mucuna pruriens (I do not think carbidopa is available by itself, and no doctor would prescribe it for us in this way), it is not worth pursuing as a viable alternative to Sinemet. Luckily, Sinemet is cheap, and it works. It is not worth Frankensteining your medication to try something that will not give you your hoped-for results.

On the other hand, mucuna pruriens is known to have a few other health benefits and may have antioxidant and neuroprotective effects. These aspects of the plant may merit further research, but at the time there are too few studies for

something that is seen as an “ancient treatment,” yet sells for quite a bit at the vitamin store. Many of mucuna pruriens’ benefits may be had more inexpensively by instead taking fish oil or an essential vitamin. <sup>3</sup>

## Melatonin

It is a well-known fact that many people with Parkinson’s have difficulty getting to sleep and staying asleep. This could be due to symptoms acting up at night, general restlessness, anxiety, or any other number of reasons. It is for this reason that many of us are constantly in search of a sleep aid, something that will not be too harsh on the body, something that will not leave us groggy in the morning, and something that can be taken daily as a part of our Parkinson’s medication schedule. Many people with Parkinson’s, as well as millions without the disease, turn to Melatonin to help aid with sleep.

Melatonin is a chemical our bodies create naturally, mostly at night, and is made in our bodies specifically to make us quietly and calmly sleepy – the natural transition from day to night, from awake to asleep. The problem is that for those of us with Parkinson’s, melatonin may not be created in sufficient amounts to overcome the symptoms

keeping us awake. So many of us turn to melatonin in supplement form to bridge the gap between what we need and what our body creates and to get a good night's sleep.

Melatonin can be purchased in gel capsule supplement form. It is typically inexpensive and has been shown to work for many people. Many people report taking melatonin at bedtime, and within 30 minutes feeling its effects of calm, often leading to a better night's rest than without it. Melatonin is also the first line of action against REM sleep disorder, a symptom of Parkinson's that makes us act out our dreams by shouting, punching, kicking, and moving around the bed, disturbing our partner, and causing us to wake up extra tired the next morning. Although there is medication that works well for this as well (Clonazepam is popular with people with Parkinson's), most people with Parkinson's try melatonin to avoid adding another medication to the routine.

Melatonin is sold in capsules, typically in various increments, with 1mg being the most common and the starting point for many people. I have gone up to 10mg to fight my REM sleep disorder until I gave up and went with the medication, but taking fewer medications is always preferable, so trying to see if melatonin works for you, is a

good way to start. Melatonin is relatively harmless as it pertains to interactions with other medications, but if taken in the morning it could lead to daytime sleepiness. As usual, speak with a naturopath if you have any questions or concerns.

## Fish Oil

Fish oil has long been thought of as a great supplement that could help, not only with heart health, but also with providing improved health to all types of cells in the body. In fact, the types of oils in fish oil are seen as essential for cellular health, and they are said to prevent or alleviate many health conditions, including Alzheimer's and Parkinson's. Fish oil could act as an anti-inflammatory treatment, which would help reduce inflammation caused by neurological diseases.

Fish oil comes from fatty fish – mackerel, sardines, anchovies – and is refined into an Omega-3 fatty acid capsule that contains EPA and DHA, two acids that comprise the beneficial parts of fish oils. Your typical supplement will contain about 1,000mg of various fish oil concentrates, EPA and DHA being two of them, though these acids are in such low quantities in most over-the-counter supplements that it

is advised to take multiple capsules daily to have an effect – sometimes up to 4-5 capsules daily. This can be cumbersome for some people, especially for those of us who have trouble swallowing large pills and capsules. The issue here is that, like most supplements, over-the-counter fish oils are not regulated by the FDA, so the concentration of EPA and DHA acids in a capsule can vary from 13% to 63%, and these concentrations vary by brand.

An option does exist for higher quality fish oil supplements, and that is to obtain it by prescription. One brand name to look for is Lovaza, and each capsule is 1,000mg, with exactly 47% EPA and 38% DHA acids, as these capsules are regulated by the FDA. Your doctor can help you determine what dose works best for you – one capsule daily for heart health, and more than one capsule daily for improved cellular function.

A second prescription option exists for those who want to ensure they are getting correct dosing. This second option is called Vascepa, and instead of containing EPA or DHA, it contains an EPA derivative called Icosapent ethyl, which has the same effect as EPA and DHA. A benefit of Vascepa over Lovaza is that Vascepa comes in 500mg capsules, making them easier to swallow. Vascepa must be taken with food.

As with any supplement, we need to be aware of the potential side effects. One side effect for fish oils is fishy burps, which are not pleasant. These fishy burps can be minimized by freezing or refrigerating the capsules. Another side effect is an increase in LDL cholesterol levels (the bad cholesterol). Many doctors will recommend a lipid panel before starting any fish oil treatment. Fish oils can also include a bleed risk (due to its ability to thin the blood), so you want to make sure you are not taking any medications that thin the blood like Warfarin, NSAIDS, etc. One final side effect to look out for is stomach and GI upset. Since you're taking a fatty oil, it could cause changes in your GI tract that could cause gastro-intestinal distress. Therefore, doctors recommend you take fish oils with food. <sup>4</sup>

So, should you go out and buy a fish oil supplement to help assist in easing the symptoms of Parkinson's? Well, the answer is maybe. There is not enough evidence that fish oil supplements help ease symptoms in PD, though the studies that do exist are promising, and do show at least some protective effects of Omega-3 in neurological conditions. Fish oil is also reported to be safe and well-tolerated, so it can be seen as a potential tool in the natural therapy toolbox. <sup>5</sup>

## Vitamin B6

Vitamin B6 is an essential co-enzyme amino acid that helps the body in many ways. It helps the nervous system by serving as a catalyst for making dopamine, serotonin, and GABA, which regulates mood and can help with feelings of anxiety, stress, and fear. B6 also works to lower homocysteine levels in the blood, which can promote heart health and prevent heart attacks. It also helps with overall nervous system health, which is one of the reasons it is listed here.

Many people are deficient in B6, and this can be for a variety of reasons. If you consume a lot of alcohol, this could leave you deficient in B6. If you are diabetic, this can also be a cause of B6 deficiency. Other ways to become B6 deficient is if you have liver or gut issues, or if you are taking birth control, antibiotics, or steroids. As we'll soon find out, a Parkinson's medication could also leave you B6 deficient. <sup>6</sup>

Luckily, B6 occurs naturally in nature, and this is the best way to obtain the amount you need for your body. The types of foods that provide healthy amounts of B6 include pork, poultry like chicken and turkey, peanuts, soybeans, wheatgerm, oats, and bananas. You should be able to get your B6 needs met with your diet, but if a blood panel shows

you are deficient and you are going to obtain your B6 from a supplement, you'll want the kind with Pyridoxal 5'-Phosphate, which is better for your liver since your liver turns B6 into P5P, so taking P5P directly lowers the effort placed on the liver. For the typical adult, the approximate amount of B6 is between 1.2mg and 1.4mg per day.

B6 plays a surprising role in Parkinson's. People who are treated with L-DOPA (or Sinemet or carbidopa-levodopa) are typically B6 deficient, and it is believed that its levels could have something to do with L-DOPA treatment.<sup>7</sup>

In another study, this time an animal study with rats, "It was demonstrated that vitamin B6 deficiency can lead to oxidative stress in rat liver and heart, while vitamin B6 supplementation can alleviate oxidative stress." They also said that "it is proposed that besides regulating homocysteine levels the antioxidant potential of vitamin B6 may lower the risk of PD through inhibiting oxidative stress." In other words, B6 could reduce the risk of getting PD, as well as reduce the oxidation caused by the disease itself. All of this sounds promising.

## Vitamin B12

Vitamin B12 is an essential B vitamin that you must get

from your diet. It helps the creation of red and white blood cells, as well as myelin, the protective sheath around nerve cells. Without myelin, the nervous system's electrical functionality does not work properly. For people with Parkinson's, this could mean worsened Parkinson's symptoms due to the lack of B12 helping boost the nervous system. Other symptoms of B12 deficiency are fatigue, pale skin, memory problems such as dementia, increased neurological problems, and anemia.

Typically, B12 deficiency comes, not from a deficiency of the vitamin itself, but from low stomach acid. The acid in the stomach absorbs minerals, and if your diet is not healthy for your body, you may not be producing the amount of acid the stomach needs to break down and absorb the B12 vitamin in foods. A common recommendation is to take apple vinegar pills or as a liquid during meals, which will help regulate the acid in the body. Eating vegetables along with the apple vinegar will help regulate the acid in the stomach. <sup>8</sup>

The most common food source of B12 is red meats. Of course, too much red meat in one's diet could create other problems, so some people prefer to get their B12 from other sources like supplements. B12 can be purchased as a supplement, or if you see a naturopath, they can give you a

B12 injection, which is supposed to last up to six months. If you are purchasing supplements over the counter, they come in two forms you need to be aware of. The first is Cyanocobalamin (synthetic vitamin B12), which is not easily absorbed into the body, and which splits off into cyanide (a toxin). The second is Methylcobalamin (natural vitamin B12), which bonds to protein in the body but which needs stomach acid to break down. Most doctors will recommend the natural version since it does not contain toxins. Check with your doctor to find out the proper amounts of B12 to take for your body; having a blood panel done can help with this.

Regarding B12's ability to help alleviate Parkinson's symptoms, one recent study found that, "low B12 levels are associated with greater walking and balance problems, possibly due to the known effect of B12 deficiency on the central and peripheral nervous systems," The researchers also found that, "low B12 may have a direct effect on the progression of Parkinson's disease, or it may be a marker of an unknown associated factor, perhaps correlating with another aspect of the disease or nutritional status." <sup>9</sup>

## Vitamin C

Vitamin C is a well-known antioxidant, which means it

helps prevent free radical cells from causing damage to healthy cells, including to brain cells and neurons. Free radicals are molecules with missing electrons, and Vitamin C donates electrons to these molecules, stabilizing them, and countering the damage they cause in the body.

Vitamin C helps enhance the body's immune system by creating antibodies, which in turn fight pathogens that are not supposed to be in the body. It also enhances B- and T-cells, which increase white blood cells, which helps fight infections. Finally, it helps increase interferon in the body, which kills infected cells. The body itself does not produce Vitamin C, so it must come from food or in supplement form.

So, with so much talk about fighting infections, why could Vitamin C be used to help fight Parkinson's? Well, scientists have discovered that Parkinson's is an auto-immune disease, a disease in which the body's own cells attack the host. This means that a powerful antioxidant could have a powerful effect on fighting the progression in Parkinson's. If your body is fighting an auto-immune disease, it will be using up the Vitamin C it has, and you will end up being Vitamin C-deficient.

Getting your Vitamin C from food is the best way to make it available to the body. Vitamin C-rich foods include

citrus fruits like oranges, lemons, and grapefruits, but also sauerkraut, leafy greens, and bell peppers. If you are not eating enough of these natural sources of Vitamin C, then a whole food based, complex Vitamin C supplement is the way to go. There are also synthetic Vitamin C supplements on the market, but these are generally seen as inferior to the whole food-based versions, since they are made with corn starch and sulfuric acid – not the ingredients we want fighting for our immunity and good health. <sup>10</sup>

Regarding research that shows Vitamin C as a powerful tool to help fight Parkinson's, one study showed that, "although Vitamin C exerted neuroprotective effects, high doses of Vitamin C and long-term treatment with this antioxidant also resulted in side effects on physiology." The normal dose for a healthy human is approximately 200mg per day, but overdosing could be problematic. "For example, administration of massive doses of Vitamin C led to renal failure and oxalate nephropathy." This suggests that "vitamin C not only has neuroprotective impacts but also exerts adverse effects when consuming the overdose of this compound. Therefore, it is necessary to consider dose-dependent effects of vitamin C on treating PD." <sup>11</sup>

So, should you make Vitamin C a part of your

supplement routine? The evidence says yes. Just make sure you are either getting your Vitamin C from foods rich in the nutrient, or from a whole food based, complex Vitamin C supplement, avoiding the supplements with synthetic ingredients. As to how much you should take, this is something to discuss with your doctor, but as 200mg is seen as a normal amount for non-Parkinson's people, that could be a good starting point until you can adjust the amount per your doctor's recommendation.

## Vitamin D

Vitamin D is useful for everyone for its many benefits to the body. One of its biggest benefits is helping the body absorb calcium (by up to 20x), which can lead to improved bone health. As people with Parkinson's, we are concerned with falls, and these falls can be made worse if we are calcium deficient and develop osteoporosis, which can make our bones more brittle and lead to fractures and breaks during falls. This is something we want to avoid, and Vitamin D provides the mechanism for helping us prevent this.

