

## Retrospective review of antimicrobial use in patients with febrile neutropenia in a rural community hospital

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### BACKGROUND

- Oncology patients are at an increased risk of infection, which results in higher morbidity and mortality
- Definitions per the National Comprehensive Cancer Network (NCCN):
- Neutropenia – an absolute neutrophil count (ANC) of less than 500 cells/ $\mu$ L
- Fever – any single oral temperature  $> 38.3^{\circ}\text{C}$ , or a sustained temperature above  $38^{\circ}\text{C} \geq$  one hour
- Due to the limited innate immune response mechanisms in these patients, the initial signs and symptoms of an infection are often absent or muted
- Fever remains an early, yet nonspecific sign of infection in these patients
- The NCCN defines Risk of complications takes into account Eastern Cooperative Oncology Group (ECOG) performance status, ANC, predicted duration of neutropenia, and comorbidities (cardiovascular disease, COPD, stress-induced hyperglycemia, etc.)
- The purpose of this study is to assess the empiric antimicrobial treatments ordered for patients admitted to St. Claire Regional Medical Center

### OBJECTIVES

#### Primary Objective:

- To assess appropriate empiric antibiotic selection for patients diagnosed with febrile neutropenia at St. Claire Regional Medical Center

#### Secondary Objectives:

- To assess the occurrence rate of febrile neutropenia in specific cancer types
- To identify areas of opportunity for improvement in empiric antibiotic selection amongst providers at St. Claire Regional Medical Center

### METHODS

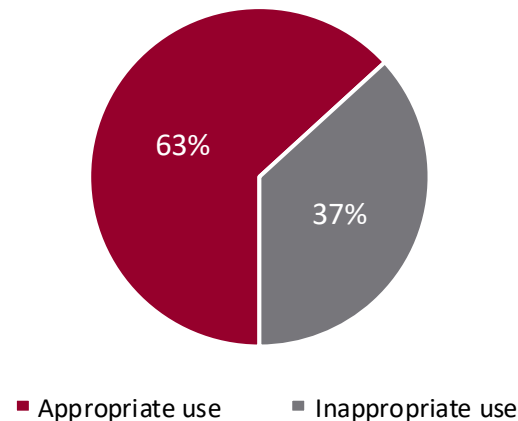
- Design:** Single center, retrospective study reviewing the occurrence and empiric treatment of patients diagnosed with febrile neutropenia
- Performance Site:** St. Claire Regional Medical Center; Morehead, KY
- Inclusion Criteria:** Patients coded with febrile neutropenia who are  $\geq 18$  years of age
- Individuals Collecting Data:** Dr. Austin Greanias, PharmD (principal investigator)
- Data Collected:** Age, gender, temperature, white blood cell count and differentiation, cancer origin, time since last chemotherapy, prophylactic antibiotic use, culture site and results, empiric antibiotic selection, antifungals used, antivirals used, granulocyte-colony stimulating factor used
- Appropriate Antibiotics:** Initial empiric therapy consists of cefepime, ceftazidime, piperacillin/tazobactam, meropenem, and imipenem/cilastin. Levofloxacin is guideline recommended for low-risk infections. Site-specific evaluation was taken into account, and vancomycin or other gram-positive coverage was deemed appropriate for cellulitis and lung infiltrates

### RESULTS

#### DEMOGRAPHICS

Number of patients assessed: 108	Included: 97 Excluded: 11 (<18 yo)
Sex	Male: 36 (37.1%) Female: 61 (62.9%)
Age (years)	Mean: 62 Range: 19-88
Met febrile neutropenia criteria	19 (19.6%)

#### Antibiotic Use per NCCN Guidelines



### CLINICAL IMPLICATIONS

- Initial empiric treatment of febrile neutropenia allows for a decreased chance of progression to a sepsis syndrome and possibly death
- Consequences of initiating inappropriate empiric therapy could be inadequate coverage, increased resistance, increased length of stay, and progression as above

### DIRECTIONS MOVING FORWARD

- In-service education to emergency medicine and hospital providers
- Creation of febrile neutropenia order sets with appropriate empiric antibiotic selection based on presentation

### REFERENCES

- Baden L, et. al. Prevention and Treatment of Cancer-Related Infections. Version 1.2019. National Comprehensive Cancer Network. 25 Oct. 2018
- Freifeld A, et. al. Clinical Practice Guideline for the Use of Antimicrobial Agents in Neutropenic Patients with Cancer: 2010 Update by the Infectious Diseases Society of America. *Clinical Infectious Diseases* 2011;52(4):e56–e93. 29 Oct. 2010.

### DISCLOSURES & ACKNOWLEDGEMENTS

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