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The Art of Drawing a Blank

❖ Fibromyalgia and Memory ❖

Okay, so you're still looking for that slip of paper with your doctor's new phone number on it. And you have yet to recover from the embarrassment of driving around town with the grocery bag perched on top of your car. And you still worry that your new boss will never forgive you for "blanking" on his name when you tried to introduce him to an important client. In short, it's hard to deny that your memory just isn't what it used to be. Does that mean you have a problem? If so, is fibromyalgia (FM) the cause? Or is there some other culprit? Or both?

The answers to these questions may surprise you. What probably won't surprise you is that to date very little research has been done on the subject of memory and FM. This article will explore available findings and offer insights which will at the very least help you make peace with yourself.

First, a few basics on how memory works (and when it doesn't). As is widely known, there are two types of memory: short-term and long-term. Short-term memory, also known as active or working memory, consists of the day-to-day details that people consciously pay attention to at any one time: the physical objects that surround them, the conversations or sensory information they are taking in, and the activities or projects in which they are engaged. In contrast, long-term memory is a permanent storage area where factual information, recollections of personal experiences, and knowledge of particular skills (i.e., riding a bike or driving a car) are retained.

Psychologist Kenneth Higbee, Ph.D., compares short-term memory to the in-basket on an office desk which has a limited capacity to hold information and must therefore be "emptied" regularly before new material can be placed there. [1] Information which is emptied is either discarded permanently (i.e., the phone number of a local carryout restaurant that you look up but don't need to remember) or is sent on to long-term memory, a series of filing cabinets used for permanent storage. Unlike short-term memory, long-term memory has virtually unlimited capacity and is not easily disrupted by environmental "noise". It also changes very little with age.

It is helpful to think about memory as consisting of three stages: (1) the acquisition of information, (2) the storage of information, and (3) the retrieval of information when it is needed. When we forget things, we tend to blame our retrieval powers. However, according to Cynthia Green, Ph.D., of the Memory Enhancement Program at Mt. Sinai (NY) School of Medicine, the most common reason that healthy adults have problems with memory is because of their failure to focus on new information. [2] In other words, they aren't paying very good attention in the first place so they never actually learn the new material they will later try to remember.

Of course, people often fail to pay proper attention to things that aren't particularly interesting to them or have little emotional impact. However, there are also a number of factors which simply get in the way of memory and can cause even "healthy" people significant problems. Many of these factors are also relevant to people with FM.

Factors Which Interfere With Memory

Multiple Tasks: Many people suffer from information overload. They may have many competing tasks to perform during a given period of time or have pressing demands from a wide variety of sources (work, family, friends, etc.). As a result, they must process an amazing amount of information, some of which comes at them with a speed or complexity which makes remembering difficult. Ironically, simple things that should be easily recalled (like the location of car keys or even the car itself) are frequently forgotten because they involve routine activities (i.e., parking the car) which are done quickly and often unconsciously amidst a maze of other involvements.

Emotional State: Depression and anxiety are two variables which have been a central focus in the study of memory. Depression is of interest because it can cause problems with attention, perception, speed of cognitive response, problem-solving, and memory and learning. [3] People who are depressed tend to be preoccupied with other concerns and find it difficult to concentrate on new tasks, particularly those requiring prolonged attention or the complex processing of information. The good news is that when depression gets better, either with time or with medical treatment, memory usually improves as well. [4]

The term "stage fright" is already familiar to most people. Many comic sketches have portrayed actors or comedians fumbling desperately for lines they have spent hundreds of hours memorizing. Thus, it is no surprise to learn that anxiety can be a formidable foe to the acquisition, storage, and retrieval of information, though it can be beneficial in boosting performance in small doses. [5]

Fatigue: Whether from lack of restful sleep, overdoing it, or conditions like sleep apnea, fatigue can have significant effects on memory because it often impedes attention and concentration. Some researchers also believe that it makes retrieving information from long-term memory difficult, even familiar or easy-to-remember items. [6] Likewise, stress in general (particularly chronic stress) can have a negative effect on memory because it is a powerful distraction and contributes to fatigue.

