Chapter 1

Puzzling for Your Health

In This Chapter

- Taking a peek inside your brain
- Storing up ammunition against Alzheimer's
- Getting your body and mind in tip-top shape
- Choosing your puzzle poison

Be honest: Do you feel as mentally sharp today as you did when you were 20? (If you're 20 now, or even younger, indulge me for a moment while I address your elders.) Can you retain information as easily as you did at that age? Or do you suspect that you don't learn as quickly as you once did, and worry about occasional fuzzy moments when you can't recall things that used to be second nature?

If you're in the "fuzzy" category, even on rare occasions, you may feel a bit anxious about the changes that seem to be taking place in your brain. And you may wonder what, if anything, you can do about them. I suspect that may be why you're reading this chapter right now, as opposed to jumping straight into Part II of this book and trying your hand at the puzzle of your choice.

As an isolated activity, working a crossword puzzle or untangling a word scramble may not dramatically change anyone's cognitive ability. But combined with other lifestyle changes, working puzzles — or doing other types of mentally stimulating activities — may have profound long-term effects on memory and overall cognitive ability. That's why I devote this first chapter to the big picture of working puzzles: why they're potentially beneficial, and what else you can do to try to recapture your twenties (if only in your mind!).

Pumping Up Your Synapses

You may suspect that *I'm* the one who needs some mental help, writing about synapses in a puzzle book. But bear with me — I'll try to demonstrate that I haven't gone around the bend.

On the off chance that you aren't a neurologist, let me start with a couple definitions. *Neurons* are cells that control your central nervous system: your brain and spinal column, and the nerves connected to them. *Synapses* are tiny gaps between the neurons in your brain. When synapses are working correctly, they allow your neurons to communicate with each other, which keeps your nervous system functioning the way it should.

Your nervous system must function properly in order for you to learn new things, retain information, and use your powers of logic and reason.

You're feeling some love for your synapses now, aren't you?

You have about 100 billion neurons in your brain. And you have literally trillions of synapses — possibly even a *quadrillion* (that's a 1 followed by 15 zeroes). It sure

seems like you have plenty to spare, but as you age, your synapses deteriorate. And because your brain activity takes place courtesy of synapses, their deterioration equates to a decrease in your brain function, including memory.

The take-home lesson here is that if you want your mind to live to a ripe old age, you need to do more than just take care of your body (although that's crucial too, as I explain later in this chapter). You need to keep your synapses in top condition. How do you do that? Keep reading!

Building a Cognitive Reserve

In the late 1980s, a study published in the *Annals of Neurology* raised questions about why some people develop symptoms of Alzheimer's disease and some don't. Autopsies were conducted on 137 former nursing-home patients. As expected, the brains of those who had demonstrated symptoms of Alzheimer's were filled with *plaques* (brain deposits made up of dead cells and proteins) and *tangles* (nerve cells that had become tangled together) — characteristic physical signs associated with the disease.

Here's the unexpected part: The brains of ten patients who *didn't* show any symptoms of Alzheimer's contained the same level of plaques and tangles. If the physical reasons for the disease were present in those people, why didn't they get the symptoms?

There was another twist as well: The ten patients in question had heavier brains and more neurons than they should have given their age.

What made these ten people different from their peers?

As a result of this study, a new theory emerged: the *cognitive reserve* theory. It essentially says that people who have a larger reserve of neurons and stronger cognitive abilities can tolerate some brain deterioration without showing symptoms. In other words, the more you use your brain, the greater your chances of avoiding symptoms of Alzheimer's.

Strong stuff, huh?

Obviously, no one is offering guarantees here. I can't promise that anything I suggest in this book will add X number of years to your life, and that those years will be free of any symptoms of memory loss or other mental decline. But study after study in the past two decades has shown that mental activity can — and often does — have a positive effect on your quality of life in the long run, and I can't argue with that.

How do you build a cognitive reserve? The same way that you keep your synapses happy and healthy. Keep reading — the following section offers specific suggestions.

Taking a Whole-Body Approach to Brain Health

The great news about the steps you can take to improve your chances of long-term cognitive health is that many of them are the same steps you take to keep your body healthy. You need to add just a couple items to a list that's probably already familiar. And the new items are fun — promise.

