



It sounds funny, but it's no joke;
it's "chemo-brain"
and it's very real

Chemo-brain is a lesser-known side effect of chemotherapy that may be subtle, but can be very frustrating to the person who is experiencing it.

Fortunately, the condition has been getting increased attention from doctors and researchers. As a result, anyone experiencing chemo-brain can feel comfortable addressing the issue with his doctor. There is no longer any reason for patients to feel like they are "going crazy" or that they are imagining things. On the contrary, chemo-brain is very real.

What exactly is chemo-brain?

According to patients who experience it and scientists who research it, chemo-brain is a cognitive dysfunction or impairment that results in:

- Memory lapses
- Trouble concentrating
- Inability to remember certain things
- Inability to do more than one thing at a time
- Trouble remembering common words
- Inability to learn new skills

Not everyone experiences chemo-brain, and for many of those who do, it comes on quickly and lasts only briefly. For others, however, it may mean long-lasting mental changes that affect daily activities.

How does science know chemo-brain is real?

The effects of chemo-brain can be seen by doctors. Imaging tests of people who have complained of chemo-brain have shown that the areas of the brain that are part of memory, planning, putting thoughts into action, monitoring thought processes and behavior, and inhibition were smaller following treatment. Other imaging studies have compared the brains of cancer survivors treated with chemotherapy to the brains of people who were not treated and the former group showed changes in brain activity that did not appear in the latter group. The picture is clear: although the brain usually recovers over time, it *can* be impacted by chemotherapy, proving that the condition known as chemo-brain is very real.

Does science know what causes chemo-brain?

Unfortunately, no – at least not entirely. What is known is that most people with chemo-brain have it as a by-product of other chemotherapy side effects, such as anemia, fatigue, and depression. All of *these* side effects have the potential of causing the chemo-brain side effect. And the good news is that all of these side effects are treatable.

What is confounding researchers now is how to treat those patients whose chemo-brain *isn't* caused by one of the above factors. It's believed that as many as 25 to 30 percent of patients, both men and women, fall into this category.

While the specific cause of chemo-brain is not known, and there is not currently a way to predict who will get it, or any way to prevent it, researchers *are* making progress and new studies have yielded more and more insights.

Chemo-brain research and studies

One of the biggest hurdles has already been overcome: Chemo-brain is now recognized as a side effect of cancer treatment. With that hurdle behind us, studies are being done to learn more about the condition. For example, there are studies under way to:

- Look at which chemotherapy drugs are most likely to cause chemo-brain and in what doses.
- Determine which patients are most likely to be chemo-brain sufferers. To do this, people's mental abilities are measured before treatment, after treatment, and then compared.
- Investigate ways to protect the brain from chemo side effects, such as with more specific, targeted drugs that focus on the cancer cells and spare normal, healthy cells.
- Look at medications for depression, attention-deficit hyperactivity disorder (ADHD), and dementia as possible medications for chemo-brain.
- Look at genetic differences that may make some people more likely than others to experience chemo-brain. One particular gene, called APOE, is being examined more closely. Research has shown that one version of this gene, E4, is associated with Alzheimer's disease and when present, increases the chance for cognitive problems after traumatic brain injury. Studies are trying to find out if carriers of the E4 gene who get chemotherapy may have a higher risk of developing long-term chemo-brain.
- Investigate whether certain hormonal factors make some people more susceptible to mental effects from chemotherapy: estrogen is one target of investigation.
- Further examine the effects of chemotherapy drugs on nerve and brain cells. Recent studies have already shown clear evidence of nerve damage from at least some forms of chemotherapy. Identifying which nerve or brain cells are most at risk is critical to developing ways to reduce the damage.

How to manage chemo-brain

Most people who have chemo-brain have it because of another side effect, such as anemia. Since those side effects are treatable, doctors will often start with treating the original side effect. If that doesn't help the chemo-brain, there are other places to turn and other options that can help people cope.

One option to consider is visiting a neurologist, psychoneurologist, or psychologist who is an expert at testing brain functioning and can diagnose the symptoms of chemo-brain. With testing, these professionals can determine the scope of the problem and suggest the most appropriate mental exercises.

Below are some of the exercises and management techniques specialists may recommend:

- Use a detailed daily planner, keeping everything in one place – appointments, schedules, “to do” lists, important birthdays and anniversaries, phone numbers and addresses, meeting notes and any other notes or reminders.
- Exercise the brain: Take a class, do word puzzles, or learn a new language.
- Get enough rest and sleep.
- Exercise: Regular physical activity is not only good for the body, but it also improves mood, alertness, and stamina.
- Eat lots of vegetables, which have been shown to help maintain brainpower.
- Establish routines, such as following the same daily schedule and establishing a single spot for placing all commonly lost objects.
- Focus on one thing at a time; don't try multitasking.
- Track memory problems by keeping a diary of the time they are experienced and the events going on simultaneously. By making a note of when the problems occur most, you can plan around them – avoiding important conversations at those times, for example.
- Try not to focus on the chemo-brain symptoms, remembering that many people who never had chemotherapy also struggle with memory issues.

A word of caution

It's important to remember that most people do fully recover from the effects of chemotherapy, usually a year or two after the therapy ends. For that reason, and because chemo-brain is usually mild, any plans to forego the proven and effective therapies of chemo drugs should not be changed in an effort to prevent chemo-brain.

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