

Can Your Gut Microbiome Affect How You Age?

We all hope to live a long, healthy life, but there is no escaping the aging process. Everyone experiences cellular changes that gradually impact physical and cognitive function. Changes in immune function and response to inflammation put older adults at increased risk for acute and chronic diseases.

However, not everyone ages in the same way. Genetics, diet, lifestyle, and environment play vital roles in aging. Research also suggests the gut microbiome may provide clues about how well a person will age.

Aging, Immune Health, and Inflammation

The aging process is complex and related to various factors, including DNA mutations and other types of cellular damage, oxidative stress from exposure to free radicals, and glycation (when sugar molecules bind with proteins or fats). These can lead to a gradual decline in immune health and increased inflammation that becomes more common with age, a condition scientists call “inflammaging.”^{1,2}

This low-grade, chronic, age-related inflammation contributes to a wide range of health conditions that are more prevalent in older adults, including:^{1,2,3}

- Atherosclerosis (hardening of the arteries)
- High blood pressure
- Heart disease
- Type 2 diabetes
- Increased risk of infections
- Cancer
- Arthritis
- Osteoporosis
- Sarcopenia (age-related muscle loss)
- Parkinson’s disease
- Alzheimer’s disease

The Gut Microbiome and Immunity

The gut microbiome includes the collection of trillions of bacteria, yeasts, and other microbes that live in the digestive tract. It plays many crucial roles in the body, including supporting immune health and managing inflammation. There is no consensus on what makes a “healthy microbiome.” However, scientists note that adults in good health have a rich, diverse microbial mix.¹

A more diverse microbiome helps keep harmful bacteria and other pathogens in check. Beneficial gut bacteria also produce various health-promoting compounds, including short-chain fatty acids (SCFAs). These compounds help

strengthen the colon lining, providing a defense against pathogens and toxins. Gut bacteria also aid digestion and absorption of nutrients that support immune health and promote a normal, healthy response to inflammation.¹

A rich, diverse gut microbiome carries out many functions that promote good health. On the other hand, an imbalance in the microbiome, known as dysbiosis, can hinder these essential functions and perhaps even threaten immunity and worsen inflammation.²

The gut microbiome is dynamic, and the composition changes throughout the lifecycle in response to internal and external exposures and stressors. Infancy, adolescence, and old age are all critical periods when the microbiome is more likely to be disrupted by these and other factors:^{1,2,3}

- A poor diet with large amounts of highly processed junk foods, sugar, or alcohol
- Environmental toxins, such as cigarette smoke or air pollution
- Use of certain medications, such as antibiotics, which can kill off beneficial as well as harmful bacteria.
- Chronic stress
- Poor sleep quality

A richer, more diverse microbiome is believed to be more resilient and able to maintain balance even with exposure to these stressors.²

The Aging Microbiome

Research suggests that the mix of microbes in the gut stays relatively constant from late adolescence through adulthood. Healthy individuals can recover from short-term or occasional microbiome disruptions. However, the microbiome undergoes significant changes later in life. Older adults (65+) may be less likely to maintain microbial diversity. With older age comes more frequent and compounded exposure to these and other conditions, which may promote dysbiosis: ^{1,3,4}

- Environmental and social influences from other people in the household, more time spent indoors, or social isolation.
- Reduced physical activity and fitness.
- Diet changes or poor nutrition due to reduced ability to smell, taste, chew, or swallow.
- Reduced ability to digest and absorb nutrients due to lower amounts of stomach acid and digestive enzymes.
- Changes in gut function caused by altered motility (constipation or diarrhea)
- More frequent or multiple medication use.
- Increased infections or chronic health conditions that stress the microbiome.

Researchers have noticed less diversity and varying degrees of dysbiosis in older people living in nursing homes and those with fixed or limited diets, limited mobility, reduced time outdoors, acute or chronic illness, and multiple

medications. On the other hand, studies on centenarians, people who live to or past the age of 100, show that their gut microbiome maintains diversity and develops higher numbers of inflammation-fighting bacterial species.^{2,5}

It is unclear if microbiome changes during aging result from or contribute to age-related disorders. However, longevity seems linked to a particular gut microbiome profile that makes some people more resistant to age-related diseases.^{2,5}

Support for the Aging Microbiome

These strategies can benefit the aging microbiome while also supporting immunity and a healthy inflammatory response independently of gut health:

- Eat a variety of plant foods every day. Fruits, vegetables, legumes (beans), nuts, seeds, and whole grains provide fiber and prebiotic compounds that support and nourish beneficial gut bacteria. Older adults should aim for 20-30 grams of fiber each day.
- Avoid fast foods, highly processed packaged meals and snacks (junk foods), excess sugar, and alcohol. These foods promote or worsen inflammation, while a whole-food diet with more plant foods and omega-6 and -3-rich fats from nuts, seeds, olive oil, and oily fish can help reduce inflammation and support immune health.
- Many older adults produce less stomach acid or [digestive enzymes](#), which can impair digestion, so supplementing these may be helpful. Heartburn may also be more common with age. Eating smaller meals with nutrient-dense snacks and limiting late-night eating can help.
- All adults should aim for at least 30 minutes of moderate physical activity most days (ideally outdoors) and two to three strength training sessions each week. Aerobic exercise and strength training help maintain muscle, strength, and stamina. Spending a few minutes in the sunshine each day helps maintain healthy vitamin D levels, a key nutrient for immune health.
- Avoid toxins in the environment and home as much as possible. Suspected microbiome disruptors include cigarette smoke, harsh household cleaning solutions, pesticides, heavy metals, BPA in plastics, triclosan in antibacterial soaps and personal care products, and artificial sweeteners like sucralose or aspartame.⁶
- Sleep is essential for immune and cognitive health, and all older adults should aim for at least seven hours of sleep each night. Instead of relying on sleep medications, practice good sleep hygiene. Turn off blue-light-emitting devices like the television, computer, phone, or tablet at least 60 minutes before sleep. Ensure the bedroom temperature is cool and comfortable, avoid late-night eating, and promote relaxation by meditating, journaling, or gentle stretching.

Some evidence suggests [magnesium](#) and [sleep support supplements](#) can promote relaxation, reduce the time it takes to fall asleep and improve

sleep quality.⁷ Also, note that loud snoring and excessive sleepiness during the day may be signs of sleep apnea, which is more common with aging, especially in those who are overweight.

- Chronic stress can impair the immune system and contribute to excess inflammation. Strategies such as yoga, meditation, tai chi, or talk therapy are beneficial for stress management. Clinical trials show that [the adaptogen Ashwagandha](#) is also helpful in reducing feelings of stress and anxiety.⁸
- Only use over-the-counter and prescription medications when necessary. Consider healthy lifestyle or diet interventions first. These are often the first line of defense to manage chronic health conditions.
- Consider using probiotics, prebiotics, or [synbiotics that combine both](#). A quality [probiotic designed for adults 60+](#) can add beneficial species and strains of bacteria for extra gut and immune support.

There is still much to learn about the gut microbiome, but it appears to influence health throughout the entire lifecycle. When considering strategies to maintain physical and cognitive health in old age, it's also crucial to address gut health. The microbiome may hold an important key to longevity and quality of life, helping us to thrive, not just survive in the later years of life.

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