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(photos p.36)



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HOLDING THE LINE

Exercise can help stave off the ills of aging, making you stronger and sharper

BY BETH HOWARD

This year the first wave of baby boomers hits 65, and health officials are bracing for a tsunami of chronic ills, from arthritis to osteoporosis. Yet a growing body of evidence shows that regular exercise can delay or prevent many age-related ailments, even among longtime couch potatoes.

"There's compelling data that older individuals participating in exercise programs show dramatic improvement in function and abilities," says Cedric Bryant, chief science officer for the American Council on Exercise in San Diego. In fact, experts suggest that many ills once attributed to normal aging are now being viewed as a result of chronic inactivity.

Despite this promising message, fewer than 5 percent of seniors follow the recommended guidelines for physical fitness (30 minutes of moderately intense exercise on most days). "Levels of activity in people 65 and older haven't budged in decades," says Miriam Nelson, director of the John Hancock Research Center on Physical Activity, Nutrition, and Obesity Prevention at Tufts University in Medford, Mass.

Even if they've never exercised, the middle-aged and older can still benefit by beginning now. Experts say sedentary people will actually fare better in percentage gains relative to active people, since they're starting from zero. "It doesn't matter how old you are," says Colin Milner, founder and CEO of the International Council on Active Aging in Vancouver, British Columbia. "It's never too late to start exercising."

And getting a workout need not be daunting if you think of it in broad terms—"not as something you do in a special place, at a special time, while wearing special clothes," says Wojtek Chodzko-Zajko, head of the Department of Kinesiology and Community Health at the University of Illinois-Urbana-Champaign. "Walking, dancing, even gardening can have significant payoffs. Finding ways to build more activity into your life is as beneficial as taking out a gym membership."

The first step is to identify your goals, whether it's to run your first marathon or simply to keep living at home. Then find something you will enjoy doing. Try to mix it up—walk the dog, use resistance bands while you watch TV, brave a Zumba class—so you get the two key components of fitness: aerobics and strength training (Page 172).

Contrary to what experts once advised, most people don't need to check in with their doctors before venturing off the couch. "Even if you have a chronic but stable medical condition, it's safer to be exercising," Nelson says. "I like to joke that you need a doctor's note to stay sedentary—that's far more risky!" In fact, those who exercise regularly will generally see a drop in their risk for many of the diseases and disabilities tied to aging. Consider:

ARTHRITIS

If you suffer from the pain and stiffness of osteoarthritis, becoming more active may seem like the last thing you want to do. But increasingly, research suggests it could be one of the best strategies for feeling better, especially when it comes to sore knees—a common occurrence in older people. "Almost all studies show that exercise reduces pain and disability if it's done at a level that does not cause unusual pain during the workout, and no data shows it's harmful," says N. John Bosomworth, clinical instructor in the Department of Family Practice at the University of British Columbia in Vancouver. Bosomworth says his 2009 peer-reviewed analysis of current research also found that the exercise benefit is roughly equivalent to the continuous use of nonsteroidal anti-inflammatory drugs, such as ibuprofen.

Although researchers don't know for sure how physical

Almost all studies show that exercise reduces pain and disability from osteoarthritis

activity eases arthritis, they speculate that improving muscle tone around the joints may increase their stability, thus reducing symptoms. Plus, an exercise habit promotes weight loss, which reduces pressure within the joints, relieving pain and boosting function.

DEMENTIA

"Exercise can keep your brain sharp," says Milner. Indeed, its effect on brain fitness is drawing the scrutiny of researchers. In a 2006 study by the Group Health Research Institute in Seattle, higher levels of physical activity were associated with a 30 to 40 percent reduction in the risk of dementia and Alzheimer's disease in people age 65 and up. "In our study, as little as 15 minutes a day, three times per week helped maintain the brain," says lead investigator Eric Larson, an internal medicine doctor and geriatric researcher.

Researchers at the Mayo Clinic in Rochester, Minn., have also shown that moderate physical activities like walking and swimming later in life were similarly effective when it came to mild cognitive im-





pairment—an intermediate state between normal cognitive aging and dementia. “It’s true, you ‘Use it or lose it,’ but research suggests you should use it even after you start to lose it,” Larson says.

