

# Memory Loss Mechanism on Amnesia

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## Abstract

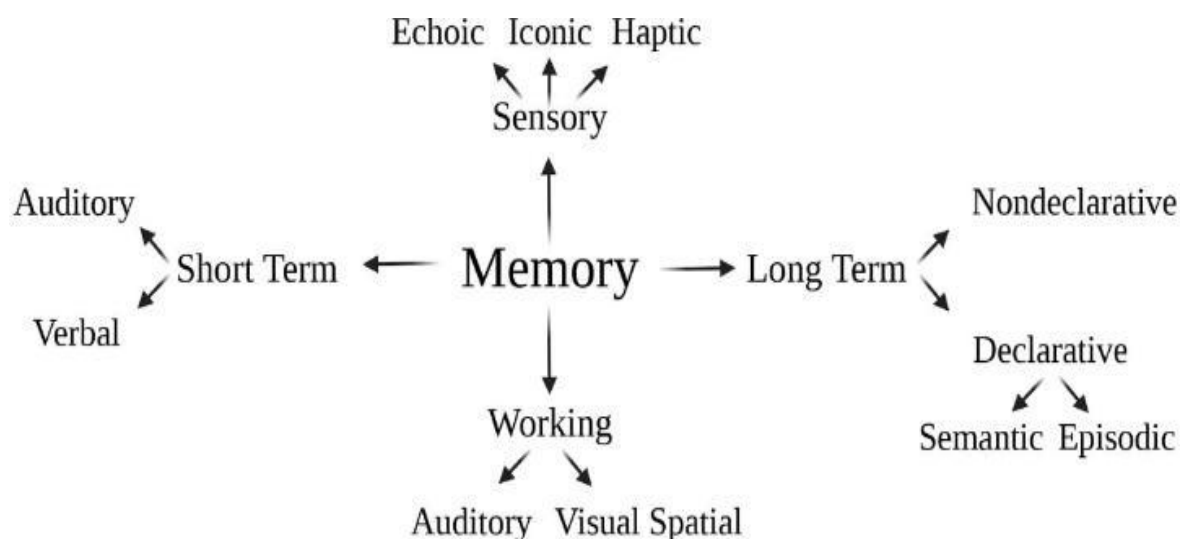
Neurological amnesia has been the focus of a lot of research because scientists want to better understand how memory works and how the brain is involved. There is now a general agreement that damage to the hippocampus (a part of the brain) or areas around it leads to problems with episodic memory, which is the ability to remember personal experiences, as well as issues with recalling things after some time and remembering details of events. However, there is still ongoing debate about how other types of memory, like general knowledge (semantic memory), recognizing things after a delay, short-term memory (working memory), and the ability to imagine, are affected by amnesia. This review highlights some recent advances in these discussions and what they tell us about amnesia and how the hippocampus works.

**Keywords :** memory Loss , Psychological , Amnesia , brain injury

## Introduction:

Memory is the brain's way of recalling information it has learned and stored. While everyone forgets things from time to time, this doesn't mean they have amnesia. Memory loss is also a normal part of aging. About 40% of people experience different levels of memory loss (Wikidoc, 2021) , leading to many misconceptions about amnesia and its symptoms.

