

Understanding and Coping with Breast Cancer-Related Cognitive Changes

Lunch and Learn for the Breast Cancer Resource Center

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Research Focus:

My research is aimed at treating and
preventing cognitive and psychosocial
outcomes in cancer survivors.

Disclaimers

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Questions addressed in this presentation

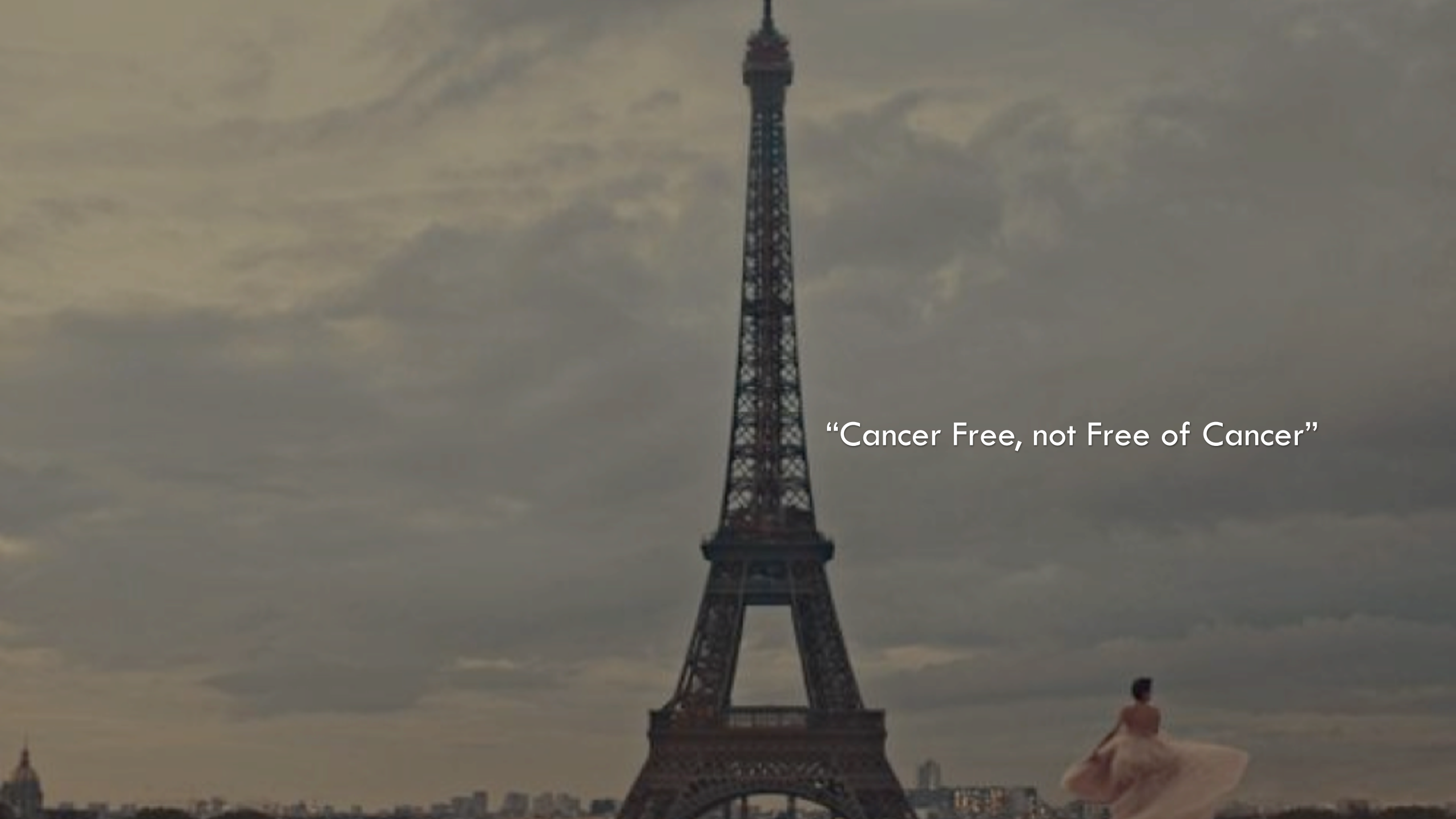


What are cancer related cognitive changes?
What causes cancer related cognitive changes?
What can I do to prevent or improve cognitive symptoms?

Cancer Survivors

- As of 2020:
 - Almost 17 million cancer survivors
 - 3.8 million breast cancer survivors (BCS)
 - 150,000 living with metastatic breast cancer
 - 64% > 65 years old
 - 7% < 50 years old



A full-page background image featuring the Eiffel Tower in Paris, France, under a dramatic, cloudy sky at dusk or dawn. In the lower right foreground, a ballerina in a long, flowing white tutu is captured in a graceful pose, her back to the camera. The overall mood is contemplative and artistic.

“Cancer Free, not Free of Cancer”

What are cancer-related cognitive changes?

