Fatigue and Cognitive Changes in Cancer Survivorship: Two Sides of the Same Coin?

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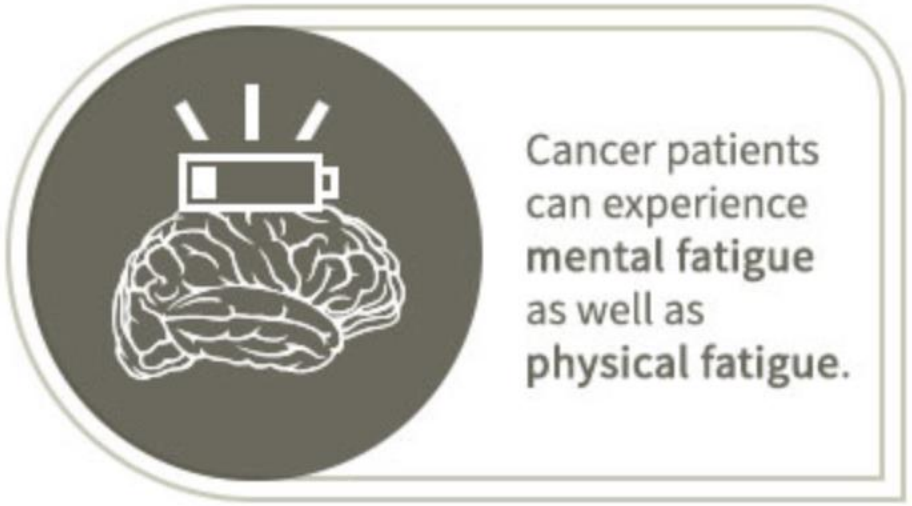
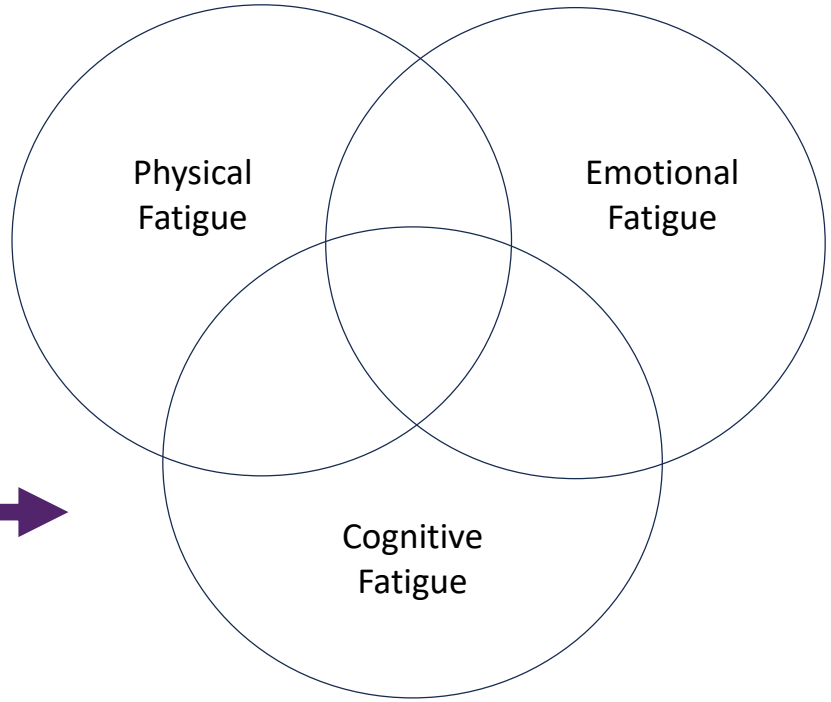
June 7, 2025 – 19th Annual Moving Beyond Cancer to Wellness

UW Medicine
DEPARTMENT OF REHABILITATION MEDICINE

What is cancer-related fatigue?

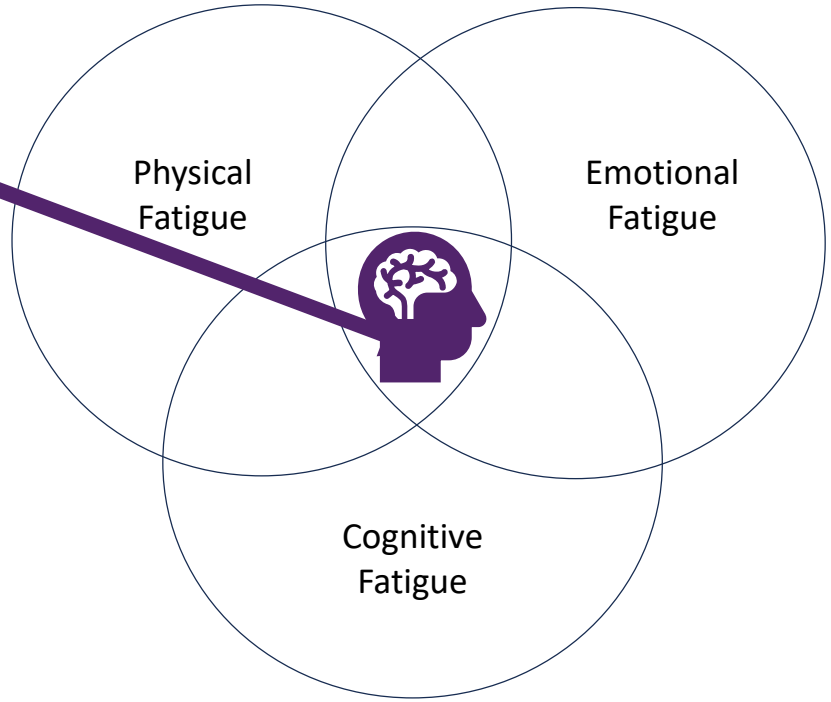
NIH NATIONAL CANCER INSTITUTE
Division of Cancer Prevention





What is cancer-related fatigue?

