


 Cedars-Sinai Blog

## How COVID-19 Compromises Brain Function

Apr 26, 2021 *Cedars-Sinai Staff*

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A full year has passed since the [COVID-19 pandemic \(https://www.cedars-sinai.org/newsroom/coronavirus-what-you-need-to-know/\)](https://www.cedars-sinai.org/newsroom/coronavirus-what-you-need-to-know/) began, and the mind-boggling aftermath of the virus continues to confuse doctors and scientists. Particularly concerning for doctors and patients alike are lingering side effects, such as memory loss, reduced attention and an inability to think straight.

Wondering how a respiratory virus can lead to cognitive effects that last for weeks? It turns out, some sort of mental fallout after an infectious illness is not uncommon.

"What we're seeing with COVID-19 is similar to infectious complications we've seen with other viruses, such as SARS and H1N1," explains [Dr. Rachel Zabner](https://bio.cedars-sinai.org/zabnerr/index.html) (<https://bio.cedars-sinai.org/zabnerr/index.html>), an infectious disease specialist and co-director of [Cedars-Sinai's COVID-19 Recovery Program](/covid-19/post-covid-19-recovery.html) (</covid-19/post-covid-19-recovery.html>) along with [Dr. Catherine Le](https://bio.cedars-sinai.org/lecat/index.html) (<https://bio.cedars-sinai.org/lecat/index.html>).



*Rachel Zabner, MD*

It may be months before the data provides a clear picture of this post-COVID-19 "brain fog," but experts suspect that the stress of navigating COVID-19 coupled with the virus's physical toll on the body is resulting in a significant cognitive hit for a subset of patients.

**"Plenty of patients get COVID-19, recover well and then a month or two later develop cognitive symptoms, such as slow thinking, difficulty concentrating and fatigue."**

## What is post-COVID-19 brain fog?

While there's no clear-cut definition of COVID-19-related "brain fog," people are using the term to describe the constellation of symptoms such as short-term memory loss, poor attention span and fatigue that plagues up to 20% of COVID-19 patients weeks after they have recovered from typical COVID-19 symptoms—such as fever, cough and shortness of breath.

Researchers think these cognitive effects are a byproduct of [inflammatory processes](/discoveries/inflammation.html) (</discoveries/inflammation.html>) within the brain that occur microscopically.

"With COVID-19, there's an activation of the immune system that persists for months, which can affect neural connections in the brain," Dr. Zabner says. "The stress of navigating COVID-19—constantly being in 'fight mode'—can affect brain function, too."

Read: [Myths about Dementia, Alzheimer's and Memory Loss \(/blog/dementia-alzheimers-and-memory-loss.html\)](/blog/dementia-alzheimers-and-memory-loss.html)

The problem is there's no diagnostic test for "brain fog," and the condition isn't visible on brain imaging exams. Instead, patients and doctors rely on the following symptoms to determine whether a patient is suffering from post-COVID-19 cognitive impairments:

Headaches

Dizziness

Fatigue

Decreased attention span

Memory loss

Poor executive function

In rare and severe cases, patients may develop post-COVID-19 psychosis ranging from hallucinations and paranoia to severe mood disorders.

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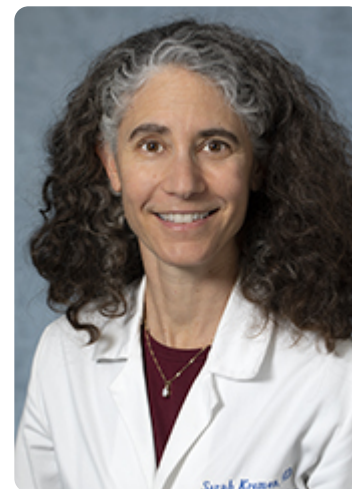
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## Who is at risk of developing brain fog?

Scientists don't yet know who is likely to suffer from post-COVID-19 brain fog. However, there may be a link between the condition and anosmia (losing the sense of smell and taste) during active infection.

"A virus can enter the nasal passages where it can then access nerves that lead into the brain. When these neurons are affected, the resulting condition—from coronavirus or any other virus—is anosmia," says [Dr. Sarah A. Kremen](https://bio.cedars-sinai.org/kremens1/index.html) (<https://bio.cedars-sinai.org/kremens1/index.html>), director of the [Neurobehavior Program](/programs/neurology-neurosurgery/clinical/memory-disorders.html) (</programs/neurology-neurosurgery/clinical/memory-disorders.html>) at the Jona Goldrich Center for Alzheimer's and Memory Disorders. "Once the virus that causes COVID-19 reaches the olfactory bulb, it can travel long the olfactory pathways to other places in the brain.



Sarah A. Kremen, MD

While early studies don't show any correlation between severity of disease and long-hauler symptoms such as brain fog, it makes sense that a brain starving for oxygen is likely to become compromised. Everything from poor heart and lung function to the social isolation caused by COVID-19 can affect cognitive processes. Treatments for COVID-19, including sedation, intubation and various medications, may also come with cognitive side effects.

*Read: [Dealing with Stress: Know the Hidden Symptoms](/blog/hidden-symptoms-of-stress.html) (</blog/hidden-symptoms-of-stress.html>)*

"But plenty of patients get COVID-19, recover well and then a month or two later develop cognitive symptoms, such as slow thinking, difficulty concentrating and fatigue," says Dr. Kremen. So, even patients who had mild disease and recovered seamlessly may still develop post-COVID-19 brain fog.

**"With COVID-19, there's an activation of the immune system that persists for months, which can affect neural connections in the brain. The stress of navigating COVID-19—constantly being in 'fight mode'—can affect brain function, too."**

## What should you do if you think you have post-COVID-19 brain fog?

Unfortunately, there's no established treatment for post-COVID-19 cognitive side effects. Some clinicians are treating patients with low-dose stimulants (typically prescribed for attention deficit disorder). Others suggest awakening the senses by introducing strong smells. Still others are experimenting with behavioral strategies such as meditation, exercise and support groups and psychological counseling.

"If you're experiencing cognitive symptoms after a case of COVID-19, you should see your [primary care provider \(/programs/primary-care.html\)](/programs/primary-care.html)," Dr. Kremen says. "Your doctor can rule out other issues, such as thyroid disease, high blood sugar and other medical causes of cognitive impairment." And if your doctor suspects your symptoms are COVID-19-related, the symptoms are likely to dissipate over time.

*Read: [COVID-19 Recovery Program Cares for Those With Persistent Symptoms \(/blog/covid-19-recovery-program-cares-for-those-with-persistent-symptoms.html\)](/blog/covid-19-recovery-program-cares-for-those-with-persistent-symptoms.html)*

Once your immune system returns to baseline and the immune cavalry recedes, your brain will recover. In the meantime, you can support healthy brain function by eating well, getting regular exercise, spending time outdoors and gradually resuming your usual activities. Most important, stay vigilant in terms of preventing the spread of the virus that causes COVID-19 to support the health of our community.

"As with any condition, the best treatment is prevention," Dr. Zabner says. "Get vaccinated, wear your mask and if you're experiencing COVID-19 symptoms, get tested and quarantine for two weeks."

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