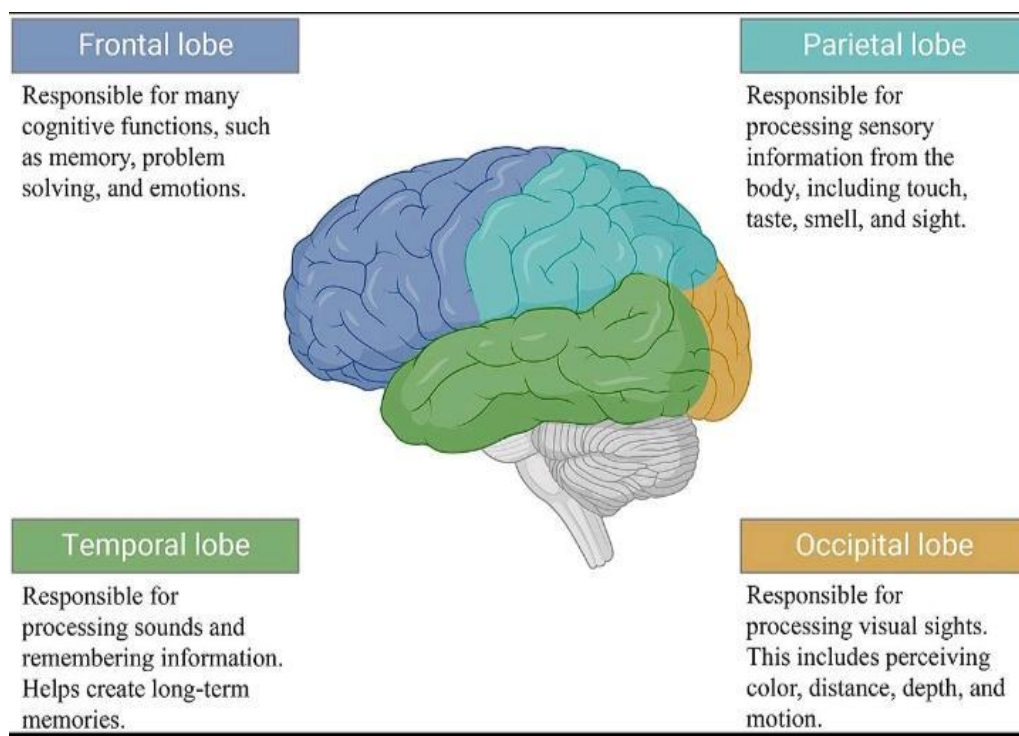
Amnesia is a more serious type of memory loss, often caused by things like drugs, alcohol, brain injury, or illness (Allen, 2018). People with amnesia may have trouble remembering past events or facts they used to know, and they might find it hard to form new memories or learn new skills.



Memory can be divided into four main categories:

1. Sensory Memory: Briefly holds sensory information.
2. Short-Term Memory: Holds a small amount of information for a short time.
3. Working Memory: Helps us process and use information in real time.
4. Long-Term Memory: Stores information for a long time, possibly for life.

Memory is our brain's way of storing and using information. There are different types of memory: sensory, short-term, working, and long-term.



1. Sensory memory: Information from our senses (like hearing, sight, touch, smell, and taste) stays in our brain for just a few seconds.
2. Short-term memory: This keeps information for a short time, from seconds to days, and it's easy to forget afterward.
3. Working memory: It helps us store and use information briefly, just long enough to complete tasks
4. Long-term memory: There are two types:
5. Declarative memory (we remember facts and events consciously), like recalling a wedding
6. Episodic memory: Remembering personal event
7. Semantic memory: General knowledge and facts.
8. Non declarative (procedural) memory (we do things without thinking), like riding a bike or brushing teeth.

Memory is stored in different parts of the brain, not just one place. Different types of memory use different areas of the brain.

### Discovery:

Theodule-Armand Ribot, a French psychologist, was one of the first to study amnesia. His work led to the term "Ribot gradients" to describe the pattern of memory loss. He proposed Ribot's Law, which explains how memory fades in a specific order when someone has retrograde amnesia (loss of past memories). According to the law, the most recent memories disappear first, followed by personal memories (like experiences and emotions), and finally, intellectual memories (like learned knowledge). Essentially, the newest memories are the first to go.

### Symptoms:

Amnesia is a condition where a person loses their memory. This can include forgetting past events or facts, or having trouble making new memories. Some forms of amnesia are short-term, while others last longer or are permanent.

People with amnesia can often still remember who they are and keep their motor skills, like walking or talking. The main signs of amnesia are:

- Trouble remembering things or learning new information.
- Confusion.
- Difficulty recognizing people or places.
- Sometimes, the brain fills in memory gaps with made-up memories
- Amnesia is different from the normal memory changes that happen with aging.