In addition, researchers at the University of Miami and Columbia University in New York found that older people who regularly engaged in moderate to intense activity were 40 percent less likely to experience the small brain lesions sometimes called “silent strokes.” These lesions increase the risk for dementia. Doctors theorize that exercise slows the rate at which blood vessels degenerate, allowing the brain to sustain less damage during times of stress. Plus, physical activity may directly improve blood flow in the brain and even reopen old blood vessels or help grow new ones. Similarly, other recent studies have shown that exercise resulted in an increase of nerve cells in the hippocampus (the brain region involved in memory formation).

OSTEOPOROSIS

Falls and broken bones often spell the difference between living independently and having to rely on assistance. Research indicates that exercise can prevent these setbacks by building stronger bones and lowering the risk of fractures.

In a 2010 study, researchers from Friedrich-Alexander University in Erlangen, Germany, compared women 65 and older who participated in an exercise regimen with peers who instead joined general wellness classes. Among the 227 women who completed the study, those who worked out showed significant increases in bone mineral density (BMD) in the spine and hips and a 66 percent reduction in the rate of falls. What’s more, fractures due to falls were half as common in the exercise group as in the control group.

In general, aerobics, weight-bearing activities (for example, walking, running, or stair climbing), and resistance exercises (which require the person to resist a particular force, like pulling against rubber tubing or lifting a dumbbell in a triceps curl) are all effective in increasing BMD in the spine. Bryant notes that simply taking a walk can help beef up hipbones, while “with resistance training, not only are muscles getting stronger, but connective tissues and bones” are too, which helps reduce the potential for injury.

TYPE 2 DIABETES

Working up a sweat not only helps keep blood glucose under control, but also addresses heart and blood flow problems, reducing the risk of heart disease and nerve damage—common concerns for people with diabetes.

For a study ending in 2001, the National Institutes of Health enrolled roughly 3,200 people at risk for diabetes in a two-year program.

One group was asked to make lifestyle changes, including losing 7 percent of their body weight through diet and exercising at least 150 minutes weekly. A second took the diabetes drug metformin, and the third was the placebo or control group. After roughly three years, the lifestyle changers showed a 58 percent reduced incidence of diabetes and the metformin patients a 31 percent reduction when compared to the rate of diabetes in the placebo group.

A recently released 10-year follow-up study for NIH's Diabetes Prevention Program confirmed these results. The lifestyle patients who had relied on exercise and diet showed a 34 percent reduction in diabetes incidence versus 18 percent in the metformin group when compared to the diabetes rate in the placebo group. The results were particularly pronounced among the lifestyle participants over 60. They slashed their risk of developing diabetes by half, notes lead investigator Jill Crandall, a professor of clinical medicine at Yeshiva University's Albert Einstein College of Medicine in New York.

Experts believe that much of the improvement might be tied to the multiple ways that exercise affects the body's use of glucose. For example, it increases the density of capillaries, improving the delivery of glucose to muscles and lowering levels of circulating free fatty acids. It also decreases visceral fat that accumulates dangerously around the vital organs in the abdomen and contributes to a decline in the body's insulin resistance.

HEART DISEASE

Exercise has long been known for its healthful effects on the cardiovascular system. A study from Brigham and Women's Hospital in Boston, published in 2007, showed that the benefits rise with the amount of physical activity. Researchers reviewed records of more than 27,000 women who had been followed for an average

