

OPTIMIZING COGNITIVE FUNCTIONING DURING AND AFTER CANCER TREATMENT

Recommendations from the Henneghan Lab at
UT Austin School of Nursing

Introduction

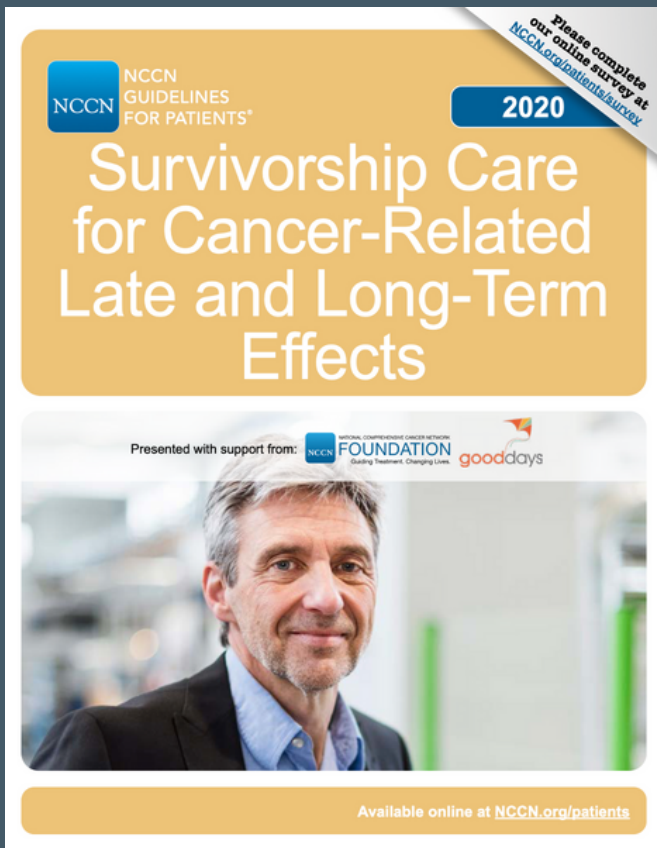
Cognitive problems during and after cancer treatments are very common. These problems may include being slower to think through issues and respond; having difficulty keeping track of what you are doing; feeling overwhelmed or bombarded with stimuli; having difficulty analyzing a situation, planning a course of action, and carrying it out; and/or forgetting _____[fill in the blank]. Cognitive symptoms are usually unique to the individual and can vary from day to day. The good news is that for most, these problems will improve over time. Here are some resources to consider if you are experiencing persistent cognitive problems after treatment.



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Addressing Contributing Factors



Cognitive dysfunction can be related to a number of other factors including pain, poor sleep, medications, mood, and fatigue. See these guidelines below provided by the National Comprehensive Cancer Network for more details.

GUIDELINES

Evidence Based Interventions to Manage Cognitive Symptoms

- Cognitive Rehabilitation or Therapy/Cognitive Training
- Exercise
- Meditation / Stress Reduction
- Yoga
- Complementary and Alternative Therapies
- Nutritional and Dietary Changes
- Music Based Interventions



Cognitive Rehabilitation or Therapy/Cognitive Training:

Memory, processing speed

Cognitive rehabilitation typically refers to a clinic-based, therapeutic program aimed to improve cognitive abilities, functional capacity, and real-world skills. Programs can be inpatient or outpatient and involve patients meeting individually and/or in groups with a trained clinician (typically a neuropsychologist, psychologist, speech and language pathologist, or occupational therapist). Studies show that cognitive rehabilitation can improve memory, processing speed, and executive functioning in some cancer survivors.¹ Unlike cognitive rehabilitation, cognitive training tends to focus on independent cognitive skills practice. Cognitive training programs are widely available, relatively inexpensive, and allow for remote administration with improved feasibility and access. Evidence on the effectiveness of cognitive training is mixed, but some studies demonstrate cognitive enhancement.² You can also search for cognitive rehabilitation centers or therapists in your area. Kaizen Brain Center is one that is based in California, but does virtual visits.



