



# TrainSmarter

## Melatonin Can Be Dangerous

Over 3 million Americans take the hormone melatonin to help them sleep. But **this supplement can reduce the effectiveness of certain medications, and it has potentially dangerous side effects.** Many people who take melatonin do so at the wrong times or for problems that it will not solve. **A melatonin supplement will not help you fall asleep but it could help you sleep through the night if you chronically wake too early and cannot fall back asleep.** (Our natural melatonin production decreases as we age.) A melatonin supplement also can help shift your sleep schedule following travel between time zones, reducing jet lag. Melatonin supplements are safe for most people, but **they have been shown to decrease the effectiveness of certain crucial medications including blood pressure drugs, seizure-prevention drugs, antidepressants and birth control medications. They can increase blood sugar levels, making them potentially dangerous for diabetics.** Other potential side effects include headaches, dizziness, stomach irritation, irritability, short-term depression and grogginess. These side effects are most likely when people take excessive doses and almost everyone takes excessive doses. **An appropriate initial adult dose typically is 0.5 milligrams (mg), but most melatonin supplements contain three, five or even 10 mg per pill.**

## Omega-3 Supplements Don't Protect Against Heart Disease

Supplements containing omega-3 fatty acids, the oils abundant in fatty fish, are ineffective for the prevention of heart disease. The analysis pooled data from 10 randomized trials in people who had had cardiovascular disease or were at high risk for it. **No matter how the researchers looked at the data, they could find no association of the supplements with lowered risk for death from heart disease, or with nonfatal heart attacks or other major cardiovascular events.** There was no effect in people with prior coronary heart disease, those with diabetes, people with high lipid levels, or in people using statins. **The American Heart Association recommends supplements for people with coronary artery disease who may not get enough omega-3's by diet alone, but the study provided "no support" for those guidelines, Dr. Clarke said.**

## Don't Fear Fruits' Sugars

In a study of 4,908 Australians, **those with dietary patterns characterized by higher intakes of fruit were 12% less likely to be obese than those with lower fruit intakes.** But, people who had a diet higher in sugary soft drinks and chocolate were about 9% more likely to be obese. **"Natural sugars, such as in fruits, and added sugars, such as in sugar-sweetened drinks, are chemically similar, but research suggests they have opposite effects on our health,"** says Katherine Livingstone, PhD, lead author of the study at Deakin University in Australia. **"This is because the combination of other nutrients that make up the food (and your overall diet) is very important. Fruits should be encouraged as they are an important source of many beneficial nutrients, such as potassium and fiber."** In looking at people's diets as a whole, **those who ate more fruit were less likely to eat white (refined) bread, processed meats and high-calorie drinks and snacks.**

## Eating Fast May Raise Obesity Risk

Japanese researchers studied 59,717 people who had been given diagnoses of Type 2 diabetes. At periodic checkups over six years, they collected data on obesity and waist circumference, eating and sleep habits, alcohol consumption, the medications they took and whether they smoked. The researchers categorized the subjects as fast, normal or slow eaters based on self-reports. **They found that compared with the slow eaters, normal speed eaters were 29% more likely, and fast eaters 42% more likely, to be obese. Going to sleep within two hours of eating dinner and snacking after dinner were also associated with obesity, but skipping breakfast was not.** The study found an association, not a causal relationship. But the researchers suggest that a possible reason for the association is that fast eaters may continue eating without waiting to realize they have eaten enough, whereas slow eaters may have time to start to feel full and then stop.



## If You Stop Thinking Of Exercise As A Way To Lose Weight, You May Actually Enjoy It

For years, I thought of exercise in terms of calories in and calories out: Eat too much pizza on Saturday night, take an extra spin class. Skip an hourlong run, skip a bagel the next day. Train for a triathlon, eat whatever I want — because, hey, wasn't I burning like a zillion calories a day? This approach had two problems. First, it didn't work. My workout load seemed to have no bearing on my weight, and this isn't just anecdotal; studies have shown that exercise isn't a particularly effective way of losing weight. Second, it seriously screwed up my relationships with both food and exercise, two things that I inherently enjoy. I worked out way past the point of fun because I felt I had to make up for the previous day's overindulgences — which I hadn't really enjoyed because I was already anticipating the need to burn them off.

My lightbulb moment came when I no longer had time for the longer workouts I'd done in my relative youth. I'd try to shoehorn them into my schedule, but I couldn't keep that up for long, so my exercise life became inconsistent and guilt-ridden. Finally, I decided that just regularly doing something, even if it was only a short run or throwing a few weights around, was better than the all-or-nothing cycle I'd settled into. Running 20 minutes most days of the work week didn't feel like a big burden, but it added up to much more exercise than one failed attempt to run for 50 minutes every two weeks. As it turns out, my shorter routine was already pretty much meeting the recommendations for preventing heart disease, diabetes, cancer and early death. And because I knew my new regimen wasn't burning a ton of calories, I started paying more attention to my eating habits. Exercise became a way to achieve better health, not control my weight. This shift in thinking has profoundly changed my life. When I stopped leaning on exercise to save myself from my dietary habits, it became more fun and doable.

