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Chronic inflammation

and its impact on health

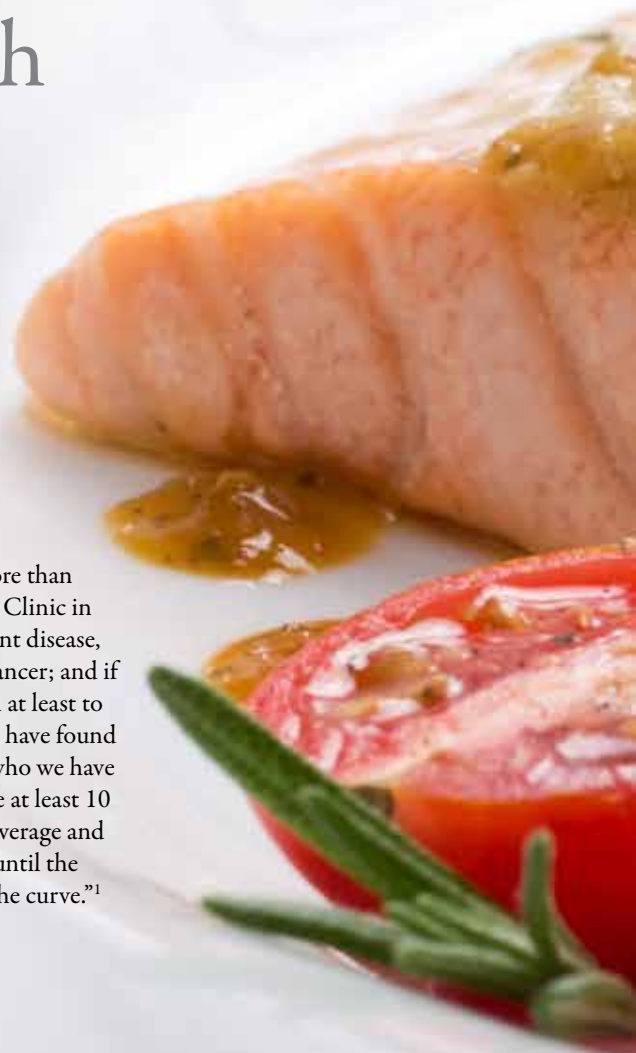
Chronic inflammation links to ‘a multitude of medical issues,’ notes this renowned preventive medicine pioneer. Outlining what causes this inflammation, he highlights healthy habits that can help reduce it

by Kenneth H. Cooper, MD, MPH

In the practice of medicine, the primary role is to diagnose and treat acute disease. It is the main emphasis of most medical schools and the continued focus of medi-

cal research. Conversely, for more than 50 years our mission at Cooper Clinic in Dallas, Texas, has been to prevent disease, particularly heart disease and cancer; and if we cannot prevent disease, then at least to diagnose it early. As a result, we have found among our patient database—who we have followed for 45 years—they live at least 10 years longer than the national average and tend to enjoy life to the fullest until the end. We call this “squaring off the curve.”¹

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Many medical problems are related to chronic inflammation, which is on the rise. Acute inflammation, such as when you have a sore throat or cut your finger, is transient. Following acute inflammation, however, an individual could have long-term “smoldering” inflammation called systemic chronic inflammation, known to cause a multitude of medical issues.

Inflammation and chronic conditions

The subject of chronic inflammation was first brought to my attention in an article published in *Harvard Magazine's* May/June 2019 issue, titled “Raw and Red-Hot. Could Inflammation Be The Cause of Myriad Chronic Conditions?”² The article includes a statement that “you can have a brain full of amyloid plaque and tangles, but if you don’t have neuroinflammation, you don’t get the disease.” In other words, you need a “spark to light the fire.” It appears that “chronic inflammation is...absolutely causal to the process, and if you interfere with it, you can reverse the pathology.”²

In 2021, Stephen Kopecky, MD, an invasive cardiologist at Mayo Clinic, wrote the book *Live Younger Longer: 6 Steps to Prevent Heart Disease, Cancer, Alzheimer's and More*.³ In this book, he said, “As we get older, what strips us of our health and eventually our lives are conditions that affect us over the long term—chronic diseases of the heart and blood vessels, diabetes, dementia and other illnesses that are common today.” This list also includes Alzheimer’s disease, cancer, arthritis, asthma, gout, psoriasis, multiple sclerosis, depression and Parkinsonism, all indeed triggered by low-grade, long-term inflammation, according to the *Harvard Magazine* article.²

What are the causes of chronic inflammation?

