

4 tips to boost immunity



A healthy immune system is essential — especially when you have MS.

by **Matt Alderton**

COVID-19 taught people to treasure toilet paper, live music, indoor dining and hugs. For many, it led them to appreciate good health — the foundation of which is a strong immune system.

A healthy immune system is especially vital for people with autoimmune diseases like multiple sclerosis, according to MS immunology researcher Jeri-Anne Lyons. Lyons says the immune system in people with MS attacks the central nervous system, damaging the protective myelin sheaths that insulate healthy nerves.

“The immune system is a balancing act between a pro-inflammatory response and an anti-inflammatory response,” explains Lyons, associate vice president for research and dean of the Graduate School at the University of Northern Colorado. “A small amount of inflammation is good. It’s what clears infections. The damaging immune response in multiple sclerosis results from chronic inflammation, which happens in part when the immune system’s anti-inflammatory mechanisms are faulty.”

It’s like a faucet: The pro-inflammatory response that destroys infections is like a hot-water tap that will scald you if it’s left running. The immune system has a counteractive anti-inflammatory reaction that acts like a cold-water tap to moderate the temperature.

“Some researchers theorize that MS attacks happen when protective immunity drops,” says

Lyons, who points to evidence that bacterial and viral infections may trigger MS exacerbations by riling up the immune system. “For example, urinary tract infections often will predispose a relapse.”

Underscoring the importance of immunity in the MS community are some disease-modifying therapies (DMTs), which may further compromise the immune systems of people with MS and leave them susceptible to dangerous infections.

“If someone’s on an immunosuppressive drug, that puts their immune system at a deficit, which means they need to bring their immune system back up to a normal, healthy baseline to fight off infections and diseases,” explains MS researcher Alexander Ng, a professor of exercise science at Marquette University. “You need a healthy immune system in case you step on a rusty nail and to protect you from colds and flus. It’s central for survival.”

Fortunately, the immune system is equipped with at least four levers you can pull to maintain its balance: exercise, diet, sleep and stress.

1. Exercise

You already know that exercise is good for your heart. What you might not realize, however, is that it’s also good for your immune system. “The evidence is clear,” Ng says. He says the body interprets physical activity as stress, and its response is to flood the bloodstream with disease-fighting white blood cells.



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The response is as manual as it is chemical, according to Lyons, who cites the role of lymph — the fluid that circulates white blood cells through the body. “Our lymph vessels help regulate the immune response, but they don’t have the same pumping action that our blood does,” she explains. “They’re not pumped by the heart. They’re pumped by movement. So, when we exercise, we’re forcing lymph to circulate through the body. The more lymph that circulates, the more opportunity it has to encounter and destroy infectious agents.”

Research indicates that exercise might even promote the growth of helpful gut bacteria. That’s particularly interesting in the context of a November 2020 study, funded in part by the National Multiple Sclerosis Society, which found evidence of immune cells that react to

specific gut bacteria in people with MS; during MS relapses, they travel from the gut to the brain to reduce inflammation.

Be careful, though: Evidence suggests that too much exercise, especially without adequate rest, may hurt instead of help the immune system.

“Again, exercise is a type of stress. And when we’re stressed, we release stress hormones like cortisol that can depress the immune system,” explains Ng, who says the secret to getting a positive instead of negative immune response is to focus on exercising at a moderate instead of vigorous intensity. On a scale of zero to 10, where zero is being sedentary, and 10 is sprinting at full speed up a hill, he says you should be at a three or four — just starting to break a sweat. Anything more vigorous could trigger cortisol production.

Exercise duration is as important as the intensity. You should get at least 150 minutes of physical activity per week, broken up into increments of anywhere from 10 to 90 minutes at a time.

Exercise sessions that are longer might depress immunity, according to Ng, who says you can further mitigate the hormonal effects of exercise with a post-workout snack.

“Exercise can produce chemicals that have a beneficial anti-inflammatory effect. However, exercise can also deplete glucose from muscle or blood that contributes to a stress response,” Ng says. “It’s advised that after vigorous or prolonged exercise you consume carbohydrates immediately, which replenishes blood glucose and can blunt the body’s physiological stress response,” he adds.

2. Diet

Diet is an important immune system lever, according to neurologist Vijayshree Yadav, MD, director of Oregon Health & Science University’s Multiple Sclerosis Center. Yadav says the best thing you can do for your immune system is maintain a fit and well-nourished body and healthy weight. “When you eat poorly, you can become overweight or obese. And when you’re overweight or obese, you can be at risk for many problems and diseases,” she says.



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People affected by obesity are more likely to develop bacterial and viral infections, according

to the Obesity Action Coalition, which cites as a possible culprit chronic inflammation from excess fat, which makes it harder for the body to battle microbes.

“Especially for people with MS who may not be able to do as much exercise because of disability or fatigue, the best way to achieve weight reduction is by a supervised nutrition program and caloric restriction,” says Yadav, who emphasizes that there’s no “right” diet. “Any diet that can give you a good cardiovascular profile in the long term can help you achieve that goal as long as you’re paying attention to the quantity and the quality of the calories and nutrients you’re consuming.”

