



## MRSA PCR

- Antimicrobial regimen for methicillin-resistant *Staphylococcus aureus* (MRSA) coverage with antibiotics such as vancomycin are recommended for empiric use in the treatment of suspected MRSA<sup>(1-2)</sup>
- Nasal MRSA Polymerase Chain Reaction (PCR) assay has shown high negative predictive value for MRSA pneumonia
- Currently, no data is available regarding the use of MRSA PCR to de-escalate empiric therapy in the ED

## Vancomycin

- Mechanism of Action:** Inhibits the cell wall synthesis of gram-positive bacteria, producing a bacterial static effect
- Previous Literature:** previous retrospective studies in the inpatient setting have demonstrated no difference in hospital mortality or decreased exposure to broad-spectrum antimicrobials (vancomycin) with MRSA PCR utilization for de-escalation of therapy<sup>(3-5)</sup>

## Clinical Implication

- Early utilization of MRSA PCR by pharmacists in the ED will lead to early de-escalation or avoidance of vancomycin in patients with suspected pneumonia and MRSA risk factors

## Methodology



### Design:

Single center, retrospective cohort study



### Groups:

**Control Group:** Historical cohort, no pharmacist MRSA PCR intervention and received IV vancomycin

**Intervention Group:** Pharmacist initiated MRSA PCR assay



### Inclusion Criteria:

- Patients presenting the Emergency Department between 8-1-2019 and 9-30-2020
- ≥ 18 years
- Radiographic diagnosis of pneumonia
- Patients with empiric vancomycin ordered



### Exclusion Criteria:

- Currently on chemotherapy for malignancy or with neutropenic fever
- Patients with lung transplant or cystic fibrosis
- Prior positive MRSA in a blood, sputum culture, or suspected MRSA infection elsewhere
- Patients with concomitant empiric agents with MRSA activity (e.g., linezolid, ceftaroline)



### Sample size:

38 patients (patient enrollment ongoing)

1

### Primary Endpoint:

- Number of patients who received only one dose of vancomycin prior to MRSA PCR result

2

### Secondary Endpoints:

- Number of patients in whom empiric vancomycin was avoided in the Emergency Department
- Number of patients who had positive MRSA sputum or blood culture despite negative MRSA PCR results
- Hospital length of stay and hospital mortality
- Need for vancomycin trough or random level measurement

## Conclusion

- Data collection is currently ongoing, and results presented are preliminary data
- More patients in the intervention group had initial dose of vancomycin avoided in ER thus reducing exposure to broad spectrum antibiotics
- More patients in the control group had vancomycin levels drawn

## Results

	Control (N=29)	Intervention (N=9)	P-Value
Age (yr), m (IQR)	70 (61-82)	83(65-87)	0.19
Sex (male), n (%)	15(51.7)	3(33.3)	0.33
History of tracheostomy, n (%)	4 (13.8)	1(11.1)	1.00
Hemodialysis at admission, n (%)	10 (34.5)	3(33.3)	1.00
Sepsis in the ED, n (%)	9 (31.0)	4 (44.4)	1.00
Septic Shock in the ED, n (%)	4(44.4)	2(50)	1.00
Indication for vancomycin, n (%)			
CAP	12 (8.5)	3 (60)	-
HCAP	1 (7.1)	1 (20)	-
HAP	0 (0)	1 (20)	-
VAP	1 (7.1)	0 (0)	0.27
<b>MRSA PCR ordered in the ER, n (%)</b>	<b>12 (41.4)</b>	<b>8 (88.9)</b>	<b>0.01</b>
<b>MRSA PCR turn around time, m (IQR)</b>	<b>129.5 (120-218)</b>	<b>146 (112-159)</b>	<b>0.3</b>
<b>Was vancomycin avoided in the ER, n (%)</b>	<b>25 (86.2)</b>	<b>4 (44.4)</b>	<b>.02</b>
Positive blood or sputum cultures for MRSA, n (%)	0	0	-
Vancomycin trough/random level drawn, n (%)	12 (41.4)	2 (22.2)	0.3
Hospital length of stay (days), m (IQR)	7 (3-12)	5 (4-6)	0.97
Death during admission, n (%)	6 (20.7)	1 (11.1)	0.52

### Author Contact Information

sabrina.najibi@aah.org  
Twitter: @NajibiSabrina

### Disclosure

Authors have nothing to disclose concerning possible financial or personal relationships with commercial entities.

### References:

- Metlay JP, et al. Am J Respir Crit Care Med 2019;200(7):e45-67
- Kalil AC, et al. Clin Infect Dis 2016;63(5):61-111
- Cowley MC, et al. Chest 2019;155(1):53-9
- Baby N, et al. Antimicrob Agents Chemother 2017;61(4):02432-16
- Dunaway, et al. International Journal of clinical pharmacy 2018;40:526-32

# Emergency Department Pharmacist Led Methicillin Resistant *Staphylococcus Aureus* Polymerase Chain Reaction Assay for Vancomycin in Pneumonia

Sabrina Najibi, PharmD Candidate, Yekaterina Antonishina, PharmD Candidate, Stephany Nuñez Cruz, PharmD, BCPS, Marc McDowell, PharmD, BCPS, Jaxson Burkins, PharmD, BCPS, Nadine Lomotan, PharmD, Lauren Stambolic, PharmD, Dharati Desai, PharmD, BCCCP

Advocate Christ Medical Center, Oak Lawn, IL

Utilize MRSA PCR assay by pharmacist in the ED for early de-escalation or avoidance of vancomycin in patients with suspected pneumonia and MRSA risk factors