

# THE WELLNESS CORNER

## Music Is Medicine

It has been stated time and time again - exercise is as important as medication. Exercise helps people with Parkinson's lead their best possible lives by helping to counteract Parkinson's symptoms, improve balance/flexibility, reduce falls, help with posture and gait, reduce freezing, improve endurance and help with movement. Exercises like walking, strength training, boxing, dancing, tai chi have beneficial effects on our health, movement and quality of life.

Brain games, puzzles, meditation, using your senses, learning a new skill and reading help exercise our brains and keep us mentally sharp. Did you know music can help exercise your brain and complements the exercise you are already doing to slow the progression of the disease?

The concept of music having a healing effect on the mind and body has been around for thousands of years in ancient times and many cultural beliefs. Music may be uniquely suited to address the different challenges people with PD face in ways more traditional medical interventions cannot.

Engaging with music requires a multifaceted set of skills—keeping a rhythm, hitting the correct notes, or coordinating specific body parts, for example—and may make it particularly effective in activating and reshaping many parts of the brain affected by PD. The brain is not a static object. It is malleable and plastic, able to change its connections and activity based on a person's experience. Simply put, for people with Parkinson's music is therapy and helps our brain "exercise" by creating new neural pathways.

Rhythm is an essential element in both music and many motor-control functions. Music is capable of stimulating synchronized bodily movements and this phenomenon can bring about positive therapeutic effects beyond the pleasure of dancing to one's favorite song. Music can also boost motivation and magnify the effects of exercise.

Several studies show the wide variety of benefits of music - reduces high blood pressure, lowers stress and anxiety, improves sleep, builds connections and pathways in the brain, helps with cognition and can be an effective mood booster. Music is more than just a beat: it can also stir up powerful feelings, which can help PD patients.

"If you want to firm up your body, head to the gym. If you want to exercise your brain, listen to music. There are few things that stimulate the brain the way music does. If you want to keep your brain engaged throughout the aging process, listening to or playing music is a great tool. It provides a total brain workout." - John Hopkins Medicine

Listening to and producing music is associated with increased activity in brain areas involved with reward and emotion and increased release of dopamine. By naturally increasing the brain's dopamine levels, music may partially counteract the loss of dopamine neurons from the progression of PD. As an added benefit, music is intrinsically motivating, which means music therapy is more effective and easier to keep up with compared to other training regimens, like conventional physical therapy.

Recent studies conducted by neurologist Alexander Pantelyat of Johns Hopkins University found that regular choir, guitar, or drum sessions helped patients with Parkinson's disease improve their movement, rhythm and coordination as well as their mood. One recent meta-analysis involving almost 600 participants concluded that music-based movement therapy is an effective treatment for motor function, balance, and walking speed of people living with PD.

Group music sessions also provide a social benefit, establishing a community for PD patients who may otherwise find themselves isolated and lonely. Allowing PD patients to experience camaraderie and develop social bonds likely benefits their mood and quality of life.

"There's no question, anecdotally at least, that music has a very stimulating effect on physical activity," says Daniel Tarsy, MD, a Harvard Medical School professor of neurology and director of the Parkinson's Disease and Movement Disorders Center at Beth Israel Deaconess Medical Center (BIDMC)

Musical interventions can be used to help re-train movement such as walking, and fine and gross motor movements. There is no single musical center in the human brain, since music is processed by dozens of scattered neural networks throughout the brain. This means that music has the ability to activate compartmentalized regions of the brain, such as the motor region.

## Neurologic Music Therapy

Neurologic Music Therapy (NMT) is an evidence-based treatment system that uses research-based techniques to treat the brain using specific elements of music such as rhythm, melody, dynamics, tempo. Research has shown that music can be used to help build new connections in the brain (called neuropathways) thus improving brain function. There are regions in the brain where both sound processing and motor system controls occur creating very direct connections between the two networks.

In NMT therapists use standardized techniques to address non-musical goals such as speech, physical movement, cognition and other functional abilities. Neurologic Music Therapy can change brain activity and function by using different musical instruments, auditory cues and singing. Therapists use timing cues in music rhythm to re-train Parkinson's disease patients in movements like walking, gross (involving movements of the legs, arms or entire body) or fine motor skills (involving movements of the hands, wrists, fingers, feet, toes, lips and tongue), and initiation of speech.

One of the most common Neurologic Music Therapy techniques used with people with Parkinson's is Rhythmic Auditory Stimulation (RAS), which facilitates the rehabilitation of gait by using rhythm to access movement centers in the brain.

Gait abnormalities, such as shuffling steps, start hesitation and freezing, are common and often incapacitating symptoms of Parkinson's. Pharmacological and surgical approaches have only limited efficacy in treating these gait disorders.

