

Xpert™ EV

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*The only molecular in vitro diagnostic
Enteroviral meningitis test.*



defining *on-demand* molecular diagnostics.

 **Cepheid®**
Bring answers to life.

Xpert™ EV: The only molecular *in vitro* diagnostic enteroviral meningitis test

A powerful solution is now available for fast detection of enteroviral meningitis — Cepheid's Xpert™ EV. Designed to significantly enhance patient management, results from Xpert EV (available in about 2.5 hours) provide critical answers when they matter most. Today, waiting 2–15 days for culture results is no longer your only option. Coupled with the simplicity of Cepheid's GeneXpert® System, on-demand EV results can be available 24 hours a day, 365 days a year.

problem:

Enteroviruses are the most common cause of meningitis in the US, resulting in an estimated 30,000 to 50,000 hospitalizations per year. Most cases of meningitis are caused by infectious agents, primarily bacteria and viruses. Bacterial meningitis is generally more severe and potentially more life threatening. The viral form usually self-resolves within 7–10 days and accounts for the majority of cases overall. Currently, when a patient presents with meningitis-like symptoms, a spinal tap is performed and the cerebral spinal fluid is cultured to determine the etiology. Patients are often treated empirically with antibiotics, and possibly antiviral drugs, until bacteria and viral

cultures become available in two to three days. Isolation of EV, from CSF, requires 2–3 days or longer — and results are rarely rapid enough to affect patient management.

solution:

Introducing Cepheid's Xpert™ EV, the only molecular *in vitro* diagnostic test that delivers results in about 2.5 hours. When Xpert EV results are used in conjunction with standard laboratory results (for CSF Gram stain, CSF bacterial culture, CSF glucose, CSF blood glucose ratio, CSF total protein concentration, and CSF leukocyte count) physicians can confidently identify patients with EV and manage them appropriately instead of just treating symptoms.

Xpert: in action

impact:

The impact of Cepheid's Xpert EV is substantial: identifying those patients with Enterovirus and helping to rule out bacterial meningitis quickly allows for appropriate management of patients. Timely answers provide assurance to patients and their families to reduce anxiety.

integrated:

The GeneXpert® is the only system to combine sample preparation with real time PCR amplification and detection for fully integrated and automated nucleic acid analysis. The system purifies, concentrates, detects, and identifies targeted nucleic acid sequences in about 2.5 hours.

flexible:

The GeneXpert System's unique random access capability enables users to perform from one to 16 molecular tests concurrently. And because runs can be started at different times, multiple operators can easily use the GeneXpert System simultaneously. With the GeneXpert System, the days of inefficient batch processing are finally over. Specimens can now be processed on demand — 24 hours a day, 365 days a year.

Xpert: by design

easy to use:

The GeneXpert System requires minimal hands-on time. Users simply insert the biological sample for testing in a self-contained cartridge and the GeneXpert System does the rest.



Sensitive and Specific:

Provide the best patient management decisions.

Table 1A: Prospective clinical samples evaluated against "Clinical Diagnosis"

		Clinical Diagnosis	
		+	-
GeneXpert®	+	26	3
	-	1	103
Totals		27	106

Sensitivity:
96.3%, 95%
CI 81-99.9%

Specificity:
97.2%, 95%
CI 91.9-99.4%

Table 1B: Banked prospectively collected clinical samples evaluated against "Clinical Diagnosis"

		Clinical Diagnosis	
		+	-
GeneXpert®	+	23	3
	-	0	96
Totals		23	99

Sensitivity:
100%, 95%
CI 85.2-100%

Specificity:
97%, 95%
CI 91.4-99.4%

Reproducible:

Confidence and consistency in your results.

