

Evaluation of a pharmacist-guided antimicrobial stewardship program on antibiotic prescribing rates in a suburban internal medicine clinic

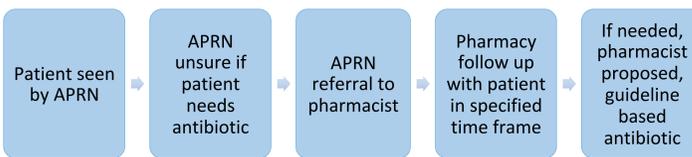
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Background

- 60% of antibiotic use occurs in the outpatient setting, with up to 30% of prescriptions deemed unnecessary.¹
- Midlevel providers, including advanced practice registered nurses (APRNs), prescribed 68.4 million antibiotics in 2016, which was the second highest amount behind primary care physicians.⁵
- Overprescribing of antibiotics can increase the risk of drug-related adverse events, *Clostridioides difficile* infections, and antibiotic resistance.
- To increase stewardship efforts, a collaborative program was implemented between outpatient pharmacists and APRNs. The program included:
 - A presentation overviewing antibiotic stewardship and proper treatment of common viral-induced infections
 - Introduction of a delayed antibiotic prescribing protocol

Figure 1: Delayed Antibiotic Prescribing Workflow



Purpose

- Primary outcome:**
- Composite of the difference in APRN antibiotic prescribing rates for pharyngitis, acute sinusitis, acute bronchitis, and upper respiratory tract infections (URTI) pre and post program implementation
- Secondary outcomes:**
- Difference in APRN antibiotic prescribing rates for each individual infection of the composite pre and post program implementation
 - Difference in APRN prescribing rates of first and second line antibiotics prescribed for pharyngitis and acute sinusitis pre and post program implementation
 - Difference in median duration of treatment for pharyngitis and acute sinusitis pre and post program implementation
 - Number of pharmacy referrals by APRNs

Methods

- Single-center, retrospective medication use evaluation (MUE)
- Inclusion criteria:
 - Age \geq 18 years old
 - Seen by an APRN at the specified internal medicine clinic for pharyngitis, acute sinusitis, acute bronchitis, or URTI
- Time frame:
 - Pre-implementation group: Aug 16th, 2018- Nov 16th 2018
 - Post-implementation group: Aug 16th, 2019- Nov 15th 2019
- Statistical Analysis Performed:
 - Chi square test on categorical data
 - Student t-test on continuous data
 - P value <0.05 considered statistically significant
- Study exempt by the LMH Health Institutional Review Board

Results

Table 1: Patient Baseline Demographics

Characteristics	2018 (N=251)	2019 (N=317)
Female, n (%)	175 (70%)	222 (70%)
Age (years), median [IQR]	64 yo [49-72]	64 yo [53-73]
Diagnosis, n (%)		
Acute Sinusitis	35 (14%)	68 (21%)
Acute Pharyngitis	61 (24%)	56 (18%)
Acute Bronchitis	49 (20%)	94 (30%)
URTI	106 (42%)	99 (31%)

Table 2: Delayed Antibiotic Prescribing Collaboration

Characteristics	2019 (N=317)
Referrals, n (%)	13 (4.1)
Median days to pharmacy follow up	2
Patients requiring antibiotic upon follow up, n (%)	1 (7.7)
First-line antibiotic prescribed, n (%)	1 (100)

Figure 2: APRN Antibiotic Prescribing Rates Pre and Post Stewardship Program Implementation

