The scientific and medical communities used to think that only a few movement disorders were genetically based. It is now widely believed that many more, if not the majority of these disorders, involve genetic factors. Here are the important things to keep in mind when beginning to understand the relationship between genetics and movement disorders:

**A “classically genetic” disorder is entirely explained by a single gene. Most movement disorders are not “classically genetic.”**

Even if a patient has an identified gene mutation, having that mutation does not always ensure that the patient will develop symptoms. There are other factors we mostly do not understand that probably also contribute to a gene mutation causing a diagnosable movement disorder. In some cases, there may be a combination of several genes involved.

**Genes do not operate in a vacuum.**

Many movement disorders are complex diseases with both genetic and environmental factors contributing to their cause. There may be environmental triggers, for instance, that need to be present, as well as an inherited predisposition.

**We know some of the specific genes involved in movement disorders and there are more yet to be identified.**

So far, more than a dozen genes have been associated with Parkinson's disease (PD) or parkinsonism, including LRRK2 (leucine-rich repeat kinase 2), shown at left. The different images reflect LRRK2 with various mutations of the gene. Another PD-related gene is SNCA (synuclein alpha), which is shown below at left on what is known as a gene sequencing diagram. Yet another is GBA (glucosidase beta acid), shown below at right. For dystonia, there are more than a dozen identified genes; for ataxia, as many as 44 identified genes.

How a disease produces symptoms is as important as why it occurs in the first place. The mechanism—how a disease evolves and the steps or cascade of events that lead to symptoms—may be the same whether a patient has a genetic mutation or not. For this reason, scientists believe that finding ways to treat genetically caused movement disorders will also benefit those that are not genetically based.

**Therapies are now being developed that target some of the movement disorder genes.**

National trials are expected to begin within this decade (and the Mount Sinai Health System will be one of the sites) that will test agents that target LRRK2 and GBA. Even though these trials may only affect a small proportion of the Parkinson's population, it is a significant development that we are targeting underlying causes of the disease.

**A major thrust of research includes finding the answers to these questions:**

- What other genes are yet to be discovered that contribute to movement disorders?
- How important is a mutation in determining the likelihood of getting a movement disorder?
- What factors trigger disease in a person with gene mutation and protect another with the same mutation from ever developing disease?
- How do gene mutations cause disease, and what are their distinct and shared mechanisms?
- How do these mutations affect the progression of the disease if a patient is diagnosed?
- How do these gene mutations affect response to current treatments of the disease?

*For more on research into the genetics of movement disorders, see page 3.*
It’s wonderful to welcome you back to *Movement Disorders News*, the biannual publication of the Robert and John M. Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital and the Alan and Barbara Mirken Department of Neurology Movement Disorders Center at Mount Sinai Beth Israel. As always, we hope you enjoy this issue and we welcome your input, comments, and submissions. See page 12 on how you can send us your feedback.

Patients are drawn to our movement disorders team for many reasons. First and foremost, they know that they are being treated compassionately by the finest minds in movement disorders who use the very best practices. From our attending neurologists to our other physicians (neurosurgeons, psychiatrists, and fellows) to our other care providers (neuropsychologists, social workers, nurse practitioners, genetic counselors, and research teams), we provide outstanding care for what is now the largest and most comprehensive movement disorders group in the country.

Our patients also enjoy that which makes living with movement disorders easier and less isolating. We’re excited to see our uptown patients investigating some of the extensive classes and support groups downtown at the Philips Ambulatory Center in Union Square and we know that several downtown patients have signed up for the 92nd Street Y Parkinson’s disease exercise class. For a full roster of the upcoming support groups, classes, workshops, lectures, and other events, turn to pages 10 and 11.

Beyond these important elements—ongoing treatment and support—we are delighted with the opportunities the Mount Sinai Health System merger has allowed us as movement disorders researchers. Together, at both The Mount Sinai Hospital and Mount Sinai Beth Israel campuses, we have started collaborating on some projects and are planning to combine more databases and other research infrastructure.

Patients like that we are active researchers. They appreciate that they can participate in research with as much or as little effort as appeals to them and their lifestyle. Some patients are only interested in filling out a simple questionnaire or doing a spit test. That’s fine; these are valuable contributions and are very welcomed. Other patients are interested in more, say, giving a family history or a tube of blood. Still others, eager to give back to science and their fellow and future patients, volunteer for extensive efforts such as regular blood work, brain imaging, and lumbar punctures, as does Paul Basista, one of our patients profiled on page 6.

