

# Impact of Type of Provider on Appropriateness of Treatment for Gonorrhea & Chlamydia in Outpatient Clinics

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## BACKGROUND

- Patients with sexually transmitted infections (STIs) receive care in a variety of outpatient settings with medical providers of different levels of training and expertise, especially regarding STIs.

## OBJECTIVE

- Determine the impact of type of provider on the appropriateness of treatment for chlamydia and gonorrhea in a large integrated health system.

## METHODS

- Retrospective cohort study.
- Adult patients diagnosed with chlamydia and/or gonorrhea at any outpatient clinic in 2019.
- Adequate treatment was defined as prescription for appropriate antibiotic, dose and duration within 7 days of the positive test.
- Logistic regression models with robust standard errors to adjust for clustering by clinic were built.

## FIGURES

Variable	All Visits n = 515	Treatment		p-value
		Appropriate n = 462 (%)	Inappropriate n = 53 (%)	
Age, Median (IQR)	22 (20-26)	22 (20-26)	24 (20-30)	0.025
Female Sex	500 (97.1)	449 (89.8)	10 (10.2)	0.694
Pregnant Status	88 (17.1)	70 (79.6)	18 (20.4)	0.001
Type of Infection				0.001
Chlamydia	416 (80.8)	382 (91.8)	34 (8.2)	
Gonorrhea	99 (19.2)	80 (80.8)	19 (19.2)	
Co-Infection	37 (7.2)	33 (89.2)	4 (10.8)	0.914
Type of Clinic				0.316
Urgent Care Clinic	165 (32.0)	152 (92.1)	13 (7.9)	
Family Medicine	135 (26.2)	122 (90.4)	13 (9.6)	
OB-GYN	215 (41.8)	188 (87.4)	27 (12.6)	
Type of Provider				0.011
Physician	181 (35.2)	157 (86.7)	24 (13.3)	
Mid-Level Provider	308 (59.8)	285 (92.5)	23 (7.5)	
CNM	26 (5)	20 (76.9)	6 (23.1)	

Table 1 (Above). Demographic characteristics of adult patients diagnosed with chlamydia and/or gonorrhea in outpatient clinics by appropriateness of treatment. Des Moines, Iowa, January 1, 2019 to December 31, 2019

Total Number of Patients with Errors	n = 53
Antibiotic Prescribed >7 days from Diagnosis	23/53 (43.4%)
Treatment Never Prescribed	21/53 (39.6%)
Inappropriate Antibiotic Prescribed	13/ 53 (24.5%)
Inappropriate Antibiotic Dose (Over-dosing)	2/53 (3.8%)
Inappropriate Antibiotic Dose (Under-dosing)	1/53 (1.9%)

Note: Sums to > 100% since some patients had more than 1 error

Table 2 (Left). Type of therapeutic errors encountered among patients diagnosed with chlamydia or gonorrhea

## RESULTS

- 481 unique patients and 515 unique encounters were identified. Considering unique patients only, the median age was 23 years (IQR 20-26), 466/481 (96.9%) were female (96.9%), 15/481 (3.1%) were male, and 79/481 (16.4%) were pregnant (Table 1).
- 53 patients had inappropriate treatment, some with multiple errors (Table 2).
- Compared to physicians, certified nurse midwives (CNMs) had 33% lower odds of prescribing appropriate treatment (95% CI 0.49-0.91;  $p$ -value = 0.010), with no difference in appropriateness of prescribing by mid-level providers (OR 1.61, 95% CI 0.82-3.17;  $p$ -value = 0.167).
- Pregnancy was independently associated with lower odds of appropriate treatment (aOR 0.35, 95% CI 0.24-0.52;  $p$ -value <0.001), as was gonorrhea infection (aOR 0.29, 95% CI 0.12-0.68;  $p$ -value = 0.004).

## CONCLUSION

- CNMs had lower odds of prescribing appropriate treatment for STIs. Efforts aimed at improving prescribing by healthcare providers should actively engage with this group.