## 2007. Impact of Combining Rapid Diagnostics with an Interpretation Guide on Vancomycin Usage for Contaminant Blood Cultures Growing Coagulase-Negative Staphylococci (CoNS)

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*Background.* Contaminant blood cultures can lead to unnecessary antibiotic use, longer admissions and increased costs. Rapid diagnostics, like the BioFire® FilmArray® Blood Culture Identification (BCID) Panel, can potentially lessen these harms. BioFire BCID was implemented at VA Greater Los Angeles in 7/2017. When providers review BCID results, they are also directed to an interpretation guide developed by our antimicrobial stewardship program. This study aimed to determine the impact of BioFire BCID with this interpretation guide on unnecessary vancomycin use for contaminant blood cultures growing CoNS.

*Methods.* This was a retrospective cohort study on adult inpatients with contaminant blood cultures positive for CoNS. We evaluated cases before BCID (April 2016–July 2017) and after BCID (July 7/2017–December 2018) implementation. Cases with patients who died or were discharged prior to preliminary results, polymicrobial cultures, no empiric vancomycin use, or where vancomycin was indicated were excluded. We defined a "case" as anytime a provider concurrently ordered blood cultures and empiric antibiotics. Our primary outcome was the duration of unnecessary vancomycin. Secondary outcomes were time to discontinuation/modification of any empiric antibiotic, length of stay (LOS), LOS in ICU and 30-day mortality.

*Results.* A total of 99 cases were included (N = 45 pre-BCID; N = 54 post-BCID). Demographics between the 2 groups were largely similar except the post-BCID group had more patients with end-stage renal disease (ESRD) (14 vs. 4, P = 0.037) and more frequent infectious disease (ID) consultation (21 vs. 8, P = 0.027). The post-BCID group had shorter mean duration of unnecessary vancomycin (53.0 hours vs. 38.1 hours, P = 0.0029). After controlling for ESRD and ID involvement, the mean duration of unnecessary vancomycin was not significantly different between the 2 groups (P = 0.30 and P = 0.49, respectively). There was no difference in time to modification/discontinuation of any empiric antibiotic (44.6 hr vs. 35.0 hr, P = 0.36). There was no difference in mean LOS, mean LOS in ICU, or 30-day mortality.

*Conclusion.* Shorter duration of unnecessary vancomycin for CoNS bacteremia after BCID implementation and provision of an interpretation guide may have been driven in part by more frequent ID consultation.

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## 2008. Outcomes of Patients with Positive Procalcitonin Levels Who Do Not Receive Continued Antibiotics

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*Background.* Procalcitonin (PCT) is a biomarker used to direct continued use of antibiotic therapy in patients with sepsis and community-acquired pneumonia. There is a lack of data on outcomes of patients with a positive PCT who do not receive continued antibiotics. We compared outcomes in patients with positive PCT levels who received antibiotics <24 hours to those who received ≥ 24 hours.

*Methods.* A single-center, retrospective study to compare outcomes of adult patients with positive PCT (>0.25 μg/L) levels based on antibiotic duration. A report of hospitalized patients from January to June 2018 was generated and screened for inclusion criteria. Data collection included demographics, microbiologic data, Charlson Weighted Index of Comorbidity (CWIC), ICU admission, length-of-stay (LOS), and in-hospital mortality. Continuous and categorical variables were analyzed using Student's t-test and Chi-square, respectively.

*Results.* 443 of 998 patients met the inclusion criteria. 113 patients (25.5%) received <24 hours of antibiotics (Group 1) and 330 patients (74.5%) received ≥ 24 hours (Group 2). Group 1 had a higher CWIC, lower mean PCT and were less likely to have positive cultures (see table). Mean LOS was significantly different between the groups. ICU admission and mortality were not found to be different between the groups. While Group 1 had higher rates of noninfectious causes of mortality and Group 2 had higher rates of infectious, the differences were not significant. Among patients who died in-hospital, 47.6% vs. 63.2% had acute or chronic renal failure in Group 1 vs. Group 2, respectively.

