Optimal Health with Parkinson’s Disease
A Guide to Integrating Lifestyle, Alternative, and Conventional Medicine

Monique L. Giroux, MD
“Dr Giroux has written an excellent book for people with Parkinson’s disease, based upon her years of clinical experience, her unique insights into the patient perspective, and her extensive knowledge of integrative medicine. This book will be a ‘must-read’ for the many patients who are seeking a balanced, well-informed viewpoint on traditional and complementary aspects of PD care.”
—Melanie M. Brandabur, MD, Medical Director, Ultragenyx Pharmaceuticals

“This book is a wonderful addition to understanding the importance of integrative medicine in Parkinson disease. It lays the groundwork for a comprehensive understanding and implementation of various therapies. It is a must have for patients and practitioners.”
—Rita Gandhy MD, MPH, Movement Disorders Neurologist, The Parkinson’s Disease Institute

“Exercise or medication alone is not enough. People with Parkinson’s disease need to be empowered and educated at the stage of diagnosis with resources about what they can do to get better and stay better. *Optimal Health with Parkinson’s Disease* provides a toolbox full of those resources which contain the potential to optimize brain health, symptoms, function, quality of life, and response to exercise and medication.”
—Becky Farley, PT, MS, PhD, Chief Executive Officer/Founder, Parkinson Wellness Recovery
Optimal Health with Parkinson’s Disease
Also by Monique L. Giroux, MD

*Alter Your Course: Parkinson’s—The Early Years* (with Sierra M. Farris, PA-C)

*DBS: A Patient Guide to Deep Brain Stimulation* (with Sierra M. Farris, PA-C)

*Every Victory Counts: Essential Information and Inspiration for a Lifetime of Wellness with Parkinson’s Disease* (with Sierra M. Farris, PA-C)
Optimal Health with Parkinson’s Disease

A Guide to Integrating Lifestyle, Alternative, and Conventional Medicine

Monique L. Giroux, MD
To my mother who shaped her own journey with chronic illness by showing compassion and empathy for others.
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Introduction

By definition, Parkinson’s disease (PD) is a movement disorder. In reality, PD is more than this label implies. Once diagnosis is made, the many non-motor symptoms become more apparent and often hold even greater significance than the movement symptoms. Motor symptoms and non-motor symptoms alike impact daily living. Coupled with this is the fact that PD is a progressive condition, which raises questions about the future.

How can I best prepare and, most importantly, what can I do to influence the future, the symptoms, of this disease?

It is so often the case that individuals living with PD, and indeed many progressive neurologic conditions, become defined by their symptoms. If symptoms are left unchecked, your life becomes the disease, with the quality of each day or moment determined by the degree or severity of these symptoms. Treatment too can focus only on symptoms, neglecting to support you as a person.

You are not your disease. But you are living with your disease. Living your best, then, means a focus that extends beyond the treatment of symptoms. It means having a broader focus that encompasses emotional adaptation, resiliency, personal healing, and prevention. You are unique not just in the symptoms you experience but also in how you approach life and live life with PD.

This book is written to help you live and thrive. It is intended to help you move beyond a reductionist and traditional approach defined by symptoms to an integrative or holistic approach. This approach respects you as a person and reinforces the concept that traditional medical therapies work best when you are empowered and supported in your quest to influence healing on an emotional, physical, and even physiologic level.

An integrative approach complements traditional medical care, which focuses on medications and surgical interventions, by introducing therapies designed to promote personal healing and well-being. In conventional or traditional medicine, these therapies or healing arts are often referred to as alternative or complementary, implying that they are somehow different in their approach or intention. These therapies are perhaps different in their focus on personal
empowerment and healing, but not in their goal of better outcomes and better living.

Many physicians are leery of these approaches and sometimes for good reason. Conventional medicine and treatments are held to the principle of “evidence-based medicine.” Treatments undergo aggressive testing, ideally controlling for more generalized effects such as the placebo effect. (You will learn more about this important topic as you read the chapters.) The Food and Drug Administration (FDA) regulates the use of treatments, defining the specific conditions or disease for their use and further ensuring that the benefits outweigh the risks for each therapy.