- **Cancer-related fatigue** is a physical, emotional, and mental feeling of tiredness or exhaustion in someone with cancer, that doesn't improve with rest



American Cancer Society; 7/16/2024

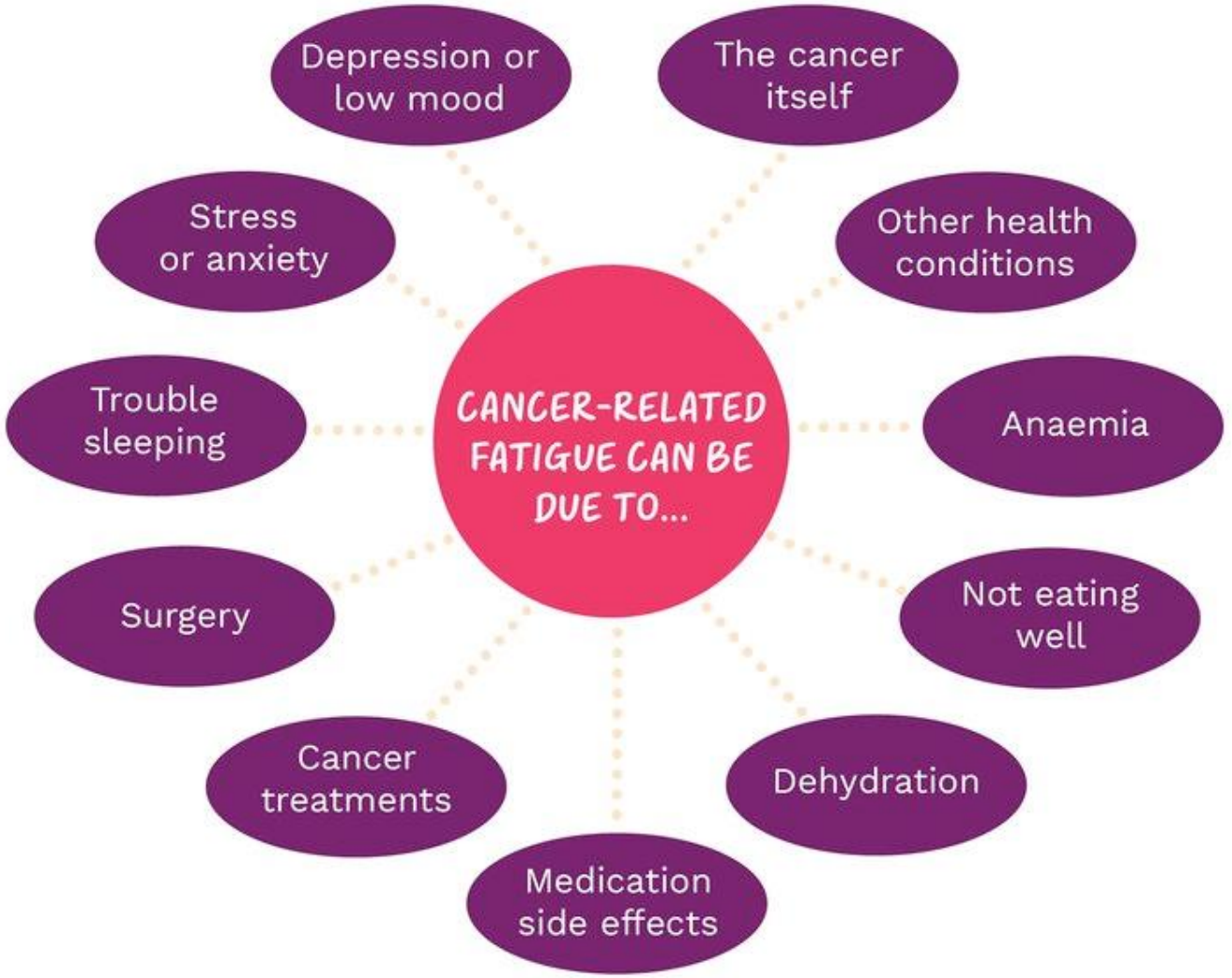
Our brain is very active – even at rest.

- Our brain uses 20% of resting metabolic energy (brain = 2% of our body weight)
- Demanding thinking tasks increase brain energy by ~ 5%

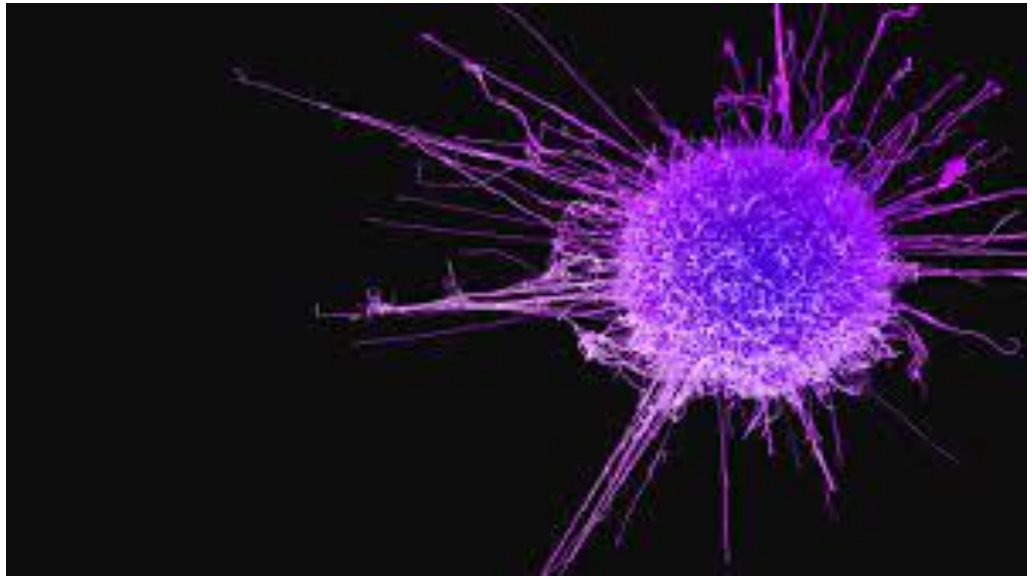
In cancer survivorship, cognitive functioning and fatigue are closely related