A whole other group of patients sign up for clinical trials as they are applicable, interested in early access to possible new drugs and treatments, as was Greg Khalil, our other patient profile currently recruiting. Here’s the thing: Whatever level of care we provide today—and we provide the best—we need to do better. And the only way to do that is to conduct further research. New treatments and medications are groundbreaking and important and can help symptoms enormously and improve lives. We are all for that, as are our patients. But we want a cure. And for that reason, we are as proud of our roles as researchers as we are of any other single thing we do. In that spirit, we are especially pleased that the bulk of this issue’s pages are dedicated to explaining the importance of research and our role in the ongoing search to better understand and cure movement disorders.
In 2004, research teams in Europe, Britain, and the United States identified mutations in the gene LRRK2 in a handful of families with histories of Parkinson's disease (PD). The mutation was thought to be rare.

"Once the gene was identified, other labs began screening their Parkinson's disease patients to determine the types and frequencies of LRRK2 mutations. Were LRRK2 mutations truly rare causes of PD? For instance, mutations were extraordinarily rare in Germany, based on the screening of cases by one of our collaborators," says Susan B. Bressman, MD, Chair of the Mirken Department of Neurology and Division Chief of Movement Disorders at Mount Sinai Beth Israel. "This colleague asked us for samples to confirm her findings. My team had over the years collected DNA samples from many of our patients, and so we sent her a group of our samples."

The German colleague was completely befuddled by her screening and thought there must be a mistake. "Whereas she found no mutations in her PD populations, 20 percent of our samples were positive for a specific LRRK2 mutation," says Dr. Bressman. "We screened another set of samples and the findings were confirmed. Our analysis showed that this high frequency of LRRK2 was based on the fact that our New York City area included many more Ashkenazi Jews than those of the European samples. Turns out Ashkenazi Jews have a much higher rate of LRRK2-associated PD." The findings were reported in a 2006 letter to the New England Journal of Medicine, which led to a greater appreciation of the import and clinical features of the LRRK2 mutation.

Since then, physician-researchers at the Mount Sinai Health System have been continuing their efforts to contribute to movement disorders knowledge through their collecting of "biomarkers."

The term biomarkers describes the many different measures that may be associated with a disease from genes and components of blood, urine, and spinal fluid, to physical exam findings, neuroimaging, and measurements of sleep, cognition, mood, smell, and more. Biomarkers have many uses, including being able to better understand and diagnose disease, find new drug targets, and track disease progression. Two examples of biomarkers being evaluated at Mount Sinai Beth Israel include:

**Digitized spiral analysis**
Spiral analysis captures movement-related features. It is performed when a patient draws a spiral on a tablet connected to a computer, which allows for more careful quantification of movement than the classic finger-tapping movement performed in the regular office examination. Mount Sinai Beth Israel researchers have shown that the spiral may be abnormal in a PD patient on a side of the body that is not yet affected by PD.

**Transcranial sonography**
Brain imaging biomarkers range from ultrasonography of the brain to standard and specialized MRI, to other types of scans that assess brain functional pathways by using labeled tracers. Mount Sinai Beth Israel is one of only a few sites in the United States with a transcranial sonography laboratory for movement disorders. Using sound waves, we are able to non-invasively evaluate brain signals that are often abnormal in patients with PD.

Observational studies, especially of genetics and other biomarkers, are at the cornerstone of the movement disorders research at the Mount Sinai Health System. While these studies do not yet involve treatment interventions, they help pave the path to newer and better agents to treat Parkinson's disease and other movement disorders, and improved and more efficient clinical trials to test new medications.
Physician Profiles

Steven Frucht, MD
Director of Movement Disorders, Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital; Professor of Neurology, Icahn School of Medicine at Mount Sinai

Dr. Frucht’s research interests focus on the evaluation and treatment of hyperkinetic movement disorders, specifically task-specific dystonia affecting musicians (he was trained as a classical musician), myoclonus, and tremor. Dr. Frucht serves as a permanent member of the National Institutes of Health K-award study section for neurology. He has participated in numerous clinical trials, published more than 100 peer-reviewed articles, authored two textbooks, and given many lectures worldwide.

A native New Yorker, Dr. Frucht received his undergraduate and medical degrees at Harvard before training in neurology at New York Hospital where he served as chief resident.

Rachel Saunders-Pullman, MD, MPH, MS
Neurologist, Mirken Department of Neurology, Movement Disorders Center at Mount Sinai Beth Israel; Associate Professor of Neurology, Icahn School of Medicine at Mount Sinai

Funded by the National Institutes of Health, The Michael J. Fox Foundation, and the Bigglesworth Family Foundation, Dr. Saunders-Pullman researches genetics and epidemiology of movement disorders, particularly PD and dystonia. She serves on the Executive Committees of the Dystonia Study Group and the Pan-American Section of the Movement Disorders Society, and served on the Scientific Advisory Board of the Dystonia Medical Research Foundation.

She graduated summa cum laude from Amherst College, and received medical and public health degrees from Columbia University. Dr. Saunders-Pullman was a chief resident in neurology at Columbia, where she also completed movement disorder and neuroepidemiology fellowships.