- oxidative stress: pollution, smoking
- poor nutrition, including processed foods
- unmanaged stress
- excess alcohol consumption (more than one drink per day)

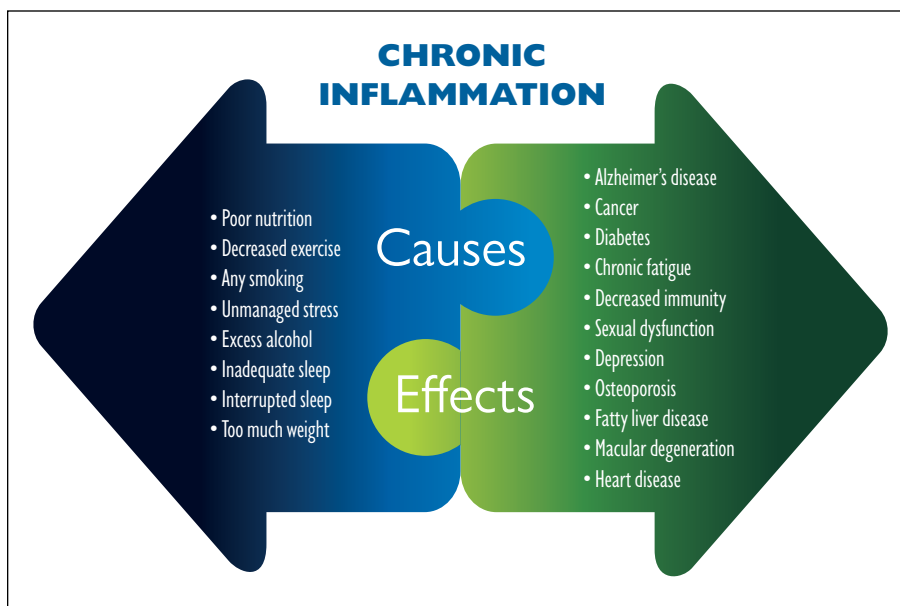


Figure 1. Chronic inflammation and its causes and effects. Reference: Kopecky, S. (2021). *Live Younger Longer: 6 Steps to Prevent Heart Disease, Cancer, Alzheimer's and More*. Rochester, MN: Mayo Clinic Press. Image courtesy of Cooper Aerobics.

- inadequate sleep (less than seven hours a night)
- too much weight (body mass index above 25, which is overweight; and particularly above 30, which is obese)
- physical inactivity

[Ed. See “Figure 1. Chronic inflammation and its causes and effects” above.]

Inflammation and physical activity

Numerous studies have shown an inverse relationship between physical activity and inflammation—in other words, the greater the amount of physical activity, the lower the level of inflammation, according to Kopecky.³ As a physician who has practiced preventive medicine for 66 years, I concur. I have seen that the greater the amount of physical activity in my patients, the lower the level of inflammation.

One key article published by The Cooper Institute®, our nonprofit research entity, is “The Association Between Midlife Cardiorespiratory Fitness Levels and Later Life Dementia.”⁴ In this study, 19,458

community-dwelling, “nonelderly adults” (average age 49.8 years) were followed for 25 years; 21% of the participants were women. Medicare data was evaluated between ages 65 and 75 years. Fitness level was the only risk factor considered during this study, measured by time on the maximal performance treadmill stress test. The top quintile of performance on the treadmill was compared with the bottom quintile. Conclusions: Higher midlife fitness levels seemed to be associated with lower hazards of developing all-cause dementia later in life independent of cerebrovascular disease (36% reduction in the top quintile versus the bottom quintile).

I believe the major difference between the two quintiles was due to participants’ weight and physical activity. Individuals in the top quintile were more active and lighter in weight during the 25 years than the bottom quintile, which were the reverse. Those in the bottom category of fitness were overweight and inactive, resulting in a highly significant difference in their level of chronic inflammation.

