Figure 1. Overall pneumonia panel usage by location pre- and post-intervention

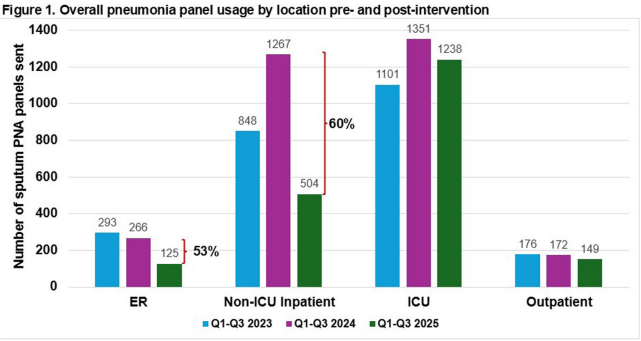
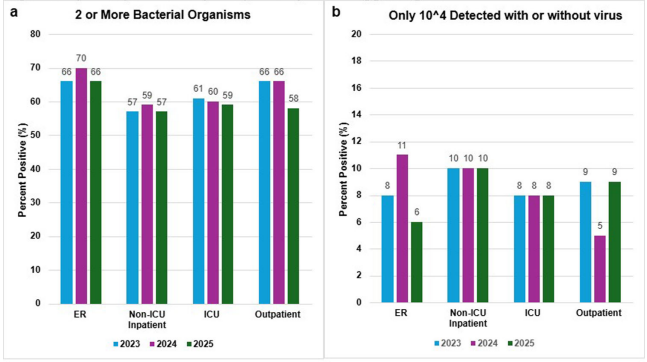



Figure 2. Sputum pneumonia panel positivity rates suggesting colonization or contamination




outpatient, which are areas not targeted by the intervention. The positivity rate was consistent over the three years (70-75%). Most sputum PCRs detected multiple bacterial organisms (57-70%, Figure 2a) and 5-11% of samples detected bacteria at a quantity of only 10^4, with or without viral co-infection (Figure 2b). After reviewing post-implementation quarter 1 2025 data, broad Gram-negative coverage was removed as a testing criterion since it was selected frequently (32%) but not accurately (10% accuracy). **Conclusion:** Implementation of a clinical decision support tool in Epic led to more appropriate diagnostic stewardship of the multiplex pneumonia PCR, improving care and reducing costs. Future interventions will target improving stewardship in the ICU.

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**Presentation Type:**
Poster Presentation
**Subject Category:** Diagnostic Stewardship
**Evaluating meningitis/encephalitis PCR panel performance**‡

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**Introduction:** The BioFire® FilmArray® meningitis/encephalitispanel can be a helpful test for early diagnosis of community acquired central nervous system infection. However, excessive ordering can lead to patient harm, increased healthcare costs, and excessive environmental impact. Despite a diagnostic stewardship algorithm in place at our institution, ME panels are frequently nondiagnostic, prompting inquiry into whether our diagnostic stewardship algorithm could be improved and if a ME panel ordering decision rule could improve test utility. Objective: Review ME panels performed over a one month period and evaluate for adherence to our institution's diagnostic stewardship pathway. **Methods:** We performed a retrospectivechart review of ME panels performed on adult patients over a one month time period at our institutionfor order indication,progress note clinical indication, other cerebrospinal fluid (CSF) test results, ME panel result, and patient outcome. Adherence to our current microbiology lab diagnostic stewardship algorithm and clinical utility were evaluated. The current algorithm calls for ME panels to be performed only on CSF collected via lumbar puncture (LP) with CSF total nucleated cells (TNC) <5, low glucose (<40 mg/dL), or abnormal protein (<15 mg/dL or <45 mg/dL) in non-neutropenic adults. Our electronic medical record (EMR) also provides hard stops if order indication for ME panels include "Evaluate for ventriculoperitoneal shunt infection" or "Evaluate for brain mass/abcess." An "other" option was made available to prompt an infectious disease consult to discuss clinical indication for the test. **Results:** Twenty-three ME panels were performed on adult inpatients and outpatients at our healthcare system over the month reviewed. All 23 ME panels resulted as normal for all 14 pathogens. Eleven out of 23 ME panels met clinical indication outlined in our microbiology lab's diagnostic stewardship algorithm. Ten out of 23 were ordered for meningitis in an immunocompromised host, although none of the patients had WBC <1 or ANC <0.5. Five out of 10 panels were ordered on immunocompromised individuals who did not were not appear immunocompromised upon chart review. Two out of six ME panels were run for community acquired meningitis despite completely normal CSF parameters. **Conclusion:** There is a discrepancy between our institution's diagnostic stewardship algorithm indications for for ME panels and actual ME panel ordering and completion. There is also a high rate of negative ME panel test results which may indicate test overuse. Re-evaluation of our ME panel algorithm and the utility of a clinical decision rule are warranted.