Another benefit of Vitamin D is that it helps support a strong immune system. For people with Parkinson's, who typically have weaker immune systems and could even be

considered immunocompromised, Vitamin D helps strengthen the immune system against pathogens. There is some research that shows that Parkinson's is an autoimmune disease, and if this is the case, Vitamin D can help ease symptoms in Parkinson's.

Yet another benefit of Vitamin D, which specifically affects those with Parkinson's, is that it helps fight depression. People living further from the equator tend to have a lot less sun exposure during the winter months, and this can not only worsen depression caused by Parkinson's, but could also increase Seasonal Affective Disorder, the depression that comes specifically in the winter months. <sup>12</sup>

Vitamin D comes in two forms that are useful in the body: Vitamin D3 (Cholecalciferol) is the form made naturally by the body in response to sunlight. If you live far from the equator, you may have Vitamin D deficiency, and may consider obtaining your Vitamin D from foods or from a supplement. Vitamin D2 (Ergocalciferol) comes from plants. Vitamin D is converted into a usable form by our bodies and gets stored in the kidneys. The body's supply of Vitamin D helps get oxygen into the blood and carbon dioxide out of the blood. <sup>13</sup>

Although much of the food in the United States is

fortified with Vitamin D (milk, cereal, etc.), deficiency could still occur, and this is when you may consider taking a supplement to help replace the Vitamin D. When considering a supplement, you will want to buy an extra virgin cod liver oil, which contains up to 10,000 IU of Vitamin D3 (Cholecalciferol). If you are concerned with taking too much Vitamin D, which can lead to Vitamin D toxicity, it is worth doing a blood panel and consulting with your doctor as to the right amount to take in supplement form.

A recent study about Vitamin D's role in Parkinson's found "the inverse association between serum vitamin D level and motor symptom severity in cross-sectional studies. While these data suggest that vitamin D may modify the disease, another likely explanation is confounding due to limited mobility. Fall risk has been associated with vitamin D in PD, but more study is needed to determine if supplementation decreases falls, which has been demonstrated in the general population." Essentially, this is medical speak to say that proper Vitamin D levels may decrease falls and may even help modify the disease's progression.

Further, this study found "the association between vitamin D and non-motor symptoms is less clear. There is some evidence that vitamin D is associated with verbal

fluency and verbal memory in PD.” So, Vitamin D could be critical for improved verbal ability in people with Parkinson’s.

The study authors concluded “While more research is needed, given the numerous potential benefits and limited risks, vitamin D level assessment in PD patients and supplementation for those with deficiency and insufficiency seems justified.”<sup>14</sup>

## Vitamin E

Vitamin E is a powerful antioxidant, which helps support cells in the body because it can go directly through the cell wall, something which other vitamins cannot do. The way it works is it provides energy to cells so they can do their work. Vitamin E prevents oxidation of cells, including neurons in the brain, but also cells elsewhere in the body. In addition, Vitamin E prevents nerve damage, and supports glutathione, the most powerful antioxidant in the body. Just like any good antioxidant, Vitamin E prevents inflammation, infection, and oxidation.

Typically, people are not deficient in Vitamin E, but in some cases that prevent absorption in the GI tract, Vitamin E could be lacking. In addition, refined grains and carbohydrates like pastas, breads, rice, and others deplete your body of Vitamin E because they use it in digestion, but

do not replenish your body with more. Foods that replenish Vitamin E in the body are foods rich in vegetable-based fats like wheatgerm oil, sunflower seeds, almonds, raw nuts, leafy greens, and avocados.

If you decide to get your Vitamin E from a supplement, you want to make sure it is a complex supplement, which contains Tocopherol (support for the liver), Gamma Tocopherol (reduces cancer risk, supports arteries), and Tocotrienols (helps support lipids, supports the skin, and reduces the risk of breast cancer. Using a complex vitamin that contains all three components of Vitamin E will ensure that the vitamin is being used to its maximum potential. According to the National Institutes of Health, the recommended dose for the average person is 100IU of Vitamin E, but many US adults take up to 400IU per dose (and even more if there is a deficiency), so check with your doctor to see if they recommend more or less Vitamin E in your particular case. <sup>15</sup>

So, is Vitamin E useful for people with Parkinson's? The evidence suggests so, although more research is needed. In one study, "Chronic administration of Vitamin E fully restored corticostriatal synaptic plasticity in mice, suggestive of a specific protective action." Researchers concluded that

“Altogether, both clinical and experimental findings suggest that Vitamin E could be a potential, useful agent for PD patients. These data, although preliminary, may encourage future confirmatory trials. <sup>16</sup>

## Calcium

We have all heard that calcium is important to maintain strong bones into adulthood and beyond, but did you know that calcium is also important for proper neurological function? Calcium is a tricky mineral – too little calcium in the body causes problems like deterioration of the myelin sheath, a cell membrane that protects neurons, and too much calcium could lead to toxicity and to other health problems. In addition, getting calcium through supplements has been shown to cause more problems than it solves. <sup>17</sup>

So how much calcium does a healthy body need, and where can you get this calcium if you do not want to use supplements? The adult body needs about 1,000mg of calcium daily, and 1,200mg daily if you are a woman aged 51 and above. Foods that could help you meet your daily calcium requirement include a cup of milk (300mg of calcium), 8oz of plain yogurt (415mg of calcium), ½ cup of firm tofu (250mg), a slice of bread (30-70mg), ½ cup of

broccoli (21mg), and 1oz of almonds (70mg). Dairy is a major source of calcium, but since many people become lactose intolerant later in life, and many people with Parkinson's are known to be lactose intolerant, you will be happy to know that many milk substitutes are fortified with calcium. So, soy, almond, coconut, and hemp milk products like ice creams, cheeses, and more are all fortified with calcium. Shop around and look at the labels to see what products you can buy that have the extra calcium our bodies need.

What is calcium's effect on Parkinson's? As it turns out, it is complicated. While calcium is important to keep our bones strong to prevent fractures or breaks when we fall, too much calcium may have a negative effect on Parkinson's and the progression of the disease. In fact, too much calcium could lead to brain cell stress and damage that leads to cell death. So, we need calcium to survive, but it potentially makes Parkinson's worse? The solution to this is calcium channel blockers that prevent the calcium from affecting brain cells while keeping your bones strong. Recently, a large phase III trial tested the ability of isradipine (a calcium channel blocker) but came back with disappointing results, so we are still faced with this dilemma. <sup>18 19</sup>

Until more is known about calcium's role in

Parkinson's, it is best to ask your doctor how to best incorporate calcium into your diet. They may likely recommend obtaining your calcium from food rather than supplements, and perhaps at a lower dose than the amount suggested for most adults. Unfortunately, calcium presents us with tradeoffs now, but hopefully new research will enlighten us on how to best take advantage of calcium's health benefits while avoiding its downsides.

## CoQ10

Coenzyme Q10 (or CoQ10 for short), an antioxidant that supports cellular function, once showed immense promise to potentially stop or even reverse the progression of Parkinson's, and at minimum could ease symptoms. But after many studies came back mixed (one trial showed slower functional decline while another found no beneficial effect), a definitive study in 2014 found that CoQ10 had no benefit for slowing the progression or easing symptoms.<sup>20</sup>

Recently, naturopathic doctors have begun new trials and brought fresh ideas to how CoQ10 could be used to help treat Parkinson's, but as of now I will follow the existing science and say that there is no benefit of taking CoQ10 to alleviate Parkinson's symptoms, or to alter the course of the

disease.<sup>21</sup>

## Creatine

Creatine is an over-the-counter nutritional supplement primarily used for muscle growth. In the early 2000s, it was believed that creatine could have disease altering effects on Parkinson's, including effects on mental wellness, activities of daily living, and motor symptoms. Several studies came back with results that "creatine has no observed benefit in PD patients." While several studies still saw potential for creatine and called for more research to be done, that additional research did not result in showing any benefits from taking creatine.<sup>22 23</sup>

This is an instance of anecdotal evidence being taken seriously and manufacturers being quick to promote the supplement, which launched clinical trials and research studies that lead nowhere. Unfortunately, this is too often the case with supplements and diets that gain popularity with the masses. We follow the science, and yet sometimes we are still disappointed. But better to be disappointed momentarily than waste time, energy, and money on a therapy that does not work.

## Curcumin / Turmeric

You may have heard, both from doctors, as well as anecdotally from others, that Turmeric and Curcumin are powerful antioxidants. To be proper, Turmeric is the spice that contains curcuminoids – bioactive compounds of which curcumin is one. But indeed, you heard correctly. Turmeric is known to help lessen inflammation and helps the body block pain, so many use it to replace pain relievers like ibuprofen. Turmeric has been shown to be neuroprotective, meaning it crosses the blood-brain barrier and helps protect neurons from degeneration. <sup>24</sup>

The main downside is that turmeric has low bioavailability, so it is not easily absorbed and processed by the body. This means you should consider taking turmeric in its pure form as a spice and use it generously in the foods you consume.

If you do decide to buy Turmeric in supplement form, know that the contents have been processed and refined so that the capsule is in a concentrated form. However, just like with other supplements, the FDA does not regulate the contents of the turmeric capsule, and what you get from a supplement varies. You can see this for yourself by buying a couple of different turmeric supplements, opening a capsule

of each and comparing the contents to turmeric purchased as a spice. The color will be different, the smell may be different, and the potency may differ as well.<sup>25</sup>

In a review of 13 animal studies about curcumin's effects on Parkinson's, the study authors found, "the majority of the experiment studies demonstrated that curcumin was more significantly neuroprotection effective than control groups for treating PD. Among them, five studies indicated that curcumin had an anti-inflammatory effect in the PD animal models ( $p < 0.05$ ). Meanwhile, four studies showed the antioxidant capability of curcumin, by which it protected substantia nigra neurons and improved striatal dopamine levels. Furthermore, two studies in this review displayed that curcumin treatment was also effective in reducing neuronal apoptosis [(aging)] and improving functional outcome in animal models of PD." The researchers concluded that "the results demonstrated a marked efficacy of curcumin in experimental model of PD, suggesting curcumin probably a candidate neuroprotective drug for human PD patients."<sup>26</sup>

So, while turmeric and curcumin have shown excellent results in animal models, and while some doctors freely recommend it and people with Parkinson's freely use it, there

is no evidence in humans as of yet that this spice will slow down Parkinson's or will help relieve symptoms. Some doctors and people who swear by it anecdotally would argue that "it won't hurt to take turmeric – it's healthy and delicious, and if it turns out to be neuroprotective in humans, that's a bonus." I could not agree more. If you include turmeric or curcumin in the meals you make at home, future research may show a benefit in humans, and you will have been ahead of the game! There is no hurt in trying it, but do not set your hopes too high.

## Ginger

Ginger is a flowering plant from south-east Asia, and we usually find it in root form. It is related to turmeric, so it is no wonder that ginger has also been used as an antioxidant, and to prevent or reduce oxidative stress in the body. Most people buy the actual root and cut it up to put into foods, or slice it to brew homemade ginger tea, but ginger can also be purchased in a powder or oil form. Of course, the pure, fresh ginger root is the best way to consume ginger.

Ginger has been studied extensively, and studies have shown that ginger can help ease nausea, including that caused by an upset stomach or morning sickness. In fact,

ginger has been known to be gentle on the stomach, and plays a role when digestive issues are present. Chronic indigestion, menstrual pains, and cholesterol levels can all be helped with ginger. <sup>27</sup>

For Parkinson's, animal model studies have shown that an active compound in ginger, 6-Shogaol, protects dopaminergic neurons in Parkinson's via anti-neuroinflammation. <sup>28</sup>

Of course, more evidence must be done in human trials, and then we may know for sure if ginger could have this same effect on human neurons. Other research – again in animal models – has shown that ginger may improve brain function and protect against Alzheimer's disease. Brain diseases may or may not be related, but many modern doctors see treatments for some brain disorders as a positive sign for helping other brain disorders.

While the jury is still out on the clinical evidence that ginger helps people with Parkinson's with symptoms, nausea from medication is a real symptom and ginger provides real relief from this. So go ahead and pick up some ginger root the next time you are at the supermarket, cut about an inch off, then slice that bit and mix it with hot water. This has been done for centuries, and it helps with nausea at a very

low cost.