Jamadar et al., 2025; Trends in Cognitive Sciences

Contributors to Fatigue in Cancer

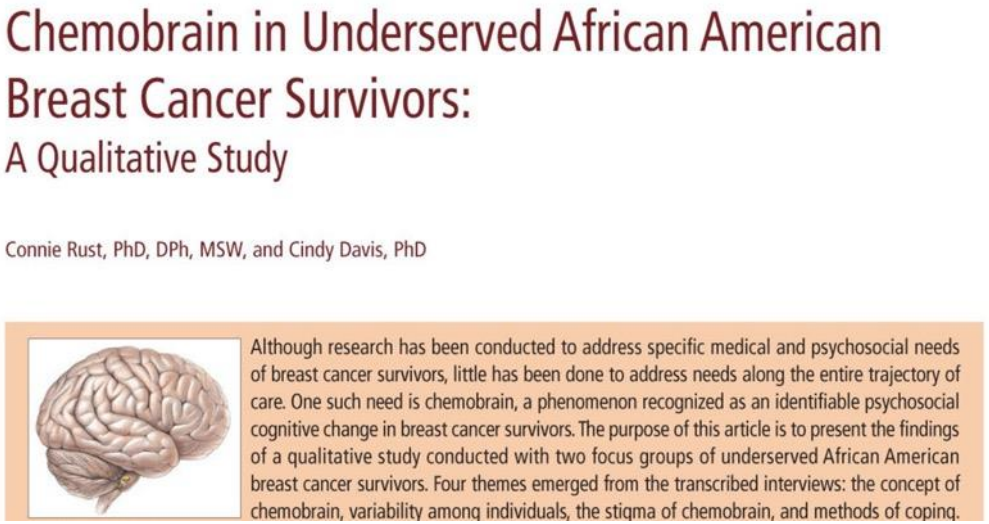


Effects of Cancer and Treatment on Cognitive Functioning



What is “Chemobrain?”

- *“Fogginess,” “forgetfulness,” “going blank”*
- *“Why am I not doing it the way and as quickly as before?”*
- *“… when driving, I couldn’t remember if I am supposed to turn or not.”*



Chemobrain in Underserved African American Breast Cancer Survivors:
A Qualitative Study

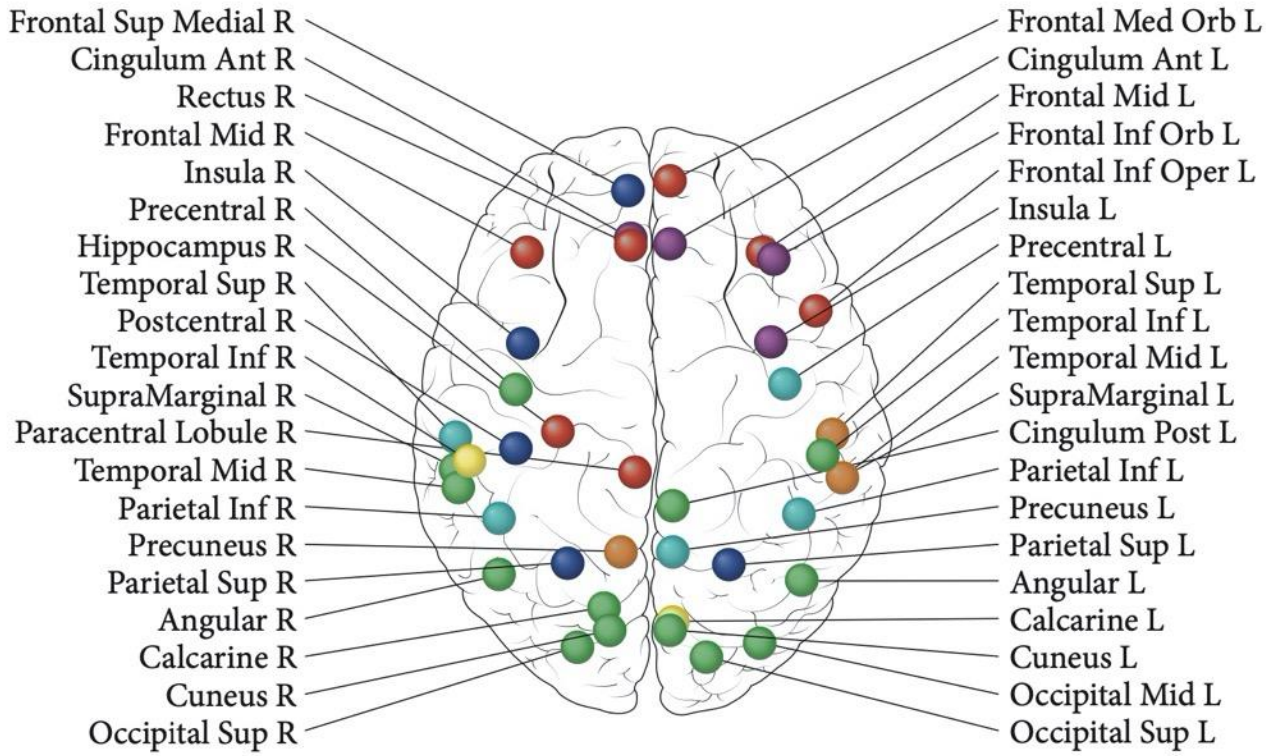
Connie Rust, PhD, DPh, MSW, and Cindy Davis, PhD

