

## Epilepsy and Memory (Adults)

People with epilepsy often report memory concerns and/or memory problems. The most common form of epilepsy related memory problems are with immediate, recent (short-term), and prospective memory. It is less common for epilepsy to affect long-term memory.

### Different Types of Memory

**Immediate Memory** – Memory of the past/recent few seconds. This memory can fade very quickly if you are distracted.

**Recent Memory (Short-term Memory)** – Memory of the last few minutes, maybe hours. Like immediate memory, recent memory fades away after that.

**Prospective Memory** – Remembering to do something in the future (For example, remembering to pick up milk on the way home).

**Long-Term Memory** – ‘Permanent’ memories of things you have learned or memorized. There may be no real time limit or maximum amount of information you can store.

**Procedural Memory** – Long-term memory for how to do things that may be hard to put into words such as tying shoelaces or riding a bicycle. Similar to ‘muscle memory’.

**Declarative Memory** – Long-term memory you can put into words. There are two main types:

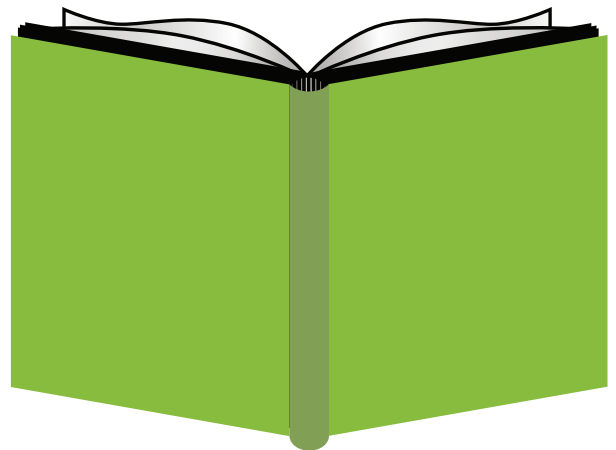
- Semantic Memory – Long-term memory for facts and information.
- Episodic (autobiographical) – Memories tied to a person’s life at a specific time and place.
- Remote Memory – Memories from the distant past.

Most of our memories are distributed around the brain. Damaging one part of our brain doesn’t mean we lose one specific memory. Exception: The hippocampus is important in creating new memories. If the hippocampus is damaged, a person may have difficulty building new memories.

### Why do people with epilepsy have memory problems?

#### Seizures

- If someone loses consciousness during a seizure, they won’t be able to form new memories based on what is going on around them.
- Some people will be conscious during a seizure, but can’t really pay attention to their surroundings and they will probably be unable to form memories during that seizure.
- If the seizure is in the hippocampus (the part of the brain that helps form new memories), the person may be unable to create new memories during that seizure.
- Unusual brain activity between seizures can disrupt thinking and memory making.
- Damage to the brain (particularly the hippocampus) is often connected to problems with memory. In some cases it is unclear if the damage is due to epilepsy or if the epilepsy was triggered by the damage.



## Surgery

Surgery can result in memory changes in some people, but not everyone. In fact, many people can have surgery and experience no noticeable change in their memory. There are many factors that help determine if surgery will lead to memory challenges, including:

- how memory was functioning before surgery
- where in the brain surgery will take place

Even if it is likely that there will be memory change due to surgery, there is no guarantee that a person's memory will be affected when they have surgery.

When surgery does affect someone's memory, the person does not experience complete memory loss. Their ability to form new memories may become worse, but it is not gone. They may become more forgetful in day-to-day life (e.g. forget appointments), but they won't forget who they are.

## Anti-Seizure Medications

Memory problems can be more frequent with older anti-seizure medications like Phenobarbital or Tegretol. Many of the newer medications tend to have fewer side effects. One exception is that some people taking Topamax have trouble with concentration and attention, which can affect memory.

When anti-seizure medications affect memory, it is often related to the dosage. In those cases, the memory problems are likely reversible if a doctor reduces the prescribed dosage or prescribes another medication. Of course, controlling seizures with the right medication is important too.