Cognitive Domains

- Executive Functioning
- Verbal Fluency
- Memory
- Attention
- Processing Speed

One of the most distressing, disruptive, and potentially disabling treatment effects



Day-to-Day Examples

- Slower to think through issues and respond
- Difficulty keeping track of what you were doing or multi-tasking
- Feeling overwhelmed or bombarded with stimuli and/or emotions
- Difficulty analyzing a situation, planning a course of action, and carrying it out
- Forgetting _____ (fill in the blank)



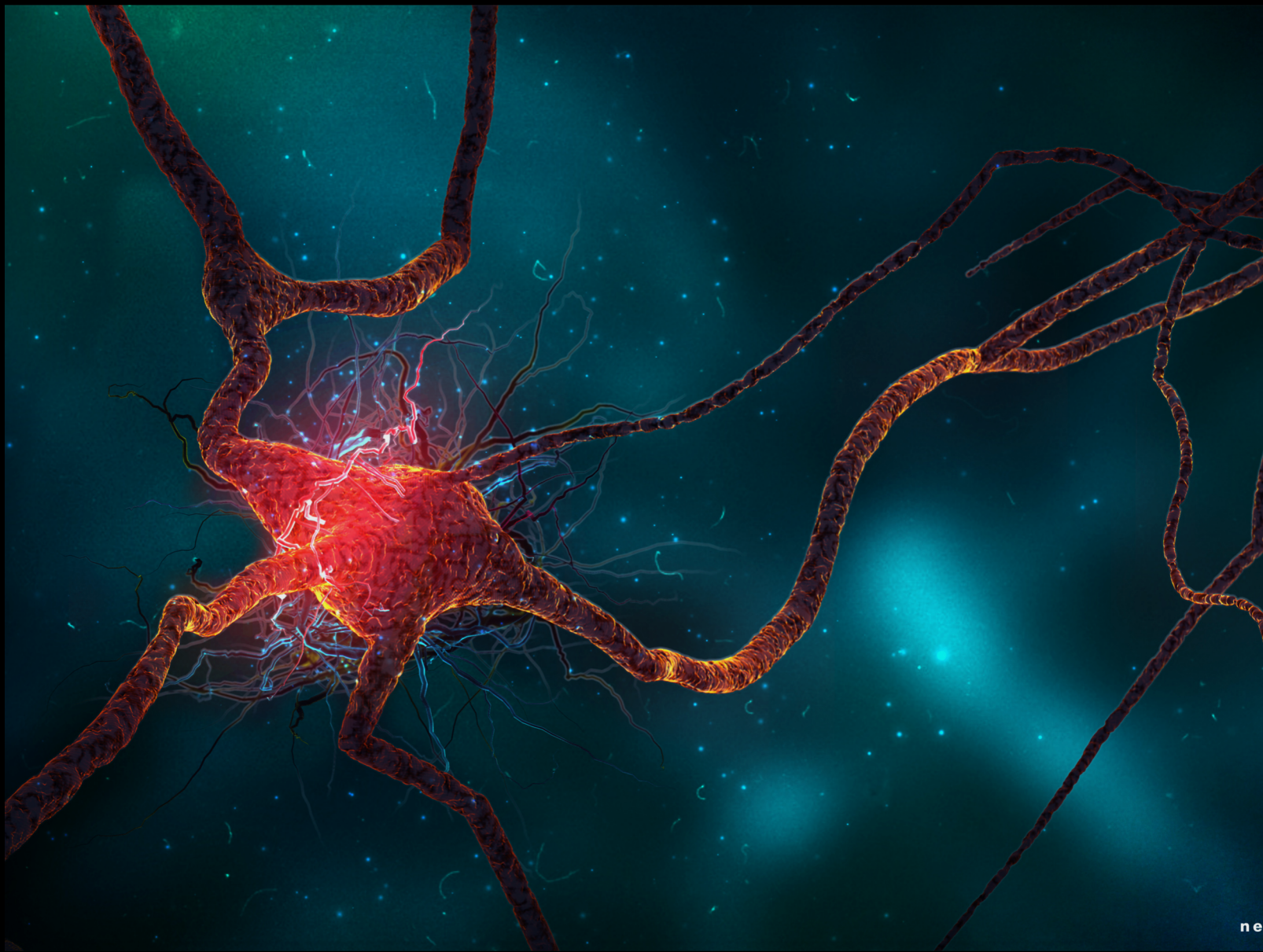
Statistics

- Approximately 1/3 prior to treatment
- Approximately 3/4 during treatment
- Approximately 1/3 after treatment
- Subtle or dramatic; temporary or permanent; stable or progressive
- Cognitive symptoms diminish for most

Intelligence

- Wisdom acquired over life is NOT affected by cancer
- Access Issue





What causes cancer-related cognitive changes?

