

EVALUATION OF CULTURE REVIEW
AND FOLLOW-UP TO IMPROVE ANTIMICROBIAL
STEWARDSHIP AND PRESCRIBING PRACTICES
IN THE EMERGENCY DEPARTMENT

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DISCLOSURES

- I, Molly M. Grasberger, have no actual or potential conflicts of interest related to this presentation
- No research funding was received
- The results presented herein are subject to different interpretations and are intended to be educational in nature

LEARNING OBJECTIVES

- Identify prescribing trends for emergency department providers
- Describe areas for process improvement

INTRODUCTION

- Increasing bacterial resistance is recognized as a growing health threat
- Infections caused by resistant bacteria result in increased mortality, length of stay, and cost
- The Joint Commission Antimicrobial Stewardship Standard requires hospitals to have an antimicrobial stewardship program (ASP)

The Joint Commission, Antimicrobial Stewardship Standard
Losier M, *Ann Pharmacother*. 2017; 51: 774-790

INTRODUCTION

- Historical focus on ASPs in the inpatient setting with a lesser focus on ASPs in the emergency department (ED)
- Antimicrobial prescribing is predominantly empiric, with most microbiology results reported after patient discharge
- Culture follow-up (CFU) and review processes ensure appropriate antimicrobial therapy during this transition of care

The Joint Commission, Antimicrobial Stewardship Standard
Losier M, *Ann Pharmacother*. 2017; 51: 774-790

BACKGROUND

PHARMACIST-DRIVEN ANTIMICROBIAL OPTIMIZATION IN THE EMERGENCY DEPARTMENT

• Objective

- Determine the value of a pharmacist-driven antimicrobial optimization service in the ED measured by the number of clinical interventions made

• Methods

- Retrospective electronic chart review of ED patients with positive cultures during two different three-month periods
 - Phase 1: ED nursing performed CFU
 - Phase 2: ED pharmacists performed CFU

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Davis LC, Am J Health Syst Pharm, 2016; 73(5 Suppl 1): S49-56

PHARMACIST-DRIVEN ANTIMICROBIAL OPTIMIZATION IN THE EMERGENCY DEPARTMENT

• Results

- Phase 1 (n=499): Nursing intervention on 21/42 (50%) of cultures
 - Phase 2 (n=473): Pharmacist intervention on 24/30 (80%) of cultures
- **30% absolute ↑ in interventions for inappropriate therapy (p=0.01)**

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Davis LC, Am J Health Syst Pharm, 2016; 73(5 Suppl 1): S49-56

PHARMACIST-DRIVEN ANTIMICROBIAL OPTIMIZATION IN THE EMERGENCY DEPARTMENT

• Conclusion

- Pharmacist-driven antimicrobial stewardship initiative and culture review in the ED
 - ❖ Increased interventions for inappropriate therapy
 - ❖ Ensured resolution of infection through modification of therapy for patients with bug-drug mismatches
 - ❖ Improved empiric prescribing trends

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Davis LC, Am J Health Syst Pharm, 2016; 73(5 Suppl 1): S49-56

STUDY SETTING

SAINT FRANCIS HOSPITAL



- Tulsa, Oklahoma
- 687-bed tertiary care hospital
- Level II trauma emergency center
 - Approximately 108,000 ED visits during FY2017
 - ED clinical pharmacist Monday-Friday day shift
 - Contracted ED physician group

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SFH CULTURE FOLLOW-UP AND REVIEW PROCESS

- ED nurse is not regularly scheduled to perform CFU and review
- When scheduled, ED nurse
 - Reviews positive cultures
 - Compares antibiotic therapy with culture and susceptibility
 - Nursing resource guide provided by contracted ED physician group

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NURSING INTERVENTIONS

- Documents culture review and planned interventions
- Contacts patient by telephone
- Mails letter after two unsuccessful calls

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STUDY DESIGN

OBJECTIVES

- **Primary**
 - Assess antibiotic appropriateness
 - Administered in ED
 - Prescribed at discharge
 - Prescribed after culture review
 - Identify discharge prescription errors
 - Review number, type, appropriateness of nursing interventions
- **Secondary**
 - Measure time to culture review
 - Identify treatment failures
 - Examine resistance patterns

