1 mg/kg/day, tapered based on clinical and radiological response plus oral fluconazole. Montreal cognitive assessments (MOCA) scores at baseline and 1 month were the primary endpoints and CSF parameters including WBC, glucose, HLA DR4+ CD4 and CD8 cells and cytokines were also determined at baseline and after 1 week of solumedrol. Paired nonparametric t-tests were conducted using GraphPad Prism 7.0.

Results. All patients demonstrated clinical improvement despite 7 being initiated at the point of stupor and 6 having received ventriculoperitoneal shunts without clinical response. MOCA scores at 1 month showed significant improvement ($P = 0.002$), accompanied by significant improvements in CSF: serum glucose ratios, CSF WBC, protein and HLADR4 positive T cells 1 week after receiving corticosteroids ($P < 0.02$). Patients with hearing or visual deficits exhibited clinical improvement. CSF cultures remained negative.

Conclusion. Our findings in this small observational cohort of refractory non-HIV CM with PIIRS demonstrated significant clinical benefit of high dose adjunctive pulse-taper corticosteroids. The study also demonstrates the utility of physiology-based immunophenotyping to guide therapy in neuroinflammation associated with infectious diseases.

Disclosures. **All Authors:** No reported Disclosures.

1821. Evaluation of Cerebrospinal Fluid White Blood Cell Count Criteria for Use of the BioFire® FilmArray® Meningitis/Encephalitis Panel in Immunocompetent Patients

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Background. In 2016, our academic medical center implemented the BioFire® FilmArray® Meningitis/Encephalitis Panel (MEP), which detects 14 viral, bacterial, and fungal pathogens. Institutional guidelines recommended the test be used in nonimmunocompromised patients age ≥2 years only if the cerebrospinal fluid (CSF) white blood cell (WBC) count was >10 cells/mm^3.

Methods. We reviewed all MEP performed at our institution over 2 years (January 1, 2017 to December 31, 2018). We collected CSF WBC count, protein, and glucose; MEP results; CSF culture results; and demographics. We excluded children age <2 years, immunocompromised patients, those without a CSF WBC count, and duplicate tests during the same illness.

Results. Of 453 patients, 311 met inclusion criteria. The median age was 51, 51% male. Median CSF indices: WBC/mm^3 = 4, protein = 57 mg/dL, glucose = 66 mg/dL. MEP positivity rate = 12% (37/311): viruses (29/37), bacteria (7/37), and fungi (1/37). Positive bacterial/fungal MEP results compared with CSF culture are summarized in Table 1. No clinically significant discordant negative MEP results occurred compared with CSF culture, cryptococcal antigen, or other viral PCR testing. Of the 311 patients, 184 (59%) had ≤10 CSF WBC/mm^3. Of these, 4 had positive MEP results: 1 enterovirus, 1 human herpes virus 6 (HHV-6) and 2 varicella zoster virus (VZV). The HHV-6 was judged clinically insignificant. The 2 VZV cases had concomitant shingles and were already on acyclovir. No clinically significant MEP results occurred in 110/311 (35%) patients with ≤ 2 CSF WBC/mm^3.

Conclusion. In nonimmunocompromised patients, age ≥ 2, with ≤ 10 CSF WBC/mm^3 on lumbar puncture, positive MEP results were rare and the clinical significance of the 4 positives was debatable. A hard-stop restriction in this setting could have reduced overall use by up to 59% and resulted in significant cost savings. Lower CSF WBC/mm^3 cut-offs could be considered and still improve MEP utilization.

Bacterial and Fungal MEP results compared to culture		
MEP result	# MEP positive	Culture Positive
S. pneumoniae	4	1/4
H. influenzae	1	1/1
S. agalactiae	1	0/1
N. meningitidis	1	0/1
C. neoformans/gatti	1	1/1

Disclosures. **All Authors:** No reported Disclosures.