Rhythmic auditory stimulation (RAS), such as playing marching music and dance therapy, has been shown to be a safe, inexpensive, and an effective method in improving gait in PD patients. Immediate improvement to walking is seen after introducing an external rhythm through music or a metronome beat. Patients are able to walk in time with the beat, and over time, the beat can be increased and eventually faded out. RAS has been proven to be more effective than physiotherapy, and studies have shown that it has helped reduce the risk of falls in Parkinson's Disease.

There are complementary additions to just music therapy alone that are also beneficial to people with Parkinson's and impact Parkinson's symptoms. This includes playing instruments (drumming, strumming etc.), dance based therapy (dancing to music), song based therapy (singing to music) and psychosocial (thought and behavior). All of these therapies have been studied, are continuing to be studied and shown to be useful and helpful to patients with Parkinson's.

Music stimulates the brain's reward centers, while dance activates its sensory and motor circuits. Dance is a multi-sensory environment - you get the element of exercise and movement, but you also get balance and flexibility. Then add the element of choreography where you have to remember sequences of dance and movement. It's not just physical. It's mental. It's cognitive because you're remembering things. And there's the element of artistic expression, which brings grace to people with a movement disorder.

A first of its kind study published in Brain Sciences today, shows patients with mild-to-moderate Parkinson's disease (PD) can slow the progress of the disease by participating in dance training with music for one-and-a-quarter hours per week. Over the course of three years, this activity was found to reduce daily motor issues such as those related to balance and speech, which often lead to social isolation.

Studies using PET imaging have identified regions of the brain that contribute to dance learning and performance. These regions include the motor cortex, somatosensory cortex, basal ganglia, and cerebellum. The motor cortex is involved in the planning, control, and execution of voluntary movement. The somatosensory cortex, located in the mid region of the brain, is responsible for motor control and also plays a role in eye-hand coordination. The basal ganglia, a group of structures deep in the brain, work with other brain regions to smoothly coordinate movement, while the cerebellum integrates input from the brain and spinal cord and helps in the planning of fine and complex motor actions.

While some imaging studies have shown which regions of the brain are activated by dance, others have explored how the physical and expressive elements of dance alter brain function. For example, much of the research on the benefits of the physical activity associated with dance links with those gained from physical exercise, benefits that range from memory improvement to strengthened neuronal connections.

You don't just need to dance. Studies show the effects of mind-body complementary/alternative medicine practices, like tai chi because of its benefits for both balance and mental function. Research has shown that the increased susceptibility to falls that occurs among people who are aging or who are dealing with disorders such as Parkinson's can be mitigated by the practice of tai chi; it improves their strength and flexibility as well as their cognitive performance. On average, the participants who did tai chi achieved balance measures that were two times better than those achieved by weightlifters and four times better than those participants who stretched. Those people who practiced tai chi also fell less and had slower rates of decline in overall motor control.

### Sing Your Heart Out

Singing (Vocal Intonation Therapy (VIT) is a NMT technique) is a highly effective way of stimulating the required neural networks and muscles associated with respiration (breathing) and aims to train aspects of voice control including inflection, pitch, breath control, phonation (production of speech sounds), articulation and resonance (volume), intonation. Singing is also fun and a good way to relieve stress! Song based therapy has been shown to improve voice quality and vocal clarity, as well as, swallow function. Singing, either in your head or out loud, also can be a way to start or regulate walking in Parkinson's too!

These types of therapy can be delivered to groups or individuals and home programs. Listening to music, dancing (even in a chair/seated) and singing are all 'therapies' you can do at home on your own and your loved ones can utilize the techniques at home with you!

A suggestion is to start swapping some of your television time during the day/evening with some time for music. You can start with 30 minutes to an hour a day, you may not even realize how long you have been listening to music for or choose to listen to music more over having the television playing in the background since singing, dancing and listening to music can be such a rewarding, pleasurable, fun experience. Plus it puts you in a great mood and can put a smile on your face. Music, dancing and singing can help PD patients in areas of life that traditional medicine cannot address by providing motor and non-motor benefits.

So how can you incorporate more music into your daily life? Can you make time to sing or dance each day? Can you find a station or channel that you enjoy?

Whether it is on the radio, on a streaming service on your phone or computer (Apple Music, Spotify, SiriusXM), play it through the speakers in your home or even on YouTube. There are so many options these days to enjoy music and it is all at your fingertips. YouTube has a ton of FREE playlists for any genre and as many hours worth as your heart desires. If you have an Amazon Alexa/Google Hub or Speakers (bluetooth, Sonos, etc.) you can listen to music anywhere, anytime throughout your home.

*On the following page we have created some questions you can answer to help create your own playlist for a variety of different occasions, reasons and activities. Use this playlist as a basis or source for creating these pathways/connections in your brain (spurring your brain), motivation on the difficult days, a pick me up, a little bit of sunshine or happiness when you are feeling down or as a source for how to help combat some of the challenges you face when your PD symptoms are acting up.*