Measuring chronic inflammation

Now that we've identified causes of chronic inflammation and healthy habits to reduce it, how exactly do we measure this chronic inflammation? The test we use at Cooper Clinic is the hsCRP (high-sensitivity C-reactive protein), which is rarely measured in conjunction with most annual examinations. The usual complaint is this test is "too expensive (about \$65) and not worth it!" We have also found it is a more sensitive measure of acute inflammation in older people than relying upon the elevation of the white blood-cell count or sedimentation rate.

A focus of mine going forward is the importance of measuring chronic inflammation and if elevated (hsCRP above 3.0), to make a major effort to reduce it, concentrating first on promoting weight loss and increasing physical activity. I recommend at least 30 minutes collective or sustained aerobic activity most days of the week (150 minutes per week is also the recommendation of the American College of Sports Medicine⁵).

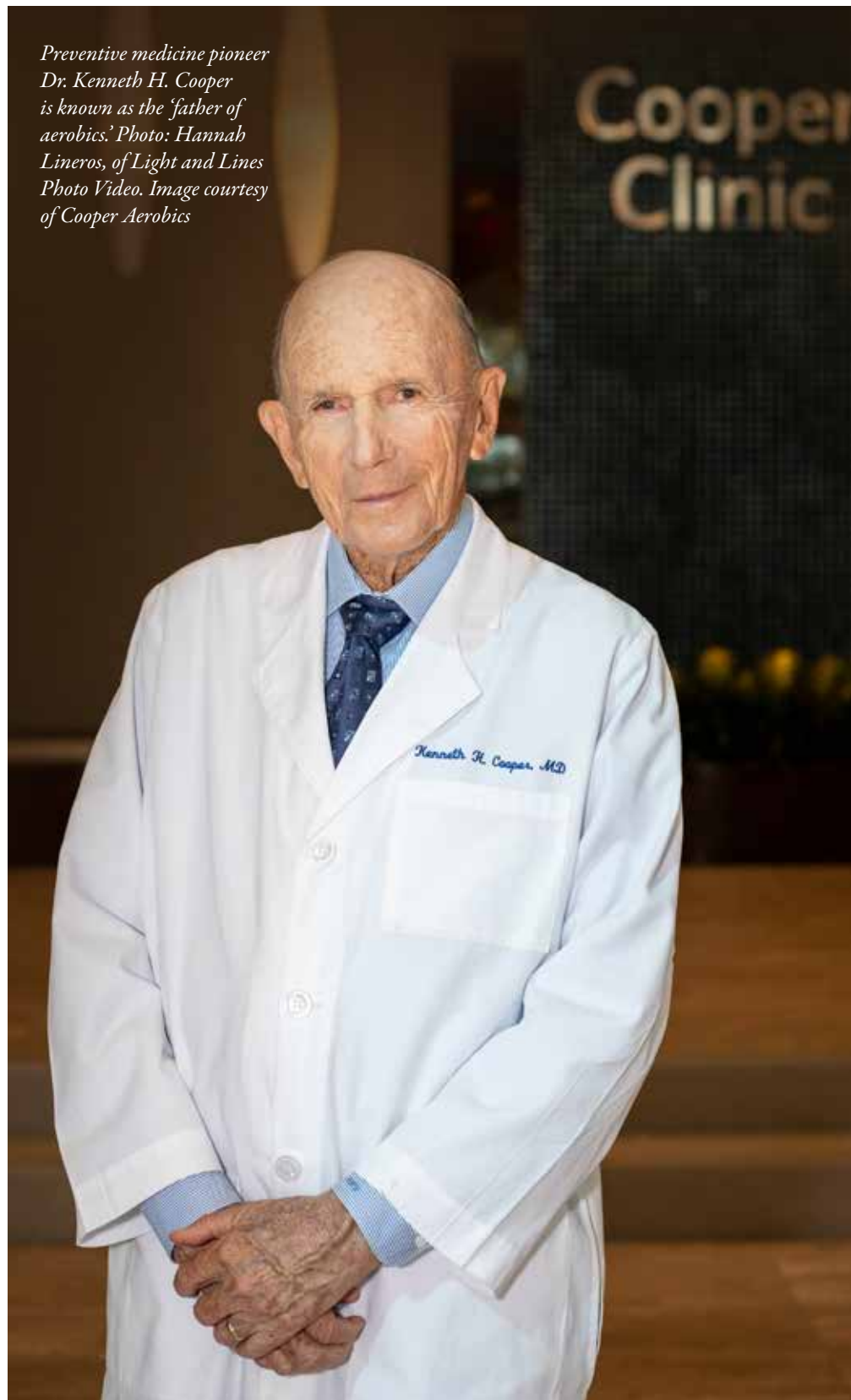
Healthy habits and inflammation

An epidemic of inactivity and obesity in the United States today^{6,7} fuels chronic inflammation in many Americans, including children. Remember, what is good for the heart is also good for the brain. Healthy habits can effectively reduce chronic inflammation. Active-aging professionals can encourage their residents or members to adopt the following:

- Exercise 30 minutes a day, collective or sustained, most days per week.
- Sleep at least seven hours per night.
- Socialize—avoid isolation by joining a club, synagogue, support group or volunteer at your church or in the community.
- Do not use tobacco of any type.
- Drink alcohol in moderation, if at all—I recommend both men and women avoid

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Preventive medicine pioneer Dr. Kenneth H. Cooper is known as the 'father of aerobics.' Photo: Hannah Lineros, of Light and Lines Photo Video. Image courtesy of Cooper Aerobics





consuming more than one drink a day or seven drinks per week.

- Supplement properly. Vitamins are extremely important for overall health and immunity as well as dementia prevention. One study has shown having vitamin D blood levels greater than 50 ng/mL offers considerable protection against Alzheimer's disease and dementia.^{8,9,10} I recommend taking each day 50 mcg of vitamin D₃, 400 mcg of vitamin B₁₂ and 1,000 mg of omega-3 (and/or at least two servings of fatty fish per week).

Multiple studies from The Cooper Institute emphasize that higher levels of fitness decrease the risk of dementia, depression, heart attack, stroke, multiple cancers and osteoporosis—as well as reduce health care costs.^{11,12} In addition, in a recently published study in *Medicine and Science in Sports and Exercise*, The Cooper Institute shows low levels of