Although research has been conducted to address specific medical and psychosocial needs of breast cancer survivors, little has been done to address needs along the entire trajectory of care. One such need is chemobrain, a phenomenon recognized as an identifiable psychosocial cognitive change in breast cancer survivors. The purpose of this article is to present the findings of a qualitative study conducted with two focus groups of underserved African American breast cancer survivors. Four themes emerged from the transcribed interviews: the concept of chemobrain, variability among individuals, the stigma of chemobrain, and methods of coping.

- *“You backtrack. I forget where I put things.”*
- *“The other day I asked my son, “Where is my telephone?” and I was talking on it!”*

Rust & Davis, 2013; J Oncol Nursing

Neuroimaging: Chemotherapy Can Impact Both Brain Structure and Function

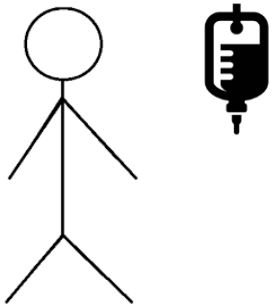


- **Problem**: Some cognitive concerns reported by patients are not seen on cognitive testing or appreciated by others

Lange et al., 2019; Annals of Oncology

Cognitive Dysfunction After Chemotherapy?

Twin A = Cancer + Chemotherapy

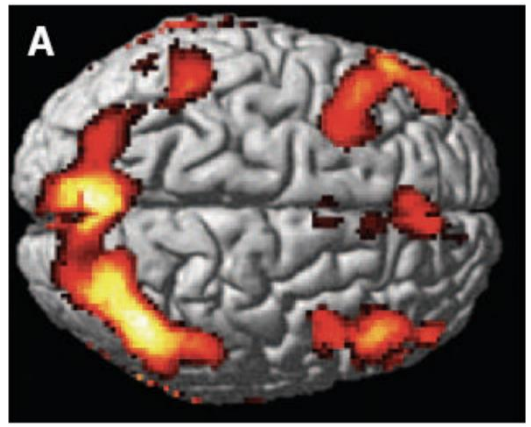


Cognitive Concerns?

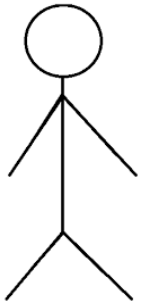
YES

Performance on Cognitive Testing

"Normal"



Twin B = No Cancer, No Chemotherapy

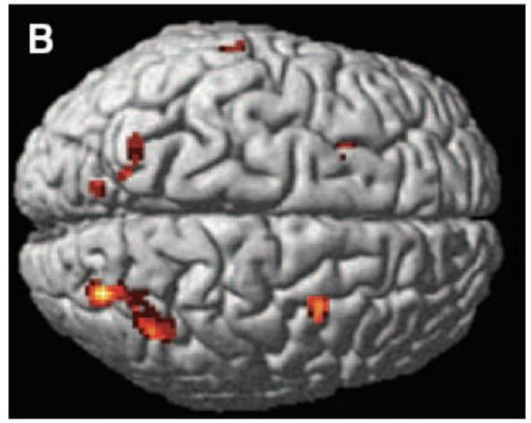


Cognitive Concerns?

NO

Performance on Cognitive Testing

"Normal"



Ferguson et al., 2007; J Clin Oncol

Nature and Course of Chemotherapy-Related Cognitive Impairments

- Generally **mild** cognitive weaknesses
  - Can affect everyday functioning (work, education, etc.)
- Usually resolve within 1 year
  - For some cancer survivors, mild cognitive changes may persist for years (or possibly decades)

What is cancer-related cognitive dysfunction?