Chemotherapy

Possible mechanisms:

- Direct neurotoxic effect through crossing the blood-brain barrier
- Inflammatory effects through cytokines and free radical production
- Brain-derived neurotrophic factor
- Tropomyocin-related Kinase Receptor-B

Radiation therapy

Possible mechanisms:

- Dysregulation of immune system through chronic oxidative stress and inflammation
- Changes in integrity of blood-brain barrier, oligodendrocyte function, microglia modulation and synaptic transmission

Immunotherapy

Possible mechanisms:

- Dysregulation of immune system through inflammatory mediators, cytokines and chemokines
- Direct effect on the brain through neuroinflammation

Targeted therapy

Possible mechanisms:

- Direct neurotoxic effect through crossing the blood-brain barrier
- Inhibition of vascular endocrine growth factor
- Chronic encephalopathy

Endocrine therapy

Possible mechanisms:

- Estrogen and androgen depletion
- Inhibition of neuronal growth and dendritic branching

Stem Cell Transplantation

Possible mechanisms:

- Total body irradiation
- Prolonged periods of myelosuppression
- Major complications (eg: Graft-versus-host disease)

Treatment-related factors

Interaction between treatment- and patient-related factors

Cancer-related
Cognitive Impairment

Modifiable/Lifestyle
factors (stress, loneliness,
sleep quality)

Patient-related factors

Systemic dysfunction

- General health status
- Organ dysfunction due to disease progression or/and treatment complications

Nutrition and fluid balance

- Micronutrient deficiencies
- Dehydration and electrolyte imbalance, especially in patients with advanced disease

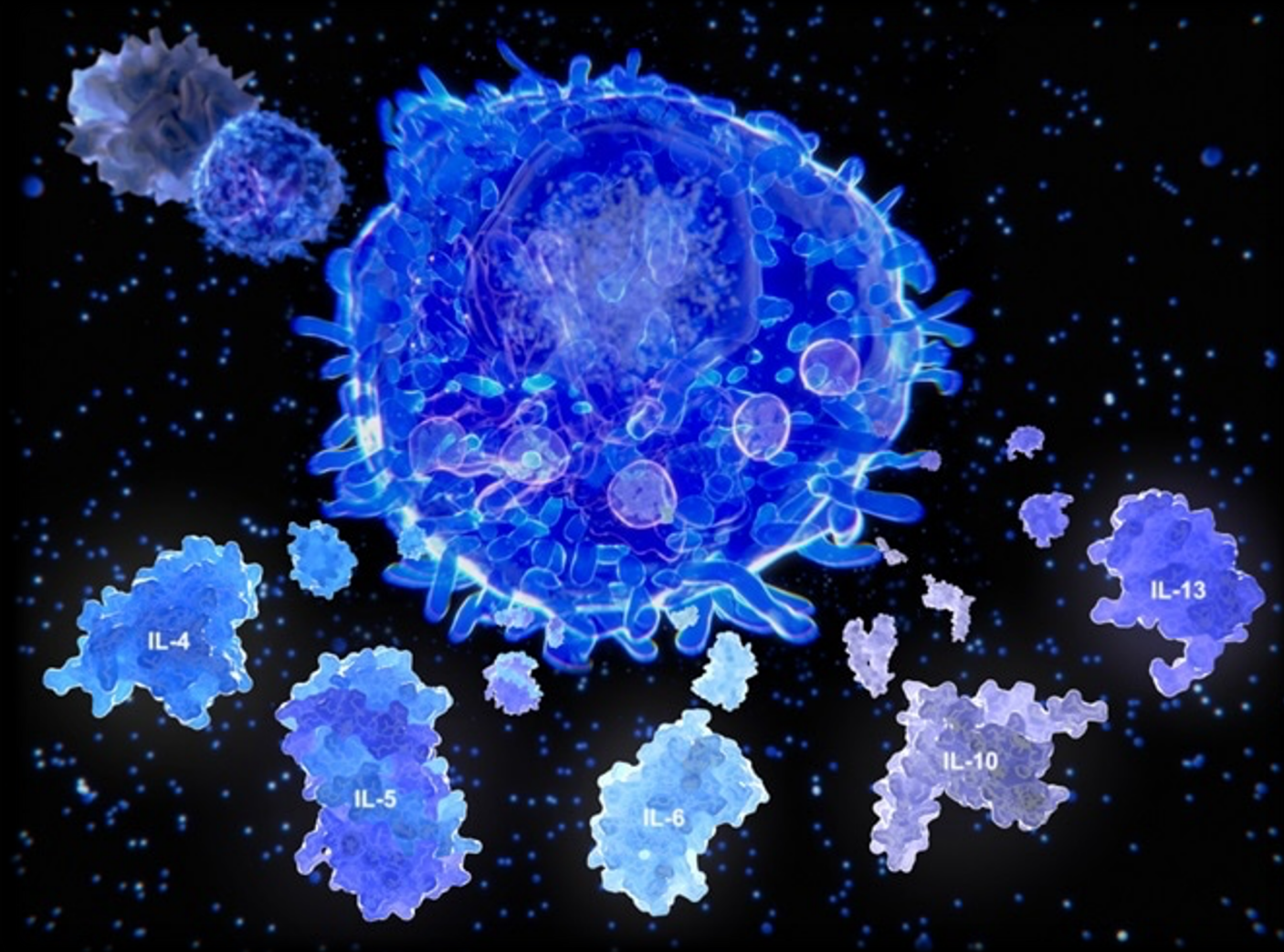
Anemia

- Low hemoglobin levels associated with tissue hypoxia and decreased oxygen delivery to brain