Medications: If you take medications regularly for fibromyalgia, you already know that they can cause grogginess or other side effects which make concentration and recall difficult. Antihistamines, anti-anxiety drugs, painkillers, beta blockers, and some anti-depressants are particular culprits in this regard. Drug interactions can be problematic as well. While it may be imprudent for FM patients to discontinue medications which happen to impair memory, knowing that such side effects exist can also provide peace of mind. Maybe your memory isn't so faulty after all!

Illness: There is no question that illness or disease can interfere with memory. Not only can a cold or the flu impair one's ability to retain or recall information, but many chronic conditions like diabetes, hypertension, endocrine imbalance, and multiple sclerosis can also worsen memory. [7] There is also mounting evidence that chronic fatigue syndrome, a medical condition which overlaps with fibromyalgia, can cause difficulties with recall. In many chronic health conditions, impairment often improves as the underlying illness is treated.

Research on FM & Memory

So what about fibromyalgia? Many with FM complain about difficulties with memory, particularly short-term memory. Some link such difficulties to "fibro-fog", a term defined by FM researcher Stuart Donaldson, Ph.D., as "decreased ability to concentrate, decreased immediate recall, and an inability to multi-task". [8] Does this mean that there is something intrinsically wrong with the memory centers in the brain, or do certain FM symptoms or environmental factors simply get in the way of learning or recall? Although fibromyalgia research is now exploring such issues as cerebral blood flow, abnormal levels of certain brain chemicals, and various neuroendocrine anomalies in fibromyalgia patients, the emphasis is frequently on the origins of pain or the behavior of specific hormones and not on the function of memory systems per se. Thus, there is not yet much hard, empirical evidence on possible biophysiological origins of memory impairment in the brain. However, a few recent studies in the fields of chronic pain and FM do consider the issue of memory in fibromyalgia. Their results are mixed and somewhat conflicting.

In an article published in 1995, Canadian researchers Schnurr and MacDonald reported on their study of the effect of chronic pain on memory in 134 subjects. [9] They compared the memory complaints reported by two groups of chronic pain patients (i.e., those who had received whiplash injuries in an automobile accident and those who had suffered lower back or repetitive strain injuries in a work-related accident) to two control groups of medical/dental and psychotherapy patients who had no pain symptoms. The researchers chose two distinct pain groups because they had noticed that many chronic pain patients had cognitive symptoms and pain behaviors similar to persons who had sustained a mild, closed-head brain injury. They chose whiplash sufferers because they were persons who might have had an underlying head trauma. None of the pain group with work-related accidents had sustained head injuries, so they served as a comparison pain group.

The researchers subsequently found that both of the chronic pain groups reported significantly more memory problems than the two control groups even when the effects of depression (another common deterrent to concentration and memory) was statistically removed. In addition, they found no differences between the two chronic pain groups in terms of amount of memory impairment and concluded that "mild head injury did not appear to be the sole contributing factor to memory complaints in chronic pain patients". [10] They also recommended that future studies include neuropsychological testing to determine actual memory and cognitive functioning rather than perceived problems as had been reported in this study by subjects.

In an article also published in 1995, Norwegian researchers Sletvold, Stiles, and Landro compared the scores of a group of patients with fibromyalgia to a group of patients with depression on a battery of information processing tests. [11] Both groups' scores were then compared to those of a control group. While as predicted, patients with depression were found to have an information processing deficiency compared to controls, the investigators were surprised to find a similar deficiency in fibromyalgia patients. Moreover, when they tested a subset of the fibromyalgia patients who did not have any history of major depression, they found that group still significantly different from controls in their information processing capacity. There was, however, an interesting difference between the patients with depression and those with fibromyalgia. The test results also suggested that the patients with depression had cognitive abnormalities suggestive of a dysfunction of the right hemisphere of the brain. No such abnormality was found in the FM patients, and the researchers concluded that "FM and depression are biologically different conditions". [12]

