Overview

Useful For
Rapid (qualitative) detection of varicella-zoster virus DNA in clinical specimens for laboratory diagnosis of disease due to this virus

Method Name
Real-Time Polymerase Chain Reaction (PCR)/DNA Probe Hybridization

NY State Available
Yes

Specimen

Specimen Type
Varies

Necessary Information
Specimen source is required.

Specimen Required
Submit only 1 of the following specimens:

Supplies: Aliquot Tube, 5 mL (T465)

Specimen Type: Fluid

Sources: Spinal, pleural, peritoneal, ascites, pericardial, amniotic, or ocular

Container/Tube: Sterile container

Specimen Volume: 0.5 mL

Collection Instructions: Do not centrifuge.

Supplies:
Culturette (BBL Culture Swab) (T092)
M4-RT (T605)

Specimen Type: Swab

Sources: Miscellaneous; dermal, eye, nasal, or throat

Container/Tube: Multimicrobe media (M4-RT) (T605) and ESwabs

Collection Instructions: Place swab back into multimicrobe media (M4-RT [T605], M4, or M5).
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Varicella-Zoster Virus PCR

Supplies:
Culturette (BBL Culture Swab) (T092)
M4-RT (T605)

Specimen Type: Swab
Sources: Genital; cervix, vagina, urethra, anal/rectal, or other genital sources
Container/Tube: Multimicrobe media (M4-RT) (T605) and ESwabs
Collection Instructions: Place swab back into multimicrobe media (M4-RT [T605], M4, or M5).

Specimen Type: Fluid
Sources: Respiratory; bronchial washing, bronchoalveolar lavage, nasopharyngeal aspirate or washing, sputum, or tracheal aspirate
Container/Tube: Sterile container
Specimen Volume: 1.5 mL
Supplies: M4-RT (T605)

Specimen Type: Tissue
Sources: Brain, colon, kidney, liver, lung, etc.
Container/Tube:
Preferred: Multimicrobe media (M4-RT) (T605)
Acceptable: Sterile container with 1 to 2 mL of sterile saline
Specimen Volume: Entire collection
Collection Instructions: Submit only fresh tissue in a sterile container containing 1 mL to 2 mL of sterile saline or multimicrobe medium (M4-RT [T605], M4, or M5)

Forms
If not ordering electronically, complete, print, and send a Microbiology Test Request (T244) with the specimen.

Specimen Minimum Volume
Body Fluid, Ocular Fluid, or Spinal Fluid: 0.3 mL
Respiratory Specimens: 1 mL
Tissue: 2 x 2-mm biopsy

Reject Due To
Test Definition: LVZV
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| Swab/Tissue | Calcium alginate-tipped swab, wood swab, or transport swab containing gel Formalin-fixed and/or paraffin-embedded tissues |

Specimen Stability Information

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<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Varies</td>
<td>Refrigerated (preferred)</td>
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<td></td>
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<tr>
<td></td>
<td>Frozen</td>
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Clinical and Interpretive

Clinical Information

Varicella-zoster virus (VZV) causes both varicella (chickenpox) and herpes zoster (shingles). VZV produces a generalized vesicular rash on the dermis (chickenpox) in normal children, usually before 10 years of age. After primary infection with VZV, the virus persists in latent form and may emerge clinically (usually in adults 50 years of age and older) to cause a unilateral vesicular eruption, generally in a dermatomal distribution (shingles).

Reference Values

Negative

Interpretation

Detection of varicella-zoster virus (VZV) DNA in clinical specimens supports the clinical diagnosis of infection due to this virus.

VZV DNA is not detected in cerebrospinal fluid from patients without central nervous system disease caused by this virus.

This LightCycler PCR assay does not yield positive results with other herpesvirus gene targets (herpes simplex virus, cytomegalovirus, Epstein-Barr virus).

Cautions

A negative result does not exclude the possibility of varicella-zoster virus (VZV) infection.

