

# Drug treatments for Alzheimer's disease

Factsheet 407LP  
April 2018



There are no drug treatments that can cure Alzheimer's disease or any other common type of dementia. However, there are medicines for Alzheimer's disease that can ease symptoms for a while, or slow down their progression, in some people. These drugs do not slow down or stop the progression of the underlying disease in the brain.

This factsheet tells you how the main drug treatments for Alzheimer's disease work, how to access them, and when they can be prescribed and used effectively. For more information about Alzheimer's disease see factsheet 401, **What is Alzheimer's disease?**

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# Drug treatments for Alzheimer's disease

Medication can be an important part of a person's treatment for Alzheimer's disease. However, drugs can only help with some symptoms and should only be one part of a person's care. Information and advice, activities, support and treatments that don't involve drugs are just as important in helping someone to live well with Alzheimer's disease. A person with Alzheimer's disease can look at booklets 872, **The dementia guide: Living well after diagnosis**, or booklet 616, **Alzheimer's disease: Understanding your diagnosis** for more information.

## What are the main drugs used?

Many drugs have at least two names:

- a name for the main substance in the medicine (such as paracetamol)
- a brand name (such as Panadol or Calpol).

Drugs are sometimes made with only the name of the substance (such as paracetamol) on the packaging.

There are four drugs for Alzheimer's disease:

Substance name	Examples of brand names (UK):
Donepezil	Aricept
Rivastigmine	Exelon
Galantamine	Reminyl, Acumor XL*, Galsya XL*, Gatalin XL*
Memantine	Ebixa, Nemdatine, Alzhok

\*XL refers to a drug that is in a slow-release form (see 'Taking the drugs' on page 10).

**Donepezil, rivastigmine and galantamine** work in a similar way and are all known as 'acetylcholinesterase inhibitors'. (This is often shortened to 'cholinesterase inhibitors'.)

**Memantine** works differently to the other drugs, and is known as an 'NMDA receptor antagonist'.

The next section tells you more about how these drugs work.

## How do they work?

### Cholinesterase inhibitors (donepezil, rivastigmine and galantamine)

In the brain of a person with Alzheimer's disease, there are lower levels of a chemical called acetylcholine. Acetylcholine helps to send messages between certain nerve cells. In Alzheimer's disease some of the nerve cells that use acetylcholine are also lost. Because of these changes in the brain, symptoms of Alzheimer's disease get worse over time.

Donepezil, rivastigmine and galantamine all prevent an enzyme called acetylcholinesterase from breaking down acetylcholine. This means there is a higher concentration of acetylcholine in the brain, which leads to better communication between nerve cells. This may ease some symptoms of Alzheimer's disease for a while.

All three cholinesterase inhibitors work in a similar way. However, one drug might be better for someone than another. For instance, a person may have fewer side effects from one drug.

## **NICE guidance on drug treatments**

The National Institute for Health and Care Excellence (NICE) produces guidance on use of drugs in the NHS. NICE reviews the evidence and decides whether treatments represent good enough value for money to be available as part of standard NHS care. Drugs considered by NICE will also have been through the UK or European licensing process for new medicines. This means the medicine has been tested and met strict standards of safety, quality and effectiveness. The licence will be granted for treatment of a particular health condition (such as Alzheimer's disease).

For the cholinesterase inhibitors, the NICE guidance (produced in 2011 and updated in 2016) suggests that the cheapest drug (currently donepezil) should generally be tried first.

## **Memantine**

Memantine works differently from donepezil, rivastigmine and galantamine. Glutamate is another chemical that helps to send messages between nerve cells in the brain. However, when nerve cells are damaged by Alzheimer's disease, too much glutamate is produced. This causes more damage to the nerve cells. Memantine protects nerve cells by blocking the effects of too much glutamate.

## **Are these drugs effective for everyone with Alzheimer's disease?**

### **Donepezil, rivastigmine and galantamine**

NICE guidance recommends that donepezil, rivastigmine or galantamine is offered as part of NHS care for people with mild to moderate (early to middle stage) Alzheimer's disease. There is good evidence (especially for donepezil) that these cholinesterase inhibitors also help people in the later stages of Alzheimer's disease (see 'Stopping treatment').