## Ginkgo

Ginkgo Biloba extract from the Ginkgo tree has been used for years to help memory, though only for those who are aging normally. More interestingly, ginkgo has been shown to be an antioxidant as well as neuroprotective. In a 2013 literature review of ginkgo used in animal models, the author found that, “these reports led us to believe that the a possible cause of PD or Parkinsonism might be oxidative stress, which could be effectively prevented by [ginkgo], as observed in the results obtained in this systematic review of the beneficial effects of the extract in animal models of PD.” As for future studies in humans, the author concluded, “Studies with humans are warranted, because they could aid in symptom reduction and improve the quality of life of individuals with Parkinson’s disease. Therefore, we might conclude that Ginkgo biloba extract could be a coadjutant in the treatment of Parkinson’s disease, with beneficial and/or protective effects.”<sup>29</sup>

Do these findings mean that you should go out and buy Ginkgo Biloba supplements and start taking them now? Not necessarily. Although Ginkgo had good results in animal

models, this means nothing for human benefits. This is one supplement to keep an eye on and see if more human studies and trials materialize, but the evidence currently does not point to benefits for humans with Parkinson's.

## Green Tea

Green tea, yes that green tea you can buy from the supermarket in small boxes or brew from the actual leaves, is perhaps the most powerful antioxidant for the money on this list. All tea (but not herbal) is brewed using the leaves from the *Camellia sinensis* bush. The more oxidation of the leaves, the darker the tea. Green tea comes from unoxidized leaves from this plant and is also the least processed of all teas. Because it is not processed like other teas, it retains the antioxidants, which makes it to your cup of tea. Fun fact: green tea is the second most consumed drink in the world, just after water.

Much of the evidence for green tea's power comes from anecdotal evidence – perhaps by stories passed through generations of family, green tea, the superfood. Have a stomachache, drink green tea. Want to lose weight or prevent liver disorders, green tea. Want to improve heart and mental health, that's right, green tea. The problem is that none of

this is proven in large clinical trials. So, most of green teas benefits are assumed by the anecdotal evidence.

However, there have been studies for Parkinson's that show that green tea has neuroprotective properties. One study from 2020 concluded that, "studies have suggested that the consumption of green tea protects against free-radicals, inflammation, and neuro-damages. Several in vivo studies aid in understanding the overall mechanism of green tea. However, the same dose may not be sufficient in humans to elicit similar effects due to complex physiological, social, and cultural development. Future research focused on more clinical trials could identify an optimum dose that could impart maximum health benefits to impart neuroprotection in PD." Further, this study discusses how green tea, "strongly inhibited the aggregation of  $\alpha$ -synuclein and prevented the toxicity mediated through it."

The study finally concluded, "Treatment of catechin-rich tea polyphenol extract improved motor impairments, recovered tyrosine hydroxylase (TH), and dopamine level, reduced the level of  $\alpha$ -synuclein oligomers, and their aggregation in cynomolgus monkeys administered with MPTP [58]." In other words, green tea helped improve movement in monkeys with Parkinson's. <sup>30</sup>

Much more has been written in this study than I include here, and I suggest you read the entire study (and skip over the fancy language) if you are further interested in how green tea helps offer neuroprotection to those of us with Parkinson's.

One last note about green tea. When buying green tea, be sure that it comes from the *Camellia sinensis* bush and is not herbal or mixed with other ingredients. I also recommend consuming this as a tea and forget the supplement capsule, which has been processed and which has questionable potency. If you can find fresh green tea sold loose leaf, use that for your teas. You could even chew a bit of it without the hot water. There is a bit of caffeine in green tea, not as much as in coffee, but just be aware of this if you are limiting your caffeine intake for any reason.

## Lycopene

Lycopene is a strong antioxidant and anti-inflammatory that could help in the prevention of dementia, diabetes, heart disease, and certain types of cancers. It is found in fruits and vegetables that have a red coloring, coloring that comes directly from the lycopene nutrient, such as tomatoes, watermelons, and pink grapefruit. Antioxidants prevent

oxidation of cells in the body, and help keep the body free of free radicals, which attach to cells and neurons and could accelerate the decline in Parkinson's. Lycopene is protective of the neurons in your brain.

Lycopene is best taken into the body through the natural foods that contain the nutrient naturally. There are lycopene supplements you can take that would provide some availability to the body, but the very best way to obtain it is to heat and then eat tomatoes, for example, increasing the bioavailability by more than 4 times that of a supplement or by eating a tomato at room temperature. Lycopene is fat soluble, and so by heating tomatoes with oil, this will maximize the absorption. This is because lycopene requires bile in the stomach and adding oil will maximize the absorption.<sup>31</sup>

In a relatively recent review of animal studies with lycopene, it was found that, "In the central nervous system, lycopene also has prophylactic and/or therapeutic effects in different types of disorders, such as Alzheimer's disease (AD), Parkinson's disease (PD), Huntington's disease (HD), cerebral ischemia, epilepsy, and depression. Lycopene also improves cognition and memory ability of rodents in different pathological conditions, such as diabetes, colchicine

exposure, high-fat diet (HFD), and aging. In some special conditions, lycopene administration displays special therapeutic effects. Mechanisms including inhibition of oxidative stress and neuroinflammation, inhibition of neuronal apoptosis (the death of cells which occurs as a normal and controlled part of an organism's growth or development), and restoration of mitochondrial function have been shown to mediate the neuroprotective effects of lycopene.”<sup>32</sup>

The study review concluded that, “Further research is needed to elucidate whether the anti-oxidative and anti-apoptotic effect of lycopene in PD models are interconnected and whether regulation of neuroinflammatory response could contribute to the therapeutic effect of lycopene.”

In the case of lycopene, we see that it has potential to be an important clue to how Parkinson’s works, how it progresses, and how it may be treated. We need to see human trials of lycopene, since animal trials and successes often do not translate into humans. However, since lycopene is so common in a diet recommended by doctors for people with Parkinson’s (Mediterranean diet), you may already be consuming lycopene in large amounts and may already be benefitting from its therapeutic nature.

## Milk Thistle

Milk Thistle, also known as silymarin, is a powerful herb, which has special neuroprotective qualities. It is known to have anti-inflammatory, anti-carcinogenic, and antioxidant properties, making it a versatile supplement with many positive outcomes. Unlike the other nutritional supplements in this section, I do recommend you obtain your milk thistle from a supplement, since this is the best way to obtain it (the other way being in plant form). The best supplement for milk thistle is one which comes in the raw, freeze-dried form, making sure it has proven potency. You may need to shop around a bit for brand that has guaranteed potency, but know that even with “guaranteed” potency, this is not regulated by the FDA, so there is no way to tell if it is the guaranteed potency or not. <sup>33</sup>

Milk thistle may be familiar to you as a way to prevent disease in the liver. It helps protect against chemical poisoning of the liver – imagine taking medications your whole life and what that does to your liver! It will also protect the liver from alcohol poisoning. When your body is attacked by oxidants and you have inflammation in the liver, milk thistle can help counter that. This is a great reason alone for

people with Parkinson's to take milk thistle supplements.

According to one review study looking at the effects of milk thistle on different neurological conditions, "It is considered safe at therapeutic doses, but improper administration of dosages may lead to cause adverse drug reactions (ADRs) where gastrointestinal effects are more common among them." So, while it helps provide therapy for those with Parkinson's, drug interactions with your Parkinson's medication could occur. As always, I recommend speaking to a naturopathic doctor or your main doctor before beginning any treatment. They might be aware of drug interactions that you are not aware of. <sup>34</sup>

The study went on to say, "Neuroprotective effects of silymarin have been studied in various models of neurological disorders such as Alzheimer's disease, PD, and cerebral ischemia. Reducing oxidative stress, inflammatory cytokines, altering cellular apoptosis machinery, and estrogen receptor machinery are mechanisms that are responsible for neuroprotection by silymarin." In other words, milk thistle works, at least in the models that were tested here, to help as a therapy for Parkinson's itself, not just its symptoms. As I already mentioned, I do not trust animal models or simply "models" as much as I trust real

clinical trials with humans, but this is a good start, though more research is needed.

## Resveratrol

Resveratrol is a polyphenol, which comes from the red skin of grapes. It has been shown in some studies to act as an antioxidant, helping to eliminate free radicals from the blood and in the brain. Resveratrol has also gotten a bad name as of late as a “miracle supplement.” Why does this give it a bad name? Shouldn’t being called a “miracle supplement” be a good thing? Well, it depends on who is doing the calling, I suppose. Resveratrol has gained enough popularity as a supplement, that some snake oil salespeople (the ones we want to look out for), tell us it can extend our lives and prevent all disease, among other outrageous and unproven claims. Wouldn’t it be nice?

Studies have also shown that resveratrol has low bioavailability, meaning that to have this life extension and disease-free outcome, you would need to take many more times of resveratrol per day than is safe, and so this is not possible (except to those who want to sell us the “miracle supplement”). According to the research in the Parkinson’s arena, resveratrol seems to partially restore (or “rescue”)

cellular defects in the mitochondrial part of cells. This means, that, at least in the studies done (mostly animal studies), Resveratrol could reverse the effects of Parkinson's. Again, the amounts that would need to be taken to do this would be toxic for the rest of the body. <sup>35</sup>

You should also check with your doctor if you are on blood thinners or regularly take aspirin or ibuprofen, as mixing them with resveratrol could increase bleeding. The dosages in most supplements are of around 250mg to 500mg, much lower than the 2,000mg used in some studies. Until more quality research is done, its best to stick with the natural versions of other polyphenols such as berries and nuts. Polyphenols get their own section later on in this book.

### St. John's Wort

St. John's Wort (also known as *Hypericum Perforatum*) is a flower that has been extensively studied for its anti-depressive effects, and has been compared with Tricyclic antidepressants, as well as Serotonin Reuptake Inhibitors (SSRIs). It has gone through over 40 clinical trials, and many studies and reviews have been published, especially in cases of Parkinson's. Trials have shown than St. John's Wort is more effective than placebo, and similar in functionality to

Tricyclics and SSRIs. The way this works is it interacts with the hypothalamus-pituitary-adrenal axis in the brain, which lowers Cytokine production, which dampens depression.

The way most non-Parkinson's adults take St. John's Wort is at around 900mg per day, taken as 300mg capsules, three times daily. This may go as low as 300mg or as high as 1800mg, depending on what your naturopath may recommend to you. As with any supplement, the way it is prepared may influence potency, and again, the potency of St. John's Wort supplements is not verified or guaranteed by the FDA. <sup>36</sup>

St. John's Wort is considered safe for most non-Parkinson's people but could lead to mild side effects like dry mouth, constipation, and dizziness. Some more serious side effects include phototoxicity (an extreme sensitivity to sunlight), and Serotonin syndrome, which could lead to serotonin toxicity. Therefore, most doctors will not recommend St. John's Wort if you are already on an antidepressant. The combination of this supplement and a wide variety of medications may lead to interactions that could cause hospitalization. It is very important to speak to your MD or ND about St. John's Wort and seek their counsel before deciding to go on it or not.

According to Parkinson.org, “Although Hypericum Perforatum is one substance known to be present in the flowers and leaves of this plant, it also contains other unidentified compounds that appear to be active. In one study of Hypericum Perforatum in a mouse model of PD, there appeared to be some inhibition of the effect of the toxin (MPTP) used to cause Parkinsonism.” In addition, they warn, “St. John’s Wort should not replace traditional prescription medicine for the treatment of a serious or major depressive episode. Do not take St. John’s Wort if you take blood thinners such as aspirin, heparin or warfarin (Coumadin). People with PD who also take asthma medications, steroids, birth control pills, cough medicine, digoxin, immunosuppressants, HIV medications, triptans (used to treat migraines) should consult their physicians or health care providers before taking St. John’s Wort.

## Natural Therapies

Natural therapies have long been the domain of the ultimate in quacks. People who sell these products are often more motivated by money than by helping people. They often confound the word “therapy” with the word “remedy.” Remember, there are no remedies for Parkinson’s. This would imply that there is some way to reverse the disease. What we are trying to do is to provide therapies – ways we can reduce the effects of symptoms. I’m not afraid to point out the many products and “ancient remedies” on the market are of no use and are not worth your time.

Many of the quacks involved in selling therapies or “remedies” prey on unsuspecting people who are desperate for a cure. These customers want to reduce or eliminate suffering and they are willing to pay big money to achieve it. Over the years, I have heard stories of people buying expensive fitness devices that were supposed to improve balance; they did not. I have heard stories of doctors in Germany who would acupuncture your ears, and that this

would eliminate symptoms; it did not. I have read about helmets with LEDs that were supposed to ease or even eliminate symptoms; they did not.

The problem is, when you find a population of people who are desperate, absolutely desperate, for a cure, those people are willing to throw logic out the window and allow themselves to be taken in by quacks whose scheme is simply disgusting. Never disregard the science. Always look for therapies with multiple clinical studies, with hundreds of participants, in which they verify results of earlier studies. That's why I will include resources to help you read the science when it comes to each of the therapies below.