I had visions of a self-help book empire based on this insight, but alas, it turns out I wasn't the first to have it. **Yoni Freedhoff, a family physician and medical director of the Bariatric Medical Institute in Ottawa, has spent years pushing for “detaching exercise from weight loss and reattaching it to health.”** As he likes to say, regular exercise is the single best thing you can do for your health. Evidence suggests that it can lower cholesterol and blood pressure, reduce deaths from heart disease, prevent and treat Type 2 diabetes, improve respiratory fitness in people with asthma, and help with depression, among other things. As many experts have observed, if exercise were a pill, it would be the most beneficial medication on the market.

**Yet despite all its health benefits, exercise is not a particularly effective tool for weight loss.** One review from 2014 found that unless you're doing an awful lot of aerobic exercise, you're not likely to lose a lot of weight. **Without caloric restriction, most people who are overweight and obese can expect to lose up to about 4 pounds with exercise. That's not the same as saying it's totally useless — it isn't. It appears to help, albeit modestly, lessen weight gain over the long term. And it seems to reduce the chances that lost weight will creep back.**

**But we actually don't burn a ton of calories when we exercise, Freedhoff said.** If we did, we wouldn't have survived as a species during the majority of human history when calories were scarce. That's especially true in relation to the food we eat. For example, a 155-pound person burns 298 calories in 30 minutes of running at a 12-minute-mile pace. But the same person burns 42 calories in a half-hour of sitting around reading a book, so the net burn is closer to 256. That barely covers a half-cup of Ben & Jerry's, depending on the flavor. **There are also studies suggesting that even when we increase activity, our overall caloric expenditure holds steady, for reasons not fully understood.** Perhaps we unconsciously compensate for workouts by being less active during the rest of the day. **Of course, there will always be exceptions, but in general, exercise has a “disappointing” influence on weight,** Freedhoff said.

**If you're exercising with the expectation that you'll lose weight, you may be discouraged and tempted to quit when the pounds don't peel off, he said.** There is even research suggesting that people who believe obesity is caused by a lack of exercise rather than a poor diet are more likely to be overweight and to eat more. On the other hand, if your goal is general health, there is plenty of evidence that exercise is effective. Public health groups, including the Centers for Disease Control and Prevention and the American College of Sports Medicine, are in consensus: Aim for a minimum of about 150 minutes per week of moderate-intensity exercise, such as brisk walking; 75 per week of more intense exercise, such as running, aerobics or fast cycling; or some combination of the two.

**Why 150 minutes? “It's the magic number because according to the epidemiological research, that's the critical point where you start to see more substantial changes in the risk of disease and mortality,”** said Carol Ewing Garber, professor of movement sciences at Columbia University and an author of the ACSM's guidelines. There's a benefit at lower levels of activity — something is definitely better than nothing — but the 150-minute-mark weekly is where you start getting a better bang for your buck.



## If You Stop Thinking Of Exercise As A Way To Lose Weight, You May Actually Enjoy It (cont'd)

Public health groups also recommend regular strength and flexibility training, something that I had a much easier time fitting in when I wasn't trying to aerobicize myself into a smaller pants size. **Strength training is particularly important to fight off the loss of muscle mass as you age.** Of course, public health recommendations for entire populations aren't going to fit everyone. **Individual response to exercise varies, and some people need more than others to get to the same level of fitness,** Garber said. And diseases may require different amounts of exercise for prevention. A meta-analysis published in 2015 suggested that **to substantially lower the risk of heart failure, people needed to exercise two or four times the current public-health recommendations.** Again, though, **even though "more is consistently better" with heart failure prevention, anything is better than nothing,** said Ambarish Pandey, a cardiology fellow at UT Southwestern Medical Center and an author of the study. **More exercise than the minimum is definitely associated with "additional and more extensive health benefits,"** according to the CDC. So if you're happily exercising beyond the current recs, great! But that's not strictly necessary: **You can do something really great for your health by simply meeting the exercise guidelines, even if it's not the best way to tackle your weight.** If you're like me, that reframing may even make exercise more pleasant and rewarding.

*Katherine Hobson fivethirtyeight.com*

## This Is How Much More Sleep to Get If You Want to Cut Back on Sugar

**Sleeping at least seven hours a night may help people eat less sugar,** according to a new study in the American Journal of Clinical Nutrition. The research also found that **getting more shuteye was an attainable goal for healthy adults who typically got less than the recommended amount, and that simple strategies like reducing screen time before bed and avoiding coffee late in the day really did help.** Researchers at King's College London wanted to see whether it was possible to successfully extend sleep duration in "short sleepers" with just a short one-time intervention. To find out, they designed a randomized controlled trial: First, they recruited 42 healthy adults who reported regularly sleeping between 5 and 7 hours a night, and asked them to wear sleep trackers and keep food and sleep diaries for one week. Half of the volunteers then participated in a 45-minute sleep consultation with a sleep psychologist, which aimed to extend their time in bed by up to an hour and a half per night. The people in the study were counseled on why sleep is important, and each received a recommended bedtime along with a list of at least four behaviors—personalized to their lifestyle—they should try to adopt over the next few weeks. Those behaviors included avoiding caffeine and electronic devices before bed, establishing a relaxing bedtime routine and not going to bed full or hungry. The remaining volunteers did not receive a consultation and were told to go about their normal behaviors and keep their regular schedules. Both groups were then followed for four weeks. During the last week of the study, they again wore sleep tracking devices and kept sleep and food diaries. The sleep intervention worked, at least for those four weeks: **Of the people who received counseling, 86% increased their average time spent in bed.** Half also increased their average time asleep, with increases ranging from 52 to 88 minutes. Among the people who did not receive a consultation, there were no significant changes. The researchers also analyzed people's food diaries to see if increased sleep could affect diet and nutrient intake. They found that **people who extended their sleep patterns consumed, on average, 10 grams fewer added sugars per day at the end of the study, compared to the beginning. The numbers also suggested that those who slept longer consumed fewer fats and total carbohydrates as well, although those findings were not as strong. When it came to changes in weight, body composition, cholesterol or blood glucose levels, there were no significant changes between the two study groups. But that may be because the study only lasted four weeks,** says lead author Wendy Hall, a researcher in the department of nutritional sciences. **"The intervention period was relatively short, so the next step is to test whether body weight and body fat percentage would also be lowered following an intervention lasting months, rather than weeks,"** Hall said. Still, she calls the reduction in added sugars "exciting and potentially important." Hall also notes that the study involved a young, healthy group of adults. **"We may find more exaggerated effects in groups at risk for heart disease and diabetes,"** especially since lack of sleep is a risk factor for these and other chronic conditions. It's significant in that it shows how easy, low-cost strategies can really make a difference, says Hall. **"Most participants found that limiting technology use from back-lit screen devices close to bedtime, keeping technology devices outside of the bedroom, maintaining regular bedtimes and wake times, and avoiding caffeine later in the day were among the more applicable practices they could apply to their current lifestyle,"** she says. *Health.com*

