

# Memory Changes

***There's not much data to be found on memory issues and brain tumours, but according to the Brain Tumour Charity in the U.K.: "1 in 2 people we spoke to experienced memory difficulties caused by a brain tumour or its treatment.***

So the good news is, half of us don't have an issue here. The other half of us might have something to work on.

Is the data missing because memory is so subjective? Perhaps you struggle with a few important words a day, but in the big picture you are doing okay. Some memory struggles are exacerbated by other symptoms -- fatigue, anxiety or headaches -- and only flare under pressure. Some memory issues are severe, while others improve with time and healing.

**According to the Brain Tumour Charity, the types of memory loss you may experience are 1:**

- **Retrograde amnesia:** Losing memories from pre-brain tumour times. Retrograde amnesia can be temporary or permanent. If you recover, older memories tend to return first -- so watch for that.
- **Anteretrograde amnesia:** Difficulty holding onto memories formed after you had a brain tumour or treatment.<sup>1</sup>

*This resource is not intended as a substitute for medical advice. The reader should regularly consult their health care provider in matters relating to their health especially about any symptoms that may need diagnosis or medical attention.*



**Anteretrograde amnesia can make daily life a struggle. To deal with forming new memories, there are 4 kinds of functional memory to consider:**

- **Long-term memory** -- recall of information over a long period of time (hours, days, weeks, or years)
- **Short-term memory** -- The recall of a small amount of information from a recent time period ("Where did I park the car?" Or, "Did I turn off the stove?"). A healthy brain discards the memory when it's no longer needed.
- **Working memory** - A small amount of information that can be held in mind and used for cognitive, or "working" tasks (mental math in the grocery store checkout line, or dialing a phone number someone is reading out to you)
- **Sensory memory** - The storage of information sent to us via the senses -- we hear a truck in the near-distance and, judging by volume, we know when to expect it to pass by; we feel the sand on the beach under our feet; the smell of cookies baking in the oven is very familiar<sup>2</sup>.

## What does it feel like ?

Memory loss, of course, feels different for everyone. On the brain tumour journey, it's a different experience than everyday forgetfulness or the more organic dementia-related losses. One of the more frustrating feelings is how others react -- perhaps thinking it's like Alzheimer's and you won't improve.

It can be terrifying if you are regularly losing common words (for example, the names of household objects such as 'doorknob' or 'stove'). But once you realize you are struggling, the words may eventually come back as the neurons start firing in search of that old connection.

Your friends and family might be more concerned, as they watch for signs outlined by the Mayo Clinic for general memory loss due to Alzheimer's:<sup>3</sup>

- Asking the same questions repeatedly
- Forgetting common words when speaking
- Mixing words up — saying "bed" instead of "table," for example
- Taking longer to complete familiar tasks, such as following a recipe
- Misplacing items in inappropriate places, such as putting a wallet in a kitchen drawer
- Getting lost while walking or driving in a familiar area



## What it is

Memories happen when electrical charges activate specific groups of neurons in the brain.

*The University of Queensland Brain Basics site describes the activity: "The brain simmers with activity. Different groups of neurons (nerve cells), responsible for different thoughts or perceptions, drift in and out of action"<sup>4</sup>*

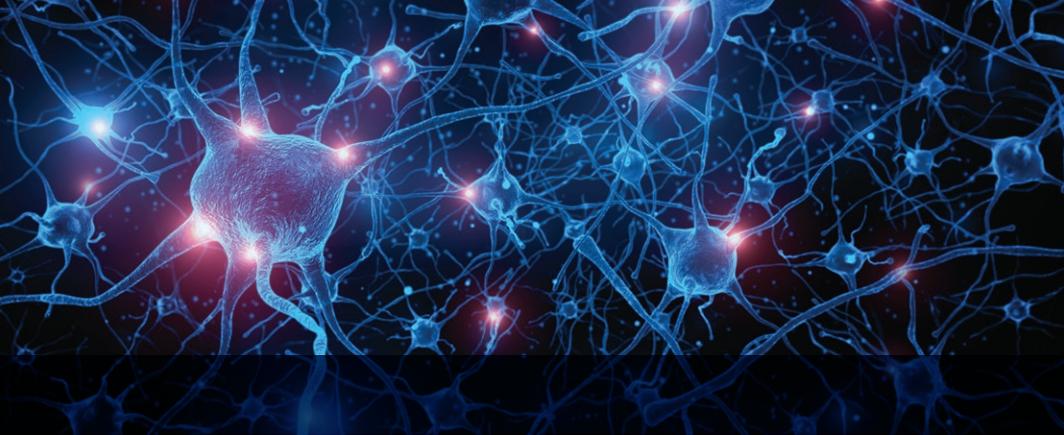
Where are memories stored in the brain? This is where the science gets interesting. New research indicates there isn't some physical vault of memories in the cranium. Instead, memories may live within the synapse or connections between all the millions of tiny neurons travelling around the brain.

