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Community Acquired Pneumonia Order Set Utilization Evaluation: A Retrospective Chart Review

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OBJECTIVE

To evaluate the adherence of antimicrobial regimen selection using a community acquired pneumonia (CAP) order set updated to Infectious Disease Society of America/American Thoracic Society guidelines.

BACKGROUND

- In 2019, the IDSA published an update to their clinical practice guidelines for adults with CAP.¹
- Parkview Health updated their existing CAP order set to reflect these recommendations, in addition to providing more specific guidance relative to selection of antimicrobial agents.
- As part of the update to Joint Commission standards for 2023, a new objective requires health systems to evaluate implementation of evidence-based guidelines in their antimicrobial stewardship requirements.² This order set was chosen due to its recent implementation.

METHODS

- Retrospective chart review of all adult patients ≥ 18 years old who received at least one antibiotic from a CAP order set between July 1, 2022 and June 30, 2023.
- The primary endpoint was to assess adherence to 2019 IDSA CAP guidelines, utilizing order sets that were updated to reflect these guidelines.
- This was determined by measuring how often the regimen patients received reflects the order set guidance.
- The CAP order set directs providers to select therapy based on patients' severity (severe vs. non-severe). Next, providers are instructed to select "pseudomonal risk" or "no pseudomonal risk" with consideration to previous culture results and/or recent hospitalizations with receipt of intravenous antibiotics. Providers can then select treatments based upon allergy presence and severity.
 - Non-severe treatment: β -lactam + azithromycin OR levofloxacin monotherapy
 - Severe treatment: β -lactam + azithromycin OR β -lactam + levofloxacin
- Finally, if patients had a history of positive MRSA cultures and/or recent hospitalizations with receipt of intravenous antibiotics, providers could add MRSA coverage.

Criteria for Defining Severe CAP

Minor Criteria (≥ 3 of the following)	Respiratory rate ≥ 30 breaths/min	Uremia (BUN ≥ 20 mg/dL)
	PaO ₂ /FiO ₂ ratio ≤ 250	Leukopenia (WBC < 4 th/ μ L)
	Multilobar infiltrates	Thrombocytopenia (PLT < 100 th/ μ L)
	Confusion/disorientation	Hypothermia (core temp. $< 96.8^\circ$ F)
	Hypotension requiring aggressive fluid resuscitation	
Major Criteria	Septic shock requiring vasopressors	
	Respiratory failure requiring mechanical ventilation	

