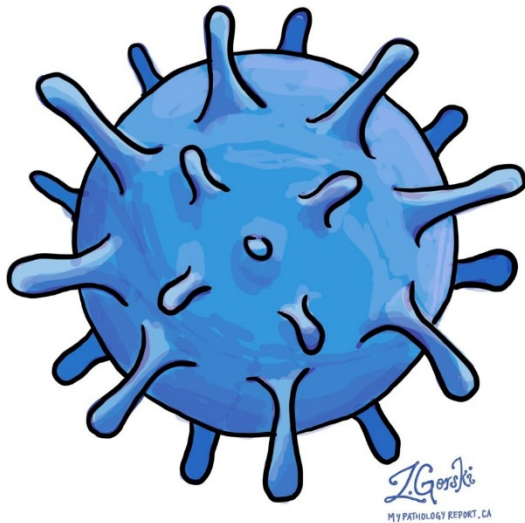


COVID-19 (from www.mypathologyreport.ca)

A SINGLE VIRUS PARTICLE



This article was reviewed on March 25, 2020 by Matthew Magyar MD and Karam Ramotar PhD

What is COVID-19?

COVID-19 is a new human respiratory disease that has recently turned into a pandemic effecting more than 336,000 people in 192 countries. COVID-19 was first discovered in Wuhan, China but has now spread around the world. It is caused by a [virus](#) called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This virus is part of a large family of viruses known as coronaviruses.

The coronavirus family includes many different types of viruses, some that cause disease in humans and some that cause disease in animals. SARS-CoV-2 is very closely related to the coronaviruses that cause Severe Acute Respiratory Syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS).

What are the symptoms of COVID-19?

According to the evidence available today, most people who develop COVID-19 will experience mild symptoms such as cough, low energy, and muscle aches. Less common symptoms include sore throat, runny nose, and nasal congestion. Some people infected by SARS-CoV-2 will not experience any symptoms at all.

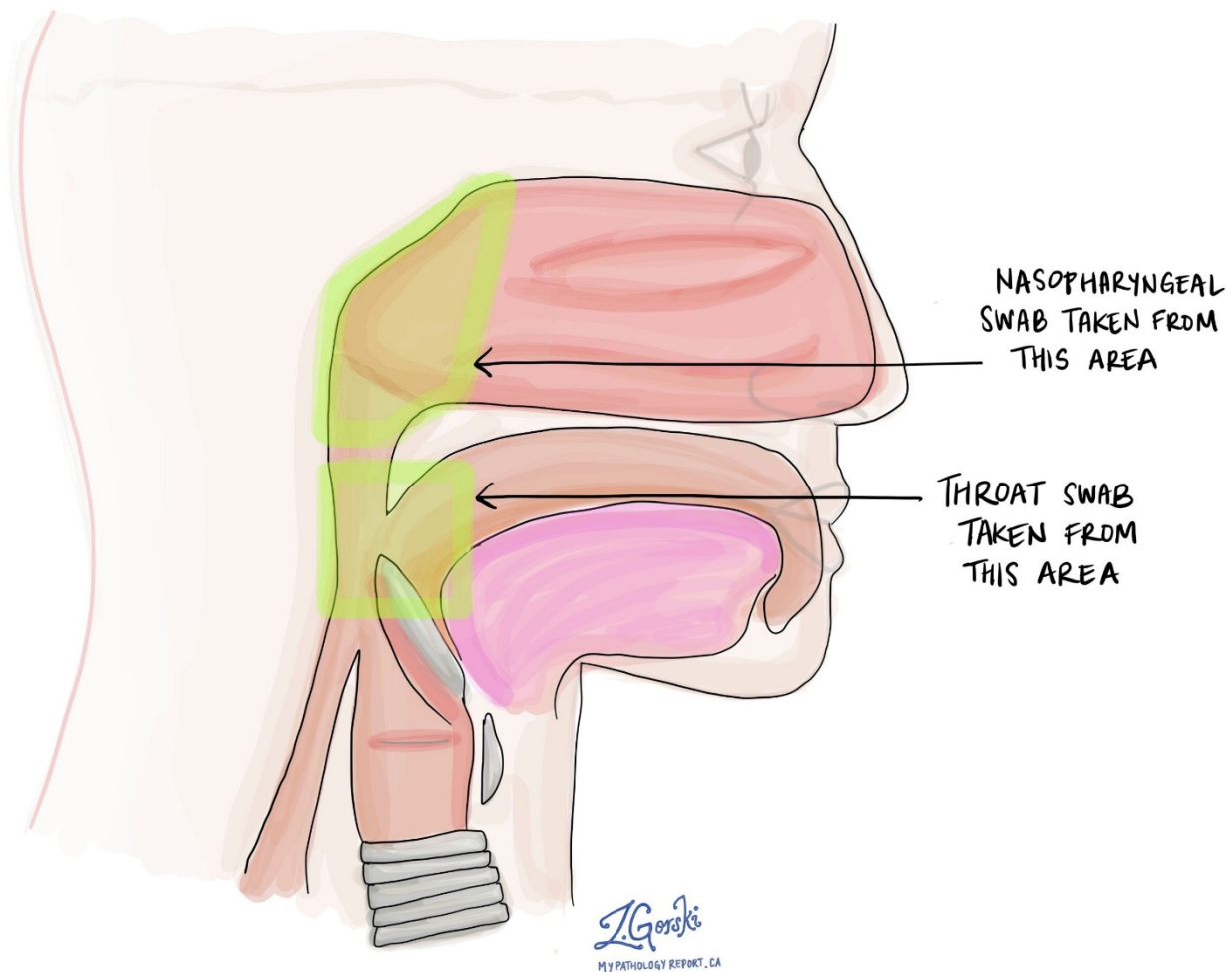
More severe symptoms such as difficulty breathing can develop in older patients and those with pre-existing medical conditions. A type of lung injury called pneumonia can develop and this can lead to respiratory failure. These people may need to be hospitalized until their lung injury improves. People with severe disease can die without medical attention.

