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## Published In/Presented At

Taveras, J. Villalobos, T. (2018, October 3rd). *The Impact of Multiplex PCR Panel in the Diagnosis of Meningitis in Children*. Poster Presented at: IDweek, San Francisco, California.

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# The Impact of Multiplex PCR Panel in the Diagnosis of Meningitis in Children

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## BACKGROUND

- Cerebrospinal fluid (CSF) culture is the gold standard for diagnosis of bacterial meningitis, but results can take 48–72 hours.
- Patients remain hospitalized and receive antimicrobial therapy while awaiting results of CSF cultures.
- BioFire FilmArray™ Meningitis/Encephalitis panel (MEP) tests CSF for 14 bacterial, viral and fungal pathogens with turnaround time of 1 hour.
- The objective of the study was to compare the results of MEP to bacterial CSF cultures and potential impact on length of stay and antimicrobial use.

## METHODS

- Retrospective review of data from MEP processed by Health Network Laboratories.
- Children 0–18 years of age from Feb. 1, 2016 to Dec. 31, 2017 at Lehigh Valley Children's Hospital.

## RESULTS

### DISTRIBUTION OF PATHOGENS IN POSITIVE MEP

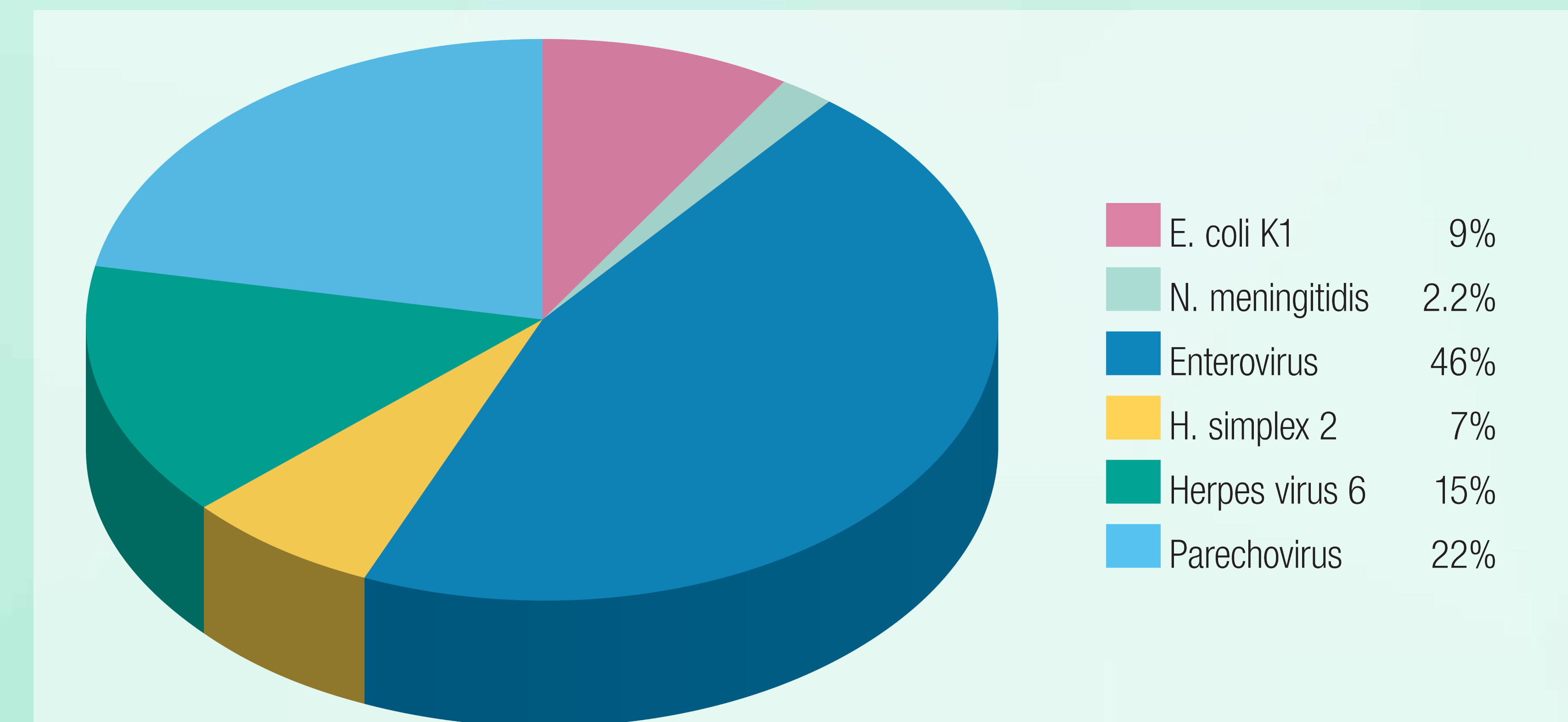


Figure 1. Distribution of pathogens in positive MEP.

| Turn around Time (hours)         | MEP | CSF Culture |
|----------------------------------|-----|-------------|
| Average TAT for all samples      | 6.9 | 48.8        |
| Max TAT for all samples          | 46  | 80          |
| Min TAT for all samples          | 4   | 20          |
| Average TAT for Positive samples | 6.2 | 48.2        |
| Average TAT for Negative samples | 7.1 | 48.9        |

Table 1. Turnaround time in hours for MEP and CSF cultures.