Here's the familiar stuff:

- **Reduce stress.** If you've heard this advice from your doctor in relation to a physical condition, you now have double the reason to heed it. Research shows that stress causes synapses to malfunction.

  Long-term stress can cause a *neurotransmitter* (a chemical that carries messages between nerve cells) called glutamate to build up in your synapses. If enough of it accumulates, it can become toxic and interfere with your memory and your ability to learn.

- **Get aerobic exercise.** Aerobic exercise can help you manage and resist stress, which is enough reason to make it part of your daily routine. But among its many other benefits, studies suggest that it stimulates the creation of new neurons and strengthens the connections between them.

- **Eat a diet rich in antioxidant foods.** If your physical health alone hasn't inspired you to stock up on blueberries and spinach, do so for your mental health. Foods rich in antioxidants may help counteract effects of free radicals in your brain. (*Free radicals* are molecules that contain oxygen that attack cells throughout your body. They have been linked to cancer and heart disease, as well as brain deterioration.)

- **Control high blood pressure and diabetes.** A study published in the journal *Neurology* in 2001 showed that the mental abilities of participants with high blood pressure or diabetes declined more rapidly than those of other participants. High blood pressure is a risk factor for a condition called *vascular dementia,* in which a series of tiny strokes can affect memory and other cognitive abilities.

Early diagnosis and tight control of these conditions may help prevent some of the ill effects on your cognitive health.

Ready for the steps that may be new on your to-do list?

- **Get lots of mental stimulation.** Ahhh, *this* is where the puzzles come in — finally!

  You may be hard-pressed to find a scientist who would claim to know exactly how much mental stimulation the average adult of a certain age needs, or what types of mental activities are best for a certain population. The science is fairly young, and I guarantee you'll hear a lot more about it in the years to come. But the general consensus is this: Mental stimulation of any kind can have positive effects on warding off memory problems and other declines in cognitive function. And lack of stimulation is a serious factor in mental decline.

  So, how should you use your brain to get the maximum results? Only you can answer that question. That's because whatever you do, it has to be enjoyable enough to truly stimulate you and to keep you coming back for more, day after day. We're talking about running a mental marathon here — not winning a sprint. So you have my permission to read *War and Peace* or pull out your old calculus textbook, but only if thats what you really *want*. Otherwise, I suggest you look for other types of activities that will keep you interested in the long term. (Anyone for Sudoku?)

  The bottom line: If there's a hobby you love that you haven't made time for in years, make time for it. If there's an activity you've been meaning to do but have put on the back burner because it seems less important than folding laundry, do it. If there's a

subject you've been curious about for ages but haven't had time to study, study it. And if anyone (including your conscience) pesters you about how you're spending your time, memorize your new mantra: *My brain needs me.*

- **Stay curious.** This is an extension of the previous point. If you've buried your curiosity about the world around you because you haven't had time to explore it since childhood, now's the time — no matter how old you are or what your life circumstances are — to rediscover how curiosity feels.

Whatever activities you choose to help keep your brain stimulated, you need to enjoy them enough to do them regularly. You can't get your body fit by working out three hours in a row and then ignoring your health altogether for two weeks (because you're so sore from the marathon workout that you can't move for the first five days!). You benefit much more from working out consistently for shorter amounts of time — for example, every day for 30 minutes, or four days a week for 45 minutes each time.

The same seems to be true of mental exercise. Your goal should be to make time for mental stimulation at least several days a week, if not every day. If you can't devote time to working a crossword every day, no problem. But don't let a month go by between mental workouts. You have to invest the time if you want the results (see the sidebar "A puzzle constructor's dream").

A puzzler constructor's dream

An article published in *The New England Journal of Medicine* in 2002 reports on potential connections between leisure activities and the risk of dementia. Here's a quote:

> *Participation in leisure activities is associated with a reduced risk of development of dementia, both Alzheimer's disease and vascular dementia. The reduction in risk is related to the frequency of participation. According to our models, for example, elderly persons who did crossword puzzles four days a week . . . had a risk of dementia that was 47 percent lower than that among subjects who did puzzles once a week . . .*

Now, I swear I did not author this study! But I will tout it gladly to support the idea that spending quality time with this book, *The New York Times,* or any other source of quality crosswords may pay valuable dividends.