Alternative therapies are not as strictly regulated and are a multibillion dollar industry subject to strong commercial and marketing influences. Without regulation, such treatments are often promoted to treat symptoms and even cure disease without the evidence to support these claims. Anecdotal reports and personal stories touting benefit are often used to sell a product or treatment, while the results of rigorous testing and direct outcomes to support these claims are overlooked. Physicians and patients alike must navigate the truth from the hype and evaluate them with a critical eye.

This book is designed to serve as your guide, providing you with information on the role integrative medicine can play in treating PD along with a systematic approach to help ensure that your personalized care is effective and safe. With this in mind, you will first explore the philosophical underpinnings of an integrative approach, followed by the scientific evidence for its use. Well-informed, you will be better prepared to make positive lifestyle changes and critically review the many therapies available to shape your personal care.

MY PERSPECTIVE AND JOURNEY

My interest in integrative medicine began early in my career during fellowship training (specialized training in movement disorders completed after formal training obtained as a neurology resident) and is shaped daily by the stories and experiences shared by my patients during their clinic appointments. I learned from my instructors, mentors, and patients alike how stress worsens motor symptoms of tremor, dyskinesia, or freezing of gait. This observation, and indeed fact, was presented as a problem to overcome and not as an opportunity. Through the eyes of my patients I was able to shift perspective away from problems and hindrances and toward new possibilities and ideas about disease, health, and healing. The very fact that stress can worsen symptoms implies that our environment, attitudes, experiences, and emotions can and will influence PD.

Could this knowledge be used to benefit patients?

Once again the answer came from my patients. Their stories have had such a powerful influence on my own growth as a physician, and my approach to the
care of people with PD, that I have included them in the hope that you too will benefit from their stories.

Although it was almost 20 years ago, I remember very clearly my first appointment with an older woman who was seeing me for the first time to discuss her treatment. She told me she had PD for 25 years, which I found remarkable and in fact did not believe since she was doing so well. We talked and I questioned her further. As her story emerged, I understood.

“What is your secret?” I asked. She responded, “I do yoga.”

Back then, exercise was not even considered a crucial part of treatment, and I quickly understood the power of her commitment to exercise and movement. As we talked further, she revealed that yoga was of tremendous help in relieving her symptoms but was not her secret.

“I teach yoga to people with advanced cancer and AIDS. This, I believe, is my secret. I benefit from the compassion I share with others.”

Of all that I have learned over the years about medications, surgery, and neurochemistry, this simple statement was, and remains, my most powerful learning experience.

Each of us has the power to heal. Our thoughts, attitudes, and experiences play a powerful role in our personal healing. This embrace of mind, body, spirit, and compassion is an integral part of healing and can influence how we approach life with disease, and perhaps the disease itself.

A few years later I was performing a consultation with an individual in advanced stages of PD. As I walked into the exam room, my first impression was of a man bent over as he sat in a wheelchair. Immediately my mind anticipated his first words, expecting to hear a long list of the difficulties he was experiencing. I had to lean in very close to hear him speak since his voice was soft and barely audible. His first words were not what I had anticipated.

“I am blessed,” he said.

Again wanting to learn more, I asked him to describe why he thought this when it was obvious his symptoms and movement problems were quite significant. He looked across the room and gestured toward his family. This man was a successful businessman, CEO, and “captain of industry.” Before developing PD, he spent little time with his family and poured all of his energy into his work. Parkinson’s changed all that, prompting him to take inventory of his life, his priorities, and values.
“Before Parkinson’s,” he said, “my family would not be sitting here with me. Parkinson’s has given me that—an appreciation of what is truly important to me.”

He now had his family as part of his life and a new definition of what it means to be well. As a doctor, I realized from this experience that focusing on disease and symptoms alone means I will fail to see the strength that can accompany fragility, the empowerment fueled by challenge, and the compassion that can emerge in the process. From this point on my very definition of health and wellness changed.

Wellness is not the absence of disease or problems. If this were the case, wellness truly would not be obtainable. Wellness is different for each of us and includes more than just the physical symptoms we experience.

