Does Exercise Really Make You Healthier?

Six claims about the benefits of weight lifting and aerobics to see which carry the most...weight The Department of Health and Human Services (HHS) has released its new Physical Activity Guidelines (2009), calling for adults between the ages of 18 and 64 to exercise moderately (such as

- 5 brisk walking or water aerobics) for at least two hours and 30 minutes or vigorously (running, swimming, or cycling) for at least an hour and 15 minutes weekly. The longer, harder and more often you do **it**, the greater the health benefits, including reducing the risk of diseases such as cancer and diabetes, according to the recommendations, which were based on a decade of scientific research.
- 10 Studies have shown that people who engage in the amount of exercise recommended by the feds live an average of three to seven years longer than couch potatoes, according to William Haskell, a medical professor at Stanford University who chaired the HHS advisory committee. But how exactly does exercise accomplish **this**? And what about claims by naysayers (objectors) that exercise not only isn't healthy but may actually be bad for you? Is there any truth to **them**?

15 **1.** Good for the heart and blood vessels

In the past decade or so, various studies involving thousands of participants have shown that workouts lower the risk of heart disease. "Exercise has a favorable effect on virtually all risk factors of cardiovascular disease," says Jonathan Meyers, a health research scientist at the Palo Alto Veterans Affairs Health System in California. The reason, he says: when a person exercises, the

- 20 heart muscle contracts forcefully and frequently, increasing blood flow through the arteries. **This** leads to subtle changes in the autonomic nervous system, which controls the contraction and relaxation of these vessels. **This** fine-tuning leads to a lower resting heart rate (fewer beats to pump blood through the body), lower blood pressure and a more variable heart rate, all factors that lower the risk of developing cardiovascular disease, he says.
- 25 Meyers says that exercise also limits inflammation associated with heart trouble, such as arteriosclerosis or hardening of the arteries around the heart, which may lead to heart attacks. Many recent studies have focused on C-reactive protein, a marker of inflammation. Meyers says that research showed that sedentary folks who embarked on three- to six-month exercise programs, on average, experienced a 30 percent dip in their C-reactive protein levels about **the same drop** as
- 30 someone given a statin (a cholesterol and inflammation-lowering drug). In other **words**, in many people, exercise might be as effective as an Rx (a prescription) in tamping down inflammation, one of the key risk factors for cardiovascular disease.

Exercise also boosts cardiovascular health by decreasing the amount of plasma triglycerides—fatty molecules in the blood that are associated with plaque build-up in the arteries— notes Haskell.

- 35 What's more, he adds, physical activity helps reduce the particle size of low-density lipoprotein (LDL) or so-called bad cholesterol in the blood, and increase amounts of high-density lipoprotein (HDL), aka (or so-called) good cholesterol, **which** translates to less artery clogging. But exercise may not have the same effect on every person's cardiovascular system, notes Arthur
- Leon, chief cardiologist at the University of Minnesota's Heart Disease Prevention Clinic in 40 Minneapolis. "On average, there is a response but there is great variability, and that variability runs in families," he says. Take, for example, HDL cholesterol. Most broad studies show physical exercise leads to up to a 5 percent increase in HDL levels, but a closer examination shows that the
 - percentages vary from zero to 25 percent, depending on the study subject, he says, noting that only about half of the population seem to experience HDL increases as a result of exercise.

45 **2. Less cancer**

Several studies (including the ongoing federal National Health and Nutrition Examination Survey) following thousands subjects for several years, show that regular exercise lowers the risk for certain cancers, particularly breast and colon cancer, says Demetrius Albanes, a researcher at the National Cancer Institute in Bethesda, Md. Scientists have yet to pinpoint the mechanisms involved but have

50 come up with several plausible explanations.

"Physical activity beneficially affects body weight," says Albanes, noting that leaner people have lower circulating levels of insulin, a hormone produced by the pancreas that helps cells absorb glucose, their primary energy source. Obese and overweight people, are more likely to develop insulin resistance, a condition in which the cells no longer respond to the hormone and absorb

- 5 glucose. When **this** happens, the pancreas produces greater amounts to compensate, flooding the bloodstream with insulin; high levels of insulin in the blood have been linked to some types of cancer. "Insulin is essentially a growth hormone," Albanes says. "Insulin could create new tumors by increasing rates of cell division, or it could just make small tumors grow."
- Albanes says that exercise may also ward off cancer and other diseases because **it** appears to beef up the body's immune system. Exercise may also help reduce levels of the female hormones estrogen and progesterone in the blood, potentially also lowering the risk of developing breast and uterine cancers linked to high levels of those hormones.

Despite the apparent link between physical exercise and lower odds of cancer, Albanes acknowledges that there could be other factors at work. "Because most of these studies are not controlled trials, **it** could be some other lifestyle factor that helps explain the lower cancer risk," he

says, noting that people who exercise may also eat healthier diets.

3. Builds strong bones

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Robert Recker, an endocrinologist and current president of the National Osteoporosis Foundation in Washington, D.C., says research indicates that moderate exercise increases and maintains bone
mass and reduces the risk of osteoporosis. "The most compelling evidence," he says, "is that if you don't do anything, your fracture risk is much greater."

Like muscles, bones become stronger when forced to bear more weight than normal. "The skeleton is a smart structural organ and knows how much load is being put on **it**," Recker says. "Pick up a pail (bucket) of water, and you're loading your arm, your shoulder, your spine, your legs and your

25 hips." **That** means muscles are contracting, exerting forces on the bones supporting those body parts. **This force** stimulates the bone to maintain or even build new tissue. But scientists have yet to figure out why. "**That** is a focus," he says, "of incredibly aggressive research." Recker says that researchers speculate, however, that **it** has to do with exercise triggering osteocytes (the most mature bone cells) to instruct bone-building cells called osteoblasts to increase bone formation.