**Causes:**

Amnesia, or memory loss, can happen due to two main types of causes: neurological (related to brain damage) and psychological (related to mental health).

Neurological causes happen when the brain gets damaged or doesn't work properly. These can include:

- Drinking too much alcohol (causing blackouts).
- Alzheimer's disease.
- Brain aneurysms or tumors.
- Lack of oxygen to the brain.
- Certain drugs or medications, including non-medical drug use.
- Epilepsy or seizures.
- Dementia.
- Head injuries, like concussions.
- Brain infections (like encephalitis).
- Degenerative brain diseases like Parkinson's or multiple sclerosis.
- Stroke.
- Poisoning, like from carbon monoxide.
- Wernicke-Korsakoff syndrome (caused by a severe vitamin B1 deficiency, often due to long-term alcohol use).

Psychological causes happen when memory loss is linked to mental health issues, often due to trauma or emotional distress. This can occur with conditions like dissociative amnesia or post-traumatic stress disorder (PTSD). Experts believe the brain might block certain memories to protect you from psychological harm.

**Types of Amnesia**

Types	How it affects?
Anterograde amnesia	<p><b>Anterograde amnesia usually happens after a head injury. It makes it hard for a person to remember new things, but they can still remember old memories from before the injury. The brain damage prevents new information from being stored as long-term memory. This condition makes everyday life difficult because the person struggles with their short-term memory. It can also be dangerous, affecting safety at work and while driving.</b></p>

Retrograde amnesia	<p><b>Retrograde amnesia is when someone loses the ability to remember events or personal experiences from before a head injury. Depending on how severe the injury is, they might forget everything or only some things. Typically, the memories from the recent past are affected more than memories from a long time ago.</b></p>
Transient global amnesia (TGA)	<p><b>This is a temporary memory loss, common in people over 50. The person can't remember things that happened just a few minutes ago. It often happens because of changes in the brain that come with aging.</b></p>
Dissociative amnesia/Psychogenic amnesia	<p><b>This type of amnesia happens when someone forgets personal details, like their identity or past, because of a very traumatic event, such as a life-threatening situation or assault. The memory loss can last from a few hours to even years. Although the person usually gets their memory back, they might never fully remember the traumatic event itself.</b></p>
Traumatic amnesia	<p><b>This type of amnesia happens due to a head injury from things like a car accident, being hit on the head, or falling from a height. How much memory is lost depends on how severe the injury is, and the memory loss can be either short-term or permanent.</b></p>
Drug induced amnesia	<p><b>Short-term amnesia caused by drugs like benzodiazepines happens when these drugs interfere with the brain's ability to form memories. While under the influence of the drug, a person can't remember events that occurred. However, once the drug's effects wear off, their memory returns to normal.</b></p>

Infantile amnesia	<p><b>A person may not remember events from their early childhood because their brain was still developing at that time. The parts of the brain that help store memories and the ability to describe them using language were not fully ready yet. As a result, many early experiences get lost as the brain grows and matures.</b></p>
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### **Diagnosis:**

Diagnosing amnesia involves a thorough process to make sure it's not caused by something else, like Alzheimer's, dementia, depression, or brain tumors.

The process starts with gathering detailed medical information, often from a family member or caregiver. This includes questions about how long the memory loss has been happening, if any events like a head injury or stroke may have triggered it, family history, drug or alcohol use, and other symptoms such as confusion or changes in personality.

A physical exam, especially a neurological check, looks at reflexes, senses, and balance. Cognitive tests are also done to evaluate thinking, judgment, and memory, including the ability to remember facts, personal details, and recent events.

These tests help figure out how serious the memory loss is and guide treatment options. Diagnosing amnesia early makes treatment more effective.

### **Treatment:**

#### Managing Amnesia: Strategies for Improvement

Although there is no cure for amnesia, several approaches can help people manage their memory loss and enhance their daily lives:

#### 1. Cognitive Rehabilitation:

Therapists work with patients to create strategies that help organize information, making it easier to remember. This often includes using existing memories to build new ones, which can improve understanding in conversations and social interactions.