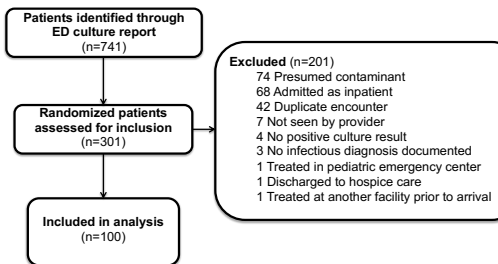
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METHODS

- Randomized, retrospective chart review
- Adults treated and discharged from ED
 - May 1, 2017, through July 31, 2017
- Positive ED culture result from any source

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METHODS, CONTINUED



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DEFINITIONS

- Appropriateness of therapy
 - Evaluated with respect to current published treatment guidelines or by co-investigator consensus
 - Prescribing errors
- Time to intervention
 - Time between culture and susceptibility reporting and attempted patient contact
- Treatment failure
 - ED revisit within 30 days for same or similar infectious concern

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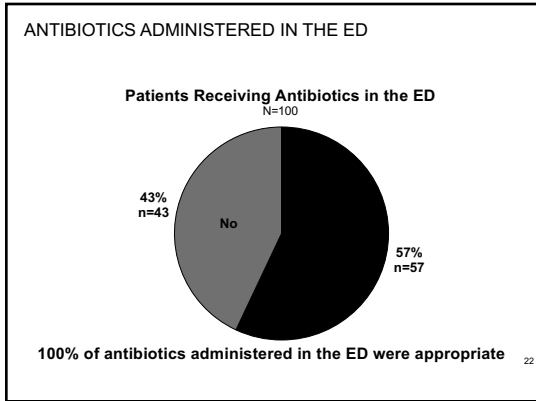
RESULTS

BASELINE DEMOGRAPHICS

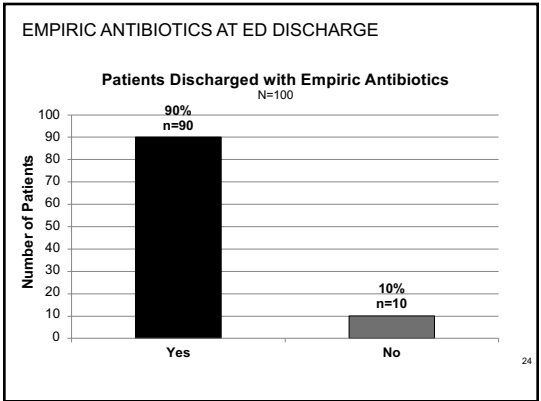
N=100

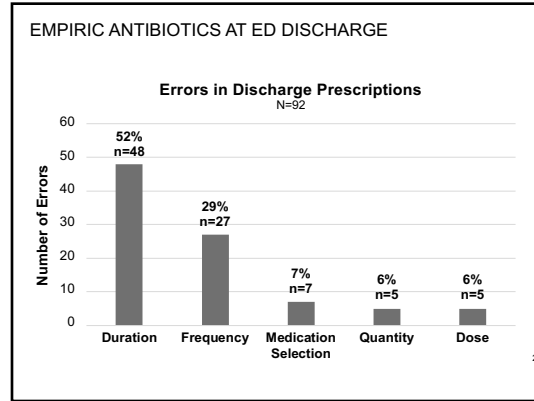
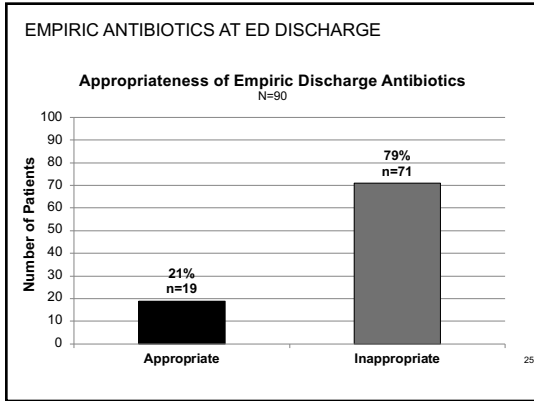
Characteristic	
Female, n	79
Age, years	
Average	40
Range	18 – 92
Comorbidities, n	
Diabetes mellitus	15
COPD	4
Heart failure	4
Primary infectious diagnoses, n	
Genitourinary	76
Sexually transmitted diseases	7
Acute bacterial skin and skin structure infections	6
Other	11

