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## **MEMORY LOSS: WHAT YOU NEED TO KNOW**

We all forget things. More things, it seems, as we get older. But when you are concerned about memory loss, it is not at all helpful when others are dismissive - “Oh, that happens to me all the time!” or even competitive - “That’s nothing! The other day, I couldn’t remember my own phone number!” So here is some information about how memory works, what causes memory problems, and what you can do about them.

### **HOW MEMORY WORKS**

In order for us to remember something - a name, a location, a fact - three things have to happen. First, the information has to get into our brain and be processed, or *encoded*. Next, it has to be recorded, or *stored*, in the brain. And finally, it has to be accessed, or *retrieved*. These three stages of memory are called *encoding*, *storage*, and *retrieval*.

#### ***Encoding***

Here is a familiar example of a failure of memory *encoding*: You “forgot” where you put your keys, or your glasses, and you spend a frantic half hour searching for them. Chances are, what happened is that when you put them down earlier, you weren’t really paying attention – you were thinking about something else. You came in and the phone was ringing, so you ran to get it, and your hand deposited the keys somewhere, without your conscious awareness. So, the information – the location of the keys, maybe under the mail on the table by the front door - never actually got into your brain.

#### ***Retrieval***

Just as often, the information we are trying to remember is in there - it’s been stored in our brain for years, but we can’t find it when we need it. This is a failure of *retrieval*. An example: You’re in the middle of a conversation and suddenly you stop, because that word you need, or the name of the actor in the movie you saw last week, or that restaurant you always go to when you’re in the city, just won’t come. You may feel frustrated or embarrassed, and when it pops into your head some time later in the day, or tomorrow (when it’s too late), it seems totally obvious.

#### ***Working Memory***

Another process that often lets us down is called *working memory*. This is holding information in mind in order to do something with it, like when we need to calculate the cost of something that is on sale for 20% off, or figure out the date it will be next Thursday, or remember the third step in a series of directions someone is giving us. It is because of a failure of working memory that we have

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to keep looking back at that phone number we're trying to dial.

These kinds of everyday forgetting are normal. However, if you are worried that this is happening more frequently, or is beginning to interfere with your work, your relationships, or your everyday responsibilities, it is important to investigate the cause.

### CAUSES OF MEMORY PROBLEMS

The reason that forgetfulness is so common is that these are high-level brain processes that are very vulnerable to disruption by fatigue, stress, and illness. Staying focused (as required for *encoding*), holding information in mind (*working memory*) and *retrieving* information from memory (so-called "executive" brain processes), occur along wide-ranging pathways that communicate among many brain regions. As such, they work best when we are awake and alert, "firing on all cylinders." When we are tired, upset, distracted, or not feeling well, they become unreliable.

#### *Stress*

The most common cause of increased forgetfulness is stress. Jobs end, relationships go sour, loved ones become ill or injured, and sometimes we just have too much to do and not enough time. It is precisely when we are doing or thinking about too many things at once that things get misplaced, appointments are missed, and tasks are overlooked. We remember best when we can give our full attention to the present moment.

Prolonged stress can lead to anxiety or depression, which interfere more significantly with memory. These mood disorders reflect an imbalance of chemical messengers (*neurotransmitters*) in the brain, which interferes with memory processes. These conditions can be triggered by life events, hormonal changes and many kinds of illness.

#### *Illness*

Physical illness can also disrupt memory processes. In chronic conditions, such as cardiac, pulmonary and autoimmune diseases, memory difficulties can become more apparent over time. They can be a symptom of nutritional deficiency or infection. Mild head injury or concussion, or even non-impact "whiplash" injuries, can cause memory problems that usually resolve with time. Some people experience temporary memory problems while undergoing chemotherapy treatment.

While problems with encoding or retrieval are common, failure of the *storage* mechanism of memory is actually quite rare. Brain trauma, cerebrovascular disease or stroke, infection or bleeding within the brain, and progressive



conditions such as Alzheimer's disease, disrupt memory storage, by damaging the particular areas of the brain that control the recording of new information. In this case, long-past events are remembered, but even very recent events are not. Specialized memory testing is often necessary to determine the nature of the memory problem.

### **WHAT YOU CAN DO**

Your first step, if you are concerned about your memory, should be speaking with your primary care physician. A complete physical exam, including diagnostic tests, can identify a possible medical cause and its appropriate treatment. If no cause is found and you are still concerned, your doctor can refer you for neuropsychological assessment, which includes detailed memory testing.

#### ***Neuropsychological Assessment***

This can identify subtle changes in brain function even when neurological exam and brain scan or MRI are normal. It also identifies the exact nature and extent of any changes in memory and other cognitive processes and how best to address them.

Neuropsychological assessment begins with a careful interview with you and the person who knows you best, and a review of any relevant medical records. This is followed by one or two visits engaging in a variety of tasks – answering questions, looking at pictures, and solving puzzles - each requiring different kinds of thinking and memory. The results and recommendations are explained at a final visit, and a written report is sent to your doctor. If needed, testing can be repeated and the results compared, to determine whether memory is getting better in response to treatment or worse over time.

The information provided by neuropsychological assessment can be very helpful, whether you have mild memory difficulties or a severe memory loss. For most people, knowing exactly what's going on feels a lot better than having vague concerns and no real information. Understanding your areas of strength and weakness allows you to better navigate any changes in the way your brain is working.

#### ***Strategies***

The key to compensating for memory difficulties is a willingness to do things differently, for example, keeping track of things by writing them down, even though you didn't have to do that in the past. Other strategies for mild memory difficulties include trying to focus on one thing at a time, building in time for planning, reducing your number of commitments, increasing emotional support, and having a set schedule or routine for most recurring tasks, rather than having to decide or remember "on the fly," which is hardest for all of us.



If you have more severe or progressive memory loss, with impairment of memory storage, you will do best when the people closest to you are involved and informed as soon as possible. It can be frightening to sense that you can't remember, when no one is admitting that they notice. Sometimes, simple changes can reduce frustration and allow increased participation in daily activities. For example, although you may not be able to plan or execute a complex task on your own, like preparing a meal, you can help with the steps, by peeling the potatoes or washing the salad greens. A one-on-one conversation is much easier to follow than a group discussion, and casual comments with clues to what's going on ("It's almost lunchtime already!") are more helpful than pop quizzes ("Remember who came by yesterday?")

If you or someone you love is having memory difficulties, information, guidance and support are available to help you identify the cause and address the problem. Most likely, it is nothing serious, and worrying - as we've learned - only makes us more forgetful.