FACT SHEET FOR HEALTHCARE PROVIDERS

Assure COVID-19 IgG/IgM Rapid Test Device - Assure Tech. (Hangzhou Co., Ltd)

July 6, 2020

Coronavirus Disease 2019 (COVID-19)

This Fact Sheet informs you of the significant known and potential risks and benefits of the emergency use of the Assure COVID-19 IgG/IgM Rapid Test Device.

Assure COVID-19 IgG/IgM Rapid Test Device is authorized for the detection of IgG and IgM antibodies to SARS-CoV-2 in human venous whole blood (sodium EDTA), serum, or plasma (sodium EDTA).

All individuals whose specimens are tested with the test will receive the Fact Sheet for Recipients: Assure COVID-19 IgG/IgM Rapid Test Device.

What are the symptoms of COVID-19?
Many individuals with confirmed COVID-19 have developed fever and/or symptoms of acute respiratory illness (e.g., cough, fever, difficulty breathing). The current information available to characterize the spectrum of clinical illness associated with COVID-19 suggests that symptoms include cough, shortness of breath or dyspnea, fever, chills, myalgias, headache, sore throat or new loss of taste or smell. Based on what is known about the virus that causes COVID-19, signs and symptoms may appear any time from 2 to 14 days after exposure to the virus. Based on preliminary data, the median incubation period is approximately 5 days, but may range 2-14 days.

Public health officials have identified cases of COVID-19 infection throughout the world, including the United States, which poses risks to public health. Please check the CDC webpage for the most up-to-date information.

What do I need to know about COVID-19 antibody testing?
Current information on COVID-19 for healthcare providers is available at CDC's webpage, *Information for Healthcare Professionals* (see links provided in "Where can I go for updates and more information" section).

- Assure COVID-19 IgG/IgM Rapid Test Device can be ordered by healthcare providers to test human venous whole blood (sodium EDTA), serum, or plasma (sodium EDTA) for use as an aid in identifying individuals with an adaptive immune response to SARS-CoV-2, indicating recent or prior infection.
- Assure COVID-19 IgG/IgM Rapid Test Device should not be used to diagnose or exclude acute infection and should not be used as the sole basis for treatment or patient management decisions. Direct testing for SARS-CoV-2 should be performed if acute infection is suspected.
- Assure COVID-19 IgG/IgM Rapid Test Device is authorized for use in laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet requirements to perform moderate or high complexity tests.
- Please refer to the Assure COVID-19 IgG/IgM Rapid Test Device instructions for use for additional information.

This test detects human SARS-CoV-2 IgM and IgG that are generated as part of the human adaptive immune response to the COVID-19 virus and is to be performed only using human venous whole blood, serum, or plasma specimens.

Specimens should be collected with appropriate infection control precautions. Current guidance for COVID-19 infection control precautions are available at the CDC's website (see links provided in "Where can I go for updates and more information" section).

Use appropriate personal protective equipment when collecting and handling specimens from individuals suspected of having COVID-19 as outlined in the CDC *Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 (COVID-19)*. For additional information, refer to CDC *Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons Under Investigation (PUIs) for Coronavirus Disease 2019 (COVID-19)* (see links provided in "Where can I go for updates and more information" section).

Report Adverse events, including problems with test performance or results, to MedWatch by submitting the online FDA Form 3500 (https://www.accessdata.fda.gov/scripts/medwatch/index.cfm?action=reporting.home) or by calling **1-800-FDA-1088**

There are no approved available alternative tests. FDA has issued EUAs for other antibody tests that can be found at https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization#2019-ncov.

What does it mean if the specimen tests positive for antibodies against the virus that causes COVID-19?

A positive test result with the Assure COVID-19 IgG/IgM Rapid Test Device indicates that antibodies to SARS-CoV-2 were detected, and the individual has potentially been exposed to SARS-CoV-2.

Antibodies to SARS-CoV-2 are generally detectable in blood several days following infection. Individuals may have detectable virus present for several weeks following seroconversion. A positive result can indicate recent or past infection but does not exclude recently infected patients who are still contagious. ***It is unknown how long antibodies to SARS-CoV-2 will remain present in the body after infection and if they confer immunity to infection. Incorrect assumptions of immunity may lead to premature discontinuation of physical distancing requirements and increase the risk of infection for individuals, their households and the public.***

False positive results may occur due to cross-reactivity from pre-existing antibodies or other possible causes.

The Assure COVID-19 IgG/IgM Rapid Test Device has been designed to minimize the likelihood of false positive test results. However, in the event of a false positive result, risks to individuals could include the following: a recommendation for isolation of the individual, monitoring of household or other close contacts for symptoms, isolation that might limit contact with family or friends and may increase contact with other potentially COVID-19 individuals, limits in the ability to work, the delayed diagnosis and treatment for the true infection causing the symptoms, unnecessary prescription of a treatment or therapy, or other unintended adverse effects. ***Due to the risk of false positive results, confirmation of positive results should be considered – using a second, different antibody assay that detects the same type of antibodies.***

Laboratory test results should always be considered in the context of clinical observations and epidemiological data in making patient management decisions.

