

GUIDeline AdhereNCE of Broad-Spectrum Antibiotic Prescriptions on Family Practice Units at Vancouver General Hospital (GUIDANCE Study)



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Background & Rationale

- Use of broad-spectrum antibiotics is critical in life-threatening infections.
- Approximately 30-50% of antibiotic use is reported to be inappropriate or unnecessary.
- Consequences of broad-spectrum antibiotic use include adverse drug events (ADEs), multidrug-resistant colonization/infection.
- Antimicrobial stewardship (AMS) support to optimize antibiotic use on Family Practice Units is limited to weekly review.

Objectives

- Primary Objective:**
 - To determine proportion of broad-spectrum antibiotics prescriptions that were adherent to AMS Guidelines 72 hours after initiation.
- Secondary Objectives:**
 - To determine proportion of patients seen by ID/AMS teams.
 - To determine overall usage and cost of broad-spectrum antibiotics.
 - To determine number of ADEs.

Methods

- Design:** Retrospective chart review of Family Practice Unit patients at VGH (identified from the PCIS information system)
- Study Period:** January 1, 2019 and June 30, 2019
- Inclusion:**
 - All patient prescribed any prespecified broad-spectrum antibiotics for at least 72 hours:
 - ciprofloxacin IV/PO, moxifloxacin IV/PO, levofloxacin IV/PO,
 - meropenem IV, imipenem IV (restricted to ID),
 - piperacillin-tazobactam (Pip-Tazo) IV, or
 - vancomycin IV
- Exclusion:**
 - Recurrent admissions by same patient
- Sampling:** Convenience sample of 200 patients
- Analysis:** Descriptive statistics

Results

Table 1: Patient Demographics

Patient Characteristics	n = 180
Mean Age (y) +/- SD	83 ± 10
Mean Length of Stay (d) +/- SD	23 ± 20
ID or AMS Consult	31 (17%)

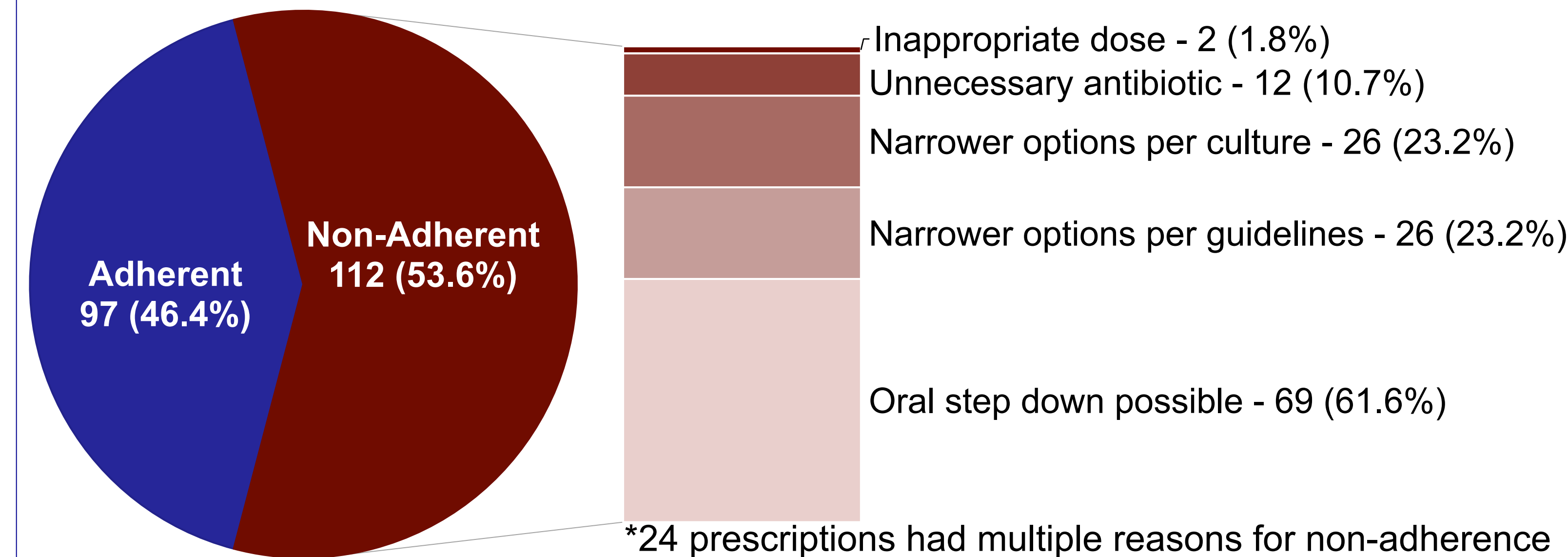


Figure 1: Adherence to VCH Guidelines at 72 hours After Antibiotic Initiation (n=209)

