

## HIGHLIGHT

### Memory loss

by Patricia Wadsley

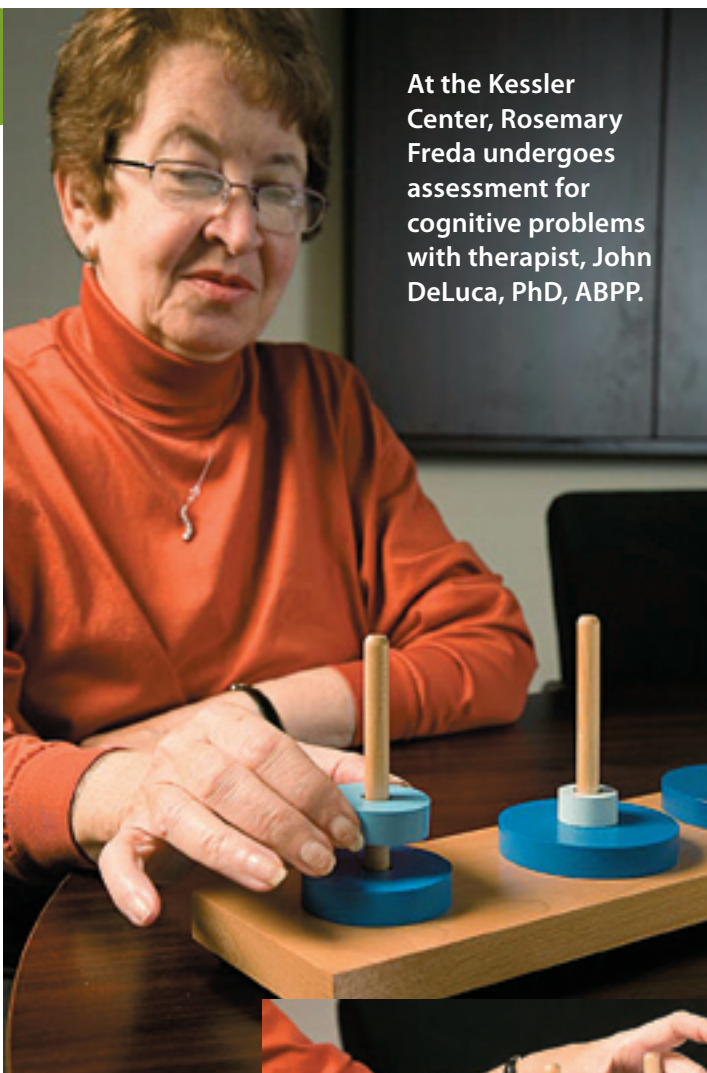
Not as sharp as you used to be? You're not alone. An estimated 60% of people with MS experience some sort of cognitive dysfunction in their lifetime. It might become harder to remember things, to concentrate or to plan and organize. And just like physical symptoms in MS, no two people experience these cognitive dysfunctions the same way.

"It is highly variable," said John DeLuca, PhD, ABPP, vice president of Research for the Kessler Foundation Research Center. "Some people with MS will only experience difficulties in one or two areas of cognitive functioning, others in several."

Dr. Rosalind Kalb, clinical psychologist and director of the Professional Resource Center of the National MS Society, agrees—and offers some perspective. "Although a small percentage of people with MS have severe cognitive challenges," she said, "the majority have manageable problems. The changes may be annoying or frightening, but people go on to live their lives and do work."

#### Where did I leave my gloves?

"The most common complaint we hear is 'I can't remember'—whether it's phone numbers, items to be bought at a store, or



At the Kessler Center, Rosemary Freda undergoes assessment for cognitive problems with therapist, John DeLuca, PhD, ABPP.



getting the right word out," said DeLuca.

But some kinds of memory are unaffected. "Procedural memory," like how to ride a bike, and "semantic memory" for the meaning of words both remain intact.

So do memories from pre-MS days—like your first love or the third-grade teacher you hated. The memory process most often affected is "working memory"—the day-to-day recollection of



**Poor memory bedevils many people with MS. Research finds some reasons why—and some practical remedies.**

where you left your sunglasses or where you parked the car. Lists, PDAs, calendars and routines help with these lapses—but working memory is also essential to learning anything new.



### It's "encoding" not "retrieval"

Until a few years ago, scientists thought that most memory problems lay in not being able to access facts or retrieve information stored in the brain. But more recently, studies led by DeLuca and other researchers show that inadequate "information encoding," or the initial learning of new information, is the barrier.

In other words, it's hard to remember things that were not thoroughly learned. Fortunately, there are practical and proven measures to improve the encoding process and enhance working memory: techniques

like visualization, mapping and "chunking."

### Images, chunks, stories and maps

"In visualization you attach a vivid image to a word or idea to help you remember it," said Britta Schramm, a speech pathologist who has MS. She helped develop CogniFitness, a program being used in the Southern California Chapter. "In chunking, you remember a list by sorting it into categories—for the supermarket you sort meats, cleaning supplies, vegetables. It works. And it shows your brain is eager for some sort of filing system."

With speech pathologist colleague Licia Coceani Paskay, Schramm developed the eight-week CogniFitness Program by drawing on their clinical work at the Marilyn Hilton MS Achievement Center, a joint program of the Society and the Neurology Department at UCLA.

Other techniques are "storytelling," which arranges words to be remembered in the context of a story, and "mapping," to help with planning and executive functions. Mapping works like this: you are arranging a trip. Instead of listing everything that has to be done, you take a blank piece of paper, draw a circle in the center and put the main idea in a center circle first. Then add all the tasks which need to be done on spokes that emanate from it. When that's complete, you prioritize and note the time

needed for each task.

