



## *Parkinson's Medications*

### Parkinson's Medications - An Overview

People with Parkinson's disease often take a variety of medications in different doses in order to manage the symptoms of the disease. These factors, combined with the frequency with which one must take their medicines, can be confusing. People with Parkinson's and their caregivers should become familiar with their medications in order to use them most effectively and avoid possible interactions. Understanding a medication regime and sticking to it will provide the greatest benefit from the drug and avoid unpleasant "off" periods due to missed doses or confusion.

Please note that the side-effects listed in the tables that accompany each class of medication are the most commonly experienced. Not all patients will experience such side-effects. For many people who do experience side-effects, they can often be effectively limited or eliminated with careful adjustments to dosage or the timing of the individual doses. If any side-effects are experienced, speak to the treating physician immediately. For a complete description of each drug and its possible side-effects, please request a "package insert" from your pharmacist for each drug being used. It is recommended that all prescriptions be filled at the same pharmacy to avoid possible interactions between medications. Interactions can be dangerous and even life-threatening, so make sure the pharmacist knows of all medications and supplements being taken - including over-the-counter medications and supplements.

Although there are general guidelines that doctors use to choose a treatment regimen, each patient must be individually evaluated to determine which drug or combination of drugs is best for them. For some, a "first choice" drug might be one of the levodopa preparations, and for others, an initial prescription may be given for one of the agonists, an MAO inhibitor or an anticholinergic. The choice of drug treatment depends on many variables including symptom presentation, other concurrent health issues (and the medications being used to treat them) and a person's age. And while the suggested starting dosages (as indicated by the package insert) are listed here, remember that they too can vary greatly depending on a person's needs and metabolism.

Carbidopa/Levodopa (Sinemet®) Levodopa is a substance that is converted into dopamine by an enzyme in the brain. It is then released by brain cells and activates dopamine receptors allowing for normal function of the movement control centers of the brain. Forty years after its discovery, levodopa remains the most effective medication for Parkinson's disease. In fact, 70 to 80 percent of treated Parkinson's patients are on levodopa therapy. Levodopa is the "gold standard" by which all treatments for Parkinson's is measured.

Levodopa combined with carbidopa (or Sinemet®) represented a significant improvement in the treatment of Parkinson's disease. The addition of carbidopa prevents levodopa from being converted into dopamine in the bloodstream, allowing more of it to get to the brain. Therefore, a smaller dose of levodopa is needed to treat symptoms. In addition, the nausea and vomiting often associated with levodopa treatment is greatly reduced by the presence of carbidopa. Unfortunately, with increased dosing and prolonged use of levodopa, patients experience other side-effects including dyskinesias (spontaneous, involuntary movements) and "on-off" periods when the medication will suddenly and unpredictably start or stop working.

Check with a doctor before taking any of the following to avoid possible interactions: antacids, anti-seizure drugs, anti-hypertensives, anti-depressants and high protein food.

Stalevo® (carbidopa, levodopa and entacapone) is a combination tablet for patients who experience end-of-dose "wearing-off." The tablet combines carbidopa/levodopa with entacapone. While carbidopa reduces the side effects of levodopa, entacapone extends the time levodopa is active in the brain (up to 10 percent longer). The same drugs that interact with carbidopa/levodopa and entacapone interact with Stalevo®.

#### Medication

Available Doses

Initial Dosing

Side Effects

Indications

Interactions

Carbidopa/

Levodopa

(Sinemet®)

10/100 mg

25/100 mg

50/200 mg

25/100 mg 2-3X/day

Low blood pressure, nausea, confusion, dyskinesia, dry mouth, dizziness

First course of treatment; converts to dopamine to manage major symptoms

Antacids, anti-seizure drugs, anti-hypertensives, anti-depressants, high protein food

Carbidopa/

Levodopa

controlled release

(Sinemet CR®)

10/100 mg

25/100 mg

50/200 mg

50/200 mg 2X/day

Low blood pressure, nausea, confusion, dyskinesia, dry mouth, dizziness

First course of treatment; converts to dopamine to manage major symptoms and may prolong effectiveness

Antacids, anti-seizure drugs, anti-hypertensives, anti-depressants, high protein food

Carbidopa/

Levodopa/

Entacapone

(Stalevo®)

12.5/50/200 mg

25/100/200 mg

37.5/150/200 mg

12.5/50/200 mg

Dyskinesia, nausea, diarrhea, hyperkinesia, abdominal pain, dizziness, harmless discoloration of urine, saliva and/or sweat

Secondary course of treatment; combines entacapone with levodopa/carbidopa to block COMT enzyme and prolong levodopa's effectiveness

Same as levodopa/carbidopa, MAO inhibitors, Comtan, Sinemet, high doses (10 mg or more) of selegiline

Dopamine agonists are drugs that stimulate the parts of the human brain that receive dopamine. In effect, the brain "thinks" it is receiving dopamine, so these drugs help satisfy the brain's need for dopamine. Dopamine agonists can be taken alone or in combination with medications containing levodopa. Agonists available in the United States include bromocriptine (Parlodel®), pergolide (Permax®), pramipexole (Mirapex®) and ropinirole (Requip®).

Consult a doctor before taking any of the following to avoid possible interactions: alcohol, anti-psychotics, medications that lower blood pressure, Navane® (thiothixene), Taractan® (chlorprothixene), Haldol® (haloperidol), Reglan® (metoclopramide), phenothiazines, thiozanthenes, cimetidine, phenothiazines, butyrophenones, Cipro® and benzodiazepines.

## Medication

Available Doses

Initial Dosing

Side Effects

Indications

Interactions

APOKYN™ injection (apomorphine hydrochloride)

.02 mL -

.06 mL

.02 mL during "off" periods

Nausea, vomiting, low blood pressure, sleepiness, dyskinesias, hallucinations, chest pain

Adjunct levodopa therapy to treat "off" periods

5HT<sub>3</sub> agonists (for example, Zofran®, Kytril®) antihypertensives (for example Norvasc® and Zestril®)

## Bromocriptine

(Parlodel®)

2.5 mg

5 mg

2.5 mg 3X/day

Low blood pressure, nausea, edema, confusion, dry mouth, depression, headaches

First course of treatment alone or with levodopa;

mimics dopamine to manage major symptoms

Alcohol, anti-psychotics, blood pressure lowering medications

## Pergolide

(Permax®)

.05 mg

.25 mg

1 mg

0.05-0.25 mg 3X/day

Low blood pressure, nausea, edema, confusion, dry mouth, depression, headaches

First course of treatment alone or with levodopa;

mimics dopamine to manage major symptoms

Alcohol, Navane® (thiothixene), Taractan® (chlorprothixene), Haldol® (haloperidol), Reglan® (metoclopramide), phenothiazines, anti-hypertensives

Pramipexole

(Mirapex®)

.125 mg

.25 mg

.5 mg

1 mg

1.5 mg

.125 mg 3X/day

Arthritis, chest pain, nausea, low blood pressure, sleep disturbances, sedation

First course of treatment alone or with levodopa;

mimics dopamine to manage major symptoms

Sedatives and tranquilizers; metocipramide, thiozanthenes, cimetidine, phenothiazines, butyrophenones

Ropinirole

(Requip®)

.25 mg

.5 mg

1 mg

2 mg

3 mg

4 mg

5mg

.25 mg 2X/day

Abdominal pain, sleep disturbances, nausea, low blood pressure, sedation

First course of treatment alone or with levodopa;

mimics dopamine to manage major symptoms

Alcohol, anti-depressants, Cipro®, anti-psychotics, benzodiazepines

Anticholinergics (trihexyphenidyl, benztropine mesylate, procyclidine, etc.) do not act directly on the dopaminergic system. Instead they decrease the activity of another neurotransmitter that controls movement, called acetylcholine, to balance out the production of dopamine and acetylcholine. In general, mild PD that consists of tremor at rest can often be treated initially with anticholinergic agents. Adverse effects of these drugs include blurred vision, dry mouth and urinary retention. Anticholinergics may be contraindicated in older patients because they can cause confusion and hallucination.

Check with a doctor before using anticholinergics with anti-histamines, Haldol®, Thorazine®, Symmetrel®, Clozaril® and alcohol.