Cognitive Brain Games

[BRAIN HQ](#)

[LUMOSITY](#)

[MIND GAMES](#)



Other Links

[KAIZEN BRAIN
CENTER](#)

Exercise

Exercise and physical activity, especially cardio/aerobic activity, are associated with improved cognitive function in both human and animal studies. There is growing evidence that exercise can improve cognitive function in healthy older adults and adults with cognitive impairments, and some studies have shown that exercise is beneficial to cancer survivors. Regular exercise improves brain health and helps with other contributing factors like sleep and emotional regulation.^{3,4}



Meditation & Stress Reduction

Various types of meditation and mindfulness have been used to reduce cognitive problems after cancer treatment. These are practices that increase awareness of one's body, mental state, and surroundings in the present moment. Mindfulness practice can serve as training for attention and has been the most effective method to improve attention in cancer survivors.⁵ and have shown some evidence for improving cognition among breast cancer survivors. Other types of meditation including Kirtan Kriya, Tibetan Sound, Qigong have also demonstrated improvements in global cognitive functioning, verbal abilities, and memory.⁷

[CLICK FOR
AMERICAN
CANCER
SOCIETY
GUIDELINES
FOR EXERCISE
AFTER CANCER](#)



Information on Cancer & Meditation

[CANCER.ORG](#)

[MSKCC.ORG](#)

[CANCER RESEARCH UK.ORG](#)

Apps & Websites

[APP: HEADSPACE](#)

[APP: CALM](#)

[CANCER CARE.ORG](#)

[AURA HEALTH.ORG](#)



Yoga & Cancer Information

[CANCER.NET](https://www.cancer.net)

[CANCER.ORG](https://www.cancer.org)

[MSKCC.ORG](https://www.mskcc.org)

[BREASTCANCER.ORG](https://www.breastcancer.org)

Free & Low Cost Yoga Options

[YOGA4CANCER.COM](https://www.yoga4cancer.com)

[YOUTUBE LINK](#)

[YOUTUBE LINK](#)

Yoga

Yoga is an ancient practice that has become a popular form of exercise in modern times. Yoga incorporates specific poses and alignment, breathing techniques, meditative technique, and sometimes chants and wisdom teachings. While it is not known how yoga improves cognitive function, it is likely a combination of things (breathing, physical activity, mindfulness) that collectively improve brain and cognitive functioning. can improve stress/distress during cancer treatment and can improve post-treatment disturbances in sleep and cognition. Research also supports that yoga may improve biomarkers of stress, inflammation, and immune function which could indirectly improve cognitive functioning. There are different types of yoga. Hatha yoga, a gentle style of yoga, has been most commonly evaluated within the context of cancer.⁸ Look for yoga classes in your community or find some suggested websites/apps with free or low cost options (Refer to right.)



Complementary & Alternative Therapies

A few studies have looked at using either acupuncture or acupressure for improving cognitive functioning after cancer treatment. Both therapies are provided by a trained professional and have been deemed “safe”. Acupuncture, which refers to a Traditional Chinese Medicine technique that involves thin needles being inserted superficially in the skin, has been shown to reduce various cancer-related symptoms and improve cognitive capacity. Larger clinical trials evaluating acupuncture are currently underway. Acupressure, which involves applying pressure to specified points on the body, has not been evaluated for cancer-related cognitive functioning, but has been shown to alleviate cancer-related fatigue¹⁰ which is directly related to cognitive abilities. It has also been used successfully to treat mild cognitive impairment in adults.¹¹

*Acupressure therapy is not as regulated as acupuncture. Many training programs fall under massage therapy. Search in your local area for massage therapists who are trained in acupressure. You can also search on YouTube for acupressure for brain/cognitive function for free options to try.

Nutritional & Dietary Changes

It is hypothesized that one of the causes of cancer-related cognitive changes is underlying inflammation and accumulation of oxidative stress and free radicals in the blood and body. There are many nutrients and dietary factors that can reduce or balance out this type of cellular damage including fruits, vegetables, fatty acids, and antioxidant rich foods. Research on specific nutrient or dietary compounds are still underway in mouse and animal models.

[Click Here for general nutritional guidelines for cancer survivors. To read more about anti-inflammatory diets and/or antioxidant rich diets, see these resources.](#)¹²

Diet and nutrition should be tailored to individuals, so consider meeting with a registered dietician if you feel that your diet and nutrition could be optimized. Importantly, while “dietician” and “nutritionist” may be seen as synonyms, there are critical differences between these professionals. Dietitians, also referred to as registered dietitians, or registered dietitian nutritionists, can treat clinical medical issues. Nutritionists may give more general nutritional advice and cannot offer medical treatment.

Acupuncture & Cancer Information

[CANCER.GOV](https://www.cancer.gov)

[NCCIH.NIH.GOV](https://nccih.nih.gov)

[MSKCC.ORG](https://www.mskcc.org)

Licensed Practitioner Directories

[NCCAOM.ORG](https://www.nccaom.org)

[ASACU.ORG](https://www.asacu.org)

ANTI-INFLAMMATORY DIET LINKS

[AMERICAN INSTITUTE FOR CANCER RESEARCH](https://www.aicr.org)

[HARVARD](https://www.harvard.edu)

[FIND A REGISTERED DIETICIAN](#)



Music-Based Interventions

Music therapy is recommended by American Society for Clinical Oncology and the Society for Integrative Oncology for anxiety and mood disturbance for cancer patients.¹³ Music based interventions including playing or listening to music are known to engage the brain and have been increasingly used in neuro and cognitive rehabilitation settings. Intentionally listening to music can improve mood, emotional regulation, psychological outcomes, and cognitive outcomes. Listening to music can be relaxing, and is pleasurable for most people. Science has shown that listening to music can activate and engage the whole brain. It's possible that regular music listening serves as a form of attention training, and improving one's attention can be beneficial for other cognitive processes like remembering, multitasking, and processing information.¹⁴ Our lab has shown that regularly sitting and listening to music without lyrics improves cognitive functioning for cancer survivors. Music listening is accessible and low cost and don't require a lot of time, travel, or specialized instructions or training.