## How to Improve Memory

### Diet and Exercise

- People who eat a balanced diet full of vitamins and minerals and lower in fat and cholesterol tend to have better thinking and memory abilities.
- After light to moderate exercise, people have a period of improved memory right after the exercise.
- Going for a walk once in a while can help with memory. People who maintain a semi-regular exercise routine where they get up and move around may have better memory function than those who don't have some regular activity.

## Reduce Stress

High levels of stress cause an increase in the hormone cortisol. Small amounts of cortisol for a brief period of time can be helpful. High levels of cortisol over a long time can worsen memories.

**FACT:** Stress can be negative (e.g. anxiety about a health concern) or positive (e.g. planning a birthday party). Both negative and positive stress increases the level of cortisol.

Luckily the effects of increased cortisol tend to be reversible once stress is reduced. Stress reduction can sometimes help improve memory.

Try activities that relax you and make you feel better. You could try meditation, yoga, and other relaxing activities.

## Brain-Activating Activities

Do things you enjoy to stimulate thinking, including reading, socializing, doing puzzles and games.

## Memory Strategies

If you're having difficulty with memory, there are a number of strategies that you can use to work around these challenges.

### 1. Focus Attention

- Focus on the information you want to remember.
- Be choosy about what you want to pay attention to.
- Reduce distractions. Work in a quiet place. Clear your desk except for the material you need.
- Reduce multi-tasking. Do one thing at a time.

### 2. Emphasize key information

- Picture yourself doing the activity you want to remember, such as turning off the stove or locking the door.
- Say what you're trying to remember out loud. (e.g. "I've turned off the stove"). It's a form of repeating it and this makes the brain think about it in a different way.

### 3. Add Meaning

- Put the information in a context that helps explain why it's important.
- Add unusual meaning like a visual image. The more unusual or odd the meaning, the better. This is very good for names.
- Use rhymes or sayings to remember things. (e.g. In the year 1492, Columbus sailed the ocean blue.)
- Look for patterns. Break a long series of numbers into chunks (e.g. phone numbers).

#### 4. Repeat information in different ways.

- Instead of going over and over the information, review the information in smaller chunks spread out over time.
- Start with a very short space between repetitions. Then repeat the information at gradually increasing intervals. (e.g. immediately, 5 sec, 10 sec...5 min, 15 min)
- Do something else during that time.
- If you forget the information, go back to shorter intervals.

#### 5. Organizing

- Always put important things in the same place. (e.g. keys, phone, etc.)
- Use logical locations. (e.g. place your keys on a hook and your phone on the counter)
- Don't use this for everything; just for a few important things.
- Organize lists by categories.
- On your shopping list put meat items together and dairy items together in separate sections.
- Organize To-Do list by the order of tasks, their importance, or some other logical order
- You may have to recopy your list to do this, but it will help.

#### 6. Written Reminders

- Post-It notes are great if you carry them with you.
- A notebook is good, but a planner or organizer is better.
- If you use a paper organizer, you can carry post it notes with you to add little items to remember for short periods of time (e.g. where you parked).
- The organizer should be small enough that it's easy to carry it with you.
- Determine a set place for it when you have it at home.
- Check the organizer regularly at set times (e.g. morning and night or at meal times).

You can use an electronic or paper organizer. Each of them have pros and cons.

#### Paper Organizer

##### Pros

- It's easy to learn how to use
- They're inexpensive
- It's ok to drop it
- They're easy to replace

##### Cons

- They can fill up
- You need a new one every year

#### Electronic Organizer

##### Pros

- They have "unlimited" space
- You can use them for years
- They come with many extra features (e.g. alarms/reminders, telephone)
- Many people can use the cell phone they already own for all their reminders, appointments, phone numbers, and alarms.

##### Cons

- It can be hard to learn how to use.
- They may be expensive.
- They are breakable.
- They can be expensive to replace.

Not every technique works for everyone. Try different things and see what works for you. You may find you only want, or need, a few of the suggestions listed above.

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