## Medication

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## Benzotropine mesylate

(Cogentin®)

.5 mg

.5 mg 2X/day

Confusion, hallucinations, nausea, blurred vision, dry mouth, urinary retention, nervousness; not used long-term due to side effects

Secondary medication; tremor; attempts to restore balance by inhibiting other enzymes and nerve cells that may attack dopamine

Anti-histamines, Propulsid®, Haldol®, Thorazine®, Symmetrel®, Clozaril®, alcohol

## Trihexyphenidyl HCL

(Artane®)

1 mg

2 mg

1-2 mg 2X/day

Confusion, hallucinations, nausea, blurred vision, dry mouth, urinary retention, nervousness; not used long-term due to side effects

Secondary medication; tremor; attempts to restore balance by inhibiting other enzymes and nerve cells that may attack dopamine

Anti-histamines

MAO-B inhibitors such as selegiline or deprenyl (Eldepryl®) are used to block an enzyme in the brain that breaks down levodopa. They have been shown to delay the need for Sinemet® when prescribed in the earliest stage of Parkinson's, and have also been approved for use in later stages of the disease to boost the effects of Sinemet®.

Eldepryl® may interact with anti-depressants, narcotic pain killers and decongestants. Check with a doctor before taking any new medications.

#### Medication

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Interactions

#### Selegiline

(Eldepryl®, Carbex®)

5 mg

5 mg 2X/day

(max dose)

Agitation, insomnia, hallucinations

Tertiary medication; controls brain's metabolism of dopamine

Anti-depressants, narcotic painkillers, decongestants

COMT inhibitors such as entacapone (Comtan®) represent a different class of Parkinson's medications and they must be taken with levodopa. COMT inhibitors prolong symptom relief by blocking the action of an enzyme which breaks down levodopa, allowing a larger amount of levodopa to reach the brain, which raises the dopamine level. This helps provide a more stable, constant supply of levodopa.

#### Medication

Available Doses

Initial Dosing

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Interactions

#### Entacapone

(Comtan®)

200 mg

200 mg with levodopa; max 8 per day

Abdominal pain, back pain, constipation, nausea, diarrhea, blood in urine

Secondary medication; delays wearing off by prolonging effectiveness of levodopa

MAO inhibitors

#### Tolcapone

(Tasmar®)

100 mg

200 mg

100 mg 3X/day

Abdominal pain, back pain, constipation, nausea, diarrhea, blood in urine, liver failure

Tertiary medication for motor fluctuations; limited in use to those who have exhausted other treatment options

MAO inhibitors

Other medications

Medication

Available Doses

Initial Dosing

Side Effects

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Interactions

Amantadine

(Symmetrel®)

100 mg

100 mg 2-3 X/day

Dizziness, weakness, dry mouth, constipation, skin blotches

Secondary medication for tremor and muscle rigidity

Cogentin® (benztropine), Disipal® (orphenadrine), Sinemet® (levodopa), Artane® (trihexyphenidyl), amphetamines, alcohol

Over-the-Counter Medications

Although there is little conclusive scientific information on natural supplements, researchers are examining several substances to evaluate their effectiveness on slowing Parkinson's disease progression and managing its symptoms. Nutritional supplements are not regulated with the same approval method for prescription drugs, and people with Parkinson's should discuss any medications, prescription or over-the-counter, with a doctor before taking them to avoid potentially dangerous interactions.

Since there is evidence relating oxidative damage of nerve cells to PD, some researchers are studying antioxidants. A 2002 study focused on the potential antioxidant Coenzyme Q10 (CoQ10), which is believed to play an important role in mitochondria health. Mitochondria are the "powerhouses" of a cell, and some scientists think that abnormalities of mitochondrial function may play a role in Parkinson's. A recent clinical trial found that high doses of CoQ10 (up to 1200 mg) showed a possible slowing of disease progression in a small number of subjects. These results are promising but researchers have not studied CoQ10 extensively enough to recommend it to Parkinson's patients.

Scientists have also examined Vitamin E, Vitamin C and health foods to evaluate their oxidative properties. Vitamin E can fight damage in the brain caused by free radicals, and has been suggested to lower the risk of PD. However, researchers conducted an extensive and thorough study over 10 years ago ( the DATATOP trial) and failed to find any evidence that Vitamin E slows the progression of Parkinson's or manages symptoms. Since Vitamin E has very few side-effects, many Parkinson's patients continue to take it in high doses of 400 IU or more. Researchers are also examining health foods, such as fermented papaya and blueberries, to determine their role in slowing nerve cell death. Scientists are optimistic about the research but do not have enough conclusive data to recommend these supplements to treat Parkinson's disease.