40–70% of people with Alzheimer's disease who take a cholinesterase inhibitor find it helps them. Doctors cannot reliably know in advance whether the medication will help a specific person. Where the treatment helps someone, symptoms improve temporarily (usually for between six and 12 months). This effect then wears off a bit, so symptoms gradually get worse over the following months (even though the person is still taking the medication). People who take a cholinesterase inhibitor may find it helps with:

- anxiety
- motivation
- memory and concentration
- ability to continue daily activities (such as managing money, shopping or cooking).

It is not clear whether the cholinesterase inhibitors also help with behavioural changes such as agitation or aggression. Research hasn't given a clear answer one way or the other.

### Memantine

NICE guidance recommends using memantine as part of NHS care for people with severe (late stage) Alzheimer's disease. NICE also recommends memantine for people with moderate (middle stage) Alzheimer's disease who cannot take the cholinesterase inhibitor drugs – this is usually because of side effects.

Memantine is licensed for the treatment of moderate to severe Alzheimer's disease. In people in the middle and later stages of the disease, memantine can slow down the progression of symptoms. These include worsening mental abilities (such as disorientation) and problems carrying out daily activities such as getting dressed. There is some evidence that memantine may also help with symptoms such as delusions, aggression and agitation. For more information see factsheets 408, **Drugs for behavioural and psychological symptoms in dementia**, and 509, **Aggressive behaviour**.

If the person is taking memantine and has also been kept on a cholinesterase inhibitor, this means they will get both drugs together. There is now evidence that this combination treatment is better for someone with late-stage Alzheimer's than the cholinesterase inhibitor alone. This may be because the drugs work in different ways.

# 40–70%

of people with Alzheimer's disease who take a cholinesterase inhibitor find it helps them.

## Are there any side effects?

Most people can take cholinesterase inhibitors and memantine without too many side effects. Not everyone has the same side effects, or has them for the same length of time.

The most common side effects of donepezil, rivastigmine and galantamine are:

- loss of appetite
- nausea
- vomiting
- diarrhoea.

Other side effects include muscle cramps, headaches, dizziness, fatigue and insomnia. Side effects can be less likely for people who start treatment by taking the lower prescribed dose for at least a month (see 'Taking the drugs').

The side effects of memantine are less common and less severe than for the cholinesterase inhibitors. They include:

- dizziness
- headaches
- tiredness
- raised blood pressure
- constipation.

Talk to the doctor or the pharmacist about any side effects.

None of these drugs are addictive.

### How are these drugs prescribed?

The drugs listed above should only be prescribed to a person who has been diagnosed with certain types of dementia (see 'Are these drugs effective for other types of dementia?'). For more information about diagnosis of dementia see factsheet 426, **Assessment and diagnosis**.

NICE guidance also states that a person can only start using these drugs with a prescription from a specialist in dementia care. A specialist will often be a consultant old-age psychiatrist, geriatrician or neurologist. But it could also be a GP or nurse prescriber with expertise in dementia care. (In some parts of the country the consultant might write to the GP or nurse prescriber to ask them to start prescribing the drugs.)

Once the person has started on the drugs and is on the right dose for them (see 'Taking the drugs'), the specialist will usually ask the GP to take over prescribing them. The person should then have regular reviews of how well their medication is working, with either a specialist at the memory clinic or the GP. (When the consultant and primary care share responsibility for prescribing like this, it is sometimes called shared care prescribing.)



When deciding to start or continue drug treatment, the doctor should not rely only on scores from mental ability tests to assess how severe someone's dementia has become. Instead, the assessment should be based on a broader view of the person's condition. This should include their mental abilities, behaviour and ability to cope with daily life. It should also not be based on one single thing changing – such as the person's mental ability test score going below a certain number, or because they have gone into a care home. The doctor should ask the person (or their carer) for their views at the start of drug treatment and at check-ups.

### **Are these drugs effective for other types of dementia?**

The cholinesterase inhibitors were developed to treat Alzheimer's disease. There has not been as much research into whether they (or memantine) are helpful for people with other types of dementia.

### **Dementia with Lewy bodies and Parkinson's disease dementia**

There is now good evidence that donepezil and rivastigmine are effective and safe in people with dementia with Lewy bodies (DLB) and dementia due to Parkinson's disease, a closely related condition. This is to be expected because acetylcholine levels are often even lower in people with DLB or Parkinson's disease dementia than in those with Alzheimer's disease.