As these individuals prove, you can live well with PD. Improved well-being requires an approach broader than traditional medical treatment. Despite the importance of an integrative treatment plan, there is no clear guide to help you in this endeavor. I wrote this book to introduce you to the many therapies, lifestyle choices, and experiences that can help. Equally important is the need to present the scientific underpinnings of these therapies, along with a practical and balanced approach to help you personalize your own wellness care.
How to Personalize Your Care

This book is designed to help you expand your own personal healing and care through a coupling of traditional medicine’s best offerings with complementary treatment, community therapies, and personal empowerment. It is intended to educate and raise your awareness of the many therapies and treatment strategies available to you, but is not intended to endorse or prescribe any one treatment or approach. Your personalized care is unique to you—shaped by your values, experiences, and beliefs. You will explore and perhaps challenge these ideas and values as part of your own journey in self-care. Backed by the power of this information and your own personal reflection, you will be in a better position to understand and navigate the complex world of alternative and lifestyle medicine integral to your own personal healing and work with your neurologist or health care provider to integrate these therapies into your current treatment.

This book is divided into five sections, beginning with generalized information about integrative medicine and therapies and progressing to more specific information that can be applied to your situation. You may be tempted to flip through the initial pages and focus instead on the section describing individual therapies and treatments. But remember that these treatments are merely vehicles by which true healing and well-being can occur. For this reason, information is presented first within the context of the disease and the supporting science describing how these therapies may be effective. That information is followed by a discussion of how everyday living, thoughts, and values can influence holistic care and the very outcome of these treatments. Only then are individual treatments reviewed. The book is organized as follows:

- **General Overview**
  In this section you will review basic information about PD, the philosophical underpinnings and scientific rationale as to how various therapies can be effective and integrated into your overall care, and general concepts that will help you make wise and safe decisions about the integration of traditional with non-traditional treatments.

- **General Health and Lifestyle Medicine**
  Integrative health is an active process beginning with a personal commitment to health and healing and the lifelong changes that support this
commitment. This outlook is so important to health and healing that it should take precedence over any integrative therapy. With this in mind, individual therapies can then be added to support a healing lifestyle. Information on general health, especially important to people with PD, is also included since a holistic approach extends beyond the focus often given to one disease.

- **Integrative Therapies**
  In this section, you will learn about specific therapies, how they work, and the evidence for their use in PD.

- **Symptom Relief**
  Parkinson’s can be associated with movement and non-movement symptoms or problems. In this section you will learn about specific ways that traditional and integrative therapies can be used in concert to treat motor and non-motor problems.

- **Personalize Your Care**
  This final section includes worksheets and tools designed to help you create a step-by-step plan for personalizing and optimizing your care.

Whether you are a true believer in alternative therapies or a skeptic, the following steps will help you expand and personalize your care to gain better health.

**STEP 1: KEEP AN OPEN MIND**

Begin with an open mind. An open mind means that you are not accepting of all the wonderful things that alternative therapies claim to offer or skeptical of all that traditional or conventional medicine can deliver. It means that you are open to the possibility that these treatments, when carefully chosen, can add true value to your care and how you feel.

With an open mind you will be in a position to fairly assess each therapy, beginning with an understanding of its mechanism of action, followed by the evidence that supports positive (or negative) results, and finally how the therapy fits into your own needs. Approaching each therapy in this fashion is especially helpful when conclusive evidence is not available for a specific therapy.

**STEP 2: PRIORITIZE YOUR CARE**

Integrative medicine opens up many opportunities for new and unique strategies designed to enhance your well-being. This can be overwhelming. Begin by prioritizing what is important to you. Focus on the symptoms or problems you wish to manage. Then review how you are currently treating these symptoms and identify any new ways or approaches you can use to manage them.

For example, first think about how each problem is impacting how you feel and your day-to-day activities. Work with your health care provider to prioritize your focus if needed. Some symptoms, such as depression, may be a priority and
require a dedicated focus. Depression will affect how you feel, your motivation, and your openness to new ideas and the potential for change. Focusing on one or two problems is less overwhelming and more likely to result in successful change.

Next, think about how you will focus your treatment to combat these problems. You will learn more about specific therapies for symptoms in later sections, but remember you have a choice in how you organize your care.

- Will you rely solely on medication?
- Can you commit to lifelong results through active lifestyle changes such as exercise, diet, or stress management?
- Who will be involved in your care?
- Are your treatments balanced to include emotional, physical, and social well-being?

STEP 3: ALIGN YOUR PERSONAL LIFE PHILOSOPHY AND VALUES WITH TREATMENT

Each of us brings different experiences, cultural beliefs, personal values, and philosophical approaches that will shape health and self-care. The following questions will help you understand your own values and philosophy as related to your care choices.

