



Medication used in the Treatment of Parkinson's

A guide for people with Parkinson's
and those who care for them



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About this booklet

Parkinson's New Zealand has produced this booklet to provide general information about medications for people with Parkinson's, and to detail information about each drug. It is important to bear in mind when referring to the booklet that no two people with Parkinson's are exactly the same, and each will have a different combination of symptoms and medication.

In this booklet the type of drug appears as the section heading, the drug is then listed according to the generic name with common brand names in brackets afterwards. Technical terms are explained in the alphabetical glossary on page 24.

The drugs covered in this booklet are only those currently available in New Zealand – this may change from time to time. It includes both subsidised (drugs you don't have to pay for), part subsidised (drugs you have to pay a small charge for) and non-subsidised drugs (drugs you have to pay for).

In this booklet when we refer to your doctor this means the person you see for the treatment of your Parkinson's – this could be your GP, neurologist, geriatrician or other specialist.

WHAT IS PARKINSON'S?

Parkinson's is a common neurological disorder that is thought to affect more than 8.5 million people world-wide.

Parkinson's is a slowly progressive disorder that is life altering, but is not life threatening. Recent advances in medication and surgery mean that doctors and people with Parkinson's now have better control over the condition than ever before.

Parkinson's is caused by the loss or degeneration of nerve cells that produce a substance called dopamine in the brain. The main area affected is found deep in the brain and is known as the substantia nigra. These cells produce a chemical messenger or neurotransmitter called dopamine. When 80% of dopamine is lost, the symptoms of Parkinson's occur. The loss of dopamine-containing cells affects the body's ability to control normal movements.

Parkinson's is not just a condition of older people

Although the average age of diagnosis is 59, one in 20 people with Parkinson's first develop **symptoms under the age of 40.**

Symptoms of Parkinson's

Not everyone will experience exactly the same symptoms. The condition affects everyone very differently and in some cases it may be many years before there is any disability or significant limitation of daily activities.

In the early stages of Parkinson's symptoms tend to affect one side of the body only. Some typical symptoms that people with Parkinson's can experience include:

- Shakiness or trembling in the hands, arms, legs, jaw and face; often referred to as tremor
- Stiffness or rigidity – where muscles become tight and stiff
- Slowness of movement for example, difficulty initiating movements like getting up from a chair. Your doctor may refer to this as bradykinesia or akinesia
- Problems with balance and co-ordination or postural instability, which are usually late features of the condition.

Other symptoms can also occur including sleep disturbances, depression, difficulties with speech or swallowing, and memory loss. These usually occur later in the condition. Importantly, many of these symptoms can be improved by medications.

HOW IS PARKINSON'S TREATED?

It is still not known exactly what causes Parkinson's. In most cases it seems to develop for no obvious reason and is therefore known as idiopathic Parkinson's.

At the moment, researchers have not been able to find a way to prevent or cure Parkinson's. However, the symptoms can be effectively controlled using a combination of medical and sometimes surgical approaches. People with Parkinson's can achieve a lot of benefit from a range of self-help activities such as exercise. The input of therapists (physiotherapy, speech therapy, etc.) is also beneficial.

Balancing your medications

- The main aim of drug treatments for Parkinson's is to: increase the level of dopamine that reaches the brain, stimulate the parts of the brain where dopamine works, or block the action of other chemicals that affect dopamine such as acetylcholine.
- In most newly diagnosed people considerable improvements can be achieved by the careful introduction of one or more anti-parkinsonian drugs.
- A combination of different medications is often required to provide the most effective symptom control.
- You will need to work with your doctor to find the right balance of medications to effectively manage the symptoms of your condition. Only one change in medication should be made at a time.
- The effectiveness of Parkinson's medications depends greatly on the medication being taken at the right time. You will also need to work with your doctor to find the times that are best for you.
- Drug treatment for Parkinson's is prescribed to suit the individual, both in terms of dosage and the times the drugs are taken, and each person will react to their medication in different ways.
- Treatment is generally started with low doses of a drug; this dose is then gradually increased until the required control over the symptoms is achieved. The gradual introduction helps avoid side effects.
- Your doctor will probably want to check your response to the medications as you receive them, and the dose and timing of medications may need to be adjusted over time as your symptoms change (or side effects occur).

When somebody has only mild symptoms, their doctor may decide with them that the best option is to postpone drug treatment for a while, and instead make some changes to their lifestyle, with exercise, relaxation etc., for the time being.

Getting the best out of your treatment

Whatever medication you are taking, it is important that you understand:

- How many or how much of your medication you should take
- Under what circumstances your medication should be taken, e.g. before, with or after food
- The importance of taking medication at a regular time recommended by your doctor
- What other types of medication you should not combine with your current medication
- All medications have possible side effects and most people will not experience these to any great extent. However if side effects become troublesome, please consult your doctor.
- You should not suddenly stop your medication without consulting your doctor.

