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Guidance

Understanding lateral flow antigen testing for people without symptoms

An explanation of the technology behind asymptomatic testing and the role these tests play in the national COVID-19 testing programme.

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Department of Health and Social Care (https://www.gov.uk/government/organisations/department-of-health-and-social-care)

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NHS Test and Trace is making rapid lateral flow antigen testing available alongside standard lab-based polymerase chain reaction (PCR) tests (https://www.gov.uk/government/publications/nhs-test-and-trace-how-we-test-your-samples). These tests play a different, but crucial role in the fight against COVID-19.

Around 1 in 3 individuals with COVID-19 do not display symptoms. Opening testing up to catch those showing no symptoms will help to find positive cases earlier and to break hidden chains of transmission.

Lateral flow antigen testing

Lateral flow testing is a fast and simple way to test people who do not have symptoms of COVID-19, but who may still be spreading the virus. In some circumstances lateral flow tests can also be used for other diagnostic tasks.

The tests are easy to use and give results in 30 minutes. Those who test positive must immediately self-isolate to avoid passing the virus on to others.

Why lateral flow tests are being offered

Around 1 in 3 people with COVID-19 do not have symptoms, so a test that rapidly detects these otherwise hidden cases is a very useful additional tool for tackling the virus.

Lateral flow tests are practical, easy to interpret and can be used in a wide range of settings. This makes them ideal for widespread use in the community.

Clinical evaluation by Public Health England (PHE) and Oxford University (https://www.ox.ac.uk/news/2020-11-11-oxford-university-and-phe-confirm-lateral-flow-tests-show-high-specificity-and-are) shows that the tests perform best when levels of virus are at their highest. Thousands of positive COVID-19 cases (https://www.gov.uk/government/collections/nhs-test-and-trace-statistics-england-weekly-reports) have already been detected using these tests.

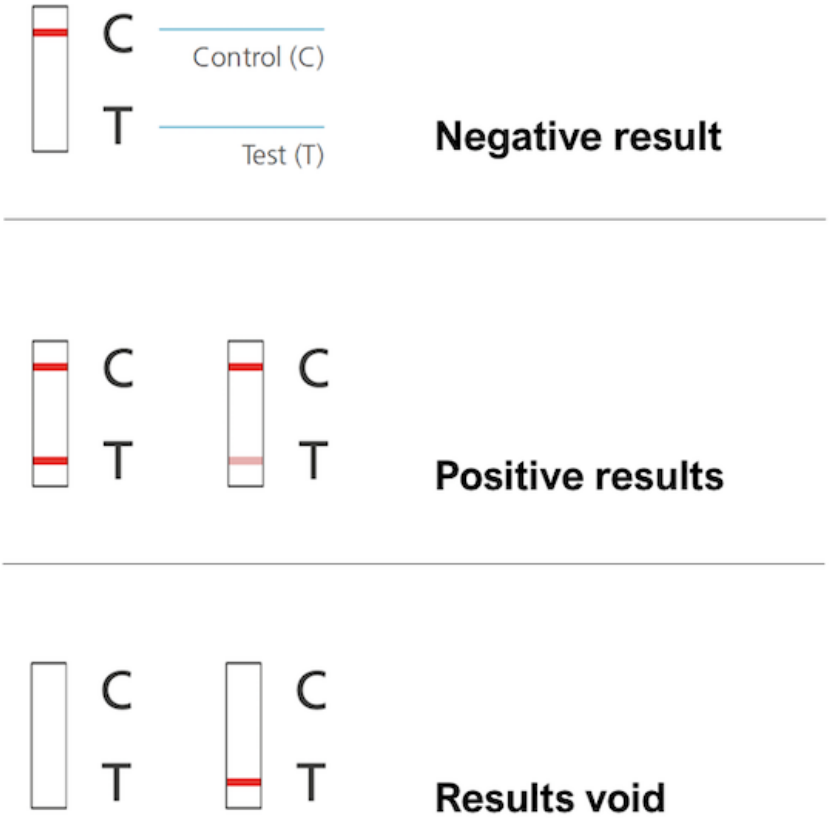
Each positive case identified can help prevent many additional people becoming infected over time.