**PRIMARY OUTCOME
ANTIBIOTICS ADMINISTERED IN THE ED**



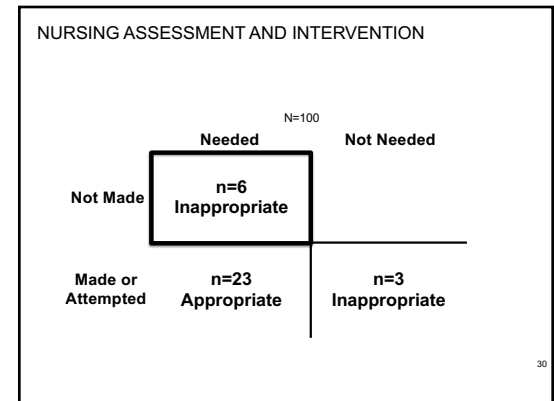
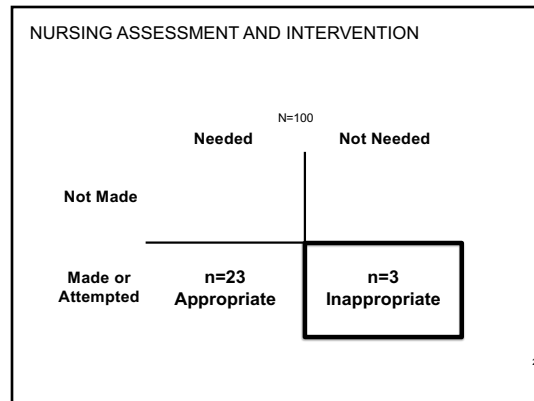
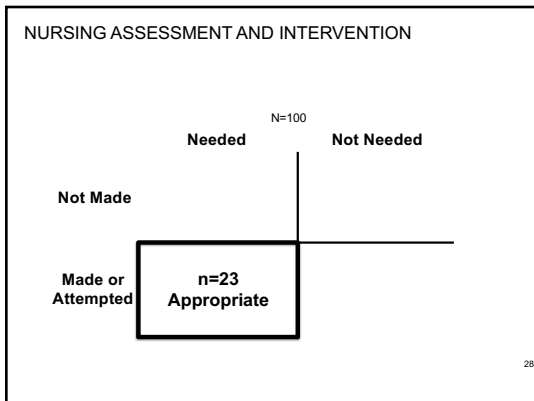
**PRIMARY OUTCOME
EMPIRIC ANTIBIOTICS AT ED DISCHARGE**