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**Presentation Type:**
Poster Presentation
**Subject Category:** Dialysis
**Identifying Resilient Systems in Outpatient Hemodialysis Using Machine Learning**‡

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**Background:** Resilient healthcare systems prevent, absorb, and learn from stressors. Identifying resilient performance in healthcare systems can be challenging due to complex underlying processes and associated outcomes. This study aimed to identify resilient performance in US outpatient hemodialysis (HD) facilities during the COVID-19 pandemic by characterizing associated operational factors and classifying longitudinal patterns in bloodstream infections (BSI) rates using machine learning. **Methods:** This study used longitudinal BSI data reported to National Healthcare Safety Network (NHSN) by outpatient HD facilities during pre-pandemic (April 1, 2018–April 30, 2019) and pandemic (April 1, 2021–April 30, 2023) periods. For each period, facilities were classified into distinct patterns based on facility-level BSI rates (cases per 100 patient months) using k-means clustering for longitudinal data (KmL), an unsupervised machine-learning method. CMS Dialysis Facility data provided key facility characteristics and NHSN Annual Dialysis Facility Surveys provided use of Core Interventions for Dialysis BSI Prevention. Facility resilience was operationalized as classification in a lower BSI rate cluster during the pandemic period. Associations between KmL classification during the pandemic and facility operational factors were assessed using multivariable logistic regression. **Result:** Of 7084 outpatient HD facilities, 4907 (69%) reported BSIs to NHSN during both periods and linked to CMS data. KmL grouped facilities into two clusters for each period. During the pandemic, a lower-rate cluster (n=4132, 84%) and a higher rate cluster (n=775, 16%) had mean BSI rates of 0.19 and 0.76 per 100 patient-months, respectively. Both clusters reported strong implementation of Core Interventions; however, the higher-rate cluster had increased odds of implementing ≤64% of interventions. In the multivariable model, facilities in the

‡The abstract titles in this supplement have been corrected since original publication. A notice detailing the changes has been published at https://doi.org/10.1017/ash.2026.10802.



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higher-rate pandemic cluster were associated with being in the higher-rate pre-pandemic cluster, structural factors (non-profit ownership, non-chain facility status, having <20 dialysis stations), processes (increased central vascular catheter use, lower use of antiseptic-impregnated catheter end caps, rarely administering antibiotics before obtaining blood cultures for suspected BSIs), and geography (Northeast or Midwest US location, rurality). **Conclusion:** Using machine learning, two distinct BSI rate trajectories emerged before and during the COVID-19 pandemic, with key operational differences between facility groups. Facilities demonstrating lower and stable BSI trajectories during pandemic could be interpreted as exhibiting more resilient performance under system stressors. This approach can inform resilient performance across other patient safety processes, healthcare settings, and system stressors. Understanding structures and processes associated with patient safety outcomes during disruption can support public health prioritization and targeted interventions to strengthen healthcare system resilience.