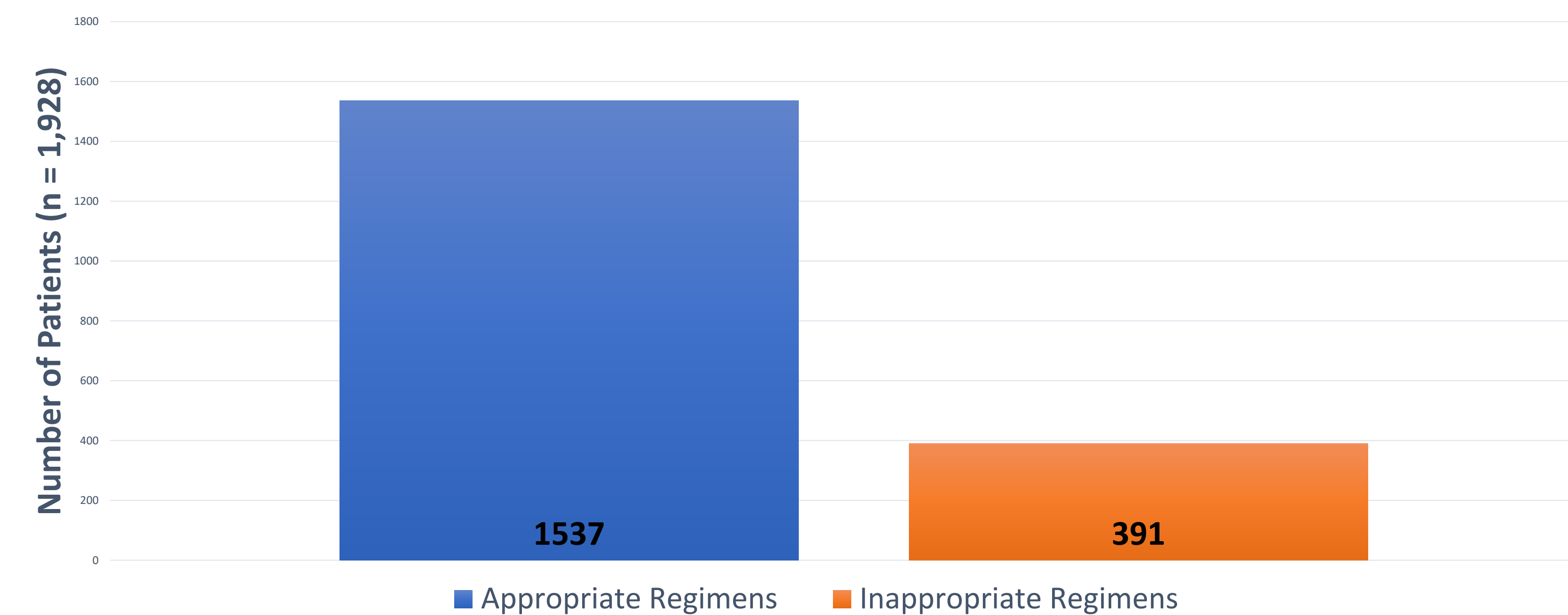
RESULTS

- A total of 1,934 patients were identified as the initial population. The final population included 1,928 