Learning & Memory Retrieval

Remembering items on a shopping list

Speed of Mental Processing

Keeping up with conversations

Attention / Concentration

Maintaining attention

Executive Functions

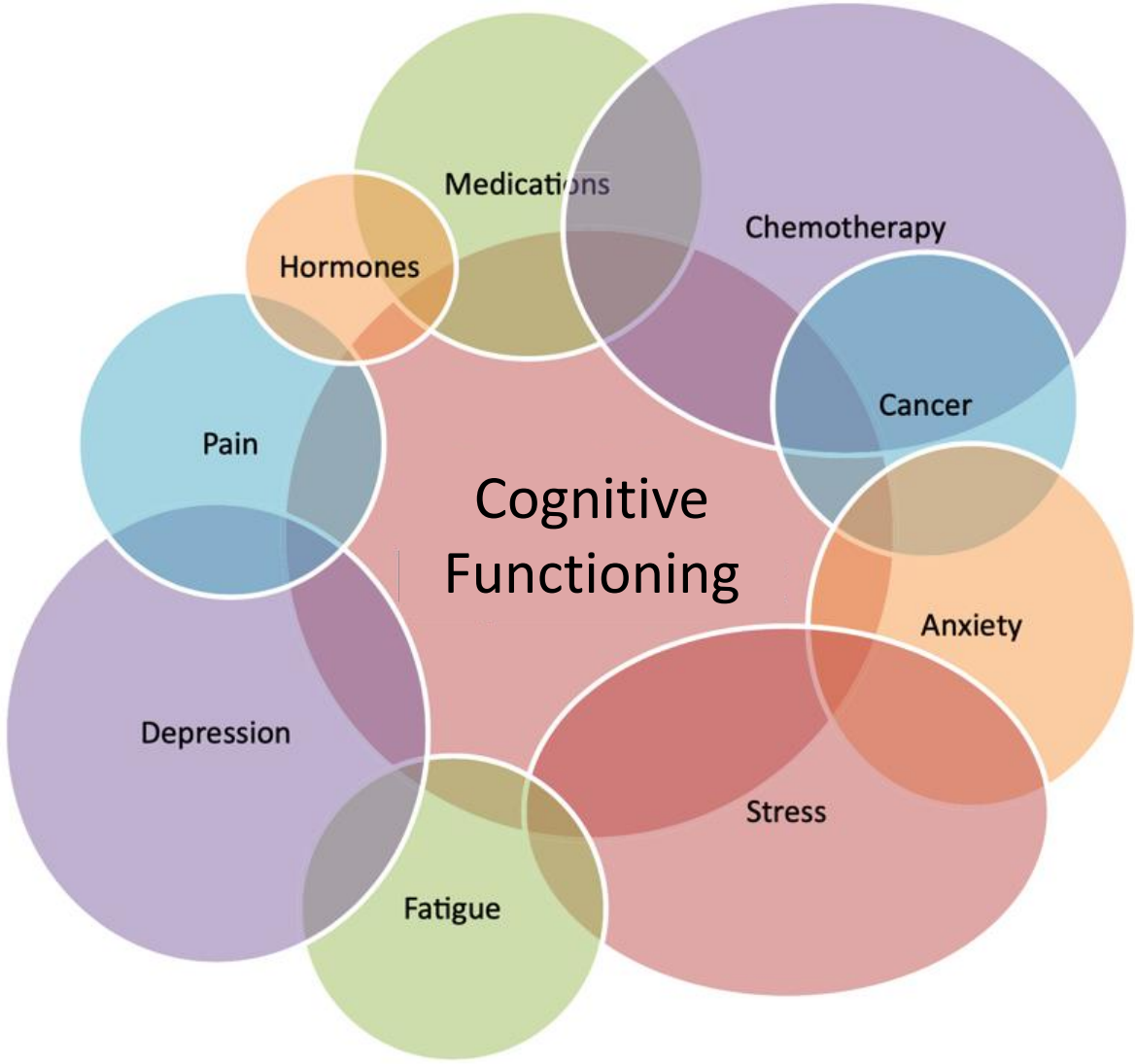
<u>Switching</u> between cooking and talking with a family member

Problem Solving

Organization and Planning

Lindner et al., 2014; Neuropsychology
Hodgson et al., 2013; Cancer Treat Review
Vardy et al., 2015; J Clin Oncol

Fatigue is Not the Only Factor that Impacts Cognitive Functioning



Vannorsdall, 2017; Med Clin North Am

Management Strategies for Cognitive Changes and Fatigue

Managing Fatigue

- ***Consistent p*hysical activity: strongest evidence for cancer-related fatigue**

- **Pacing: Follow the clock, not your body, for breaks**
  - Even if your body is not tired, take regular breaks to minimize impacts of fatigue

Managing Fatigue: Consistent Physical Activity

- **After cancer and cancer-related fatigue, the mindset that "more is better" can exacerbate fatigue**
  - On your best energy days: Do not go above set goals, even if you feel you have enough energy
  - On your worst energy days: Try to meet some level of activity

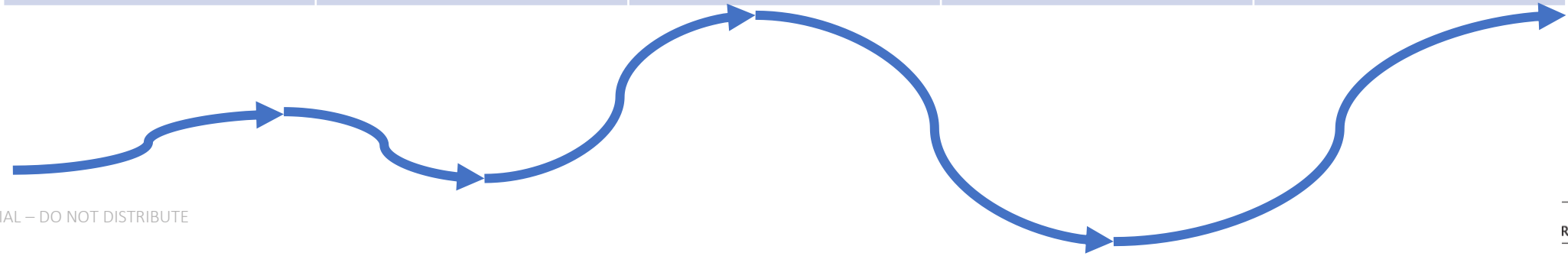
- **Use the "75% rule" for setting activity goals**
  - Typical Day Ability= 20-minute walk daily
  - Goal = 15-minute walk daily (75%)

Slide Credit: Hanna Hunter, MD

INconsistent Physical Activity Example

- **Example:** Charlene has set a goal to walk 20 minutes daily, which is about her maximum amount of energy most days

Monday	Tuesday	Wednesday	Thursday	Friday
Charlene walks 20 minutes	Charlene is tired from Monday, decides to walk only 10 minutes	Charlene walks 20 minutes, but feels great and walks an additional 15 minutes	Charlene is exhausted, decides to take a day off	Charlene walks for 30 minutes to make up for missing Thursday



Consistent Physical Activity Example

- **Example:** Charlene has set a goal to walk 15 minutes daily

Monday	Tuesday	Wednesday	Thursday	Friday
Charlene walks 15 minutes	Charlene walks 15 minutes	Charlene walks 15 minutes	Charlene walks 15 minutes	Charlene walks 15 minutes

What physical activities are helpful for fatigue?