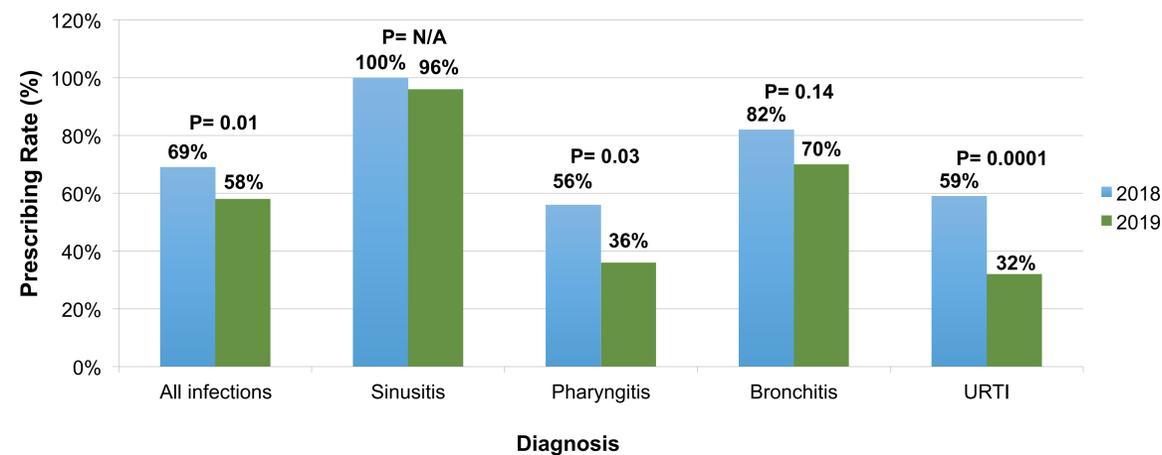


Figure 3: Rates of Prescribing Guideline Recommended Antibiotics for Sinusitis & Pharyngitis

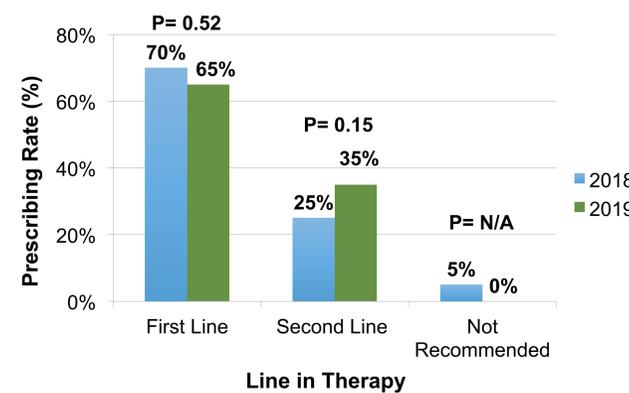
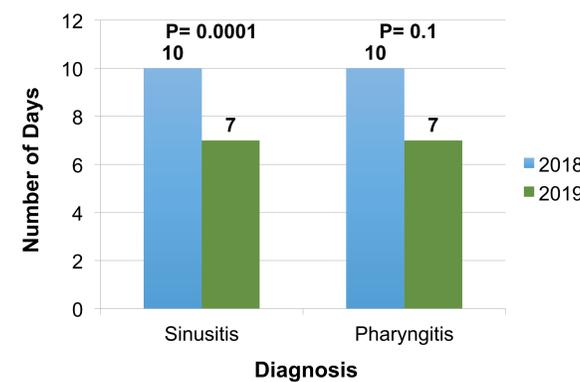


Figure 4: Median Duration of Therapy Prescribed for Sinusitis & Pharyngitis



Discussion

- The results of this MUE compliment other studies published regarding implementation of stewardship programs.
 - In 2015, Drekonja D., et al published a systematic review of antimicrobial stewardship programs in outpatient settings. 50 studies were eligible for inclusion, with most reporting on respiratory tract infections.
 - Provider and/or patient education was associated with a decrease in antibiotic prescribing.
 - Delayed antibiotic prescribing was associated with a reduction in antimicrobial use.
- Similarly, in this MUE, prescription rates for all four infections evaluated decreased.
 - APRNs increased the use of 1st and 2nd line antibiotics to 100% for sinusitis and pharyngitis in 2019.
 - The median duration of therapy prescribed for sinusitis and pharyngitis decreased by 3 days in 2019.
 - $<10\%$ of pharmacy referrals were prescribed antibiotics.
 - The only antibiotic proposed by the pharmacist was a first line guideline recommended regimen.

Limitations

- It is unknown if a patient was given an antibiotic by a provider outside of the health system.
- The study period was limited to three months.
- Number of patients each APRN saw was unequal.
- Method by which APRNs classify infections is not universal.

Conclusion

- Implementation of a pharmacist-guided stewardship program resulted in a statistically significant decrease in antibiotic prescribing by clinic APRNs for four specified infections.
- These results encourage continuous implementation of antimicrobial education programs and interdisciplinary collaboration among providers to help protect patients from unnecessary drug therapy.
- Next steps include presenting results to antibiotic stewardship committee to discuss implementing to other clinics and providers.

References

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Disclosures

The authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter.