

‘Chemo brain’ (cancer-related cognitive impairment)

This page is about cancer-related cognitive impairment, often called ‘chemo brain’. It affects some people with lymphoma as well as people with other cancers.

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What is 'chemo brain' (cancer-related cognitive impairment)?

Cancer-related cognitive impairment is a change in thinking processes that affects some people with cancer. The changes mainly affect memory, concentration and thinking speed. You might also hear it called 'cancer-related (or chemo-related) cognitive dysfunction' or 'post-chemotherapy cognitive impairment'. It's also known as 'chemo brain' or 'chemo fog', although it doesn't only affect people being treated with chemotherapy. All these names refer to the same thing.

Read more about [Adam's experience](#) and how he coped with cancer-related cognitive impairment.

Who gets 'chemo brain'?

'Chemo brain' affects up to three-quarters of people during or soon after treatment for cancer. About 1 in 5 people with cancer might notice the effects of 'chemo brain' before they start any treatment at all.

'Chemo brain' can affect people with [Hodgkin](#) or [non-Hodgkin lymphoma](#). The effects might be more noticeable in people with lymphoma who also have '[B symptoms](#)' (unexplained weight loss, night sweats and fever).

Although it's called 'chemo brain', it can affect people with cancer who haven't had [chemotherapy](#), or people who are treated with [radiotherapy](#). At the moment, there is little research on 'chemo brain' in people treated with [newer, targeted treatments](#) so we do not know how – or if – these may influence thinking.

You might be more likely to be affected by 'chemo brain' if:

- you are older
- you are female
- you have a longer course of chemotherapy (for example, 6 cycles rather than 3)

- you have high-dose chemotherapy (for example, prior to **stem cell transplantation**, or certain regimens used to treat **Burkitt lymphoma** or **CNS lymphoma**)
- your chemotherapy is injected into the spinal canal (intrathecal chemotherapy) or directly into an artery (intra-arterial chemotherapy; this is unusual for lymphoma treatment)
- you have certain other medical conditions, such as **anaemia**, heart disease or diabetes
- you have **depression** or anxiety
- you already had problems with thinking and memory before you developed cancer or started your treatment.

Some chemotherapy medicines used to treat lymphoma could be more likely to cause 'chemo brain' than others. These include methotrexate, carmustine, melphalan, fludarabine, cytarabine and cisplatin. Most of the research is based on studies in animals and it's difficult to know whether this applies to humans.

Depression, anxiety and 'chemo brain'

People who have depression or anxiety are more likely to experience poor concentration or memory than people who have good mental health. This may not necessarily be linked to cancer or its treatment – it could be due to changes in thinking processes resulting from changes in mood. However, people with depression or anxiety potentially find the effects of 'chemo brain' more troublesome.

The important thing to remember is that depression and anxiety are treatable. Treating anxiety and depression in people with 'chemo brain' might help reduce the effects of 'chemo brain'.

Age and 'chemo brain'

'Chemo brain' can affect people of any age, including children and young adults. It seems more common in older people – but this may be because cancer itself is more common in older people, and because of natural changes in thinking processes throughout life.

Our thinking processes are generally at their best when we're in our twenties. However, our brain and thinking processes undergo significant changes throughout our entire life – which can be disrupted by cancer and its treatment. Older people can experience changes in memory, attention and thinking speed as a normal part of getting older. They are also more likely to have other medical conditions that can affect thinking, such as dementia or diabetes. Cancer and cancer treatment can make this change in thinking processes worse. It can be hard to work out how much of the change is due to getting older and how much is due to the cancer or cancer treatment.

What causes 'chemo brain'?

Nobody knows exactly what causes 'chemo brain'. It's probably a combination of the effects of the cancer and of the cancer treatments. These effects include inflammation and changes to the chemicals, hormones and blood flow in your brain. Some **chemotherapy** drugs can damage nerve cells in your brain. Cancer and chemotherapy also cause other issues, like **anaemia** or infections, that can potentially affect thought processes.

Scientists think a combination of all these things affects the way your brain works when you have cancer or cancer treatment. They're studying 'chemo brain' in more detail to try to find out more.

What are the signs of 'chemo brain'?

'Chemo brain' can cause changes to your memory, concentration, attention span and complex thinking processes (sometimes called 'executive function') – for example:

- organising and planning
- starting new tasks
- staying focused and ignoring distractions
- self-control (of emotions and behaviour)

- self-monitoring (keeping track of what you're doing)
- reasoning or problem solving
- mental flexibility.

How might it affect me?

'Chemo brain' affects different people in varying ways. The effects of 'chemo brain' are usually mild and generally get better over time. However, they can be frustrating and can affect your quality of life. The symptoms can vary from day-to-day, at different times of day and, if you're on treatment, at different times in your treatment cycle. They are usually worse when you're tired or busy.

Effects on memory

You might notice that your memory isn't as good as it used to be. For example, you might forget people's names, misplace things like keys or glasses, or struggle to find the word you want to use.

'Chemo brain' can make it difficult to remember what medicines you need to take and when, especially if you have a lot of different tablets. You might accidentally miss appointments.

Effects on concentration and attention span

Some people feel 'spaced out' and find it hard to focus on what they're doing. This can make everyday things difficult, like following a conversation or television programme or reading a book.

Effects on complex thinking processes

Thought processes you normally find easy, such as making shopping lists, doing puzzles or adding up numbers in your head, might seem harder or slower. It can also be hard to swap between tasks if you're doing more than one thing at a time. It might take you longer than usual to take in new information, learn new things or do familiar things like getting ready to go out. Some people don't feel confident to drive because of the effects of 'chemo brain'.

