

Cancer Association of South Africa (CANSA)



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Fact Sheet on Chemo Brain

Introduction

Chemo brain, also known as post-chemotherapy cognitive impairment (PCCI), chemotherapy-induced cognitive dysfunction or impairment, or chemo fog, describes the cognitive impairment that can result from chemotherapy treatment. Approximately 20–30% of people who undergo chemotherapy experience some level of post-chemotherapy cognitive impairment. The phenomenon first came to light because of the large number of breast cancer survivors who complained of changes in memory, fluency, and other cognitive abilities that impeded their ability to function as they had pre-chemotherapy.

[Picture Credit: Chemo Brain]



Although the causes and existence of post-chemotherapy cognitive impairment has been a subject of debate, recent studies have confirmed that post-chemotherapy cognitive impairment is a real, measurable side effect of chemotherapy that appears in some patients. While any cancer patient may experience temporary cognitive impairment while undergoing chemotherapy, patients with PCCI continue to experience these symptoms long after chemotherapy has been completed. PCCI is often seen in patients treated for breast cancer, ovarian cancer, prostate cancer, and other reproductive cancers, as well as other types of cancers requiring aggressive treatment with chemotherapy.

The clinical relevance of PCCI is significant, considering the increasing number of long-term cancer survivors in the population, many of whom may have been treated with aggressive dosing of chemotherapeutic agents, or with chemotherapy as an adjuvant to other forms of treatment. In some patients, fear of PCCI can impact treatment decisions. The magnitude of chemotherapy-related cognitive changes and their impact on the activities of daily living are uncertain.

(Wikipedia).

Post-chemotherapy Cognitive Impairment (PCCI)

Chemo brain is a common term used by cancer survivors to describe thinking and memory problems that can occur after cancer treatment. Chemo brain can also be called chemo fog, chemotherapy-related cognitive impairment or cognitive dysfunction.

Though chemo brain is a widely used term, it's misleading. It's unlikely that chemotherapy is the sole cause of concentration and memory problems in cancer survivors. Despite the many questions with regard to this problem, it is clear that the memory problems commonly called chemo brain can be a frustrating and debilitating side effect of cancer and its treatment. More study is needed to understand this condition.
(Mayo Clinic; MacMillan Cancer Support).

Cancer patients have long complained of neurological side effects such as short-term memory loss and, in extreme cases, seizures, vision loss, and even dementia. Until very recently, these cognitive side effects were often dismissed as the by-product of fatigue, depression, and anxiety related to cancer diagnosis and treatment. Now a growing body of evidence has documented the scope of these conditions, collectively referred to as chemo brain. And while it is increasingly acknowledged by the scientific community that many chemotherapy agents may have a negative impact on brain function in a subset of cancer patients, the precise mechanisms that underlie this dysfunction have not been identified.

Virtually all cancer survivors experience short-term memory loss and difficulty concentrating during and shortly after treatment. A study two years ago by researchers with the James P. Wilmot Cancer Center at the University of Rochester showed that upwards of 82% of breast cancer patients reported that they suffer from some form of cognitive impairment.



[Picture Credit: Blame it on Chemo Brain]

While these effects tend to wear off over time, a subset of patients, particularly those who have been administered high doses of chemotherapy, begin to experience these cognitive side effects months or longer after treatment has ceased and the drugs have long since departed their systems. For example, a recent study estimates that somewhere between 15 and 20 percent of the nation's 2.4 million female breast cancer survivors have lingering cognitive problems years after treatment. Another study showed that 50 percent of women had not recovered their previous level of cognitive function one year after treatment.
(Science Daily).

Causes of Post-chemotherapy Cognitive Impairment (PCCI)

It is still not clear what causes mild cognitive impairment. Research suggests that there may be a number of factors that contribute to it, including:

Chemotherapy - so far, research has not clearly shown whether chemotherapy causes these thought and memory changes. Early studies only tested people after their chemotherapy. These tests showed that people had cognitive impairment. But more recent research has shown that some people with cancer have similar problems before they start any treatment and that the changes may even improve during treatment. This implies that it could be something to do with having cancer, rather than having cancer treatment. There are,

however, many individuals complaining of post-chemotherapy cognitive impairment who are certain that they never had similar problems before their cancer treatment.

Other cancer treatments - many people have more than one type of treatment for cancer, which makes it difficult to work out what is causing a particular side effect. A small study looked at 31 women treated with the hormone therapies, tamoxifen and anastrozole. They found that women taking anastrozole had more thought and memory problems than women taking tamoxifen. Another study compared women taking tamoxifen with women taking exemestane and with women who had not had breast cancer. This study found that the women taking tamoxifen had more problems with memory and organisation skills than those taking exemestane and the women who hadn't had cancer. We need more research to find out what effects hormone therapy and other cancer treatments may have.