1823. Incidence of Meningoencephalitis in the Absence of CSF Pleocytosis

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Background. Cerebrospinal fluid (CSF) pleocytosis, defined here as ≥5 white blood cells (WBC)/high power field (HPF) suggests inflammation of brain parenchyma /meninges or both. However, the absence of pleocytosis does not rule out meningoencephalitis. The frequency with which infectious targets are identified in the absence of CSF pleocytosis is not well known. Traditional diagnostic methods based on culture and single target polymerase chain reaction (PCR) assay were inadequate to answer this question. However, the availability of multiplex (PCR) panels opens up the opportunity.

Methods. Starting June of 2016 Akron children's hospital adopted the Biofire® Meningitis encephalitis panel (MEP). The panel is run routinely on all CSF specimens obtained from patients presenting with a clinical picture consistent with

meningoencephalitis irrespective of their CSF biochemistry and cell count Results. We retrospectively collected laboratory data for all the MEP positive patients. The data were filtered based on CSF WBC count, pathogens identified as well as by patient age.

Results. A total of 133 positive results were identified from June 2016 to March 2019. Due to unclear significance, 22 positive Human herpes virus (HHV) 6 results were excluded, One VZV positive result was also excluded (Figure 1). Of the remaining 110 positives, 29% had CSF WBC count < 5/HPF. Parecho and Enterovirus were the most common. Three isolates were positive for Herpes simplex 1 (HSV 1) and one for Herpes simplex 2 (HSV 2). *Haemophilus influenzae* was detected in one patient (Figure 2).

Conclusion. Our observations suggest that viral meningoencephalitis may occur frequently in the absence of CSF pleocytosis. Bacterial meningitis seems less likely. Several centers have a policy to restrict multiplex PCR panel testing based on CSF WBC cut-offs, citing increased costs. However, this approach may lead to missed diagnosis. As a direct result of this additional investigations and/or treatment may be pursued leading to increased overall costs as well as exposing the patient to potential harm. Additionally making a diagnosis could lend itself to monitoring outcomes—an area where there is paucity of high-quality data.

Figure 1

Positive CSF isolates on FilmArray with <5 WBC/HPF – 32/110

Isolate identified	Number of positive samples	Age range of patients
Parecho virus positive isolates	16	5 days – 3 months
Enterovirus positive isolates	11	12 days – 18 months
HSV 1	3	5 days – 17 years
HSV 2	1	2 months
Haemophilus influenzae	1	1 month

Figure 2
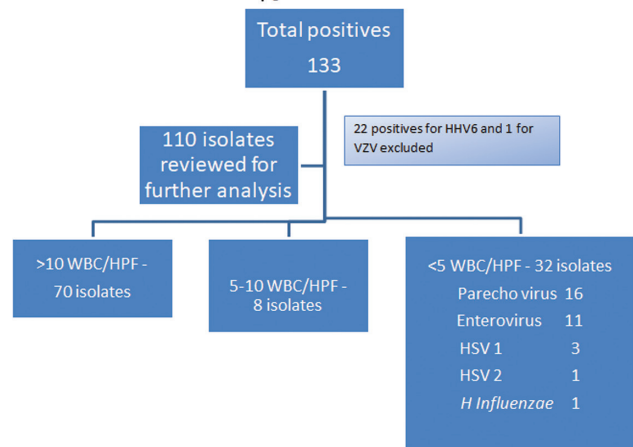
Disclosures. **All Authors:** No reported Disclosures.

1824. Herpes Simplex Encephalitis: Outcomes from a 10-Year Retrospective Single-Center Case Series

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Background. Herpes simplex virus (HSV) is the most common cause of infectious encephalitis in the United States. While early treatment with acyclovir has improved acute management, long-term morbidity and mortality remain high and warrant further characterization.