## 'Forget walking 10,000 steps a day'

*I've started to hear disturbing stories of people becoming obsessed with their fitness technology. Several people have laughingly described walking around their bed in circles at night to "hit the 10,000 steps mark" while I know of one case where a man won't rest until he sees he has 20,000 steps every day. There's nothing magic about 10,000 steps, as you'll read below. The important thing is to not be sedentary. Studies have shown that running 10,000 steps in the morning is virtually negated if you spend the rest of the day sitting!*

These days it is hard to walk the streets without running into someone who is anxiously looking at their wrist to see if they are on target to reach the magic 10,000 steps. Is it really a goal worth striving for, or might there be something better? And where did that figure come from? **You might be surprised to hear it was the result of a 1960s marketing campaign in Japan. In the run-up to the 1964 Tokyo Olympics, a company came up with a device which they started marketing to the health-conscious. It was called a Manpo-Kei. In Japanese, "man" means 10,000, "po" means steps and "kei" means meter. So it was, literally, a 10,000 steps meter. The device was an early pedometer, based on the work of Dr Yoshiro Hatano, a young academic at Kyushu University of Health and Welfare. Dr Hatano was worried that the Japanese were busy importing a slothful American lifestyle, as well as a love of watching baseball, and wanted to help them get more active. He reckoned that if he could persuade his fellow Japanese to increase their daily steps from 4,000 to around 10,000 then they would burn off approximately 500 extra calories a day and remain slim.** That, apparently, was how the "10,000 steps a day" regime was born. It was clearly a great marketing success. But is it still the most effective way to improve our fitness? I went to a factory in Sheffield with Prof Rob Copeland from Sheffield Hallam University. Our aim was to do a small experiment in which we would compare the benefits and ease of doing 10,000 steps against something called, "Active 10". **With Active 10 you don't need to count steps. You simply aim to do three brisk 10-minute walks a day.** Our volunteers all had different reasons for wanting to get fitter. Dave said: "I'm very aware that I'm not as fit as I used to be and I've put a lot of weight on," while Judy confessed: "My only activity at the moment is knitting." And Nathan, who has a six-year-old daughter, said: "She runs so fast, and I run so slowly, I can't catch her up."

Our small group of volunteers was fitted with activity monitors so we could not only monitor what they did, but also how vigorously they did it. **First, a normal day's activity was measured. Rob then split them into two groups. One was asked to hit the 10,000-step target - around five miles - in a day, while the other group was asked to do three sessions of "Active 10" - which adds up to around 1.5 miles - more like 3,000 steps. The Active 10 group were also told that their aim was not to amble but to get their pace up so that they would be working their heart and lungs. Prof Copeland told them: "You are aiming to walk fast enough so that you can still talk but not sing." When we looked at the volunteers' results, two out of the three asked to do 10,000 steps had managed to hit their target. But they had all struggled. The Active 10 group, on the other hand, had found it relatively easy. They had formed a small walking group and met together at convenient times during their working day to go for a brisk walk together.**

**So 10,000 steps was harder to achieve - but which activity was better for health?**

Prof Copeland had analysed the data from their tracking monitors and he said **the findings were very clear. "The Active 10 group actually did 30% more 'moderate to vigorous physical activity' than the 10,000-step group, even though they moved for less time. "And it's when you are doing moderate intensity activity that you are starting to get the greatest health benefits."** So even though the Active 10 group spent less time actually moving, they spent more time getting out of breath and increasing their heart rate. Prof Copeland told the group: **"What we really wanted you to do was to get your heart beating faster. There's lots of evidence to suggest that by doing so you can lower your risk of diabetes, cardiovascular disease and some cancers."** So three short brisk walks were easier to fit into the day and better for health. I thought that was really interesting and I found it very encouraging, because I really don't like doing 10,000 steps. So the fact that **you can get similar, perhaps greater, benefits from a few brisk walks a day** is enormously encouraging. *Michael Moseley BBC*