Creatine is another compound of scientific interest that increases levels of phosphocreatine (an energy source in muscle and the brain). The National Institute of Neurological Disorders and Stroke (NINDS) is conducting a multi-center clinical trial to determine if creatine protects against nerve cell damage. Researchers have also studied a compound called glutathione to determine its effect on nerve cell metabolism and its power as an antioxidant. Both compounds show promise, but the appropriate dosing is unclear, as are the most effective method of administration, side-effects and long-term dosing risks.

Although nutritional supplements have shown some promising results in preliminary studies, it is important to remember that there is not sufficient scientific data to recommend them for Parkinson's disease. Over-the-counter medications can and do have side-effects and interactions with other drugs. They tend to be expensive and they vary with different manufacturers. Before taking any over-the-counter medication, it is very important that a person with Parkinson's discuss the addition of these supplements with their doctor.

### Managing Your Medications

Taking medications for Parkinson's disease is straightforward for most people during the first several years of medication treatment. The effect of each dose usually lasts well into the period after the next dose, and delaying a dose even by an hour does not disrupt the effective coverage of symptoms.

The situation is different for many people who have been taking Parkinson's medications for several years (usually five years or more). In these stages of the disease, effective relief from symptoms can depend on carefully following a regular schedule of medication doses. There are several ways for Parkinson's patients to achieve the greatest possible benefit from their medications. Since in the more advanced stages of Parkinson's disease the symptoms are often unpredictable and can fluctuate daily, it is important to take an active role in finding a routine that is tailor-made and makes the most of the medicine. A person should ask themselves how long it takes for a pill to work and how long its positive effects remain. Note if the pills should be taken with food, between meals or on an empty stomach and how the body feels when medication starts to wear off. The answers to these questions can help explain how the pill works and possibly increase a person's "on" time.

People with Parkinson's must know what medications they are taking, when and why. This can be achieved by working with one pharmacist. A pharmacist will note all of the medications a person is taking in a computer, which safeguards them from any interactions. Another way to obtain this information is by constructing a medication chart (to download a sample chart, [click here](#)). The chart should include information such as the medication's name, the strength and a time schedule of when it should be taken daily. This chart can help the patient and/or caregiver easily recognize the medication and decreases the chance of a missed dose. People with Parkinson's can also share this chart with a neurologist to make sure both parties are clear on what is being taken and why.

Organization is a key factor in getting the most from Parkinson's medications. Since several medications will probably be taken at different times of the day, a timing device can be crucial in getting the medication in the body on time and without missed doses. Talking systems, beeping watches and multi-alarm timers are widely available. These systems can be both discreet and loud, with vibrating and sound features. In addition, pill dispensers organize pills by day and time to eliminate carrying several large prescription bottles.

These tips can help people with Parkinson's manage their medications to suit their lifestyles and needs. Most people have their own personal routine that works best for them. These options can help a person decide what will work best to achieve the maximum benefit from medications.

#### Saving on Medications

The substantial cost of Parkinson's medications is often a large burden for many people. Several pharmaceutical companies feature programs to help eligible applicants reduce their medication costs. These programs are usually limited to the company's brand-name medications, and will most likely have specific requirements including age and income. Visit drug makers' websites or call the company's toll-free hotline for more information on money-saving assistance programs. These programs are often best accessed with the help of your doctor and healthcare team.

Researching the various drug assistance programs can be a great deal of work. An organization called The Partnership for Prescription Assistance (PPRA) may be able to help navigate these systems to find the best options. PPRA brings together America's pharmaceutical companies, doctors, other health care providers, patient advocacy organizations and community groups to help qualifying patients who lack prescription coverage get the medicines they need through public or private programs. PPRA's website, [www.pparx.org](http://www.pparx.org), provides access to more than 275 public and private patient assistance programs, including more than 150 programs offered by pharmaceutical companies. PPRA can also be contacted by calling (888) 477-2669.