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**Presentation Type:**
Poster Presentation
**Subject Category:** Disinfection/Sterilization

**Evaluation of Disinfection Methods and Effects for Handwashing Sinks Contaminated with Pseudomonas aeruginosa**‡

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China

**Objective:** To address the recurrent contamination of handwashing sinks with Pseudomonas aeruginosa (PA) in the Pediatric Intensive Care Unit (PICU), evaluate the PA elimination efficacy of different disinfectants and disinfection methods, and optimize disinfection strategies to prevent PA colonization and transmission, thereby reducing the risk of healthcare-associated infections (HAIs)? **Methods:** Nine handwashing sinks in the PICU (August–December 2024) were selected, meeting the criteria of three consecutive positive PA detections, usage frequency ≥20 times/day, and no prior special disinfection interventions (excluding those with recent pipe replacement or structural damage). They were divided into three groups (3 sinks per group). Three disinfectants were prepared: 500 mg/L chlorine-containing disinfectant, 0.5% benzalkonium chloride disinfectant, and 75% ethanol stock solution. Three disinfection methods were applied: rinsing method (disinfectant flushing for 1 minute twice daily at 5 L/min), soaking method (full coverage soaking with disinfectant for 30 minutes every morning followed by flushing), and slow-release soaking method (slow injection of disinfectant into the trap for 30-minute soaking, 10-minute standing, then flushing at 2 L/min). Samples were collected from the overflow outlet, drain, and other sites before disinfection, 1 minute after disinfection, and 24 hours after disinfection. Colony counting was performed using the pour plate method, PA was identified via the VITEK 2 system and mass spectrometry, and statistical analysis was conducted with SPSS 26.0 (α=0.05). **Results:** 75% ethanol showed the best immediate effect (colony count <0.1 CFU/cm² and PA detection rate 0% 1 minute after disinfection, P<0.001) but PA reoccurred at 24 hours. Chlorine-containing disinfectant performed stably (colony count reduced to 0.2 CFU/cm², PA detection rate 0%, P=0.002) with the optimal 24-hour bacteriostatic effect. Benzalkonium chloride had weak efficacy (colony count reduced to 5.0 CFU/cm², PA detection rate 33.3%). The soaking method and slow-release soaking method were significantly more effective in biofilm removal than the rinsing method (e.g., no PA detected with chlorine-containing disinfectant soaking method and <10% recurrence rate at 24 hours, compared to 66.7% PA positivity rate with the rinsing method at 24 hours), and the soaking method was more operable. **Conclusion:** For PA-contaminated handwashing sinks in the PICU, the chlorine-containing disinfectant soaking method has the best comprehensive effect, combining strong bactericidal power, good long-term bacteriostatic effect, and high operability. It is suitable as a routine disinfection scheme to prevent PA colonization in the

Table 1. Method One (Rinsing Method) Disinfection Effect

| Sampling Time | 75% Ethanol | | 0.5% Benzalkonium Chloride | | Chlorine-Containing Disinfectant | |
|---|---|---|---|---|---|---|
| | Colony Count (CFU/ml) | A | Colony Count (CFU/ml) | A | Colony Count (CFU/ml) | PA* |
| Before Disinfection | >100 | | >200 | | >100 | + |
| 1 Minute After Disinfection | <0.1 | | 0.6 | | 0.2 | + |
| 24 Hours After Disinfection | 60 | | >100 | | 1.5 | + |

*: + Positive for PA, - Negative for PA

Table 2. Method II (Soaking Method) Disinfection Effect

| Sampling Time | 75% Ethanol | | 0.5% Benzalkonium Chloride | | Chlorine-Containing Disinfectant | |
|---|---|---|---|---|---|---|
| | Colony Count (CFU/ml) | A | Colony Count (CFU/ml) | A | Colony Count (CFU/ml) | PA* |
| Before Disinfection | >100 | | >100 | | >100 | + |
| 1 Minute After Disinfection | <0.1 | | 5 | | <0.1 | - |
| 24 Hours After Disinfection | 10 | | >100 | | 5 | - |

*: + Positive for PA, - Negative for PA

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Table 3. Method Three (Slow-Release Soaking Method) Disinfection Effect

| Sampling Time | 75% Ethanol | | 0.5% Benzalkonium Chloride | | Chlorine-Containing Disinfectant | |
|---|---|---|---|---|---|---|
| | Colony Count (CFU/ml) | A | Colony Count (CFU/ml) | A | Colony Count (CFU/ml) | PA* |
| Before Disinfection | >100 | | >100 | | >100 | + |
| 1 Minute After Disinfection | <0.1 | | 0.6 | | 0.2 | - |
| 24 Hours After Disinfection | <0.1 | | 5 | | 5 | - |

*: + Positive for PA, - Negative for PA



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