## Lift Weights, Eat More Protein, Especially if You're Over 40

People who would like to become physically stronger should start with weight training and add protein to their diets, according to a comprehensive scientific review of research. The review finds that **eating more protein, well past the amounts currently recommended, can significantly augment the effects of lifting weights, especially for people past the age of 40. But there is an upper limit to the benefits of protein,** the review cautions. On the other hand, any form of protein is likely to be effective, it concludes, not merely high-protein shakes and supplements. **Beef, chicken, yogurt and even protein from peas or quinoa could help us to build larger and stronger muscles.**

It makes intuitive sense that protein in our diets should aid in bulking up muscles in our bodies, since muscles consist mostly of protein. When we lift weights, we stress the muscles and cause minute damage to muscle tissue, which then makes new proteins to heal. But muscles also will readily turn to and slurp up any bonus proteins floating around in the bloodstream. Knowing this, bodybuilders have long swallowed large amounts of gloppy, protein-rich shakes after workouts in the expectation of adding greater bulk to their muscles than the lifting alone. But the advantages of added dietary protein for the rest of us have been less clear. Past studies have indicated that, in general, people will gain more strength and muscle mass while weight training if they up their intake of protein than if they do not. But many of those studies have been relatively small or short-term and often have focused on only one kind of person, such as young men or older adults, or one kind of protein, such as whey shakes or soy. Whether everyone, including women, benefits similarly from consuming added protein while weight training and just how much protein is ideal, as well as what that protein should consist of and when it should be eaten, are all open questions.

So for the review, which was published in the *British Journal of Sports Medicine*, researchers from McMaster University in Hamilton, Ontario, and other institutions decided to aggregate the results from the best past studies of weight training and protein. Using databases of published research, they looked for experiments that had lasted at least six weeks, included a control group and carefully tracked participants' protein intake as well as the eventual impacts on their muscle size and strength. They wound up with 49 high-quality past experiments that had studied a total of 1,863 people, including men and women, young and old, and experienced weight trainers as well as novices. The sources of the protein in the different studies had varied, as had the amounts and the times of day when people had downed them.

To answer the simplest question of whether taking in more protein during weight training led to larger increases in muscle size and strength, the researchers added all of the results together. And the answer was a resounding yes. **Men and women who ate more protein while weight training did develop larger, stronger muscles than those who did not. The impacts of this extra protein were not enormous. Almost everyone who started or continued weight training became stronger in these studies, whether they ate more protein or not. But those who did ramp up their protein gained an extra 10 percent or so in strength and about 25 percent in muscle mass compared to the control groups.**

The researchers also looked for **the sweet spot for protein intake, which turned out to be about 1.6 grams of protein per kilogram of body weight per day. In practical terms, that would amount to about 130 grams of protein a day for a 175-pound man. (A chicken breast has about 45 grams of protein.) Beyond that point, more protein did not result in more muscle benefits. That number is considerably higher, however, than the protein levels called for in the current federal recommendations, which suggest about 56 grams of protein a day for men and 46 grams a day for women.**

"We think that, for the purposes of maximizing muscular strength and mass with resistance training, most people need more protein" than is advised in the recommendations, says Rob Morton, a doctoral student at McMaster who led the study. **That advice holds especially true for middle-aged and older weight trainers, he says, almost none of whom were getting the ideal amount of protein in these studies and who, presumably in consequence, tended to show much smaller gains in strength and muscle size than younger people. On the other hand and conveniently, any type of and time for protein was fine. The gains were similar if people downed their protein immediately after a workout or in the hours earlier or later, and it made no difference if the protein was solid or liquid, soy, beef, vegan or any other. Still, many questions remain, including whether adding more protein affects body weight or metabolism and if so, what that means for health.**

"We obviously need more studies," Mr. Morton says. But in the meantime, if you are wondering about your own protein intake, you can find many apps that will parse your diet, he says. *NY Times*

