

# Online program reduces neurological symptoms linked to chemotherapy in cancer patients

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Up to 70 per cent of cancer patients report cognitive symptoms following chemotherapy. These symptoms have been linked to poorer quality of life and increased depression, anxiety, and fatigue among cancer survivors.

This deterioration in cognitive function, commonly referred to as "chemobrain" or "chemofog," was largely unacknowledged by the medical profession until recent years. It has now been termed "cancer induced cognitive impairment" as it can occur prior to receiving chemotherapy.

The study examined 242 adult cancer patients who had completed three or more cycles of chemotherapy in the previous five-years, and who self-reported [cognitive symptoms](#), indicated by changes in concentration and/or memory. Of those who participated in the study 89 per cent were women with [breast cancer](#).

Study participants were randomly assigned to either the online neurocognitive learning program or standard care from their treating physician. The two groups were compared at baseline, immediately after the intervention (15 weeks) and at six months.

Participants were assessed on the following parameters:

- Self-reported cognitive function - measured 37-item the Functional Assessment of Cancer Therapy Cognitive Function version 3 (FACT-COG) questionnaire. It comprises four subscales: perceived cognitive impairments (PCI), perceived cognitive abilities, impact of PCI on quality of life, and comments from others on cognitive function.
- Objective neuropsychological function - as assessed by Cogstate, an 18-minute computerised battery, comprising seven tests evaluating processing speed, decision making, working memory, executive function, continuous performance, matching, and new learning.

## **Main findings**

- Compared to participants who received standard care, those assigned to the online program had less cognitive symptoms immediately following the intervention and at six months.
- Participants using the online program group had significantly lower levels of anxiety, depression and fatigue than the standard care group immediately after treatment, but not at six months.
- There was no difference in quality of life between the groups immediately following the intervention, but the online program group had better quality of life at six months.
- There was no difference on objective neuropsychological function between the comparison groups immediately following the intervention, or at six months.

The online program - 'Insight from Posit Science' - uses adaptive exercises targeting processing systems aimed at improving cognition through speed and accuracy of information processing. It is now available as an internet-based program and accessible at: <http://www.brainhq.com/welcome>

"Cancer induced cognitive impairment for [cancer patients](#) is a real problem and there is little evidence to guide how best to treat it," said study lead author, Dr Victoria Bray, a medical oncologist and PhD candidate at The University of Sydney.

"We know there is a poor association between cognitive symptoms and impairment assessed on formal cognitive testing. Our study shows that survivors who used the online neurocognitive learning program had improved cognitive symptoms compared to survivors who received standard care immediately after treatment and at six months. This gives us a new option for treatment of cognitive symptoms, even though we did not find a difference in the objective cognitive testing".

Cancer Council NSW's Lead Supportive Care Manager, Hannah Baird, said that often the memory and day-to-day problems experienced by people following chemotherapy are dismissed as the result of dealing with the stress of coping with cancer treatment.

"For a lot of people who we hear from who have been through cancer treatment, day-to-day functioning issues are very real. Many people say they have difficulty concentrating, focusing and remembering things. The cancer experience does not end on the last day of treatment - the reality is that people often have to adapt to a different way of living".

Dr Alessandra Muntoni, Director of Research Investment from the National Breast Cancer Foundation said the outcomes are important for breast cancer survivors.

"With survival rates for breast cancer constantly increasing and more than 170,000 women and men living with the aftermath of breast cancer diagnosis and treatment, research to improve their quality of life has the potential to make a life-changing difference," said Dr Muntoni.

While this is the largest cognitive intervention study in patients with cancer, there are still a number of other unanswered questions to be addressed in future research.

"If we could identify patients who are at risk of [cognitive impairment](#), we could intervene earlier, and possibly achieve even better results. We would also like to explore whether there is added benefit from combining cognitive training with physical exercise," said Dr. Bray.

Provided by University of Sydney

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