In 1997, the same group of researchers used the identical three study groups to look specifically at memory impairment (rather than the more general information processing skills studied previously). In this later, small, exploratory study, when the fibromyalgia patients were divided into two groups containing those with and those without a history of major depression, only the "depression sub-group" showed memory impairment compared to controls. [13]

Most recently, researchers have looked at the problem of memory impairment and cognitive performance not only in terms of pain and depression but also in terms of sleep quality, level of anxiety or emotional distress, and the patients' own assessment of their performance.

In an innovative study reported in 1997, Canadian researchers Cote and Moldofsky compared patients with fibromyalgia to healthy controls in terms of sleep patterns, their speed and accuracy in completing complex cognitive tests (i.e., grammatical reasoning, serial addition/subtraction, and a simulated multi-task office procedure), and their assessment of their own accuracy in responding to test questions. [14] The researchers found that the FM group spent more time in stage 1 sleep than the controls and also reported more sleepiness, pain, negative mood, and lower (perceived) accuracy on complex cognitive tests over a 14-hour day. However, while the FM group was in fact slower in test-taking speed, their accuracy and performance was not significantly different from the control group.

In 1999, the Canadian investigative team of Gloria Grace reported on a study of memory performance in fibromyalgia patients versus controls on a battery of tests. They also measured pain severity, trait anxiety, and depression in FM patients. [15] What they found was that while the FM group as a whole performed within normal limits across all of the tests, some individuals had significant impairments on particular memory-related tasks. This was thought to be a result of difficulties with attention rather than "primary memory processes". [16] Such patients tended to score poorly on arduous tasks requiring either sustained concentration or the recall (either immediate or delayed) of material presented only once. In fact, many subjects were so anxious about the more prolonged tests that the latter had to be discontinued before completion. In contrast, when engaged in less taxing memory tasks involving attention/concentration or where items to be recalled were repeated several times, the same subjects performed normally. The authors concluded that "as a group, patients with FS [fibromyalgia syndrome] had good basic attentional skill; only when significantly challenged to sustain their attention did they show worse performance than the control group". [17] They also noted that "objective memory deficits in FS are more related to anxiety levels and subjective pain intensity than to either quality of sleep or depressed mood". [18] Like Cote and Moldofsky, Grace et al., found in their study that the FM group greatly underestimated their performance on the tests administered.

At the 1999 Annual Scientific Meeting of the American College of Rheumatology, University of Michigan psychologist Denise Park, a specialist in the field of cognition in the aging, reported on a new study of cognitive functioning in fibromyalgia patients that was funded by the Arthritis Foundation and the NIH National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). [19] Park and her co-investigators wondered if persons with FM had cognitive function similar to adults 20-30 years their senior. They selected a sample containing three groups of twenty subjects each: (1) FM patients with an average age of 47, (2) age-matched, healthy controls, and (3) adult controls 20 years older than the patient group. It should be noted that none of the patient group suffered from major depression or any other rheumatoid condition. In addition, all subjects were well educated.

The researchers administered a variety of tests designed to measure cognitive function and memory. What they found was that in speed of processing (i.e., how fast information could be handled), FM patients were similar to the healthy controls and therefore normal. Park considered this an extremely important finding as speed of processing is considered a very reliable measure of overall neurological intactness. Where the FM patients seemed to have problems, however, was with memory processes governed largely by the brain's pre-frontal cortex.

When it came to short-term memory, long-term memory, and verbal fluency, the FM patients scored worse than the healthy controls and more like the older controls. The researchers were also surprised to discover that the FM group scored worse than both control groups on vocabulary measures, a finding which reinforced patient reports of difficulties with word-finding and vocabulary.

