

## Viral encephalitis (HSV, CMV, and VZV)

Several studies have shown that in patients with confirmed *Herpes simplex* virus (HSV) encephalitis, culture of cerebrospinal fluid (CSF) is usually negative since CSF rarely contains viable organisms. Therefore the sensitivity of CSF culture method varies from 0-4%. With the advent of the polymerase chain reaction (PCR) method, the detection of HSV encephalitis has been much improved with the sensitivity ranging from 75-100%. Because PCR has proven to be a much more sensitive test, the microbiology laboratory will automatically use PCR instead of culture for HSV from CSF specimens. Cytomegalovirus (CMV) and *Varicella zoster* virus (VZV) are also Herpes viruses, the culture of which, from CSF also suffers from lack of sensitivity. So requests for detection of CMV and VZV will be converted to PCR for the same reason.

The exception to the very low sensitivity of CSF culture for HSV is when CNS disease is due to primary, not reactivated, HSV infection. Most adult and childhood HSV encephalitis (>95%) is reactivation. In contrast, perinatally or neonatally acquired HSV, or meningitis at any age associated with primary genital HSV can have more frequent (up to 24%) positive cultures. In the neonate or infant less than 6 months old, ideally both PCR and culture of CSF for HSV should be obtained.

The approximate cost of PCR testing for HSV, CMV, or VZV is \$ 160.

**The detection of HSV, CMV or VZV from CSF specimens will be converted to the PCR method, except for infants less than 6 months old. In these cases PCR and culture will be performed. For optimum detection of HSV, CMV or VZV; 0.5 ml. of unspun CSF is needed for PCR and an additional 1.0 ml. of unspun CSF is needed for culture.**

In spite of the vastly increased sensitivity of the PCR test, false negatives can occur. A negative PCR test does not rule out Herpes virus infection. In a patient with Herpes virus infection, the test may be negative due to PCR reaction inhibitors or due to the presence of Herpes virus DNA in concentrations below the level of detection by the assay. The diagnosis of CNS Herpes virus infection should not rely solely upon the results of a PCR assay. The result should be considered in conjunction with clinical presentation and

### **MIS ORDERING HINTS:**

**Select specimen matrix for CSF tests and then select PCR testing. MIS will jump to another screen. Select virus suspected. There is a reminder to order rapid viral culture if patient is less than 6 mo. old.**

### REFERENCES:

Jackson AC, Acute viral infections, current opinion, *Neurology*, 8:170-4, 1995.

Lakeman FD, Whitley RJ and NIAID Collaborative Antiviral Study Group, Diagnosis of *Herpes simplex* encephalitis, *J Infect Dis*, 171: 857-863, 1995.

Wolf DG, Spector S, Diagnosis of human cytomegalovirus central nervous system disease in AIDS patients by DNA amplification from cerebrospinal fluid, *J Infect Dis*, 166: 1412-15, 1992.

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