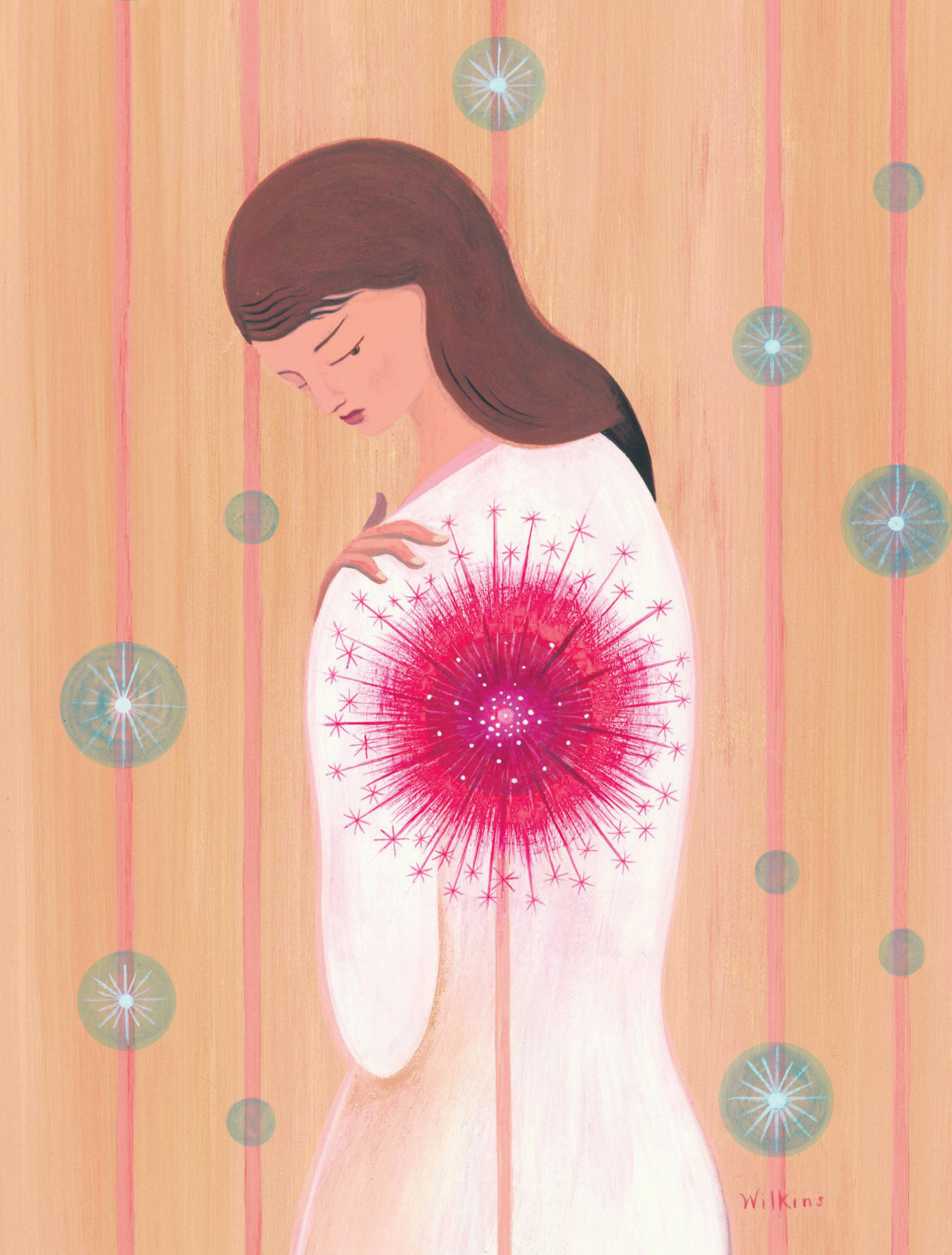
INFLAMMATION NATION

IT'S THE HEALTH HAZARD YOU'VE NEVER HEARD OF, YET IT CONTRIBUTES TO EVERY MAJOR CHRONIC CONDITION FROM HEART DISEASE TO CANCER TO DIABETES. BUT YOU CAN TURN DOWN THE DIAL ON INFLAMMATION WITH THESE 10 DIET AND LIFESTYLE CHANGES.