"Mapping was very helpful to me," said freelance writer and **Momentum** contributor Alison Dale, who has MS. (See her latest article on page 54.) "I found it easy to manage executive functions this way. It stopped me from trying to do everything at once."

### More new techniques?

Stringent new clinical trials point the way to still other techniques. Dr. Yael Goverover, assistant professor of Occupational Therapy at New York University's Steinhardt School, led a trial at the Kessler Foundation where she is a visiting professor of Neuropsychology and Neuroscience. The trial was about "self generation," a learning process that requires active rather than passive participation in learning. Goverover's study involved people with MS and a "healthy" control group. All participants were asked to learn two recipes, each requiring 12 steps. One recipe was given to the participants to read over and remember. The other had words missing in each step, such as "Step One: beat ..." and people had to fill in the missing words as they went along. All participants remembered the "self generated" recipes better—after 30 minutes and after a week. **Arch Phys Med Rehab** 2008; 89

"The effect was still strong long after the test," said Goverover. "It shows that active

involvement helps with encoding in a much better way than passively receiving information.”

In a Society-funded study conducted at Kessler, Goverover tested a technique called “spaced learning.” Participants with MS

as well as people without MS were presented with two paragraphs to read. They were all asked to read the first paragraph three times in a row without taking a break. Then they read the second paragraph three times, but took five-minute rest breaks between each reading. All participants—with and without MS—remembered better and longer after the spaced learning.

“Giving the brain a chance to rest between readings improved learning and retention in all the subjects,” Goverover wrote.

**J Clin and Exp Neuropsych**  
2009; 31(5), 513–522

### Games boost brains

“We also advise people to play games such as Brain Age and Big Brain Academy,” said Dr. Monique Tremaine, the senior Neuropsychiatry and Clinical manager of Kessler’s Cognitive Rehab Program. “These games are designed to boost the brain.”

Brain Age was developed by Japanese neuroscientist Dr. Ryuta Kawashima. A success in Japan before hitting U.S. shores, Brain Age and its follow up, Big Brain Academy, offer fast-paced exercises.

“Our experience is that people with MS start out with low scores, but with practice, they’re scoring as high as anyone,” said Tremaine.

The Society recently partnered with Microsoft and Bayer HealthCare Pharmaceuticals to develop MyBrainGames, the first games designed specifically for people with MS. MyBrainGames can be played for free at [myMSmyWAY.com](http://myMSmyWAY.com).

### fMRI shows learning happens, given time

In the past few years, functional MRIs (fMRIs) that pinpoint brain activity have offered new insights. One is the finding that when people with MS are called upon to learn new information, they compensate for damaged areas of their brains by recruiting other brain areas. The good news is the brain has not lost its ability to think, and this finding bolsters many current treatments and techniques. The bad news is that the process takes time—in other words, it simply takes longer for people with MS to learn.

“Processing speed is at the core of cognition,” said Dr. Helen Genova, who led one of the most recent Kessler Foundation studies. Genova tested



her participants on accuracy, as well as speed. She found the people with MS performed as accurately and remembered as well as people without MS, but they performed slower. **J Inter Neuropsychol Society** 2009; 15: 383–393

“This suggests that people with slower processing speeds can perform as accurately as people without MS if given more time,” said Genova. “If students in school who have

**“The brain is like a muscle and the more we exercise it, the better off we are.”**

learning difficulties can have extended time, why can't adults with learning difficulties have the same accommodations on the job?”

### **A speed boost?**

Next up, Goverover wants to see if retraining can increase processing speed.

“Tests have been shown that processing speed can be increased in the elderly, another population with memory loss,” said Goverover, who cited a study by gerontologist Jerri Edwards, MD. “In studies conducted with older adults, participants responded to stimuli on the computer. They increased their cognitive processing speeds as they went along. If you can increase processing speed in elderly adults, you should be

able to do it in people with MS. Actually, in MS there could be even better results because the MS damage is more localized.” **Gerontology** 2002; 48:329–340

In Southern California, increasing processing speed in people with MS is being addressed practically. “We start out working on attention and focus, because you can't process information if you are not here and in the present,” said Schramm. “You have to recognize

when you are drifting and take control of the situation.

“Set upon a new task when your mind is at its best,” she advised. “You also have to work on your environment. If you can't stand fluorescent lights, change them. If people are talking around you, ask them to be quiet. Slow down, take a few deep breaths and set the scene for learning.”

Michelle Hazan agreed. Hazan was diagnosed in 2000, when she was a psychotherapist with a full caseload of clients. But when she started forgetting appointments and her paperwork seemed overwhelming, she knew she had to make a change.

“I had to give up my job,” she said, “and I became really depressed, not knowing what I would do next in my life. That's

when I turned to the National MS Society and met Britta. I had to learn new strategies for memory. But I did. I am in my fifties and I had never used a digital camera before. But I taught myself—slowly. Now I take care of animals and photograph them for their travelling owners. I love it. And I look at learning in a different way now.”

### **Cognitive reserves— a lifelong task**

These techniques might sound like a lot of work, but experts can now point to specific evidence suggesting that work pays off. Moreover, it can't begin too soon. Kessler Foundation research scientist Dr. James Sumowski led a study that found lifetime cognitive enrichment, which he measured simply by vocabulary knowledge, helps to protect people with MS from cognitive deficits and inefficiency. **J Int Neuropsych Soc**; 15: 606–612

The concept, called “cognitive reserve,” has already been applied to older adults and to people with Alzheimer's with the same results. Goverover believes that the concept of cognitive reserve could be broadened. “Stay active,” she said. “Stay involved.”

Schramm agreed. “The brain is like a muscle and the more we exercise it, the better off we are.”

Patricia Wadsley is a freelance writer. Her most recent story for **Momentum** was “Safe Driving with MS” in Fall 2009.