Concerning immunity, foods that can alleviate inflammation should be the primary source of high-quality calories. For example, research suggests that green leafy vegetables, olive oil, berries, nuts, fish and tomatoes may reduce inflammation. In contrast, red meat, dairy, gluten, fried foods and processed sugars may cause it.

To get their anti-inflammatory effects, you generally have to eat whole foods. However, there is at least one dietary supplement that’s worth taking: vitamin D.

“Vitamin D is critical for a whole host of reasons,” Lyons says. “It helps regulate calcium absorption, which is important for bone health, but it also helps regulate the immune response.”

Its immune-modulating properties make vitamin D especially important for people with autoimmune diseases, including MS.

“Data shows that low vitamin D levels can increase disease activity in MS and may impact disease progression,” Yadav says. Although the body produces its own vitamin D from sunlight — it can take as little as 10 minutes of direct sunlight on the arms and legs to get your daily recommended allowance of vitamin D — most people are deficient. Supplementation is therefore helpful.

“It’s one of the few supplements you can take that makes a difference,” Lyons says.

3. Sleep

Sleep can have downstream effects on the immune system, according to Abbey Hughes, a rehabilitation psychologist at Johns Hopkins University School of Medicine.

“There have been lots of studies showing that when one is not getting enough sleep — or enough good-quality sleep — they are more vulnerable to getting the flu or seasonal colds,” says Hughes, whose specialties include MS and sleep disturbances. “For people who are immune-compromised, like people with MS, that underscores the importance of getting regular sleep to protect your immune system.”

According to Hughes, minor adjustments at bedtime can make a big difference for people who have occasional and mild sleeplessness. She suggests turning off screens an hour before

bed and abstaining from alcohol late in the evening. Blue light from phone and computer screens inhibits the sleep hormone melatonin. Alcohol becomes a stimulant as it's metabolized, causing wakefulness in the middle of the night. Having a dark, quiet and cool bedroom also is helpful. If necessary, use an eye mask, earplugs and a fan.



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People who suffer from chronic sleeplessness, including those with sleep disorders like insomnia, might need to reprogram their brain.

“The key to treating insomnia usually is managing your brain’s association with the bed, so you’re not equating it with frustration around sleep,” explains Hughes, who suggests maintaining a consistent bedtime. Over time, it may be easier to fall asleep by setting the body’s internal clock. “People who aren’t getting enough sleep often try to go to bed earlier. But if sleep doesn’t come easily, you might want to make your bedtime later. People who delay their bedtime until they’re sleepy are more likely to fall asleep sooner and to sleep through the night.”

That could mean initially getting only four or five hours of sleep a night instead of eight. Once you’ve established a routine that works, however, you can gradually dial back your bedtime.

The worst thing you can do is lie in bed awake. “The natural reaction is to lie there trying to will yourself to sleep. But if you’re not falling asleep after about 10 minutes, you should get out of bed and go do some other low-key, relaxing activity for maybe 20 minutes, then try again,” Hughes says. “When you spend time lying in bed, you train your brain that it’s OK to be awake in bed. You don’t want to make that association.”

4. Stress management

Even if you’re getting optimal exercise, nutrition and sleep, stress can sabotage your immune system.

“Chronic stress can make you more vulnerable to infection and potentially to MS relapse, so

it's very important to manage it effectively," Hughes says.

As Ng previously explained about exercise, the problem with stress is the body's hormonal reaction to it, which creates inflammation. You can neutralize that response by engaging in activities like yoga, tai chi and meditation, all of which have been shown to reduce the stress hormone cortisol.

Even something as simple as deep breathing can be effective. "If you have an Apple Watch, use the breathing app," Lyons suggests. "Stopping to focus on your breath for even a minute when you're stressed can help bring down your stress levels."

Mental strategies can work as well as physical ones. Yadav, for example, suggests positive self-talk — especially for people with MS. "Having MS itself is extremely scary, but accepting the disease and adapting to it are really important," she says. "Teaching yourself to have a positive attitude can help you cope with the stress of your perceived deficits."

Deficits can be physical, in the case of MS, but also financial, spiritual or relational.

For relationships, improving your communication skills might help. "Because relationships can be a big source of stress, improving how you interact with your family, your partner or your friends can be a really great stress-management technique," explains Hughes. One strategy she often promotes is "perspective-taking." "If we feel that our point of view is being threatened, that will often increase our stress response. One way to reduce that when you're having a conversation is taking the other person's perspective to understand where they're coming from. It sounds basic, but it really can help when you're having a disagreement."

Strategies like perspective-taking can reduce conflict, but they can't eliminate it. No matter what you do, you'll still experience stress — not to mention inadequate sleep, nutrition and exercise.

And that's OK.

"We have the opportunity to impact how reactive our immune system is and how vulnerable we are to infection. But impacting our immune system is not the same thing as controlling it," Hughes concludes. "If you have a relapse, or if you get the flu, that doesn't mean you did something wrong. We can't do all of the 'healthy' things all of the time. We just have to do the best that we can."

Matt Alderton is a writer and editor in Chicago.

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