fitness in women are directly correlated to a higher lifetime risk of all-cause mortality.¹³

The impact of lifestyle

Given what we know about chronic inflammation and the mitigating effect of healthy habits, I am passionate about further investigating chronic inflammation and its relationship to chronic diseases. First, I'd like to discover a better way of *testing* for chronic inflammation and of reversing it. Currently, the only measure we use is the C-reactive protein, which measures overall inflammation, rather than strictly chronic inflammation. With a better way of testing, we could focus on the impact of chronic inflammation in longitudinal studies to see if we could possibly stop or even reverse some of its harmful effects.

My hope for the future is for physicians around the world not to limit their practice

to taking care of acute disease, but to concentrate more on prevention—particularly the role of systemic chronic inflammation. This could have a revolutionary effect in the way medicine is practiced internationally.

In addition to learning more about chronic inflammation and its causes, patient education is key to combating it. As an active-aging professional, you can let people know it does not take a lot of money or even direct contact with a physician if they understand the most underappreciated risk factor in the world today—lifestyle.

Up to 70% of the diseases we have are now preventable,^{14,15} as are 50–60% of cancers.^{16,17} **No drug can replicate the benefits of an active lifestyle.** But the key word is discipline. It is not what individuals did six months ago that counts, it is what they did yesterday!🌀

Kenneth H. Cooper, MD, MPH, preventive medicine pioneer, is founder and chairman of the Dallas, Texas-based Cooper Aerobics Center, home of six health and wellness companies and renowned nonprofit research center The Cooper Institute. During his 13 years' service in the US Army and US Air Force, Dr. Cooper served as a flight surgeon and director of the Aerospace Medical Laboratory in San Antonio. He worked with NASA to help create the conditioning program preparing astronauts for space and the in-flight anti-deconditioning program. He also developed the 12-minute and 1.5-mile fitness tests and the Aerobics Point System. In 1968, Dr. Cooper introduced the concept of exercising in pursuit of good health when he launched the worldwide phenomenon Aerobics—his first of 19 books on health and fitness. His latest book, Start Strong, Finish Strong, is a collaboration with his son, Tyler Cooper, MD, MPH. Both father and son are board certified in preventive medicine and hold masters in Public Health from Harvard University.

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