Try to avoid starting a new medication when you will not have access to your doctor or other healthcare professional, for example, at the weekend, during public holidays, or before you go on holiday. Always ensure that you have adequate supplies of your medication available.

As branded drugs get older, they cease to be protected by patent. Once this happens, they can be produced as generic versions by other drug companies and cost less than the original brand. Generic versions of drugs are subject to the same stringent quality requirements as the original branded drugs. Sometimes a person with Parkinson's will be prescribed a generic version of a drug. This may look different from the branded version and will not have the same name, but the active ingredients in the drug are the same, and there is no cause for concern.

Your doctor is the best person to advise you on the appropriate drug treatment and to give you further information. Every effort has been taken to make this booklet as user friendly as possible. However, if you have any difficulty understanding the advice contained in this booklet your doctor or a Parkinson's Educator may be able to help you. If you are at all concerned, please consult your doctor.

Levodopa

Levodopa is converted to dopamine in the body, which then replenishes the deficiency of dopamine in the brain. Levodopa is highly effective in controlling most symptoms of Parkinson's. More than 50 years after its discovery it remains the cornerstone of Parkinson's therapy, and a large majority of patients receive levodopa therapy.

Many people find levodopa treatment very effective, but some doctors delay treatment with levodopa for some time because of its side effects, particularly the development of involuntary movements (dyskinesias).

Levodopa - Sinemet (Levodopa + Carbidopa), Madopar (Levodopa + Benserazide)

Comments	Possible Side Effects
<p>Madopar and Sinemet are available in a variety of capsules and tablets in regular and controlled release form (see over page). Madopar is also available in a dispersible form (see over page).</p> <p>There is no dispersible form of Sinemet, but standard Sinemet tablets (not the CR ones) may be crushed prior to use and mixed with a liquid or soft food such as a spoonful of yoghurt. This may make swallowing of the tablets easier and speed the rate of their absorption.</p> <p>If you are having or have had, treatment for melanoma, please be sure to inform your medical team if you are taking medication containing levodopa.</p> <p>Some antidepressants such as Tranylcypromine (Parnate) should not be taken with levodopa – talk to your doctor.</p>	<p>If side effects occur nausea and vomiting are the most common, especially when treatment first starts. Dizziness and light-headedness may occur from a lowering of blood pressure. Other side effects may include:</p> <ul style="list-style-type: none">• Dry mouth, headache or constipation• Mood swings, hallucinations or confusion• Urine, sweat or tears may look red. <p>Consult your doctor if any of the above side effects occur or you experience any of the following:</p> <ul style="list-style-type: none">• Uncontrolled body movements (dyskinesias)• A fast heartbeat• Any unusual behaviour (e.g. punding) or mood changes.

DISPERSIBLE MADOPAR

Madopar 62.5 is a dispersible tablet that may be swallowed whole or dissolved in water. Absorption of the dispersible form is quicker than the standard levodopa drugs and can be used by people with Parkinson's in the morning to kick start their day, or in cases where control of the Parkinson's is difficult with standard levodopa.

A dispersible form is also of use if the person is having difficulty swallowing tablets or capsules.

NOTE: MADOPAR CAPSULES SHOULD NOT BE BROKEN.

CONTROLLED RELEASE PREPARATIONS OF MADOPAR AND SINEMET

Controlled release preparations are recognised by the letters HBS or CR after the drug name. Madopar HBS and Sinemet CR release the drug over a four to six hour period and may result in more even levels of levodopa in the blood. If replacing standard Sinemet or Madopar with controlled release forms people with Parkinson's may see the total amount of levodopa taken per day change.

With controlled release preparations the time between doses can be prolonged by 30% to 50%. They may be used when a person with Parkinson's is experiencing wearing-off of the dose of standard levodopa. They can also be taken before going to bed to reduce stiffness and immobility during the night.

NOTE: MADOPAR HBS AND SINEMET CR SHOULD NOT BE BROKEN, AND SHOULD NEVER BE CRUSHED OR CHEWED, BUT SWALLOWED WHOLE IN ORDER TO BENEFIT FROM THE SLOW RELEASE ACTION.

LEVODOPA AND PROTEIN

It is usually recommended that levodopa is not taken with food. One of the reasons for this is that dietary protein (found in foods such as meat, fish, eggs, milk, cheese, beans, pulses and nuts or high protein drinks like Ensure or Sustagen) can interfere with the absorption of the medication. This may decrease its effectiveness.

Levodopa is absorbed into the blood stream and then into the brain via the stomach.

Levodopa is chemically similar to some amino acids, which are the building blocks of protein. This means that proteins use the same pathway for absorption into the bloodstream or brain and can compete with levodopa for absorption. As a result, taking your medication with or after a protein-rich meal may result in less of the drug reaching the brain.