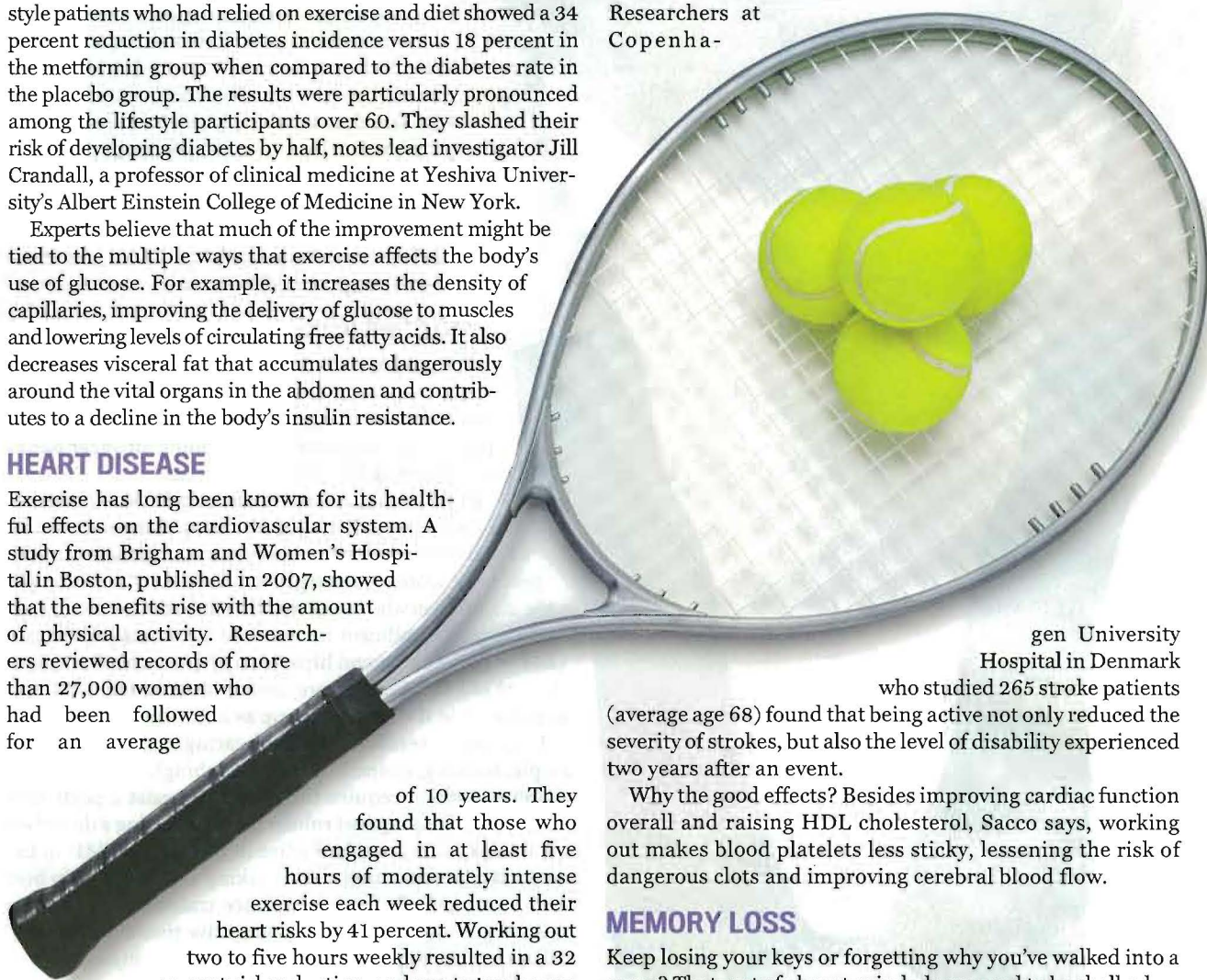
of 10 years. They found that those who engaged in at least five hours of moderately intense exercise each week reduced their heart risks by 41 percent. Working out two to five hours weekly resulted in a 32 percent risk reduction, and one to two hours, a 27 percent drop. Studies have further shown

that a regular exercise routine can also lower blood pressure, reduce levels of unhealthy blood fats such as triglycerides, and increase levels of "good" HDL cholesterol—providing extra protection against atherosclerosis (the buildup of fatty plaque in artery walls) and heart attacks. Regular activity also helps circulation by boosting production of nitric oxide by the cells lining the arteries.

STROKE

When an obstruction develops within a vessel that carries blood to the brain, a person can suffer a stroke. Physical activity in older adults is associated with a substantially decreased risk for such an event. Benefits are particularly striking for those engaging in moderate to vigorous physical activity—they can lower their odds of a stroke by about 60 percent, says Ralph Sacco, chair of neurology at the Miller School of Medicine at the University of Miami.

Researchers at
Copenha-



gen University
Hospital in Denmark
who studied 265 stroke patients

(average age 68) found that being active not only reduced the severity of strokes, but also the level of disability experienced two years after an event.

Why the good effects? Besides improving cardiac function overall and raising HDL cholesterol, Sacco says, working out makes blood platelets less sticky, lessening the risk of dangerous clots and improving cerebral blood flow.