patients, after excluding patients that were less than 18 years of age.

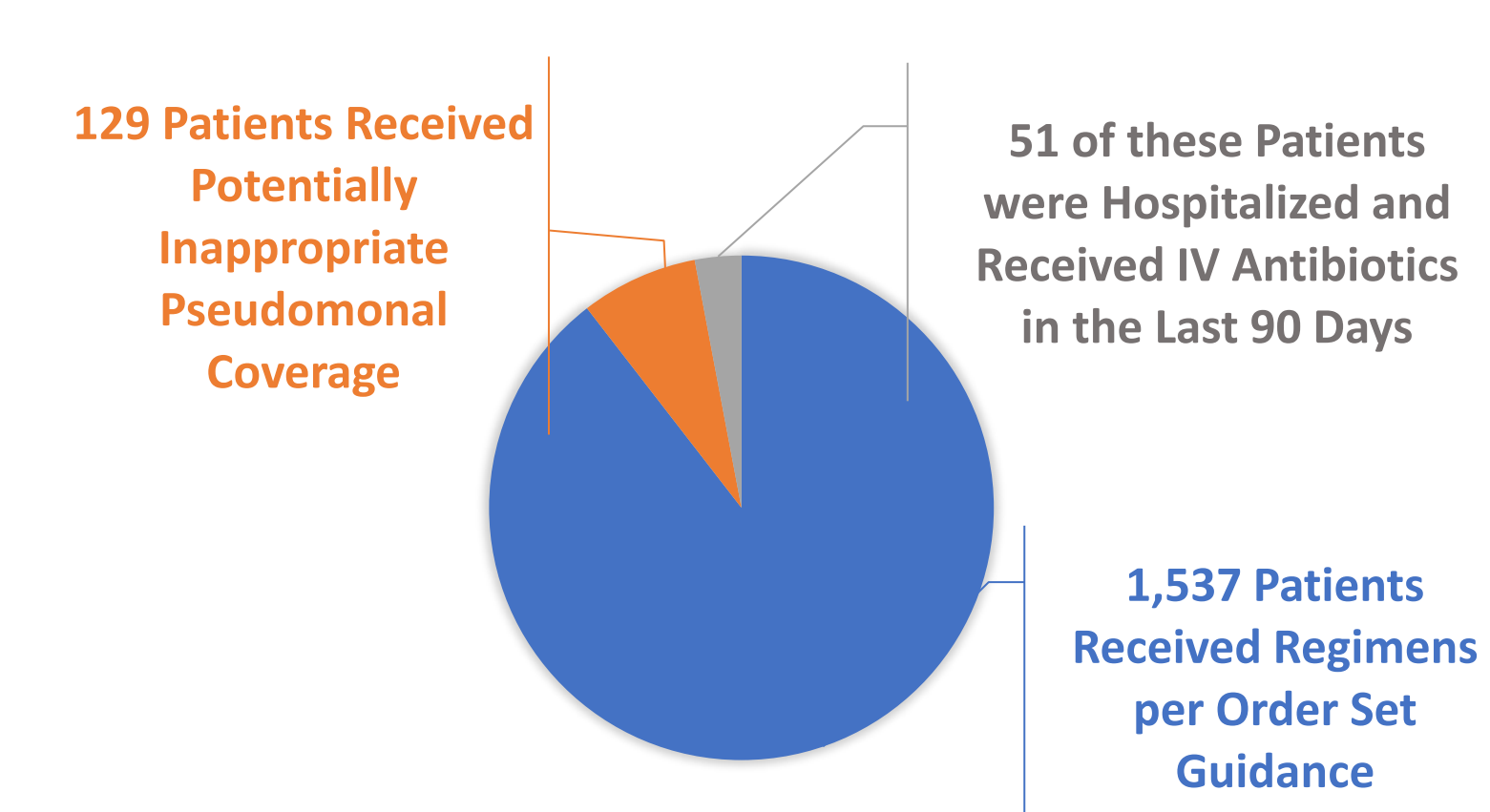
Patient Demographics with Average Value on Admission