Methods. We retrospectively identified adult patients (≥18 years) with HSE admitted to the Cleveland Clinic Main Campus and affiliated regional hospitals from April 2006 to June 2016. HSE diagnosis was concordant with Infectious Disease Society of America Encephalitis Guidelines. HSE diagnosis was confirmed in that HSV-1 DNA was detected in cerebrospinal fluid (CSF) by polymerase chain reaction (PCR) assay for all patients included in this study. Patients for which HSV-2 was detected in the CSF were excluded to avoid inclusion of HSV meningitis. Clinical information was collected in a REDCap database and analyzed by descriptive statistics. Patients were indexed at the date of admission, and Kaplan–Meier analysis was used to estimate overall survival.

Results. We identified 32 patients with confirmed HSE. The median patient age was 62 years (interquartile range [IQR] 45–72). All patients received treatment with intravenous (IV) acyclovir, with a median treatment duration of 24 days (IQR 19–30). The median time from initial symptom onset to IV acyclovir treatment was 5 days (IQR 3–8). Three patients (9%) died during the hospitalization course, 16 (50%) were discharged to a nursing facility, 11 (35%) returned home, and two (6%) transitioned to an acute care facility (Figure 1). Within three months of discharge, 15 (47%) patients were readmitted, six (19%) of which readmitted for HSE relapse. The overall survival rate at one month was 84% and 74% at 12 months (Figure 2). At outpatient follow-up, cognitive deficits were self-reported by 19 (66%) patients, followed in frequency by motor (31%) and sensory deficits (7%).

Conclusion. Despite appropriate treatment with IV acyclovir, HSE survivors frequently experienced severe morbidities after initial hospitalization, including HSE relapse, discharge to long-term care facilities, and neurocognitive impairment. Risk of death was highest within one month of admission. Further investigation is needed to optimize treatment of HSE to improve mortality and to reduce permanent neurologic deficits.

Table 1.*	
Number of confirmed HSE cases	32
Demographics	
Age at diagnosis (years)	62 (45-72)
Male	16 (50%)
Treatment	
Received intravenous acyclovir	32 (100%)
Time from symptom onset to IV acyclovir treatment (days)	5 (3-8)
Duration of IV acyclovir (days)	24 (19-30)
Length of admission (days)	12 (7-20)
Readmission	
All-cause 3-month readmission	15 (47%)
Patients readmitted with HSE relapse	6 (19%)
Discharge disposition after initial admission	
Home	11 (35%)
Acute care facility	2 (6%)
Long-term care facility	16 (50%)
Death during hospitalization	3 (9%)
Discharged patients with lasting neurologic deficits	29
Cognitive	19 (66%)
Motor	9 (31%)
Sensory	2 (7%)
*Continuous variables presented as median and interquartile range.	

Discharge Disposition by Age

[Survival curve]

Overall survival (months) from HSE admission date
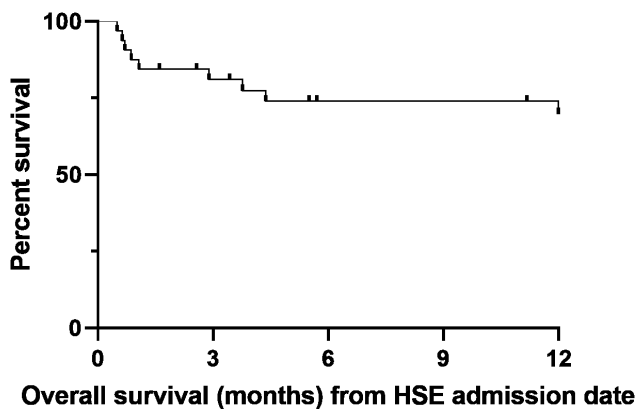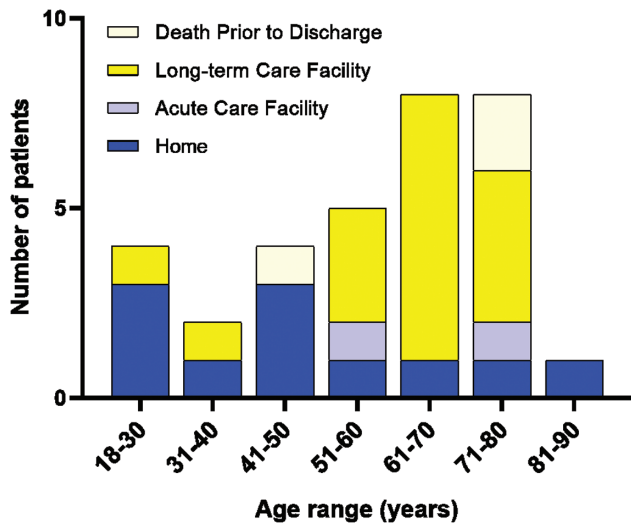
1825. Optimizing β-lactam Therapy in Surgical Intensive Care Unit Patients Using Therapeutic Drug Monitoring

