Background. A negative nasal MRSA PCR test has a 98-99.6% sensitivity in confirming that MRSA is not the causative organism associated with pneumonia in hospitalized patients. Evidence supporting the clinical utility of nasal MRSA PCR testing in the Veteran patient population is limited, with no identified publications to date. The purpose of this project was to share outcomes associated with implementation of nasal MRSA PCR testing in the Veteran population to guide duration of vancomycin therapy.

Methods. This retrospective cohort quality initiative compared treatment of pneumonia that included vancomycin during a pre-Antimicrobial Stewardship Program (ASP) intervention phase (August 2013–February 2014) to an active ASP intervention phase (August 2017–March 2019). ASP intervention consisted of utilization of a negative nasal MRSA PCR as a rapid diagnostic test to support discontinuation of vancomycin prior to microbiologic culture results. Retrospective chart review evaluated vancomycin days of therapy (DOT), hospital length of stay (LOS), 30-day hospital readmission, and 30-day mortality. Patients admitted to the intensive care unit during the identified hospitalization were excluded.

Results. The average vancomycin DOT significantly declined by 1.08 days when comparing the pre-ASP intervention phase (N = 25) to the ASP intervention phase (N = 47) (3.6 vs. 2.52 days, respectively; P = 0.0088). Mean hospital LOS decreased by 1.5 days (6.04 vs. 4.54 days, respectively, P = 0.0885). There was no significant difference in 30-day hospital readmission rate (12% vs. 8.5%) or 30-day mortality rate (12% vs. 10%).

Conclusion. Vancomycin DOT was reduced by 30% (1.08 days) and hospital LOS was reduced by 24.8% (1.5 days) in patients with pneumonia during a Vet Affairs medical center’s utilization of negative nasal MRSA PCR testing to support vancomycin discontinuation. This project highlights the role of nasal MRSA PCR as a rapid diagnostic test to aid in diminishing empiric vancomycin usage and its associated toxicities.

Table 1. Clinical Outcomes in Pre-ASP vs. ASP Intervention Phases

|                      | Pre-ASP Intervention (N = 25) | ASP Intervention (N = 47) | P-value |
|----------------------|-------------------------------|---------------------------|---------|
| Vancomycin DOT, mean (range) | 3.6 (1–8 days)               | 2.52 (1–8 days)           | 0.0088  |
| Hospital LOS, average  | 6.04 days                     | 4.54 days                 |         |
| 30-day Readmission    | 12%                           | 8.5%                      |         |
| 30-day Mortality      | 12%                           | 10%                       |         |

Figure 1. Duration of Vancomycin Therapy for Treatment of Pneumonia, Before & During MRSA Nares PCR Utilization

Figure 2. PCT use in LRTI and associated LOS

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2004. Impact of Procalcitonin Roll-out Without Antimicrobial Stewardship Guidance in a Community Hospital Emergency Department

Alfredo J. Mena Lora, MD1; Samah Qasimieh, PharmD2; Eric Wemeler, PharmD1; Scott Borgetti, MD1; Naman Jhaveri, MD1; Richard Doyle, MD2; Martin Cortez, PharmD2; Susan C. Bleasdale, MD1;1University of Illinois at Chicago, Chicago, Illinois; 2Saint Anthony Hospital, Chicago, Illinois

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Background. Lower respiratory tract infections (LRTIs) are one of the most common infectious disease-related emergency department (ED) visits in the United States. The ID Society of America and the Agency for Healthcare Research and Quality support the use of procalcitonin (PCT) for antimicrobial stewardship (ASP) in LRTI. Though not widely available, awareness and access to PCT is rising. At our facility, PCT became available in February 2018. The aim of our study is to assess the impact of PCT at an urban community hospital and identify possible targets for ASP interventions.

Methods. Retrospective review of cases from February to August 2018. Cases from the ED were selected for review. Appropriateness of testing was assessed, defined as guideline-based use for cessation of antibiotics in uncomplicated LRTIs without critical illness or immunosuppression. Demographic variables and clinical characteristics, such as, diagnosis, antimicrobial use and PCT levels were obtained.