Winona Tse, MD
Neurologist, Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital; Assistant Professor of Neurology, Icahn School of Medicine at Mount Sinai

Dr. Tse has particular interest in Parkinson’s disease, restless legs syndrome, and botulinum toxin injections for disorders such as hemifacial spasm, blepharospasm, and spasticity. She supervises the clinical trials at the Bendheim Parkinson and Movement Disorders Center.

She earned a Bachelor of Arts degree in biology from the Brown University Program in Liberal Medical Education and her medical degree from SUNY Stony Brook. Dr. Tse completed a neurology residency at The Mount Sinai Hospital and served as chief resident. She then completed a fellowship in electromyography at the New York-Cornell Presbyterian Medical Center.

Patient Perspective

New Treatments and a Research Trial Revive a Violinist’s Fingers and Musical Passion

Throughout his adolescence, Greg Khalil, now 41, pursued his dream of being a professional violinist. “I studied seriously for years, playing three to five hours a day.” As he approached his college senior year, absorbed in preparing for the auditions that would be his next career step, he noticed that two of his fingers were not cooperating. “They just would not do what my brain told them to do,” he says. As time went on, the fingers became contorted with no easy way to work around them.

A Diagnosis of Dystonia with an Underlying Genetic Predisposition

At first, Greg chalked it up to overuse or tendonitis, but when it didn’t go away, he visited several physicians. One of them made a connection after taking Greg’s medical history. “When I was a child, I was given medicine for nausea from a bad case of the flu,” says Greg. “I had a rare reaction to the meds—my jaw locked and had to be pried open with a spoon. Upon hearing that, this doctor recognized evidence of a genetically based dystonia.” Greg finally received an accurate diagnosis. He had musician’s dystonia, a subset of the movement disorder that affects just a small group of muscles, in this case, the very muscles Greg needed in his fingers to play music.

Whatever the cause of his immovable fingers, the effect was quite clear to the then-22-year-old. “I was completely shocked. All of a sudden, a career in music was just not an option for me anymore,” he says.

Greg eventually found his way to Yale Law School and has since led a fulfilling career in international relations. “In the grand scheme of things and compared to some patients with generalized dystonia, I’m fine. I can walk, I have a nice life. But, to be perfectly honest, I never fully recovered from the loss of playing. It was a huge blow. For a while, I couldn’t even listen to music,” he says. Haunted, he poked around the Internet every so often wondering if there were any more developments in the world of dystonia treatments.
Connecting with the Mount Sinai Health System and a Clinical Research Trial that Offered the Potential for Hope

An Internet search led Greg to Steven Frucht, MD, Director of Movement Disorders at Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital. Dr. Frucht, himself a Julliard-trained violinist, has a research interest in musician’s dystonia and was overseeing clinical trials studying botulinum toxin treatments.

The trial is not assessing if botulinum toxin injections work for relief of dystonia symptoms. Doctors already know that they do in many cases. What the research aims to do is refine the doses, the amount injected, and their impact on the muscle movements.

Greg joined and his first treatment was December 2015. At each session, David Simpson, MD, an expert on botulinum toxin for neurological diseases, administers the injections and uses electrical stimulation to precisely locate the affected muscles.

Initially, Greg wasn’t sure if he was receiving botulinum toxin (a control group receives a placebo, but no one knows which group he or she is in), until one morning. “I realized my fingers were not holding simple things like a toothbrush,” says Greg.

“But they were moving as I asked them to, they just were incredibly weak.” He went to the violin. “For the first time in 20 years, when my brain told my third finger to go down, it went down. It was a really exciting moment, but overwhelming, too,” he says.

Research Revives a Musician’s Love and Adds to the Understanding of How Best to Treat Future Cases

Since that pivotal moment, Greg continues to practice the violin and get his strength back and retrain his fingers. “This part is exhilarating,” he says. “I’m going back to all the basics, the foundational training for violinists. I’m doing the exercises very carefully and slowly, but I can do them.” He doubts with the years lost that a professional career in music can be pursued. “But if I could perform again in some capacity that would be an added bonus. Either way, even if I continue playing as I am right now, that enough is a tremendous gift,” says Greg.

Likely, Greg will need periodic injections, every three to six months for the rest of his life, something he considers “totally worth it.” He adds, “It sounds over the top, but I feel like a loved one who was dead to me has been resurrected. Being a part of Dr. Frucht’s research has revived a whole part of my life that I thought was gone forever.”
What You Need to Know About Participating in Research

Choosing to participate in research is an important personal decision. There are two types of research:

1. **An observational study**, where researchers are recording symptoms or behavior without seeking to change them in order to find patterns and cause-and-effect relationships.

2. **A clinical trial**, where researchers are testing a new therapy or drug.

Although there is an important distinction between medical care and research, the ethical and legal codes that govern medical practice also apply to research. In addition, all research trials are subject to institutional oversight, and, in the case of clinical trials, independent monitoring protects the participants.

The benefits of participating in research are many: If you participate in a study or trial, you can play a more active role in your care, learn more about your condition, and help others by contributing to the expansion of medical understanding. You may also enjoy the extra attention from your providers since you may be seen more frequently than your typical care demands. Furthermore, if enrolled in a clinical study, you may gain access to experimental therapies or drugs before they are widely available.

There are potential risks, as well: You may find it inconvenient to come to the study site more frequently than your normal care routines. You may be required to undergo regular tests, scans, or complex dosage requirements, some of which may be unpleasant. If you are part of a clinical trial, there may be serious side effects from an experimental therapy or the treatment may not be effective for you.

The following questions might be helpful for you to discuss with the health care team if you are considering entering an observational study or clinical trial:

- What is the purpose of the study?
- Who is going to be in the study?
- If I am going into a clinical trial, why do researchers believe the new treatment being tested may be effective? Has it been tested before?
- What are the screenings, tests, and treatments?
- How do the possible risks, side effects, and benefits in the study compare with my current treatment?
- How might this trial affect my daily life?
- How long will the trial last?
- Will hospitalization be required?
- Who will pay for the treatment or other expenses?
- What type of long-term follow-up care is part of this study?
- Could I be given a placebo drug?
- How will I know that the treatment is working?
- Will results of the trial be provided to me?

Contributing to Research Helps a Patient Live with Parkinson’s Disease and Give Back

Walking can be tough for Paul Basista, 65. He has to use a cane. But twice a week, he still manages to make his way to a dance class and, yes, dance. “The key is to keep moving,” says Paul, who has been diagnosed with Parkinson’s disease (PD). “I love the dance classes, which incorporate ballet, modern, and jazz. They have been very effective in keeping me as well as possible.”

Three years ago, Paul started having difficulty walking. He went to a neurologist and was told that he didn’t have Parkinson’s disease. He was, however, prescribed a medication for PD with the hope that it would eliminate his symptoms. It didn’t. In fact, his difficulties worsened.

“Finally, my wife suggested I go to the Mayo Clinic for a complete work-up,” says Paul. For one week, he was evaluated and tested by every specialist you could think of—cardiologists, neurologists, internal medicine physicians, even occupational therapists. “At the end, they said: ‘The good news is you have Parkinson’s disease.’ I was like, what?! But, in a way, they were right. With PD they could do something.”

The Search for a PD Program that Offers Excellent Care and Research Trial Opportunities

The Mayo Clinic physicians carefully adjusted the PD meds Paul had been taking and his condition vastly improved. When Paul and his wife returned back home to New York City, he was determined to find a local physician to follow his condition and a program that offered the possibility of being involved in research and having access to developing breakthroughs.

Paul’s search led to Rachel Saunders-Pullman, MD, MPH, MS, a neurologist at the Mirken Department of Neurology at the Movement Disorders Center at Mount Sinai Beth Israel, who is also a noted Parkinson’s disease researcher. Dr. Saunders-Pullman is especially interested in the genetics and epidemiology of movement disorders. Epidemiology studies the incidence and distribution of diseases.
Paul participates in one of Dr. Saunders-Pullman’s multisite trials called the Parkinson’s Progression Markers Initiative or PPMI, which explores biomarkers in the disease. He has volunteered for the intensive arm of the study, undergoing periodic DaTscan brain scans, MRIs, and lumbar punctures.

DaTscan is a type of nuclear imaging test. A radiopharmaceutical tracer is injected through an IV into the patient’s bloodstream. Then a special camera takes 3-D pictures of the brain to assess the patient’s dopamine system. Dopamine is a chemical that is essential in controlling movement, and of which PD patients have a deficiency. A lumbar puncture allows physicians to collect and analyze the fluid that bathes the brain. Both these tests provide researchers important data about how PD develops and the differences and similarities between patient subgroups.

Learning to Live with Parkinson’s Disease and Finding New Meaning

Last September, Paul moved to Dallas because of a career opportunity for his wife. “I’m still able to take part in the Mount Sinai Beth Israel research and be followed by Dr. Saunders-Pullman because I come back to New York at least twice a year,” he says.

While PD has forced Paul to retire from his career as an executive for a professional association, he has, nevertheless, built an enriched life. “I miss being in the workplace, but I have an important role running the household so my wife can focus on her career,” he says.

Dance classes also add focus and interest to his week. “When I’m in New York, the class I take in Brooklyn at the Mark Morris Dance Center has a live pianist, which is really fun,” he says.

Participation in research brings meaning to life, too. “PD research is moving at such a rapid rate,” says Paul. “I’m very encouraged. I’m in the PPMI research project at Mount Sinai Beth Israel for five years and, selfishly, I like the idea that if they were to discover something that needed to be addressed, I would know as soon as possible. In a way, the more information they have about me, the more I’ll be in a position to deal with whatever comes up as my PD progresses.” But Paul also takes the longer, more altruistic view: “Change is coming. I hope it comes soon for me, but even if I can’t take advantage of it, it’s important to me that I’m helping others. Like it or not, we’re all members of the same club.”
Observational Studies

Genetic and Imaging (no study drugs)

The Mirken Department of Neurology Movement Disorders Center at Mount Sinai Beth Israel is conducting the following observational studies. If interested in any, and for more specifics, contact Deborah Raymond at 212-844-8713 or draymond@chpnet.org, or Brooke Johannes at 888-228-1688 or bjoannes@chpnet.org, unless otherwise specified.

Key goals of our Parkinson disease (PD) genetic studies are to better understand the range and course of PD symptoms and to develop the best possible biomarker battery for PD. This knowledge is a necessary foundation for future discovery and testing of vitally needed new medications for PD. The following two large studies (PPMI and U01) build on the knowledge we have gained from studying our Ashkenazi patients and their families over the past years. Both previously recruited and new participants are eligible. A special note to all Ashkenazi Jewish spouses and friends: We need you as well for these studies! The research depends on comparison groups including people without PD, an important control group.

The Parkinson’s Progression Markers Initiative (PPMI): This multicenter worldwide research initiative is sponsored by The Michael J. Fox Foundation for Parkinson’s Research and is designed to further explore biomarkers in genetic forms of PD. Researchers around the world are seeking Jewish patients with PD, as well as individuals willing to undergo lumbar puncture. Participation includes a blood sample, a noninvasive brain ultrasound, a cognitive assessment, various motor tasks, and personal and family history. You will be asked to repeat the visit at six-month intervals over the next two years. Although not required for the study, we ask our participants to consider a lumbar puncture. This is a safe and routine procedure performed by experienced staff and, importantly, allows us to evaluate cerebrospinal fluid, which is the fluid that bathes the brain. Rachel Saunders-Pullman, MD, MPH, MS is the Principal Investigator.

The Biomarkers Study (U01): This study is funded by the National Institutes of Health (NIH) and is designed to further explore PD biomarkers as part of the NIH Parkinson Disease Biomarker Program (PDBP). Many of our PD patients are already enrolled, and we are now seeking additional participants without PD, as well as individuals willing to undergo lumbar puncture. Participation includes a blood sample, a noninvasive brain ultrasound, a cognitive assessment, various motor tasks, and personal and family history. You will be asked to repeat the visit at six-month intervals over the next two years. Although not required for the study, we ask our participants to consider a lumbar puncture. This is a safe and routine procedure performed by experienced staff and, importantly, allows us to evaluate cerebrospinal fluid, which is the fluid that bathes the brain. Rachel Saunders-Pullman, MD, MPH, MS is the Principal Investigator.

Gaucher Generations Project: Research has shown that people who suffer from Gaucher disease type 1 (G1D) may have an increased risk of developing PD. G1D results from having two mutated copies of the GBA gene. While one mutated copy of the GBA gene does not cause G1D, it has been associated with a higher risk of PD, Parkinson’s disease dementia, and dementia with Lewy bodies. GBA mutations are commonly screened among the Ashkenazi Jewish population. We are reaching out to those families affected by Gaucher disease or who know they carry a GBA mutation, especially if there is an individual with PD in the family. Contact Imali Perera at 212-844-6055 or iperera@chpnet.org.

Bigglesworth Family Foundation Study: This research study seeks to expand our center’s existing studies of GBA mutations by exploring the relationship between genetic Parkinsonism and cognition. Study participants include those of Ashkenazi Jewish and non-Jewish descent with Parkinson’s disease, Parkinson’s disease with dementia, or dementia with Lewy bodies, as well as individuals who harbor GBA mutations but have not developed PD or dementia. Rachel Saunders-Pullman, MD, MPH, MS is the Principal Investigator. Contact Robert Ortega at 212-844-6839 or rortega@chpnet.org.

Dystonia Genetic Study: Together with numerous collaborators, we have made great strides, including identifying dystonia genes DYT1, DYT6, DYT12, and GNAL. There is still a great deal of work to be done. We are seeking dystonia patients to participate in genetic studies. Participation involves filling out paperwork, having a neurological exam, and giving a blood sample.

Dystonia Coalition Project: This international collaboration of medical researchers and patient advocacy groups has a mission to advance the pace of dystonia research to find better treatments and a cure. This study, sponsored by the NIH, aims to create a Comprehensive Rating Tool for Cervical Dystonia. Participants must have a diagnosis of primary cervical dystonia and not have any other significant dystonia in other parts of their bodies. Study visits will take around three hours. Participants are asked to answer questionnaires about their medical and family history and current state of mind. A neurological exam will be videotaped and some blood will be drawn. Lawrence Severt, MD, PhD, is the Principal Investigator. Contact Emily Muller at emuller@chpnet.org.

