FACT SHEET

Testing Methods for COVID-19 or SARS-CoV-2

Introduction

The 2019 novel coronavirus disease (COVID-19) is a new virus of global health significance caused by infection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 is thought to spread from person to person in close contact through respiratory droplets. There are two basic types of laboratory tests for COVID-19 available a viral RNA test and an antibody test.

Viral RNA Test

The Viral RNA test for COVID-19 / SARS-CoV-2 are run on mucus samples. The sample types that can be tested include: samples swabbed from deep inside the nose; samples obtained by flushing of the nose and/or sinuses with saline; and saliva. This is a diagnostic PCR test that detects viral RNA and work only in the narrow window of time – about two weeks – when the virus is in the body.

Antibody Test

The Antibody test detects the body's immune response to the virus by measuring COVID-specific antibodies in the blood. An antibody (Ab), also known as an immunoglobulin (Ig) is a Y-shaped protein produced mainly by white blood cells that is used by the immune system to neutralize pathogens such as bacteria and viruses.

Antibody tests measure several types of antibodies to get a fuller picture of the immune landscape. These include:

- IgM antibodies are the first to appear to fight a new infection. They appear in the blood and often do not protect against infection.
- IgA antibodies are secreted into mucous and play a crucial role by preventing pathogens from taking up residence in the body.
- IgG antibodies are the most common type of antibody. They're found in all bodily fluids and often provide long-term protection against the specific pathogen they're built to fight.

The advantage of antibody testing is its ability to pick up tell-tale signs of infection long after symptoms have faded and even if the person never showed symptoms.

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The Importance of Measuring Viral RNA versus Antibodies

Viral RNA tests return a positive result only as long as the virus is present in a person's respiratory tract. Once the person recovers, this type of test can no longer determine whether they had COVID-19 versus some other respiratory illness.

Antibody test is not able to tell whether a newly infected person is harboring the virus, but it could be useful for identifying whether someone was previously infected, perhaps with mild enough symptoms that they didn't even know they were sick. This is because antibodies arise many days, even weeks, after the viral infection starts, and then they may persist indefinitely.

At this time, we don't know whether the antibodies being detected by these tests are neutralizing antibodies – meaning the type that can stop the virus from continuing to spread throughout the body – so it's unclear whether a positive antibody test would indicate that the person is immune to the virus.

Viral RNA and Antibody Testing Control the Spread of COVID-19

The Viral RNA test can rapidly identify which patients might be contagious, so they can be quarantined and the people with whom they've come in contact can be traced. The Antibody tests can't detect early stage disease, so they aren't useful for effectively isolating new cases, but they can identify which people have encountered the virus previously and might be protected against it. Based on what we know about COVID-19 so far, many of these people will be immune, though it's important to note that a positive antibody test doesn't necessarily mean the person is not contagious. Even someone who is immune to having disease can be a short-term carrier as they fight off the virus.

Experts generally believe that if you develop antibodies to the novel coronavirus, then you have at least temporary immunity from reinfection, although they stress that this is still unproven and that the parameters of that immunity are still unknown.

It is now known that a sizable fraction of people have asymptomatic infections or very mild infections and never get tested. So, there's no way to know they were infected without antibody testing.

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