For some people this can result in, or worsen, the wearing-off effect where the benefit from a dose of levodopa wears off before the next dose is due. If you experience this, taking your levodopa one hour (two hours with controlled release)

before meals may help. You can take it with a carbohydrate food like a cracker or a biscuit to reduce nausea.

If this doesn't make a difference, or is not practicable due to the number and timing of doses, it may help to make some modification to your diet.

NOTE: IT IS IMPORTANT THAT ANY CHANGES TO YOUR DIET ARE UNDERTAKEN ONLY AFTER A FULL DISCUSSION WITH YOUR DOCTOR OR DIETICIAN.

Protein redistribution diet

This involves changing how and when you eat protein. You may benefit from eating most of your daily protein in the evening which can help the levodopa treatment to be more effective in the day-time, when you are likely to need it more. However you should not reduce the overall amount of protein you consume. Protein is essential for a healthy diet and reduction can cause dangerous weight loss.

If modifying your diet is effective in increasing the amount of levodopa you absorb from each dose, you may experience side effects and need to have your medication reviewed. Constipation can also interfere with the absorption of levodopa so talk to your doctor before making any changes to how you take your medications or to your diet.

Dopamine Agonists and Amantadine

Dopamine agonists simulate the natural dopamine rather than replacing it in the way that levodopa does.

Dopamine agonists – Ropinirole (Ropin), Pramipexole (Ramipex)

Comments	Possible Side Effects
<p>Dopamine agonists mimic the signal from dopamine that is lost in Parkinson's.</p> <p>The drugs are usually started at a low dose and increased slowly to reduce any possible side effects.</p> <p>Several clinical studies have shown that dopamine agonists can be effective treatments for several years when used alone and the likelihood of developing dyskinesias is greatly reduced while people remain on a dopamine agonist alone or in combination with a low dose of levodopa.</p> <p>Dopamine agonists are best taken with meals.</p> <p>Another possible side effect is the development of impulse control disorders (ICD). It is still unclear how many people may be affected by these problems but it is now believed to be around 20%. ICD cause a change in behaviour with people becoming either impulsive (acting out of impulse not thought) or compulsive (repeating actions time and time again). Common types of ICD in people with Parkinson's include problem gambling, hypersexuality, obsessive shopping, overeating and punding.</p>	<ul style="list-style-type: none">• Nausea and vomiting• Confusion and hallucinations• Dizziness or light-headedness (don't stand up too quickly)• Dry mouth. <p>You should contact your doctor if any of the above side effects persist or become troublesome, or if you experience any of the following:</p> <ul style="list-style-type: none">• Severe dizziness, fainting or headache• Swelling of the feet or ankles or any leg cramps. <p>Drowsiness can also be a side-effect of dopamine agonists, and can sometimes be severe. Since uncontrolled sleepiness can have serious consequences, people taking these should consider not driving or operating other complex machinery until they have gained sufficient experience with them to gauge whether or not it affects their mental and/or motor performance adversely.</p>

<p>Talk to your doctor if you or others notice any extreme changes in behaviour.</p> <p>If you have any form of heart or lung disease, or symptoms that might be related to a problem with the heart or lungs, be sure to inform your medical team if you are taking, or about to start taking, one of the dopamine agonist drugs.</p>	<p>People should be advised that if excessive or sudden sleepiness is experienced at any time during treatment, they should not drive or participate in potentially dangerous activities and should contact their doctor. This may not be peculiar to this group of drugs but may be a feature of Parkinson's and/or other Parkinson's treatments.</p>
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Apomorphine (Movapo)

Comments	Possible Side Effects
<p>Some people with Parkinson's continue to experience sudden fluctuations in their symptoms in spite of all efforts to adjust their medication. In these cases, injections of Apomorphine may be used between doses of their usual medication.</p> <p>As Apomorphine can only be given by injection, people with Parkinson's and their carers have to be able to cope with this and assessment and training is required.</p> <p>Many people self-inject intermittently, with a syringe or a pre-loaded metering device, but some may need a more continuous supply of Apomorphine and so may require an infusion pump.</p> <p>This portable, battery-driven syringe pump works by the insertion of a needle under the skin of the outside of the thighs, or into the abdomen (below the navel). The site should be rotated on a daily basis to prevent skin irritation.</p>	<p>Similar side effects as other dopamine agonists (see previous page). Consult your doctor if any side effects persist or become troublesome.</p> <p>Apomorphine may cause nausea, so an antinauseant medication called domperidone (is prescribed during the introduction of Apomorphine and sometimes longer. In a few cases Apomorphine may initially make dyskinesias worse.</p> <p>Soreness can develop at the injection sites, and if this occurs you should seek advice from your doctor or Parkinson's Educator.</p>

Amantadine (Symmetrel)