The reference range is typically "negative" for this assay. This assay is only to be used for patients with a clinical history and symptoms consistent with VZV infection, and must be interpreted in the context of the clinical picture. This test is not used to screen asymptomatic patients.

Supportive Data

The following validation data supports the use of this assay for clinical testing.

Accuracy/Diagnostic Sensitivity and Specificity:

LightCycler PCR (primers, directed to varicella-zoster virus [VZV], gene 29) was compared with shell vial cell cultures for the detection of VZV from 253 dermal specimens. Twenty-three specimens (9.1%) were positive for VZV by LightCycler PCR and by the shell vial cell culture assay. An additional 21 specimens exclusively yielded VZV DNA. These discrepant specimens were resolved as true-positive results by confirmation of results by PCR using primers.
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directed to another gene of VZV. Importantly, there were no instances in which VZV was recovered by the shell vial assay and not detected by LightCycler PCR (specificity, 100%). Of 100 cerebrospinal fluid specimens tested by both conventional PCR and LightCycler PCR, VZV DNA was detected in 49 specimens by both methods; 1 specimen was positive only by the conventional PCR assay. Fifty specimens were found to be negative for VZV DNA by both techniques.

Supplemental Data (Spiking Studies):

To supplement the above data, 30 negative specimens each of various types were spiked with VZV plasmid at the limit of detection (10-20 targets/microliter). The spiked specimens were run in a blinded fashion along with approximately 30 negative (nonspiked) specimens each of various specimen types; 90% to 100% of the spiked specimens were positive and 100% of the nonspiked specimens were negative.

Analytical Sensitivity/Limit of Detection (LoD):

The LoD of this assay is 10 to 20 DNA target copies per microliter in specimen matrix.

Analytical Specificity:

No PCR signal was obtained from extracts of 27 bacterial, viral, and fungal isolates that could be found as normal flora in sites normally tested for this organism or that could cause similar symptoms.

Precision:

Interassay precision was 100% and intraassay precision was 97%.

Reportable Range:

This test is a qualitative assay and results are reported as negative or positive for targeted VZV DNA.

Clinical Reference


Performance
Method Description
Viral nucleic acid is extracted by the MagNA Pure automated instrument (Roche Applied Science) from clinical specimens. Primers directed to target DNA (ss DNA binding proteins: gene 29) produce a 202-bp amplicon. The LightCycler instrument amplifies and monitors by fluorescence the development of target nucleic acid sequences after the annealing step during PCR cycling. This is an automated PCR system that can rapidly detect (30-40 minutes) amplicon development through stringent air-controlled temperature cycling in capillary cuvettes. The detection of amplified products is based on the fluorescence resonance energy transfer (FRET) hybridization probe with a donor fluorophore, fluorescein, on the 3’ end is excited by an external light source and emits light that is absorbed by a second hybridization probe with an acceptor fluorophore, LC-Red 640, at the 5’ end. The acceptor fluorophore then emits a light of a different wavelength that can be measured with a signal that is proportional to the amount of specific PCR product. Melting curve analysis is performed following PCR amplification. Starting at 45 degrees C, the temperature in the thermal chamber is slowly raised to 80 degrees C, and the fluorescence is measured at frequent intervals. Analysis of the PCR amplification and probe melting curves is accomplished through the use of LightCycler software. (Dhiman N, Wright PA, Espy MJ, et al: Concurrent detection of herpes simplex and varicella-zoster viruses by polymerase chain reaction from the same anatomic location. Diagn Microbiol Infect Dis 2011 Aug;70(4):538-540 doi: 10.1016/j.diagmicrobio.2011.03.014; Espy MJ, Teo R, Ross TK, et al: Diagnosis of varicella-zoster virus infections in the clinical laboratory by LightCycler PCR. J Clin Microbiol 2000;38[9]:3187-3189)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Saturday; Varies

Analytic Time
Same day/1 day

Maximum Laboratory Time
3 days

Specimen Retention Time
1 week

Performing Laboratory Location
Rochester

Fees and Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
87798
## LOINC® Information

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<td>Varicella-Zoster Virus PCR</td>
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