Dr. Park suggested that future studies should take advantage of functional neural imaging technology which measures cerebral blood flow in patients who are performing particular cognitive tasks while undergoing an MRI scan. Because younger adults tend to show different patterns of brain function in these tests than older adults, knowing how FM patients compare with those the same age as themselves and older may shed some light on the cognitive brain function of individuals with FM. [20]

Memory Assistance Techniques

Clearly, more research will need to be done to better define the variables which effect memory in individuals with FM. Also, fatigue, exertion, and other elements will need to be factored into the equation. In the meantime, what can persons with FM do to improve their memories? Aside from minimizing information overload, excessive fatigue, and other factors known to interfere with concentration and memory, are there techniques available that can help? Absolutely!

Visit any bookstore, and you will find a variety of books and tapes offering a wide range of strategies, some of them very intricate, for battling memory woes. Approaches like the Loci, Peg, and Phonetic systems, for example, can help train you to learn staggering lists of words or numbers. However, there are some simple approaches which anyone can use to improve his/her memory skills. In addition, an innovative new lifestyle technique known as "neurobics" has been developed which works by exercising the mind in specific ways that keep it fit and prevent its deterioration. Both of these approaches will be described below.

As was noted earlier, the majority of memory problems which occur in healthy adults are a result of problems with focus or attention, problems which can be improved. In his book, *Your Memory: How It Works & How to Improve It*, Dr. Kenneth Higbee suggests that people make a conscious effort to be more aware. Firmly reminding yourself that you need to pay attention to something (and then doing it) is a great start. Thus, if you tend to be absent-minded and forget whether you have turned off the burner on the stove, then you will need to make a conscious effort to say to yourself, "I am turning off the stove" when you do so. Your chances of remembering whether you did later on will improve. Similarly, if you tend to walk into another room and then realize that you have forgotten why you were going there, you will need to say to yourself as you start out, "I am going in the other room to get a pencil". [21]

What can you do when you really need to commit something to memory? Among the techniques most often recommended by psychologists are the following:

- ❖ **Rehearsal:** Repeating new material several times (verbally and/or in writing) and then reviewing it until it is committed to memory. This is a technique with which most of us are already familiar.
- ❖ **Sequencing/Categorizing:** Arranging material in ways that will organize it, thereby making it easier to remember. For example, if you are memorizing the 50 states in the U.S., you might learn them in alphabetical order or by geographic location. Or you might learn the states in categories: Mid-Atlantic states, New England states, Rocky Mountain states, etc.
- ❖ **Visualization:** Picturing the word(s) or concept(s) you are trying to memorize. For example, imagine the face of a person whose name you are trying to learn so that your brain learns to associate the face with the name. Or, picture an image that goes with a particular name or word (i.e., a road painted green for the name Greenstreet) or some distinctive aspect of a person's appearance or voice (i.e., a bow-tie for Mr. Boden who always wears such an item). Visual images are very powerful, and when associated with words help memory considerably.

- ❖ **Linking:** Relating one word in a list to the next word, and so on down the list. For example, if you need to remember to purchase cat food, potatoes, and butter at the grocery store, you might imagine your cat eating a dish of mashed potatoes with melted butter on them. Interestingly, bizarre images like this one are frequently easier to remember. [22]
- ❖ **Association:** Connecting a new piece of information with something you already know. For example, most people learn that Italy is shaped like a boot or that an atomic blast looks like a mushroom. Alternatively, to help yourself remember a word or name that is on the tip of your tongue, you might also use an association technique which Dr. Higbee calls "thinking around it", meaning that you remember the context in which you learned a given word/name, where you were, what was going on at the time, etc. [23] Students can sometimes recall material when taking an exam by remembering where a particular concept was described in their textbook.
- ❖ **Creating A Story or Rhyme:** Making up a story or verse which includes all of the items you are trying to commit to memory. To remember the email address "bostoncop@mailnet.com", you might think of a Boston police officer calmly throwing a net over the local mailman. The story contains all of the elements of the phrase you are trying to commit to memory. To learn their numbers, most young children learn the rhyme, "One, two, buckle my shoe....".
- ❖ **First Letter Association:** Forming words or acronyms consisting of the first letter of a series of related words. For example, the acronym NIH stands for the National Institutes of Health. The word "HOMES" is a compilation of the first letters of the names of the Great Lakes (i.e., Huron, Ontario, Michigan, Erie, and Superior). You might also take the opposite approach and use an acrostic to create a distinctive phrase whose first letters will help you remember. For instance, the acrostic, "Every Good Boy Deserves Fun", reminds beginning musicians of the notes on the lines in the treble clef in music (EGBDF). First letter associations are helpful because they provide hints that help get your memory started, and they tell you how many items you need to remember.