*Conclusion.* Patients with elevated PCT levels are a heterogenous group. There was no overall difference in mortality between the two groups indicating that the interpretation of positive PCT results was overall appropriate in this study. Clinicians need to consider noninfectious causes of elevated PCT when evaluating patients.

| | Group 1 (n = 113) | Group 2 (n = 330) | p-value |
|---|---|---|---|
| Mean Age ± SD | 64.2 ± 15.0 | 65.4 ± 16.9 | 0.503 |
| Males, n (%) | 63 (55.8) | 166 (50.3) | 0.373 |
| Mean CWIC ± SD | 3.0 ± 2.6 | 2.4 ± 2.3 | **0.021** |
| Mean PCT ± SD | 2.8 ± 12.8 | 11.7 ± 35.6 | **0.004** |
| Positive Cultures, n (%) | 14 (12.4) | 132 (40.0) | **0.0001** |
| Blood | 5 (35.7) | 53 (40.2) | **0.003** |
| Urine | 6 (42.9) | 40 (30.3) | 0.062 |
| Sputum | 1 (7.1) | 19 (14.4) | 0.059 |
| Sterile site | 0 (0) | 6 (4.5) | 0.331 |
| Other sites | 2 (14.3) | 14 (10.6) | 0.356 |
| ICU Admission, n (%) | 33 (29.2) | 126 (37.9) | 0.109 |
| Mean LOS (days) ± SD | 5.8 ± 6.0 | 8.9 ± 7.4 | **<0.001** |
| In-Hospital Mortality, n (%) | 21 (18.6) | 38 (11.5) | 0.080 |
| Cause of Death | | | |
| Non-infectious | 17 (81.0) | 20 (52.6) | 0.061 |
| Infectious | 4 (19.0) | 18 (47.4) | 0.061 |

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## 2009. Evaluation of Time to Organism Identification and Pharmacist Impact on Antibiotic Prescribing through Utilization of MALDI-TOF at Two Community, Teaching Hospitals

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*Background.* In patients with bacteremia, delay in appropriate therapy is associated with higher morbidity and mortality. Matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) reduces the time to identification (ID) to approximately 30 minutes. Previously published studies show rapid diagnostics need to be coupled with antibiotic stewardship intervention for maximal benefit.

*Methods.* Retrospective, observational review at Cambridge and Everett Hospitals, two inpatient community, teaching hospitals that are part of Cambridge Health Alliance. The purpose is to evaluate the impact of MALDI-TOF by reviewing data in three phases: Microscan ID (January 1 to November 30, 2017), MALDI-TOF alone (December 1, 2017 to December 9, 2018), and MALDI-TOF coupled antimicrobial stewardship (December 10, 2018 to April 30, 2019). The laboratory batches all positive blood cultures to be run via MALDI-TOF mid-morning. In phase 3, a pharmacy resident is notified of the result via an automatic page. The resident determines appropriate empiric therapy using an algorithm developed by the Antimicrobial Stewardship Team and contacts the primary team. Data were collected via a laboratory report and chart review. The primary outcome is time to targeted antimicrobial therapy after ID. Secondary outcomes include time to ID, time to susceptibilities, duration of therapy for blood culture contaminants, and number of pharmacy interventions in phase 3.

*Results.* Preliminary data indicate mean time targeted antibiotic therapy was 41:45, 35:58, and 27:39 hours:minutes in phases 1, 2, and 3, respectively. Mean time to ID and final susceptibilities was also reduced in phases 2 and 3. The duration of therapy for blood culture contaminants decreased from 53:50 in phase 1 to 32:48 hours:minutes in phase 2. Pharmacy residents in phase 3 successfully implemented 47 total interventions, 24 (51%) after identification.

*Conclusion.* Implementation of MALDI-TOF with and without stewardship intervention successfully decreased time to targeted antibiotic therapy in two community hospitals. Future directions include adding an evening MALDI-TOF run and simplifying pharmacy resident standard operating procedure.