All laboratories using this test must follow standard confirmatory testing and reporting guidelines according to their appropriate public health authorities.

What does it mean if the specimen tests negative for antibodies against virus that causes COVID-19?

A negative test result with this test means that SARS-CoV-2 specific antibodies were not present in the specimen above the limit of detection. ***However***, ***patients tested early after infection may not have detectable antibodies despite active infection; in addition, it is not certain that all infected patients will develop a detectable antibody response to SARS-CoV-2 infection. A negative result should not be used to rule out infection. Direct testing of SARS-CoV-2 should be performed if acute infection is suspected.***

The absolute sensitivity of the Assure COVID-19 IgG/IgM Rapid Test Device is unknown.

Risks to an individual resulting from a false negative result include: restriction of activities deemed acceptable for individuals with evidence of an antibody response to SARS-CoV-2, lack of monitoring of infected individuals and their household or other close contacts for symptoms resulting in increased risk of spread of COVID-19 within the community, or other unintended adverse events.

What is an EUA?

The United States FDA has made these tests available under an emergency access mechanism called an Emergency Use Authorization (EUA). The EUA is supported by the Secretary of Health and Human Service's (HHS's) declaration that circumstances exist to justify the emergency use of *in vitro* diagnostics (IVDs) for the detection and/or diagnosis of the virus that causes COVID-19.

An IVD made available under an EUA has not undergone the same type of review as an FDA-approved or cleared IVD. FDA may issue an EUA when certain criteria are met, which includes that there are no adequate, approved, available

alternatives, and based on the totality of scientific evidence available, it is reasonable to believe that this IVD may be effective.

The EUA for the test you received is in effect for the duration of the COVID-19 declaration justifying emergency use of IVDs, unless terminated or revoked (after which the test may no longer be used).

Where can I go for updates and more information?

CDC webpages:

General: https://www.cdc.gov/COVID19
Healthcare Professionals: https://www.cdc.gov/coronavirus/2019-nCoV/guidance-hcp.html
Information for Laboratories: https://www.cdc.gov/coronavirus/2019-nCoV/guidance-laboratories.html
Laboratory Biosafety: https://www.cdc.gov/coronavirus/2019-nCoV/lab-biosafety-guidelines.html
Isolation Precautions in Healthcare Settings: https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html
Specimen Collection: https://www.cdc.gov/coronavirus/2019-nCoV/guidelines-clinical-specimens.html
Infection Control: https://www.cdc.gov/coronavirus/2019-ncov/infection-control/index.html

FDA webpages:

General: www.fda.gov/novelcoronavirus
EUAs: (includes links to recipient fact sheet and manufacturer's instructions) https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas

Contact information:

Assure Tech. (Hangzhou) Co., Ltd.
2nd-5th Floor, Building 4, No. 1418-50, Moganshan Road,
Gongshu District, Hangzhou, Zhejiang 310011, China

contact@diareagent.com
www.assurelabs.com

FACT SHEET FOR RECIPIENTS

Assure COVID-19 IgG/IgM Rapid Test Device - Assure Tech. (Hangzhou Co., Ltd)

July 6, 2020

Coronavirus Disease 2019 (COVID-19)

You are being given this Fact Sheet because your sample(s) is being tested or was tested for antibodies to the virus that causes Coronavirus Disease 2019 (COVID-19) using the Assure COVID-19 IgG/IgM Rapid Test Device.

This Fact Sheet contains information to help you understand the risks and benefits of using this test to evaluate your adaptive immune response to SARS-CoV-2, the virus that causes COVID-19. After reading this Fact Sheet, if you have questions or would like to discuss the information provided, please talk to your healthcare provider.

- **For the most up to date information on COVID19 please visit the CDC Coronavirus Disease 2019 (COVID-19) webpage:**
- **https://www.cdc.gov/COVID19**

What is COVID-19?
COVID-19 is caused by the SARS-CoV-2 virus.
The virus, which can cause mild to severe respiratory illness has spread globally, including the United States.
The current information available to characterize the spectrum of clinical illness associated with COVID-19 suggests that symptoms include cough, shortness of breath or difficulty breathing, fever, chills, muscle pain, headache, sore throat or new loss of taste or smell.

How are people tested for COVID-19?
Two kinds of tests are currently available for COVID-19: diagnostic tests and antibody tests.

- A diagnostic test tells you if you have a current infection.
- An antibody test tells you if you had a previous infection

What is this test?
This test is an antibody test. It will help assess if you have antibodies to the virus that causes COVID-19. An antibody test may not be able to show if you have a current infection, because it can take 1-3 weeks after infection to make antibodies.

