

BioFire Meningitis/Encephalitis (ME) Pathway

The goal of rapid diagnostics is to swiftly and safely de-escalate empiric therapy

Detects 14 pathogens (see bottom right), requiring 0.2mL of cerebrospinal fluid (CSF)

Optimal turnaround time ≈ 1 hour

Always prioritize CSF volume for traditional Gram stain and culture!

NOT validated for

- post-neurosurgical patients nor patients with an indwelling device (e.g., shunts)
 - e.g., does not detect *Staphylococcus*, *Pseudomonas*, etc.
- patients having received antibiotics prior to lumbar puncture
 - can identify a pathogen in this setting but sensitivity data is lacking

Does CSF from the patient with suspected meningitis/encephalitis have

> 10 nucleated cells/ μ L in cerebrospinal fluid (CSF)

Yes

No

Approve but remain aware:

- Only the 14 pathogens on the panel are detected!
- If HSV encephalitis suspected based on radiographic appearance
 - continue acyclovir IV even if panel negative
 - repeat test with specific HSV 1/2 PCR if suspicion is high
- Consult ID if concern for CNS infection despite negative testing

Infectious Diseases or Emergency Department can override criteria for any 1 of the following

- HIV infection
- Immunosuppressant medication (including steroid, rejection or recent chemotherapy)
- Aplastic anemia
- Primary immunodeficiency

Considerations

Bacteria

- 97.5% percent positive agreement (PPA)
- does not detect non-encapsulated *E. coli* nor *N. meningitidis*
- does not detect mycobacterium, syphilis, tick-borne disease, etc.

Virus

- 90.1% PPA
- cannot differentiate active vs latent infection
- does not detect West Nile virus (order WNV IgM on CSF if suspected)
- HHV6 detection requires clinical correlation
 - detection can reflect chromosomally integrated virus

Fungus (only *Cryptococcus*)

- 92.3% PPA relative to cryptococcal smear/culture
- but only 52% PPA relative to cryptococcal antigen!
 - should not supplant CSF cryptococcal Ag testing if suspected

Pathogens Detected

Bacteria	Virus	Fungus
<i>Escherichia coli</i> K1	<i>Cytomegalovirus</i> (CMV)	<i>Cryptococcus neoformans/gattii</i>
<i>Haemophilus influenza</i>	<i>Enterovirus</i>	
<i>Listeria monocytogenes</i>	<i>Herpes simplex virus 1</i> (HSV1)	
<i>Neisseria meningitidis</i>	<i>Herpes simplex virus 2</i> (HSV2)	
<i>Streptococcus agalactiae</i>	<i>Human herpesvirus 6</i> (HHV6)	
<i>Streptococcus pneumoniae</i>	<i>Human parechovirus</i>	
	<i>Varicella zoster virus</i> (VZV)	