

COVID nasal sprays may one day prevent and treat infection

November 28 2022, by Lara Herrero



Credit: AI-generated image ([disclaimer](#))

We have vaccines to boost our immune response to SARS-CoV-2, the virus that causes COVID. We have medicines you can take at home (and in hospital) to treat COVID. Now researchers are trialing something new.

They want to develop drugs that stop the [virus](#) getting into the body in the first place. That includes nasal sprays that stop the virus attaching to cells in the nose.

Other researchers are looking at the potential for nasal sprays to stop the virus replicating in the nose, or to make the nose a hostile place to enter the body.

Here's where the science is up to and what we can expect next.

How could we block the virus?

"Viral blockade," as the name suggests, is a simple premise based on blocking SARS-CoV-2. In other words, if something gets in its way, the virus cannot attach to a cell and it can't infect you.

As SARS-CoV-2 is a respiratory virus, it makes sense to deliver this type of medicine where the virus mainly enters the body—via the nose, in a [nasal spray](#).

There are various groups around the world working on this concept. Some research is still being conducted in the lab. Some agents have progressed to preliminary human trials. None are yet available for widespread use.

Heparin

Heparin is a common medicine that's been used for decades to thin the blood. Studies in mice show that when heparin is delivered via the nose, [it's safe](#) and [effective](#) in preventing the virus binding to nose cells. Researchers believe heparin binds to the virus itself and stops the virus attaching to the cells it's trying to infect.

A [clinical trial](#) is being [conducted in Victoria](#) in collaboration between multiple Melbourne-based research centers and the University of Oxford.

Covixyl-V

Covixyl-V (ethyl lauroyl arginine hydrochloride) is another nasal [spray under development](#). It aims to prevent COVID by blocking or modifying the cell surface to prevent the virus from infecting.

This compound has been explored for use in various viral infections, and [early studies](#) in cells and small animals has shown it can prevent attachment of SARS-CoV-2 and reduce the overall viral load.

Iota-carrageenan

This molecule, which is extracted from seaweed, acts by blocking virus entry into [airway cells](#).

One study of about 400 health-care workers suggests a nasal spray may reduce the incidence of COVID [by up to 80%](#).

IGM-6268

This is [an engineered antibody](#) that binds to SARS-CoV-2, [blocking](#) the virus from attaching to cells in the nose.

A nasal and oral (mouth) spray are in a clinical trial [to assess safety](#).

Cold atmospheric plasma

This is a gas that contains charged particles. At [cold temperatures](#), it can

[alter the surface](#) of a cell.

A [lab-based study](#) shows the gas changes expression of receptors on the skin that would normally allow the virus to attach. This results in less SARS-CoV-2 attachment and infection.

Scientists now think this technology could be adapted to a nasal spray to prevent SARS-CoV-2 infection.

How could we stop the virus replicating?

Another tactic is to develop nasal sprays that stop the virus replicating in the nose.

Researchers are designing genetic fragments that bind to the viral RNA. These fragments—known as "[locked nucleic acid antisense oligonucleotides](#)" (or LNA ASOs for short)—put a proverbial spanner in the works and stop the virus from replicating.

A spray of these genetic fragments delivered into the nose [reduced virus replication in the nose](#) and prevented disease in [small animals](#).

How could we change the nose?

A third strategy is to change the nose environment to make it less hospitable for the virus.

That could be by using a nasal spray to change moisture levels (with saline), alter the pH (making the nose more acidic or alkaline), or adding a virus-killing agent (iodine).

Saline can reduce the amount of [SARS-CoV-2 in the nose](#) by simply

washing away the virus. One study has even found that saline nasal irrigation [can lessen COVID disease](#) severity. But we would need further research into saline sprays.

An Australian-led study has found that an iodine-based nasal spray [reduced the viral load](#) in the nose. Further [clinical trials](#) are planned.

[One study](#) used a test spray—containing ingredients including eucalyptus and clove oils, potassium chloride and glycerol. The aim was to kill the virus and change the acidity of the nose to prevent the virus attaching.

This novel formulation has been tested in the lab and in a [clinical trial](#) showing it to be safe and to reduce infection rate from about 34% to 13% when compared to placebo controls.

Barriers ahead

Despite promising data so far on nasal sprays for COVID, one of the [major barriers](#) is keeping the sprays in the [nose](#).

To overcome this, most sprays need multiple applications a day, sometimes every few hours.

So based on what we know so far, [nasal sprays](#) will not singlehandedly beat COVID. But if they are shown to be safe and effective in [clinical trials](#), and receive regulatory approval, they might be another tool to help prevent it.

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by The Conversation

Citation: COVID nasal sprays may one day prevent and treat infection (2022, November 28)
retrieved 24 April 2024 from
<https://medicalxpress.com/news/2022-11-covid-nasal-sprays-day-infection.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.