A further problem with providing therapies to Parkinson's Warriors, is the fact that we are especially susceptible to the placebo effect. The placebo effect makes us believe something is working, just because we think it is working. Why is this especially prevalent with Parkinson's people? Because the placebo effect gives us a jolt of dopamine, which makes us feel good, and gives us the intended benefit, just because we think it does. Unfortunately, this effect does not continue forever, and within a week or two our body adjusts, and the therapy stops working. This is the reason anecdotal evidence is such a big

deal in the Parkinson's community. Many people begin using some supplement or therapy, and instantly feel better. They believe it is the therapy doing the job, but it's really the placebo effect. Then they go online and say, "this is really working for me." After a couple of weeks those people stop feeling the positive effects, but they don't go online to say, "this isn't working for me anymore." So, everyone still believes the positive effects of the therapy, and this is how rumors and misinformation spread online.

As I had already mentioned, I try to minimize anecdotal evidence and try to present facts from real clinical trials. I look for more than one or two trials with few participants and look for larger-scale clinical evidence on humans with repeatable results. So, let's dig into the various therapies that have been known in the Parkinson's community to work for alleviating symptoms.

## Meditation

Does this situation sound familiar to you? You are home after a long day at work. Your head hurts and you are irritable. You did not eat well, and your Parkinson's symptoms seem increased, as if you had progressed in your disease prematurely. We obviously do not want this type of

stress every day, but sometimes we are forced to endure tough emotional days at work, with loved ones, or just with ourselves and our symptoms. Well, there is one thing you can do to set your mind back to a calm state, one in which you are in control of your emotions, not the other way around. It is called meditation.

Meditation is a form of quiet reflection that helps reduce stress, and increase peace of mind, at least for a while. You may have seen people meditating, or maybe you have attended a meditation class. The most common form of meditation is one in which you close your eyes and focus on your breathing (also called “breath work”). You can be sitting upright or lying flat on your back. Simply close your eyes and focus your mind on your breathing. If you are breathing quickly or if your heart is beating quickly, breathe with intention and slow down your breathing. Feel your breath as you inhale through your nose and exhale through your mouth. After a moment, you will notice your breath coming under your control. You will also notice your heartbeat slowing, and a calming peace will come over your body.

Many people turn to meditation in order to find calm when they are going through a stressful situation or moment in their lives. What you are doing with meditation is bringing

mindfulness to your body and mind. Mindfulness involves embracing the present moment, ignoring useless stimuli, and finding joy with where you currently are in your life. By focusing on your breath with your eyes closed, you have no choice but to focus on the present moment.

The research shows that meditation can help reduce motor (tremor) and non-motor symptoms (depression and anxiety) in Parkinson's. <sup>37</sup> If you are interested in trying meditation, you can search YouTube for meditation videos and follow those to start. For more advanced and personalized techniques of meditation, ask your local yoga studio if they offer meditation classes. You may also speak about it with your naturopath, and they may offer more local resources for working with a meditation instructor, who will help you tailor a meditation routine that works for you.

## Yoga

Yoga is a form of exercise that has been found to be beneficial for all people, including for those of us with Parkinson's. It consists of slow movements that become poses, which the participant then holds for a period of time. Yoga is not only good cardiovascular exercise, but it also helps with strength, balance, and stress reduction. As for

how yoga feels on your body, I liken it to getting a massage from the inside. The stretches and poses help tone muscle and gently release pressure on every muscle group. The result is having a feeling of looseness and flexibility in your body, just as if you had just had a massage.

Yoga originates from India, but it has been adapted for use by westerners. While yoga can be practiced in privacy at home, it is usually practiced in group classes, led by an instructor who initiates poses that the class copies. We practice using yoga mats about ¼” thick in order to protect our bodies from the hard floor below. In addition to practicing yoga standing up, it can be practiced in chairs, and this is how most people with Parkinson’s practice it at special classes designed just for us. Chair yoga is especially helpful for those with bad balance or weakness that does not permit standing up.

The great news for those of us with Parkinson’s, is that yoga is one of the best exercises for helping to strengthen the body and improve balance. In fact, one study showed that people with Parkinson’s in an 8-week yoga regiment had a lower incidence of falls than those who did not participate.<sup>38</sup> “Participants in the yoga group (n=15) experienced improvements in motor function, postural stability,

functional gait, and freezing gait, as well as reductions in fall risk.” Remember that exercise is the only activity known to slow the disease progression and improve symptoms. In this case we are seeing an improvement in symptoms, though there is nothing in this study that measured whether disease progression was slowed.

Speak with your doctor about whether yoga is right for you. If your doctor clears you to practice yoga, depending on your ability, choose either chair yoga (do a web search for chair yoga in your area), or attend a level one course for absolute beginners. A yoga practice of twice a week is all that is needed in order to begin feeling the benefits of this form of exercise.

## Tai-Chi

Tai-Chi is an ancient Chinese martial art, originally created as a defense system, but it has evolved into a gentle practice often called “meditation in motion.” Tai-chi involves making slow movements with your arms and legs, flowing into various postures, while breathing intentionally. The practice of Tai-Chi helps reduce stress and anxiety and helps improve balance and coordination. It also helps gently stretch muscles and joints, while putting minimal force on

them. This makes Tai-Chi a generally well-suited activity for older adults who otherwise may not exercise.

If you are thinking that Tai-Chi sounds a lot like yoga, you are not mistaken. Although they do not share a common origin, they both work gently on your body to help improve mobility. The main difference between the two is that yoga typically requires props (yoga mat, rope), can include floor and wall exercises, and is generally more high impact than Tai-Chi. Tai-Chi favors slow, even movements instead of doing headstands (perhaps for advanced yogis!). In Tai-Chi, your feet are always planted on the ground, and you are shifting from one posture to the next in one flowing movement. There is no pausing to switch positions, as often occurs in yoga.

Studies have found that Tai-Chi helps decrease stress, anxiety, and depression, improves mood, improves aerobic capacity, increases energy and stamina, improves flexibility, balance, and agility, and improves muscle strength and definition. Although not fully proven, some evidence also shows that Tai-Chi can enhance quality of sleep, enhance the immune system, help lower blood pressure, improve joint pain, improves overall well-being, and reduces the risk of falls in older adults. <sup>39</sup>

Getting started with Tai-Chi is easy. Many local Parkinson's organizations offer free or low-cost classes, as do many local community centers. There are typically no levels to worry about, as all Tai-Chi is gentle and slow. While you may purchase videos or books about Tai-Chi, starting with a qualified instructor is best as they can offer personalized attention to your situation, and help you obtain the most benefits from your practice.

A 2012 study found that in a group of 195 participants at stages 1-4 of Parkinson's, that were divided into groups (some performed Tai-Chi and some performed resistance training and stretches, that, "the tai chi group performed consistently better than the resistance-training and stretching groups in maximum excursion." Further, "the tai chi group also performed better than the stretching group in all secondary outcomes and outperformed the resistance training group in stride length and functional reach. Tai chi lowered the incidence of falls as compared with stretching but not as compared with resistance training. The effects of tai chi training were maintained at 3 months after the intervention. No serious adverse events were observed." The study concluded that, "Tai chi training appears to reduce balance impairments in

patients with mild-to-moderate Parkinson's disease, with additional benefits of improved functional capacity and reduced falls.”<sup>40</sup>

## Acupuncture

Acupuncture is an age-old treatment of Chinese medicine. It works by trained specialists inserting thin needles skin-deep into various spots on the body. It is believed that these needles, properly placed, can reduce the effects of several maladies. This is done by releasing endorphins that help eliminate pain, increase blood flow, and change brain activity. This is done by releasing the body's essential energy, or “chi.” Many doctors of western medicine are skeptical of acupuncture, saying that its benefits are a result of the placebo effect. The placebo effect is described at length in other parts of this book but suffice to say that the placebo effect makes us think that acupuncture works because we are told it does.

Acupuncture is said to help with lower back pain, especially chronic lower back pain that we experience many times with Parkinson's. It could also help relieve headaches, arthritis pain, carpal tunnel, neck pain, and menstrual pain. Though many reports fail to show conclusive results with the

use of acupuncture, many people with Parkinson's swear by it and believe it helps, especially with relieving pain.

One group of people who should likely not use acupuncture is people with deep brain stimulation devices or pacemakers installed in their bodies. Acupuncture is generally performed only with needles, but sometimes a small electrical charge accompanies the poke, which can damage electrical devices implanted in the body. If the acupuncture is administered without electrical current, this should be ok for people with implants, but be sure ahead of the treatment by asking the acupuncturist.

A 2007 study found that, "Acupuncture was effective in relieving PD symptoms compared with no treatment and conventional treatment alone, and acupuncture plus conventional treatment had a more significant effect than conventional treatment alone." <sup>41</sup> The study further said, "Acupuncture can be considered as a combination treatment with conventional treatment for patients with PD. Further studies on this topic should be carried out according to rigorous methodological designs in both the East and the West."

[Guided Imagery](#)

Guided imagery is a kind of meditation in which you imagine yourself in a place to achieve relaxation in your body. Typically, there are three parts to guided imagery, and ideally, they are done together to maximize the benefit. The result of guided imagery is to achieve a state of relaxation and inner peace. It can be done by yourself, in a group setting, in a hospital room, while you are out in public and need a quick break from the world. Guided imagery is all about you and going to your happy place. Let's talk a little bit about each of the three parts of guided imagery.

The first part is closing your eyes and doing breathwork. This involves focusing on your breath, trying to slow it and yourself down, and letting your breath be the primary thought in your mind. Second, you want to perform a muscle scan of your body, from top to bottom or vice versa. As you breathe slowly and intentionally, you feel your muscles in your feet, then your legs, then your torso, then your arms and hands, and finally in your neck and head. Notice where you are tight and where you can loosen your muscles. Third, while your mind is focused on your breath, and your muscles are relaxed, change your thought, through your mind's eye, to a happy place. This could be somewhere you've been, like a beach as a child, or it can be somewhere completely

imaginary. This is your chance to be creative in the process. You can imagine yourself on another planet if that works for you!

The great thing about guided imagery is that it is modular and personalized. It is modular because you can perform each part individually or together, as the situation presents itself. If you are having a particularly stressful day, you can close your eyes and focus on your breathing. If you feel that your body is stressed and your muscles are tight, you can perform a muscle scan and pinpoint which muscles are tight and actively work to loosen them. If you are in a space that makes you uncomfortable, like a hospital room or a waiting room, you can perform the imagery part on its own to take you somewhere else in your mind. One of the benefits of guided imagery is that no one needs to know that you are doing it at all. You can have your own moments that are completely personal and completely unique to you.

The benefits for people with Parkinson's are obvious here. We often suffer from anxiety and depression, and often the real world is too much for us. Our bodies and minds often prefer a quiet and dark space to a loud and bright one, so this activity gives the mind and body what it wants, helping to relieve stress, anxiety, and depression, and lift our

moods. In fact, studies have begun to show that guided imagery helps reduce motor fluctuations in Parkinson's. <sup>42</sup>

## Chiropractic

Chiropractic [therapy] is a pseudoscientific alternative medicine that is concerned with the diagnosis and treatment of mechanical disorders of the musculoskeletal system, especially the spine. Practitioners of chiropractic are called chiropractors.

The chiropractic practice is considered pseudoscience for many reasons, not the least of which includes the lack of evidence that it provides a benefit beyond placebo. <sup>43 44</sup>

In addition, in one study of Canadian chiropractors in Manitoba, found that these practitioners also spread unsubstantiated information regarding vaccines and autism, told patients to avoid mammographs and colonoscopies, and to avoid wearing sunscreen. <sup>45</sup>

To be clear, the training to become a chiropractor is not as comprehensive as that of a medical doctor, though it does require a bit of training beyond undergraduate education. This statement is here to say that not all chiropractors are peddling alternative remedies that do not work – an overwhelming number are interested in the wellbeing of their

patients. But it is important to recognize that pitfalls do exist in the chiropractic profession, and your choice of doctor should come after doing your own research, and perhaps even recommendations from medical doctors including movement disorder specialists.

