**Presentation Type:**
Poster Presentation - Poster Presentation
**Subject Category:** COVID-19
**Care innovations and health disparities: An exploration of COVID-19 outcomes in inpatient and hospital-at-home care settings**
Jennifer Priem; Lisa Krinner; Stephanie Murphy; Sveta Monahan and Colleen Hole

**Background:** Hospital at home (HaH) programs have been a critical resource for providing inpatient care to acutely ill patients throughout the COVID-19 pandemic. Given that this innovative care delivery model relies on technology and environmental concerns, questions have been raised about the effectiveness of HaH for vulnerable groups. However, evidence is extremely limited regarding equity issues in the HaH context. Thus, we explored COVID-19 outcomes within vulnerable groups. **Methods:** We conducted a matched, retrospective study of 116 acutely ill patients with COVID-19, aged ≥18 years, who presented to an AH emergency department (ED) and were admitted for inpatient care. Treatment patients were admitted to AH HaH between July 15 and September 31, 2020, and control patients were hospitalized between May 8 and June 25, 2020. Patients were matched based on oxygen requirement and DS CRB-65 (DEFINE) score. Race or ethnicity and area deprivation index (ADI) were chosen as predictors of health disparities. The ADI incorporates 17 indicators of poverty, educational attainment, and housing quality at the census tract level. Outcomes included 30-day (from discharge) severe illness or death composite, IP readmission, and ED visit. **Results:** The frequency of 30-day severe illness or death and ED visits were equivalent between the groups (n = 11; ED n = 5); the proportion of severe illness was higher for White patients in AH-HaH (n = 9 vs n = 5), and for Hispanic patients treated in the hospital (n = 5 vs n = 0; Fig. 1). There were no 30-day inpatient readmissions in the AH-HaH group, but 8 readmissions occurred with inpatients. The distribution of severe illness among the ADI quintiles varied. For traditional inpatients, disease progression was limited to ADI Q3–5 (Q3 = 3, Q4 = 6, Q5 = 2); for AH-HaH patients, disease progression was not influenced by ADI. The effect of ADI on 30-day ED readmission was nonsignificant. **Conclusions:** Although exploratory in nature, the results suggest that HaH may help combat sources of health disparities that have dominated the pandemic. Although inpatient care resulted in inpatient readmissions, mainly among Black and Hispanic patients, AH-HaH stays were not associated with any inpatient readmissions. The equivalent distribution among ADI quintiles of patients who became severely ill within 30 days of their AH-HaH stay suggests that HaH may be able to leverage innovation to reach vulnerable populations and reduce the impact of factors that contribute to inequity.
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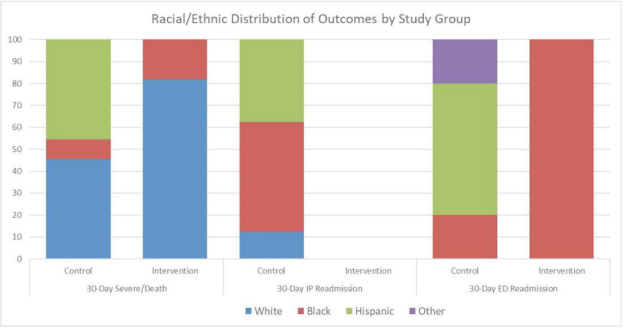


**Fig. 1.**

**Presentation Type:**
Poster Presentation - Poster Presentation
**Subject Category:** Decolonization Strategies
**Indwelling medical devices and skin microorganisms on ICU patients bathed with chlorhexidine gluconate**
Yoona Rhee; Mary Hayden; Michael Schoeny; Christine Fukuda; Pamela B. Bell; Andrew Simms; Beverly Sha; Carlos Santos and Michael Lin

**Background:** Bathing ICU patients with chlorhexidine gluconate (CHG) decreases bloodstream infections and multidrug-resistant organism transmission. The efficacy of CHG bathing on skin microorganism reduction may be influenced by patient-level clinical factors. We assessed the impact of clinical factors on the recovery of microorganisms from the skin of patients admitted to an ICU who were receiving routine CHG bathing. **Methods:** We analyzed data obtained from 6 single-day point-prevalence surveys of adult ICU patients between January and October 2018 at 1 medical ICU, in the context of a CHG bathing quality initiative. Demographics and covariates were collected at the bedside and by chart review. Skin swabs were collected from neck, axilla, and inguinal regions and were plated to selective and nonselective media. Standard microbiologic methods were used for species identification and susceptibilities. Multivariable models included patients who received a CHG bath and accounted for clustering of body sites within patients. **Results:** Across all time points, 144 patients participated, yielding 429 skin swab samples. Mean age was 57 years (SD, 17); 49% were male; 44% had a central venous catheter; and 15% had a tracheostomy Also, 140 patients (97%) had >1 CHG bath prior to skin swab collection, with a median of 9 hours since their last CHG bath (IQR, 6–13 hours). Gram-positive bacteria were more commonly recovered than gram-negative or *Candida* spp across all skin sites (Table 1). Variation by body site was detected only for gram-positive bacteria, with recovery more common from the neck compared to axilla or groin sites. On multivariate logistic regression (Table 2), presence of central venous catheter was associated with lower odds of gram-positive bacteria recovery