Dystonia Partners Research Bank: This study, sponsored by the NIH, created through a partnership with Massachusetts General Hospital, seeks to build an organized collection of clinical information and biologic samples for future research on dystonia and other diseases. Researchers around the world will be able to use information and samples, which may lead to new tests and treatments. Participants will be asked to provide some medical history and background information, as well as blood or tissue samples. Lawrence Severt, MD, PhD, is the Principal Investigator. Contact Emily Muller at emuller@chpnet.org.
The Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital is conducting the following observational studies. If interested in any, and for more specifics, contact Christina Alfonso at 212-241-2890 or Ricardo Renvill at 212-241-2220, unless otherwise specified.

Touch PD, a smartphone application study for PD patients: Do you suffer from PD, but forget to take your medications on time? If so, you may qualify to participate in this study, which evaluates how people living with PD can use the smartphone application myHealthPal to help manage medications, symptoms, and general health. Participation is two weeks and consists of a baseline visit, a telephone interview at week one, and an end-of-study visit after two weeks. Ritesh Ramdhani, MD, is the Principal Investigator.

The Dystonia Coalition: The overall goal of this project is to develop a better understanding of dystonia to improve treatment. The project will collect clinical data for future studies that will help to understand the varied clinical manifestations, natural history, and development of dystonia. Rating scales are being created and a biospecimen repository is being developed. Contact Joan Bratton at 212-241-0279 or joan.bratton@mssm.edu.

Clinical Drug Trials

The Mirken Department of Neurology Movement Disorders Center at Mount Sinai Beth Israel is conducting the following treatment studies. If interested in any, and for more specifics, contact Emily Muller at emuller@chpnet.org. Lawrence Severt, MD, PhD, is the Principal Investigator for these trials.

Apomorphine infusion in advanced PT patients: This study is enrolling advanced PD patients with off time (time when PD medications aren’t working) that cannot be satisfactorily controlled with available medical therapy. Participation lasts about 21 months, and appropriate patients who enroll in the study will be eligible to continue receiving the drug until it is available in pharmacies or the study ends. The study is sponsored by US WorldMeds.

Study examining sublingual (under-the-tongue) apomorphine in levodopa-responsive patients with PD complicated by motor fluctuations (off episodes): The objective of this study is to evaluate a new preparation of apomorphine in patients with PD over a 24-week period. We seek patients who receive stable doses of carbidopa-levodopa (sinemet) at least four times a day or Rytary three times a day. This study is sponsored by Cynapsus Therapeutics.

Open-label, phase 3 study examining the long-term safety, tolerability, and efficacy of APL-130277 in levodopa-responsive patients with PD complicated by motor fluctuations (off episodes): Patients who take L-Dopa/carbidopa at least four times a day or Rytary three times and experience off days are eligible. The objective of this study is to evaluate the safety and tolerability of APL-150277 that is designed to deliver apomorphine to patients with PD sublingually via a thin film dissolved under the tongue. The study will last for 24 weeks and is sponsored by Lundbeck LLC.

Phase 3, randomized, double-blind, placebo-controlled study investigating the efficacy and safety of CVT-301 (levodopa inhalation powder) in PD patients with motor response fluctuations (off phenomena): Multicenter study involves a planned treatment period of 12 weeks. Patients will self-administer up to five doses of inhaled study drug per day as an added treatment during their off periods while taking their usual PD drugs. Patients who successfully complete the study will be offered the opportunity to consent to a long-term (12-month) treatment extension study.

The Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital is conducting the following clinical drug trials. If interested in any, and for more specifics, contact Joan Bratton at 212-241-0279 or joan.bratton@mssm.edu.

Urate-elevating nutritional supplement, inosine, to slow clinical decline in early PD: We are seeking patients with a diagnosis of PD made within the past three years who are not yet on levodopa/sinemet. This two-year study is sponsored by the Parkinson’s Study Group.

Outpatient physical therapy intervention in PD patients with motor fluctuations currently using APOKYN: This six-week study will investigate the effects of physical therapy intervention in PD patients with motor fluctuations. The study is sponsored by US WorldMeds.

Study to evaluate perampanel in subjects with primary cervical dystonia: Those who have been treated with botulinum toxin are not excluded from participation as long it has been at least eight weeks since their last injection before enrollment. This three-month study is sponsored by the Dystonia Study Group.

Assessment of sustained effects of droxidopa therapy in PD patients with neurogenic orthostatic hypotension (symptoms of which may include dizziness, lightheadedness or the feeling that you are about to black out): This Lundbeck-sponsored study investigates whether the FDA-approved drug Northera (also known as droxidopa) is effective for longer than two weeks. Participation lasts up to 56 weeks.