## The Vitamin Myth: Why We Think We Need Supplements

On October 10, 2011, researchers from the University of Minnesota found that women who took supplemental multivitamins died at rates higher than those who didn't. Two days later, researchers from the Cleveland Clinic found that men who took vitamin E had an increased risk of prostate cancer. "It's been a tough week for vitamins," said Carrie Gann of ABC News. Seven previous studies had already shown that vitamins increased the risk of cancer and heart disease and shortened lives. Still, in 2012, more than half of all Americans took some form of vitamin supplements. What few people realize, however, is that their fascination with vitamins can be traced back to one man. A man who was so spectacularly right that he won two Nobel Prizes and so spectacularly wrong that he was arguably the world's greatest quack. In 1931, Linus Pauling published a paper in the Journal of the American Chemical Society titled "The Nature of the Chemical Bond." His concept was so revolutionary in fact that when the journal editor received the manuscript, he couldn't find anyone qualified to review it. When Albert Einstein was asked what he thought of Pauling's work, he shrugged his shoulders. "It was too complicated for me." Pauling received the Langmuir Prize as the most outstanding young chemist in the United States, became the youngest person elected to the National Academy of Sciences, was made a full professor at Caltech, and won the Nobel Prize in Chemistry. He was 30 years old. He was the first to show that sickle hemoglobin had a slightly different electrical charge -- a quality that dramatically affected how the hemoglobin reacted with oxygen. His finding gave birth to the field of molecular biology. In 1951, he published a paper titled "The Structure of Proteins," proposing that proteins also had a secondary structure determined by how they folded upon themselves. He called one configuration the alpha helix -- later used by James Watson and Francis Crick to explain the structure of DNA. In 1961, Pauling collected blood from gorillas, chimpanzees, and monkeys at the San Diego Zoo. He wanted to see whether mutations in hemoglobin could be used as a kind of evolutionary clock and showed that humans had diverged from gorillas about 11 million years ago, much earlier than scientists had suspected. A colleague later remarked, "At one stroke he united the fields of paleontology, evolutionary biology, and molecular biology." His accomplishments weren't limited to science. Beginning in the 1950s -- and for the next forty years -- he was the world's most recognized peace activist. Pauling opposed the internment of Japanese Americans during World War II, declined Robert Oppenheimer's offer to work on the Manhattan Project, stood up to Senator Joseph McCarthy by refusing a loyalty oath, opposed nuclear proliferation, publicly debated nuclear-arms hawks like Edward Teller, forced the government to admit that nuclear explosions could damage human genes, convinced other Nobel Prize winners to oppose the Vietnam War, and wrote the best-selling book No More War! Pauling's efforts led to the Nuclear Test Ban Treaty. In 1962, he won the Nobel Peace Prize -- the first person ever to win two unshared Nobel Prizes. In addition to his election to the National Academy of Sciences, two Nobel Prizes, the National Medal of Science, and the Medal for Merit (awarded by the president of the United States), Pauling received honorary degrees from Cambridge University, the University of London, and the University of Paris. In 1961, he appeared on the cover of Time magazine's Men of the Year issue, hailed as one of the greatest scientists who had ever lived. Then all the rigor, hard work, and hard thinking that had made Linus Pauling a legend disappeared. In the words of a colleague, his "fall was as great as any classic tragedy." The turning point came in March 1966, when Pauling was 65 years old. He had just received the Carl Neuberger Medal. "During a talk in New York City," recalled Pauling, "I mentioned how much pleasure I took in reading about the discoveries made by scientists in their various investigations of the nature of the world, and stated that I hoped I could live another twenty-five years in order to continue to have this pleasure. On my return to California I received a letter from a biochemist, Irwin Stone, who had been at the talk. He wrote that if I followed his recommendation of taking 3,000 milligrams of vitamin C, I would live not only 25 years longer, but probably more." Stone, who referred to himself as Dr. Stone, had spent two years studying chemistry in college. Later, he received an honorary degree from the Los Angeles College of Chiropractic and a "PhD" from Donsbach University, a non-accredited correspondence school in Southern California. Pauling followed Stone's advice. "I began to feel livelier and healthier. In particular, the severe colds I had suffered several times a year all my life no longer occurred. After a few years, I increased my intake of vitamin C to ten times, then twenty times, and then three hundred times the RDA: now 18,000 milligrams per day." From that day forward, people would remember Linus Pauling for one thing: vitamin C. In 1970, Pauling published Vitamin C and the Common Cold, urging the public to take 3,000 milligrams of vitamin C every day (about 50 times the recommended daily allowance). Pauling believed that the common cold would soon be a historical footnote. "It will take decades to eradicate the common cold completely, but it can, I believe, be controlled entirely in the United States and some other countries within a few years. I look forward to witnessing this step toward a better world." Pauling's book became an instant best seller. Sales of vitamin C doubled, tripled, and quadrupled. Drugstores couldn't keep up with demand. By the mid-1970s, 50 million Americans were following Pauling's advice.