What are the known and potential risks and benefits of the test?
Potential risks include:

- Possible discomfort or other complications that can happen during blood collection.
- Possible incorrect test result (see below for more information).

Potential benefits include:

- The results, along with other information, can help you and your healthcare provider make informed recommendations about your care.

What does it mean if I have a positive test result?
If you have a positive test result, it is possible that you have had recent or prior COVID-19 infection and that you have developed an antibody response to the virus. Your healthcare provider will work with you to determine how best to care for you based on the test results along with other factors of your medical history, your symptoms, possible exposures, and geographic location of places you have recently traveled. There is also the small possibility that this test can give a positive result that is wrong (a false positive result). Even a high-performing antibody test when used in a population without many cases of COVID-19 infection may produce as many or more false results as true results because the likelihood of finding someone who has been infected is very small. Your healthcare provider will work with you to determine the likelihood of false result.
It is not known how long antibodies to SARS-CoV-2 will remain present in the body after infection. It is not known whether having

- **Where can I go for updates and more information?** The most up-to-date information on COVID-19 is available at the CDC General webpage: **https://www.cdc.gov/COVID19.** In addition, please also contact your healthcare provider with any questions/concerns.

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antibodies to SARS-CoV-2 will protect you from getting infected again or help reduce the severity or duration of a future COVID-19 infection.

What does it mean if I have a negative test result?
A negative test result means that the antibodies to the virus that causes COVID-19 were not found in your sample. However, it is possible for this test to give a negative result that is incorrect (false negative) in some people with COVID-19. A negative result may occur if you are tested early in your illness and your body hasn't had time to produce antibodies to infection. This means that you could possibly still have COVID-19 even though the test is negative. If this is the case, your healthcare provider will consider the test result together with all other aspects of your medical history (such as symptoms, possible exposures, and geographical location of places you have recently traveled) in deciding how to care for you.

It is important that you work with your healthcare provider to help you understand the next steps you should take.

Is this test FDA-approved or cleared?
No. This test is not yet approved or cleared by the United States FDA. When there are no FDA-approved or cleared tests available, and other criteria are met, FDA can make tests available under an emergency access mechanism called an Emergency Use Authorization (EUA). The EUA for this test is supported by the Secretary of Health and Human Service's (HHS's) declaration that circumstances exist to justify the emergency use of in vitro diagnostics for the detection and/or diagnosis of the virus that causes COVID-19. This EUA will remain in effect (meaning this test can be used) for the duration of the COVID-19 declaration justifying emergency of IVDs, unless it is terminated or revoked by FDA (after which the test may no longer be used).

What are the approved available alternatives?
There are no approved available alternative tests. FDA has issued EUAs for other antibody tests that can be found at https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization#2019-ncov.

- **Where can I go for updates and more information?** The most up-to-date information on COVID-19 is available at the CDC General webpage: **https://www.cdc.gov/COVID19.** In addition, please also contact your healthcare provider with any questions/concerns.

Assure COVID-19 IgG/IgM Rapid Test Device

For Emergency Use Authorization Only
For prescription use only
For in vitro Diagnostic Use Only.

INTENDED USE

The Assure COVID-19 IgG/IgM Rapid Test Device is a rapid lateral flow chromatographic immunoassay intended for the qualitative detection and differentiation of IgM and IgG antibodies to SARS-CoV-2 in human venous whole blood (sodium EDTA), serum or plasma (sodium EDTA). The Assure COVID-19 IgG/IgM Rapid Test Device is intended for use as an aid in identifying individuals with an adaptive immune response to SARS-CoV-2, indicating recent or prior infection. At this time, it is unknown for how long antibodies persist following infection and if the presence of antibodies confers protective immunity. The Assure COVID-19 IgG/IgM Rapid Test Device should not be used to diagnose acute SARS-CoV-2 infection. Testing is limited to laboratories certified under the Clinical Laboratory Improvement Amendments (CLIA) of 1988, 42 U.S.C. §263a, that meet requirements to perform moderate or high complexity tests.
Results are for the detection of SARS-CoV-2 antibodies. The IgG and IgM antibodies to SARS-CoV-2 are generally detectable in blood several days after initial infection, although the duration of time antibodies are present post-infection is not well characterized. Individuals may have detectable virus present for several weeks following seroconversion.
Laboratories within the United States and its territories are required to report all positive results to the appropriate public health authorities.
The sensitivity of Assure COVID-19 IgG/IgM Rapid Test Device early after infection is unknown. Negative results do not preclude acute SARS-CoV-2 infection. If acute infection is suspected, direct testing for SARS-CoV-2 is necessary.
False positive results for Assure COVID-19 IgG/IgM Rapid Test Device may occur due to cross-reactivity from pre-existing antibodies or other possible causes. Due to the risk of false positive results, confirmation of positive results should be considered using second, different IgG or IgM assay.
The Assure COVID-19 IgG/IgM Rapid Test Device is only for use under the Food and Drug Administration's Emergency Use Authorization.