Comments	Possible Side Effects
<p>Amantadine does several different things, but its main beneficial effect may be to promote the release of dopamine and to allow it to stay longer at its site of action. Amantadine can be used as monotherapy in the early stages of Parkinson's, especially in younger people. If stopped suddenly it can cause a worsening of Parkinson's. Amantadine is also sometimes used to reduce levodopa induced dyskinesia in later stages of Parkinson's.</p> <p>Amantadine may have a stimulatory effect and can help some people with tiredness.</p>	<p>Common side effects include: nausea, insomnia, dizziness or light-headedness, swelling of the ankles, a mottled appearance on the skin of the lower leg and blurred vision.</p> <p>It sometimes causes confusion or hallucinations in older people.</p> <p>Contact your doctor if any of the above side effects persist or become troublesome.</p>

Anticholinergics

These are older drugs, less commonly prescribed these days, which can have a mild effect on the symptoms of Parkinson's (mainly the tremor) by blocking the action of the chemical messenger acetylcholine. Anticholinergics are often prescribed alone, or they may also be used in conjunction with levodopa or other medications.

Anticholinergics – Benztropine (Benztrop), Procyclidine (Kemadrin)

Comments	Possible Side Effects
<p>Anticholinergics can be useful for younger people in the early stages of Parkinson's when symptoms are mild. They tend to improve tremor more than slowness and stiffness. Anticholinergics may also be used to reduce saliva production when drooling is a problem and to decrease bladder contractions that can cause a strong, frequent urge to urinate.</p> <p>These drugs are not often prescribed to older people with Parkinson's because there is an increased risk of confusion as well as memory loss, and urinary hesitancy in males. They must be started at a low dose and increased very gradually.</p>	<p>Confusion, memory loss, dry mouth, nausea, constipation and blurring of vision can occur.</p> <p>Consult your doctor if any side effects persist or become troublesome, or if you experience any of the following:</p> <ul style="list-style-type: none">• Severe eye pain• Seeing or hearing difficulties• A fast or irregular heartbeat. <p>If you have glaucoma you should consult your doctor before taking this drug.</p>

Monoamine oxidase type B inhibitors (MAO-B Inhibitors) slow dopamine breakdown in the brain. They are used to make the dose of levodopa medication last longer or to reduce the amount required. They may also reduce the fluctuations in effectiveness of drugs that some people with Parkinson's experience after the first few years.

MAO-B Inhibitors – Rasagiline

Comments	Possible Side Effects
<p>Can be prescribed on its own or in addition to levodopa.</p> <p>Rasagiline acts as a mild stimulant, so is often prescribed as a single dose to be taken in the morning rather than in the evening when it might interfere with sleep.</p> <p>Rasagiline has known interactions with a number of drugs. Due to adverse effects Rasagiline must not be taken with pethidine or selective-serotonin re-uptake inhibiting antidepressants (SSRI) including Citalopram, Fluoxetine and Paroxetine.</p> <p>Rasagiline should be used with caution when used in combination with other antidepressants and with cold and cough preparations containing dextromethorphan.</p>	<p>By itself, Rasagiline has very few side effects but dry mouth, sleeping disorders, hallucinations and postural hypotension are the most commonly reported.</p> <p>This medicine may cause excessive dizziness, drowsiness or sudden onset of sleep at any time. Do not drive or operate machinery until you know how this medicine affects you. If you experience sudden onset of sleep, do not drive or operate machinery until it no longer occurs.</p> <p>Be careful when you stand up from sitting as this medicine can make you feel dizzy if you stand up too quickly.</p> <p>MAO-B inhibitors (Rasagiline) increase a substance called tyramine. When mixed with foods high in tyramine, the combination could significantly raise blood pressure. People who take these drugs should be aware of the potential for this rare but serious interaction. You do not have to avoid tyramine-containing foods completely, but eat them in moderation.</p>

	<p>Foods high in tyramine:</p> <ul style="list-style-type: none">• Alcohol: tap beer, wine, vermouth• Aged cheese: blue cheese, camembert, swiss• Cured, fermented or air-dried meat: mortadella, salami• Fermented cabbage: kimchi, sauerkraut• Pickled fish: herring, lox• Soybean products: miso soup, soy sauce, tofu. <p>If you notice any changes in your behaviour, especially unusual urges or you can't resist impulses (e.g. compulsive spending, obsessive thoughts or addictive gambling), tell your doctor immediately.</p> <p>This medicine may cause an increased risk of skin cancer—tell your doctor immediately if you notice any unusual skin changes</p> <p>Tell your doctor or pharmacist if you are smoking or intend to stop smoking. Smoking could decrease the amount of rasagiline in your blood.</p>
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COMT Inhibitors

These medications work by blocking an enzyme called catechol-O-methyl transferase (COMT) which breaks down levodopa. As a result they slow the destruction of levodopa in the body allowing more levodopa to pass into the brain to be converted into dopamine.