Music therapy may be even more advantageous for improving cognitive functioning. Music therapy involves working with a trained music therapist who asks you questions and tailors the therapy to your unique needs. A music therapy session could include listening to live or recorded music, singing, making music with simple instruments, moving to music, writing songs, or discussing what lyrics mean to you. You can search the American Music Therapy Association's online directory for a board-certified music therapist in your area.

Podcast: Music for Cancer Related Cognitive Functioning

[BREASTCANCER.ORG](https://www.breastcancer.org/podcasts/music-for-cancer-related-cognitive-functioning)



Playlists

[SOUNDCLOUD](#)

[SPOTIFY](#)

[PANDORA 1](#)

[PANDORA 2](#)

[PANDORA 3](#)



Compensatory Strategies to Cope with Cognitive Changes

Compensatory strategies are work arounds or detours for cognitive tasks. For example—if you used to be able to attend a meeting and remember all of the points you were going to make, and now you can't do that, instead you would make a list of the points you'd like to make and have it in front of you in the meeting to reference.

Other Examples Include:

- Using external aids (e.g., smart phones or day planners) to organize, keep track of to do lists, and set alarm reminders
- Breaking down tasks into smaller manageable steps
- Keeping a notebook handy to write things down as they come up or using voice recording functions on a smartphone
- Asking for feedback when talking with others, e.g. “Did I tell you this already?”
- Minimizing distractions in your work place – closing doors, turning off ringers and email when possible
- Repeating key points when talking with others to make sure you get the gist of what they are saying
- Being patient with yourself and allowing more time to complete tasks than you used to.



Healthcare Providers with Expertise in Cancer & Cognition

Many oncologists do not treat the cognitive side effects of treatment. Consider seeing one of the following healthcare providers for cognitive treatment.

- Neuropsychologist
- Cognitive Rehabilitation
- Occupational Therapist
- Speech Therapist
- Psychologist
- Integrative Medicine Practitioner
- Nutritionist/Dietician
- Nurse/Nurse Practitioner

Work Life After Cancer

Returning to work and performing like you did before your cancer treatment may seem daunting. There is a for great website available to assist cancer survivors/thrivers with this process.

[Work Life After Cancer](#)



Closing Remarks

When trying to self-manage your cognitive symptoms or deficits after cancer, there is no one size fits all approach. You will likely have to try a few of these options before finding which one (or combination of some) are the solution for you. We recommend picking a strategy that sounds fun or interesting and trying it out for a month or two. If you don't notice an improvement in your cognitive functioning, try another one for a month or two. You can always use compensatory strategies while you are "experimenting" on yourself.

The Henneghan Lab

At the Cognitive Health Initiative for Cancer Survivors, we seek to assess, identify, and improve cognitive outcomes for all cancer survivors. Cognitive changes can occur during and after receiving cancer treatment and can manifest as difficulties with paying attention, multi-tasking, prioritizing, word finding, memory, and processing speed. These changes often co-occur with unwanted psychological changes or increases in fatigue. Cognitive and psychological changes have devastating effects on the daily lives of cancer survivors.

Our research focuses on:

- Assessing the widespread impact cognitive changes have on cancer survivors in their everyday life.
- Determining which cognitive measures are most predictive of quality of life as well as social and occupational functioning.
- Developing integrative health interventions to improve biological and cognitive outcomes in cancer survivors.



Please follow The Henneghan Lab on social media or visit our website.