MEMORY LOSS

Keep losing your keys or forgetting why you've walked into a room? That sort of absent-mindedness used to be chalked up to the normal aging process, but the latest research suggests it's not inevitable and may even be reversible. True, the hippocampus—the brain region involved in memory formation—begins to shrink as people age, contributing to memory loss, even among those who don't develop dementia. Working out not only helps stave off this process, but research shows it can actually help rejuvenate the hippocampus.

In a study led by researchers from the University of

Moderate to vigorous physical activity can lower the odds of a stroke by about 60 percent

Pittsburgh and the University of Illinois–Urbana-Champaign, 120 sedentary older adults were randomly assigned either to do aerobic exercise (walking at a challenging pace) or to stretch and engage in resistance training three times a week. The results, published this year, found that “walking briskly increased the size of the hippocampus by 2 percent in one year, which amounts to a reversal of about one to two years of aging on this brain region,” says lead author Kirk Erickson, assistant psychology professor at Pitt.

Why this happens is still unclear. Scientists know that exercise improves blood flow to the brain. This could result in higher production of key proteins known as brain-derived neurotrophic factor and vascular endothelial growth factor that promote better brain function and may increase the number of nerve cells as well as the connections between them.

INFLAMMATION

When you experience an injury or disease, your immune system launches a coordinated response of cells and chemicals to heal injuries or combat infection. The resulting inflammation, manifested by pain, swelling or redness, is a sign of good health. But sometimes, the immune system—from a variety of causes—can go haywire and is unable to turn off the response, which becomes chronic. The body, in effect, turns on itself. More and more, the diseases associated with aging, like heart disease, diabetes, and even some cancers, are linked with chronic inflammation as either an initiator or a perpetuator.

One factor is the tendency of people to become heavier and less active as they age. “The fat cells of people who are obese are large and outstrip the blood supply, causing problems within the cells and cell death,” and this is a primary cause of chronic inflammation, says Jeffrey Woods, professor at the Center for Health, Aging and Disability at the University of Illinois–Urbana-Champaign.

That’s a key reason exercise, especially when coupled with weight loss (for those carrying extra pounds), is so important to good health. Numerous studies show that physical activity and general fitness reduce levels of important markers of inflammation, such as C-reactive protein (CRP). A 2009 study of nearly 3,300 Chinese men and women reported in the journal *Circulation* showed that those with the highest levels of physical activity had the lowest CRP levels. “By reducing the size of fat cells, increasing blood flow, or both, exercise leads to healthier, less inflamed fat tissue,” Woods explains.

DEPRESSION

Working up a sweat has proved to be an effective weapon against mood disorders at any age, but could be especially important for older people. A 1999 Duke University study showed that a 16-week course of aerobic exercise was as effective as antidepressants in battling depression in people over 50. A 2007 study in the journal *Psychosomatic Medicine* reached the same conclusion.

Researchers at the University of California–San Diego further tested the exercise-depression dynamic last year with older adults suffering from a milder form of the disorder called subsyndromal depression. “SSD is common in seniors and often disabling,” says senior author Dilip Jeste, distinguished professor of psychiatry and neurosciences at UCSD. What’s more, the condition raises the risk for major depression fivefold.

In the study, seniors used Nintendo’s Wii Sports, which combines play with movement, three times a week. After 12 weeks, 37 percent of the patients saw their mood symptoms drop by at least half. Although the results need to be confirmed in larger trials, Jeste says, Wii and other “exergames” could prove an appealing exercise option for older adults since they can be used at home.

Research suggests that physical activity in general may enhance mood by increasing levels of “feel-good” hormones like endorphins and reducing levels of the stress hormone cortisol. Recent studies have also indicated that exercise may help reverse the depression-induced loss of neurons in the hippocampus, which regulates mood and emotion as well as memory and learning.

PREMATURE DEATH

As part of the Aerobics Center Longitudinal Study funded by NIH, 2,600 men and women age 60 and older had their fitness levels assessed along with weight, body fat, and waist circumference. In studying the mortality rate of participants over a 12-year period, researchers led by Xuemei Sui of the University of South Carolina made a striking discovery that they published in 2007: Seniors in the least fit group of participants had a death rate four times higher than the fittest. This latest research only confirms what doctors have long said about exercise. If you want to live a long life, the best strategy is to get off the couch now and get moving. ●

**Exercise was
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depression**

