

What Does It Mean to Be Immunocompromised?

A growing number of American adults have weakened immune systems, which can leave them vulnerable to severe illnesses.



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By **Knvul Sheikh**

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Kaley Karaffa had just turned 28 when the reality of having a weakened immune system as a cancer patient started to sink in. A few weeks earlier, at an annual medical exam, Ms. Karaffa had expressed concern to her doctor about enlarged lymph nodes near her collarbone. Testing showed that Ms. Karaffa had a type of B-cell lymphoma, a cancer that affects the white blood cells, which are essential to fighting off infections.

“I had to become cautious about who I saw, the activities I was involved in and even the kind of food I ate,” Ms. Karaffa, who is now 38, said.

Even a seemingly minor threat like the common cold can lead to a serious illness in someone with a compromised immune system. For Ms. Karaffa, getting sick would also mean having to pause the clinical trial she was participating in to receive cancer treatment.

The Covid-19 pandemic made many people familiar with the term “immunocompromised.” But while public health messaging around Covid, flu season or even food-borne illness outbreaks may make those who are

immunocompromised sound like a homogenous group with the same kinds of conditions and a similarly high risk of illness, there is a broad spectrum of vulnerability.

And their numbers appear to be going up. A study published this year suggests that about 7 percent of U.S. adults — or about 18 million people — have immune systems that are suppressed in some way, up from about 3 percent in 2013. Researchers have different theories to explain the rise in immune suppression. Some believe it may be caused by an increase in autoimmune diseases, while others blame increasing rates of cancer and chronic diseases that require immunosuppressive treatment and the broader use of medications that can impact the immune system.

“It’s no longer a niche group,” said Dr. Joshua Hill, a specialist who treats infectious diseases in immunocompromised cancer patients at Fred Hutch Cancer Center in Seattle. “These are people walking around in the community that you might not know are immunocompromised,” he added.

What makes someone immunocompromised?

Experts often liken the immune system to an army that protects you from foreign enemies, like viruses and bacteria, as well as domestic ones, like cancer cells. But some people have an immune army that is not working as it should, because they were born that way or because of something that occurred later in life.

Researchers have identified more than 430 so-called primary immunodeficiencies, rare conditions that are caused by genetic variants and weaken the immune system. Some of these can be detected through routine newborn screenings or other blood tests shortly after birth.

People with severe immunodeficiencies sometimes require bone marrow transplants, which essentially replace their immune system with a new one from a donor. Both the nature of their illness and the treatment mean these individuals

tend to be among the most immunocompromised, said Dr. Paibel Aguayo-Hiraldo, the medical director of transplant and cellular therapy at Children's Hospital Los Angeles.

"Most of our young patients are home-schooled," Dr. Aguayo-Hiraldo said. "They have to be isolated and try to prevent infections, limit who visits their home, and take other precautionary measures. For at least a year after a bone-marrow transplant, they must live in a bubble because any infection can be fatal."

People who get certain blood or immune-cell cancers like leukemias, lymphomas or myelomas are also considered severely immunocompromised because both the disease and the treatment wipe out the immune system, Dr. Aguayo-Hiraldo said. Similarly, people who receive organ transplants have to take immunosuppressive drugs so their bodies don't reject the new organ. This makes it hard to fight off infections, too.

Breast, prostate, lung and colon cancers don't necessarily weaken the immune system. But some of the treatments for them can reduce the number of immune cells in the blood, Dr. Hill said.

Certain chronic conditions such as multiple sclerosis, lupus, rheumatoid arthritis and AIDS can also leave people mildly immunocompromised. These diseases are often driven by an overactive immune system that starts damaging the body's own cells, making it less capable of fighting off actual pathogens, said Dr. Carl Fichtenbaum, a professor of infectious diseases at the University of Cincinnati.

Some of these diseases are treated with high doses of steroids, which reduce inflammation but can weaken the immune system if taken for too long. Others are treated with biologic medicines, which target specific disease pathways that may indirectly affect the immune system.

Normal aging can also weaken the immune system in some ways. As people get older, they tend to produce fewer antibodies to fight off pathogens, and the defenses they do have may be deployed more slowly, Dr. Fichtenbaum said.

How are your body's defenses affected?

Depending on why someone is immunocompromised, different parts of the immune army may be temporarily or permanently out of commission.

Adriano Ortiz, 9, was born with Fanconi anemia, a rare genetic condition that predisposed him to an immunodeficient condition. Neither his T cells, which identify and attack pathogens, nor his B cells, which should remind the body how it dealt with past infections, were functioning properly. After a bone-marrow transplant in 2019, he had to remain in the hospital for more than a year to heal and avoid any infections. Even after that, he had to go back to the hospital every time he got sick over the next several years.

“I would mentally prepare for at least two days in the hospital every time he got sick,” said his mother, Eliana Ortiz.

Biologic drugs, such as those taken by people with rheumatoid arthritis, only block specific parts of the immune system, said Dr. Fichtenbaum. Some of these drugs may make patients susceptible to particular types of respiratory infections, while others may raise the risk of infections in the gastrointestinal tract or skin.

Many immunocompromised people are also unable to mount a strong response to vaccines. If vaccination produces 100 antibody “soldiers” ready to fight off Covid or the flu in a healthy person, it might produce only 50 in someone who is immunocompromised, explained Dr. Ziyad Al-Aly, the chief of research and development at the Veterans Affairs St. Louis Health Care System.

Data from Covid vaccines suggests that protection from antibodies also tends to decline more rapidly in immunocompromised people compared with healthy people. “They may need a booster dose after six months, while most of the rest of us may be OK getting vaccinated once every year,” Dr. Al-Aly said.

Does the immune system ever bounce back?

Luckily, it can recover from many types of damage. Once a person completes chemotherapy and achieves remission from cancer, or is able to stop taking biologics or steroids, the immune system can restore itself within a few weeks or months.

If the underlying cause of immunosuppression is a condition like AIDS, antiretroviral therapy can help restore immune function by controlling the virus and giving the body time to make healthy immune cells again. For people with severely compromised immune systems, it can take months or even a few years for bone-marrow or stem-cell transplants to rebuild the immune system, Dr. Aguayo-Hiraldo said. And some people with genetic immune deficiencies and severe autoimmune disorders may need continuous treatment to both manage their disease and keep pathogens at bay.

Even people whose immune systems heal somewhat may have different levels of personal comfort with exposure to potential infection, Dr. Hill said.

After Ms. Karaffa was done with her cancer treatment, she had blood tests every few months to check how her immune system was recovering. She eventually resumed traveling and volunteer work, but she still carries hand sanitizer everywhere and puts on a mask whenever someone snuffles nearby. “I’m much more conscientious about the risk of illness than I was before,” she said.

Knvul Sheikh is a Times reporter covering chronic and infectious diseases and other aspects of personal health. More about Knvul Sheikh