The objective of this study is to evaluate a new preparation of apomorphine in patients with PD over a 24-week period. We seek patients who receive stable doses of carbidopa-levodopa (sinemet) at least four times a day or Rytary three times a day. This study is sponsored by Cynapsus Therapeutics.
Support Groups

**Ataxia (Tri-State Area Group)**
Free open group discussion. Please RSVP to markmegan2@gmail.com or kgingerelli@msn.com.
Facilitators: Denise Mitchell and Kathy Gingerelli
May 12, July 14, September 8
6:30 – 8:30 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Second Floor Levy Conference Center, Room 3

**Deep Brain Stimulation**
Free open group discussion for patients who have already had DBS. Please RSVP to 212-844-6154 or BIMCMovDis@chpnet.org.
Facilitator: Joan Miravite, NP
June 21, September 20
1 – 3 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Deep Brain Stimulation Candidacy**
Open to patients and family members looking to find out more information about DBS for movement disorders. Free lectures, open group discussion, and panel discussion.
Please RSVP to 212-844-6154 or BIMCMovDis@chpnet.org.
Facilitator: Joan Miravite, NP
April 12, June 14, September 13
1 – 3 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Dystonia (NYC Adult Group)**
For adults with dystonia. Free lectures and open group discussion. Please RSVP to 212-844-6154 or BIMCMovDis@chpnet.org.
Facilitator: Joan Miravite, NP
Patient Moderator: Pam Sloate (pamsloate@yahoo.com)
April 26, June 7, September 7
6 – 8 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Essential Tremor**
Free lectures and open group discussion. Please RSVP to 212-675-8207 or peggymackey@nyc.rr.com.
Facilitator: Margaret Mackey
April 7, May 5, June 2, September 1
1 – 3 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Parkinson’s Disease**
Free open group discussion. Light refreshments provided. Please RSVP to 212-241-8297 or julie.safar@mountsinai.org.
Facilitator: Julie Safar, LCSW
April 21, May 19, June 16
10:15 – 11:15 am
The Mount Sinai Hospital
1468 Madison Avenue, Manhattan
Annenberg Building, 20th Floor, Room 201 (Guggenheim Pavilion; middle East elevators)

**Parkinson’s Disease (Manhattan Group)**
Free open group discussion. Please RSVP to 212-844-8482 or sloftus@chpnet.org.
Facilitator: Sheree Loftus, PhD
April 14, May 12, September 8
2 – 4 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Parkinson’s Disease (Men’s Group)**
Free lectures and open group discussion. Please RSVP to 212-844-6154 or BIMCMovDis@chpnet.org.
Facilitator: Joan Miravite, NP
April 4, May 2, June 6, September 12
2 – 4 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Parkinson’s Disease (Movers and Shakers Group)**
For people who are still working. Free open group discussion. Please RSVP to 212-844-8482 or sloftus@chpnet.org.
Facilitator: Sheree Loftus, PhD
April 28, May 26, September 29
6:30 – 8 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Parkinson’s Disease (Queens Group)**
In partnership with Central Queens Y, a free, quarterly support group for people with PD and/or their caregivers. For information, contact 718-268-5011 x160 or OlderAdults@cqy.org.
Moderators: Bendheim Parkinson and Movement Disorders Center staff
April 12
12 – 1 pm
Central Queens Y
67-09 108th Street, Forest Hills

**Parkinson’s Disease (Young Onset Group)**
For people diagnosed before 55. Free. Please RSVP at 212-844-8482 or sloftus@chpnet.org.
Facilitator: Sheree Loftus, PhD
April 14, May 12, September 8
6:30 – 8 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

**Parkinson’s Disease Caregivers**
Free open group discussion. Light refreshments provided. Please RSVP to 212-241-8297 or julie.safar@mountsinai.org.
Facilitator: Julie Safar, LCSW
April 21, May 19, June 16
11:15 am – 12:15 pm
The Mount Sinai Hospital
1468 Madison Avenue, Manhattan
Annenberg Building, 20th Floor, Room 201 (Guggenheim Pavilion; middle East elevators)

**Parkinson’s Disease Caregivers**
Free open group discussion. Please RSVP to 646-355-2600 or golub60@aol.com.
Facilitator: Rita Golub, LCSW
April 13, May 11, June 8, July 13, August 10, September 14
6 – 8 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04
Chair Yoga
Join this gentle class designed to help people with Parkinson's disease, dystonia, and other movement disorders. Emphasis on flexibility, coordination, facial movement, voice, balance, and gait. Free. Registration required at 212-844-6154 or BIMCMovDis@chpnet.org.
Instructor: Roberta Schine, CKYI
Weekly on Tuesdays
3:15 – 4:30 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Second Floor, Conference Center, Room 1

Hand Yoga
Manage stress focused on the hands. This workshop will provide strengthening exercises, a soothing hand massage, handwriting exercise, and meditation. You will leave with a lesson plan to help you at home. Free. Registration required at 212-844-6154 or BIMCMovDis@chpnet.org.
Instructor: Roberta Schine, CKYI
May 5, June 2
3:15 – 4:30 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