## The Vitamin Myth: Why We Think We Need Supplements (cont'd)

Scientists weren't as enthusiastic. On December 14, 1942, about thirty years before Pauling published his first book, Cowan, Diehl, and Baker, from the University of Minnesota, published a paper in the Journal of the American Medical Association titled "Vitamins for the Prevention of Colds." The authors concluded, "Under the conditions of this controlled study, in which 980 colds were treated . . . there is no indication that vitamin C alone, an antihistamine alone, or vitamin C plus an antihistamine have any important effect on the duration or severity of infections of the upper respiratory tract." Researchers at the University of Maryland gave 3,000 milligrams of vitamin C every day for three weeks to eleven volunteers and a placebo to ten others. Then they infected volunteers with a common cold virus. All developed cold symptoms of similar duration. At the University of Toronto, researchers administered vitamin C or placebo to 3,500 volunteers. Again, vitamin C didn't prevent colds, even in those receiving as much as 2,000 milligrams a day. In 2002, researchers in the Netherlands administered multivitamins or placebo to more than 600 volunteers. Again, no difference. **At least 15 studies have now shown that vitamin C doesn't treat the common cold. Neither the FDA, the American Academy of Pediatrics, the American Medical Association, the American Dietetic Association, the Center for Human Nutrition at the Johns Hopkins Bloomberg School of Public Health, nor the Department of Health and Human Services recommend supplemental vitamin C for the prevention or treatment of colds. Although study after study showed that he was wrong, Pauling refused to believe it, continuing to promote vitamin C in speeches, popular articles, and books. When he occasionally appeared before the media with obvious cold symptoms, he said he was suffering from allergies.** Then Linus Pauling upped the ante. He claimed that vitamin C not only prevented colds; it cured cancer. In 1971, he declared that vitamin C would cause a 10% decrease in deaths from cancer. In 1977, he went even further. "My present estimate is that a decrease of 75% can be achieved with vitamin C alone, and a further decrease by use of other nutritional supplements." "Life expectancy will be 100 to 110 years, and in the course of time, the maximum age might be 150 years." Cancer victims now had reason for hope. Wanting to participate in the Pauling miracle, they urged their doctors to give them massive doses of vitamin C. **"For about seven or eight years, we were getting a lot of requests from our families to use high-dose vitamin C," recalls John Maris, chief of oncology and director of the Center for Childhood Cancer Research at the Children's Hospital of Philadelphia. "We struggled with that. They would say, 'Doctor, do you have a Nobel Prize?' "Cancer researchers decided to test Pauling's theory. Charles Moertel, of the Mayo Clinic, evaluated 150 cancer victims: half received ten grams of vitamin C a day and half didn't. The vitamin C-treated group showed no difference in symptoms or mortality. Moertel concluded, "We were unable to show a therapeutic benefit of high-dose vitamin C." Pauling was outraged. Of course vitamin C hadn't worked: Moertel had treated patients who had already received chemotherapy. Pauling claimed that vitamin C worked only if cancer victims had received no prior chemotherapy. Bullied, Moertel performed a second study; the results were the same. Moertel concluded, "Among patients with measurable disease, none had objective improvement. It can be concluded that high-dose vitamin C therapy is not effective against advanced malignant disease regardless of whether the patient had received any prior chemotherapy."** For most doctors, this was the end of it. But not for Linus Pauling. He was simply not to be contradicted. Cameron observed, "I have never seen him so upset. He regards the whole affair as a personal attack on his integrity." Subsequent studies have consistently shown that vitamin C doesn't treat cancer Pauling wasn't finished. Next, he claimed that vitamin C, when taken with massive doses of vitamin A (25,000 IU) and vitamin E (400 to 1,600 IU), as well as selenium and beta-carotene, could do more than just prevent colds and treat cancer; they could treat virtually every disease known to man. **Pauling claimed that vitamins and supplements could cure heart disease, mental illness, pneumonia, hepatitis, polio, tuberculosis, measles, mumps, chickenpox, meningitis, shingles, fever blisters, cold sores, canker sores, warts, aging, allergies, asthma, arthritis, diabetes, retinal detachment, strokes, ulcers, shock, typhoid fever, tetanus, dysentery, whooping cough, leprosy, hay fever, burns, fractures, wounds, heat prostration, altitude sickness, radiation poisoning, glaucoma, kidney failure, influenza, bladder ailments, stress, rabies, and snakebites. When the AIDS virus entered the US in the 1970s, Pauling claimed vitamins could treat that, too.** On April 6, 1992, the cover of Time -- rimmed with colorful pills and capsule -- declared: "The Real Power of Vitamins: New research shows they may help fight cancer, heart disease, and the ravages of aging." The article, written by Anastasia Toufexis, echoed Pauling's ill-founded, disproved notions about the wonders of megavitamins. "More and more scientists are starting to suspect that traditional medical views of vitamins and minerals have been too limited. research shows they may help fight cancer, heart disease, and the ravages of aging." The National Nutritional Foods Association (NNFA), a **lobbying group for vitamin manufacturers, called the Time article "a watershed event for the industry."** Speaking at an NNFA trade show later in 1992, Toufexis said, "In fifteen years at Time I have written many health covers. But I have never seen anything like the response to the vitamin cover. There are no more copies."