Table 2: Summary of reproducibility results

Specimen ID	Total Agreement — Ct Results					Total % Agreement
	Day 1	Day 2	Day 3	Day 4	All Days	
Negative	20/20	18/18 ^A	20/20	20/20	78/78	100%
CA9 2X LOD	4/5 ^B	5/5	4/5 ^B	5/5	18/20	90%
CA9 4X LOD	5/5	5/5	5/5	4/4 ^C	19/19	100%
EV70 2X LOD	5/5	5/5	5/5 ^D	5/5	20/20	100%
EV70 4X LOD	5/5	5/5	5/5	5/5	20/20	100%
Number of Instruments Used	10	11	10	10	31	
Number of Modules Used	40	41	41	40	121	

^A Total runs = 21,
2 - no result, 1 - invalid

^B Total runs = 5,
1 - negative instead of positive result

^C Total runs = 5, 1 - invalid
^D Total runs = 6, 1 - no result

Two representative whole virus subtypes (i.e., Coxsackievirus CVA9 and Enterovirus EV70) were spiked into human negative CSF to create simulated specimens at both 2 x LoD and 4 x LoD. Negative samples were tested 20 times while positive samples at the different concentrations 5 times per day. Of the total samples tested, there were two samples with "Invalid" and three samples with "No Result" by instrument software control definitions. Of the 157 reportable results, 155 were correctly classified.

Comprehensive:

Complete coverage of significant serotypes.

Table 3: Enterovirus serotypes detected by the Xpert™ EV Assay:

Species	Serotypes
A	Coxsackie A2-A8, A10, A12, A14, A16, EV71
B	Coxsackie A9, B1-B6, Echo 1-7, 9, 11-21, 24-27, 29-33, EV69
C*	Coxsackie A11, A13, A15, A17-22, A24
D	EV68, EV70
Poliovirus	Poliovirus 1-3

*Coxsackie A1 not available for testing

CAUTION: The results obtained with the Xpert EV assay should be used only as an adjunct to clinical observation and other information available to the physician. Positive Xpert EV results do not rule out other causes of meningitis, including bacteria, mycobacteria, other viruses (e.g. herpes family viruses, arboviruses, mumps virus, etc.) and fungi.

The Xpert™ EV advantage: **Simplicity**

- Fully automated process reduces handling time to just minutes
- Random access for flexibility and workflow optimization
- Rapid results to improve patient management
- Fully integrated reagent and instrument system for accuracy and reproducibility

1. Dispense Binding Reagent into port 1

2. Dispense Wash Reagent into port 2

3. Dispense Elution Reagent into port 3

4. Add 140µl of Lysis Reagent into port 4S

5. Add 140µl of Sample into port 4S



Total hands-on time = 5 minutes



6. Insert cartridge and start assay

Ordering Information

Xpert™ EV Catalog No. GXEV-100N-10
(10 cartridges with reagents)

References:

1. Viral (Aseptic) Meningitis. Centers for Disease Control and Prevention: Respiratory and Enteric Viruses Branch. http://www.cdc.gov/ncidod/dvrd/revb/enterovirus/viral_meningitis.htm (15 October 2004).
2. HA. Viral meningitis. *Semin Neurol.* 2000; 20(3): 277-92.
3. Romero JR, Rotbart HA. Enteroviruses. In: Murray PR, Baron EJ, eds. *Manual of Clinical Microbiology*. 8th edition. Washington, DC: American Society for Microbiology, 2003: 1427-1438.
4. Robinson CC, Willis M, Meagher A, et al. Impact of rapid polymerase chain reaction results on management of pediatric patients with enteroviral meningitis. *Pediatric Infectious Disease Journal.* 2002; 21: 283-6.
5. Cost Savings Through Rapid Diagnosis of Enteroviral Menengitis. *Pediatric Infectious Disease Journal.* 2004
6. C. Ramers, G. Billman, M Hartin, S. Ho, M. Sawyer. Impact of a Diagnostic Cerebrospinal Fluid Enterovirus Polymerase Chain Reaction Test on Patient Management. *IAMA.* 2000; 283, 20

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