By Holly Pevzner Illustrations by Sarah Wilkins


Wilkins

Marisa Zeppieri-Caruana, 34, didn't look at all sick when she found out. "I was in amazing shape. I was a happy, busy, thin 23-year-old when I started getting strange fevers and feeling extremely tired. My doctor ordered some blood work and that's when I learned that my inflammatory markers were through the roof." Because Zeppieri-Caruana was in nursing school at the time, she knew exactly what that meant: her white blood cells, which typically help fight off illness, were actually wreaking havoc on her once-healthy body.

Under normal circumstances, some inflammation is a good thing: it's your body's natural protective response to an illness or injury. You know how your finger can get red and puffy when you get a cut? That's your white blood cells shielding your wound from contamination and infection. That's acute inflammation. Chronic or systemic inflammation—the kind that Zeppieri-Caruana was dealing with—is when the "protect me" signal misfires. "Essentially, white blood cells inappropriately move into tissues, causing destruction," explains Floyd Chilton, Ph.D., director of the NIH-sponsored Center for Botanical Lipids and Inflammatory Disease Prevention at Wake Forest Baptist Health School of Medicine in North Carolina. This reaction can happen anywhere in your body. "If the haywire inflammatory response happens in the heart, you wind up with heart disease; if it happens in the joint, it's arthritis; in the brain, it might be dementia," Chilton says. In Zeppieri-Caruana's case, her widespread inflammation was a symptom of lupus, an autoimmune, chronic inflammatory condition.

In fact, it's widely believed that chronic inflammation plays a significant role (as either a cause or effect) in many diseases, including type 2 diabetes, autoimmune diseases, such as arthritis and Crohn's disease, and the three top killers in the United States: heart disease, cancer and stroke. Emerging research is focusing on the link between inflammation and brain disorders, including Alzheimer's disease and dementia. Obesity is one of the biggest drivers for inflammation—fat tissue actually produces and secretes over 100 different types of inflammatory messengers. (Losing weight, including through gastric bypass, can significantly lower inflammation markers, according to a 2011 study in the journal *Surgery for Obesity and Related Diseases*.) But obesity is not the only cause: "It's clear that genetics, family history, lifestyle and stress all play a large role in inflammation," says Christopher P. Cannon, M.D., a professor at Harvard Medical School and author of *The Complete Idiot's Guide to the Anti-Inflammation Diet*.

The tricky thing with inflammation is that it sometimes has symptoms, such as pain and lethargy, but often doesn't. You won't know you have inflammation until you get tested. "People who are a little overweight, who have borderline high cholesterol, borderline high blood pressure—those are the people who really need to be tested now," says Cannon. (*A simple and affordable blood test ordered by your general practitioner can diagnose inflammation.* *See "Get Tested," page 46.*) "If you find elevated markers at that point, you can really help ward off inflammation-rooted problems in the future with aggressive prevention."

Translation: If your doctor sees big issues brewing—or boiling over—you may be put on medication, such as a statin. "Statins can work wonders, greatly lowering inflammation markers and significantly reducing your risk for a cardiac episode," says Cannon. However, diet, exercise and lifestyle changes—such as quitting smoking and losing weight—should be the first line of attack, if possible. "Eating well is a really powerful tool against inflammation," Cannon says. "[An anti-inflammatory diet] is actually not a terribly complicated diet. First, you need to cut back on unhealthy things, such as saturated fat, sugar, refined carbohydrates and processed food." Think in terms of big-ticket items: don't eat steak more than once a week, avoid fried foods and limit ice cream to special occasions. "I don't eat any fried food or drink soda—and I wouldn't be caught dead in a fast-food chain anymore," laughs Zeppieri-Caruana. "These changes—along with my meds—have made a world of difference."

"EATING WELL IS A **REALLY POWERFUL TOOL AGAINST INFLAMMATION**"

In addition to limiting all the unhealthy stuff, you need to ramp up the healthy foods. Says Cannon: "Add in more foods that help alleviate and prevent inflammation, such as ones high in omega-3s, fruits and vegetables and whole grains." A healthy diet, plus key lifestyle upgrades (Healthy weight! No smoking!) can make all the difference.

