

Understanding Lateral flow Testing

Why do the test?

Around 1 in 3 people with COVID-19 do not display symptoms but can still pass it on to others. Lateral flow testing (LFT) aims to catch those who might have the disease but who are not showing symptoms: people who are “carriers”.

Lateral flow testing could help find positive cases earlier and slow down the spread. Your consent to join the testing programme will help us to keep our teaching and home environments safe.

The COVID-19 lateral flow tests being used by all schools, including Cheney, deliver a rapid result, in 30 minutes. They can find positive cases with high levels of virus that are easy to transmit to others, helping to intercept and reduce further infections.

Each positive case found can help prevent many additional people becoming infected. Those who test positive must immediately self-isolate to avoid passing the virus on to others.

What is a lateral flow test?

“Lateral flow” literally means “flowing across”. It is an established technology, adapted to detect proteins (antigens) that are present when a person has COVID-19. The best-known example of a lateral flow test is the home pregnancy test kit.

LFT will NOT detect ALL cases of COVID-19. However, it WILL detect over 95% of those people who have enough virus to be infectious and pass it on to others i.e., LFT will detect over 95% of those people who have a high enough “viral load” to infect others.

A negative result means that coronavirus infection was not detected at the time of the test. However, this does NOT guarantee that you do not have coronavirus. So you should continue to follow COVID-19 recommendations, including regular hand washing, social distancing, and face coverings.

Regular testing could reduce transmission of COVID-19 and could potentially reduce the need for self-isolation for contacts of positive cases.

How does the LFT work?

The test consists of a hand-held stick with an absorbent pad at one end and a reading window at the other, a swab to take the sample, and a solution that helps get any virus off the swab. Inside the stick is a strip of test paper that changes colour if COVID-19 proteins are there (antigens).

The test looks like this:



Image © Getty Images

How do I read the results?

This is what the test “window” looks like in the strip after 30 minutes.

“C” stands for “control” – this is to make sure the test is working.

“T” stands for “test” – this is where your sample result will appear.



Image © <https://www.gov.uk/>

Negative result: one line next to C shows the test is negative.

Positive result: two lines, one next to C and one next to T, even faint lines, shows the test is positive. Positive test results need to be reported to the NHS, and the school will help guide you here.

Void: no lines, or one line next to T, means the test is void. You will need to re-take with a fresh test kit.

If you get a positive result you must self-isolate immediately, and all your contacts will also need to be tested. Your self-isolation period includes the day your symptoms started (or the day you had the test if you do not have symptoms) and the next 10 full days. Further guidance can found [here](#).

How do I take the test?

You will do the tests yourselves, with supervision. This will involve first blowing your nose and washing your hands. Next taking a sample from the nose and from the back of your throat near the tonsils using a swab, like a cotton bud on a stick.

Whilst it is better to take the sample from both the nose and the throat, it is NOT strictly necessary to do the throat swab: we do realise that this procedure will not be pleasant or possible for some of you.

The swab is then dipped into an extraction solution: the tube with liquid that comes with the kit. This is then dripped on to the paper pad on the test stick, producing the reaction that gives the result.

The result will be visible on the device precisely 30 minutes after the sample is applied. Unlike a PCR test, there is no need to send the sample to a lab.

All the information needed will be given to you when you take the test. The main thing is to realise that every test is helping towards our efforts to get back to normal.

Why aren't we being offered PCR?

You may have heard that PCR is the most accurate test. This is correct: it DOES indeed pick up almost all cases of COVID-19.

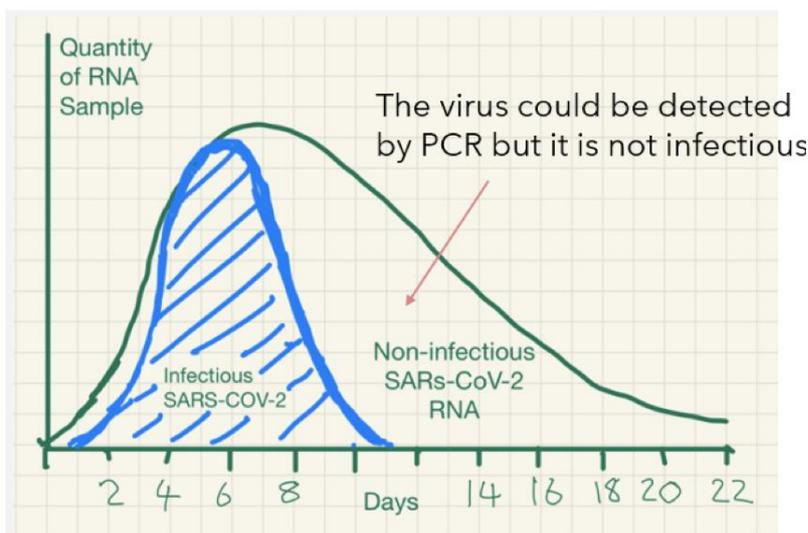
However, PCR testing is SO sensitive that it also picks up many “false positives”, which means that if we were all to go by PCR results, significant numbers of non-infectious people would be required to isolate needlessly.