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## 2010. A Significant Reduction in Empiric Vancomycin Days of Therapy for Suspected MRSA Pneumonia in Adult Non-ICU Patients After Implementation of a Rapid MRSA Nasal PCR Test with Antimicrobial Stewardship Intervention

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*Background.* Methicillin-resistant *Staphylococcus aureus* (MRSA), when implicated in respiratory tract infections, can be associated with significant morbidity and mortality. The prevalence of severe MRSA pneumonia may be as high as 10%; however, recent evidence suggests that MRSA is much less prevalent as a cause of community-acquired pneumonia (CAP) among community-dwelling patients and may be as low as 0.1%. Nonspecific features of pneumonia in non-ICU patients (viral co-infection, multi-lobar infiltrates) often lead clinicians to cautiously initiate empiric anti-MRSA therapy. Recommendations of when to safely de-escalate empiric treatment prior to known respiratory cultures are not established. To decrease anti-MRSA therapy in non-ICU pneumonia patients with a low probability of MRSA pneumonia, we employed a nasal screening paired with antimicrobial stewardship intervention.

*Methods.* A retrospective, single-center, pre-post interventional study was conducted at Northwestern Memorial Hospital (NMH), in Chicago, IL, to assess the duration of empiric vancomycin for suspected MRSA pneumonia in non-ICU patients before (January 2019) and after (March 2019) the implementation of a rapid MRSA nasal PCR test. During the post-implementation period, an NMH Antimicrobial Stewardship (AS) member identified and assessed the daily (M-F) use of empiric vancomycin for pneumonia in non-ICU patients. When vancomycin use criteria were not met, the AS pharmacist requested the team order a BD MRSA Nasal PCR test (NPV: 97.2%) to classify patients as either possible MRSA pneumonia or unlikely MRSA pneumonia. Results of a negative MRSA Nasal PCR with an ongoing clinical disposition not suggestive of MRSA pneumonia prompted the AS pharmacist to recommend de-escalation of vancomycin.

*Results.* See table.

*Conclusion.* The use of a rapid MRSA nasal PCR test with active antimicrobial stewardship intervention significantly reduced the duration of empiric vancomycin in hospitalized non-ICU patients with suspected MRSA pneumonia.

| | Pre-intervention (January 2019) | Post-intervention (March 2019) | Difference mean days | *P*-value |
|---|---|---|---|---|
| N | 36 | 34 | | |
| Duration of empiric vancomycin mean [SD], days | 3.4 [3.4] | 1.8 [1.0] | -1.6 (95% CI: -2.8 to -0.40) | 0.0098 |

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**2011. Reaction of Clinicians to Positive Respiratory Viral Panels in Non-critically Ill Patients Without Bacterial Infection**

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*Background.* Respiratory viral panels (RVPs) can detect multiple viral pathogens and give clinicians diagnostic confidence to discontinue antibiotics. However, relatively little is known about how these tests influence antibiotic prescribing in hospital settings.

*Methods.* This was a 26-month retrospective chart review of patients with positive RVPs. Hospitalized adults receiving antibiotics at the time of the RVP were included. Exclusion criteria were: ICU care, solid-organ transplantation (SOT), positive RVP for influenza, positive bacterial cultures, and antibiotic administration for bacterial infection (e.g., cellulitis). A multivariate linear regression model was created to investigate associations with longer antibiotic use after a positive RVP.

*Results.* 1,346 patients were screened and 242 met inclusion criteria. Primary reasons for exclusion were SOT, ICU, and influenza diagnosis. Patients were a median age of 60.5 years [IQR 51,70] and 35.5% were men. The median length of stay (LOS) was 4 days [IQR 3.6]. 233 patients (6.3%) had chest radiology performed, of which 71 (30.4%) had possible pneumonia noted. 50 (20.7%) were immunocompromised (IC). 199 (82.2%) had a history of pulmonary disease, most commonly COPD. Rhinovirus was isolated in 156 patients (64.5%), followed by metapneumovirus (35, 14.9%) and RSV (32, 13.3%). Antibiotics were given for a median total of 3 days [IQR 3.6]; they were discontinued within 24 hours of the RVP result in 107 patients (44.2%).

*Conclusion.* In this population of patients with viral infection and no discernable bacterial infection, 44.2% of patients had antibiotics discontinued within 24 hours of RVP results. On multivariate linear regression analysis, younger age, longer LOS, and IC status were associated with longer antibiotic duration after a positive RVP. A comparison with patients with negative RVP results could reveal if the test prompted discontinuation.