If you go to work or school, you might not manage to get as much done as usual, or feel that you're not doing it as well. Some people prefer to take some time off or to work in a reduced capacity (for example, shorter hours) while they're affected by 'chemo brain'.

Emotional effects

Because it isn't obvious to other people, 'chemo brain' can be very stressful. You may be embarrassed that you can't do things the way you used to or worry that friends, family and colleagues might notice the change in you. This can affect your self-confidence, your social life and your mood.

How is 'chemo brain' assessed?

It's difficult to measure the effects of 'chemo brain'. Your doctor or nurse might:

- give you a questionnaire or rating scale to fill in
- ask you to do some pen-and-paper tasks (for example, copying a shape)
- ask you to follow a set of instructions
- ask you a few questions to test your memory, orientation and language skills.

However, these methods only give an approximate idea of how 'chemo brain' affects your day-to-day life. Your doctor or nurse may find it more useful simply to ask you how you're getting on.

More complicated tests of your thinking processes are not used routinely in people with cancer. You might have more detailed assessments if you are taking part in a clinical trial.

How is 'chemo brain' treated?

If you are affected by 'chemo brain', don't be afraid to tell your doctor or nurse. They will understand how you're feeling and can offer you advice and support.

There are several things that can help with the symptoms of 'chemo brain'. Your medical team can help you work out what's suitable for you. Options include:

- **Treating underlying illnesses:** Your team will check for any conditions that might be making your symptoms worse, such as anaemia, infections, depression or anxiety. All these things are treatable – and treating them may help the symptoms of 'chemo brain'.
- **Information:** Learning about 'chemo brain' and how long it usually lasts may help you cope better with symptoms. There are also lots of practical things you can do to reduce the effect of 'chemo brain' on your day-to-day life.
- **Exercise:** Physical activity is good for the brain. It doesn't have to be too energetic; short, gentle exercise such as walking is enough to improve the symptoms of 'chemo brain'. It also helps other conditions that can make 'chemo brain' worse (for example, depression and anxiety).
- **Talking therapy:** Your medical team might be able to refer you for specialist help such as cognitive (talking) therapy. This can help you relearn thinking skills affected by 'chemo brain', or develop ways of compensating for changes in your thinking processes. It's provided by a specialist therapist. It can also be helpful for depression or anxiety.
- **Memory clinics:** Some centres provide memory clinics offering information, assessment and treatment advice for people affected by 'chemo brain'.

How long does 'chemo brain' last?

For some people, the effects of 'chemo brain' only last a few weeks. Most people get better between 6 months and 2 years after finishing treatment. However, about a third of people have symptoms that last longer, sometimes for many years. There are strategies that can help with symptoms.

'I can't believe how much, in 7 months, I've recovered. I never expected it to be such a quick process.'

– Adam, diagnosed with Hodgkin lymphoma in

2013

What can I do to cope with the effects of 'chemo brain'?

Here are some practical tips people have told us they found helpful:

Pace yourself and try to be organised

- Keep life as simple as possible – don't take on too much.
- Do one thing at a time – don't try to multi-task.
- Plan your day so that you do difficult things when you feel at your best.
- Put important things in one place every time you put them down (for example, your phone, keys, glasses).

Write things down

- Keep a diary or use a calendar – a paper one or an app on your phone – to record dates of social occasions, meetings, deadlines for bills to be paid, birthdays and anniversaries.
- Use a notebook to jot down things like shopping and 'to do' lists, phone calls you need to make, people's names (with a short description if that would help) and phone numbers.

- Use Post-It® notes around the house to remind you about things you need to do.
- Write down hospital appointments, medications and new symptoms somewhere obvious.

Take care of yourself

- **Reduce stress** in your life if you can. Relaxation techniques might help you do this. Mindfulness (taking time to notice what's happening in the present moment – both inside and outside your body) can improve thinking processes and reduce stress. **Meditation** or yoga can help you develop mindfulness techniques.
- Keep as physically healthy as possible – in particular, try to make sure you have a **healthy diet** that includes plenty of fruit and vegetables and try to get some **exercise** every day, even if it's just a short walk.
- Keep your mind active by doing crossword puzzles, Sudoku or using brain training computer games or apps.
- Consider telling your family, friends and work colleagues that your thinking processes have been affected to help them understand how they can support you.

'No matter how low I felt and how tired I felt, I would make sure I went out for a walk every evening.'

– Adam, diagnosed with Hodgkin lymphoma in

2013

Frequently asked questions

Does having 'chemo brain' mean I'll get dementia?

To the best of our knowledge, people who have been affected by ‘chemo brain’ are no more likely than anybody else to get Alzheimer dementia in later life. The effect of ‘chemo brain’ on your chances of getting other forms of dementia is not clear.

Are medicines used to treat ‘chemo brain’?

Several different medicines have been tested in people with ‘chemo brain’, including some antidepressants, brain-stimulating drugs and hormones. The results haven’t been clear. At the moment, there isn’t enough scientific evidence to decide which medicines could be helpful for ‘chemo brain’. However, research is going on all the time and we are hoping for stronger evidence soon.

References

These are some of the sources we used to prepare this information. The full list of sources is available on request. Please contact us by email at publications@lymphoma-action.org.uk or phone on **01296 619409** if you would like a copy.

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Further reading

- [Glossary](#)
- [Your medical team](#)
- [Living with lymphoma](#)
- [Chemotherapy](#)

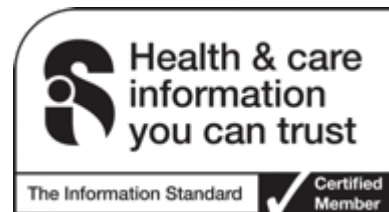
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