Genetic Predisposition

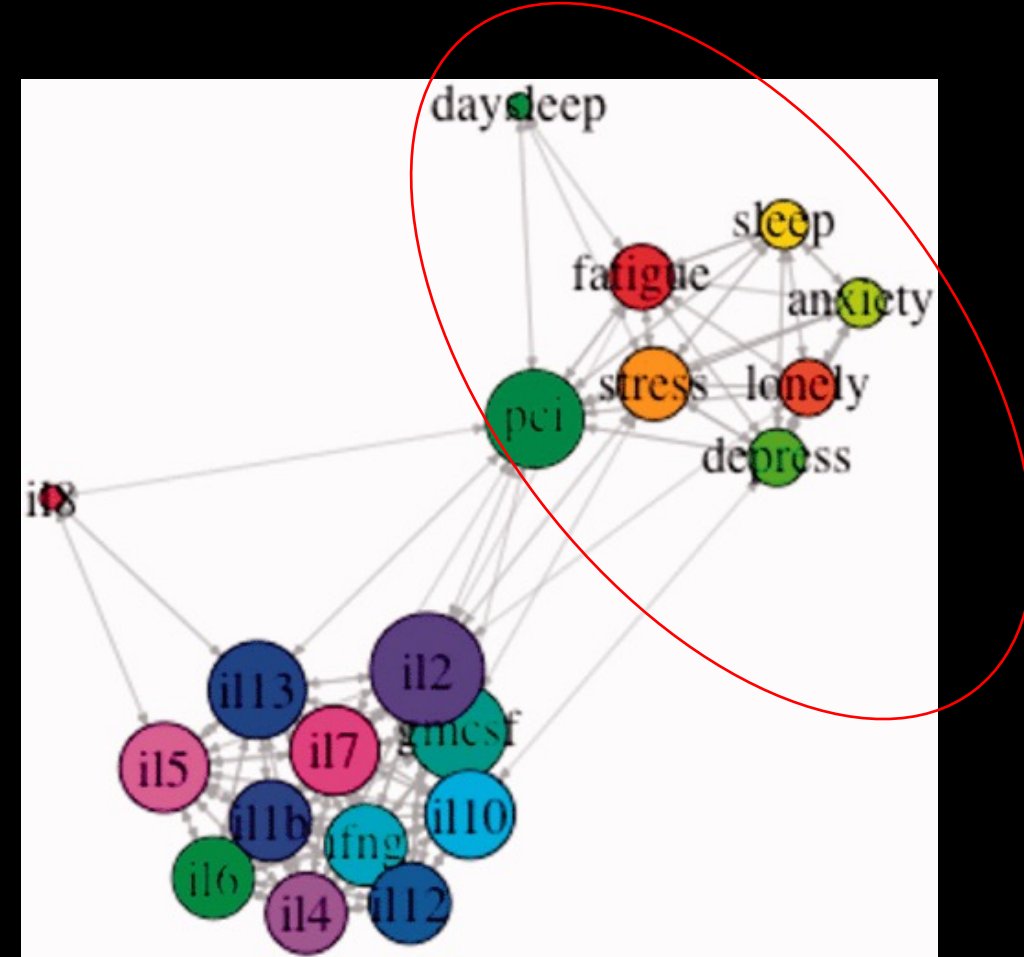
- Apolipoprotein E (APOE) gene
- Catechol-o-methyltransferase (COMT) gene
- Brain-derived neurotrophic factor (BDNF) gene

Inflammation and Cognitive Functioning



Distress and Cognitive Symptoms

- Same or different?
- Stigma
- Symptom cluster

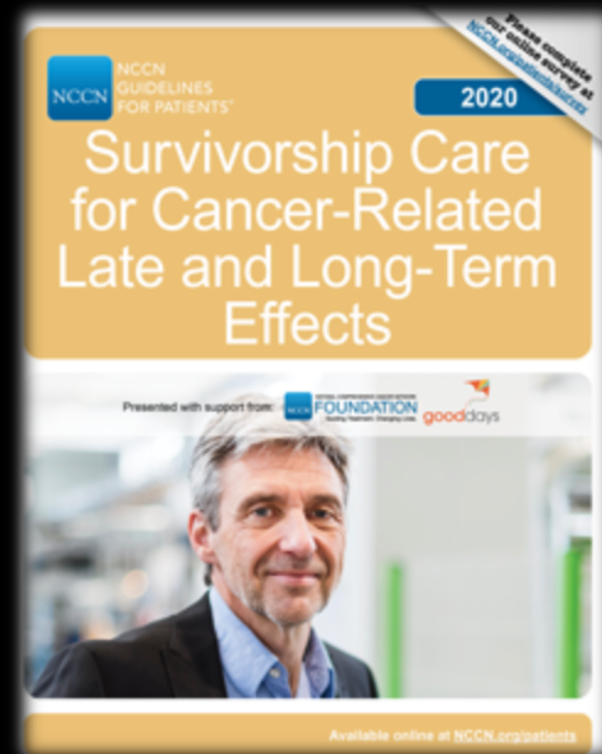




What can I do to improve my cognitive functioning?

