

Comparison of Antibiotic Susceptibility in Hospitals versus Hospital-Based Emergency Departments

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Introduction

Antibiotic susceptibility varies by hospital location (inpatient versus emergency department (ED)) and by geographic location. Despite these differences, hospitals often have one antibiogram to determine empiric guidelines. The purpose of this study was to evaluate a large health system's bacterial sensitivity for key organisms in the inpatient versus the ED setting to determine if ED specific antibiograms are necessary based on region.

METHODS

- A health-system, consisting of primarily large general community hospitals across 20 U.S. states, evaluated 156 of their affiliated hospitals and hospital-based emergency departments (ED)
- These hospitals and hospital-based EDs were divided into regions based on geographic area and hospital volume for assessment (approximately 10-20 hospitals per region)
- One year of non-duplicative isolate susceptibility data was evaluated for antibiotic sensitivity for the following organisms
 - E. coli* urinary pathogens
 - P. aeruginosa*
 - S. pneumoniae*
- Inpatient and ED susceptibilities were then compared and classified based on susceptibility differences
 - Minimal 0-4, Moderate 5-10, Considerable > 10
 - Difference was calculated:
 - % Susceptible Inpatient - % Susceptible ED

DISCLOSURES

Mandelin Cooper, Joan Kramer, Elizabeth Hofammann, Hayley Burgess: nothing to disclose
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Results

Pathogen	Inpatient Isolates	ED Isolates	Total Isolates Evaluated
<i>E. coli</i> urine isolates	41,612	97,950	139,562
<i>S. pneumoniae</i>	1,565	1,474	3,309
<i>P. aeruginosa</i>	19,983	8,702	28,685

Classification of Susceptibility Differences	
Minimal	0-4
Moderate	5-10
Considerable	>10

- Negative Number:** Indicates that the inpatient isolates have LESS resistance than what is found in ED isolates
- Positive Number:** Indicates that the inpatient isolates have MORE resistance than what is found in the ED isolates

<i>E. coli</i> Urine Susceptibility Differences (Inpatient vs. ED)				
Region	Cefazolin	Ceftriaxone	Cipro	SMX/TMP
California + Nevada	8	6	11	2
Colorado + Central Kansas	2	0	3	-2
Florida--East	2	0	11	-3
Florida--North	2	1	7	1
Florida--West	2	0	10	1
Georgia, South Carolina	1	0	6	0
Idaho, Utah, Alaska	1	1	4	-3
Kansas, Missouri, Louisiana	3	1	9	0
New Hampshire, Virginia	1	0	5	-1
Tennessee + Kentucky	-3	1	8	-1
Texas--Central West	2	2	-1	-3
Texas--Gulf Coast	2	1	11	1
Texas--North	-10	1	-3	-1
Texas--San Antonio	6	5	11	-1

S. pneumoniae Susceptibility Differences (Inpatient vs. ED)

Region	Azithromycin	Ceftriaxone	Clindamycin	Levofloxacin	Penicillin G
California + Nevada	9	0	8	-1	-10
Colorado + Central Kansas	Not Reported	0	10	0	-1
Florida--East	Not Reported	2	Not Reported	0	Not Reported
Florida--North	35	0	0	2	27
Florida--West	Not Reported	0	Not Reported	-1	0
Georgia, South Carolina	Not Reported	0	9	0	3
Idaho, Utah, Alaska	9	-2	4	0	42
Kansas, Missouri, Louisiana	-20	-2	10	1	-30
New Hampshire, Virginia	4	2	0	1	4
Tennessee + Kentucky	17	-2	0	0	Not Reported
Texas--Central West	69	6	Not Reported	13	14
Texas--Gulf Coast	41	0	9	9	0
Texas--North	Not Reported	-1	6	-1	16
Texas--San Antonio	Not Reported	1	0	3	0

P. aeruginosa Susceptibility Differences (Inpatient vs. ED)

Region	Cefepime	Ciprofloxacin	Gentamicin	Meropenem	Pip/Tazo	Tobramycin
California + Nevada	-1	-5	0	2	0	0
Colorado + Central Kansas	0	-11	0	8	0	0
Florida--East	5	1	2	6	3	1
Florida--North	0	1	0	1	0	1
Florida--West	0	0	1	2	3	0
Georgia, South Carolina	1	0	-1	4	0	0
Idaho, Utah, Alaska	5	4	1	1	3	1
Kansas, Missouri, Louisiana	1	-7	1	-1	1	-2
New Hampshire, Virginia	0	-5	0	-1	1	0
Tennessee + Kentucky	1	-5	1	-1	1	-1
Texas--Central West	1	-1	2	5	1	0
Texas--Gulf Coast	2	-3	1	2	1	0
Texas--North	0	-1	-1	-2	0	-1
Texas--San Antonio	1	-5	-2	0	1	9

Conclusion

Differences in inpatient versus ED bacterial sensitivities warrant justification for specific regions to monitor and develop inpatient and ED-specific antibiograms.

REFERENCES

- CLSI Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline. M39-A4, 2014.
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