

Parkinson's Disease and Dyskinesias

If you have Parkinson's disease (PD), there's a good chance that you are taking, or will take, medication containing levodopa, which is administered in combination with carbidopa. This drug combination is considered standard treatment for PD symptoms such as tremor, muscle stiffness, and slowness of movement. Taking levodopa, however, is associated with a side effect called dyskinesias.

What Are Dyskinesias?

The features of dyskinesias include rapid, involuntary, and uncontrollable movements other than tremor that can present as body swaying, writhing, twisting, squirming, flailing, fidgeting, or bobbing. Dyskinesias initially appear on the side of the body most affected by PD. Although they can be localized to one part of the body, such as the legs and arms, they can also spread to the torso, head, neck, and face. In some circumstances, dyskinesias can also affect speech, as well as respiratory and eye muscles.

What Causes Dyskinesias?

Taking dopaminergic medications, such as levodopa, may lead to the development of dyskinesias. However, this usually does not occur when these medications are taken in the early stages of PD. Dyskinesias tend to develop later, when there is more neurodegeneration and the disease has progressed.

The underlying cause of dyskinesias is complex and is not completely known. Normal brain function depends on a complex network of cells that communicate and function through a variety of brain chemicals, one of which is dopamine. In PD, there is a loss of brain cells called dopaminergic neurons that make dopamine; as a result, the level of dopamine in the brain starts to decrease.

The purpose of taking levodopa is to temporarily restore the dopamine that is lost. However, since levodopa is intermittently taken over the course of a day, the level of dopamine will rise and fall. These dopamine level

fluctuations, combined with the loss of dopaminergic neurons, are thought to cause dyskinesias. Dyskinesias can occur when the level of levodopa in the body is at a maximum, referred to as *peak dose dyskinesias*, or when the levels of levodopa are rising or falling, referred to as *diphasic dyskinesias*.

If Levodopa Causes Dyskinesias, Then Why Should I Take It?

At present, treatment with levodopa is the most effective way to relieve the tremor, stiffness, and slow movement associated with PD. Although levodopa may not be necessary in the early stages of PD, when other medications can be used, your doctor will most likely prescribe it as the disease progresses and its symptoms begin to interfere with daily living.

Who Gets Dyskinesias?

Being diagnosed with PD at a younger age (less than 50, also known as *early onset PD* or *young onset PD*) is associated with a greater chance of developing dyskinesias.

Are There Ways to Manage Dyskinesias?

Development of dyskinesias requires two things:

- The person with PD needs to be taking levodopa.
- There needs to be a certain level of neurodegeneration in the brain.

This means that if you start taking levodopa and it causes dyskinesias that are bothersome, you can lower or stop levodopa (with your doctor's guidance) and the dyskinesias should resolve. This also means that the clock to developing dyskinesias does not start when you start levodopa. It starts when the disease starts. Therefore, delaying the start of levodopa treatment until later in the disease will not prevent dyskinesias. It just means that there will be a shorter lag time between starting levodopa and developing dyskinesias.

Here are some strategies to manage dyskinesias:

- It is important to note that mild dyskinesias may not be bothersome, and the mobility afforded by taking levodopa may be preferable to the immobility associated with not taking it. People with PD must weigh the benefits of levodopa against the impact of dyskinesias on their quality of life. If dyskinesias are not bothersome, you may choose to remain mildly dyskinesic on your current dose in order to retain its benefits.
- If you have dyskinesias that are interfering with your daily life, your doctor may lower your dosage of carbidopa-levodopa, adjust the time at which it is taken, prescribe an extended-release formulation of this drug combination (such as Rytary® or Crexont®), or recommend continuous intestinal infusion of carbidopa-levodopa (Duopa®) or continuous subcutaneous infusion of foscarnidopa-foslevodopa (Vyalev™). These treatment strategies may help reduce fluctuations in dopamine that contribute to dyskinesias.
- The drug amantadine can reduce dyskinesias and can also help PD symptoms. Amantadine can be taken in multiple daily doses or in an extended-release formulation (Gocovri ER®) that maintains a high level of amantadine in the body throughout the day and has shown good results in reducing dyskinesias. In addition, the extended-release formulation taken orally—once at bedtime—may be more advantageous to some people than the multiple daily doses of immediate-release amantadine.
- Deep brain stimulation (DBS) is a surgical method that can be used to manage PD symptoms and dyskinesias. It can be very effective in carefully selected patients. Newer adaptive DBS systems are being studied that automatically adjust brain stimulation in real-time and may further reduce dyskinesias. Focused ultrasound is another procedure that can be effective for these issues.

Are There Coping Strategies for Living With Dyskinesias?

There are several ways to manage dyskinesias and PD in general by incorporating some basic routines into your lifestyle.

- Keep a diary that logs the time and frequency of dyskinesias, which will help your doctor assess if your medications are working and help you schedule daily activities when mobility is better. The APDA Symptom Tracker app can help you keep track of a wide range of motor and non-motor PD symptoms, including dyskinesias.
- Physical activity, including aerobic exercise, such as brisk walking, dancing, or swimming, will help keep the body strong and prevent muscle weakening. APDA has virtual exercise and movements classes for you to explore.
- Stress can make dyskinesia symptoms worse, so find ways to reduce stress (breathing exercises, massage, yoga, etc.) and try to keep a positive attitude. Creative activities can also be beneficial physically, mentally, and socially.
- Poor sleep at night is associated with dyskinesias. Aim for good sleep quality and try to experiment with different positions in bed that will help you relax and sleep better.



Are There Resources to Learn More About Dyskinesias?

APDA provides information, education, and support to those impacted by Parkinson's disease and funds scientific research into the causes, prevention, and treatments. Visit the APDA website at apdaparkinson.org.

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