

Memory explained

Memory is our ability to encode, store, retain then subsequently recall information and past experiences in the human brain. Human memory, like memory in a computer, allows us to store information for later use. In order to do this however, we need to master three processes involved in memory.

The first is called **encoding**, the process we use to transform information so that it can be stored. Next is the actual **storage**, which simply means holding onto the information. The final process is called **retrieval**, which is bringing the memory out of storage and reversing the process of encoding. In other words, return the information to a form similar to what we stored.

If there is a breakdown at any of these points, memory problems occur.

There are phases to memory that are called long and short term, with a period of consolidation as the memory is transferred from short term to long term, and stored. Information that passes from our short term to our long term memory is typically that which has some significance attached to it.

Memory is located not in one particular place in the brain, but is instead a brain-wide process in which several different areas of the brain act in conjunction with one another.

Forgetting isn't really all that bad, and is a pretty normal experience. We don't need to retain everything so we discard things that aren't important to us. As we age however, it is common to have some degree of memory lapse, "senior moments" and deterioration of memory. Nearly everyone can recall a time when a lapse in memory created an embarrassing or funny situation.

Things you are more likely to be remembered tend to be meaningful events and personal information. This is thought to be because there is a strong emotional response, the information made sense and it is connected to other information already stored.

New information such as people's names, telephone numbers, music titles and singers, jokes, medications, appointments and where personal items were left are often the most difficult things to remember.

Memory difficulties have an impact on many aspects of life including employment, scholastic pursuits, navigation, relationships and self-esteem. To reduce this impact, you can use techniques and make lifestyle changes to improve your memory.

Memory is affected by many things including:

- **Attention and concentration.** Not only do we live complex and busy lives we are bombarded with information and distractions from a wide range of sources such as TV, radio, newspapers, people, and mobile technology devices. Also if you are tired, drowsy, not feeling well, or distracted, you may not recall things.
- **Lack of meaning.** If the information is not of interest or relevant to you, you are less likely to remember it.
- **Mood.** Tiredness, anxiety including the fear of forgetting, stress and depression can all affect memory as can the medications you take for these conditions.
- **Medication.** In addition to some anti-epileptic medications [AEDs] other medication types such as some anti-hypertensives/antibiotics/anti-depressants/anti-histamines, can either directly cause cognitive impairment or indirectly contribute to memory impairment by causing tiredness.
- **Seizures**, which we will discuss below
- **Other health conditions and their medications**



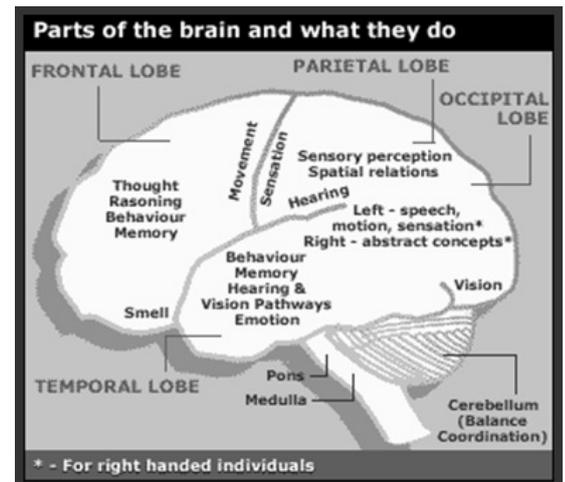
Fact Sheet: Epilepsy and Memory

Seizures and memory

Seizures and epilepsy can affect memory in some people. Certain types of epilepsy such as temporal lobe epilepsy are more likely to impact on memory because the temporal lobes play a significant role in memory.

Seizures disrupt normal brain activity and therefore depending on the type of seizure and where in the brain it occurs, different abilities can be affected. For example, our ability to solve complex problems happens in the front part of the brain (frontal lobe) while our ability to learn, consolidate and store new information is further back and in the middle (medial temporal lobe).

Changes in thinking can occur before, during or after seizures and can be temporary or long term. People who have regular seizures may have more difficulties with their memory.



Not everyone who has epilepsy experiences such changes.

Some AEDs, particularly if they are high doses, or a number of AEDs are being taken, can have an effect on memory function. Sedatives such as diazepam and midazolam can also have an effect on memory.