30 **4. Wards off diabetes**

According to Gerald Shulman, a cellular and molecular physiologist at Yale University School of Medicine in New Haven, Conn., exercising may prevent and even reverse type 2 diabetes. Diabetes type 2 is a disease in which the body begins to ignore or fails to produce enough insulin (a condition called insulin resistance). If muscles and other tissues cannot absorb glucose from the blood, nerve and blood vessel damage ensues, paving the way for heart disease, stroke and infections.

35 and blood vessel damage ensues, paving the way for heart disease, stroke and infections. "We've shown that in insulin-resistant individuals... build up of fat leads to biochemical reactions that interfere with the glucose-transport mechanism leading cells to block the activity of insulin," Shulman says. But physical activity helps reverse **this process**. He notes that when someone runs, cycles or does other vigorous exercise, muscle contractions ramp up (increase) production of

40 adenosine monophosphate-activated protein kinase (AMPK), an enzyme that promotes the breakdown of the fats interfering with the cells' glucose transporters.
"It is very likely that there are differences in the extent to which individuals respond to exercise, just as there are in responses to medications," says Ronald Sigal, a clinical epidemiologist at the Ottawa Health Research Institute in Canada. Leon agrees, pointing to research demonstrating that

45 exercise leads to varying decreases on visceral body fat (the fat surrounding organs), one of the key risk factors for developing type 2 diabetes.

5. Makes you smarter

Researchers have long believed that exercise boosts smarts but there was not any hard scientific evidence until a few years ago. Now, says Fernando Gomez-Pinilla, a neurosurgery professor at the

50 University of California, Los Angeles, **it** is known that exercise increases levels of some molecules in the brain that are very important for cognition.

One such chemical is brain-derived neurotrophic factor (BDNF), a molecule that promotes the growth and survival of brain cells as well as communication between them. Studies in rats show that physical exercise boosts BDNF levels in the hippocampus, a brain structure critical for learning and memory formation, **which** in turn helps **them** remember how to navigate their way through

5 underwater mazes. "The more exercise, the more changes in the brain; we found almost a linear relationship," Gomez-Pinilla says. "If we block the BDNF gene, we block this capacity of exercise to help learning and memory."

Numerous studies suggest that fitness enhances cognition in humans as well. A randomized clinical trial published recently in the Journal of the American Medical Association found that people 50

10 years and older with memory problems scored higher on cognitive tests after a six-month workout regimen. Those study participants assigned to exercise programs scored 20 percent higher than their sedentary **peers** at the end of the six months, and maintained a 10 percent edge one year after the trial ended.

But skeptics warn that not enough research has been done to confirm a link between exercise and human brain power. A recent review of studies on cognition in older adults (primarily those age 65 and older) by Dutch scientists published in the Clinical Journal of Sport Medicine concluded that "beneficial effects of various exercise programs on aspects of cognition have been observed in

studies among subjects with and without cognitive decline. The majority of **the studies**, however, did not find any **effect**."

20 **6. Weight Loss**

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The relationship between exercise and weight loss is complicated. Contrary to popular belief, working out at the gym every day will not necessarily lead to weight loss. "It is reasonable to assume that persons with relatively high daily energy expenditures would be less likely to gain weight over time, compared with **those** who have low energy expenditures," write the authors of the 2007 guidelines. "So far, data to support this hypothesis are not particularly compelling."

- 25 2007 guidelines. "So far, data to support this hypothesis are not particularly compelling." "Increasing physical activity—if people control caloric intake—will lead to weight loss," says William Haskell of Stanford University who helped craft the 2007 and 2009 guidelines. But he cautions that exercise alone is unlikely to lead to the instant results most people want, leading them to become frustrated and give up. "Suppose I do 30 minutes of brisk walking five days per week,"
- 30 says Haskell. "If you say walking a mile expends 100 calories, and if I walk at 3 miles per hour, I burn an extra 150 calories per day," he says. "Since one pound of fat is equivalent to about 3,600 calories, it could take three weeks to lose one pound. For most people, they are going to find this disappointing, and probably won't stick with it."

So for the average person, caloric intake—rather than calorie burning from exercise—appears to be
the most important factor in weight loss. But even if calorie intake trumps exercise, this does not mean exercise does not play a key role in helping people stay trim.

"If you talk about energy balance [when calories consumed equal calories burned], definitely there is evidence that exercise contributes to energy balance," says David Stensel, an exercise physiologist at Loughborough University in Leicestershire, England. A study recently published by

- 40 Stensel's team suggests that vigorous exercise suppresses the key hunger hormone, ghrelin, for up to 30 minutes after workouts and increases levels of the appetite-suppressing hormone peptide YY for as long as three hours after exercise. Stensel also points to studies showing that exercising may encourage people to crave healthier fare, such as unrefined foods (like fiber-rich beans and veggies) rather than foods loaded with refined sugar (such as cookies and cakes).
- 45 Some past researchers claimed that exercise would lead to weight gain in the long run because **it** ups one's appetite. But Arthur Leon of the University of Minnesota says (that) **that theory** has been shot down over the past decade. Some research suggests that **it** might lead to greater caloric intake, Stensel notes, but **that** does not necessarily translate into extra pounds. The increased calories, he says, are not enough to offset the calories burned—or energy consumed—during exercising.
- 50 The bottom line: couch potatoes may applaud the exercise naysayers but the bulk of research suggests that workouts make us physically and perhaps mentally healthier.