

Labstract – June 2018

Cytomegalovirus (CMV) – Change in Testing Methodology to Qualitative Real-Time PCR Testing

Audience

Health Care Providers who order CMV testing

Overview

Change in testing for cytomegalovirus (CMV) from shell vial culture to qualitative real-time PCR

Effective June 11, 2018 a PCR test for CMV will be implemented at Public Health Ontario (PHO) Laboratory. This PCR test (Altona RealStar® CMV PCR Kit 1.0) will replace the previous CMV EA testing in shell vial culture. The PCR test has been validated for qualitative detection of CMV.

The reason for this change is that the previous test used at PHO Laboratory for the identification of CMV (the Cytomegalovirus Immediate Early Antigen (CMV EA) confirmatory stain test kit) will no longer be manufactured.

Background information

Clinical Indications

The CMV qualitative PCR is of use in the following clinical scenarios:

- i. Evaluation of a newborn for congenital CMV infection.
- ii. Screening for CMV disease in immunocompromised patients or critically ill (e.g. admitted to ICU) immunocompetent patients where CMV disease is suspected. Positive qualitative PCR tests should be followed up with a quantitative CMV PCR test, which is not available at PHO Laboratory (see below). Testing these patients with a quantitative test as the primary testing approach is preferred if available.

Clinical Utility

Investigation of congenital CMV disease:

A positive qualitative or quantitative CMV PCR test within 4 weeks of birth is adequate for laboratory confirmation of congenital CMV infection in a neonate.

Investigation of acute CMV disease in immunocompetent patients:

Molecular testing for diagnosing acute CMV infection in immunocompetent patients who are not neonates is not used routinely, as results can be difficult to interpret. This is because following primary infection, CMV can be shed for weeks, months or years, and thereafter remains latent in many cell types (e.g. tissues, endothelial cells, and leukocytes), and can reactivate asymptotically. CMV seroprevalence increases with age and ranges from 40% to 100%. A positive qualitative PCR in immunocompetent patients may be due to persistent or intermittent asymptomatic shedding, or latent infection, and does not necessarily indicate active CMV disease.

For this reason, diagnostic CMV serology (CMV IgM/IgG) is the recommended test method for diagnosing acute CMV disease in otherwise healthy immunocompetent patients, with the exception being when evaluating for suspected congenital infection where qualitative CMV PCR should be done in addition to serology.

The qualitative CMV PCR could also be used as an initial screen in severely ill immunocompetent patients (e.g. admitted to ICU) where CMV disease is suspected. Any positive tests require follow up testing with a quantitative CMV PCR assay to better understand the clinical significance of the positive qualitative test. Testing these patients with a quantitative CMV PCR test, not currently available at PHO Laboratory, as the primary testing approach is preferred if available.

Investigation of acute CMV disease in immunocompromised patients:

Although CMV PCR is useful in evaluating immunocompromised patients for CMV disease, this patient group would be more appropriately tested using a quantitative CMV PCR (not currently available at PHO Laboratory) on blood and other relevant specimen types, as higher viral loads correlate with actively replicating virus which is more likely to be causing acute disease. Qualitative detection of CMV DNA in specimens has limited value in predicting symptomatic disease and in monitoring the success of antiviral therapy in immunocompromised patients.

Specimen Collection Requirements

There is no change in specimen collection requirements.

Similar to specimen collection for CMV shell vial culture testing, CMV PCR can be performed on bronchial alveolar lavage (BAL), bronchial wash, tissue (e.g. lung tissues, placenta, etc.), CSF and urine collected in a sterile container.

Minimum volume required: BAL/bronchial wash/urine - 2.0 ml, CSF – 400 ul and tissue - 1.0 to 2.0 grams.

For more specimen collection information please see **Cytomegalovirus Detection Test Information Sheet** on our website at publichealthontario.ca/testdirectory

Note: blood specimens will not be accepted for CMV viral load testing – the Altona RealStar® CMV PCR Kit used by PHOL has been validated for qualitative CMV detection and has not been validated to provide quantitative results.

Testing Schedule and Turnaround time (TAT)

The CMV PCR test is performed Monday, Tuesday and Thursday.

TAT for CMV PCR is up to 3 days after receipt at test site.

Interpretation of results

Results will be reported as DETECTED/ NOT DETECTED/ INDETERMINATE for CMV. For indeterminate* results, consider resubmitting another specimen if clinically indicated. The presence of CMV DNA in a sample does not always imply active infection; the diagnosis of CMV infection must be made using a combination of clinical suspicion, physical exam and detection of virus.

*Indeterminate results are reflective of a signal detected during late rounds of amplification in the real-time PCR reaction. This could represent a low quantity of CMV DNA in the specimen, or may be a nonspecific reaction giving a false signal.

For further information

- Contact the PHO Laboratory Customer Service Centre at 416-235-6556 or 1-877-604-4567 (toll-free), or by email at CustomerServiceCentre@oahpp.ca
- For PHO Laboratory specimen collection information and previous Lababstracts, refer to publichealthontario.ca/Labs
- The current version of the PHO Laboratory General Test Requisition and other forms are available at publichealthontario.ca/Requisitions
- To subscribe to future Lababstracts, [register on our website](#)
- To register for Autofax and receive laboratory reports by fax directly from our laboratory information system as soon as they are released, contact the PHO Laboratory Customer Service Centre.