LAB NEWS

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Clinical Virology Laboratory Newsletter

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For Viral Pathogens in CSF and Stool: Order PCR, not Culture

For over 50 years, cell culture has been the gold standard method for viral diagnostics (1), but is increasingly being supplanted by polymerase chain reaction (PCR) due to PCR's speed and sensitivity (2). For some specimen types, cell culture yields particularly poor results. Either the amount of virus present is too low, or the viral pathogens found in those samples do not grow well or at all in routine cultures, or the sample type is toxic to cell cultures. These samples include blood, CSF and stool. Results obtained by PCR for these samples far surpass culture results. For blood, PCR replaced viral culture years ago.

Culture results for CSF and stool: A review of the past 2½ years of virus isolation data in our laboratory has revealed **positive rates of 0% for CSF and 1.5% for stool samples**. For the stool isolates, the viral pathogens recovered in culture were also detected by PCR or DFA from the same sample or from another sample within hours of sample receipt in the lab, compared to days for a positive viral culture.

Discontinuation of viral culture for CSF and stool samples: Consequently beginning **July 1, 2015, viral culture will no longer be offered for CSF and stool samples**. Tests that will continue to be available for viral diagnosis in CSF and stool are listed in the Table below. Culture will still be performed if ordered on respiratory and tissue samples, body fluids and swabs for HSV.

Viruses diagnosed by testing CSF	**Test**	**Clinical**
HSV	HSV PCR	Encephalitis or meningitis
VZV	VZV PCR	Encephalitis or meningitis. Note: Can have positive CSF PCR in uncomplicated herpes zoster
Enterovirus (>100 types)	Enterovirus RT-PCR	Meningitis, rarely encephalitis or flaccid paralysis[a]
Parechovirus (16 types)	Parechovirus RT-PCR	Meningitis
EBV	EBV PCR	EBV-associated CNS lymphoma; rarely encephalitis or meningitis in primary infection (infectious mono)
CMV	CMV PCR	Rare, severely immunocompromised patient with systemic CMV
JCV	JCV PCR	Progressive multifocal leukoencephalopathy (PML) in compromised hosts
West Nile[b]	IgM and IgG antibodies[b]; WNV PCR in compromised hosts	Meningitis, encephalitis, flaccid paralysis
LCMV[b]	IgM and IgG antibodies[b]	Meningitis upon exposure to rodent excrement
Viruses diagnosed by testing stool		
Norovirus	Norovirus RT-PCR	Acute self limited diarrhea, all ages, more in winter
Adenovirus	Adenovirus PCR	Acute self limited diarrhea with enteric adenoviruses; respiratory adenovirus pathogens also found in stool with or without diarrhea
Rotavirus	Rotavirus ELISA	Acute self limited diarrhea in infants; controlled by vaccination
Enterovirus	Enterovirus RT-PCR	High titer in stool but often without diarrhea; may need to test stool in EV-related CNS diseases e.g. EV71[a]

a, Enterovirus D-68 can be detected in NP or throat samples, but not in CSF or stool; EV71 may be in throat, stool and not CSF.
b, Testing for CSF IgM and IgG antibodies to other arboviruses or to LCMV is sent out to a reference lab. PCR is not available.

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References

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2. Saiki R, Scharf, S, Faloona F, Mullis K, Horn, G, Erlich H, Arnheim N. (1985). Enzymatic amplification of beta-globin genomic sequences and restriction site analysis for diagnosis of sickle cell anemia. *Science* 230: 1350–1354