### AVERAGE LENGTH OF STAY (LOS)

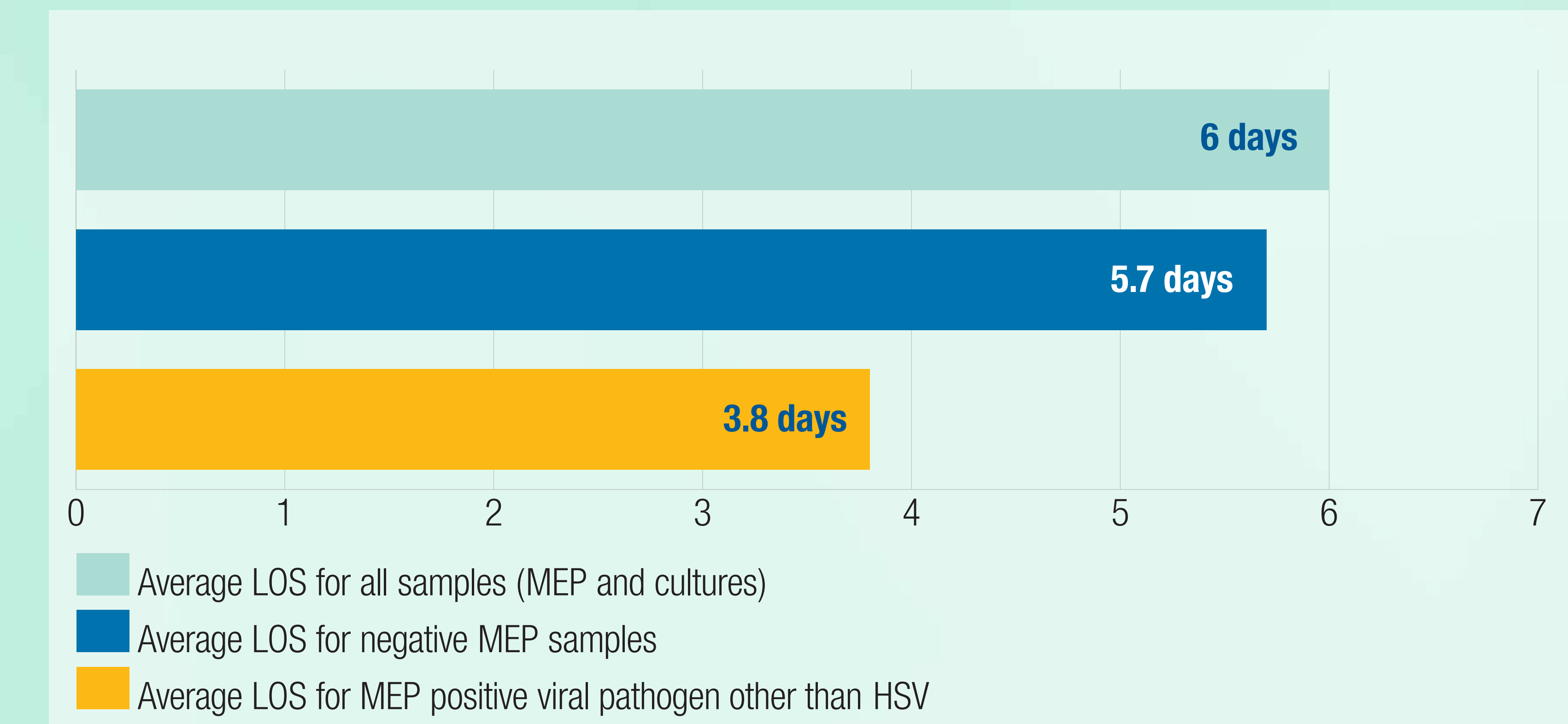


Figure 2. Comparison of average length of stay for all samples, including MEP and cultures, with average length of stay for patients with positive MEP for viral pathogens other than HSV.

| Acyclovir Doses Received in Patients with Presumed HSV Infection |                 |                     |
|--|-----------------|---------------------|
|  | No. of patients | Avg. doses received |
| Total Patients receiving Acyclovir                               | 58              | 6.3                 |
| Patients with Positive MEP for HSV                               | 3               | 64                  |
| Patients with Negative MEP                                       | 37              | 3.1                 |
| Patients with Positive MEP other than HSV                        | 18              | 1.4                 |

Table 2. Acyclovir doses received in patients with presumed HSV infection.

## CONCLUSIONS

- There was 100% concordance between MEP and CSF culture for E. coli meningitis.
- The increased sensitivity of MEP may play a role in the management of partially treated meningitis.
- The use of the BioFire MEP may be helpful in decreasing the average LOS in patients where a viral etiology other than HSV is identified.
- Early identification of a pathogen other than HSV may decrease the number of acyclovir doses received.

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