

Tackling Inflammation to Fight Age-Related Ailments

By Jane E. Brody

Personal Health

Body-wide inflammation is tied to most chronic diseases, limiting people's health and longevity.





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The quest for a fountain of youth is many centuries old and marred by many false starts and unfulfilled promises. But modern medical science is now gradually closing in on what might realistically enable people to live longer, healthier lives — if they are willing to sacrifice some popular hedonistic pleasures.

Specialists in the biology of aging have identified a rarely recognized yet universal condition that is a major contributor to a wide range of common health-robbing ailments, from heart disease, diabetes and cancer to arthritis, depression and Alzheimer's disease. That condition is chronic inflammation, a kind of low-grade irritant that can undermine the well-being of virtually every bodily system.

Chronic inflammation occurs to varying degrees with advancing age in all mammals independent of any existing infection. Researchers call it “inflammaging.” As Roma Pahwa of the National Cancer Institute and Dr. Ishwarlal Jialal of California Northstate University [put it in a recent report](#), “Although chronic inflammation progresses slowly, it is the cause of most chronic diseases and presents a major threat to the health and longevity of individuals.”

However, recent studies have identified measures potentially available to everyone that can minimize the potency of chronic inflammation and stymie — and possibly even reverse — its progression. The measures will come as no surprise to people familiar with the healthful advice that has been offered in this column for many years: Adopt a wholesome diet (details to follow), get regular exercise, avoid or reduce excess weight, get adequate quality sleep, minimize stress and don't smoke.

In essence, chronic inflammation, which can last indefinitely, results from the failure of the immune system to completely shut down its response to an illness, insult or injury. Among the factors that cause it are the body's failure to eliminate an inflammation-inducing agent like a bacterium or fungus; exposure to a foreign substance, like asbestos or silica dust, that can't be eliminated; and the presence of an autoimmune condition like rheumatoid arthritis.

As people age, their immune responses become less well regulated, resulting in elevated blood levels of inflammatory substances like C-reactive protein and chemokines, and allowing inflammatory agents like interleukin-6 (IL-6) and tumor necrosis factor-*α* (TNF-*α*) to persist in body tissues.

The drug metformin, commonly used to treat Type 2 diabetes, is known to have an anti-inflammatory effect and will be tested for its ability to delay the development of age-related diseases in a forthcoming trial called TAME, the acronym for Targeting Aging with Metformin.

Another consequence of aging is the accumulation of so-called senescent cells, normal cells that stop dividing, contribute to tissue aging and secrete substances like cytokines that induce inflammation. Elimination of senescent cells can counter chronic inflammation, said Steven N. Austad, director of aging studies at the University of Alabama at Birmingham. A combination of two drugs, dasatinib and quercetin, was shown in a Mayo Clinic study in obese mice to remove senescent cells and permit cell growth to resume in the brain. The findings were [reported in January in Cell Metabolism](#).

But consumers don't have to wait for the results of drug studies in people to take steps that can ward off chronic inflammation and the age-related ailments that it may contribute to or cause. Many practical measures known to counter chronic inflammation can be safely adopted now.

Let's start with what to eat and the foods to avoid eating. What follows will likely sound familiar to aficionados of a Mediterranean-style diet: a plant-based diet focused on fruits and vegetables, whole grains, and cold-water fish and plants like soybeans and flax seeds that contain omega-3 fatty acids.

A Mediterranean-style diet is rich in micronutrients like magnesium, vitamin E and selenium that have anti-inflammatory effects, and its high-fiber content fosters lower levels of two potent inflammatory substances, IL-6 and TNF-*α*.

Dr. Frank Hu, professor of nutrition and epidemiology at the Harvard T.H. Chan School of Public Health, strongly recommends limiting or eliminating consumption of foods known to have a pro-inflammatory effect. These include all refined carbohydrates like white bread, white rice and pastries; sugar-sweetened beverages; deep-fried foods; and red meat and processed meats. They are the very same foods with well-established links to obesity (itself a risk factor for inflammation), heart disease and Type 2 diabetes.

In their stead, Dr. Hu recommends frequent consumption of foods known to have an anti-inflammatory effect. They include green leafy vegetables like spinach, kale and collards; fatty fish like salmon, mackerel, tuna and sardines; fruits like strawberries, blueberries, apples, grapes, oranges and cherries; nuts like almonds and walnuts; and olive oil. The recommended plant foods contain natural antioxidants and polyphenols, and the fish are rich in omega-3 fatty acids, all of which counter inflammation.

Coffee and tea also contain protective polyphenols, among other anti-inflammatory compounds.

The bottom line: the less processed your diet, the better.

At the same time, don't neglect regular exercise, which Dr. James Gray, cardiologist at the Scripps Center for Integrative Medicine, calls "an excellent way to prevent inflammation." He recommends 30 to 45 minutes of aerobic exercise and 10 to 25 minutes of weight or resistance training at least four to five times a week.

"Although exercise is pro-inflammatory while you're doing it, during the rest of the time it leaves you better off by reducing inflammation, and after all you live most of your life not exercising," Stephen Kritchevsky, professor of gerontology and geriatric medicine at Wake Forest School of Medicine, told me. Independent of any effect on weight, exercise has been shown to lower multiple pro-inflammatory molecules and cytokines.

Two other recommendations from Dr. Kritchevsky: "If you're overweight, lose weight to reduce the body's inflammatory burden," and get regular dental cleanings to control periodontal disease, which can be a source of chronic inflammation. "There is no barrier between the gums and the circulation," he noted, and periodontal disease has long been linked to an increased risk of heart disease.

Chronic stress also contributes to inflammation, Dr. Gray said. Popular time-honored practices like meditation and yoga, among others, can help manage stress throughout the day. "We may not be able to change many of the stressful situations we encounter in life, but we can change our response and perception by learning to manage stress better," he said.

Dr. Pahwa and Dr. Jialal noted that stress can also cause sleep disorders, and "individuals with irregular sleep schedules are more likely to have chronic inflammation than consistent sleepers."

Finally, be judicious in the use of antibiotics, antacids and nonsteroidal anti-inflammatory drugs (NSAIDs) that can disrupt the normally healthy population of microorganisms in the gut and result in "a leaky gut that lets bacteria into circulation and is very pro-inflammatory," Dr. Kritchevsky said.