In other words, memory is very hard to pin down to just one location or source. It's more fluid, and difficult to track. Don Arnold, Professor of Biological Sciences and Biomedical Engineering, USC, writes:

"Over 130 years ago, pioneering neuroscientist Santiago Ramón y Cajal first suggested that the brain stores information by rearranging the connections, or synapses, between neurons.

Since then, neuroscientists have attempted to understand the physical changes associated with memory formation. But visualizing and mapping synapses is challenging to do. For one, synapses are very small and tightly packed together. They're roughly 10 billion times smaller than the smallest object a standard clinical MRI can visualize. Furthermore, there are approximately 1 billion synapses in the mouse brains researchers often use to study brain function, and they're all the same opaque to translucent color as the tissue surrounding them"<sup>5</sup>





## Stepping forward

**Make sleep a priority.** Sleep is when the brain refreshes and restores. A good diet and plenty of hydration is crucial for brain function. (At least two medical tests available for sleep hygiene: You might want to check with your dentist whether you're grinding your teeth in your sleep, or check with a doctor about testing for sleep apnea.)

**Maintain a small journal for things you really need to remember.** Keep a diary for day-to-day living, and use calendars for appointments and reminders. If it's a digital calendar, you can set reminder notifications -- worth spending time setting up notifications.

**Brain Fitness.** If you're having trouble with short-term memory, check out our Meditation page for helpful resources. Everyday mindfulness around the house can help with memory. For instance, the "Did I shut off the stove?" daily dilemma is an example and can be eased by slowing down in the kitchen. When you shut off the stove, take a pause to "celebrate" that moment. Perhaps do a light double-tap with your finger on the off-switch, or personalize the moment in whatever way you choose. You are more likely to remember, now that you've spent a few seconds placing the event in recall. You are deepening the neuronal connection in that moment.

**Fun with Brain Fitness.** Find memory-oriented games, either online or in books, that you enjoy and can succeed at. Crossword puzzles remain a classic go-to game, and there are dozens of apps targeted at seniors that can be useful for brain tumour patients. Make sure you enjoy your memory games, and don't over-do them to the point of fatigue. Your brain can only do so much.

**Premium Play.** One of the best premium game packages is BrainHQ, which has been developed for years to target a number of neurological issues in children and adults. It has a limited free offering and a deluxe paid subscription, but provides value by pacing the player. If you are learning and improving it will send you to higher/faster levels. When you tire or start to struggle, the app gracefully lowers the level. Improvement is measurable and rewards are provided.



## Supporting someone with Memory Changes

Don't turn life into a game of "remember when?" or "remember this?" or "remember we need to..." Avoid adding to frustration levels. It's a case of "don't sweat the small stuff." Small changes to your verbal cues can help. For example, instead of saying: "Remember you have an appointment today"... just state simply, "You have an appointment today with Dr. So-and-So" and ask as a prompt "what time is that appointment?" and help look it up if necessary.

### Support strategies to consider

- Help set up calendars, notifications and journals. Help write things down, and help place important notes where they will be seen. If you make that placement a joint discussion/decision, it might enhance a new neuronal connection.
- If they are struggling to remember a word or an event, don't rush in with the answer -- see if you can provide verbal clues that will help fire the neurons and fill in the blank.
- Out for a walk? Make a game out of naming all the flowers you see, or the number of busses that pass by -- that sort of thing. "Oh, look - there's our #98 bus!" is a gentle prompt on an important route.
- Look for a hobby you can both enjoy -- one that involves some naming or categorization. That will help the memory muscles form new "muscles." (It might be collecting newspaper/magazine articles about brain tumours, or a stress-free activity such as bird watching, sketching or gardening)<sup>6</sup>



## Resources

Love your brain: Yoga and Meditation resources (Website):

<https://www.loveyourbrain.com/>

Helping Someone with Memory Loss (Website)

<https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=1&contentid=2862>

BRIAN (App): An [app](#) developed by the UK Brain Tumour Charity, to help people cope with many issues related to the illness. Included in the app is a game to challenge your memory and some other helpful memory aids. Search your phone's app store and remember to spell 'brain' wrong -- as 'brian'.

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## References

1. Memory difficulties and brain tumours
2. 4 Types of Memory: Sensory, Short-Term, Working & Long-Term
3. Memory loss: When to seek help (Mayo Clinic)
4. How Are Memories Formed (University of Queensland)
5. Where are Memories Stored?: New Research Suggests they May be Stored in the Connections Between Your Brain Cells
6. Brain Tumors: Coping with Thinking and Memory Problems

Carefully curated by individuals affected by brain tumours for individuals affected by brain tumours with sound scientific background on topics that are important to us.

We would love to hear your feedback and any suggestions or comments you may have at [info@twosteps.ca](mailto:info@twosteps.ca)



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