It is not all bad news with chiropractic doctors. A study, albeit with only one participant, showed improvements after several chiropractic treatments, including ones not involved in aligning the back. “An 81-year-old male with a 12-year history of Parkinson disease sought chiropractic care. He had a stooped posture and a shuffling gait. He was not able to ambulate comfortably without the guidance of his walker. The patient had a resting tremor, most notably in his right hand. Outcome measures were documented using the Parkinson’s Disease Questionnaire-39 (PDQ-39) and patient subjective reports.”<sup>46</sup>

The therapies used were surprising and unconventional. “The patient was treated with blue-lensed glasses, vibration stimulation therapy, spinal manipulation, and eye-movement exercises. Within the first week of treatment, there was a reduction in symptoms, improvement in ambulation, and tremor.” The study concluded that, “For this particular patient, the use of alternative treatment procedures appeared

to help his Parkinson disease signs and symptoms.” Remember that there was only one participant in this study. And that one patient was observed after one week of treatment, when the placebo effect is strong. I include this study here because there are not a lot of studies that exist with many participants that shows chiropractic medicine as beneficial for Parkinson’s. Buyer beware is the lesson here.

## Massage

Sometimes we need things we cannot provide for ourselves, and so it is alright to seek help with those things. Having the soft tissues of your body – muscles, skin, and tendons – manipulated by a licensed massage therapist can put you into a relaxed state and help relieve pain and stress and leave us feeling calm and also feeling good. The most common kind of massage is the Swedish massage – it’s the kind of massage you get if you go to a massage therapy office and ask for “a massage.” With this type of massage, the therapist kneads the soft tissue, stretches limbs and moves them in circular motions for flexibility, and performs long strokes from certain nerve points toward the heart.

A good massage will relax you to the point of nearly falling asleep. The therapist will work your soft tissues to

remove knots, eliminate stress and tightness in your body, and maximize relaxation. Many people ignore the potential benefits that touch can bring to your therapy. As humans, we crave touch, and when this is integrated as a part of the therapy, it can give us a sense of belonging, that everything is fine and remain so. I think this is especially important for those of us with Parkinson's, since over time we may lose sensation on our skin, so the feeling of warmth from caring, healing hands is wonderful. I would highly recommend having a massage from a licensed therapist as often as every week if you could afford it (like with many complementary therapies, massage is not normally covered by most insurance except in certain cases).

Quite a few research studies have been done that show that massage therapy is useful for treating Parkinson's symptoms. In one literature review of 12 studies, the author said that "quality of life has been shown to be improved upon various therapeutic massage styles, involving classical whole-body therapeutic massage and reflexology. Non-motor symptoms, such as sleep disturbances, pain, fatigue, anxiety and depressive symptoms have been demonstrated to be improved upon different massage techniques, including classical deep therapeutic massage, Traditional Japanese

(Anma) massage, Thai massage, neuromuscular therapy and Yin Tui Na massage. Regarding motor symptoms, classical therapeutic massage, Traditional Japanese (Anma) massage, Thai massage, and neuromuscular therapy seemed to improve motor symptoms, whereas Yin Tui Na technique combined with acupuncture was associated with worse motor scores.”<sup>47</sup>

## Physical Therapy

Physical therapy is an individualized therapy that usually happens at a hospital or specialized space. Physical therapists work with you on a one-to-one basis to help you meet the challenges of your changing body over time. Physical therapy can help improve gait and balance and show you ways to strengthen your body to prevent falls and improve quality of life.

Physical therapy is about working with your body from your torso down to your legs. A physical therapist will have an initial review of your symptoms and develop a plan of action to help you improve your body and its response to your environment. As an example, I have worked with physical therapists who have helped me improve my balance by setting up an obstacle course of uneven surfaces for me to

step on, all while they held me with a belt so that I would not fall.

Physical therapy can help address the dreaded “walking and chewing gum at the same time” problem in people with Parkinson’s. We tend to focus on one activity at a time and ignore other stimuli or other actions that must be taken simultaneously. My physical therapist had me walking the obstacle course while counting back from 100 by 7s – that is when I discovered this problem. Doing the obstacle course quietly, I rushed through the course at a nice even speed, no problems. Counting backwards while doing the obstacle course was another issue all together. This time I was losing my balance on nearly every step and felt the safety belt being tugged at often in order to keep me stable.

There are many aspects of your body physical therapists could work with you on. Another activity is stair work, where I once had problems going down stairs, my therapist worked with me on this in a safe space, and now I can go down stairs more normally and with less risk. My therapist also developed exercise routines to strengthen my core, flatten my back, and improve my posture. All of these gave me improved strength and confidence to take on the obstacles in the real world.

## Occupational Therapy

Occupational therapy helps improve your use of your hands and arms, like how physical therapists work with other parts of the body. If you have a tremor or weakness in your hands, or slow movements in your fingers, an occupational therapist can help you improve your hands so that you may use them for typing, gardening, or anything else you are used to doing with them. This is done by performing exercises with therapy putty (a fabulous product which comes in different densities to simulate difficulty levels), speed exercises (solving a simple puzzle with one hand), and other tests and activities to measure and build strength and agility in the hands.

Occupational therapists can also test certain physical functionality, such as reaction time and reflexes. At one time I was worried about my driving ability, and so an occupational therapist used a machine to test my reflexes, as well as other physical and mental acuities to determine if I would be a safe driver on the road. The first test occurs in the hospital, and the second involves sitting behind the wheel of a car. Ultimately, I was cleared for driving, which gave my wife and I peace of mind that I was able to be safe

behind the wheel.

## Neuropsychological Therapy

A neuropsychologist specializes in treating patients with neurological disorders. Typically, we have different issues than most people, and a neuropsychologist can help with those. I mostly saw a neuropsychologist for my difficulties coping with my young onset Parkinson's diagnosis. We used talk therapy to discuss the various issues I had difficulty coming to terms with, like not being able to work full time anymore, as well as the prospect of having less time in my life to do things like travel due to my body's limitations.

Besides talk therapy, a neuropsychologist can also administer and review tests that check for cognitive declines. I had one such test before I was approved for deep brain stimulation. The test included general cognition, memory function, spatial abilities, and verbal ability. When I took these tests, I was in the neuropsychology office for a few hours, taking test after test. Since that was my first test, it will be used as my baseline for future tests. Since many people with Parkinson's eventually decline cognitively, it is useful to ask for this sort of test early on after your diagnosis.



## Polyphenols

Let us talk about food. Food, just like supplements and physical therapies, can have a positive effect on Parkinson's symptoms. In fact, there are certain types of foods that help reduce symptoms due to their ability to block dangerous free radicals, help maintain healthy weights, and provide Parkinson's Warriors with energy. These antioxidants fall into a category called polyphenols, and consist of natural food products like berries, cocoa powder, nuts, vegetables, flaxseeds, coffee, and many more. <sup>48 49</sup>

Before we discuss polyphenols, inflammation, and antioxidants that help protect the brain, let us discuss diet more generally. As Parkinson's Warriors, we must be especially aware of our diets and not fall for fad diets, since these are generally meant for people who are generally healthy (perhaps, except for their weight). An intake of food that does not include carbs, as an example, could interact negatively with medications that require carbs to metabolize in our bodies. So, what is the best diet for a Parkinson's

Warrior? In general, a diet with vegetables, fruits, nuts, seeds, fish, other sea food, and healthy oils not derived from animals. You rarely want to eat eggs, cheese, and yogurt, and even more rarely eat red meat. This type of diet is called the Mediterranean diet and is a common recommendation from doctors to people with Parkinson's. There is evidence this diet could delay the onset of Parkinson's and help prevent cognitive decline, among other benefits. <sup>50</sup>

Polyphenols are metabolites contained in certain foods and which contain antioxidants. According to a study of polyphenols, they are "generally involved in defense against ultraviolet radiation or aggression by pathogens." In the last decade, there has been much interest in the potential health benefits of dietary plant polyphenols as antioxidants. Epidemiological studies and associated meta-analyses strongly suggest that long term consumption of diets rich in plant polyphenols offer protection against the development of cancers, cardiovascular diseases, diabetes, osteoporosis, and neurodegenerative diseases. <sup>51</sup>

So, foods that contain polyphenols are like superfoods for our bodies – the nervous system, the immune system, and blood circulation all benefit from these foods. Unlike supplements, these foods are plentiful in nature, and unlike

exercise or fitness, these are fast and low-effort ways to boost your body's response to Parkinson's. Do they substitute medications – no. Will they slow down the progression of the disease – we don't know. But what we do know is that these superfoods are generally great for your body and a healthier body means slower progression of Parkinson's symptoms.

Polyphenols are naturally occurring compounds found largely in fruits, vegetables, cereals and beverages. Fruits like grapes, apple, pear, cherries and berries contains up to 200–300 mg polyphenols per 100 grams fresh weight. The products manufactured from these fruits, also contain polyphenols in significant amounts. Typically, a glass of red wine or a cup of tea or coffee contains about 100 mg of polyphenols. Cereals, dry legumes and chocolate also contribute to the polyphenolic intake.

“Because polyphenols are highly antioxidative in nature, their consumption may provide protection in neurological diseases. It was observed that the people drinking three to four glasses of wine per day had 80% decreased incidence of dementia and Alzheimer's disease compared to those who drank less or did not drink at all.” Of course, you should also consider the negative effects of drinking so much wine per day, but this type of polyphenol, Resveratrol, can be obtained

in supplement form. <sup>52</sup>

It has recently been reported that, “administration of polyphenols provides protective effects against Parkinson’s disease. Nutritional studies have linked the consumption of green tea to the reduced risk of developing Parkinson’s disease.” Certain, “animal models have been shown to exert a protective role against neurotoxin[s], an inducer of a Parkinson’s-like disease.” Polyphenols, “may also protect neurons by activating several signaling pathways,” including those, “which are fundamental for cell survival.” This report concludes that the therapeutic role of polyphenols, “in Parkinson’s disease is also due to their ability to [bind to] iron. This property contributes to their antioxidant activity by preventing [iron] from [initializing] free radical formation.”

53

So, let’s look at some of these polyphenols and see how they can help us with Parkinson’s! Here is a list of foods with polyphenols and associated descriptions and comments from WebMD Diet. <sup>54</sup>

**Berries** are low in calories and high in vitamin C, fiber, and polyphenols, making them an easy addition to any diet. Chokeberries and elderberries have the highest amounts, with 1,123 and 870 milligrams of polyphenols per half-cup

serving, respectively. Many other common berries have a high content per half-cup as well, including Blueberries with 535 milligrams, Blackcurrant with 485 milligrams, Blackberries, raspberries, and strawberries with about 160 milligrams.

**Herbs and Spices.** To boost your meal with polyphenols, look no further than your spice cabinet. Along with their polyphenol content, dried herbs and spices often contain a range of nutrients like calcium, magnesium, and potassium. Seasonings highest in polyphenols include Cloves with 542 milligrams per ounce, Peppermint with 427 milligrams per ounce, Star anise with 195 milligrams per ounce. Oregano, celery seed, sage, rosemary, and thyme also have more than 30 milligrams for the same serving.

**Cocoa Powder.** While you should limit your sugar intake, cocoa powder is a potent polyphenol source with 516 milligrams per tablespoon. Heating and processing cocoa powder to make chocolate products can reduce this content, however. For example, dark chocolate has 249 milligrams per tablespoon, while milk chocolate has just 35 milligrams.

**Nuts** are an easy way to add fiber, protein, and essential fatty acids to your diet, though because they're high in calories you should moderate your portions. Most nuts

contain polyphenols, but chestnuts come out on top with 347 milligrams per ounce — about three nuts. Other good choices include hazelnuts and pecans with 140 milligrams and almonds with 53 milligrams for a one-ounce serving.

**Flaxseeds** are sometimes used to improve digestion and relieve constipation. Along with their high fiber content, they also have 229 milligrams of polyphenols per tablespoon. You can add flaxseeds to cereal, sandwiches, and salads, or bake them into cookies and breads.

**Vegetables.** Experts recommend we eat 2.5 to 3 cups of vegetables per day. Because most vegetables contain polyphenols, getting enough in your diet helps you benefit from these antioxidants' health effects. Some vegetables highest in polyphenols include: 260 milligrams in a small artichoke, 168 milligrams in a small red onion, 40 grams in a cup of fresh spinach or shallots.

**Olives** are rich in vitamin E, fatty acids, and polyphenols. Twenty grams of black olives — about five olives — has 113 milligrams of polyphenols, while the same serving of green olives contains 70 milligrams.

**Coffee and Tea.** If you start your day with a cup of coffee or tea, you're already adding polyphenols to your diet. Twenty grams of coffee, or roughly the amount to make one

brewed cup, contains about 35 milligrams of polyphenols. We consume teas like black, green, or ginger in smaller amounts, but a cup can still add some polyphenols to your diet.

## Medical Marijuana

Medical marijuana has come on the alternative-medicine scene strong in the past few years. It has gone from being associated with LSD and Heroin (as a Schedule 1 substance in the United States), to being on track to full legalization at the federal level (although, we still don't know when). The thing about marijuana is that it is a nuanced drug. Forget about how you imagined pot, joints, spiffs, and Mary Jane in the old days; marijuana is becoming more regulated, more potent, and more mainstream. The first step in understanding marijuana's growth (no pun intended), is realizing that marijuana is more than one type of plant. In fact, the varieties of marijuana are as diverse as wines or artisanal beers. Really!