SUMMARY AND EXPLANATION

Coronaviruses are a large family of viruses that are common in many different species of animals, including camels, cattle, cats, and bats.
The two highly pathogenic viruses, SARS-CoV and MERS-CoV, cause severe respiratory syndrome in humans, and the other four human coronaviruses (HCoV-NL63, HCoV-229E, HCoV-OC43 and HKU1) induce only mild upper respiratory diseases in immunocompetent hosts, although some of them can cause severe infections in infants, young children and elderly individuals[1,2,3].
COVID-19 is the disease associated with SARS-CoV-2, which was identified at the end of 2019. Coronaviruses cause respiratory and intestinal infections in animals and humans[1].
The virus is transmitted mainly via respiratory droplets that people sneeze, cough, or exhale. The incubation period for COVID-19 is currently estimated at between two and 14 days. Common symptoms of COVID-19 infection include fever, cough and respiratory symptoms such as shortness of breath and breathing difficulties. More serious cases develop severe pneumonia, acute respiratory distress syndrome, sepsis and septic shock that can lead to the death of the patient. People with existing chronic conditions seem to be more vulnerable to severe illness.
Detection of IgM indicates recent infection and can be used for early diagnosis of infection. IgG antibodies gradually appear and increase in the late stage of infection, and the Assure COVID-19 IgG/IgM Rapid Test Device is a simple lateral flow immunoassay for the direct detection of anti-SARS-CoV-2 IgG/IgM antibody. It will provide a presumptive diagnosis of COVID-19.

PRINCIPLE

The Assure COVID-19 IgG/IgM Rapid Test Device is a lateral flow immunochromatographic assay for the detection of SARS-CoV-2 antibodies in venous whole blood, serum or plasma. This test uses anti-human IgM antibody (test line IgM), anti-human IgG (test line IgG) and goat anti-mouse IgG (control line C) immobilized on a nitrocellulose strip. The conjugate pad contains recombinant SARS-CoV-2 antigen (antigen is recombinant Nucleocapsid Protein and Spike Protein (S1)) conjugated with colloid gold.
During testing, the specimen binds with SARS-CoV-2 antigen- conjugated gold colloid coated particles in the test cassette. When a specimen followed by assay buffer is added to the sample well, IgM &/or IgG antibodies if present, will bind to COVID-19 conjugates making antigen antibodies complex. This complex migrates through nitrocellulose membrane by capillary action. When the complex meets the line of the corresponding immobilized antibody (anti-human IgM &/or anti-human IgG) the complex is trapped forming a red line which confirm a reactive test result. Absence of a red line in the test region indicates a non-reactive test result.
To serve as a procedural control, a red line will always appear in the control line region, indicating that the proper volume of specimen has been added and membrane wicking has occurred.
The presence of a red band(s) on the test region(s) indicates a positive result for the particular IgG and/or IgM antibodies, while its absence indicates a negative result. A red band at the control region (C) serves as a procedural control, indicating that membrane wicking is working.

REAGENTS AND MATERIALS

Materials Provided

- Individually packed test devices
- Disposable pipettes
- Negative control
- Buffer
- Package insert
- Positive control

External Negative and Positive Control
Negative controls are lyophilized human serum samples and positive controls are lyophilized IgG and IgM against SARS-CoV-2. Two negative control vials are supplied. Reconstitute each negative control vial with 30 µL purified water. Transfer one reconstituted 30 µL negative control to the positive control vial to make ready-to-use positive control. Controls can be used like a serum sample. Store reconstituted controls at 4ºC.

Materials Required but Not Provided

- Clock, timer or stopwatch
- Specimen collection container

WARNING AND PRECAUTIONS

- For use under an Emergency Use Authorization Only.
- For *in* vitro Diagnostic Use Only.
- This test has not been FDA cleared or approved; this test has been authorized by FDA under an EUA for use by laboratories certified under CLIA, that meet requirements to perform moderate or high complexity tests.
- This test has been authorized only for the presence of IgM and IgG antibodies against SARS-CoV-2, not for any other viruses or pathogens. This test is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostic tests for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.
- Read the Package Insert prior to use. Directions should be read and followed carefully.
- Do not use kit or components beyond the expiration date.
- The device contains material of animal origin and should be handled as a potential biohazard. Do not use if pouch is damaged or open.
- Test devices are packaged in foil pouches that exclude moisture during storage. Inspect each foil pouch before opening. Do not use devices that have holes in the foil or where the pouch has not been completely sealed. Erroneous result may occur if test reagents or components are improperly stored.
- Do not use the Buffer if it is discolored or turbid. Discoloration or turbidity may be a sign of microbial contamination.
- All patient specimens should be handled and discarded as if they are biologically hazardous. All specimens must be mixed thoroughly before testing to ensure a representative sample prior to testing.
- Failure to bring specimens and reagents to room temperature before testing may decrease assay sensitivity. Inaccurate or inappropriate specimen collection, storage, and transport may yield false negative test results.
- Avoid skin contact with buffer containing sodium azide which is a skin irritant.
- If infection with SARS-CoV-2 is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions and sent to state or local health departments for testing.
- Humidity and temperature can adversely affect results.