People with epilepsy are rarely able to avoid taking AEDs. Understanding the effect they may have on memory can be helpful. Speak to your doctor or pharmacist about your medication[s].

What can help?

For people with epilepsy who feel they have memory problems, the cause is most likely a combination of:

- the direct effect of seizures disrupting normal brain function
- treatment and medication
- general health
- emotional and social factors

If you have memory difficulties now, chances are that you will continue to do so. However there are ways that you can improve what you have. There are many ways to protect, manage and improve your memory, some tips and strategies for doing this are:

Be healthy, look after yourself.

- Try to get some daily exercise. Physical exercise increases the blood circulation to the brain.
- Eat plenty of healthy foods which can improve your overall feeling of wellness. Speak to your doctor about taking vitamin supplements if you feel you may need it.
- It is important to drink adequate amounts of water and keep alcohol intake to a minimum.
- Avoid smoking and using illicit drugs.
- As memory consolidation is thought to occur mostly during sleep it is essential to have enough rest and relaxation. We also function much better overall if you have a good sleep.
- Mental exercises provide intellectual stimulation. Keep your mind active by playing board games, doing crosswords and logic puzzles.

Be organised.

- Be selective in what you receive and try to retain.
- Concentrate when receiving new information and try to relate it to something familiar.
- Focus on what is important and remember that rehearsal and repetition affect how much information is stored from short to long term memory.

Fact Sheet: Epilepsy and Memory

- Keep a diary, calendar or a journal and be diligent in its use.
- Plan ahead and make lists and have a designated place to keep things like glasses and keys.
- Some simple remembering tricks are to place a loose rubber band around your wrist, change your ring positions on your fingers, and use an alarm such as on a watch or phone.

Be gentle with yourself. Relax. If you do forget something stay calm, everyone forgets things at some stage. It is not something that only you experience so people will understand. Ask your friends and family to remind you about things. Try some stress reducing activities such as deep breathing, relaxation methods and complementary therapies. If stress, depression and anxiety are a concern seek professional help.



Practical Strategies

- Put items such as keys, wallets and sunglasses in regular places. Make it a routine when you walk in the door.
- Write notes or lists, and use diaries or organisers. Use reminders or alarms on your watch, phone or electronic equipment.
- Put a noticeboard in a prominent place.
- Ask others to remind you.
- Use prompts such as wearing a ring on a different finger, your watch on the other arm, a rubber band on your hand or even writing on your hand.
- Reduce distractions such as TV, music, people talking. This is not always possible in public places, but if you are organising an event, think about the location and choose a place with less distractions.
- Focus only for short periods at a time and allow breaks.
- Make sure you are focussing fully on what someone is saying and ask them to repeat the information if you need to, or repeat something back to them to clarify.
- Prioritise tasks and decide what is important. Avoid taking on too many problems at once.
- Use a dosette box for medication. These are available at chemists.
- Break down complex tasks into smaller steps.
- Plan activities.
- Write down all options and alternatives.
- Stick to a routine as much as possible.



Memory Techniques

Everyone uses some method to remember things. Below are a list of common techniques that can help retain or remember. Not all will suit you, try what you think will work for you.

Focus

Much of what we do is almost automatic. Often the problem is not with memory but with the level of concentration. Consciously say "I am going to remember this" and think only about what you are doing while you are doing it, and where possible do one thing at a time.

Rehearse and repeat information

Saying things out loud can be helpful because you have thought about it a second time and processed it a different way [through speaking and hearing]. Repeating something over an interval can also be helpful to repeat immediately, repeat one hour later and repeat at the end of the day. When you first meet someone repeat their name back to them "Hi John, my name's..." and deliberately use their name in conversation.

Observation

Actively using as many senses as you can to give as much meaning as possible to a memory can be helpful. Concentrate on precise details, consciously note landmarks, distinguishing features, colours, smells, and noises.

Re-visualise the context or re-trace your steps

Thinking back to the situation to remember information may help trigger the memory. For example, Bob rang and you can't recall the message, you may think about where you were when you took the call, what you were doing at the time and what the piece of paper looked like that you used.

Another example, you are in the supermarket and know you need some bathroom items. Visualise the shelf in the shower and go through the items (shampoo, soap etc) to find memory prompts.

Imagination

In your mind try to 'see' (visualise) the item or person you want to remember. Making the image absurd increases the likelihood you will remember it because it can make something mundane more interesting. Imagining Graeme with green hair is one example.