We'll talk about the types of marijuana in just a minute, but first let's discuss why there is not that much research concerning the medical applications of marijuana to begin with. I've already mentioned that, as of this writing, marijuana is still a Schedule 1 substance in the United

States. Part of what this means is that no federal research dollars can go towards researching the benefits of the drug. Have you noticed how everything you've ever read about marijuana in the mainstream media is negative? I'm sure you've read all about how marijuana is addictive, and how it worsens your memory, and how ruins lives. This is part of the messaging that existed until recently, and it all stemmed from the anti-drug campaigns of the 1980s. Because, again, marijuana is a Schedule 1 drug.

As marijuana is legalized in more and more states, more research is being conducted, and more about its effects are being understood. One thing to understand and a very important point to understand is that marijuana would not be a Schedule 1 drug if not for its very true and proven effects. Marijuana is a drug, unlike supplements, that has a real and easily noticeable effect on the body – one that can be felt almost immediately depending on the delivery system. You don't take a capsule of fish oil expecting that your blood will thin and flow more fluidly within minutes of taking it. But this is how marijuana acts. Taking a capsule of good CBD ("good" to be defined later), and you will feel its effects of calmness come over your body almost immediately.

## Different Types of Marijuana

Believe it or not, there are many different types of marijuana. Cannabinoids are the active ingredients in marijuana, with CBD (cannabidiol) and THC (tetrahydrocannabinol) being the most common. This is where everything starts – CBD vs. THC. CBD works by binding with endocannabinoids in the body to reduce inflammation and pain. CBD generally has no psychoactive effects. In other words, CBD alone cannot get you high. That means no high, no munchies, no dry mouth, and no red eyes. You are likely to be able to operate heavy machinery and drive if you are using CBD only products.

THC on the other hand, works by stimulating the brain's reward system – the neurons that affect the flow of dopamine. Ah ha! This is THC's power. Once we identify THC marijuana, we have two further options in order to narrow our focus. These two options regard strains of THC – Indica provides a body high, relaxation, stimulates appetite, helps aid in sleep, provides pain relief, and is best used at night. Sativa provides a head high, promotes alertness, is uplifting and often euphoric, stimulates creativity, is associated with increased energy, and is best for daytime use.

*Warning: THC marijuana, while used for medical purposes, is a strong psychoactive drug. DO NOT operate heavy machinery or drive while using THC strains of marijuana. Side effects include dizziness, loss of balance, and nausea.*

From THC's Indica and Sativa, we could expand to beyond 1,000 different strains, all of which differ a bit. As you dig deeper and deeper. There are strains that are solely Indica or Sativa, and there are hybrids that contain different ratios of both. When we are talking about CBD, most medical marijuana dispensaries include a bit of THC (at ratios of 50-to-1 or 100-to-1), and the strains vary by dispensary or by region. Some CBD may contain a (1-2%) hybrid strain of THC, or an Indica strain. There are so many varieties to choose from!

Let's discuss some effects that fellow people with Parkinson's have felt while using medical marijuana. Keep in mind that everyone is different, and medical marijuana may work differently for different people, but I can share the facts of how marijuana works, and you can decide if you would like to try it to alleviate symptoms that the drug targets. The following are factual statements about the use of medical marijuana. I am not including any anecdotal evidence from

other people with Parkinson's, since what worked for them may not work for you, but these effects I will discuss in just a moment are actual effects felt by everyone, not just people with Parkinson's.

Indica is generally known as the mellow type of THC. While Indica is really meant to indicate the type of plant and flower, generally Indica plants generate body highs, where it may seem like your body is warm and cozy, and perhaps even floating. This leaves the person consuming this strain of marijuana relaxed and even sleepy. This is also the go-to strain if you need help sleeping at night or to use simply as a sedative. The Indica strain is also known to relieve pain as it binds with the body's pain receptors. Finally, Indica is known to stimulate appetite, so if you are having trouble gaining weight, this strain will help with that.

Sativa is generally known as the more stimulating type of THC. Sativa strains are known for their head highs, highs that you are feeling almost euphoric and like your head is floating and generating positive thoughts. Sativa strains are known to ease depression, replacing it with a boost of happiness and energy. In fact, you may find yourself laughing uncontrollably at the most mundane things. Some strains don't take you too high, and instead increase focus

and concentration – great if you are reading or writing a book or doing work on the computer that requires your full attention. This is a strain you will want to use more in the daytime, since it may inhibit sleep.

Hybrids are generally anything in between an Indica and a Sativa. Believe it or not, most commercially available strains available at dispensaries are hybrid strains. In fact, because of how marijuana plants have evolved over the centuries (and with the help of human intervention), it is rare to find a strain that is purely Indica or purely Sativa. To help make the hunt for the perfect strain less confusing, strains have been given names, and usually, those strains line up with the strain you would expect. Why am I being very vague about strains and names? Because strain XYZ may be 20% Indica and 80% Sativa at one store and going to another store will have XYZ with a 35% Indica and a 65% Sativa ratio. After a while, you really come to appreciate the science and analysis among the different batches that are grown. There is a lot of testing done in states where marijuana is legal, and potency is highly regulated in these states.

So how do you find out what the perfect strain is for you? Well, usually it is through trial and error. You will want to try different strains and see what works best for you. You

can use a website/app called *Leafly*, which gives you a huge listing of strains, what kind of marijuana they contain, as well as what kind of effects (and side effects) you can expect. Other websites and apps exist for this purpose as well, such as *Weedmaps*, but I like how *Leafly* lays it all out for you. Aside from the usual background information on each strain, the sites also show nearby dispensaries where you can buy it, along with reviews from people who have tried the strain.

CBD is the type of marijuana that does not contain THC, meaning it does not have the capability to get you high through any psychoactive effects. Instead, CBD works by binding to pain receptors in the body and alleviates chronic pain. It is also proven to reduce anxiety in people with social anxiety, and provide relief from inflammation, something people with Parkinson's suffer with a great deal. You may see CBD at pharmacies and wonder what the difference is with the CBD sold at dispensaries. Well, CBD sold at pharmacies is sold as a supplement, and as such you should follow the same protocols as buying any supplement from a pharmacy or supplement store. Just as with other supplements, the supplement form of CBD is not guaranteed to contain the exact potency mentioned on the label, and they can't even guarantee that what is in the bottle is anything better than

hemp – an inert type of marijuana typically used more as a fiber for clothing or used to make milk-alternatives than used as a supplement for consumption.

The truth is, if you want to experience the true power of CBD, you want to a) buy it at a dispensary, where potency and the strain is guaranteed by strict state regulations, and b) buy a strain of marijuana that contains some THC along with the CBD for maximum effect. There are very popular strains like Charlotte's Webb, which contains a 50-to-1 ratio of CBD to THC. Charlotte's Webb was first bred in 2011 for the use of a child with seizures. Since then, it has become the most popular strain with anyone with illnesses that CBD helps with (chronic pain, anxiety, inflammation, etc.). However, you cannot buy Charlotte's Webb at a pharmacy or supplement store because it contains a bit of THC.

When you are considering your first purchase of CBD or THC for medicinal purposes, you may go visit a dispensary and talk about Indica, Sativa, hybrids, or even ask for Charlotte's Webb directly. However, it may be more useful to research a bit further online for the qualities that give marijuana its effects: *Terpenes*. These can be compared to the underlying characteristics in wine that give both whites and reds distinct notes. The four most common terpenes are

myrcene, caryophyllene, limonene, and terpinolene. These terpenes give both Indica and Sativa strains their inherent characteristics and learning a bit more about them will give you a more nuanced experience using medical marijuana.

Just a note about strain names before we explore the terpenes: Most of these strain names that follow are traditional names for marijuana strains, therefore, they do not sound very scientific. In fact, the names of marijuana strains sound like something you would buy on a dark street corner in a bad part of town. These names are more traditional and have carried forward into current marijuana culture, and so we are stuck with these names for now. I do believe, however, when marijuana is fully legalized at the federal level in the United States, a more precise (and perhaps pharmaceutical) naming system will emerge, especially in the medical marijuana industry. I can only imagine someone with an illness (who has never tried marijuana before) going into a dispensary for the first time, as I once did, and asking for OG Kush, Harlequin, or Green Crack. It's hilarious to think about, but I think a lot of people will be more comfortable when their medication is not named something that comes out of a 1970s Cheech and Chong film.

Without further ado, let us look at the various terpenes in marijuana, what their effects are, and some common strains that are dominant in each.

**Myrcene** is one of the most common terpenes found in marijuana. It is known for its peppery, spicy, and lemongrass fragrances, and it has been used in traditional folk medicine for centuries. Myrcene is known to be a relaxant and helps aid with sleep, and so is often associated with the Indica strains of marijuana, though this is not always true. Myrcene-dominant strains: OG Kush, Blue Dream, Remedy, 9 Pound Hammer, Grape Ape, Tangie, Harlequin. <sup>55 56</sup>

**Caryophyllene** terpenes in marijuana contribute the floral, earthy, and even musky and citrusy tones. This terpene is also found in black pepper, cloves, cinnamon, and oregano. Caryophyllene helps aid in anti-inflammatory relief. This terpene is known to bind to the CB1 receptors in the brain and nervous system and provides a euphoric effect for the user. Caryophyllene-dominant strains: GSC, Bubba Kush, Sour Diesel, Chemdog, Candyland, Death Star, Original Glue, Cookies and Cream, Gelato, The White, Master Kush. <sup>57 58</sup>

**Limonene** terpenes are aromatic and produced in the flower's resin glands, and are commonly associated with

fruity, citrus aromas, and can also be found in lemon and orange rinds, cosmetics, and cleaning products. The limonene terpene is known to provide anxiety and stress relief. A flower's level of limonene may only be around 2% and this amount varies greatly from harvest to harvest of the same plant, so it is important to check individual harvests and strains at dispensaries to know which current strains on their shelves are packed with limonene. Limonene-dominant strains: Banana OG, Berry White, Black Cherry Soda, Cinex, Do-Si-Dos, MAC, Purple Hindu Kush, Quantum Kush, Strawberry Banana, Tahoe OG, Wedding Cake, White Fire OG. <sup>59 60</sup>

**Terpinolene** terpenes are rarer than most other terpenes, but they are also present in lilacs, nutmeg, and cumin, Terpinolene is common enough in the plant world to have an effect on various THC and CBD strains. Yet only about one in ten strains are terpinolene-dominant. This terpene is known to have uplifting effects. There is growing evidence that terpinolene may help prevent heart disease and inhibit the growth of cancer cells. Terpinolene-dominant strains: Dutch Treat, Jack Herer, Ghost Train Haze, Golden Goat, Golden Pineapple, J1, XJ-13, Orange Cookies. <sup>61 62</sup>

## Medical Marijuana Delivery Methods

Just as you should forget about the old, outdated ideas of marijuana being a “bad” drug, you should also give up the idea that the only delivery method for marijuana is smoking it. Smoking marijuana carries the same risks as smoking other burned toxins into your body. Even if you “partake” in a “joint” that you bought at a legal dispensary, you are inhaling carcinogenic smoke that is not good for your lungs, circulation, or nervous system. As I always tell people who ask me if they should smoke joints as a part of their treatments, you already have a neurological disease – you shouldn’t be in search of any more diseases like lung cancer, heart disease, or anything else that is caused by smoking anything.

So, what do we do if we want to use marijuana as a medical therapy for our Parkinson’s disease? We can choose any of the dozens of delivery methods available at modern dispensaries. Of course, as with anything, there are tradeoffs for each, so I will spend some time discussing some of the most popular types below. Remember that no matter what type of delivery method you choose, any will be better than smoking it. Smoking marijuana is generally an outdated delivery method, with its only benefit being a direct effect to

the brain – as soon as you breathe in that smoke, you feel the effect right away. However, new delivery methods have met the challenge of the direct effect of smoking, without the need to inhale carcinogens.

## Edibles

Edibles are likely the most common forms of delivery methods for medical marijuana. Edibles are easy on the body, easy to consume, and take their effect over time. Edibles are simply candies or chocolates infused with marijuana. You eat them like candies (please keep away from children and pets!), and they start out slowly, and the edible has its effect over several hours. The question is always, “how much should I take?” Edibles are typically sold in packs of ten, with each edible containing 10mg of marijuana. Even though this may seem like a lot, trust me when I say you should probably start slow, having at most a quarter of an edible to start with. In the first hour you are not likely to feel anything, thinking the edible was a dud or that you should take more – resist the urge! After about an hour and a half you will start to feel an effect, and by two hours in you will be “stoned” (if you are using the THC kind), or completely “baked” and sleepy (if you are using the CBD kind). At first,

never take more than a quarter of an edible in a 12-hour period.