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Background. Therapeutic drug monitoring (TDM) is a powerful tool to optimize antibiotic exposure. It seldom has been used for β-lactams (BLs). We present our BL data in patients admitted to the surgical intensive care unit (SICU).

Methods. This retrospective study included SICU patients at UF Health (2016 and 2018) who received BL therapy and had TDM. Data collected included demographics, APACHE scores, platelet count, serum creatinine (Scr), infection source, cultures/susceptibilities, BL regimens, and plasma concentrations. Clinical cure was defined as resolution of infection-related symptoms at the end of therapy. Microbiologic eradication was defined as eradication of causative organism from the primary source out to 30 days after therapy. Pharmacokinetic and statistical analyses were performed on Phoenix v8.0 and JMP Pro v14.

Results. A total of 127 patients were included. Table 1 shows the baseline characteristics. The median age was 55 years, and weight was 83 kg. Eighty-three (65%) were male. *P. aeruginosa* was the most common isolated bacteria ($n = 38$). Lung was the most common source of infection ($n = 50$). Table 2 summarizes the median (IQR) doses, infusion times, calculated free trough concentrations (fCmin) of common BLs, and the reported minimum inhibitory concentrations (MICs). Calculated median time above the MIC (fT > MIC) for 66 (52%) patients was 100%. A total of 99 (79%) patients had clinical cure and 67 (61%) patients had microbiologic eradication. For efficacy, the Cmin/MIC ratio predicted the microbiologic eradication in wound infections only ($n = 15$, OR 1.09 [95% CI 1.01–1.24]). Using stepwise regression, 1-unit increase fT > MIC and APACHE score was associated with 0.84 decrease ($P = 0.03$) and 0.62 increase ($P = 0.004$) in days of therapy, respectively. For safety, Figure 2 shows the increase in Scr vs. BL free area under the concentration–time curve from time zero to end of the dosing interval (fAUC$_{0\text{-tau}}$). Cefepime fAUC$_{0\text{-tau}}$ predicted neurotoxicity (OR per 20 unit increase 1.08 [95% CI: 1.01–1.18]).

Conclusion. In SICU patients, increase in fT > MIC was associated with shorter treatment duration, and fAUC$_{0\text{-tau}}$ increase was associated with an increase in Scr and incidence of neurotoxicity. TDM is warranted in this population to optimize therapy.

Drug	N	Daily dose, grams	Infusion time, hr	fCmin, mcg/mL	MIC, mg/L
Cefepime	87	6 (4-6)	0.5 (0.5-4)	18.9 (11.4-38.31)	2 (1-8)
Meropenem	20	3 (2-6)	0.5 (0.5-0.5)	11.5 (7.8-16.9)	0.75 (0.25-4)
Piperacillin	18	13.5 (13.5-18)	1.75 (0.5-4)	31.6 (7.4-61.6)	12 (4-32)

Characteristic	Median (IQR) or n (%)
Age, years	55 (40-69)
Male	83 (65%)
Weight, kg	83 (66-108)
CrCl, ml/min	87 (44-132)
APACHE II	18 (12-22)
Sources of infection, n	
Abdominal	34
Lung	50
Wound	24
Duration of therapy, days	12 (7-17)