10 Soothing Solutions

To help you stave off—or tamp down—inflammation

Balance Your Omega Fats.

Americans are gorging on too many inflammation-promoting omega-6 fats (found in vegetable oils, such as sunflower and corn, and processed and fast food made with them) and not consuming nearly enough inflammation-soothing omega-3 fats (found in salmon, tuna, flaxseeds, walnuts, canola and olive oils). In short: a diet high in omega-6s and low in omega-3s increases inflammation in the body, says Chilton. To better balance your omega fats, opt for as much fresh, unprocessed food as possible, swap your omega-6-rich corn or sunflower oil for omega-3-packed canola and load your plate with omega-3-rich foods. "If you eat one healthy source of omega-3 fatty acids every day, you'll be doing good things for inflammation," Cannon says. (Omega-3s boost the number of proteins in the body that quell inflammation and also reduce the level of proteins that promote inflammation.) If it proves difficult to get the recommended 1 to 4 grams of omega-3s daily through food (3 ounces of salmon delivers about 2 grams, 2 tablespoons of ground flaxseed has 3 grams), ask your doctor about taking a supplement. A 2011 study out of Ohio State University found that taking fish-oil pills daily (at a dosage of 2.5 grams/day of omega-3s) reduced stress-related production of interleukin-6, a prominent inflammatory marker, by 14 percent.

Get Your *Om* On.

A 2010 study in the journal *Psychosomatic Medicine* found that women who had regularly practiced 75 to 90 minutes of Hatha yoga twice-weekly for at least two years had markedly lower levels of interleukin-6 and C-reactive protein (CRP), two key inflammatory markers, compared to those who were new to yoga or practiced less frequently. "A central tenet of yoga is that practicing can reduce stress responses," explains Janice Kiecolt-Glaser, Ph.D., study co-author and professor of psychiatry and psychology at the Institute for Behavioral Medicine Research at Ohio State University College of Medicine. Researchers think that yoga's benefit is that it minimizes stress-related physiological changes.

Up Your Soy.

The Food and Drug Administration has indicated that eating 25 grams of soy protein daily helps to reduce your risk of inflammation-driven cardiovascular disease. But according to two 2009 studies, even as little as half that may be helpful. "We saw a reduction in inflammation after drinking just two [12-ounce] glasses of soymilk a day for three months," says study co-author Elvira de Mejia, Ph.D., associate professor of nutrition at the University of Illinois at Urbana. (Each glass contained 6 grams of soy protein.) Apparently, lunasin, a peptide found in soymilk and tofu, in combination with other soy proteins, can quell inflammation. (If you have a hormone-sensitive condition, such as breast cancer or endometriosis, check with your doctor before increasing the amount of soy in your diet.)

Enjoy a Massage.

A massage isn't just a treat—it can be part of staying healthy. Receiving a 45-minute Swedish massage can greatly lower levels of two key inflammation-promoting hormones, according to a study in *The Journal of Alternative and Complementary Medicine*. "Massage may decrease inflammatory substances by [appropriately] increasing the amount of disease-fighting white blood cells in the body," says Mark Hyman Rapaport, M.D., co-author of the study. "It may also lower stress hormones. Either way, these inflammation-lowering results can be seen after just one massage."

Limit Bad Fats.

The famed Nurses' Health Study out of Harvard (well known for being one of the largest and longest-running investigations into women's health) found that trans-fatty acids are linked to a significant bump in total body inflammation, especially in overweight women. Trans fats can be found in items including fried foods, packaged cookies, crackers, margarines and more. And buyer beware: "Even if a food label reads 0 grams trans fats, it can still contain less than 0.5 gram per serving, so if you eat multiple servings, you could be eating a few grams," advises Erin Palinski, R.D., C.D.E. Instead, check the ingredient list for partially hydrogenated oil. If you see this,

the product contains trans fats. While you're trimming the fat, cut back on the saturated variety as well, replacing butter with olive oil and being choosy about your protein sources. "Saturated fat, found in fatty cuts of meat, whole milk and butter, can convert to pro-inflammatory compounds when digested. Instead, aim to eat more lean proteins, such as fish, white-meat poultry and plant-based proteins like beans," Palinski says.