Website:
[The Henneghan Lab,](#)
[Cognitive Health Initiative for](#)
[Cancer Survivors](#)



[Facebook](#)



[Instagram](#)

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References

1. Fernandes HA, Richard NM, Edelstein K. Cognitive rehabilitation for cancer-related cognitive dysfunction: a systematic review. *Support Care Cancer*. 2019 Sep;27(9):3253-3279. doi: 10.1007/s00520-019-04866-2. Epub 2019 May 30. PMID: 31147780.
2. Bail J, Meneses K. Computer-Based Cognitive Training for Chemotherapy-Related Cognitive Impairment in Breast Cancer Survivors. *Clin J Oncol Nurs*. 2016 Oct 1;20(5):504-9. doi: 10.1188/16.CJON.504-509. PMID: 27668370.
3. Campbell KL, Zdravec K, Bland KA, Chesley E, Wolf F, Janelins MC. The Effect of Exercise on Cancer-Related Cognitive Impairment and Applications for Physical Therapy: Systematic Review of Randomized Controlled Trials. *Phys Ther*. 2020 Mar 10;100(3):523-542. doi: 10.1093/ptj/pzz090. PMID: 32065236; PMCID: PMC8559683.
4. Asher A, Van Dyk K, Patel SK, Newman R, Engle J, Hutchison N, Padgett L; Cognitive Rehabilitation Committee through the ACRM Cancer Rehabilitation Task Force. Cancer-Related Cognitive Changes. *Arch Phys Med Rehabil*. 2017 Dec;98(12):2595-2596. doi: 10.1016/j.apmr.2017.05.011. Epub 2017 Sep 12. PMID: 28985440.
5. Cheng ASK, Wang X, Niu N, Liang M, Zeng Y. Neuropsychological Interventions for Cancer-Related Cognitive Impairment: A Network Meta-Analysis of Randomized Controlled Trials. *Neuropsychol Rev*. 2022 Dec;32(4):893-905. doi: 10.1007/s11065-021-09532-1. Epub 2022 Jan 29. PMID: 35091967.
6. Cifu G, Power MC, Shomstein S, Arem H. Mindfulness-based interventions and cognitive function among breast cancer survivors: a systematic review. *BMC Cancer*. 2018 Nov 26;18(1):1163. doi: 10.1186/s12885-018-5065-3. PMID: 30477450; PMCID: PMC6260900.
7. Zhang Q, Gao X, Liu S, Yu L, Zhu J, Qiu S. Therapies for cognitive impairment in breast cancer survivors treated with chemotherapy: A protocol for systematic review. *Medicine (Baltimore)*. 2020 May;99(19):e20092. doi: 10.1097/MD.00000000000020092. PMID: 32384481; PMCID: PMC7440308.
8. Danhauer SC, Addington EL, Cohen L, Sohl SJ, Van Puymbroeck M, Albinati NK, Culos-Reed SN. Yoga for symptom management in oncology: A review of the evidence base and future directions for research. *Cancer*. 2019 Jun 15;125(12):1979-1989. doi: 10.1002/cncr.31979. Epub 2019 Apr 1. PMID: 30933317; PMCID: PMC6541520.
9. de Sousa TR, Mattos S, Marcon G, Furtado T, Duarte da Silva M. Acupuncture techniques and acupoints used in individuals under chemotherapy or radiotherapy treatment of cancer: A systematic review. *J Clin Nurs*. 2023 Jun 29. doi: 10.1111/jocn.16812. Epub ahead of print. PMID: 37382085.
10. Hsieh SH, Wu CR, Romadlon DS, Hasan F, Chen PY, Chiu HY. The Effect of Acupressure on Relieving Cancer-Related Fatigue: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Cancer Nurs*. 2021 Nov-Dec 01;44(6):E578-E588. doi: 10.1097/NCC.0000000000000997. PMID: 34380961.
11. Sun J, Zeng H, Pan L, Wang X, Liu M. Acupressure and Cognitive Training Can Improve Cognitive Functions of Older Adults With Mild Cognitive Impairment: A Randomized Controlled Trial. *Front Psychol*. 2021 Nov 17;12:726083. doi: 10.3389/fpsyg.2021.726083. PMID: 34867607; PMCID: PMC8635488.
12. Raghu SV, Kudva AK, Rao S, Prasad K, Mudgal J, Baliga MS. Dietary agents in mitigating chemotherapy-related cognitive impairment (chemobrain or chemofog): first review addressing the benefits, gaps, challenges and ways forward. *Food Funct*. 2021 Nov 15;12(22):11132-11153. doi: 10.1039/d1fo02391h. PMID: 34704580.
13. Lyman GH, Bohlke K, Cohen L. Integrative Therapies During and After Breast Cancer Treatment: ASCO Endorsement of the SIO Clinical Practice Guideline Summary. *Journal of oncology practice / American Society of Clinical Oncology*. 2018;14(8):495-499.
14. Henneghan AM, Becker H, Harrison ML, Inselmann K, Fico B, Schafer H, King E, Patt D, Kesler S. A randomized control trial of meditation compared to music listening to improve cognitive function for breast cancer survivors: Feasibility and acceptability. *Complement Ther Clin Pract*. 2020 Nov;41:101228. doi: 10.1016/j.ctcp.2020.101228. Epub 2020 Sep 11. PMID: 32949954; PMCID: PMC7704561.