When a person has low levels of virus in their system, lateral flow tests are less “sensitive” than some of the other tests we use, such as PCR tests, which we mainly use for people with symptoms. When levels of virus are at their highest and people are most likely to pass on the disease, lateral flow tests can detect over 95% of the most infectious cases.

PCR and lateral flow thus have different roles to play in controlling the virus, and their different levels of sensitivity “Work” for the differing ways they are used.

Lateral flow tests (LFT)	PCR tests
<p>LFT is useful for finding out if a person is infectious now, and able to transmit the virus to others.</p> <p>The level of sensitivity of LFT is high enough to detect most of these cases.</p> <p>LFT is less likely than PCR to return a positive result outside the infectious window.</p>	<p>PCR is useful for confirming a suspected case of coronavirus, where the person is already self-isolating and is showing symptoms.</p> <p>Higher sensitivity of PCR means it can identify genetic material from COVID-19 even after the active infection has passed.</p>

This is further illustrated in the graphic below. This is not to scale: it is just a sketch to show the concept and "danger" of false positives in PCR.



As you can see from the extension of the green curve, even people who have had COVID-19 who are no longer infectious, and very often fully recovered, will still come up as positive in PCR, in some cases for weeks.

This is because PCR will continue to pick up on the presence of viral genetic material, known as RNA (which may or may not be part of infectious viral particles) PLUS all the bits of non-viable genetic material (partly degraded viral RNA) well after the infectious period is over.

LFT testing will pick up the samples under the "blue curve" i.e. the most infectious people, with the highest viable viral load, and the most likely to pass on the virus.

LFT testing is therefore a 'reasonable' compromise that picks up the most infectious individuals.

Where can I get more information?

Here is a YouTube video (2m38s) showing how to do the test:

<https://www.youtube.com/watch?v=kZhSPnnXyPo>

If your lateral flow test is positive, get a PCR test here: <https://www.gov.uk/get-coronavirus-test>

Background on the use of lateral flow testing, Oxford:

<https://www.bdi.ox.ac.uk/news/lateral-flow-devices-detect-most-infectious-covid-19-cases-and-could-allow-a-safer-relaxation-of-the-current-lockdown>

<https://www.ox.ac.uk/news/2020-11-11-oxford-university-and-phe-confirm-lateral-flow-tests-show-high-specificity-and-are>

<https://www.ox.ac.uk/news/2021-01-21-lateral-flow-devices-detect-most-infectious-covid-19-cases-and-could-allow-safer>

http://modmedmicro.nsms.ox.ac.uk/wp-content/uploads/2021/01/infectivity_manuscript_20210119_merged.pdf

Background on lateral flow testing, UK Government Guidelines:

<https://www.gov.uk/guidance/understanding-lateral-flow-antigen-testing-for-people-without-symptoms>

<https://www.gov.uk/government/publications/assessment-and-procurement-of-coronavirus-covid-19-tests/protocol-for-evaluation-of-rapid-diagnostic-assays-for-specific-sars-cov-2-antigens-lateral-flow-devices>

<https://publichealthmatters.blog.gov.uk/2020/12/08/lateral-flow-testing-new-rapid-tests-to-detect-covid-19/>

PCR testing information from UK Government Guidelines:

<https://www.gov.uk/government/publications/nhs-test-and-trace-how-we-test-your-samples>

Academic article: [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(20\)30308-X/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(20)30308-X/fulltext)

Explanations for younger children: <https://theconversation.com/6-tips-to-prepare-your-child-for-easy-covid-19-testing-147415>

Details on self-isolation: <https://www.nhs.uk/conditions/coronavirus-covid-19/self-isolation-and-treatment/how-long-to-self-isolate/>

Lateral flow tests (LFT)

PCR tests

LFT is useful for finding out if a person is infectious now, and able to transmit the virus to others.

The level of sensitivity of LFT is high enough to detect most of these cases.

LFT is less likely than PCR to return a positive result outside the infectious window.

PCR is useful for confirming a suspected case of coronavirus, where the person is already self-isolating and is showing symptoms.

Higher sensitivity of PCR means it can identify genetic material from COVID-19 even after the active infection has passed.