- Evidence-based activities include aerobic exercise, resistance exercise, or a combination
  - Aerobic: walking, running, cycling, swimming
  - Resistance: dumbells, resistance bands, etc.
  - Mindfulness-based Exercises: Yoga, Tai Chi

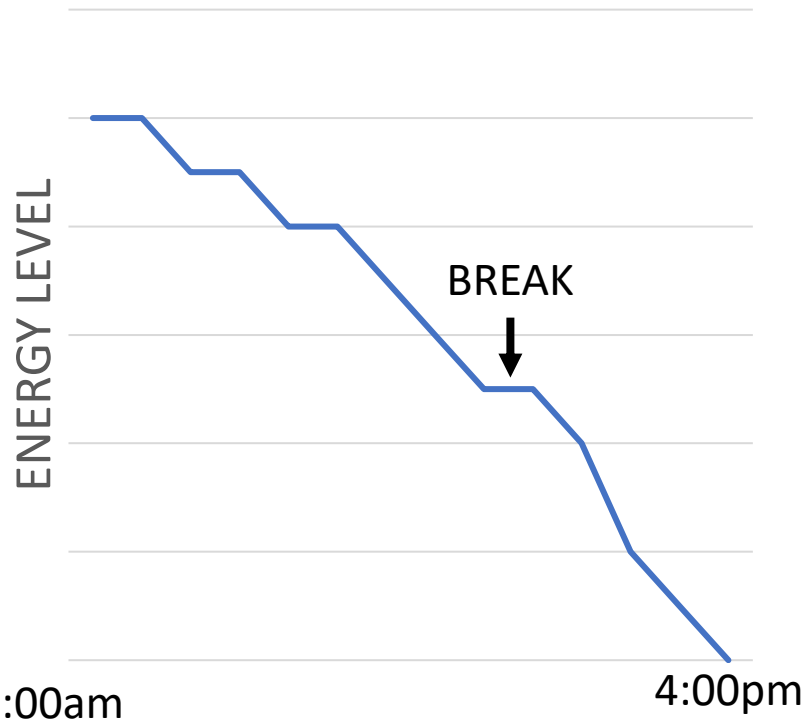
- Improves self-reported cognition and quality of life in cancer survivors
- Improves processing speed impairments in breast cancer survivors
- Reduces risk of cognitive declines in aging older adults without cancer

Korstjens et al., 2006
Hartman et al., 2018
Iso-Markuu et al., 2024
Mustian et al., 2013

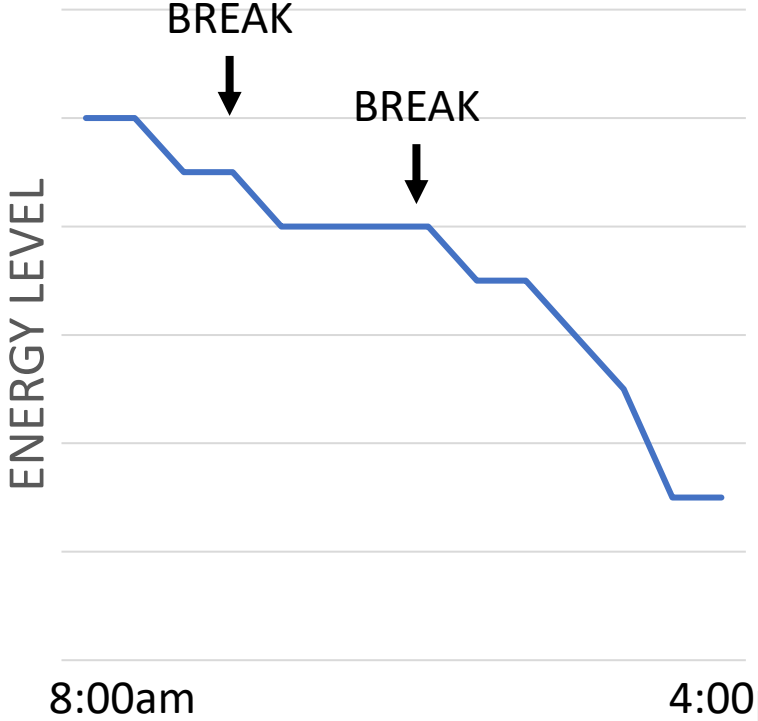
What is pacing?