PRIMARY OUTCOME
NURSING INTERVENTIONS

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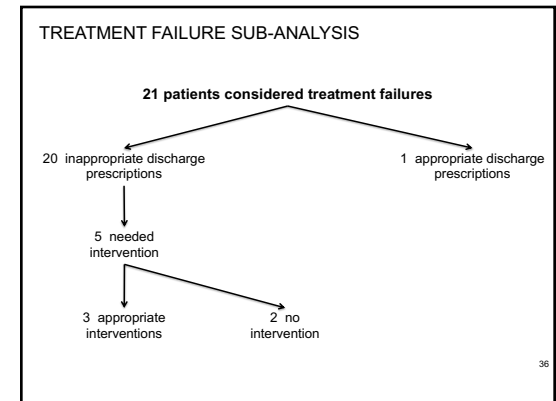
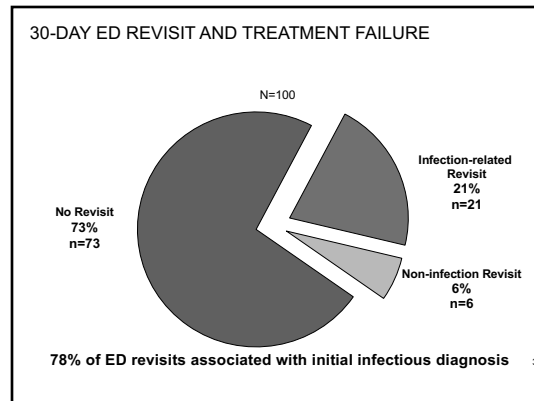
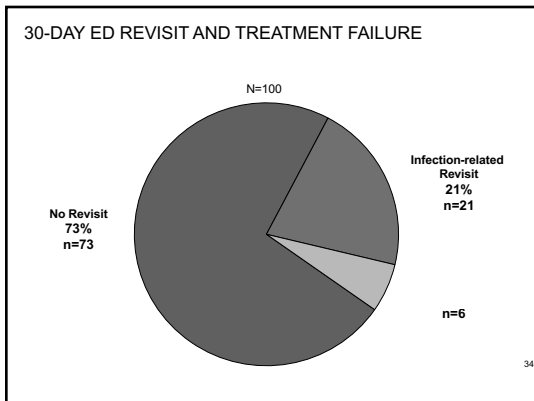
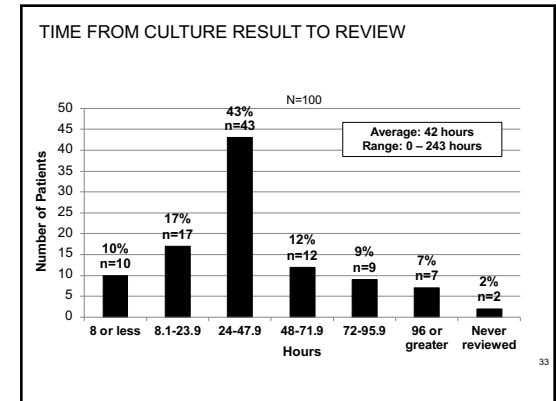
NURSING ASSESSMENT AND INTERVENTION

	N=100	
	Needed	Not Needed
Not Made	n=6 Inappropriate	n=68 Appropriate
Made or Attempted	n=23 Appropriate	n=3 Inappropriate

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SECONDARY OUTCOMES

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LIMITATIONS

- Retrospective chart review
- Inconsistent documentation
- Small sample size
- Assessed infections during summer months only

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CONCLUSION

- 79% of empiric discharge prescriptions from the ED were inappropriate
 - Incorrect duration of therapy, frequency of dosing
- Nursing action was appropriate for 91% of patients
 - Intervened on 26 patients
 - Average time to culture review was 42 hours
- 78% of 30-day ED revisits associated with initial infectious diagnosis

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FUTURE DIRECTION

- Provide tools to improve empiric discharge prescribing
- Allocate additional resources to CFU process
 - Improve discharge prescriptions
 - Increase frequency of appropriate interventions
 - Decrease time to CFU
- Revise contract-physician nursing resource guide
 - Evidence-based recommendations
 - Streamline CFU

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REFERENCES

1. The Joint Commission. Approved: New Antimicrobial Stewardship Standard. Available at: https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf. Accessed November 22, 2017.
2. Losier M, Ramsey TD, Wilby KJ, Black EK. A systematic review of antimicrobial stewardship interventions in the emergency department. *Ann Pharmacother* 2017; 51(9): 774-790.
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SELF-ASSESSMENT

- Which of the following prescribing trends were observed for patients discharged with prescriptions from the ED?
 - A. Increased appropriateness of empiric therapy in the ED
 - B. Decreased rates of prescribing errors
 - ☆ C. The most frequent error was in discharge duration of therapy
 - D. All of the above

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SELF-ASSESSMENT

- Which of the following could be considered areas for improvement for the current CFU and review process at Saint Francis Hospital?
 - A. Time to culture review
 - B. Empiric antibiotic prescribing in the ED
 - C. Number of errors in discharge prescriptions
 - ☆ D. A and C

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