- Do you believe that the lifestyle choices you make can play a role in your own health?
- Are you skeptical of non-medical therapies, relying only on prescription medications and surgery?
- Conversely, are you skeptical of prescription and surgical therapies, wishing to rely only on natural or alternative treatments even when traditional treatments are proven?
- Do you tend to seek a more active approach to your care through education and lifestyle change or a more passive approach, such as using vitamins and pills?
- Do you take vitamins, supplements, and similar pills because you believe they are the best strategy for better health?
- Are you in search of the magic pill or treatment to fix your problems?

There are no right or wrong answers. The answers are your answers and represent your personal care values. As you answer these questions (a survey is also included in the final section of this book, Personalize Your Care), think about whether there is an opportunity to expand your thoughts and ideas to include a balanced integrative approach.
STEP 4: STAY BALANCED

Balance is important to integrative medicine. By its very definition, integrative medicine balances the best of traditional medicine with the best of non-traditional therapies. Viewing these therapies as mutually beneficial is important to overall results.

Balance also refers to the activities and treatment choices you make. Is your focus on pills and supplements alone? Do you tend to focus on exercise only or do you also include healthy diet choices, stress management, and emotional health as part of your balanced care?

STEP 5: REMEMBER SAFETY

The FDA regulates prescription medications and surgical procedures to ensure that a treatment is both effective and safe. Most non-traditional therapies do not have this stringent regulatory oversight. Training, certification, and therefore quality will vary among healing specialists. In addition, the idea that natural therapies are safe is not always true. Learn how to read labels, ask critical questions about claims made, and know the certification and training associated with a therapy and/or therapist. Be sure to involve your health care provider to help you make safe choices.

STEP 6: INVOLVE YOUR HEALTH CARE TEAM

Talk to your health care provider about your interest in an integrative approach. Many physicians are skeptical of or resistant to the topic of integrative medicine. This is an obstacle but not an insurmountable one. Just as there are many ways to approach integrative care, there are many ways to talk to health care providers to gain their support and guidance. A partnership with your health care provider will help you make safe and effective choices. Tips on how to raise the topic with your health care provider are included throughout this book and in the final section, Personalize Your Care.
Optimal Health with Parkinson’s Disease
PART I

General Overview
Understanding Parkinson’s Disease

WHAT IS PARKINSON’S DISEASE?

Parkinson’s disease (PD) is a movement disorder characterized by motor symptoms of tremor, rigidity, and bradykinesia or slowness of movement. These symptoms usually begin on one side of the body and with time can spread to both sides of the body.

Motor Symptoms

The following are the primary motor symptoms associated with early PD.

Rest tremor is a rhythmic shaking noticeable in the chin or mouth, fingers, hands, arm, or leg. This tremor is present or most noticeable when the arm and leg are held in a resting or relaxed position usually while sitting, lying down, or walking. Rest tremor usually disappears or improves with activity. For instance, hand tremor is reduced with activities such as writing or eating.

Rigidity is a form of stiffness in the arms and/or legs and like tremor usually begins on one side of the body before spreading to both sides. Stiffness is noted with movement and often associated with a feeling of heaviness, tightness, or pain in the muscle. Cogwheel rigidity describes ratchet-like movement that can
be felt when your health care provider moves your wrist, elbow, or knee during examination.

Bradykinesia is a slowness of movement that influences motor speed, initiation of movements such as first steps with walking, and motor fatigue during sequential or repetitive movements such as finger tapping.

By convention, two out of three of these symptoms must be present to diagnose PD. Tremor is the most obvious symptom often bringing patients to the doctor early in the disease, but tremor is not present in about 30% of individuals.

Postural instability describes a problem with balance experienced in more advanced disease. The problem is due to a change in the balance reflex called the righting reflex, which allows a rapid adjustment in posture and stance to maintain balance when the center of gravity suddenly changes, such as when stepping off a curb or stumbling over an obstacle. This reflex allows our brain to have precise control of posture and balance. When this balance reflex is diminished, unsteadiness and falls occur. These balance problems are not typical in early disease but are noted years after diagnosis.