- Taking a break before your body/brain has notable fatigue

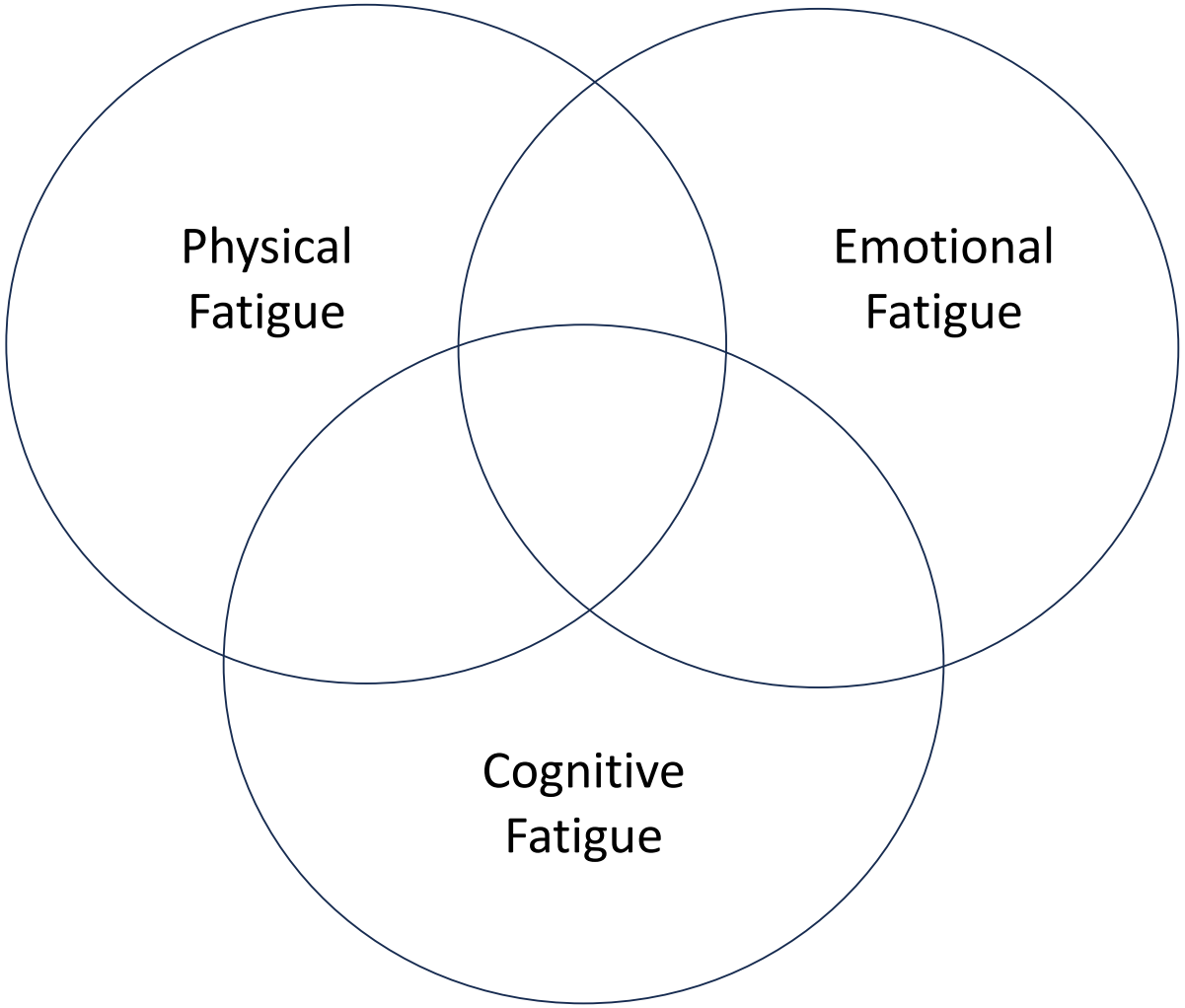
Not Pacing



Pacing



Managing Cancer-related Fatigue: Other Strategies



Managing Factors that Impact Cognitive Functioning

Your brain is like a cup

Water = information your brain is managing daily

Ice cubes = distractors (e.g., stress, fatigue, pain)

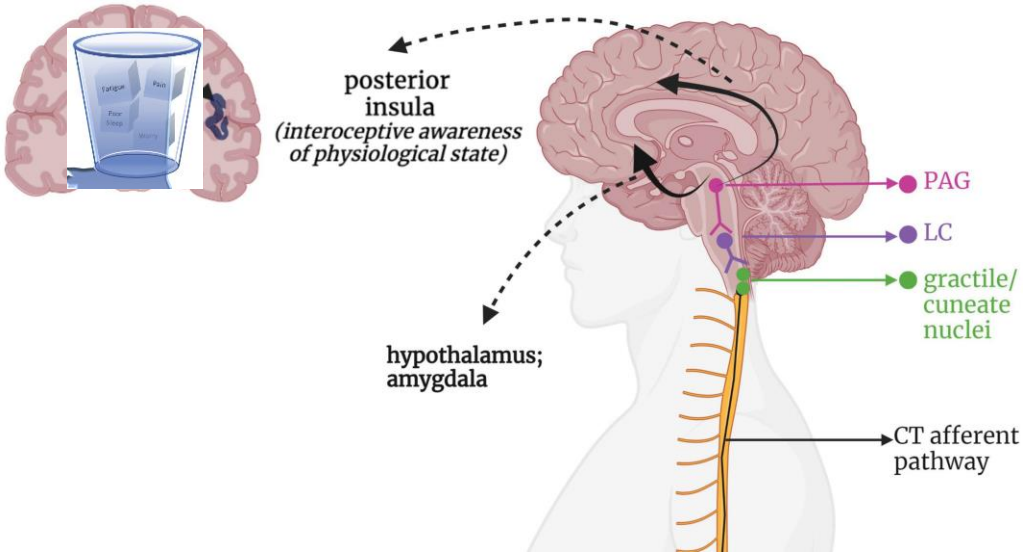
Ice cube distractors take up cognitive energy that our brain cannot use for more important daily functioning tasks.

