Identification of Inappropriate Antibiotic Orders During a Pharmacy-Supported Antimicrobial Stewardship Program in Primary Care

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INTRODUCTION

- 30% of antibiotic prescriptions (AP) were considered inappropriate during 2010-2011[1]
- Effective in 2017, The Joint Commission required that hospitals establish an antimicrobial stewardship program, and stated that standards for ambulatory care were in development[2]
- As the number of outpatient AP have increased in Florida,[3] and in anticipation of Joint Commission, an outpatient antibiotic stewardship program was implemented at a local institution in 2018
- Role of antibiotic stewardship pharmacist in education/awareness campaign
  - Developed & distributed a "Cheat Sheet" to providers detailing frequently-encountered infections and the recommended antibiotics (based on IDSA guidelines)
  - Created and placed in all clinics posters/handouts describing appropriate antibiotic use to facilitate patient discussion

PURPOSE

To determine the proportion of inappropriate antibiotic prescriptions based on indication, selection, dose, and duration of therapy.

METHODS

Study Design	▪ Retrospective, Chart Review
IRB Status	▪ Exempt
Study Period	▪ January – December 2018
Data Source & Handling	▪ Age, gender, diagnosis and antibiotic orders retrieved from EPIC ▪ Inclusion criteria: Adults ≥ 18 years and prescribed oral antibiotic during primary care visit or at a walk-in center ▪ Exclusion criteria: Pregnant women and those with chronic bronchitis ▪ Orders applied against "Cheat Sheet" to determine appropriateness ▪ Descriptive statistics analyzed data
Relevant Infections	▪ Upper respiratory tract (URTI) ▪ Lower respiratory tract (LRTI) ▪ Skin/Soft tissue (SSTI) ▪ Oral cavity
Appropriate order	Antibiotic is needed, drug chosen is correct along with correct dose, frequency and duration

RESULTS

Figure 1. Disposition

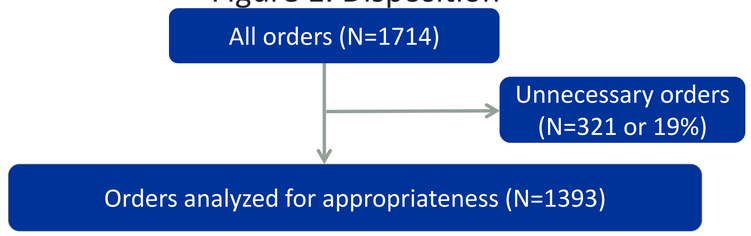


Table 1. Appropriateness of Orders, by Diagnosis

Diagnosis	Appropriate (%)	Inappropriate (%)
URTI (n=656)	46	54
LRTI (n=126)*	62	38
SSTI (n=507)	49	51
Oral cavity (n=104)	43	57
ALL (N=1393)	**48%**	**52%**
Median age (y)	48.7 (IQR 35-59)	51 (IQR 37-59)
% Female	66	66

***P=0.003** (test of individual proportions versus ALL)

Table 2. Appropriateness of Antibiotics (all Diagnoses)

Antibiotic	Appropriate (%)	Inappropriate (%)
Penicillin (n=637)	44	56
Cephalosporin (n=230)*	40	60
Fluoroquinolone (n=66)	52	48
Macrolide (n=133)*	5	41
Sulfonamide (n=102)	50	50
Clindamycin (n=121)	46	54
Tetracycline derivative (n=99)*	75	25
ALL (N=1393)	**48**	**52**

***P<0.05** (test of individual proportions versus ALL)

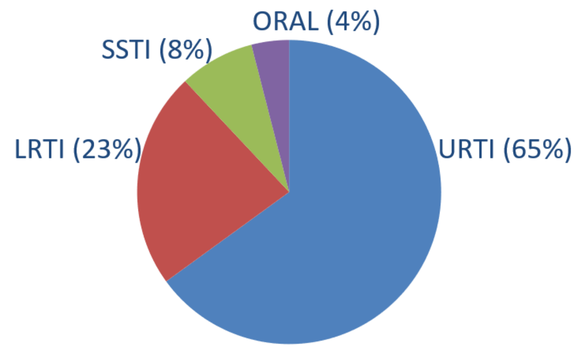
Table 3. Reasons for Inappropriateness (all Diagnoses)

Antibiotic	Wrong drug (%)	Wrong dose or Frequency (%)	Wrong Duration (%)
Penicillin (n=637)	24*	32	50*
Cephalosporin (n=230)	13*	46*	45
Fluoroquinolone (n=66)	8*	17*	48
Macrolide (n=133)	**32***	38	37*
Sulfonamide (n=102)	22	19*	45
Clindamycin (n=121)	7*	37	38
Tetracycline derivative (n=99)	6*	9*	24*
Other (n=5)	0	0	0
ALL (1393)	**19**	**32**	**44**

***P<0.05** (test for individual proportions versus ALL)

RESULTS & DISCUSSION

Figure 2. Unnecessary Orders



DISCUSSION

- Regardless of education/awareness campaign, >50% of AP were inappropriate and 19% of orders were unnecessary
  - Cephalosporin orders were more likely to be inappropriate
- Most likely to receive appropriate treatment
  - Patients with LRTI
  - Those who received a tetracycline derivative
- While patients on macrolides were more likely to receive appropriate treatment, 1/3 of prescriptions were of the wrong dose or duration
- Limitations
  1. Assumption that prescriber diagnoses were correct
  2. Single hospital system but with multiple ambulatory care centers
- Studies are needed to determine if tailored interventions, such as adjusting antibiotic pharmacotherapy in real-time, may help reduce the high rate of antibiotic inappropriateness

REFERENCES

1. Fleming-Dutra KE et al. Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011. JAMA 2016;315:1864-1873.
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DISCLOSURE

The Authors 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 of this presentation.