One important note, not just for edibles but really for all medical marijuana, is to keep it away from children. Children may think that an edible is a candy and may eat the whole thing, which is not a good situation – there is no way to eliminate the marijuana from one’s system after it is in the blood stream so the child would need to allow it time to wear off, and it may be very discomforting. No visit to the ER will help it wear off. Please keep it away from children (best if stored in a secret location in the house – high up in a pantry or at the bottom of a clothing drawer may be best. Many states with recreational marijuana have enacted laws that require clear labeling and childproof containers for edibles, but this may not be enough. If kids begin to exhibit the telltale signs of toxicity like intoxication, altered perception, anxiety, panic, paranoia, dizziness, weakness, slurred speech, poor coordination, apnea, and heart problems, it may be time to call your local poison control to see what they can do. These situations rarely if ever result in death, but it is irresponsible to allow children to consume high-THC marijuana of any kind.

On the other hand, low THC marijuana (with a 50-to-1

ratio or higher like Charlotte's Webb) may be appropriate for those with Juvenile Parkinson's but please check with a naturopath (an ND) or a medical doctor (MD) and do not self-diagnose or self-medicate. Always listen to the doctor's advice. To be safe, treat an accidental marijuana overdose like a medication overdose.

## Vapes

Vapes have gotten a very bad reputation with nicotine vapes. Those are just as addictive as cigarettes and could be as harmful to your lungs as smoking cigarettes. But in this case, we are talking about vaping marijuana juice. This juice (oils mixed with flavoring) does not contain anything that is burning, and you are not inhaling smoke. Instead, you are inhaling the steam produced by heating up the marijuana juice. This has many benefits – first, you are not inhaling smoke while still getting the direct hit of marijuana straight to the brain. This effectively renders joints useless and obsolete. Second, the juice in the vape is typically more controlled when it is produced, leading to a cleaner, more controlled amount of marijuana juice flowing through the vape. The best way to vape marijuana is to try it first to see if it is for you. You can do this by buying an inexpensive vape

pen (around \$10), and the juice separately. This will give you the vape experience without spending too much money. After you have chosen vaping as your preferred delivery method, you can buy a more sophisticated vaping device (\$100-500) that will give you more control over the temperature of the vape, among other settings. There are vapes that are specifically made for vaping the juice or oil type of marijuana. Stick to those and avoid the vapes that let you heat up and vape flower. If you are vaping pure flower, you are burning it and inhaling the burnt particles, which is not what we want.

## Teas

Believe it or not, medical marijuana is available as a tea and other beverages. With the teas, you buy a bag typically containing ten tea bags, and make tea as you normally would. This marijuana-infused tea works like edibles, so it is best to start slowly, and make a large pot of tea rather than just a cup. Many of these teas come in caffeine-free, soothing varieties like chamomile and mint. They are meant for relaxation and drinking after a stressful day or right before bedtime or settling in for an evening. A great activity to do when using teas is to make a pot of tea and enjoy it with friends. Perhaps you are on vacation at a cabin, and for

maximum relaxation you have a cup (from a full pot) – definitely a nice way to relax before bedtime. Be careful not to overdo it at the start. Begin with a pot with enough for four servings of tea and have one serving (a cup). Refrigerate the remainder tea in a bottle after it has cooled and have more the next evening.

## Oils

Marijuana infused oils, the kind used for cooking and not for vaping, can be used to infuse any food with marijuana. Oils can come in a syringe or small bottle, and usually contain 1 gram of refined marijuana oil. This means that this 1 gram of marijuana is much more concentrated than pure leaf-type marijuana and should be treated with care. You always want to start with the least amount possible and increase the amount of oil slowly. This oil also works in much the same way as edibles, where you don't feel anything at first until you feel it a couple of hours later. You can make your own tomato sauce, French fries, or brownies infused with marijuana. The possibilities are endless. Just remember, start slow; use only a bit of oil at first and see how it makes you feel before adding more in future meals.

## Capsules

Using capsules is a very common delivery method for medical marijuana. There are two types of capsules you can buy, both of which contain CBD oil. The type you buy at the pharmacy is only CBD, cannot get you high, and has the same caveats as supplements. This means that their potency is not guaranteed and that it is a “buyer beware” situation. Do your research. The second kind of capsules you can buy come from the legal marijuana dispensaries and are more strictly regulated than anything you can buy at a pharmacy. What you buy at dispensaries also typically contains at least some THC, but you can buy capsules that have 50-to-1 or even 100-to-1 ratio of CBD to THC.

Using capsules from a dispensary is probably the easiest way to begin with medical marijuana. Capsules are taken just like other capsules or pharmaceuticals, and they are well regulated for potency and contents, and they give you the expected experience. I would recommend against buying any CBD (in capsules or otherwise) from a pharmacy, as I have mentioned. You simply don't know what you are getting, and you may become discouraged if the results are not as expected. Once you have had some experience, you will notice what works and what does not work for you.

## Glass Pipes (Bongs)

If there is ever a sound that goes along with marijuana street culture, it is the sound of the bong hit, with its loud bubbling sound. Of course, we are trying to look at marijuana through a medical and curative lens, so we may choose to call these large glass water pipes (as opposed to small glass pipes, which are for burning flower and creating smoke, which we do not want). These large glass water pipes have several advantages over other delivery methods, as well as some disadvantages.

Firstly, a water pipe allows the advanced user to use any type of marijuana they want, so they are not restricted by the types sold in edibles or oils. People using water pipes can buy any loose flower, which often comes in dozens of varieties at a dispensary, rather than the pre-mixed ingredients of edibles. This is a huge advantage because some of the best strains for sleep, anxiety, and depression, not to mention pain and inflammation, only come as loose flower and can only be used with some sort of pipe.

Secondly, a water pipe, while burning smoke, filters the smoke through water, removing many of the cancer-causing carcinogens from the smoke before you inhale it. This is still

not an ideal solution for those wanting absolutely no smoke, but the smoke from a water pipe is cleaner and purer than smoking a regular pipe or a joint. Much of the marijuana in many legal regions already comes clean, organic, or is otherwise grown in an environment without added chemicals, so the smoke this marijuana creates in a water pipe is cleaner than any other smoke. The only way to eliminate smoke completely is to vape or use another method I just mentioned, but then you lose the variety of marijuana you can consume.

### [Parkinson's-related Trials](#)

There have been many trials that have begun to study the use of marijuana with people with Parkinson's. Some show more promise than others. Remember that we have seen the science behind marijuana, and know it works to help with certain conditions. Anxiety and pain, however, are not the same thing as rigidity and tremor. Could marijuana be used medicinally to stop tremors? We just don't know enough at this point to show conclusive evidence of this. Can marijuana be used to calm dyskinesias? Again, we just do not know enough yet. We need either large-scale studies, or to know for yourself, try the N-of-1 studies, which are

discussed later in this book.

For now, here are some trials that are being undertaken, or have been undertaken to test whether medical marijuana works to alleviate Parkinson's symptoms.

**The Therapeutic Potential of Cannabinoids for Movement Disorders** – This study “review[s] basic science, preclinical and clinical studies on the therapeutic potential of cannabinoids specifically as it relates to movement disorders.” The scientists found results that, “Preclinical research in animal models of several movement disorders have shown variable evidence for symptomatic benefits but more consistently suggest potential neuroprotective effects in several animal models of Parkinson's (PD) and Huntington's disease (HD). Clinical observations and clinical trials of cannabinoid-based therapies suggests a possible benefit of cannabinoids for tics and probably no benefit for tremor in multiple sclerosis or dyskinesias or motor symptoms in PD.” They concluded, “Despite the widespread publicity about the medical benefits of cannabinoids, further preclinical and clinical research is needed to better characterize the pharmacological, physiological and therapeutic effects of this class of drugs in movement disorders.”<sup>63</sup>

**Cannabinoids reduce levodopa-induced dyskinesia in**

**Parkinson's disease: a pilot study** – This study says, “In a randomized, double-blind, placebo-controlled, crossover trial (n = 7), the authors demonstrate that the cannabinoid receptor agonist nabilone significantly reduces levodopa-induced dyskinesia in PD.” The problem here is that the N (or, “n”) is very small. 7 people in a study is not sufficient to know whether cannabinoids can reduce dyskinesias in the wider Parkinson’s population. I would categorize this one as “more research is needed.”<sup>64</sup>

**Neurokinin B, neurotensin, and cannabinoid receptor antagonists and Parkinson disease** – This study, “evaluated the effects of these three antagonists of the NK3 (SR 142801), neurotensin (SR 48692), and cannabinoid (SR 141716) receptors on the severity of motor symptoms and levodopa-induced dyskinesias after administration of a single dose of levodopa in 24 patients with Parkinson disease. In this exploratory randomized, double-blind, placebo-controlled study, at the dose used, the drugs tested were well tolerated and could not improve parkinsonian motor disability.” In other words, in this study scientists found that medical marijuana did not improve the physical symptoms of Parkinson’s.<sup>65</sup>

**The Endocannabinoid System as an Emerging Target**

**of Pharmacotherapy** – This study says, “The growing number of preclinical studies and clinical trials with compounds that modulate the endocannabinoid system will probably result in novel therapeutic approaches in a number of diseases for which current treatments do not fully address the patients’ need. Here, we provide a comprehensive overview on the current state of knowledge of the endocannabinoid system as a target of pharmacotherapy.” The scientists also said, “[added to historical interest in medical marijuana] is the emergence of the endocannabinoid system, offering not only new insights into the mechanisms underlying the therapeutic actions of plant-derived phytocannabinoids but also novel molecular targets for pharmacotherapy. In this overview, we will briefly summarize current thoughts about the role of endocannabinoids in a given physiological or pathological process and then survey attempts to exploit this role for therapeutic gain.”

The scientists continued, for Parkinson’s, “Treatment with CB1 receptor agonists can decrease the tremor associated with overactivity of the subthalamic nucleus, improve motor impairment seen with dopaminergic agonists, protect against dopaminergic cell death, and delay or reduce the incidence of LID. However, cannabinoid agonists are

unlikely to be used for reducing bradykinesia in PD because of their hypokinetic profile both in primates and humans. For Parkinson's, they concluded, "Taken together, although the above studies do not offer a complete understanding of the role of endocannabinoids and cannabinoid receptors in PD and LID, they support the notion that the endocannabinoid system plays an important role in movement disorders, including PD, and may provide the framework for novel therapeutic approaches in the future."

As you can see by the results of these studies, results are inconclusive, and scientists disagree about whether medical marijuana can help with Parkinson's. The ultimate takeaway here is that more research is needed – a lot of it. We need studies on large scales with hundreds of participants, and for that we need legalization at the federal level. Other countries are already doing some research on the benefits of marijuana in general, but we will see a huge jump in knowledge when the United States gets involved with giving grants for more research!

## Risks and Benefits

When discussing the use of medical marijuana, it is important to discuss the risks versus benefits of using

marijuana at all. There is a reason why as of this writing, marijuana is still a Schedule 1 substance in the United States. It is an actual drug; it has real effects. Therefore, it was put on the Drug Enforcement Agency's list to begin with, and it is treated as quite the opposite of supplements like Fish Oil or Vitamin B-12. On the other hand, I do feel that medical marijuana could be the miracle drug, the Aspirin, of the 21<sup>st</sup> century. With its ability to block pain, alleviate depression, along with many more benefits, I must believe that its full legalization will make us all healthier, and of course more laid back.

So, let's talk about the risks. Marijuana, like alcohol, can be habit forming and abused. However, I do not think I have ever heard of someone dying from a marijuana overdose. Also, like alcohol, marijuana can leave you feeling dizzy, nauseous, and disoriented. This means you need to set aside some time with no work or driving so that you can use the drug safely. However, once marijuana leaves your body, there are typically no residual effects – no hangovers or headaches. However, also like alcohol, marijuana can lead to dehydration, so drinking lots of fluids is important while taking any medical marijuana product. Some strains of marijuana are known to cause anxiety and paranoia, so it is

best to avoid those strains if you engage in this endeavor, though the effects stop as soon as the drug's effects go away. Of course, you can always check to see which strains do what by looking them up on the *Leafly* website. In general, you want to start out slowly, and get used to the effects before taking a higher dose.