Address Contributing/Treatable factors

- Pain
- Sleep
- Fatigue
- Depression
- Medication/Supplements



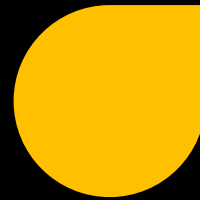
<https://www.nccn.org/patients/guidelines/content/PDF/survivorship-crl-patient.pdf>

Evidence Based Self Management Strategies



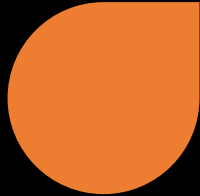
Meditation/Stress Reduction

Most supporting evidence



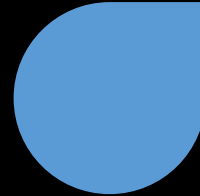
Nutritional/Dietary Changes

New area of research



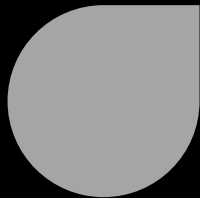
Cognitive Training/ Cognitive Therapy

Many types



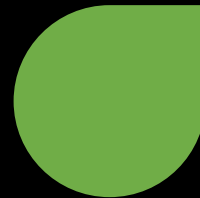
Yoga, Qigong, Accupressure

Some evidence



Exercise

Cardio most helpful



Music based interventions

New area of research



Health Care Experts

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

IMPROVING COGNITION WITH MUSIC AND MEDITATION AFTER BREAST CANCER: A PILOT STUDY

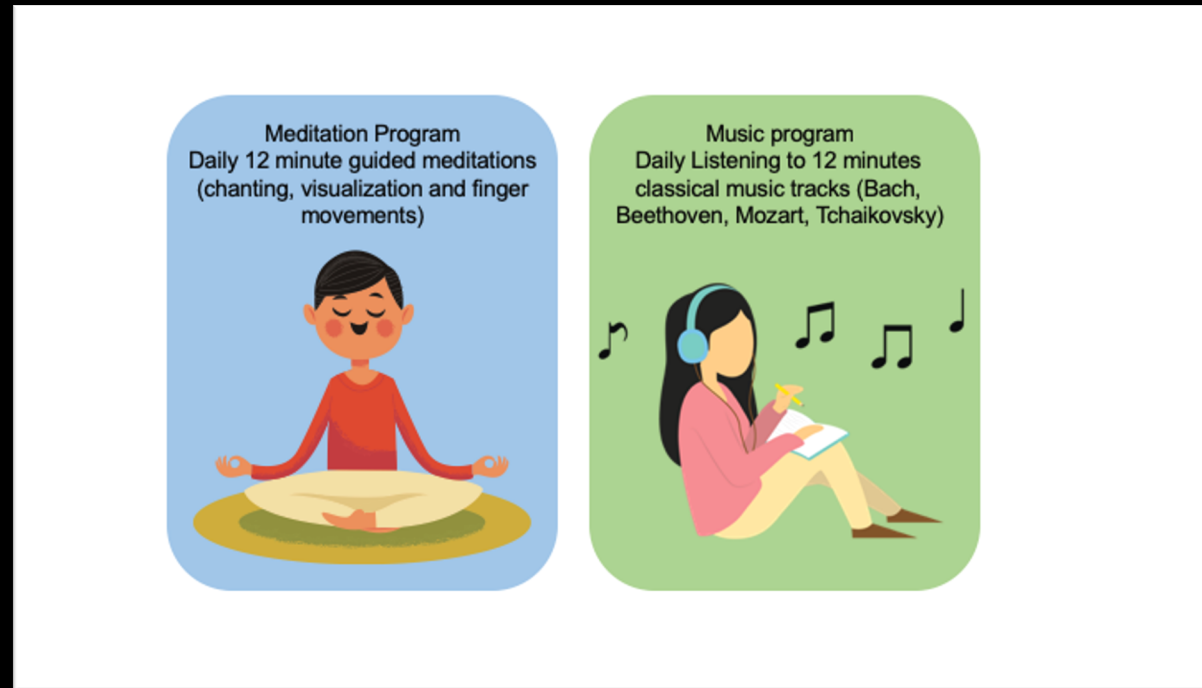


Henneghan AM, Becker H, Harrison ML, et al. A randomized control trial of meditation compared to music listening to improve cognitive function for breast cancer survivors: Feasibility and acceptability. *Complementary therapies in clinical practice*. 2020;41:101228.