COMT Inhibitors – Entacapone (Comtan), Tolcapone (Tasmar)

Comments	Possible Side Effects
<p>These drugs are particularly effective in people who are experiencing on-off fluctuations. When used with levodopa, they can reduce the daily off time and increase the on time. In many cases, the levodopa dose and dosing frequency can also be reduced.</p> <p>Be aware that other drugs, for Parkinson's or other conditions, can affect the action of Entacapone and Tolcapone. Most Parkinson's drugs can be taken with COMT inhibitors, except Apomorphine.</p> <p>Use of Tolcapone (Tasmar) was restricted in New Zealand in December 1998 on the recommendation of Medsafe due to concerns over liver failure in a small number of people taking it around the world.</p> <p>Regular blood tests to monitor liver function are necessary when taking Tolcapone. Signs of liver disorder include anorexia, nausea, vomiting, fatigue, abdominal pain, dark urine, itchy skin. Seek medical attention if these develop.</p>	<ul style="list-style-type: none">• Dyskinesias, nausea and vomiting• Sleeping problems• Constipation or diarrhoea• Urine can become discoloured due to the substances used in the drug but this is harmless. <p>An increase in side effects after starting a COMT inhibitor should be discussed with your doctor, as reducing the levodopa dose can often help.</p> <ul style="list-style-type: none">• Avoid iron-containing products at the same time of day.• Can cause excessive daytime sleepiness and sudden onset of sleep. <p>Those who experience excessive sedation or sudden onset of sleep should refrain from driving or operating machines until these effects have stopped occurring.</p>

Non-Parkinson's drugs commonly used

ANTIDEPRESSANTS

Research has shown that depression is a reasonably common Parkinson's symptom caused by a chemical imbalance in the brain. It is sometimes difficult to distinguish depression from some of the symptoms of Parkinson's; this is why it is important to discuss all your symptoms with your doctor.

For some people adjustments to their medication may improve their depression, or counselling may help. Antidepressants may also be prescribed to correct any chemical imbalance. Some will be more suitable than others for people with Parkinson's (see also *Drugs to avoid* on page 19).

There are several types of antidepressants including tricyclics and SSRIs.

Tricyclics – Amitriptyline, Clomipramine, Dosulepin (Dothiepin) Imipramine (Tofranil), Nortriptyline (Norpress)

Comments	Possible Side Effects
<p>Tricyclics have a sedating effect and so may be good for those who are agitated. They can sometimes help those with drooling, loss of appetite and night-time incontinence problems.</p> <p>Sometimes anticholinergic drugs such as Benztropine are used in the management of Parkinson's (see under Anticholinergic section on page 11). Tricyclic drugs are strongly anticholinergic and can add to the effect of the drugs for Parkinson's causing confusion and other side effects.</p>	<ul style="list-style-type: none">• Sleepiness, dry mouth, and increased hunger• Confusion, constipation and blurring of vision can also occur. <p>Some of these drugs may have some effects on blood pressure and on heart rhythm, so must be used with caution if there is any suggestion of heart disease. Some of these effects can be avoided if the medication is introduced at a low level and slowly increased until an effective dose is reached.</p>

Selective serotonin re-uptake inhibitors (SSRI) – Citalopram (Celapram), Fluoxetine (Fluox), Paroxetine (Loxamine)

Comments	Possible Side Effects
<p>Selective serotonin re-uptake inhibitors (SSRIs) are newer drugs that specifically target the neurotransmitter serotonin. They are believed to have an alerting effect, and may counteract the sedative component of traditional anti-Parkinson's medications. The drugs are often quite simple to administer, as a single dose in the morning or evening. These can be taken without food.</p> <p>There are risks in suddenly stopping taking these drugs – please consult your doctor.</p>	<p>Some people experience restlessness, agitation, headaches and nausea, especially in the first weeks of treatment, however, in most cases these disappear after several weeks of continued treatment. The tremor may increase and there have been reports of these drugs worsening other motor symptoms.</p> <p>Concern has been raised about adverse interaction between SSRI and rasagiline, although this is unusual. Anyone taking rasagiline should consult their doctor about what would be best for them.</p>

Other antidepressant drugs – Moclobemide (Aurorix), Venlafaxine (Efexor, Enlafax XR), Mirtazapine (Noumed)

Comments	Possible Side Effects
<p>These newer antidepressants are sometimes prescribed.</p> <p>Venlafaxine (Exefor) and Moclobemide (Aurorix) should not be taken by people using rasagiline</p>	<ul style="list-style-type: none">• Increased appetite and weight gain• Drowsiness, dizziness, headache• Agitation, anxiety, irritability.

COGNITIVE ENHANCERS

Memory loss can be experienced by some people with Parkinson's. For people concerned about memory loss cognitive enhancing drugs commonly prescribed for Alzheimer's such as Donepezil work by boosting existing supplies of acetylcholine.