Neurobics

Thanks to new scientific breakthroughs, scientists now have a much better general understanding of how memory works. As a result, it is now possible to design fitness exercises for the mind just as you might choose aerobic exercises to maintain physical fitness. In their book, *Keep Your Brain Alive* (Workman Publishing, 1999), neurobiologist Lawrence Katz, Ph.D., and writer/communications specialist Manning Rubin introduce the concept of "neurobics", a system of lifestyle changes which helps "maintain a continuing level of mental fitness, strength, and flexibility as you age". [24]

Neurobics is based on the premise that the brain is not the static entity it was previously thought to be which ceases to evolve and change as people grow older. Katz and Rubin note that in 1998 a team of American and Swedish researchers demonstrated that new brain cells are generated in adult humans. [25] As a result, it is now known that people are able to (mentally) grow and adapt to changing environments even as they age.

Similarly, the human memory isn't a monolithic, unchanging cavern where memories are stored. Rather, it is a highly complex and changing information network which stores information picked up by all of the senses and by the emotions. Hence, as the authors state: "Because each memory is represented in many different areas of the cerebral cortex of the brain, the stronger and richer the network of associations or representations you have built in your brain, the more your brain is protected from the loss of any one representation". [26] Katz and Rubin remind us that young babies are experts at building associations. They experience their environment in a multi-sensory fashion by looking at, touching, tasting, smelling, and hearing everything around them. Adults, on the other hand, tend to rely more on sight and sound and ignore

other powerful senses. The authors note that only the sense of smell is directly connected to the cortex, hippocampus, and other parts of the limbic system involved in storing memories. It is for that reason that just the smell of a particular type of industrial cleaner might remind you of the newly cleaned and polished halls of your childhood elementary school.

Katz and Rubin also argue that adults tend to engage in routine activities which do not challenge the mind nor make full use of its sensory equipment. They refer to passive activities like watching television and being a spectator to others' activities as "brain deadening". By using the senses and emotions in fun and unexpected ways, they maintain that it is possible to enhance the brain's natural drive to form associations between different kinds of information, feed its hunger for novelty, and increase "mental range of motion". [27]

Neurobics has two rules: (1) experience the unexpected, and (2) enlist the aid of all of the senses in the course of a day. [28] In their book, Katz and Rubin offer some interesting examples of neurobic exercises:

- ❖ Get dressed or eat a meal with eyes closed.
- ❖ Vary your normal routine--take a new route through the grocery store or choose a magazine you've never seen before at a newsstand.
- ❖ Brush your teeth with your non-dominant hand (including applying the toothpaste) or use only one hand to get dressed.
- ❖ Fill a jar with many small objects which have different shapes and textures (i.e., paper clips, buttons, screws, coins, etc.), mix them up, and with your eyes closed identify each of the objects by touch.
- ❖ Master a new gadget that intrigues you, or learn a new hobby or skill.

If you are serious about learning neurobics, it is highly advisable to consult the book as it contains a wide range of examples of exercises you can try.

Ultimately, fibromyalgia patients may well have to endure some level of memory dysfunction that is brought on by pain, poor sleep, or general stress. Nevertheless, a number of strategies are available to help you train yourself to learn and recall things better. If you take the initiative to keep your mind active and interested in the world around you, who knows what benefits you may reap?

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