Henneghan AM, Becker H, Phillips C, Kesler S. Sustained effects of mantra meditation compared to music listening on neurocognitive outcomes of breast cancer survivors: A brief report of a randomized control trial. *J Psychosom Res*. 2021;150:110628.

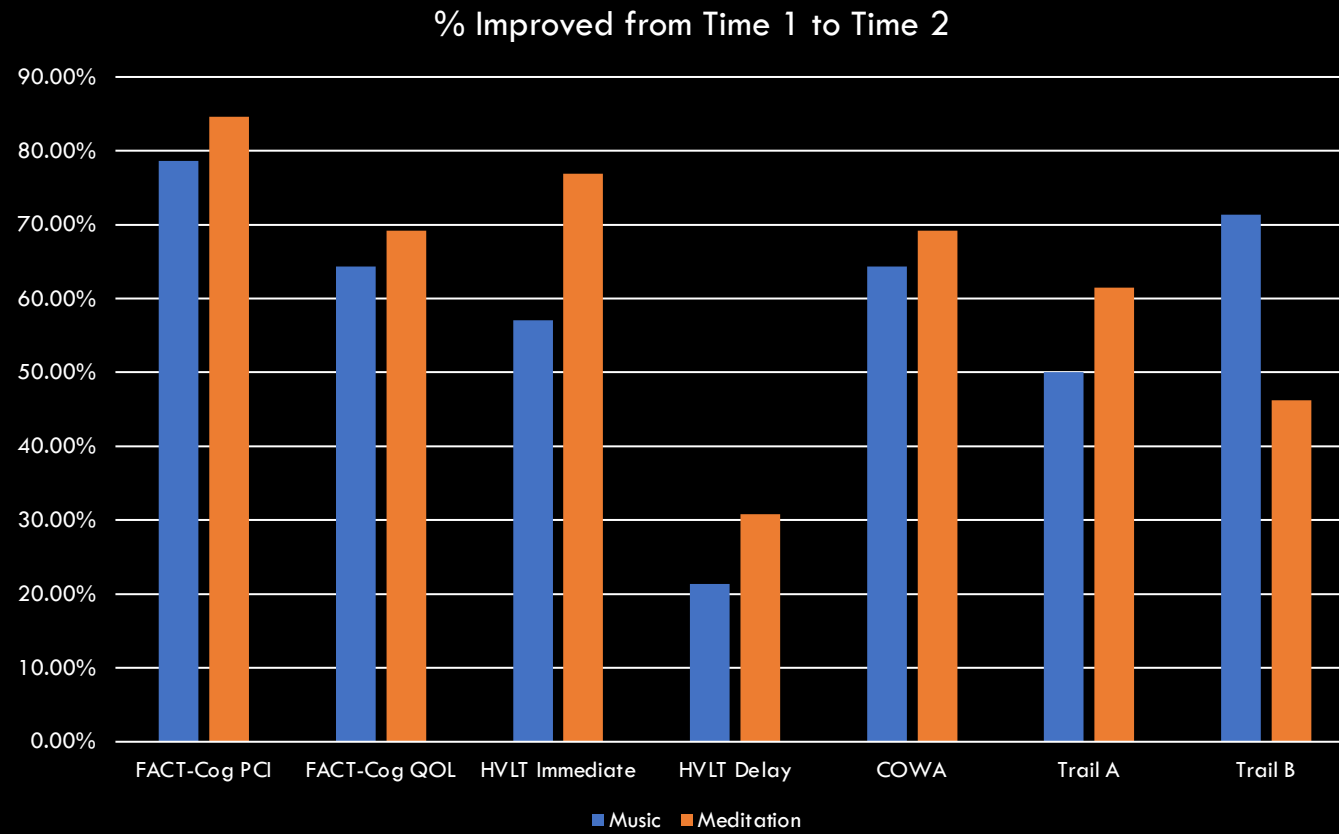
Henneghan AM, Fico BG, Wright ML, Kesler SR, Harrison ML. Effects of meditation compared to music listening on biomarkers in breast cancer survivors with cognitive complaints: secondary outcomes of a pilot randomized control trial. *Explore*. 2021.