Anxiety, fatigue, old age, depression - from research, we know that people who report thought and memory problems after chemo are more likely to have anxiety and depression than people who don't have these symptoms. But it isn't clear whether one causes the other. There could be another factor that leads to thought and memory problems as well as anxiety and depression.

Changes in blood proteins called cytokines - Cytokines are proteins made by the body as part of the immune response. Researchers have looked at blood levels of cytokines in women who had treatment for breast cancer. The researchers compared them with cytokine levels in women who didn't have breast cancer. They found that women with breast cancer had higher cytokine levels. They also found that women who reported thought and memory problems had the highest levels of cytokines. We need more research to find out what this actually means. The researchers are extending their study to include more women who have had breast cancer and also people with other types of cancer. (Cancer Research UK).

Signs and Symptoms of Post-chemotherapy Cognitive Impairment (PCCI)

Any person who has received cancer treatment and are experiencing the following types of problems, may be experiencing PCCI:

- Memory loss
- Trouble paying attention
- Short attention span
- Fumbling for the right word or phrase
- Difficulty with new learning
- Difficulty managing daily activities
- Difficulty concentrating on a single task
- Difficulty learning new skills
- Problems with short-term memory; forgetting details of recent events
- Feeling mentally 'slower' than usual
- Confusing dates and appointments
- Misplacing objects
- Being unusually disorganised
- Difficulty concentrating
- Difficulty multitasking

- Taking longer than usual to complete routine tasks
- Trouble with verbal memory, such as remembering a conversation
- Trouble with visual memory, such as recalling an image or list of words

People often notice these problems during chemotherapy treatment. Within one year of treatment, many people find these difficulties greatly improve or no longer exist. However, for some people, PCCI can continue for years following completion of treatment. (CancerCare; MD Anderson Cancer Center; Mayo Clinic).

Preventing and Treating Post-chemotherapy Cognitive Impairment (PCCI)

Doctors have been looking into how to prevent and treat cancer related thought and memory problems. It is still too early to know how well these work but they include:

- Erythropoietin (EPO)) – this drug may help by raising haemoglobin levels
- Aspirin – which works as a mild blood thinning drug
- Methylphenidate – a type of stimulant for chronic fatigue syndrome, daytime drowsiness and attention deficit disorder

The aim with EPO or aspirin treatment is to maintain or increase blood flow to the brain cells and so increase their oxygen supply. Understanding more about what causes PCCI will help doctors to find ways of preventing and treating it. (Cancer Research UK).

Coping with Post-chemotherapy Cognitive Impairment (PCCI)

Not many treatments for PCCI currently exist, although some patients may find relief from stimulants such as Ritalin®, commonly used to treat Attention Deficit Hyperactivity Disorder (ADHD). Ritalin can help improve mental focus, concentration and stamina in cancer patients.

People can use the following coping strategies to minimise the effects of PCCI:

- Exercise - even five minutes of mild to moderate activity may improve mental function
- Go for a walk
- Memory Aids - using a notebook, planner, cell phone, or list to keep track of things as they come to mind. A small recorder can also come in handy
- Also use your mobile phone, a calendar or daily planner to keep track of tasks, appointments, social commitments, birthdays etc
- Treat fatigue and sleep problems - these conditions can worsen PCCI symptoms
- Manage depression and anxiety - easing stress and elevating mood can ease PCCI symptoms
- Minimise distractions - a more soundproof environment, like an office or a cubicle in a different location can decrease distractions and improve concentration in the workplace
- Do mental exercises, such as crosswords
- Listen to music
- Plan the day to do the things that need the most thinking when feeling one's best and more alert, e.g. in the mornings

- Set aside time each day to read and respond to emails.
- Get extra rest
- Use a calendar and write down important dates and information
- Use a pill box to keep track of medications
- Try to keep one's life as simple as possible
- Avoid trying to do too many things at the same time
- Keeping one's mind active may help – for example, doing crosswords, sudoku and puzzles
- If you are working and have your own office, close the door when you don't want to be interrupted
- Put personal items (e.g. wallet, keys) in a dedicated place at home and at work so you don't misplace them
- Let phone calls go through to your answering machine or voicemail. You can listen to them and think about how you will respond when you feel ready
- Do tasks one at a time rather than multi-tasking
- Get plenty of sleep and exercise. Deep sleep is important for memory and concentration, and getting some physical activity every day will help you sleep better (MD Anderson Cancer Center; MacMillan Cancer Support; Susan G Komen; Cancer Research UK; Cancer Council NSW).

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Blame it on Chemo Brain

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