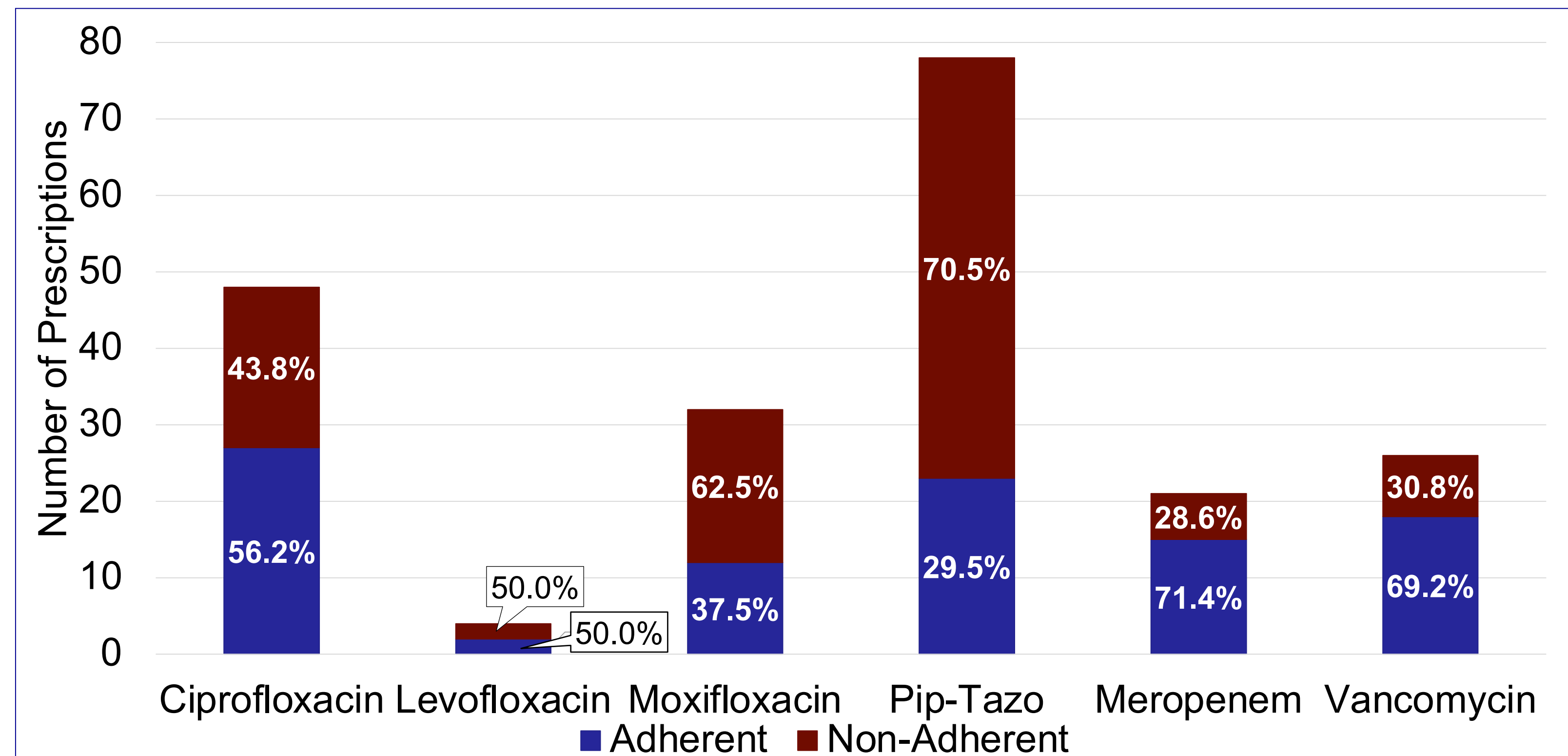


Figure 2: Antibiotic Adherence to VCH Guidelines at 72 Hours After Antibiotic Initiation (n=209)