#### 2. Memory Aids:

**Smart Technology:** Smartphones and tablets can be trained to act as electronic organizers, sending reminders for important events or medications.

**Low-Tech Aids:** Simple tools like notebooks, wall calendars, pill organizers, and photos can assist with everyday tasks and help trigger memories.

#### 3. Psychological Support:

Therapy, like cognitive behavioral therapy (CBT), can help individuals deal with the emotional effects of amnesia.

#### 4. Family Support:

Family members can play a crucial role by sharing photos from the past, using familiar scents, or playing known songs to help trigger memories and provide emotional comfort.

## 5. Medical Interventions:

While there aren't specific medications for amnesia itself, treating underlying conditions that cause memory loss can be beneficial. By using these strategies, individuals with amnesia can improve their quality of life and better cope with their memory challenges.

### Prevention:

Here are some simple habits to help lower your risk of memory loss and other health issues:

1. **Limit Alcohol and Drugs:** Avoid using alcohol or drugs heavily.
2. **Wear Head Protection:** Use helmets or other protective gear when playing sports to prevent concussions.
3. **Buckle Up:** Always wear your seatbelt in vehicles to stay safe.
4. **Treat Infections Quickly:** Get medical help right away for infections to prevent them from spreading to your brain.
5. **Regular Eye Check-ups:** If you're older, have your eyes checked every year, and talk to your doctors about medications that might make you dizzy to help prevent falls.
6. **Stay Mentally Active:** Keep your mind engaged by taking classes, visiting new places, reading, or playing challenging games.
7. **Stay Physically Active:** Keep moving with regular exercise throughout your life.
8. **Eat Healthy Foods:** Follow a heart-healthy diet rich in fruits, vegetables, whole grains, and low-fat proteins to support your brain and reduce the risk of strokes.
9. **Drink Plenty of Water:** Stay hydrated, as even mild dehydration can affect your brain function, especially in women.

### References:

1. Quinette P, Guillery-Girard B, Dayan J, et al.: What does transient global amnesia really mean? Review of the literature and thorough study of 142 cases. *Brain*. 2006; 129(Pt 7): 1640–58. PubMed Abstract | Publisher Full Text
2. Kopelman MD: Psychogenic amnesia. In *The handbook of memory disorders*. 2<sup>nd</sup> edition. John Wiley & Sons; 2003; 45
3. Alberini, C. M., & Travaglia, A. (2017). Infantile amnesia: A critical period of learning to learn and remember. *The Journal of Neuroscience*, 37(24), 5783–5795. <https://doi.org/10.1523/jneurosci.0324-17.2017>
4. Allen, R. J. (2018). Classic and recent advances in Understanding amnesia. *F1000Research*, 7, 331. <https://doi.org/10.12688/f1000research.13737.1>
5. Mastin, L. (2010). The human memory: Retrograde amnesia . Retrieved from [http://www.humanmemory.net/disorders\\_retrograde.html](http://www.humanmemory.net/disorders_retrograde.html)
6. "Memory abnormality." *Encyclopædia Britannica*. Encyclopædia Britannica Online Academic Edition. Encyclopædia Britannica Inc., 2012. Web. 21 Apr 2012
7. Alzheimer's Association. (n.d.). Korsakoff syndrome. *Alzheimer's Disease and Dementia*. <https://www.alz.org/alzheimers-dementia/what-is-dementia/types-of-dementia/korsakoff-syndrome>
8. Masferrer R, Masferrer M, Prendergast V, Harrington TR (2000). "Grading Scale for Cerebral Concussions" ([dead link]). *BNI Quarterly (Barrow Neurological Institute)* 16 (1). ISSN 0894-5799
9. Vargha-Khadem F, Gadian DG, Watkins KE, et al.: Differential effects of early Hippocampal pathology on episodic and semantic memory. *Science*. 1997; 277(5324): 376–80. PubMed Abstract | Publisher Full Text