Table 1. Microorganism Detection on Skin of Medical Intensive Care Unit Patients

| | Body Site | | | |
|---|---|---|---|---|
| Organism Type (n, %) | Neck (n=143) | Axilla (n=143) | Inguinal (n=143) | Patients (n=144) |
| Gram-positive bacteria | 115 (80) | 85 (59) | 76 (53) | 128 (89) |
| Gram-negative bacteria | 10 (7) | 8 (6) | 10 (7) | 22 (15) |
| *Candida* species | 16 (11) | 12 (8) | 23 (16) | 39 (27) |

Table 2. Adjusted Risk Factors for Microorganism Detection on Skin of Intensive Care Unit Patients (N=140) Bathed with Chlorhexidine Gluconate

| Risk Factor | Gram-Positive Bacteria OR (95% CI) | Gram-Negative Bacteria OR (95% CI) | *Candida* Species OR (95% CI) |
|---|---|---|---|
| Central venous catheter | **0.37 (0.20-0.67)** | 1.18 (0.42-3.31) | 1.50 (0.70-3.21) |
| Tracheostomy | 2.37 (0.92-6.15) | **4.64 (1.34-16.1)** | 2.42 (0.82-7.18) |
| Mechanical ventilation | 0.74 (0.36-1.50) | 0.96 (0.27-3.42) | 0.89 (0.35-2.25) |

Bolded values indicate significance with $P \leq 0.05$. Model accounted for clustering of body sites (N=417) within patients, adjusting for age, sex, obesity (BMI ≥ 30 kg/m$^2$), body site (neck, axilla, groin), ICU day of swab, hospital day of swab, and hours from last CHG bath.
Abbreviations: CHG, chlorhexidine gluconate; CI, confidence interval; ICU, intensive care unit; OR, odds ratio.

among those who received a CHG bath. Presence of tracheostomy was associated with a significantly higher odds of gram-negative bacteria detection on skin. No clinical factors were independently associated with recovery of *Candida* spp. **Conclusions:** Central venous catheter presence was associated with lower odds of gram-positive bacteria detection on skin, suggesting the possibility of higher quality CHG bathing among such patients. Tracheostomy presence was associated with greater odds of gram-negative bacteria detection, suggesting that it may be a potential reservoir for skin contamination or colonization. Indwelling medical devices may influence CHG bathing effectiveness in reducing microorganism burden on skin.

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**Subject Category:** Diagnostic/Microbiology
**Assessment of the effects of rapid diagnostic biofire blood culture identification panel in hospitalized patients**
Amy Cohen; Thomas Erwes; Dora Wiskirchen and Jessica Abrantes-Figueiredo

**Background:** Bloodstream infections (BSIs) have life-threatening consequences; they contribute to increased global morbidity and mortality, particularly in critically ill patients. Consequently, early implementation of effective antimicrobial therapy is crucial. Microbiology stewardship efforts, such as rapid diagnostic testing, streamline healthcare resources while also optimizing clinical outcomes. These outcomes include decreased mortality, fewer days of hospitalization, and more efficient time to appropriate anti-infective regimens. Biofire Blood Culture Identification (BCID) is a 2-stage multiplexed PCR system yielding multiple pathogen etiologies, as well as antimicrobial resistance genes. Results are published ~60 minutes after a blood-culture Gram stain turns positive. The purpose of this study was to assess the clinical impact of rapid diagnostic PCR testing, which was introduced at Saint Francis Hospital in March 2020. **Methods:** We conducted a single-center, retrospective observational chart review before and after implementation of Biofire BCID, surveying all positive cultures from December 2019 through June 2020. Medical records were more thoroughly reviewed for patients who met study inclusion criteria. The primary outcome of interest, time to appropriate antimicrobial therapy, included both days to targeted therapy in the setting of a probable pathogen, and days to antibiotic discontinuation in the case of a likely contaminant (nonpathogenic normal skin flora introduced into culture at the time of collection or processing). Secondary outcomes included in-hospital mortality (death during hospitalization), and inpatient length of stay (LOS). Wilcoxon rank-sum tests were used for primary outcomes and Fisher exact tests were used for secondary outcomes. **Results:** Among 643 patients with positive blood cultures, 410 (63.8%) met the criteria. In the study, 220 patients before the intervention and 190 patients after the intervention were reviewed. The difference in mean days to targeted therapy with a probable pathogen and days to antibiotic discontinuation with a likely contaminant were both observed at a significance level (3.62 vs 1.79, P Inpatient mortality rates were higher prior to launching Biofire BCID, but they were not statistically significant (15.5% vs 14.2 %; $P = .782$). The average LOS before and after implementation was 12.6 days (range, 2–92 days), and 10 days (range, 2–68 days), respectively. This parameter was also not statistically significant ($P = .597$). **Conclusions:** We detected a trend toward a significant reduction in time to appropriate antimicrobial therapy following the launch of Biofire BCID. Incorporation of molecular rapid diagnostics for BSI evaluation should be the standard of care in hospital settings.