## The Vitamin Myth: Why We Think We Need Supplements (cont'd)

Although studies had failed to support him, Pauling believed that vitamins and supplements had one property that made them cure-alls, a property that continues to be hawked on everything from ketchup to pomegranate juice and that rivals words like natural and organic for sales impact: antioxidant. Antioxidation vs. oxidation has been billed as a contest between good and evil. One consequence of oxidation is the generation of electron scavengers called free radicals (evil). Free radicals can damage DNA, cell membranes, and the lining of arteries; not surprisingly, they've been linked to aging, cancer, and heart disease. To neutralize free radicals, the body makes its own antioxidants (good). Antioxidants can also be found in fruits and vegetables -- specifically, selenium, beta-carotene, and vitamins A, C, and E. Studies have shown that people who eat more fruits and vegetables have a lower incidence of cancer and heart disease and live longer. The logic is obvious: if fruits and vegetables contain antioxidants -- and people who eat lots of fruits and vegetables are healthier -- then people who take supplemental antioxidants should also be healthier. In fact, they're less healthy. In 1994, the National Cancer Institute, in collaboration with Finland's National Public Health Institute, studied 29,000 Finnish men, all long-term smokers more than fifty years old. This group was chosen because they were at high risk for cancer and heart disease. The results were clear: those taking vitamins and supplements were more likely to die from lung cancer or heart disease than those who didn't take them -- the opposite of what researchers had anticipated. In 1996, investigators studied 18,000 people who, because they had been exposed to asbestos, were at increased risk of lung cancer. Investigators ended the study abruptly when they realized that those who took vitamins and supplements were dying from cancer and heart disease at rates 28 and 17% higher, respectively, than those who didn't. In 2004, researchers from the University of Copenhagen reviewed fourteen randomized trials involving more than 170,000 people who took vitamins A, C, E, and beta-carotene to see whether antioxidants could prevent intestinal cancers. Again, antioxidants didn't live up to the hype. "We could not find evidence that antioxidant supplements can prevent gastrointestinal cancers; on the contrary, they seem to increase overall mortality." When these same researchers evaluated the seven best studies, they found that death rates were 6% higher in those taking vitamins. In 2005, researchers from Johns Hopkins School of Medicine evaluated nineteen studies involving more than 136,000 people and found an increased risk of death associated with supplemental vitamin E. "This reaffirms what others have said. The evidence for supplementing with any vitamin, particularly vitamin E, is just not there. This idea that people have that [vitamins] will not hurt them may not be that simple." That same year, a study published in the Journal of the American Medical Association evaluated more than 9,000 people who took high-dose vitamin E to prevent cancer; those who took vitamin E were more likely to develop heart failure than those who didn't. In 2007, researchers from the National Cancer Institute examined 11,000 men who did or didn't take multivitamins. Those who took multivitamins were twice as likely to die from advanced prostate cancer. In 2008, a review of all existing studies involving more than 230,000 people who did or did not receive supplemental antioxidants found that vitamins increased the risk of cancer and heart disease. On October 10, 2011, researchers from the University of Minnesota evaluated 39,000 older women and found that those who took supplemental multivitamins, magnesium, zinc, copper, and iron died at rates higher than those who didn't. They concluded, "Based on existing evidence, we see little justification for the general and widespread use of dietary supplements." Two days later, researchers from the Cleveland Clinic published the results of a study of 36,000 men who took vitamin E, selenium, both, or neither. They found that those receiving vitamin E had a 17% greater risk of prostate cancer. Steven Nissen, chairman of cardiology at the Cleveland Clinic, said, "The concept of multivitamins was sold to Americans by an eager nutraceutical industry to generate profits. There was never any scientific data supporting their usage." On October 25, a headline in the Wall Street Journal asked, "Is This the End of Popping Vitamins?" Studies haven't hurt sales. In 2010, the vitamin industry grossed \$28 billion, up 4.4% from the year before. "The thing to do with [these reports] is just ride them out," said Joseph Fortunato, chief executive of General Nutrition Centers. "We see no impact on our business." Given that free radicals clearly damage cells -- and given that people who eat diets rich in substances that neutralize free radicals are healthier -- why did studies of supplemental antioxidants show they were harmful? The most likely explanation is that free radicals aren't as evil as advertised. Although it's clear that free radicals can damage DNA and disrupt cell membranes, that's not always a bad thing. People need free radicals to kill bacteria and eliminate new cancer cells. But when people take large doses of antioxidants, the balance between free radical production and destruction might tip too much in one direction, causing an unnatural state in which the immune system is less able to kill harmful invaders.

Researchers have called this "the antioxidant paradox."



## The Vitamin Myth: Why We Think We Need Supplements (cont'd)

Whatever the reason, **the data are clear: high doses of vitamins and supplements increase the risk of heart disease and cancer; for this reason, not a single national or international organization responsible for the public's health recommends them.** In May 1980, during an interview at Oregon State University, Linus Pauling was asked, "Does vitamin C have any side effects on long-term use of, let's say, gram quantities?" Pauling's answer was quick and decisive. "No," he replied. Seven months later, **his wife was dead of stomach cancer. In 1994, Linus Pauling died of prostate cancer.** *The Atlantic*

## Why Small Amounts of Weight Gain Shouldn't Go Unchecked

**"Many misleading stories based on deeply flawed analyses have suggested that it's okay to put on some pounds during midlife,"** says Walter Willett, professor of epidemiology at the Harvard T.H. Chan School of Public Health. **"But it's not a good idea at all."** Willett co-authored a study that tracked roughly 93,000 women and 25,000 men from midlife to their later years. **"Even modest increases in weight between entering adulthood and age 55 were related to a higher risk of the many outcomes we looked at,"** he notes.

**Women who gained only 5 to 20 pounds after age 18 had a higher risk of type 2 diabetes, cardiovascular disease, high blood pressure, obesity-related cancers, gallstones, and severe arthritis compared to women whose weight was stable.**

**Men had to gain more weight before their risk of most problems rose. But those who gained just 5 to 20 pounds after age 21 had a higher risk of type 2 diabetes and high blood pressure. That's not trivial.**

**"The gain in weight may not show up as health problems by age 45 or 55,"** says Willett. **"But it's a strong predictor of how healthy you'll be from that time on."**

He cautions that you can gain weight and still have a body mass index classified as "healthy."

**"Women can go from, say, a BMI of 18 to a BMI of 24, and they're still technically at a healthy weight,"** explains Willett. **"But that corresponds roughly to a 40-pound weight gain. That represents a huge increase in risk."**

**The goal: stay as close as you can to what you weighed around age 20.**

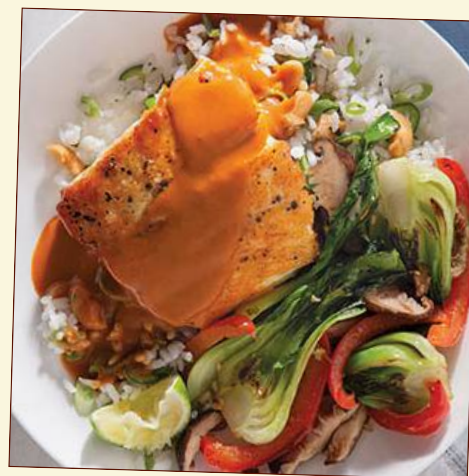
**"If you see your weight from age 20 creeping up even by five or so pounds, that's something to be concerned about,"** says Willett. **It's not just because those few pounds add some risk. "More importantly, that weight gain essentially indicates that you're on track to gain even more weight,"** notes Willett. **"If you don't do something, that increase is going to continue, and by the time you get to 50 or 55, you can end up with a very large and very serious gain in weight."** Even doctors may not take a small weight gain seriously. **"This has been a neglected issue,"** says Willett. **"Physicians often watch their patients gain weight and do nothing about it. Our study should be a heads up both to health care providers and to everybody else."** **"It's easy to put on pounds living in our environment, where there's food all around and often no good place to exercise,"** says Willett. **"But that doesn't mean we shouldn't try the best we can to minimize that weight gain."** **Both quantity and quality matter. "A high-quality diet—with fruits, vegetables, beans, whole grains, and nuts—can make it easier to control weight, rather than loading up on things like sugar-sweetened beverages, refined starches, and sugars,"** says Willett.