A person in the early or middle stage of DLB or Parkinson's disease dementia who takes donepezil or rivastigmine may find that it helps with:

- mental abilities such as memory, attention and alertness
- motivation
- delusions and hallucinations
- daily activities.

There is very little evidence about whether galantamine helps or not in either DLB or Parkinson's disease dementia. Galantamine should only be prescribed if neither donepezil nor rivastigmine can be taken.



Rivastigmine is licensed for Parkinson's disease dementia but none of these drugs are licensed for DLB. So prescription of a cholinesterase inhibitor (or memantine) for a person with DLB will be outside the terms of the drug licence ('off label'). The drugs are safe but the doctor should mention this when the person starts the treatment.

There is not enough evidence yet to show clearly that memantine is helpful for people with DLB and Parkinson's disease dementia. Memantine may be prescribed if the person cannot take a cholinesterase inhibitor.

For more information, see factsheet 403, **What is dementia with Lewy bodies (DLB)?** and factsheet 442, **Rarer causes of dementia.**

**Most people can take cholinesterase inhibitors and memantine without too many side effects. Not everyone has the same side effects, or has them for the same length of time.**

## Vascular dementia

There has been research on treating vascular dementia with the drugs used for Alzheimer's disease. This has shown that these drugs don't have much of an effect. Where they bring a benefit, this is small and is usually seen for mental abilities of people who have both Alzheimer's disease and vascular dementia (the most common type of mixed dementia). NICE guidelines recommend cholinesterase inhibitors for treatment of mixed dementia when Alzheimer's disease is one of the causes, but not for the treatment of just vascular dementia. For more information see factsheet 402, **What is vascular dementia?**

## Frontotemporal dementia (FTD)

There is no good evidence that the cholinesterase inhibitors or memantine help people with FTD, including Pick's disease. In some people they may make symptoms worse.

These drugs are not licensed for FTD and will not usually be prescribed for it. For more information see factsheet 404, **What is frontotemporal dementia (FTD)?**

## Taking the drugs

NICE guidelines say the healthcare professional should ask the carer for their views on the condition of the person with dementia, before treatment and during follow-up appointments. They should also seek the views of the person with dementia if possible.

The person should take the drugs in the amounts and way prescribed by the doctor (for example, at bedtime or with food). The person may find it helpful to use a pill box with different compartments for each day of the week, containing the prescribed dose. The pharmacist may be able to supply drugs pre-packed like this.

If the person misses a dose of any of these drugs, they should take it as soon as they remember, as long as it is on the same day. If it is the next day, the person should not take extra tablets, but should just continue with their normal dose.

The dose prescribed varies from person to person. Usually someone will start on a low dose, which will be gradually increased to make the treatment work better. Some people may not be able to take the highest dose because of side effects. The doctor will prescribe the best dose for each individual. Information about doses is on pages 11 and 12.

The drugs are available in a range of different forms, including:

- solid tablets
- 'orodispersible' tablets - designed to dissolve in the mouth
- 'soluble' tablets - designed to dissolve or mix in water
- capsules
- skin patches
- oral solutions – to drink.

Getting the right form of the drug for someone will make it much easier for them to take the right dose at the right time. The doctor or pharmacist should advise on getting the right form for the person.

### Donepezil

Donepezil is available in 5mg or 10mg solid and orodispersible tablets. It also comes as a solution. Donepezil is taken once a day, usually at bedtime. Treatment is started at 5mg a day and then increased to 10mg a day after one month if necessary. The maximum licensed total daily dose is 10mg.

### Rivastigmine

Rivastigmine comes in capsules from 1.5mg to 6mg and as a solution. It is taken twice a day, with morning and evening meals. People start with 3mg a day in two divided doses, which will usually increase (at intervals of at least two weeks) to between 6mg and 12mg a day.

The maximum licensed total daily dose for rivastigmine taken by mouth is 12mg.

Rivastigmine skin patches are also available. These deliver daily doses of 4.6mg, 9.5mg or 13.3mg, with fewer side effects than the capsules. Patches may be better for people who find it hard to take medication by mouth. Only one patch should be used at any one time and a new patch should be put on a different area of the skin, to avoid the person getting a rash.