As we have seen, marijuana can have huge benefits for those needing extra help quelling symptoms, but want to keep the extra therapy as natural as possible. We know marijuana helps reduce pain, helps reduce anxiety and depression, can help you fall asleep and have a better night's sleep, can help reduce inflammation, and much more. I know some people who take a 50-to-1 CBD capsule whenever they get headaches. I predict that when marijuana is fully legal everywhere and its effects are fully understood, it could replace traditional pain killers like ibuprofen or acetaminophen. Pharmacies may carry it on their shelves, or perhaps behind the counter with other stronger medications like pseudoephedrine (the active ingredient in many allergy medications, as well as a primary ingredient for meth).

## Medical Marijuana Legality

The future looks bright for the legality of marijuana for

medical (as well as recreational) use. CBD and Hemp have been legal for a long time (hemp is used to make milk-substitute, clothing, housing, etc.), while they are only now gaining mainstream acceptance. THC is a different story, however. Since THC marijuana is a Schedule 1 substance in the United States, it is technically illegal at the federal level throughout the country. However, many individual states have legalized marijuana – Oregon was the first state to decriminalize marijuana in 1973, California was the first state to legalize medical marijuana in 1996, while Colorado was the first state to legalize recreational marijuana in 2012.

Since then, 18 other states have legalized marijuana for recreational use, while 13 other states have decriminalized its use, and the DEA is taking a “hands off” approach to enforcement. A handful of other countries have legalized marijuana for medical or recreational use, and a couple of dozen have decriminalized it or allow it for medical use only. The issue in the United States, and many other places where it has been decriminalized but not fully legalized, dispensaries in legalized states, provinces, or municipalities still cannot have bank accounts (which are federally insured) or accept credit cards (which are nationwide companies).

Ultimately, this will all work itself out and marijuana

will become legal in the entire United States, as well as in many Western countries. The idea of legal marijuana is just too popular to “put the genie back inside the bottle,” as it were. A 2018 Gallup poll said that 66% of Americans supported legalization, including 75% of Democrats, 71% of Independents, 59% of people over 55, and at least 65% support in the East, South, Midwest, and West. (McCarthy, Justin (October 22, 2018). "Two in Three Americans Now Support Legalizing Marijuana". Gallup. Retrieved October 30, 2018.)

## N of 1

If you do not follow science, you may have not heard the term “N of 1” or “N of” anything. The simplest way to explain this concept is by saying that, in clinical trials and other scientific research where several people are participants in the trial, the research is published with the number of participants, an N of something. This is the number of people who are taking part in a particular study. A larger number of participants is better, as we will soon find out. But it is important for studies to not only indicate how many people participated in the study, but during what period the study was conducted, and if any participants dropped out. The best studies are ones trying to verify the outcome of previous studies. Repeatability of results is key to the scientific method.

Since it is impossible to test the entire population in any particular study – imagine for every trial for a new Parkinson’s drug, the pharmaceutical companies tested all one million people with Parkinson’s in the United States. Not

only would this be cost prohibitive, but researchers will also never be able to include everyone in their study for one reason or another (people don't want to be "guinea pigs", many people may live in rural areas away from major hospitals, etc.). Instead, study and trial organizers must select a number that is smaller than the entire population of people in the research group, but a large enough sample to represent a broad range of people in that population. Therefore, you will often see clinical trials for Parkinson's in the hundreds. Statisticians have figured out what number of people is needed in a study to represent a larger population.

Let's say there is a Phase 3 study for a brand-new Parkinson's drug. Instead of conducting the research on all one million people with the disease in the United States, they figure that 500 people with Parkinson's will be enough to represent the entire population at large. If there are 500 participants in a trial, then the  $N = 500$  (although it is usually indicated with a lowercase  $n$ , here I am using the uppercase  $N$  for clarity). I have mentioned how large trials are best for discovering the usefulness of a particular therapy. For example, when the COVID vaccine trials were going on, a phase 3 trial would include an  $n$  of 60,000. This number is a statistical number that is meant to represent the

entire population of the United States (with participants chosen for their diversity, as seen in the total population. An n of 30,000 would have been too few to account for all the possible combinations of people in a large population the size of the United States, and an n of 100,000 would have been a waste in many respects, with too many unnecessary samples not needed for an accurate representation of the population.

So why does this all matter for those of us fighting Parkinson's? First, it's important to understand how studies work, so that we can accurately determine if a study is statistically significant for us to pay attention to (therefore, I do not pay as much attention to news stories that say "a new therapy is being developed for Parkinson's – 9 people in a trial have shown good results"). Second, we must learn to become junior scientists about our own illness, and embrace the fact that Parkinson's affects everyone differently, and there is no better study or clinical trial FOR YOU, than that of your own experiences with supplements, therapies, foods, or medical marijuana. Throughout your life using these natural therapies, you will need to conduct studies where the  $N = 1$  (you!). With Parkinson's, there is no substitute for what works best for you, so you must track and adjust what works for you during the various phases of the disease.

Your N = 1 study should be thorough, and I recommend daily analysis of your symptoms when taking supplements, engaging in physical therapies, eating healthy foods, and using medical marijuana. You may use a journal, a spreadsheet, or an app like Parkinson's LifeKit, but you should keep track of changes in your condition over time. This is the only way you will know for sure, objectively, that your chosen therapy is working or is not working. I will present examples of how to begin tracking your stats so that you can share them with your physical therapist, naturopath, movement disorder specialist, or nutritionist. This is an adventure to understanding what works for you and for only you. Remember, with Parkinson's, everyone's experience is different, and you are unique in the types and severity of your symptoms.

When using a journal of some sort, you can keep track and make marks on the lines of the journal. Name the test you are conducting at the top of the page. Then draw a large L shape down the side and bottom of the page, leaving about an inch or two free on the outside of the L shape. On the left side, indicate whatever you want to track, and on the bottom indicate the date. Let's say you are tracking the time it takes you to complete a daily crossword puzzle, which is a good

indicator of mental agility. In this case, you would indicate “Daily Crossword Puzzle Time with Fish Oil” at the top of the page. Then, you would indicate today’s date at the bottom. Finally, on the left side, indicate the time it takes you to complete the daily puzzle, with the top of the grid being the longest time (let’s say an hour), and the shortest time at the bottom (let’s say zero minutes). As the days go by, you will not only have a record of your daily puzzle completion times, but you will be able to draw a line graph by connecting the dots, and you will be able to notice any trends.

Here is an example of this type of graph. This is an example of how you can draw the graph on paper, or how you can use a spreadsheet program to create the graph.

## Daily Crossword Puzzle Time with Fish Oil

35 mins.				
30 mins.				
25 mins.	•		•	
20 mins.		•		•
15 mins.				
10 mins.				
5 mins.				
	06/23/2021	06/24/2021	06/25/2021	06/26/2021

Here is the important part: you must do this daily for each task and with each type of therapy to properly document the effects over time. As was mentioned earlier in the book, you must add or subtract one type of therapy at a time to know if that therapy has a benefit or not. This type of graphing technique can be used to track any task that you do daily – one-mile runs (with time on the left and date on the bottom), number of taps on a “tap tracking” app (number of taps on the left and date at the bottom), time awake (with time awake on the left and date on the bottom).

These are all good indicators of symptoms and severity

over time, but they must be matched with the therapy as the third variable. So, if fish oil has a positive effect on your puzzle time as time goes on, then go ahead and add another supplement in a new graph to test that one. Let us call it “Daily Crossword Puzzle Time with Fish Oil and Curcumin.” If over time your times do not improve, then drop the curcumin and try something else. Repeat this until you have a combination that works for you. It may take a year or more to figure this all out, but in the end, it will be worth it for improved health and the reduced severity of symptoms.

Remember that these self-studies are great for indicating what therapies work for you, but you and I are different, and your symptoms and severities are going to be different. It is impossible to know what works for different people for Parkinson's, so you must treat these as  $N = 1$  studies, and you should indicate this if you share your experiences with others. They may try CBD oil and not have the same results as you, so be sure to let people know this when you share your experiences.

## Conclusion

To sum up everything we have covered in this book, we have had overviews of a variety of natural therapies for Parkinson's. We realize that a therapy and a remedy are very different forms of treatment, we have looked into supplements and the various advantages and pitfalls associated with them, we have learned about a variety of activities we can do on our own or with the help of therapists, we learned about polyphenols and their incredible antioxidant properties, we took an extensive look at medical marijuana, and finally we learned how to conduct N of 1 experiments, since we are unique and everyone responds to therapies differently.

Let us recall the difference between a therapy and a remedy. A therapy is something that alleviates symptoms, increases strength, or makes you feel better overall. A remedy is something that promises a cure, to which we know there is none for Parkinson's. This book offers therapies. I have been sure to point out where medical quacks exist and

how they sell their “miraculous cures.” Please do not fall for these salespeople who are looking to play on your desperation and give you false hope on remedies that do not work. Always follow the science and ignore “clinical trials” that have only a few participants or “cures” that are only available from one company.

Speaking of quackery, there is a lot of false hope and misinformation in the supplement business. Even good supplements that help build your defenses like Fish Oil and Vitamins C and D, can suffer from poor manufacturing or from inaccurate potency, since no supplement’s potency is guaranteed or verified by the Food & Drug Administration. Do your research to ensure you are getting what you pay for and avoid premium brands that sell at a steep price but basically contain the same ingredients and suffer the same pitfalls of cheaper supplements.

Although there is not a cure for Parkinson’s (yet!), one activity known to delay the progression of the disease is exercise. We learned about yoga, tai-chi, physical and occupational therapies, and more. Movement is the key, whether it is at a pinball machine, on a yoga mat, at a physio’s office, in a chair, on a brisk jog (or a slow walk), or doing any activity that involves movement. Do not stop

moving and integrate exercise into your daily routine. Even a little bit of exercise is better than nothing – no need to run a 4-minute mile or bench 400lbs.

There is a wonderful world of micronutrients in fruits and vegetables called polyphenols. They are present in a variety of foods including berries, nuts, and coffee, just to name a few. These nutrients are present in many foods that make up the Mediterranean diet, the diet recommended to most people with Parkinson's. The nutrients are rich in antioxidants, are neuroprotective, and occur naturally in food so no need to take supplements to get your daily dose.

We spent a long time understanding how medical marijuana works, and how to seek out the best combination of terpenes, the right CBD-to-THC ratio, and the best strains to address the symptoms of Parkinson's. This section is particularly important as medical marijuana becomes legal in more places and begins being accepted as a real treatment, not only for Parkinson's, but for a host of illnesses like cancer, chronic pain, and anxiety and depression.

“You can't manage what you don't track,” as the famous saying goes. This is especially true with Parkinson's since everyone is different regarding their symptoms and the

severity of each. Really, not everyone experiences the same symptoms, even those classic symptoms first identified in the 1800s: Tremor, slowness of movement, and muscle rigidity. I know many people with Parkinson's who are missing one or two of the classic symptoms and were still diagnosed as having Parkinson's. Therefore, it is important to track your own illness using standard activities. There are so many symptoms not identified by Dr. Parkinson, that if his research were conducted today, it would include dozens of potential symptoms. Track your symptoms, track your medication, track your exercise, and then correlate them all to see where things can be tweaked to make you feel better.

Overall, we have covered a lot of material regarding natural therapies in this book. And while there will always be new research, new therapies, and fingers crossed, a cure(!), this book lays the foundation for understanding therapies yet to be discovered. Just remember to do your research and never be taken in by faulty studies or shady salespeople. If something seems too good to be true, then it probably is – except exercise!

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## About the Author

In 2011 Nick Pernisco was diagnosed with Parkinson's disease – a disease typically affecting those over 60 – at age 33. After enduring a prolonged period of depression, he found a way to move beyond his grief and fight back by taking control of his disease and is using his experiences to educate and advocate for others. From this mission, he has created several resources to help others living with Parkinson's.

The Parkinson's LifeKit app is used by thousands of people with Parkinson's around the world to help them take control by tracking symptoms and fitness, managing medication, and more accurately reporting on their condition to their doctors.

Parkinson's Warrior was launched as a news and resource website in 2018, and has since become a platform to publish books and other media, and has spurred a Facebook support group, all of which serve as guides to

adopting a Warrior Mindset to take control of each day and each battle in pursuit of an improved quality of life.

In 2018, after years of disease progression and failing medications, Nick decided to have Deep Brain Stimulation surgery to help ease the symptoms of the disease. Since then, Nick's quality of life has improved significantly. Though not a cure, it has changed the way he lives his life and has changed his views on life in general.

In addition to being an author, app developer, and Parkinson's advocate, Nick is also a media studies professor. He has lived in Buenos Aires, Los Angeles, Seattle, Amsterdam, and most recently, New York, where he lives with his wife and two cats.