STORAGE AND STABILITY

- Store the Assure COVID-19 IgG/IgM Rapid Test Device at 2~30℃when not in use.
- **DO NOT FREEZE**.
- Kit contents are stable until the expiration dates marked on their outer packaging and containers.
- Perform testing immediately after specimen collection. Serum and plasma specimens may be stored at 2-8°C for up to 7 days. For long term storage, serum or plasma specimens should be kept below -20°C. Whole blood collected by venipuncture should be stored at 2-8°C if the test is to be run within 3 days after collection. Do not freeze whole blood specimens.
- Containers containing anticoagulants such as sodium EDTA, should be used for whole blood storage.
- Bring specimens to room temperature prior to testing. Frozen serum or plasma specimens must be completely thawed and mixed well prior to testing. Avoid repeated freezing and thawing of specimens.
- If specimens are to be shipped, pack them in compliance with all applicable regulations for transportation of etiological agents.

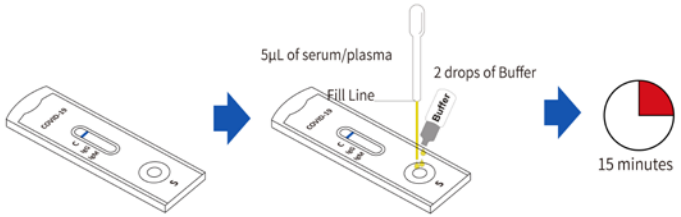
TEST PROCEDURE

Allow the test device, specimen, buffer, and/or controls to reach room temperature (15-30°C) prior to testing.

1. Bring the pouch to room temperature before opening. Remove the test device from the sealed pouch and use it as soon as possible.
2. Place the test device on a clean and level surface. **Note: There should be a blue line in the control region (next to "C"), discard the device if there is no blue line.**
3. Label the test with patient or control identification.
4. Add the specimens.

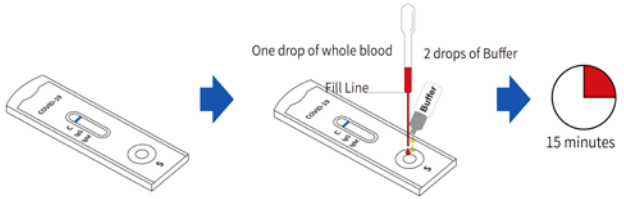
For Serum or Plasma Specimens

a) Using the provided disposable pipette, draw the specimen up to the Fill Line, and transfer all the specimen (appr. 5 µL) into the specimen well of the test device, then add 2 drops of buffer and start the timer.



For Venous Whole Blood Specimens

a) Using the provided disposable pipette, draw the specimen above the fill line (avoid the specimen entering the bubble of disposable pipette) and transfer one drop of the specimen into the specimen well of the test device, then add 2 drops of buffer and start the timer.



RESULT INTERPRETATION

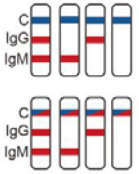
For Assure COVID-19 IgG/IgM Test:

IgM and IgG Positive:*The colored line in the control region (C) changes from blue to red, and two colored lines should appear in IgG and IgM test regions. The color intensities of the lines do not have to match. The result is positive for IgM and IgG antibodies.

IgG Positive:*The colored line in the control region (C) changes from blue to red, and a colored line appears in the IgG test region. The result is positive for COVID-19 virus specific-IgG antibodies.

IgM Positive:*The colored line in the control region (C) changes from blue to red, and a colored line appears in the IgM test region. The result is positive for COVID-19 virus specific-IgM antibodies.

Negative: The colored line in the control region (C) changes from blue to red. No line appears in IgM or IgG test regions.



Invalid: Control line (C) is still completely or partially blue, and fails to completely change from blue to red. Insufficient buffer volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the procedure with a new test device. If the problem persists, discontinue using the test kit immediately and contact your local distributor.

NOTE:

1. The color intensity in the test region may vary depending on the concentration of analytes present in the specimen. Therefore, any shade of color in the test region should be considered positive.

Note that this is a qualitative test only, and cannot determine the concentration of analytes in the specimen.

2. Insufficient specimen volume, incorrect operating procedure or expired tests are the most likely reasons for control band failure.