Intervention Programs

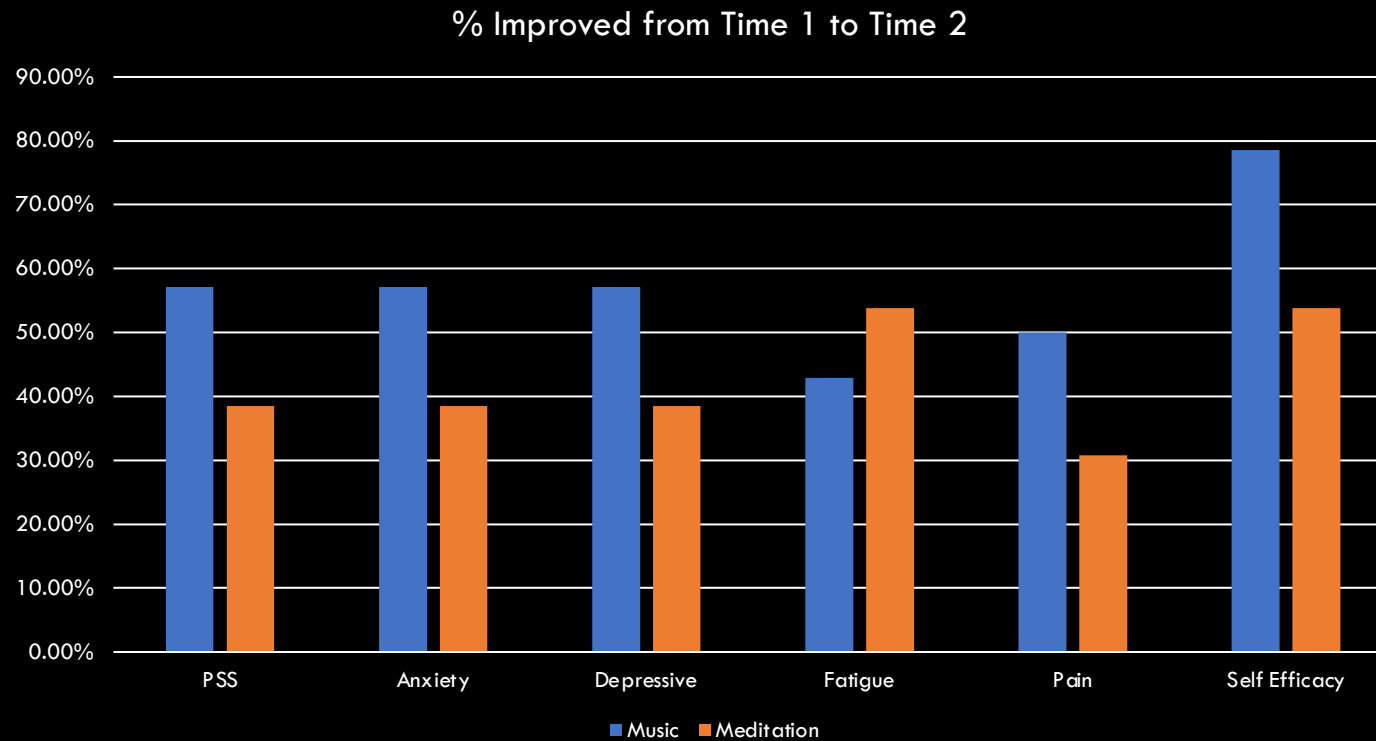


<https://alzheimersprevention.org/research/12-minute-memory-exercise/>

Cognitive Outcomes



Other Patient Reported Outcomes



Work and Home Life

- Independence
- Shame
- Isolation
- Family/ friends' reactions
- Job performance

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Once your cancer treatment is complete or nearing completion and you've been cleared to return to work, at least part-time, more challenges await. Find out what you need to know about how your cancer history may affect you on the job and how to take full advantage of the protections afforded you under the law.

EASING BACK INTO THE ROUTINE

If you can set the tone as a relaxed, confident cancer survivor, chances are those around you may be less uptight, too. If you can see your return to work as a major step forward in your recovery, that will affect your attitude in the most positive way, too.

After your medical leave is over, gear up for the next challenge: making your re-entry to your job as comfortable as possible. For cancer survivors, returning to work often brings mixed emotions: relief, trepidation, hope -- and perhaps awkwardness. Even if you are sure you're ready to return, you may worry: Will you encounter skepticism or support? That depends partly on how you approach the situation, experts say. Here are some suggestions for smoothing the transition from cancer patient back to valued employee.

FOLLOW YOUR STYLE

If you're naturally talkative and share information easily, you'll probably want to update co-workers and your boss on your recovery. If you're more private, just tell everyone you're doing fine and let it go at that. (You can expect your supervisor to honor your requests for confidentiality.) How much you divulge can also depend on the work environment and



NEED TIPS ON GETTING BACK TO WORK?

Ask one of our Career Coaches
for personalized advice!