Other motor symptoms observed as the disease progresses are as follows:

**Early Stage**
- Symptoms on one side of the body
- Decreased arm swing on one side when walking
- Decreased stride length or dragging the foot while walking
- Scuffling toes when walking, especially when tired
- Change in leg coordination when cycling or running
- Sense of muscle fatigue or heaviness in the arm or leg on one side of the body
- Difficulty completing repetitive movements due to muscle fatigue
- Trouble with hand coordination especially on one side, noted with bimanual tasks using both hands (such as when shampooing your hair)
- Reduced range of motion in the shoulder, shoulder pain, or frozen shoulder
- Mask-like face or a decrease in facial expression called hypomimia
- Decreased or small handwriting called micrographia

**Mid-Stage**
- Symptoms on both sides of the body
- Hypophonia or soft speech
- Mild swallowing problem, such as difficulty swallowing pills
- Mild flexed or bent posture and shuffling gait
- Motor fluctuations that occur when the effects of medicine start to wear off between doses
- Dyskinesia or uncontrolled involuntary movement caused by medicine
Late Stage
- Postural instability with balance problems and falls
- Freezing of gait
- Significant speech and swallowing problems
- Drooling
- Neck and trunk rigidity
- Increase in flexed posture or leaning to one side

Non-Motor Symptoms
PD is more than just a movement disorder, and indeed certain non-motor symptoms may impact quality of life more than motor symptoms. This is especially true for symptoms of depression and cognitive function. The following is a list of non-motor symptoms associated with PD. These symptoms are characterized broadly as autonomic (part of the nervous system regulating control of involuntary organ function), sensory, cognitive-behavioral, and sleep-related problems.

Autonomic Nervous System
- Constipation
- Gastric bloating and reflux
- Urinary control (frequency or urgency)
- Labile blood pressure (high and low swings)
- Orthostatic hypotension and dizziness, a drop in blood pressure when changing position from lying down to sitting or from sitting to standing
- Temperature dysregulation, such as cold hands or feet or drenching sweats

Sensory
- Pain or numbness often in arms, legs, or abdomen
- Restless legs syndrome
- Loss of smell
- Vision change, such as reduced depth perception or difficulty seeing in situations with low contrast and low lighting
- Altered taste (usually associated with loss of smell)

Cognition and Behavior
- Executive dysfunction, such as trouble with multitasking, cognitive flexibility, abstract thinking, or speed of thought
- Psychosis or, more commonly, visual hallucinations caused by medicines
- Depression
General Overview

- Anxiety
- Apathy
- Daytime sleepiness
- Fatigue
- Social withdrawal
- Impulsivity problems, such as pathologic gambling or binge eating or spending, often caused by medicines
- Decreased desire to eat or increased desire for sweets

Sleep

- Restless legs syndrome
- Fragmented sleep and early awakening
- Sleep apnea
- REM (or rapid eye movement) sleep disorder (see the following list of preclinical non-motor symptoms)

Preclinical Symptoms

Certain non-motor symptoms precede diagnosis. These problems in isolation are common and not specific to PD. However, they can be the first signs of this disease, often beginning before movement problems emerge:

- Depression or anxiety, unexplained by other conditions or problems
- REM sleep disorder, defined as vivid, active, and physical dreaming, such as yelling, kicking, punching, and acting out of dreams during the REM stage of sleep
- Reduced or lost sense of smell
- Constipation

HOW DOES PD PROGRESS?

One of the most common questions I am asked is, “How will my disease change or progress, and how quickly will it change?” The Hoehn and Yahr rating scale identifies disease stages from mild to advanced. These stages describe motor changes that occur over time as the disease and symptoms progress.

**Modified Hoehn and Yahr Rating Scale**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Unilateral (one side of body) symptoms, minimal problems</td>
</tr>
<tr>
<td>Stage 1.5</td>
<td>Unilateral and axial symptoms (middle of body)</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Bilateral (both sides of body) or axial symptoms without balance problems</td>
</tr>
</tbody>
</table>
Stage 2.5  Bilateral symptoms with mild postural instability (easily recovers)

Stage 3  Bilateral symptoms, mild to moderate disability with impaired postural reflexes or balance problems, but still able to walk without walker and be physically independent

Stage 4  Severely disabling symptoms, but able to walk or stand with assistance (such as use of walker)

Stage 5  Non-ambulatory, confined to wheelchair and/or bedridden

One study of 695 people showed that the average time to progress from Hoehn and Yahr stage 1 to stage 2 was 20 months; from stage 2 to 2.5 was 62 months; from stage 2.5 to 3 was 25 months; from stage 3 to 4 was 24 months; and from stage 4 to 5 was 26 months. How quickly symptoms change for you as an individual will certainly vary. Some factors such as age predict a faster decline. Depression and the presence of other medical problems are additional factors that can negatively influence physical symptoms if not the disease itself. Yet other factors under your control, such as exercise, diet, and stress management, can be associated with better health, slower change, and even symptom improvement. Your proactive approach will influence your own trajectory.