QUALITY CONTROL

Internal Procedural Controls

The Assure COVID-19 IgG/IgM Rapid Test Device has built-in (procedural) controls. Each test device has an internal standard zone to ensure proper sample flow. The user should confirm that the blue band should be always located at the "C" region before testing, and the red band should be always present before result interpretation.

External Positive and Negative Controls

Good laboratory practice suggests testing positive and negative external controls to ensure that the test reagents are working and that the test is correctly performed.

LIMITATIONS OF THE TEST

For use under an Emergency Use Authorization Only

1. Use of the Assure COVID-19 IgG/IgM Rapid Test Device is limited to laboratory personnel who have been trained. Not for home use.
2. The Assure COVID-19 IgG/IgM Rapid Test Device is for *in vitro* diagnostic use only. The test should be used for the detection of SARS-CoV-2 antibodies in whole blood, serum or plasma specimens only. Neither quantitative value nor the rate of increase in SARS-CoV-2 antibody concentration can be determined by this qualitative test.
3. The Assure COVID-19 IgG/IgM Rapid Test Device is not validated for finger stick blood.
4. The Assay Procedure and the Interpretation of Assay Result must be followed closely when testing for the presence of SARS-CoV-2 virus specific antibodies in the serum, plasma or whole blood specimen from individual subjects. For optimal test performance, proper sample collection is critical. Failure to follow the procedure may give inaccurate results.
5. Reading test results earlier than 10 minutes after the addition of Buffer may yield erroneous results. Do not interpret the results after 20 minutes.
6. The Assure COVID-19 IgG/IgM Rapid Test Device will only indicate the presence of SARS-CoV-2 antibodies in the specimen and should not be used for the diagnosis of SARS-CoV-2.
7. In the early onset of symptom, anti-SARS-Cov-2 IgM and IgG antibody concentrations may be below detectable levels.
8. A high dose "hook effect" may occur where the color intensity of test band decreases as the concentration of anti-SARS-CoV-2 IgG/IgM increases. If a "hook effect" is suspected, dilution of specimens may increase color intensity of the test band.
9. Results from immunosuppressed patients should be interpreted with caution.
10. As with all diagnostic tests, all results must be interpreted together with other clinical information available to the physician.
11. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions, IgM antibodies may not be detected in the first few days of infection; the sensitivity of the Assure COVID-19 IgG/IgM Rapid Test Device early after infection is unknown. False positive results for IgM and IgG antibodies may occur due to cross-reactivity from pre-existing antibodies or other possible causes. Samples with positive results should be confirmed with alternative testing method(s) and clinical findings.
12. A negative result can occur if the quantity of the anti-SARS-CoV-2 antibodies present in the specimen is below the detection limits of the assay, or the antibodies that are detected are not present during the stage of disease in which a sample is collected.
13. Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E.
14. Results from antibody testing should not be used to diagnose or exclude SARS-CoV-2 infection or to inform infection status.
15. Not for the screening of donated blood.

The sensitivity of the test is impacted after being open for one hour-the intensity of the T line becomes weak. Testing must be performed within one hour after opening the pouch.

Conditions of Authorization for the Laboratory

The Assure COVID-19 IgG/IgM Rapid Test Device Letter of Authorization, along with the authorized Fact Sheet for Healthcare Providers, the authorized Fact Sheet for Recipients, and other authorized labeling are available on the FDA website: https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas.

Authorized laboratories using the Assure COVID-19 IgG/IgM Rapid Test Device ("your product" in the conditions below), must adhere to the Conditions of Authorization indicated in the Letter of Authorization as listed below:

1. Authorized laboratories* using your product will include the test result reports, all authorized Fact Sheets. Under exigent circumstances, other appropriate methods for disseminating these Fact Sheets may be used, which may include mass media.
2. Authorized laboratories using your product will use your product as outlined in the Instructions for Use. Deviations from the authorized procedures, including the authorized clinical specimen types, authorized control materials, authorized other ancillary reagents and authorized materials required to use your product are not permitted.
3. Authorized laboratories that receive your product will notify the relevant public health authorities of their intent to run your product prior to initiating testing.
4. Authorized laboratories using your product will have a process in place for reporting test results to healthcare providers and relevant public health authorities, as appropriate.
5. Authorized laboratories will collect information on the performance of your product and report to DMD/OHT7-OIR/OPEQ/CDRH (via email: CDRH-EUA-Reporting@fda.hhs.gov) and Assure Tech (Hangzhou Co., Ltd). (via email: contact@direagent.com) any suspected occurrence of false reactive or false non-reactive results and significant deviations from the established performance characteristics of your product of which they become aware.
6. All laboratory personnel using your product must be appropriately trained in immunoassay techniques and use appropriate laboratory and personal protective equipment when handling this kit and use your product in accordance with the authorized labeling. All laboratory personnel using the assay must also be trained in and be familiar with the interpretation of results of the product.
7. Assure Tech. (Hangzhou Co., Ltd), authorized distributors, and authorized laboratories using your product will ensure that any records associated with this EUA are maintained until otherwise notified by FDA. Such records will be made available to FDA for inspection upon request.