Age	Sex	Temperature	WBC	BUN	RR	Platelets
67 (± 15) years	Male 924 (48%)	Female 1004 (52%)	98.8°F (± 1.5) th/ μ L	12.7 (± 8) mg/dL	24 (± 17) breaths/min	22 (± 6) th/ μ L

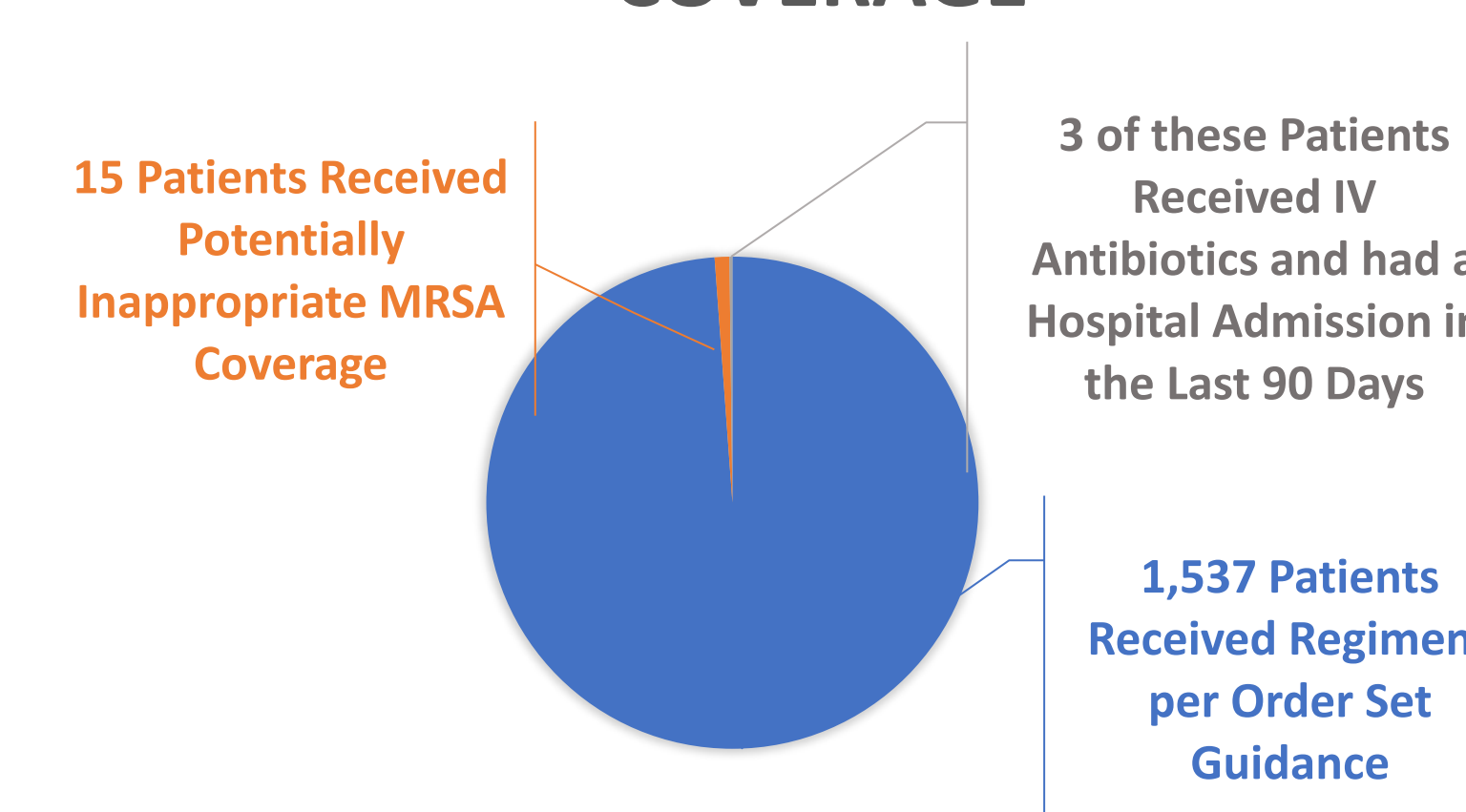
Assessment of Initial Antibiotic Therapies for CAP per the 2019 IDSA Guidelines/Order Set