How lateral flow testing works

Lateral flow 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.

The test kit is a hand-held device with an absorbent pad at one end and a reading window at the other. Inside the device is a strip of test paper that changes colour in the presence of COVID-19 proteins (antigens).

Test results



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. You or your test provider must report this test result to the NHS.

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, preventing further transmission of the virus.

A negative result means that active coronavirus infection was not detected, at the time of the test. However, this does not guarantee that you do not have coronavirus. You should continue to follow coronavirus rules, including regular hand washing, social distancing and face coverings where required.

How to take the test

Taking a lateral flow test usually involves taking a sample from the back of the throat near the tonsils and from the nose, using a swab.

The swab is dipped into an extraction solution. This is then dripped on to the device's paper pad, 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.

Who can be tested?

Lateral flow testing is currently being offered to people who do not have symptoms, in a range of different settings.

We conduct the majority of lateral flow testing at asymptomatic test sites, which are deployed in a range of community settings such as universities, schools, care homes and workplaces. Testing at these sites is assisted: you will swab yourself under the supervision of a trained operator who then processes the test and reads the result.

If you do have symptoms of COVID-19 you should not visit an asymptomatic test site. You should self-isolate immediately and follow the guidelines:

Get a PCR test here to confirm if you have coronavirus (https://www.gov.uk/get-coronavirus-test) when the following apply:

- you have a high temperature
- you have a new, continuous cough
- you've lost your sense of smell or taste or it has changed

How effective is lateral flow antigen testing?

Lateral flow tests can help to drive down the spread of COVID-19.

Lateral flow tests 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.

Lateral flow tests used by the UK government go through a rigorous evaluation by the country's leading scientists. This means they are accurate, reliable and successfully identify those with COVID-19 who don't show symptoms and could spread the virus without realising.

Lateral flow tests are not being offered in isolation, but alongside a range of other measures to drive down cases and break chains of transmission. See more on this topic on the Public Health England blog (https://publichealthmatters.blog.gov.uk/2020/12/08/lateral-flow-testing-new-rapid-tests-to-detect-covid-19/).

How sensitive are the tests?

'Sensitivity' refers to the proportion of people with COVID-19 that have a positive test.

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 the vast majority of cases (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).

PCR and lateral flow have different roles to play in controlling the virus, so it isn't helpful to directly compare them in terms of how sensitive they are:

- Lateral flow is useful for finding out if a person is infectious now, and able to transmit the virus to others. The level of sensitivity is high enough to detect the vast majority of these cases. Lateral flow testing is less likely 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.

The different levels of sensitivity are therefore appropriate for the ways they are used.

How lateral flow testing was trialled

The tests underwent a rigorous validation process (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) including evaluations from Public Health England and the University of Oxford. The Medicines and Healthcare products Regulatory Agency (MHRA) provides ongoing regulatory oversight.

Trials were carried out on the tests in a wide range of environments.

Large-scale pilots have also been carried out, including the whole city pilot in Liverpool in November 2020. As a result of the pilot, 897 positive individuals who would not otherwise have known they were infected, tested positive using lateral flow tests.

Pilots and evaluations

We have an ongoing programme of piloting and evaluating other potential uses of lateral flow tests in a number of institutions and workplaces, such as Jaguar Land Rover and John Lewis Partnership.

This includes piloting the regular testing of contacts of people who tested positive for coronavirus in order to find more coronavirus cases and break the chains of transmission, as people who have had close contact with a confirmed positive case are at higher risk than normal of having the virus.

A recent study (https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(20)30308-X/fulltext) suggests that regular testing contacts of confirmed cases is an effective way to reduce transmission of COVID-19, and could potentially reduce the need for self-isolation for contacts of positive cases

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1. 1 February 2021
   Added a new section on pilots and evaluations.
2. 27 January 2021
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