*The Letter of Authorization refers to, "Laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet the requirements to perform moderate or high complexity tests" as "authorized laboratories".

PERFORMANCE CHARACTERISTICS

Clinical Evaluation

Study I

Total of 61 positive and 105 negative serum or venous whole blood samples were collected at 4 different study sites. These samples were tested with both RT-PCR method for SARS-CoV-2 infection and Assure COVID-19 IgG/IgM Rapid Test device for antibodies. The obtained sensitivity and specificity results are summarized in following tables.

Table 1. IgG PPA for the Assure COVID-19 IgG/IgM Rapid Test Device

Site	Days post symptom onset	# PCR Positive at any time	Assure COVID-19 IgG/IgM Rapid Test Device		
			#Positive Results	PPA	95%CI
(Site 1+3+4) Serum	≤7	8	7	87.5%	52.9%-97.8%
	8-14	15	13	86.7%	62.1%-96.3%
	≥15	25	25	100%	86.7%-100%
(Site 2) Venous Whole Blood	≤7	1	1	100%	20.7%-100%
	8-14	3	3	100%	43.9%-100%
	≥15	9	9	100%	70.1%-100%
Combined Sites (Serum + Blood)	-	61	58	95.1%	86.5%-98.3%

Table 2. IgG NPA for the Assure COVID-19 IgG/IgM Rapid Test Device

Site	# PCR Negative	Assure COVID-19 IgG/IgM Rapid Test Device		
		#Negative Results	NPA	95%CI
(Site 1+3+4) Serum	96	96	100%	96.2%-100%
(Site 2) Venous Whole Blood	9	9	100%	70.1%-100%
Combined Sites (Serum + Blood)	105	105	100%	96.5%-100%

Table 3. IgM PPA for the Assure COVID-19 IgG/IgM Rapid Test Device

Site	Days post symptom onset	# PCR Positive at any time	Assure COVID-19 IgG/IgM Rapid Test Device		
			#Positive Results	PPA	95%CI
(Site 1+3+4) Serum	≤7	8	8	100%	67.6%-100%
	8-14	15	13	86.7%	62.1%-96.3%
	≥15	25	21	84%	65.3%-93.6%
(Site 2) Venous Whole Blood	≤7	1	1	100%	20.7%-100%
	8-14	3	3	100%	43.9%-100%
	≥15	9	9	100%	70.1%-100%
Combined Sites (Serum + Blood)	-	61	55	90.2%	80.2%-95.4%

Table 4. IgM NPA for the Assure COVID-19 IgG/IgM Rapid Test Device

Site	# PCR Negative	Assure COVID-19 IgG/IgM Rapid Test Device		
		#Negative Results	NPA	95%CI
(Site 1+3+4) Serum	96	94	97.9%	92.7%-99.4%
(Site 2) Venous Whole Blood	9	9	100%	70.1%-100%
Combined Sites (Serum + Blood)	105	103	98.1%	93.3%-99.5%

Study II: Independent Clinical Agreement Validation

The COVID-19 IgG/IgM Rapid Test Device from Assure Tech. (Hangzhou) Co., Ltd. was tested on 2020-06-15 at the Frederick National Laboratory for Cancer Research (FNLCR) sponsored by the National Cancer Institute (NCI). The test was validated against a panel of previously frozen samples consisting of 30 SARS-CoV-2 antibody-positive serum samples and 80 antibody-negative serum and plasma samples. Each of the 30 antibody-positive samples was confirmed with a nucleic acid amplification test (NAAT) and both IgM and IgG antibodies were confirmed to be present in all 30 samples. The presence of antibodies in the samples was confirmed by several orthogonal methods prior to testing with the Assure COVID-19 IgG/IgM Rapid Test Device. The presence of IgM and IgG antibodies specifically was confirmed by one or more comparator methods. Antibody-positive samples were selected at different antibody titers.

All antibody-negative samples were collected prior to 2020 and include: i) Seventy (70) samples selected without regard to clinical status, "Negatives" and ii) Ten (10) samples selected from banked serum from HIV+ patients, "HIV+". Testing was performed by one operator using one lot of the Assure COVID-19 IgG/IgM Rapid Test Device. Confidence intervals for sensitivity and specificity were calculated per a score method described in CLSI EP12-A2 (2008).

For evaluation of cross-reactivity with HIV+, it was evaluated whether an increased false positive rate among antibody-negative samples with HIV was statistically higher than the false positive rate among

antibody-negative samples without HIV (for this, a confidence interval for the difference in false positive rates was calculated per a score method described by Altman). The results and data analysis are shown in the Tables 5 and 6 below.

