THE PATHCARE NEWS

New Meningitis / Encephalitis PCR test

PathCare is introducing a new Meningitis/Encephalitis Multiplexed PCR test with an expanded organism profile and reduced turn-around time. This new PCR test is able to detect 14 potential central nervous system (CNS) pathogens (table 1) and will replace the current viral meningitis PCR and bacterial meningitis PCR tests.

Table 1. Bacteria, Viruses, and Yeast Detected by the Meningitis/Encephalitis (ME) Panel.
*A separate Enterovirus PCR test is also available

Bacteria	
Escherichia coli K1	*Neisseria meningitidis*
Haemophilus influenzae	*Streptococcus agalactiae* (group B)
Listeria monocytogenes	*Streptococcus pneumoniae*
Viruses	
Cytomegalovirus (CMV)	Enterovirus (EV)*
Human herpesvirus 6 (HHV-6)	Herpes simplex virus 1 (HSV-1)
Human parechovirus (HPeV)	Herpes simplex virus 2 (HSV-2)
Varicella zoster virus (VZV)	
Yeast	
Cryptococcus neoformans/gattii	

The ME Panel is able to detect and identify multiple bacterial, viral, and yeast nucleic acids directly from cerebrospinal fluid (CSF) specimens obtained from patients with symptoms and signs of meningitis and/or encephalitis. The expanded profile includes the ability to detect *E. coli* K1 strains, an important cause of neonatal meningitis which account for about 80% of *E. coli* isolated from CSF. The panel also can detect Human parechoviruses (HPeV). These viruses were originally classified as Enterovirus, but comprise another genus of the *Picornaviridae* family. Similarly to the Enteroviruses, respiratory and gastrointestinal illness are common. HPeV-3 is associated with severe disease, including encephalitis, meningitis, and hepatitis in infants < 3 months of age.[1] The routinely used Enterovirus PCR will fail to detect HPeVs due to genetic differences between these viruses. VZV has been found to be the third most frequent viral agent causing CNS disease in adults.[2] Encephalitis and meningitis may complicate both varicella (chickenpox) and zoster (shingles) infections. The vesicular rash is a characteristic finding for viral reactivation, but may be absent in more than a third of cases. HHV-6B, one of the causes of roseola in infants (HHV-7 being the other) and HHV-6A establish latency in host cells, including the CNS tissues.[3] CNS disease may occur particularly in immunosuppressed individuals. In addition to the common bacterial and viral CNS pathogens, *Cryptococcus neoformans/gattii* can also be detected with this multiplexed PCR test.

SPECIMEN COLLECTION:

The Meningitis/Encephalitis PCR test requires 0.5 ml of unspun CSF. Due to the sensitive nature of this test, it is important to prevent contamination of the specimen during collection using an aseptic technique. Some organisms detected with the ME Panel such as *S. pneumoniae* and *H. influenzae* can be shed from the respiratory tract of healthy individuals. HSV-1 may be shed from persons with or without active cold sores. Some studies indicate that 70% of individuals shed

HSV-1 asymptomatically at least once a month and even up to 6 times a month.[4;5] During sample collection, healthcare workers are advised to wear a surgical mask (or equivalent) and avoid touching the mask while collecting specimens.

It is recommended to collect the CSF specimen for the PCR test in a separate sterile tube to minimize handling of the specimen during processing. Ideally 2 CSF specimens must be submitted if both a molecular screen and culture are requested.

The PCR test is not intended for use with CSF collected from indwelling CSF shunts.

Specimens should be transported at 2 - 8°C if > 8hrs transport time to the analysing laboratory.

TEST RESULT AND INTERPRETATION:

- The turn-around time for this test is < 8 hours from reaching the analysing laboratory.
- Please note that the ME Panel does not distinguish between latent and active CMV and HHV-6 infections. Detection of these viruses may indicate primary infection, secondary reactivation, or the presence of latent virus. These viruses may be reactivated during infection due to other pathogens, including agents not detected with the ME Panel such as *Mycobacterium tuberculosis*. The results should be interpreted together with other clinical and laboratory information.
- Viral shedding of VZV into the CSF may occur in cases of zoster due to reactivation. The detection of VZV in the CSF may not be the cause for CNS disease in these cases.
- False negative results may occur when the concentration of organism(s) in the specimen is below the limit of detection for the test.

RECOMMENDATION:

The new Encephalitis/Meningitis PCR test is recommended for all patients with encephalitis and for those with viral meningitis of unknown origin in order to better target antiviral treatment, as well as for the identification of bacterial CNS pathogens in patients who received antibiotic therapy prior to CSF collection that may lead to negative cultures. The rapid diagnosis of a viral etiology may allow early discontinuation of antimicrobial therapy.

Results for this assay are generated by simultaneously performing several PCRs in a contained, automated procedure. Separation of the various targets (viral, bacterial and fungal) is not supported and as such, they cannot be requested independently.

References:

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5. Miller CS et al. Asymptomatic shedding of herpes simplex virus (HSV) in the oral cavity. Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology. Vol. 105, Issue 1, 43-50.

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