A generic form of Donepezil is now funded for selected people with dementia (severe memory loss). Your doctor can advise on eligibility.

DRUGS FOR IMPOTENCE

Problems with sexual function in both men and women may occur as part of Parkinson's, possibly due to an impaired nervous system. This is relatively common and probably vastly under-reported due to the sensitive nature of the subject. Depression and lowered self-esteem also contribute to sexual dysfunction.

Men may experience impotence. Over the age of 60 it is not uncommon for some men to experience erectile dysfunction related to vascular disease, diabetes, prostate enlargement, depression, or drugs, especially anticholinergic drugs, and alpha and beta blockers (drugs used to treat high blood pressure). Thus Parkinson's itself may not be the cause. Before attributing the impotence to Parkinson's, other possible causes should be investigated.

While difficult to talk about, doctors are very sensitive to the embarrassment this topic may cause.

A number of drugs are available to treat impotence including Sildenafil (Viagra, Vedafil, Silvasta), Tadalafil (Cialis, Cilatil), and Vardenafil (Levitra). However, these are currently not subsidised so you will have to pay for them.

The main ingredients for success in treating impotence or other sexual problems are the willingness of you and your partner to seek help, to discuss everything openly, and to respect each other's needs.

DRUGS FOR HALLUCINATIONS

Some people with Parkinson's experience hallucinations when they may see, hear, feel, smell or taste something which, in reality, does not exist.

Sometimes hallucinations occur when an adjustment has been made to the dose of a particular Parkinson's drug or when a new drug is added to a combination that the person is already taking. They may also occur as a result of infection or other illness. On other occasions it seems that the hallucinations occur spontaneously without any immediate cause.

Sometimes lowering the levels of levodopa may help alleviate symptoms. If this is not successful a neuroleptic or antipsychotic drugs may be prescribed. Unfortunately, most of these drugs make the symptoms of Parkinson's worse. There are two types – the older, conventional ones and newer atypical drugs. Older more conventional antipsychotics usually markedly worsen Parkinsonism. Newer antipsychotic drugs prescribed by a specialist to prevent hallucinations include Quetiapine and Clozapine.

Antipsychotic Drug - Quetiapine (Quetapel), Clozapine (Clopine, Clozaril)

Comments	Possible Side Effects
<p>Tell your doctor if you are taking medicines for epilepsy or diuretics and what Parkinson's medication you are currently on.</p> <p>It is important when advised to stop taking these drugs that a gradual reduction in dose over a 1-2 week period is undertaken.</p>	<p>Quetiapine has been shown to have few adverse effects, however Clozapine can seriously affect white blood cells and has other side effects requiring careful monitoring including regular blood tests.</p> <p>Possible side effects of both drugs can include:</p> <ul style="list-style-type: none">• Drowsiness• Agitation• Anxiety• Insomnia• Headache• Weight gain.

Drugs that should be avoided by people with Parkinson's

It is not uncommon for people to have other medical conditions in addition to Parkinson's. Although, generally the medication for other conditions will not pose a problem, it is important for your doctor to consider how it interacts with the medication for Parkinson's.

NOTE: THE TABLE BELOW IS NOT EXHAUSTIVE. IT IS VITAL FOR PEOPLE WITH PARKINSON'S TO INFORM THEIR DOCTOR ABOUT ALL THE MEDICATION THEY ARE TAKING, INCLUDING THOSE THAT HAVE BEEN BOUGHT WITHOUT A PRESCRIPTION SUCH AS HERBAL AND HOMEOPATHIC REMEDIES.

THE ONLY ROUTINELY AVAILABLE ORAL ANTI-NAUSEA DRUG THAT CAN BE SAFELY TAKEN BY PEOPLE WITH PARKINSON'S IS DOMPERIDONE.

Ondansetron may also be considered.

Prescription medications to be avoided

Comments	Possible Side Effects
Prochlorperazine (Nausafix, Buccastem)	Nausea/vomiting/dizziness
Metoclopramide	Nausea/vomiting – especially after surgery
Flupenthixol (Fluanxol)	Confusion, hallucinations, disorientation
Chlorpromazine (Largactil)	Confusion, hallucinations, disorientation
Fluphenazine (Modectate)	Confusion, hallucinations, disorientation
Risperidone (Risperdal)	Confusion, hallucinations, disorientation
Olanzapine (Zypexa, Zypine)	Confusion, hallucinations, disorientation

Non-prescription medications to be avoided

ANTIHISTAMINES

There are a large number of antihistamines which are included as ingredients in allergy medication, cough/cold preparations, sleeping aids and also preparations to prevent motion sickness.