The Hoehn and Yahr scale illustrates another important point. We have clear knowledge of how symptoms can change over time. With this knowledge comes power and motivation to put a plan in place to reduce or delay anticipated problems. A focus on prevention will change the course and timeline of your disease. Speech, balance, depression, physical strength, and stamina are examples of symptoms or problems that can be targeted at any stage of the disease with the intention of improving your future.

What’s more, your brain will react to these positive changes in physiologic ways that go beyond prevention. The science behind neuroprotection and neuroplasticity will be touched on in greater detail elsewhere (see Chapter 3), but the results are clear. How you live, the activities you chose, and the experiences you have will impact brain activity and how you experience PD symptoms.

WHAT CAUSES PD?

PD is associated with loss of nerve cells in a region of the brain called the basal ganglia. The basal ganglia is located deep within the brain and represents a network or interconnection of cells that work together to produce motor, emotional, and cognitive actions. The following drawing represents a vertical two-dimensional slice through the brain showing the important nuclei or group of cells that are a part of the basal ganglia. This complex network of cells is involved in the planning, initiation, learning, and execution of movement.

Nerve cells originating in the substantia nigra degenerate or die, the result of which causes symptoms of PD. These nerve cells produce an important
neurotransmitter called dopamine. As the nerve cells die, dopamine levels reach low levels and motor symptoms emerge.

The DaTSCAN approved for use in 2012 is a nuclear medicine brain scan that can help determine if tremor is caused by PD or other causes. This brain scan measures dopamine nerve cell levels in the basal ganglia. The following picture compares the DaTSCAN\(^1\) image of a person without PD (left) to that seen in early-, mid-, and late-stage disease (far right). The center of each image shows the dopamine nerve cell concentration and, with PD, the asymmetry and decline that is associated with progression.

Of interest is the fact that first motor symptoms do not appear until 60% to 80% of dopamine nerve cells are lost. This fact highlights the concept of resiliency of the brain and the body’s ability to compensate for and limit symptoms even

\(^1\) Image courtesy of GE Healthcare.
when change with disease is significant. This ability to modify symptoms in the face of disease is an important tenet of integrative medicine. In other words, are there activities or treatments that can reduce or enhance resiliency and therefore exacerbate or improve symptoms for a person? Although science has not yet provided definitive answers to this question, epidemiology (the study of large populations to define patterns, risks, or factors associated with disease) provides clues to suggest this is indeed the case.

Epidemiologic studies offer significant clues about factors associated with an increased risk of PD and therefore possible causes and/or avenues of therapy. Some of the strongest evidence to date suggests that exposure to known environmental toxins such as pesticides and industrial solvents, such as those used in industrial agriculture and the dry-cleaning industry, are associated with an increased risk of PD. Conversely, lifestyle factors such as a prudent diet (a diet high in fruit, vegetable, and fish intake) and exercise can reduce the risk of developing PD.

Once risk factors are identified, the next step is to gain a better understanding of how these factors affect brain chemistry, physiology, and disease. Neuropathological studies bring into question the original teaching that PD is caused solely by dopamine nerve cell loss in the basal ganglia. Although this is true, it does not tell the whole story. The Lewy body is the pathological feature defining PD at the cellular level. The Lewy body is an abnormal protein deposit found in nerve cells of people with PD. Pathological studies analyzing Lewy body deposition at autopsy show the first signs of nerve damage and Lewy body deposits in the olfactory bulb (nerve cells in the nose) and the nerves along the gastrointestinal tract. These changes are noted long before the first signs of cell damage and loss are measured in the brain and may, in part, explain the presence of the many associated non-motor symptoms. But these findings also suggest a more interesting phenomenon—the first signs of PD are located in areas of the body and nervous system directly exposed to the environment. Although only speculation, could it be possible that specific environmental exposures trigger a chain of chemical reactions in nerve cells in people who are at risk for PD?