Table. Factors evaluated for antibiotic duration after RVP result

| | | Univariate analysis | | Multivariate analysis | |
|---|---|---|---|---|---|
| | | Duration of antibiotics after RVP reported (days), median [IQR] | Wilcoxon Rank Sum p-value | Estimate | p-value |
| Gender | Male | 1 [0, 3] | 0.134 | -0.058 | 0.633 |
| | Female | 1 [0, 2] | | | |
| IC | IC | 1 [0, 2.5] | 0.210 | 0.230 | 0.038 |
| | Not IC | 1 [0, 3] | | | |
| Any pulmonary condition | Yes | 1 [0, 3] | 0.221 | 0.254 | 0.209 |
| | No | 1 [0, 3] | | | |
| Asthma | Yes | 1 [0, 2.25] | 0.168 | 0.030 | 0.834 |
| | No | 1 [0, 3] | | | |
| COPD | Yes | 1 [0, 2.25] | 0.785 | -0.034 | 0.813 |
| | No | 1 [0, 3] | | | |
| Heart failure | Yes | 0 [0, 2.5] | 0.096 | 0.197 | 0.175 |
| | No | 1 [0, 3] | | | |
| Positive CXR | Yes | 1 [0, 3] | 0.211 | -0.134 | 0.295 |
| | No | 1 [0, 3] | | | |
| Age | NA | NA | NA | -0.017 | 0.038 |
| LOS | NA | NA | NA | 0.355 | <0.001 |

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**2012. Trends in Microbiological Culture Collection Across Veterans Affairs Medical Centers and Community Living Centers, 2010 to 2017**

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*Background.* Microbiological cultures are critical in the diagnosis of infection, identification of pathogenic organisms, and tailoring antibiotic use. However, unnecessary collection of cultures, particularly from the urine, may lead to overuse of antibiotics. There have been no national studies to evaluate trends in the collection of cultures in acute and long-term care settings. Here we describe changes in the collection of cultures nationally across Veterans Affairs medical centers (VAMCs) and Community Living Centers (CLCs).

*Methods.* All positive and negative cultures collected from 2010 to 2017 among Veterans admitted to VAMCs or CLCs were included. Cultures were categorized by specimen source (urine, blood, skin and soft tissue, or lung). *Joinpoint* software was used for regression analyses of trends over time and to estimate annual average percent changes with 95% confidence intervals (CI).

*Results.* A total of 5,089,640 cultures from 158 VAMCS and 342,850 cultures from 146 CLCs were identified. The number of cultures collected for all culture types in VAMCs and CLCs decreased significantly. The number of cultures collected per admission decreased significantly by 5.5% annually among VAMCs (95% CI −7.0 to −4.0%) and by 8.4% annually among CLCs (95% CI −10.1 to −6.6%). The proportion of positive cultures decreased 1.6% annually among VAMCs (95% CI −2.3 to −0.9%) and remained stable among CLCs (-0.4% annually, 95% CI, −1.1 to 0.4%). The most common culture source among VAMCs was blood (36.2%), followed by urine (31.8%), and among CLCs was urine (56.9%), followed by blood (16.0%). Urine cultures decreased by 4.5% annually among VAMCs (95% CI −5.4 to −3.6%) and 7.0% annually among CLCs (95% CI −7.6 to −6.4%).

*Conclusion.* Our study demonstrates a significant reduction in the number of cultures collected over time. Positive cultures decreased significantly in VAMCs, possibly indicating fewer culture-positive infections.In both VAMCs and CLCs, decreases in cultures taken may represent an important reduction in the collection of unnecessary cultures nationally driven by increased awareness about over-testing and over-treatment of presumed infection, particularly urinary tract infections.

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**2013. Blood Culture Contamination in the Emergency Department: A Risk Factor Analysis**

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*Background.* Blood cultures (BCx) guide treatment for hospitalized patients, yet contaminated BCx lead to clinical uncertainty, impacting care. The Clinical and