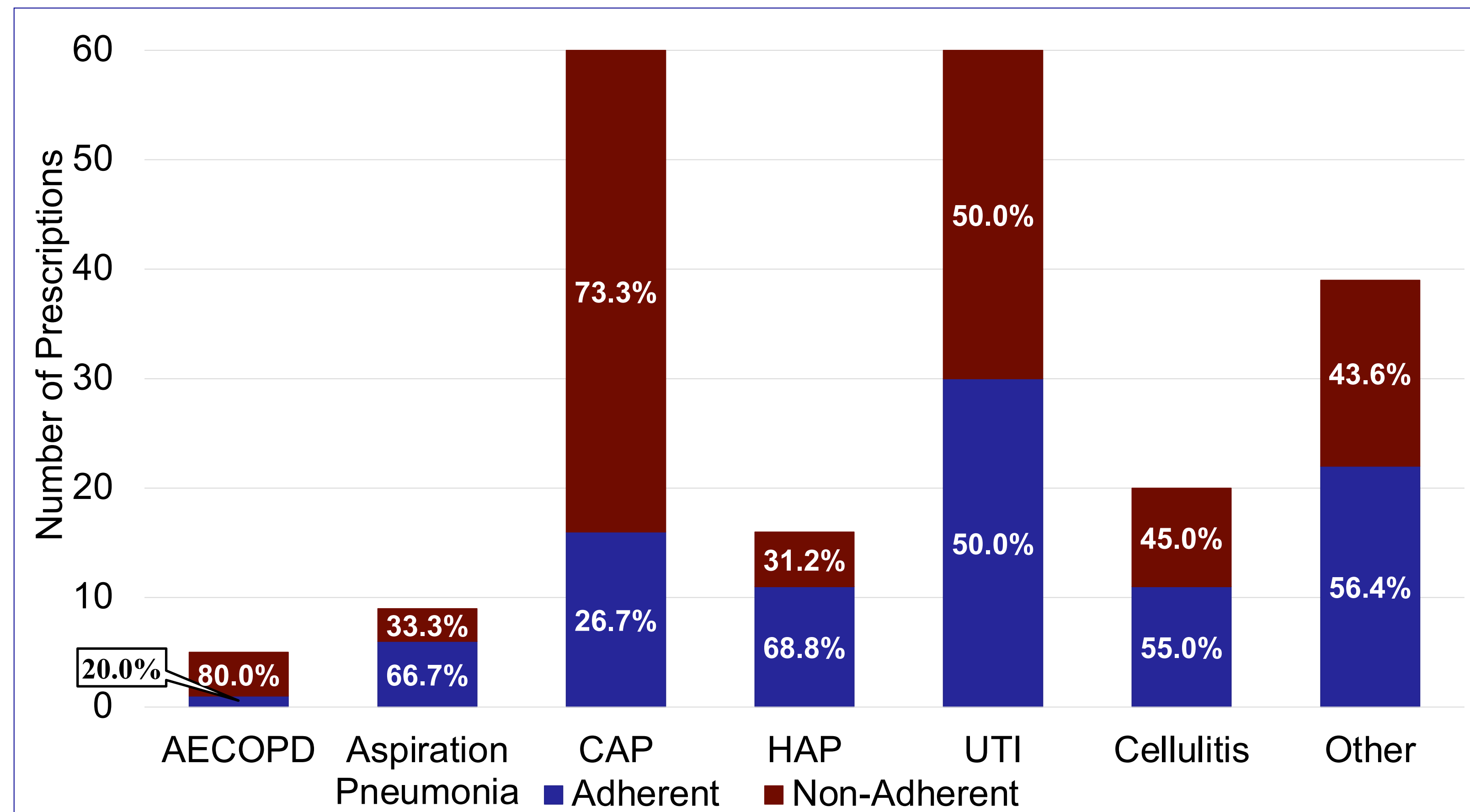


Figure 3: Adherence to VCH Guidelines at 72 Hours After Antibiotic Initiation Characterized by Working Diagnosis (n=209)

Table 2: Antibiotic Usage and Cost

Antibiotic	Adherent Antibiotic Prescriptions			Non-Adherent Antibiotic Prescriptions		
	Median duration(d) (Range (d))	Total (d)	Cost (\$)	Median duration(d) (Range (d))	Total (d)	Cost (\$)
Ciprofloxacin	5 (3-6)	145	122.62	5 (3-14)	120	120.78
Levofloxacin	6 (6-6)	12	456.14	8 (4-12)	16	331.22
Moxifloxacin	5.5 (3-9)	66	377.73	5 (3-7)	102	403.47
Pip-Tazo	7 (4-17)	159	2785.70	4 (3-14)	254	1996.08
Meropenem	9 (4-41)	156	2557.30	3 (3-4)	19	17.97
Vancomycin	10.5 (4-52)	298	3237.56	6 (3-11)	51	116.44
Total			9536.94			2985.96

Table 3: Adverse Drug Events

Outcomes	Adherent Antibiotic Prescriptions	Non-Adherent Antibiotic Prescriptions
Diarrhea	5 (5.2%)	4 (3.6%)
C. difficile Infection	6 (6.2%)	5 (4.5%)

Limitations

- Retrospective, observational chart review design
- Limited access to data from patient charts and health records as all data were obtained from the PCIS computer information system
- Broad-spectrum antibiotic prescriptions continued on discharge were not captured

Conclusions

- Forty-six percent of broad-spectrum antibiotic prescriptions were adherent to AMS guidelines at 72 hours.
 - Most common reason for non-adherence was not stepping down to oral antibiotic therapy when indicated.
 - Piperacillin-tazobactam, levofloxacin, and moxifloxacin were associated with the highest proportion of non-adherence where the most common indication was CAP. These prescriptions were often inappropriate as there were narrower options or oral options available.
 - AECOPD, CAP, and UTI were associated with the highest proportion of non-adherence due to overly broad coverage and ability for oral step down.
- The monetary drug cost associated non-adherent prescriptions was approximately \$3000 annually in this 6-month period
- Opportunities exist to collaborate with hospitalists to promote best practice in broad-spectrum antibiotic use.

References

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- Villarreal, Armando A., et al. "Use of broad-spectrum antibiotics and the development of irritable bowel syndrome." *Wmj* 111.1 (2012): 17-20.
- Jedrychowski, W., et al. "Wheezing and asthma may be enhanced by broad spectrum antibiotics used in early childhood. Concept and results of a pharmacoepidemiology study." *Journal of physiology and pharmacology: an official journal of the Polish Physiological Society* 62.2 (2011): 189.