PROPORTION OF PATIENTS THAT RECEIVED PSEUDOMONAL COVERAGE

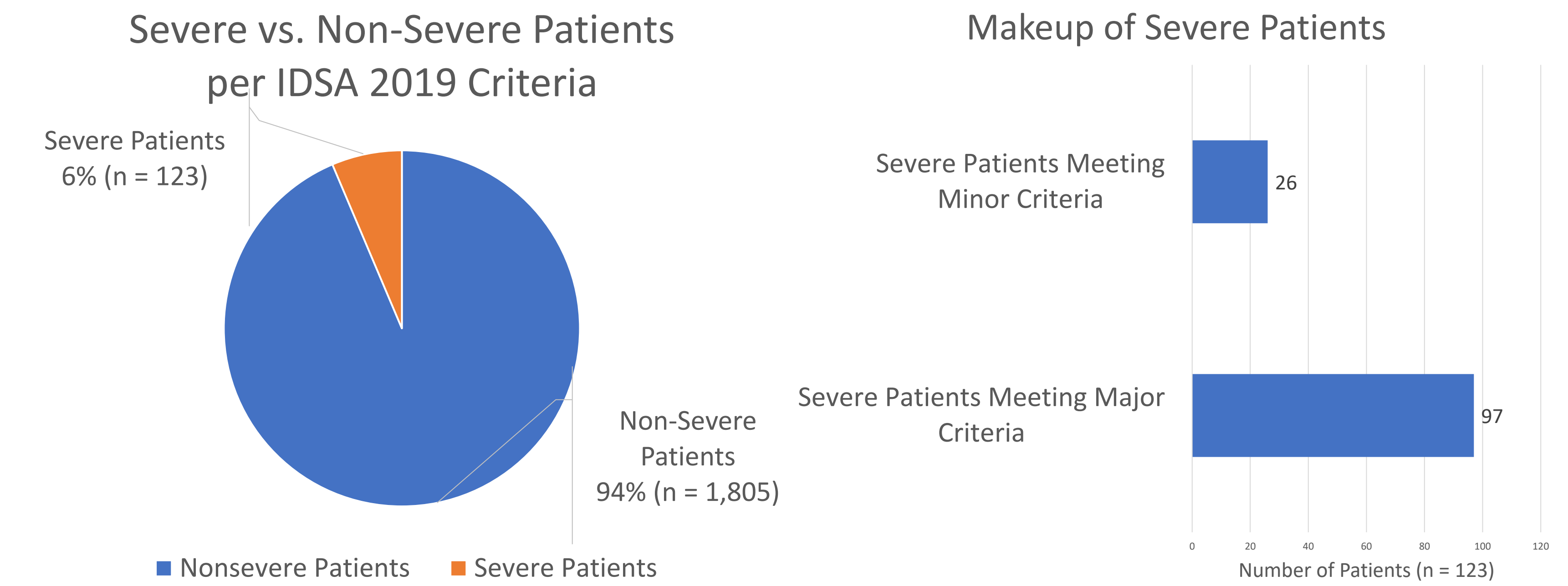


PROPORTION OF PATIENTS THAT RECEIVED MRSA COVERAGE



INAPPROPRIATE REGIMENS	# OF PATIENTS
CEFTRIAXONE	128
AZITHROMYCIN	59
PIPERACILLIN/TAZOBACTAM	27
AZITHROMYCIN, CEFTRIAXONE, PIPERACILLIN/TAZOBACTAM	8
AZITHROMYCIN, CEFTRIAXONE, PIPERACILLIN/TAZOBACTAM, VANCOMYCIN	6
MEROPENEM	4
AZITHROMYCIN, CEFTRIAXONE, CEFEPIME	2
CEFTRIAXONE, PIPERACILLIN/TAZOBACTAM, VANCOMYCIN	2
CEFEPIME	2
PIPERACILLIN/TAZOBACTAM, VANCOMYCIN	2
OTHER	7

RESULTS



DISCUSSION & CONCLUSIONS

- Our health system has been following guidance put forth in the CAP order set, which was updated to reflect the 2019 IDSA CAP guidelines.
- Appropriate antimicrobial regimens were initiated in 80% of patients (n = 1,537/1,928) utilizing the CAP order set.
- Of patients that received guideline directed therapy, 12% (n = 180/1,537) received additional pseudomonal coverage. 1% of patients (n = 18/1,537) received additional MRSA coverage.
- Of the patients that received pseudomonal and MRSA coverage, 54 had documented history of hospitalization and intravenous antibiotics 90 days prior to admission.
- It is important to note that previous culture history was unable to be easily collected. This serves as a limitation to our study, leaving 144 patients that received MRSA and pseudomonal coverage without clear documentation necessitating this additional therapy. These patients were categorized as having received inappropriate antimicrobial regimens per the order set.
- Going forward, this information will need to be collected manually to justify empiric MRSA and pseudomonal coverage in CAP patients.
- Several inappropriate regimens were provided to patients. After assessing these regimens, further provider education is necessary to provide adequate care to our patients. Potential improvements to the CAP order set will also be reviewed.

REFERENCES

- Metlay JP, et al. Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. *Am J Respir Crit Care Med.* 2019; 200(7): e45-e67. doi: 10.1164/rccm.201908-1581ST.
- Allen C, et al. R³ Report: Requirement, Rationale, Reference. *The Joint Commission.* 2022; 35: 1-4.

Disclosure
The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
Kristin Lytal, PharmD: Nothing to disclose | Luke Keller, PharmD: Nothing to disclose | Blake Burton, PharmD: Nothing to disclose | Sarah Ferrell, PharmD: Nothing to disclose