Credit: Brett Parmenter, PhD & Kati Pagulayan, PhD

Behavioral Management of Mood and Stress

Behavioral stress management

- Diaphragmatic breathing, paced breathing, etc.
- Meditation
- Mindfulness
- Yoga
- Physical activity
- Additional treatment of mood (example: Cognitive-Behavioral Therapy)

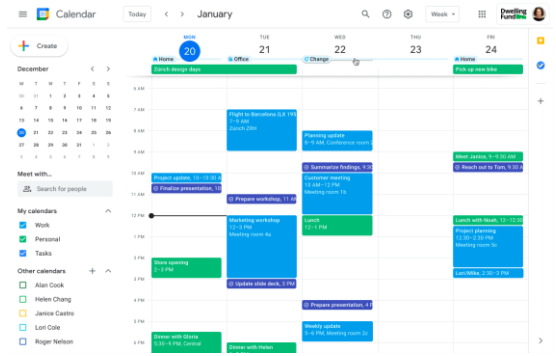


Strategies to Manage Cognitive Dysfunction

- Look for your own patterns in thinking lapses (journals/diaries can help identify patterns)
  - Consider tracking fatigue (0-10 scale) to see if lapses occur with worsened fatigue

External Compensatory Strategies

- Use a list or memory notebook
  - Use a single system. Multiple lists increase multitasking.
- Use an organizer or planner
  - Find a time each day to review schedule and prioritize tasks or adjust schedule.
- Use a wall calendar
  - Some people prefer this. Put it in an obvious place.



External Compensatory Strategies

- Use alarms or electronic calendar to cue memory
- Central hub / memory station for essential items (keys, phone)
- Pillbox for organizing medications
- Minimize distractions during important tasks

Fatigue/Cognitive Rehabilitation Strategies

1. **Start using a single to-do list, even if you have no problems remembering completing tasks**
   - This is a fatigue management strategy by reducing brain energy used to track information

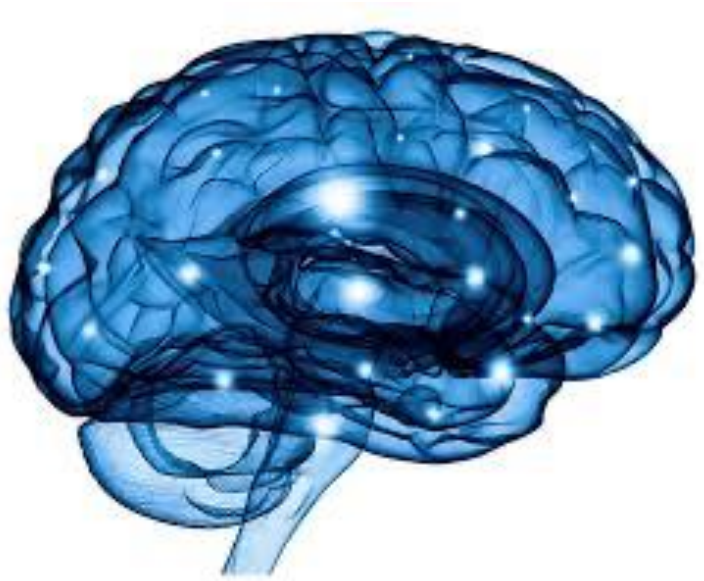
2. Set aside 5-minutes each day to review your list, even if you already know everything you have to do that day

3. Set aside 20 minutes each week to review your upcoming week

Sleep Hygiene

- Keep a consistent schedule
- Give yourself 20-30 minutes to fall asleep, then get out of bed to perform a quiet activity in low light. Return to bed when sleepy and repeat as needed.
- Nap or not to nap?
  - Sleep is like a hunger—eating a snack before a big meal can impact our appetite
- Minimize caffeine use in afternoon/evening, avoid alcohol before bedtime, turn off electronics 30 minutes before bed

Where to Start: Supporting Fatigue and Cognitive



- Set an achievable goal for daily physical activity using the 75%; Example: walking 20-minutes each day
- Set an alarm to take a 10-minute break twice per day to give your brain a rest and minimize fatigue
- Start a to-do list notebook, and set an alarm to review this each morning or afternoon
- Practice diaphragmatic breathing once daily for 5-minutes
- Keep a journal/diary of cognitive lapses and fatigue

Additional Steps to Address Fatigue Cognitive Difficulties

- **Work with medical team to treat risk factors for cognitive decline and fatigue**
  - Anemia, sleep apnea, high blood pressure, high cholesterol, diabetes, thyroid dysfunction
- **Talk with your doctor about additional workup**
  - This could include meeting with a neuropsychologist to further assess thinking skills, or referral to rehabilitation to identify specific physical activity goals

Resources: Fatigue in Cancer Survivorship

- **National Cancer Institute**
  - https://www.cancer.gov/about-cancer/treatment/side-effects/fatigue

- **American Cancer Society**
  - https://www.cancer.org/cancer/managing-cancer/side-effects/fatigue-weakness-sleep/fatigue.html

Resources: Cognitive Functioning in Cancer Survivorship

- **National Cancer Institute**
  - https://www.cancer.gov/about-cancer/treatment/side-effects/memory/cognitive-impairment-pdq#_AboutThis_1
  - https://www.cancer.gov/about-cancer/treatment/side-effects/memory

- **American Cancer Society**
  - https://www.cancer.org/cancer/managing-cancer/side-effects/changes-in-mood-or-thinking/chemo-brain.html
  - https://www.cancer.org/content/dam/cancer-org/cancer-control/en/booklets-flyers/getting-help-for-chemo-brain.pdf

QUESTIONS?