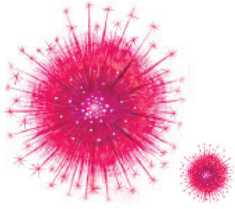
Eat Your Greens. Here's yet another reason not to skimp on green leafy vegetables, whole grains and nuts: they are all rich in magnesium, a mineral that about 60 percent of us don't consume enough of. "I encourage anyone who's susceptible to inflammation to assess their magnesium intake," says Forrest H. Nielsen, Ph.D., a research nutritionist at the USDA's Grand Forks Human Nutrition Research Center in North Dakota. (Ask your doctor to check your magnesium levels with a blood test.) "There's a lot of evidence that people with high inflammatory markers often have low magnesium levels. Plus, people who have conditions associated with inflammation, like heart disease and diabetes, also tend to have low magnesium levels," Nielsen says. In short: eating more magnesium-rich foods could help lower your chances of inflammation.

Keep Stress at Bay. Frequently frazzled? You may be opening the door to inflammation. A recent study in the journal *Brain, Behavior, and Immunity* found that people who have a strong emotional reaction to stressful tasks (you bite your nails when you have to make a presentation at work or get tense when someone presses your buttons) experience a greater increase in circulating interleukin-6 during times of stress than those who take stressful tasks in stride. While stress harms your body in many ways, Cannon puts it like this: "Stress increases blood pressure and heart rate, making your blood vessels work harder. Essentially, you're pounding on them more often and creating damage. If that damage happens over and over, inflammation persists."

Sleep More. If you're not clocking at least 6 hours of restful sleep a night, you're more susceptible to inflammation than those who have a solid night of slumber, according to research presented at the American Heart Association 2010 Scientific Sessions in Chicago. Getting less than 6 hours of sleep was linked to significantly increased levels of three key inflammatory markers—interleukin-6, CRP and fibrinogen.

Exercise Often. Losing excess weight via exercise (or eating better) is a great way to lower inflammation. Working out, however, can lower inflammation even if you don't drop one single pound. The reason? Exercising at about 60 to 80 percent of your maximum heart rate—think brisk walking where you can still talk but it would be difficult to carry on a conversation—lowers levels of the key inflammation marker CRP, Chilton says.

Drink Green Tea. Even if coffee is your beverage of choice, you might not want to bag tea all together—especially the green variety. Green tea is full of potent antioxidants that help quell inflammation. In fact, researchers from Texas Tech University Health Sciences Center in Lubbock recently found that green tea can inhibit oxidative stress and the potential inflammation that may result from it. "After 24 weeks, people who consumed 500 mg of green tea polyphenols daily—that's about 4 to 6 cups of tea—halved their oxidative stress levels," says Leslie Shen, Ph.D., the study's lead author. (The placebo group didn't see a single change.)



GET TESTED: WHAT'S YOUR CRP LEVEL?

"There are hundreds of markers of inflammation, but the most recognized and the one that we can easily test is called C-reactive protein," says Floyd Chilton, Ph.D., director of the NIH-sponsored Center for Botanical Lipids and Inflammatory Disease Prevention at Wake Forest Baptist Health School of Medicine in North Carolina.

CRP is a protein produced by the liver. "Changes in CRP levels are often the first sign of inflammation," says Christopher P. Cannon, M.D., professor of medicine at Harvard Medical School in Boston. "Your CRP level may rise even before you feel any effects of inflammation." In fact, a *New England Journal of Medicine* study found that CRP predicted heart attacks and strokes better than any other laboratory test. "Logic tells us that CRP is also linked to inflammation-related conditions, such as diabetes and arthritis. We're just waiting for the studies to catch up," says Chilton.

C-reactive protein levels in the blood are measured in milligrams per liter (mg/L). It's a simple—and affordable—blood test your doctor can order. If you have 1 mg/L or more, it's considered high and may indicate chronic inflammation. Talk to your doctor for follow-up advice. However, most acute inflammation shows CRP levels above 10 mg/L. "If your CRP level is above 10 mg/L, I recommend repeating the test after 2 to 3 weeks," says Cannon. "Sometimes inflammation markers are high because you were fighting an infection and not because you have an underlying disease associated with inflammation."