

WHAT WE KNOW
(AND DON'T) ABOUT
COVID-19'S
EFFECT
ON THE
IMMUNE SYSTEM

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LASTING IMPACT



Growing research shows infection with SARS-CoV-2 can create **lasting differences** in some people's immune systems.

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Sources: CDC, Memorial Sloan Kettering Library

THIS LOOKS LIKE...

1

Altered immune system cells

Severe cases of COVID-19 can change the [parent stem cells](#) that generate immune cells. These altered stem cells create cells that are more inflammatory.

2

Viral reservoirs and fragments

Proteins and fragments that have been found in people with Long COVID can set off a [continuing immune response and amplify inflammation](#).

3

Immune dysregulation and chronic inflammation

Dysregulation = when [some immune cells are working hard, and others are exhausted](#). How long it can last is unknown.

4

Triggered autoimmune conditions, blood clots, and latent viruses

COVID-19 infections can trigger autoantibodies that lead to [autoimmune disorders](#).

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Sources: NIH, Memorial Sloan Kettering Library, PNAS, Nature Immunology, Nature, Cell, eClinical Medicine

5-20%

of people develop **lingering symptoms** or new health conditions after infection, called

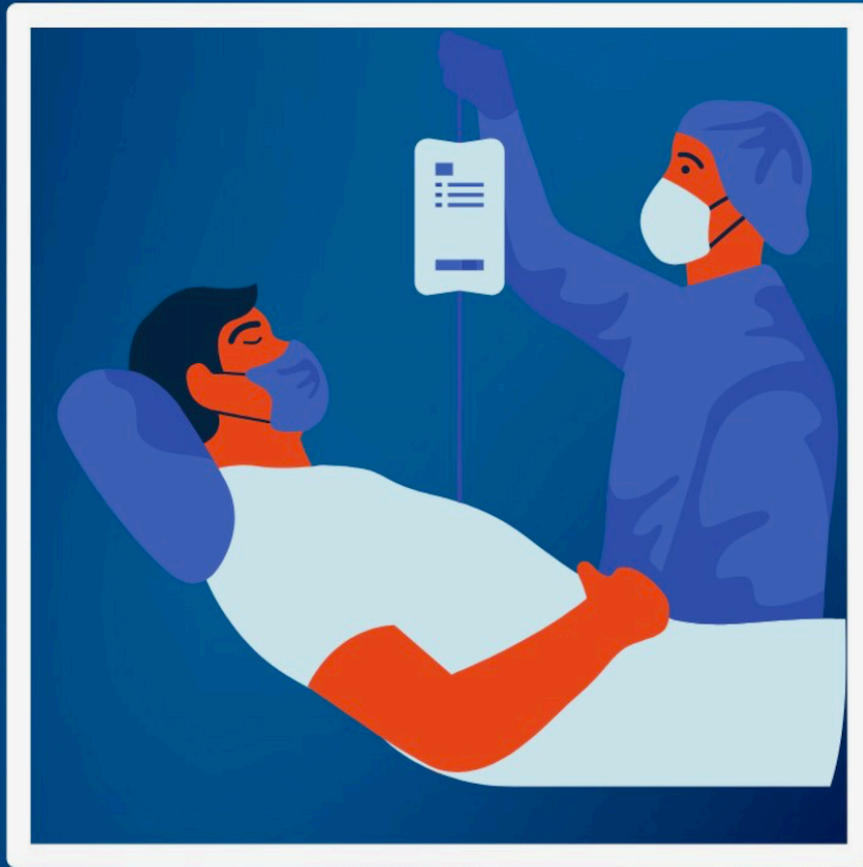
Long COVID.

As of the CDC's latest count in March 2024, **30%** of all American adults who've had COVID have experienced Long COVID.



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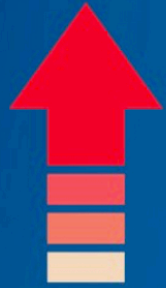
Sources: WHO, CDC



The more COVID-19 vaccine doses you get, the lower the risk of Long COVID. The more reinfections you have, **the higher the risk.**

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Sources: Statistics Canada, NPJ Vaccines, Int. Journal of Molecular Sciences, Nature Medicine



172%

INCREASED RISK

The risk of developing an autoimmune disease rose by up to 172% after infection, per a study following people from 2020 to 2022.

Up-to-date COVID-19 vaccination can reduce the likelihood of developing an autoimmune condition after infection.

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Sources: Nature Reviews Rheumatology, Cedars-Sinai, Journal of Translational Medicine, Clinical Rheumatology, eClinical Medicine

OTHER ILLNESSES

SARS-CoV-2 can also **activate other viruses** that have been lying dormant, like Epstein-Barr and herpes viruses.



Studies have found kids with prior COVID-19 infections had a **greater risk** of RSV infections.

Always feel run-down? Practice harm reduction and learn how you can protect yourself from more damage.

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Sources: Family Medicine and Community Health (BMJ), Frontiers in Immunology, Nature, Cell



49% OF COVID INFECTIONS ARE ASYMPTOMATIC,

which means you may not know if you are actually sick. This is why it's important to take a multilayered approach (one or more of the following) to protect yourselves and others:

N95 and KN95 masks



HEPA air filtration



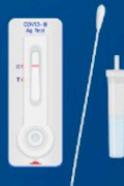
Good ventilation (carbon dioxide <800 parts per million)



Up-to-date vaccinations



Rapid tests before gathering



Attention to wastewater levels of COVID-19



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Sources: The Lancet Regional Health, CDC

WHAT WE DON'T KNOW

1

The long-term impact on other illnesses

Outside of the influence on RSV and reactivated viruses, it's TBD whether altered immune systems predispose people to conditions like other [infectious diseases](#), [neurodegenerative diseases](#), or [cancer](#).

2

Why some people's conditions persist

We don't yet know [why some people recover](#) and their immune system restores, and why others continue to decline.

3

What diagnostics and therapies can help restore the immune system

More identifiers like [viral load tests](#) and [biomarker tests](#), plus [treatments](#) for Long COVID, are needed to help the millions living with the condition.



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