Results. PCT was ordered 268 times hospital-wide, of which 160 (60%) were in the ED. Ages ranged from 0–90, with an average of 47. Most cases were male (51%). Appropriate testing for LRTI occurred in 33 (29%) cases. Antimicrobials were used in 75% of cases with low (< 0.5) PCT levels (Figure 1). Length of stay (LOS) was higher in groups that received antimicrobials (Figure 2). Testing was not appropriate in 127 cases (71%), with upper respiratory (21%), soft-tissue (17%), genitourinary (15%) and abdominal (13%) infections as the most common reasons for testing. Other diagnosis included altered mental status and altered mental status. Cumulative cost of PCT testing was $24,000, of which $19,050 was not consistent with guidelines.

Conclusion. Clinicians routinely ordered PCT in the ED. Antimicrobials were used for LRTIs despite low PCT levels. This may have contributed to higher LOS and excess antimicrobial use. Unwarranted PCT testing had a cost of $19,050. As PCT becomes widely available in hospitals across the United States, education and decision support by ASP to clinicians may be needed to enhance guideline-appropriate evidence-based use of PCT. Targeted ASP interventions in the ED may have cost savings by reducing excess testing, length of stay and improving antimicrobial use.

2005. Successful Implementation of a Procalcitonin Algorithm Associated with Reduction in Antibiotic Days

John R. McCoury, PharmD1; Randolph V. Fugit, PharmD2; Mary T. Bessessen, MD3; 1VA Eastern Colorado Health Care System, Aurora, Colorado; 2Denver VA Medical Center, Aurora, Colorado; 3University of Colorado-Denver, Aurora, Colorado

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Background. Randomized controlled trials of procalcitonin (PCT)-based algorithms for antibacterial therapy have been shown to reduce antimicrobial use and improve survival. Translation of PCT algorithms to clinical settings has often been unsuccessful.

Methods. We implemented a PCT algorithm, supported by focus groups prior to introduction of the PCT test in April 2016 and clinician training on the PCT algorithm for testing and antimicrobial management after test roll-out. The standard PCT algorithm period (SPAP) was defined as October 1, 2017 to March 31, 2018. The antimicrobial stewardship team (AST) initiated an AST-supported PCT algorithm (ASPA) in August 2018. The AST prospectively evaluated patients admitted to ICU for sepsis and ordered PCT per algorithm if the primary medical team had not ordered them. The ASPA period was defined as October 1, 2018–March 31, 2019. The AST conducted concurrent chart review and feedback for all antibiotic orders during both periods, using PCT result when available. We compared patient characteristics and outcomes between the two periods. The primary outcome was adherence to the PCT algorithm, with subcomponents of appropriate PCT orders and antimicrobial discontinuation. Secondary outcomes were total antibiotic days, excess antibiotic days avoided, ICU and hospital length of stay (LOS), 30-day readmission and mortality. Continuous variables were analyzed with Student t-test. Categorical variables were analyzed with chi-square or Mann–Whitney test, as appropriate.

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Results. There were 35 cases in the SPAP cohort and 57 cases in the ASPA cohort. There were no differences in demographics or infection site (Table 1). Baseline PCT was ordered in 57% of the SPAP cohort and 90% of the ASPA cohort (P = 0.0006) (Table 2). Follow-up PCT was performed in 23% of SPAP and 76% of ASPA (P < 0.0001). Antibiotics were discontinued per algorithm in 2/35 (7%) in the SPAP cohort and 25/57 (44%) in the ASPA cohort (P < 0.0001). Total antibiotic days was 7 (IQR 4–10) in the SPAP cohort and 5 (IQR 2–7) in the ASPA cohort (P = 0.02). There was no significant difference in LOS, ICU LOS, 30-day readmission, or mortality (Table 4).

Conclusion. A PCT algorithm successfully implemented by an AST was associated with a significant decrease in total antibiotic days. There were no differences in mortality or LOS.

Patient Characteristics

| Variable                  | PSAP Cohort N=35 | ASPA Cohort N=57 | P     |
|--------------------------|------------------|------------------|-------|
| Age                      | 64.9             | 68.1             | 0.16  |
| Gender (% male)          | 94.3             | 91.2             |       |
| Treatment team (% Medicine) | 27/35 (77.1%)   | 47/57 (82.5%)   | 0.59  |
| Infection Site           |                  |                  |       |
| Lung                     | 25 (71.4%)       | 39 (63.4%)       | 0.8   |
| Abdominal                | 6 (17.1%)        | 8 (14.0%)        | 0.77  |
| Urinary Tract            | 3 (8.6%)         | 6 (10.5%)        | >0.99 |
| Skin and soft tissue or bone | 1 (2.9%)         | 1 (1.8%)         | >0.99 |
| Undifferentiated         | 0                | 3 (5.3%)         | 0.29  |
| Admission WBC            | 13.9             | 14.8             | 0.98  |
| Admission temperature    | 98.7             | 99.0             | 0.68  |
| Procalcitonin not performed | 15 (42.9%)      | 6 (10.5%)        | 0.0006|

PCT Order Adherence

| Variable                        | PSAP Cohort | ASPA Cohort | P     |
|---------------------------------|-------------|-------------|-------|
| Baseline PCT performed          | 20/35 (57.1%)| 51/57 (89.5%)| 0.0006|
| FU PCT performed                | 7/30 (23.3%) | 32/42 (76.2%) | <0.0001|
| Antibiotics discontinued per algorithm | 2/35 (7.4%) | 25/57 (43.9%) | <0.0001|

Baseline Procalcitonin Strata Among Patients Who Had a Baseline Procalcitonin Measured

| Procalcitonin stratum | N=20 PCT | N=31 PCT | P     |
|-----------------------|-----------|----------|-------|
| < 0.25                | 6 (30%)   | 23 (45.1%)| 0.29  |
| 0.25 < 0.5            | 3 (15.0%) | 10 (19.6%)| 0.74  |
| > 0.5                 | 11 (55%)  | 18 (35.3%)| 0.18  |

Outcomes

| Variable                        | PSAP Cohort | ASPA Cohort | P     |
|---------------------------------|-------------|-------------|-------|
| Mean Total Antibiotic Days      | 7 (4–10)    | 5 (2–7)     | 0.02  |
| Median Antibiotic Days Saved Median | 0 (0–3)   | 0 (0–5)  | 0.4   |
| Mean Antibiotic days Saved      | 1.6         | 2.3         |       |
| 30 day mortality                | 9/35 25.7%  | 16/57 28.1% | >0.99 |
| 30 day readmission              | 2/35 5.7%   | 4/57 7.0%  | >0.99 |

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2006. Evaluation of Rapid Blood Culture Identification with Antimicrobial Stewardship Treatment Recommendations at a Community Health System in Patients with Gram-negative Bacteremia: Adequacy, Adherence, and Outcomes Erin Deja, PharmD; Jeremy J. Frens, PharmD; Cone Health, Greensboro, North Carolina

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Background. Sepsis mortality is greatly affected by the timely receipt of appropriate antibiotics. FilmArray Blood Culture Identification (BCID) is used at Cone Health to identify organisms in blood cultures within one to 2 hours after growth detected. The Cone Health antimicrobial stewardship (AMS) team has created treatment recommendations for each organism and resistance mechanism identifiable by BCID. Results and antibiotic recommendations are communicated in real time to providers by clinical pharmacists. The purpose of this evaluation was to validate the adequacy of antibiotics recommended by the BCID treatment algorithm for Gram-negative rods (GNR); assess proper implementation of the BCID notification procedure; and evaluate its effect on AMS.

Methods. Patients with GNR BCID results in January and April 2018 were retrospectively identified. Information collected for each patient included: demographics, location, organism, admission antibiotics, pharmacist compliance with BCID procedure, recommendation acceptance rate, organism susceptibility, changes to antibiotics post-BCID and final cultures, extended-spectrum β-lactamase (ESBL) incidence, length of antibiotic therapy, and patient outcome.

Results. A total of 101 patients were evaluated. The BCID treatment algorithm recommended coverage 97% of identified organisms (Figures 1–4). Resistant isolates were ESBL producers. Pharmacist antibiotic recommendations matched the treatment algorithm 66% of the time. Providers accepted 90% of pharmacist recommendations. Twenty-two percent of antibiotics were not de-escalated after BCID results without identifiable reason.

Conclusion. The BCID treatment algorithm provided adequate coverage for nearly all identified organisms, except ESBLs. However, patients with ESBL organisms all survived to hospital discharge. Pharmacists are following the BCID protocol in a majority of cases. One-third of recommendations deviated from the algorithm but only 17% did not have documented reasoning. Providers are very receptive to pharmacist input, with only 8% of recommendations rejected without documented reasoning. Finally, nearly a quarter of empiric antibiotics were not de-escalated despite organism identification, which represents opportunity for improvement.

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