**If the person misses a dose of any of these drugs, they should take it as soon as they remember, as long as it is on the same day. If it is the next day, the person should not take extra tablets, but should just continue with their normal dose.**

### Galantamine

The recommended starting dose for galantamine is 8mg each day for four weeks, increasing to 16mg a day for another four weeks, and then kept at a dose of between 16 and 24mg daily. Galantamine comes in different forms including a twice-daily solution, and tablets of 8mg and 12mg. Slow-release capsules (that have XL after the drug name) are available in doses of 8mg, 16mg and 24mg and only need to be taken once a day.

The maximum licensed total daily dose for galantamine is 24mg.

### Memantine

Memantine comes in various forms: as solid and soluble tablets ranging from 5mg to 20mg, and as a solution. The recommended starting dose is 5mg a day, increasing every week by 5mg, up to 20mg a day after four weeks.

The maximum licensed total daily dose for memantine is 20mg.

### Questions to ask the doctor when starting the drugs

If a person has been prescribed one of these drugs, it's important they understand what it does and how to take it. They may want to ask the doctor about some of the following things. You may find it helpful to write down these questions and the answers the doctor gives:

- Why have I been prescribed this drug specifically?
- How can taking this drug help me?
- How long will it be before I see a result?
- If I get side effects, should I stop taking the drug immediately?
- What will happen if I stop taking the drug suddenly?
- Can I drink alcohol while taking the drug?
- How might this drug affect other medical conditions?
- What changes in health should I report immediately?
- How often will I need to visit the clinic or surgery?
- If this drug doesn't suit me, can I try another drug?

## Stopping treatment

Medication should be reviewed regularly, and continued for as long as the benefits are greater than any side effects. If the person with dementia decides to stop taking a drug, they should speak to the doctor first if possible, or as soon as they can after stopping treatment. The doctor may also advise stopping the treatment if the person becomes unable to take the medicines in the way prescribed, even with support from someone else.

If someone stops taking their prescribed drug, their condition may get worse more quickly. If someone has stopped and thinks they should start their medication again, they should talk to their doctor as soon as possible.

When a person's dementia becomes severe (late stage), the doctor will need to decide with someone who knows the person well whether they should continue taking a cholinesterase inhibitor.

There is now good evidence that cholinesterase inhibitors continue to help even when someone's Alzheimer's is severe. Many doctors therefore continue to prescribe a cholinesterase inhibitor for late-stage Alzheimer's until the person's side effects become too severe or they become unable to take the medications in the way prescribed. In the last days of a person's life, doctors will often review their medication. After discussion with someone who knows the person well, the doctor may then decide to stop anti-dementia drugs.

## Research into new treatments

No new drugs have been licensed in the UK for Alzheimer's disease since memantine in 2002. However, there is a lot of research into new drug treatments. These aim either to give people better relief from symptoms or – if possible – to slow down or stop the disease in the brain.

For more information about taking part in research, you can ask your local memory service or go to the Join Dementia Research website at [joindementiaresearch.nihr.ac.uk](http://joindementiaresearch.nihr.ac.uk)

## Other useful organisations

### National Institute for Health and Care

Excellence (NICE)  
10 Spring Gardens  
London SW1A 2BU

0300 323 0140  
[nice@nice.org.uk](mailto:nice@nice.org.uk)  
[www.nice.org.uk](http://www.nice.org.uk)

Provides guidance, advice and information services for health, public health and social care professionals.

## Factsheet 407LP

Last reviewed: April 2018

Next review due: April 2021

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This factsheet has also been reviewed by people affected by dementia.

To give feedback on this factsheet, or for a list of sources, email [publications@alzheimers.org.uk](mailto:publications@alzheimers.org.uk)

### **Alzheimer's Society National Dementia Helpline England, Wales and Northern Ireland:**

**0300 222 1122**

**9am–8pm Monday–Wednesday**

**9am–5pm Thursday–Friday**

**10am–4pm Saturday–Sunday**

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Alzheimer's Society is the UK's leading dementia charity. We provide information and support, improve care, fund research, and create lasting change for people affected by dementia.