You can use imagination to remember several items (known as chaining). This time you link the items together by thinking of images to connect them. For example a shopping list with milk, oranges and a tin of tuna. You may make an image of milk cartons hanging from an orange tree that is potted in an old tin of tuna.

If there are quite a few items it is helpful to make several images or a story rather than try and link everything into one image.

Location

Location methods use a fixed environment that is very familiar such as rooms in a house or the route to work. They are fixed so we can mentally walk back and pick up information we have deposited there. In its simplest form you may use it to retrace your steps to find something you have lost.

Another level is to use our imagination and link items to be remembered to the specific places. This method is particularly useful for remembering information in a particular order. Location can be illustrated using a shopping list again and the route to work:

- Front door (a puddle of milk to step over)
- Bus stop (potato heads talking to each other)
- Bus seat (a chicken roosting on the seat)
- Work (bread piled up in entrance)

Chunking

It is easier to break something up into chunks than try and remember the whole thing. It is easier to remember a telephone number that is broken up into two, four digit sections than one eight digit number, for example, 8288-3340 rather than 82883340.

Associations

Associations involve creating a mental link between something new or abstract with something that is familiar or has meaning.

Associations include:

- Using the beginning letter of the word to make another word, eg. Shelley likes shells
- Connecting information to a meaningful personal memory, eg. a bank account pin number 1097 You may associate your child's birthday (October) 10th month and the year you married (1997)
- Remembering the meaning of a new word by pulling out a part of the word to create a key word or clue in order to make a verbal or visual association, eg. CLAYMORE = sword (key word is clay). You may picture a sword crumbling to clay when it is used to strike something.

Fact Sheet: Epilepsy and Memory

Rhymes (Mnemonics)

The rhyme "30 days has September, April, June, and November. When short February's done. All the rest have 31..." is a good example of a method for remembering complex information.

Related to this is making up your own saying where the first letter of each word is the first letter of the subject you need to remember or a word where each letter is a clue for information. This method provides the brain with a simple clue to remember more complex information.

An example to illustrate this method is "My Very Educated Mother Just Served Us Nine Pizzas" represents the order of planets Mercury Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto.

Common problem areas

Learning New Names – some tips for when you first meet someone.

- Repeat their name immediately.
- Make a connection – My son's name is John.
- Confirm spelling – is that spelt Jon or John?
- Deliberately use the name in conversation a few times such as "how long have you been playing the piano John?"
- Link the person's name with something that begins with the same letter "John likes juggling".
- Scan the alphabet. You think their name started with J enables you to go through J names such as Jack, Joe, John etc. If you made a link, in this case, 'juggling', it can act as a clue.
- If you are attending an event, where possible, find out who will be there and rehearse their names in your head before meeting them.

There is no secret to a good memory. It is good habits and practice, practice, practice!

Remembering where you put things

- Pay attention as you are doing something. For example, when you put something down repeat the action in your head, visualise it or say it out loud.
- Where possible use the same location to place things.
- Use your imagination to expand on the image such as the keys are next to the computer. Imagine keys locking out the computer viruses, or your wallet is in the kitchen, picture your wallet popping out of the toaster.
- Visualise or retrace your steps.

For more detailed information on memory read: <http://allpsych.com/psychology101/memory/>

How to improve your memory: <http://www.helpguide.org/articles/memory/how-to-improve-your-memory.htm>

Memory techniques: <http://www.dummies.com/how-to/content/improving-your-memory-for-dummies-cheat-sheet.html>

References:

Dr Simon Collinson, Thinking and memory. Senior Neuropsychologist The Alfred Hospital, Prahran and in private practice at The Memory Centre, East Melbourne

<http://allpsych.com/psychology101/memory/>

<http://www.human-memory.net/>

Acknowledgements:

Dr Laurie Miller, Clinical Neuropsychologist, Royal Prince Alfred Hospital. Senior Clinical Lecturer in Medicine, University of Sydney.

Dr Rubina Alpitsis, Principle Neuropsychologist, The Alfred, Melbourne.

© Epilepsy Action Australia

This information is given to provide accurate, general information about epilepsy. Medical information and knowledge changes rapidly and you should consult your doctor for more detailed information. This is not medical advice and you should not make any medication or treatment changes without consulting your doctor.