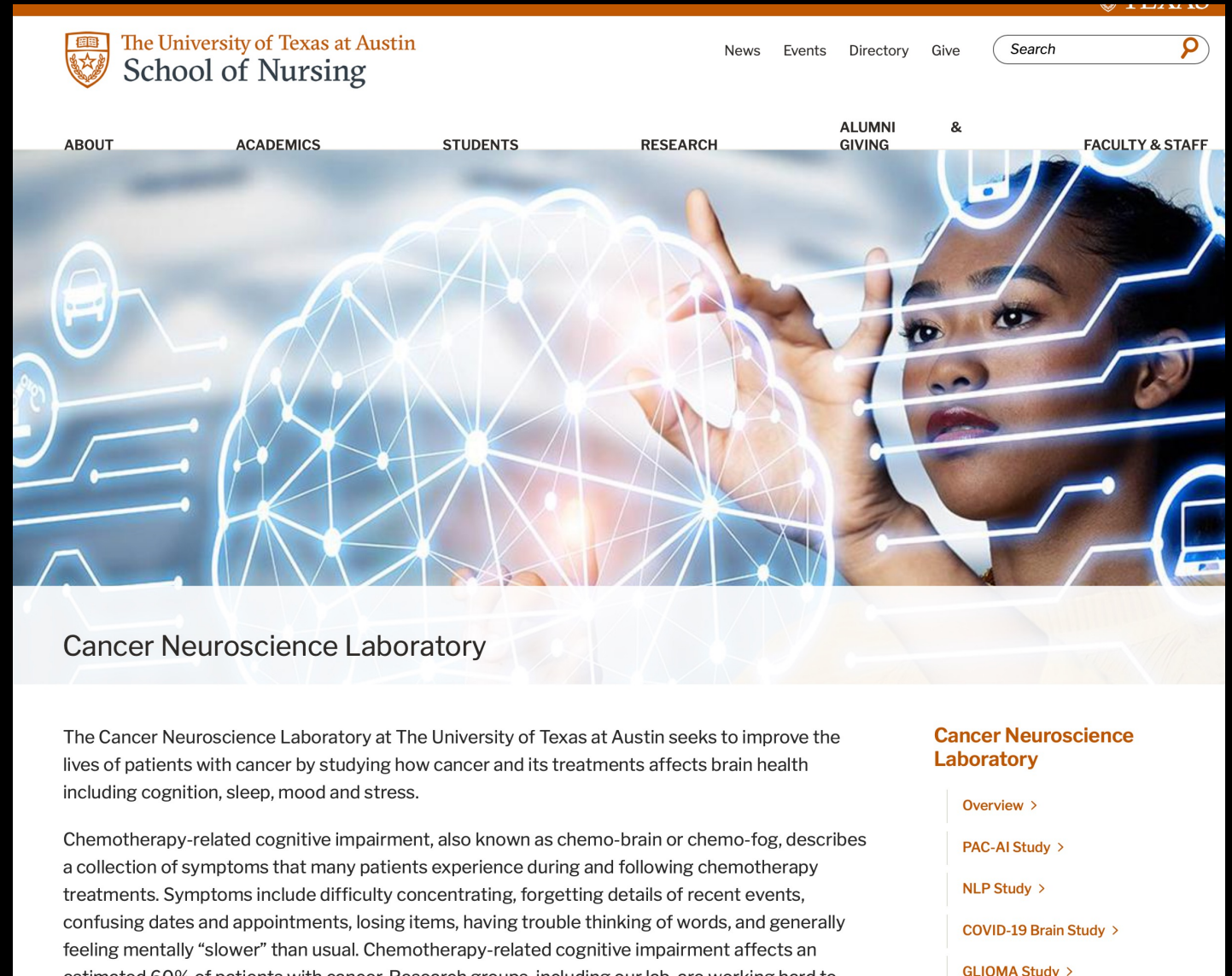
[Visit Ask a Career Coach](#)

Connect with us!

Will be enrolling for studies in 2022!

Email me to be added to our study information email list: ahenneghan@utexas.edu

PDF of this presentation available upon request.



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Cancer Neuroscience Laboratory

The Cancer Neuroscience Laboratory at The University of Texas at Austin seeks to improve the lives of patients with cancer by studying how cancer and its treatments affects brain health including cognition, sleep, mood and stress.

Chemotherapy-related cognitive impairment, also known as chemo-brain or chemo-fog, describes a collection of symptoms that many patients experience during and following chemotherapy treatments. Symptoms include difficulty concentrating, forgetting details of recent events, confusing dates and appointments, losing items, having trouble thinking of words, and generally feeling mentally “slower” than usual. Chemotherapy-related cognitive impairment affects an estimated 60% of patients with cancer. Research groups, including our lab, are working hard to

Cancer Neuroscience Laboratory

- Overview >
- PAC-AI Study >
- NLP Study >
- COVID-19 Brain Study >
- GLIOMA Study >

Questions



Answers

Metastatic Breast Cancer

- Very understudied, almost always excluded
- Additional treatments to consider:
 - CDK4/6 inhibitor, everolimus or a PI3K inhibitor (with hormonal therapies)
 - virtually no research on cognitive effects of these drugs in BC treatment
 - Apatinib (which may be given with certain chemo drugs or hormone therapy) or ado-trastuzumab emtansine (Kadcyla), when HER2 positive
 - Targeted drug called a PARP inhibitor, such as olaparib or talazoparib for HER2 negative
 - Alpelisib is a targeted drug known as a PI3K inhibitor that can be used along with fulvestrant to treat postmenopausal women with advanced hormone receptor positive breast cancer
 - one trial reported no difference in cognitive functioning when alpelisib was added to fulvestrant regimen
- 20% of triple negative cancers can be treated with immunotherapy drug atezolizumab (Tecentriq)+ chemo
 - a couple of trials have included some questions about cognitive function and atezolizumab does not seem to make cognitive functioning worse than chemo alone