Because of the side effects of **MOST** antihistamines, the risk of having a fall when on these medications is greatly increased. They are therefore not advisable for people with Parkinson's. **SOME** antihistamines also have the potential to worsen Parkinson's symptoms. There are a few of the newer antihistamines which don't cause these affects, and if an antihistamine is needed e.g. for hayfever or for an allergic reaction Loratadine would be the safest to use. Cetirizine is another antihistamine that can be used but discussion with a pharmacist or doctor is recommended first.

COLD AND COUGH MEDICINES

Cough and cold preparations may contain active ingredients that interact with other drugs. Most over-the-counter (OTC) cold and cough medications contain phenylephrine. These should be used with caution if you are taking antidepressants and drugs for helping blood circulation. Cold treatments may also contain pseudoephedrine (prescription-only in New Zealand but may be found in OTC drugs overseas). It can affect blood pressure when taken with some Parkinson's medications and should be avoided.

CARDIOVASCULAR MEDICATION (For high blood pressure and heart conditions)

Many medications taken for high blood pressure can increase the risk of postural hypotension (feeling dizzy or light-headed when standing up from a sitting or lying position). If your doctor prescribes you any of this type of medication, always stand up slowly from a sitting or lying position. Also ask your doctor to take your blood pressure in both lying and standing positions.

ENLARGED PROSTATE MEDICATION

Some medicines for this e.g. Doxazosin and Prazosin can cause postural hypotension so the same precautions as above should be taken.

DRUG INDUCED PARKINSONISM

Some people experience something called 'drug induced Parkinsonism'. They get Parkinson's- like symptoms when taking certain kinds of drugs. Large doses of neuroleptic drugs, such as chlorpromazine, used to treat schizophrenia and other psychotic disorders can cause it, as can some drugs used to treat indigestion, nausea and dizziness. It disappears after the medication is stopped. People who already have Parkinson's should be aware that such drugs might worsen their condition. Many of the drugs which are used to treat hallucinations and some drugs used for dizziness and nausea can also do this (see table on page 18 and section on anti-psychotics).

BEFORE SURGERY

If you need surgery you **MUST** talk to your doctor and anaesthetist about the medications you are taking, the dosage and the timing of them. Show **ALL** your medication to your specialist. You may like to discuss the information in this booklet with the doctors treating you in hospital.

NOTE: THERE IS A POTENTIALLY FATAL INTERACTION BETWEEN PETHIDINE (USED FOR PAIN RELIEF) AND RASAGILINE.

Dos and don'ts

- DO** ask your doctor to explain something again if you do not understand.
- DO** report the effects of medication, good and bad, to your doctor. It is useful to make some notes in advance of your appointment so that nothing is overlooked.
- DO** keep a diary or chart particularly when starting a new drug or when adjusting your dosage. Record the dosage and timings of your drugs, the duration of your on/off periods, or dyskinesias and anything unusual you may experience. This can be extremely helpful for the doctor when tailoring your new drug regime. If you have difficulty writing, ask someone to fill in any information for you.
- DO** take your drugs at a regular time recommended by your doctor. Taking medication on time every time ensures you get the maximum effectiveness and benefit from Parkinson's drugs.
- DO** take a forgotten dose as soon as you remember, provided this does not result in taking a double dose. If that should be the case, omit the forgotten dose.
- DO** keep your drugs out of the reach of children and store at normal room temperature (between 15°C-25°C) unless otherwise stated; e.g. the Apomorphine supplied in glass ampoules must be kept refrigerated.
- DO** ask your doctor to supply your drugs weekly in a strip pack if you have multiple medications or difficulty remembering if you have taken your medication.
- DO** seek advice from your doctor or Parkinson's Educator if you have concerns about any aspect of your life which may be affected by Parkinson's or your Parkinson's medication.
- DO** remember that unexpected dizziness may be a symptom of low blood pressure. If you experience this, you are advised to have your blood pressure checked in both lying and standing positions.
- DO** seek advice from your doctor if you have Parkinson's and suspect that you may be pregnant.
- DO** remember that your pharmacist can be a useful source of advice. They will also help you dispose of your unused medicine if necessary.
- DO** consult with your doctor before making changes to your treatment.

DON'T assume that your treatment, dose, or the timing of your medication, should be the same as that of other people with Parkinson's. Should you go into hospital or respite care, it is important that the doctors, nurses or carers know your current medication regime and the time of day you take each medication. It is a good idea to keep all of your Parkinson's information together in a folder for this purpose.

DON'T assume that you will experience serious side effects – most people won't.

However, if there is anything of concern, report it to your doctor or Parkinson's Educator.

DON'T suddenly make big changes to your dose. Rapid changes in dose can provoke side effects. Your doctor is likely to suggest that you experiment with timings to find the regime that suits you, while maintaining the daily dosage that has been suggested.

DON'T make any changes to your diet without consulting your doctor.