Meditation for Stress Reduction
Introduction to simple, easy-to-learn techniques such as body scan, breath, candle, loving kindness, and visualization to help you begin to relax, focus, and reduce stress. Free. Registration required at 212-844-6154 or BIMCMovDis@chpnet.org.
Instructor: Roberta Schine, CKYI
May 2, 9, 16, 23; June 6, 13, 20, 27;
September 12, 19, 26
12:30 – 1 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Second Floor, Conference Center, Room 1

PEP! Parkinson’s Exercise Program
Developed by Karin L. Ruhe, 92Y May Center Group Exercise Coordinator, in collaboration with and supported by the Bendheim Parkinson and Movement Disorders Center at The Mount Sinai Hospital. A gentle group exercise class emphasizing stability, strength, gait preservation, motor coordination, and balance improvement. Participants must be able to climb a short flight of stairs. Price is $144 per 8-class session. Registration is available for Monday and/or Wednesday classes. You must register for both classes if you wish to participate two days per week. Call 212-415-5722 for more information and to schedule an interview.
Instructor: Carolyn Perkins
Monday and or Wednesday sessions (call for start dates of 8-class sessions)
1:30 – 2:25 pm
92nd Street Y
1395 Lexington Avenue, Manhattan
Cardio Court Studio, Fourth Floor

Tai Chi
Simple, effective movement routine that brings vital energy. No special clothing is required. Free. Registration required at 212-844-6154 or BIMCMovDis@chpnet.org.
Instructor: Carolyn Perkins
Weekly on Thursdays
6:15 – 7:15 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Second Floor, Conference Center

Voice Yoga
Learn simple and fun yoga exercises to help you communicate better by strengthening your vocal cords and learning to articulate and speak louder. Free. Registration required at 212-844-6154 or BIMCMovDis@chpnet.org.
Instructor: Roberta Schine, CKYI
May 3, 10, 17, 24, 31, September 13, 20, 27
5 – 6 pm
Mount Sinai Beth Israel
Phillips Ambulatory Care Center (PACC)
10 Union Square East, Manhattan
Fifth Floor Levy Conference Room 5K04

Walk to Mark April as PD Awareness Month
Join the Mount Sinai Health System team at the PD Unity Walk (a gentle 1.4 miles) as we walk to raise funds for PD research. For more information, visit http://www.unitywalk.org.
April 23 (rain or shine)
Registration at 8:30 – 11:30 am
Rolling walk starts: 8:30 am – 12:30 pm
72nd Street Bandshell
Central Park, Manhattan

Treatments in Movement Disorders
Patients and caregivers are invited to learn about treatment options for Parkinson’s disease, essential tremor, and dystonia. Free; light refreshments will be provided. RSVP required before May 6, at 212-241-3835 or NeuromodRSVP@mssm.edu.
May 15
Registration at 10:45 am
Lecture is 11 am – 2:30 pm
The Mount Sinai Hospital
1468 Madison Avenue, Manhattan
Stern Auditorium, First Floor
Dystonia Research: New Findings and Publications

Important discoveries from the labs of the Mount Sinai Health System

The Dystonia and Motor Control Laboratory at the Mount Sinai Health System, headed by Director Kristina Simonyan, MD, PhD, seeks to better understand the physical processes of isolated focal dystonia. It investigates the condition by studying neuroimaging, neuropathological, clinical, genetic, and environmental correlates. The lab is also interested in comparing neural features of dystonia with other movement disorders, such as essential tremor and Parkinson’s disease. The laboratory is funded by the National Institute of Neurological Disorders and Stroke (NINDS) and National Institute on Deafness and Other Communication Disorders (NIDCD).

Using a multidisciplinary approach and novel technologies, the lab is developing a better understanding of normal and diseased states of the central nervous system, which will ultimately help develop new therapies for patients.

Recent and fascinating developments by its researchers include:

- A paper published in Brain Imaging and Behavior defined for the first time the neural correlates of dystonia tremor and showed that these dystonia and dystonic tremor are similar disorders at different ends of the clinical spectrum.
- Another study published in NeuroImage: Clinical determined abnormal sensory discrimination to represent an endophenotypic marker of spasmodic dysphonia with specific correlates related to abnormal brain function and structure in this disorder.
- A major study in Cerebral Cortex defined for the first time that isolated focal dystonia is not merely a basal ganglia disorder but involved disorganization of the entire brain networks across different forms of this disorder.
- A paper published in Journal of Neurology examined the curious phenomenon of alcohol responsiveness of dystonia symptoms in more than 500 patients with spasmodic dysphonia. More than 55 percent had some positive benefits on their voice symptoms following alcohol consumption. This study opens avenues for the development of novel therapeutic options.
- In an article in The Laryngoscope, researchers defined the novel diagnostic entity, negative dystonia of the palate, and reported on the neural underpinnings of this forms of dystonia.

If you want to opt out of receiving this newsletter, please contact 212-241-5607 or BIMCMovDis@chpnet.org and we will remove your name from our mailing list.