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**Subject Category:** Diagnostic/Microbiology
**The impact of GenMark Dx ePlex blood-culture identification on the treatment and outcomes of gram-positive bacteremia**
B. Matthew Kiszla; Todd McCarty; Cameron White; Derek Moates; Sixto LealJr. and Rachael Lee

**Background:** In the treatment of bloodstream infections, the identification of the causal pathogen, and the evaluation of its susceptibility to antibiotics, often serve as the rate-limiting steps of the patient's hospital stay. The GenMark Dx ePlex blood culture identification gram-positive (BCID-GP) panel aims to alleviate this bottleneck, thereby reducing the risk of severe complications and the spread of resistance, using electrowetting technology to detect the most common causes of GP bacteremia (20 targets) and 4 antimicrobial resistance (AMR) genes. We hypothesized that implementation of the ePlex BCID-GP panel would improve antimicrobial choice and de-escalation where appropriate. **Methods:** A mixed blinded and unblinded study was conducted to assess the effect of the BCID-GP panel on the outcomes and antibiotic stewardship of GP bacteremic patients before ePlex results were made clinically available (before implementation, N = 73) and once they accompanied the standard-of-care work-up (after implementation, N = 82). Differences in time to different benchmarks between the 2 modalities and the effect on patient outcomes were analyzed using null-hypothesis significance testing. **Results:** During the study, the BCID-GP panel identified 63 (42%) *Staphylococcus epidermidis* isolates, 31 (21%) *Staphylococcus* spp, 24 (16%) *Staphylococcus aureus* isolates, 12 (8%) *Streptococcus* spp, and 7 (5%) *Enterococcus* spp, and results were similar in the pre- and postimplementation groups ($P = .13$). The panel saved an average of 32.0 ± 24.2 hours in pathogen identification over standard-of-care methods, with no statistical difference made by the clinical availability of the data (Table 1). In terms of susceptibility testing, the panel saved an average of 70.1 ± 58.2 hours but with less unity between the 2 cohorts ($P = .005$). Of the 66 cases with follow-up, identification via ePlex indicated an escalation of therapy in 20 (30%) and a narrowing of coverage in 31 (47%). In patients identified to have *Staphylococcus aureus,* BCID-GP could change antimicrobial therapy in 79%; the need for escalation of antibiotics was identified in 58% of cases. In patients with *Staphylococcus epidermidis* bacteremia, implementation of BCID-GP panel could have resulted in de-escalation of antimicrobial therapy in 67% of patients. The implementation of the BCID-GP panel was correlated with no significant change of in-hospital mortality ($P = .72$) but was correlated with a significantly decreased death-censored total length of stay (LOS) ($P < .001$) and LOS after culture ($P = .001$). **Conclusions:** Our study has demonstrated that nonculture identification of bacteria and susceptibility can result in major improvements in antimicrobial therapy in patients, particularly those with contaminants identified.

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Table 1. Patient Demographics and Outcomes of Implementing the ePlex BCID-GP Panel for Patients with Gram Positive Blood Cultures

| Outcome | Modality | Pre-implementation (N=73) | Post-implementation (N=82) | Total | P-value |
|---|---|---|---|---|---|
| Time from collection to identification—Mean ± SD (hours) | ePlex BCID-GP | 27.8 ± 8.8 | 30.2 ± 16.1 | 29.1 ± 13.2 | 0.98 |
| | MALDI-TOF | 61.0 ± 23.5 | 62.1 ± 33.2 | 61.6 ± 29.6 | 0.73 |
| Time saved in identification (hours) | | 32.6 ± 21.7 | 31.4 ± 26.4 | 32.0 ± 24.2 | 0.59 |
| Time from collection to susceptibility (hours) | SOC | 81.8 ± 19.4 | 114.4 ± 83.5 | 95.9 ± 58.8 | 0.011 |
| | ePlex BCID-GP | 61.0 ± 23.5 | 62.1 ± 33.2 | 61.6 ± 29.6 | 0.73 |
| Time saved in susceptibility (hours) | | 56.4 ± 18.9 | 88.0 ± 82.9 | 70.1 ± 58.2 | 0.005 |
| In-hospital mortality | | 16 (22) | 14 (17) | 30(20) | 0.72 |
| Total LOS (death censored, days) | | 31.0 ± 36.0 | 9.96 ± 9.24 | 20.0 ± 28.2 | <0.001 |
| LOS after culture (death censored, days) | | 20.7 ± 30.4 | 8.26 ± 9.17 | 14.4 ± 23.1 | 0.001 |