**Exercise also matters. Your best bet: a mix of aerobics—like walking, biking, jogging, or swimming—and strength training. A weight-loss diet with exercise shrinks deep belly fat more than diet alone. "Resistance training should be part of your activity pattern,"** says Willett. **"Even a few minutes a few times a week makes a big difference."** That's because our muscles shrink as we age. **"Even if we keep our diet and activity the same, our muscle mass tends to go down due to decreases in hormones that maintain muscle,"** Willett explains. **"Testosterone, estrogen, and insulin-like growth factor decline with age for reasons we don't understand."** Declining hormones is probably a good thing, he adds. **"If they didn't, we would probably have a lot more cancer. But the decline also means that our muscles shrink, so we need to increase resistance training just to maintain the same muscle mass."** *Nutrition Action*

## Coconut Curry Halibut

1 1/2 tablespoons brown sugar  
 2 tablespoons red curry paste  
 1 tablespoon lower-sodium soy sauce  
 1 tablespoon rice vinegar  
 1 (14-ounce) can light coconut milk  
 1 tablespoon fresh lime juice  
 3 mint sprigs  
 3 basil sprigs  
 1 tablespoon canola oil  
 4 (6-ounce) halibut fillets  
 1/4 teaspoon freshly ground black pepper  
 1/8 teaspoon kosher salt



Combine first 5 ingredients in a medium saucepan over high heat, whisking until smooth. Bring to a boil; reduce heat, and simmer until reduced to 3/4 cup (about 25 minutes). Remove from heat. Stir in lime juice, mint, and basil; let stand 5 minutes. Strain into a measuring cup; discard solids. Keep sauce warm.

Heat a large nonstick skillet over medium-high heat. Add oil; swirl to coat. Sprinkle fish evenly with pepper and salt. Add fish to pan; cook 4 minutes on each side or until desired degree of doneness. Serve fish with sauce. [myrecipes.com](http://myrecipes.com)

*I made this last weekend with some random frozen fish filets I found in the freezer and it was DELICIOUS! I don't know why this red curry sauce was better—maybe the rice vinegar? Try it & let me know what you think!*

## Do Calories Matter?

“The Key to Weight Loss Is Diet Quality, Not Quantity, a New Study Finds,” reported the New York Times online earlier this week. Here’s what the study actually found. **The study, called DietFits, was designed to see if people lose more weight on a healthy low-fat diet or a healthy low-carb diet. “Healthy” meant minimally processed whole foods. Feel free to cut carbs or fat for weight loss. The key is loading up on veggies and limiting added sugars and white flour.** “We told everyone in both groups to eat as little white flour and sugar and as many higher-fiber vegetables as possible,” says lead investigator Christopher Gardner, professor of medicine at Stanford University. The year-long trial, involving 609 people, was funded by the NIH and the Nutrition Science Initiative. The low-fat group was advised to eat high-quality carbs like lentils, low-fat yogurt, steel-cut oats, quinoa, fresh fruit, and beans. The low-carb group was told to eat high-quality fats like salmon, avocados, nuts, seeds, hard cheeses, and olive oil. **And no one told the participants to cut calories.** “If you prescribe calorie restriction, people feel deprived,” says Gardner. “So we just said, ‘Eat as low as you can on fat or carbs and don’t be hungry.’” **The results: Whether they cut fat or carbs, “each group reported a 500-calorie reduction,” says Gardner. And after a year, the people in each group had lost an average of about 12 pounds. In other words, when it comes to weight loss, it doesn’t matter if you cut carbs or fat. Although the study participants weren’t told to count calories, calories still mattered.** “Dr. Gardner said it is not that calories don’t matter,” explained the Times, near the end of the article. **Despite the headline and illustration printed in the Times this week, calories (and nutrition facts labels) matter.** What’s more, the study couldn’t show that “The Key to Weight Loss is Diet Quality, Not Quantity,” because it didn’t compare diet quality to quantity. (To do that, Gardner would have had to tell a third group of dieters to count calories.) **DietFits’ most surprising finding: It didn’t matter if people were resistant to their body’s insulin when they entered the study. “We assumed that insulin-resistant people would do better on a low-carb diet—as they did in some earlier studies—but they didn’t,” says Gardner. Maybe that’s because both groups were told to eat healthy foods, he suggests. Gardner also noted that—as in earlier studies—the results varied dramatically. “Someone lost 60 pounds, someone gained 20 pounds, and we saw everything in between. The range, which was similar in both diet groups, was stunning.” Bottom Line: You can lose as much weight on a healthy low-fat diet as a healthy low-carb diet. If you find it cumbersome to count calories, eat as little white flour and added sugar and as many fiber-rich vegetables as possible. You’ll likely end up cutting calories without thinking about it, but that doesn’t mean that calories don’t matter.**