Table 5. Summary Results

Assure COVID-19 IgG/IgM Rapid Test Device		Comparator Method			Total
		Positive (IgM/IgG) +	Negative (IgM/IgG) -	Negative, HIV+	
Positive	IgM+/IgG+	27	0	0	27
	IgM+, IgG-	3	1	0	4
	IgM-, IgG+	0	0	0	0
Negative	IgM-/IgG-	0	69	10	79
Total (n=110)		30	70	10	110

Table 6. Summary Statistics

Measure	Estimate	Confidence Interval
IgM+ Sensitivity (PPA)	(30/30) 100%	(88.7%; 100%)
IgM- Specificity (NPA)	(79/80) 98.8%	(93.3%; 98.8%)
IgG+ Sensitivity (PPA)	(27/30) 90.0%	(74.4%; 96.5%)
IgG- Specificity (NPA)	(80/80)100%	(95.4%; 100%)
Combined Sensitivity	(30/30) 100%	(88.7%; 100%)
Combined Specificity	(79/80) 98.8%	(93.3%; 98.8%)
Combined PPV for prevalence = 5%	80.8%	(40.9%; 96%)
Combined NPV for prevalence = 5%	100%	(99.4%; 100%)
Cross-reactivity with HIV+	(0/10) 0% not detected	----------

Cross Reactivity

There was no cross-reactivity with plasma specimens meeting the disease state shown below. No IgM or IgG false positive results were observed with the following potential cross-reactants:

Table 7. Cross-reactivity Study Data of Assure COVID-19 IgG/IgM Rapid Test Device

Conditions	Number of samples	Conditions	Number of samples
Anti-HAV IgM +	5	Lyme disease+	5
Anti-HEV IgG +	2	P. falciparum +	5
HBsAg +	5	P. vivax +	5
Anti-HCV +	5	Toxoplasma IgM +	5
Anti-HIV +	5	HAMA +	1
Anti-Rubella IgM +	5	RF +	5
Anti-CMV IgM +	5	ANA+	5
Anti-HSV-I IgM +	5	Anti-Influenza A IgM +	3
Anti-HSV-II IgM +	5	Anti-Influenza B IgM +	1
EBV IgM +	4	Anti-RSV IgM +	3
Anti-Dengue IgM +	5	Legionella pneumophila IgM+	2
Anti-Yellow fever +	5	Anti-Adenovirus IgM +	1
Anti-Zika IgG +	5	Anti-Mycoplasma pneumonia IgM +	3
Chagas Ab+	5	Anti-Chlamydia pneumonia IgM +	3
Anti-Syphilis IgG +	4	Anti-Chlamydia pneumonia IgG +	2
Anti-Tuberculosis +	5	Measles IgG +	1
Typhoid IgM +	5	Mumps IgG +	1

Interfering Substances

The assay performance of COVID-19 IgG/IgM Rapid Test Device is not affected by substances at concentrations listed below.

Table 8. Interference Study Data of Assure COVID-19 IgG/IgM Rapid Test

Interfering substances	Concentration of analytes
Blood analytes	
Albumin	5 g/dL
Anticoagulants	
EDTA (sodium salt)	3.4 µmol/L
Abnormal blood sample	
Visual hemolysis (Hemoglobin)	20 g/dL
Icteric (Bilirubin)	5 mg/dL
Lipemic (Triglycerides)	500 mg/dL
Common medicines	
Acetylsalicylic acid	3.62 mmol/L
Ascorbic acid (Vitamin C)	342 µmol/L
Amoxicillin	206 µmol/L
Fluconazole	245 µmol/L
Ibuprofen	2425 µmol/L
Loratadine	0.78 µmol/L
Nadolol	3.88 µmol/L
Naproxen	2170 µmol/L
Paroxetine	3.04 µmol/L
Anti-malarial medicines	
Quinine	148 µmol/L
Anti-tuberculosis medicines	
Rifampicin	78.1 µmol/L
Isoniazid	292 µmol/L
Ethambutol	58.7 µmol/L
Common consumables	
Coffee (caffeine)	308 µmol/L
Alcohol (ethanol)	86.8 mmol/L

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GLOSSARY OF SYMBOLS

ρ	Catalog number	ϐ	Temperature limitation
ι	Consult instructions for use	Λ	Batch code
I	*In vitro* diagnostic medical device	ε	Use by
μ	Manufacturer	σ	Do not reuse

Manufactured by:
Assure Tech. (Hangzhou) Co., Ltd.
2nd-5th Floor, Building 4, No. 1418-50, Moganshan Road,
Gongshu District, Hangzhou, Zhejiang 310011, China

www.assurelabs.com
contact@diareagent.com
Customer Service Phone: 1-800-618-5829
Service date/hours: Monday through Friday 9:00 AM to 5:00 PM CST