Currently there are no specific treatments available for COVID-19 and there is no vaccine available to prevent the disease. People with mild symptoms do not require any medical treatment and will recover fully within 7 to 14 days.

How do doctors test for coronavirus?

In order for a person to become infected, a virus needs to enter the body and get inside our cells. Once inside a cell, the virus uses the machinery of the cell to make new viruses. Similar to human cells, viruses have their own unique genetic material which can be found inside an infected cell. Doctors test for COVID-19 by looking for pieces of genetic material that are only found in SARS-CoV-2.

SARS-CoV-2 typically infects cells at the back of nose (nasopharynx), throat, and lungs. To see if a person has been infected by SARS-CoV-2, a doctor will use a swab to take a sample of cells from the back of the nose or throat (see picture below). The cells will then be sent to a laboratory which will test for the virus.



How does the lab test work?

The test used to identify SARS-CoV-2 is called polymerase chain reaction (PCR). The test works by looking for very specific pieces of viral genetic material called sequences. The test uses chemicals called primers which are specially designed to stick to the sequences unique to the virus. Primers that stick to a sequence are used to make more genetic material which tells the machine that the virus has been found.

How are the results of this test reported?

This kind of test can produce three possible results:

1. **Detected** – The virus was found in the sample. This is considered a positive test result.
2. **Not detected**– The virus was not found in the sample. This is considered a negative test result.
3. **Invalid** – The test could not be completed normally. This result does not mean that the virus was not found in the sample. An invalid test should be repeated.

When will a person test positive?

A person can test positive when they have been infected and their body is producing new copies of the virus. For most people this will happen early in the disease when they have symptoms. Some people will test positive before symptoms start. These people are still contagious and should take precautions not to spread the virus to others. People near the end of the disease who still have symptoms may test negative because the test looks for pieces of viral genetic material which may still be found after the virus has become inactive. For this reason, a person who tests positive does not need to be re-tested even if they continue to have symptoms.

Can a person have coronavirus and test negative?

It is uncommon but a person with COVID-19 can test negative for SARS-CoV-2. One possible reason is that the test was performed too early in the disease and the person was not making enough virus to be detected by the test. Another possible reason is that the swab was performed incorrectly and not enough cells from the back of the nose or throat were sampled.

How long will it take to receive my result?

This will depend on the type of machine used to perform the test and the number of people tested in your area. After the tissue sample has been received, most types of machines can produce a result in 24-48 hours. However, it may take longer depending on the number of tests that are being performed. You should check with doctor or local health authority to find out how long it will take to receive your result.

Other helpful COVID-19 resources

[Government of Canada](#)

[Province of Ontario COVID-19 Self Assessment Tool](#)

[World Health Organization](#)

[Centers for Disease Control](#)