Glossary

Acetylcholine - a chemical messenger in the brain that works in balance with dopamine to transmit messages between nerve cells and muscles, enabling us to perform co-ordinated movements.

Amino acids - organic compounds which are the basic elements ("building blocks") of protein.

Anticholinergic drugs - a group of drugs used to treat Parkinson's which work by blocking the action of acetylcholine and so facilitate the function of dopamine cells in the brain.

Atypical neuroleptic - a group of newer anti-psychotic or sedative drug.

Benserazide - the medication Madopar contains levodopa and benserazide. Benserazide prevents levodopa being changed to dopamine before it reaches the brain.

Carbidopa - the medications Sinemet and Sindopa contain levodopa and carbidopa. Carbidopa prevents levodopa being changed to dopamine before it reaches the brain.

COMT inhibitors - a drug which works by blocking an enzyme called catechol-O-methyl transferase (COMT) which converts levodopa to an inactive substance. As a result they slow the destruction of levodopa.

Dopamine - a chemical messenger produced by cells in the brain. It works in balance with acetylcholine to transmit messages from the brain to other parts of the body, particularly to those parts involved in the co-ordination of movement.

Dopamine agonists - drugs that directly stimulate the parts of the brain where dopamine works.

Dyskinesias - involuntary or abnormal movements - from writhing and spasms to jerks and twitches - which can affect any part of the body, and vary in their severity. They seem to be partly caused by Parkinson's, and partly by anti-Parkinsonian medication. Dyskinesias are common in people who have been taking levodopa for many years. When someone has had Parkinson's for a number of years, their medication regime often has to be adjusted and readjusted to find a balance between enough medication to control the symptoms, and a level of dose that does not bring on too many dyskinesias.

Enzyme - any group of complex proteins produced by living cells, which act as catalysts in specific biochemical reactions.

Generic – the generic name is simply the official name for the specific type of drug.

As a number of older drugs cease to be protected by patent, they can be copied and produced by other companies as generic versions. As the new manufacturer does not bear the cost of research and development, generic brands are significantly less expensive than the original brand. Generic versions of drugs are subject to the same stringent quality requirements as the original branded drugs.

Levodopa – a natural amino acid that the brain converts into dopamine.

Monotherapy – when a drug used on its own to treat a condition, for example, levodopa in Parkinson's.

Neuroleptic – acting as a sedative.

On/off phenomenon – a term used to describe the abrupt and unpredictable changes in mobility of some people with long-standing Parkinson's, who are taking levodopa.

In the 'on' state, they are able to move and in the 'off' state they can be virtually immobile. They can switch from one state to the other within a very brief period of time – minutes or even seconds.

Postural hypotension – a drop in blood pressure when changing position from lying/sitting to standing with possible accompanying symptoms of light-headedness or feeling faint.

Sometimes causes falls. Can be a symptom of Parkinson's or a medication side effect. Also known as orthostatic hypotension.

Punding – a behaviour characterised by the person repeatedly and pointlessly doing everyday activities or hobbies such as persistent handling, collecting, organising or disassembling household objects; or excessive writing, doodling, grooming, singing, walking, tinkering or computer use. It is usually associated with excessive levodopa or sometimes dopamine agonist intake and often with insomnia and overnight rescue doses.

Side effect – any unwanted non-therapeutic effect caused by a drug.

Substantia nigra – part of the brain where dopamine is produced.

Wearing-off effect – this is experienced by many people with long-standing Parkinson's. The duration of benefit from a single dose of the drug treatment is reduced so that it 'wears off' some time before the next dose is due.

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Who are we? Ko wai mātou?

Parkinson's New Zealand is the only national charitable trust in Aotearoa New Zealand providing information, education and support to people with Parkinson's and Parkinson's plus conditions, their whānau, carers and health professionals.

WE OFFER

- 🌸 Home visits, phone and video call support
- 🌸 Support Groups for people with Parkinson's and carers
- 🌸 Advice, advocacy and whānau meetings
- 🌸 Referrals to health professionals such as physiotherapists, occupational therapists, and speech therapists
- 🌸 Education including an online Goodfellow unit course for health professionals
- 🌸 Website, social media, news on Parkinson's, monthly digital newsletters, and our twice-yearly magazine, *The Parkinsonian*
- 🌸 Seminars, conferences, and webinars
- 🌸 Red Tulip Membership including social activities and exercise classes

To become a client and/or member and for more information about our services please visit www.parkinsons.org.nz or call **0800 473 4636**.



COLLABORATION

My strength is not as an individual but as a collective

MAHITAHI

Ehara taku toa i te toa takitahi he toa takitini

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Living Positively with Parkinson's
Kia noho ngākau pai koe ki te Mate Paiori

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Parkinson's New Zealand Charitable Trust (CC55231).
Donations are always appreciated.

Parkinson's New Zealand recommends that if you have further queries
about your medication you discuss them in full with your doctor.