Indeed, if toxins and other environmental exposures increase risk of disease, can their exposure or effects be minimized to prevent or treat disease? This is a guiding principle of integrative medicine. The following examples illustrate how this can occur.

Oxidative Stress. Certain pesticides are linked to dopamine nerve cell damage similar to that seen in the substantia nigra in PD. Toxicity occurs through oxidative stress, a process discussed in greater detail in Chapter 3. An integrative medicine approach tackles this problem in these ways:

- The first is to limit exposure to pesticides by choosing pesticide-free produce or organic foods, if possible, and by encouraging gardeners to limit chemicals in their own gardens and/or household.
- The second is through a diet high in antioxidants, to combat overactive free radicals and the unchecked oxidative stress lethal to nerve and other cells.
• Third, prescription medicines and supplements are studied using laboratory and animal models of PD to look for a treatment that blocks the chemical and cellular damage caused by these toxins.

• Finally, integrative medicine does not differentiate among lifestyle, complementary, and traditional medical therapies but promotes the idea that these therapies and changes can work together synergistically. Diet, environmental exposures, and pills could be used together to prevent exposure, block oxidative stress, and prevent or limit disease.

**Inflammation.** Studies suggest that inflammation plays a role in propagating neurologic changes associated with PD. Interestingly, the use of non-steroidal anti-inflammatory drugs (NSAIDs) such as the common medicines ibuprofen and naproxen used to treat pain, are associated with a lower risk of PD and even other neurodegenerative diseases such as Alzheimer’s disease. Yet taking anti-inflammatories when they are not needed carries significant risk, including bleeding and kidney and heart disease. Integrative medicine offers a safe and healthier approach

• Reduce inflammation through a change in diet by limiting foods high in glycemic load and inflammatory fats (see Chapter 5).

• Consider the use of anti-inflammatory supplements (see Chapter 6).

• Explore other therapies that might reduce the body’s inflammatory response, such as mind-body therapies.

• Adopt the premise that some of these therapies will not have the full body of support to prove they work to reduce brain inflammation. Until this information is available, a risk/benefit analysis can be applied to the use of these therapies. For instance, theoretical evidence suggests that mind-body therapies may reduce inflammation through their impact on immune health and production of inflammatory chemicals. But evidence to date fails to support a direct link between specific mind-body therapies and brain inflammation. However, risk is low and the potential generalized benefit is high, including mood, stress, sleep, heart, and pain benefits.

**Nature vs. Nurture**

Since conclusions based on epidemiologic and environmental studies are drawn from observations of very large groups of people or geographic regions and statistical analysis of probability, it is often difficult to apply this information to you as a single individual. This is especially true since multiple factors in combination with genetics appear to work together to cause PD. This is called the *multiple hit hypothesis* because factors taken individually do not necessarily cause disease, but together their contribution to disease is greatest. For instance, toxic effects of pesticides are stronger in individuals found to have certain genetic abnormalities.

In the majority of cases, genetic abnormalities do not actually cause PD but instead increase susceptibility or the risk of developing the disease. Both nature
and nurture, then, come together as a combination of genetics and environment combine to increase a person’s risk.

Familial or genetic PD (when a parent, sibling, or child also has the disease) accounts for only 10% to 15% of cases. Not all associated genes have been discovered, but familial cases to date are most commonly associated with these genetic mutations: LRRK2, PARK2, PARK7, PINK1, or SNCA. Most cases, however, are sporadic, likely resulting from a complex interaction between environment and genetics not yet identified.

Research suggests that genetics is more likely to play a role in people with symptom onset prior to age 40. A recent study found that 16% of people diagnosed before age 40 have abnormal genes with the most common being Parkin, LRRK2, and glucocerebrosidase. Having one family member with PD also increases risk. For example, the cumulative lifetime risk of developing PD for a first-degree family member (parent, sibling, or child) in the United States is between 3% and 7%. This is compared to a lifetime risk of developing PD of 1% to 2% in the general population.

The fact that genetics does not tell the whole story is important to integrative medicine and to you. Simply knowing that there are environmental and lifestyle factors that influence risk of disease means that there are specific changes you can make to influence this risk, even if you have the genetic abnormality.

References

Parkinson’s Overview


**Nature vs. Nurture**


