



Evaluation of an Audit and Feedback Intervention to Improve Acute Respiratory Tract Infection (ARI) Antibiotic Prescribing in Outpatients

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Poster #1898

ABSTRACT

Background: Antibiotic overuse is associated with the development of drug-resistant organisms and may confer unnecessary adverse effects to patients. The largest component of inappropriate antibiotic use in outpatient settings is for Acute Respiratory tract Infections (ARIs) including: sinusitis (S), pharyngitis (P), bronchitis (B), and the common cold (CC). In 2015-16 we implemented a multi-faceted approach to improve ARI management including 5 proposed core elements of outpatient antibiotic stewardship: commitment, action, tracking, reporting, and education.

Methods: Commitment: Support for improvement in ARI management was publicly stated by leadership during a facility-wide educational event. Action: Individualized academic detailing and audit and feedback of prescribing patterns for providers with \geq 20 ARI encounters annually; and facility-wide introduction of computerized ARI specific management menus. Tracking: Provider-specific ARI management reports including antibiotic prescribing and menu use rates. Reporting: Monthly provider-specific audit and feedback reports distributed by team champions/pharmacists. Education: Facility-wide provider (group) education on ARI management and patient-materials available in clinic. Audit and Feedback reports compared individual performance to the top 20% of prescribers. Antibiotic appropriateness was defined as 1st/2nd line therapies for S or P (with positive RADT) and no antibiotic therapy for B or CC. Retrospective review and electronic data capture were used to characterize outpatient ARI visits during the 2014-15 and 2015-16 ARI seasons.

Results: Appropriateness of prescribing improved from 63.2% to 75.9% ($p < 0.0001$) compared to 2014-15, with a 23.5% reduction in antibiotics for any ARI. Audit and feedback recipients had improvement in appropriateness of prescribing (80.6% v 70.8%, $p < 0.01$), and were more likely to use computerized ARI specific menus (18.7% v 10.3%, $p < 0.01$), as compared to recipients of education and access to ARI specific order menus alone.

Conclusion: Individualized academic detailing coupled with audit and feedback promotes a reduction in inappropriate antibiotic prescribing for ARIs more than education or the availability of ARI specific order menu alone.

OBJECTIVE

Determine appropriateness of antimicrobial prescription rates, documentation of ARI diagnostic criteria, and 30 day safety endpoints of ARI management:

- Winter 2015-16 ARI season versus Winter 2014-15 ARI season
- Extensive intervention (ED, Episodic Care) versus Standard Intervention during 2015-16 ARI season

METHODS

- Retrospective chart review and electronic data capture (Dashboard)
- **Inclusion criteria:** Outpatient clinic visit for sinusitis, bronchitis, pharyngitis or the common cold (ICD 9/10 codes) between 12/2015 - 3/2016.
- **Exclusion criteria:** Immunocompromised stats, hemodialysis, chronic lung disease, recurrent ARI within 30 days, concurrent infectious diseases diagnosis, chronic pharyngitis/sinusitis.
- **2015-2016 ARI season intervention components:**

Standard Intervention (Facility-wide)	Extensive Intervention (ED & Episodic Care)
Provider/Patient Education	Individual Academic Detailing
EMR ARI Order Menus	Provider Audit & Feedback
Clinic level feedback reports	

RESULTS

Visit Information

Table 1. Demographics and visit information from manual chart review

	2014-15 (n=100)	2015-16 (n=255)	Significance (P value)
Average Age, yr (\pm SD)	50(\pm 15)	54(\pm 16)	
Male, n (%)	85 (85)	216 (85)	
Provider Type, n (%)			
Physicians	57 (57)	104 (41)	<0.01
PA/NPs	34 (34)	137 (54)	<0.01
Provider/Trainee	9(9.0)	14 (5.5)	0.11
Site of Care, n (%)			
Emergency Dept	39 (39)	79 (31)	0.08
Main Campus Clinic	37 (37)	135 (53)	<0.01
CBOC- Offsite Clinic	24 (24)	41 (16)	0.04

Diagnosis Distribution

Table 2. Distribution of diagnoses from electronic data capture

	2014-15 (n=687)	2015-16 (n=560)	Significance (P value)
Sinusitis	39.3%	20.8%	<0.01
Pharyngitis	10.0%	11.4%	0.22
Bronchitis	22.5%	27.3%	0.05
Common Cold	28.1%	40.4%	<0.01

- **Of note, diagnoses where antibiotics may be indicated decreased while diagnoses where antibiotics are not usually indicated increased**

Documentation supporting diagnosis

- **There was a non-significant difference in chart documentation to support diagnosis comparing 2014-15 to 2015-16 (15% vs. 18%) and standard intervention to extensive intervention (16% vs. 20%).**

Antibiotic Prescribing

Table 3. Absolute change (%) in antibiotic prescribing rates from 2014-2015 to 2015-2016 ARI seasons

	Extensive Intervention (N=695)	Standard Intervention (N=552)	Overall (N=1247)
Sinusitis	-1.4	0.9	-2.2
Pharyngitis	-29.7 [^]	-19.3	-23.4 [^]
Bronchitis	-48.0 [^]	-11.5	-30.4 [^]
Common Cold	-11.1 [*]	0.3	-6.1
All Diagnoses	-32.8[^]	-10.9[*]	-23.4[^]

Legend: ^{*}Indicates P<0.05, Chi-square test; [^]Indicates P<0.01, Chi-square test

- **There was an overall reduction in antibiotic prescribing rates of 23.4% between 2014-15 and 2015-16 with a large portion of this difference from reduction in prescribing for bronchitis.**

RESULTS

Guideline-Concordant Antibiotic Prescribing

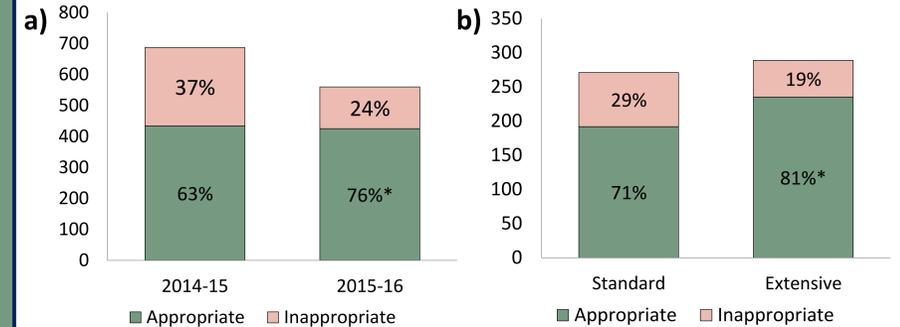


Figure 1. a) Appropriate prescribing comparing 2014-15 to 2015-16. b) Appropriate of prescribing comparing standard to extensive bundle during 2015-16 ARI season using electronic data capture. * P<0.01.

- **There was a significant increase in appropriateness of prescribing when comparing 2014-15 and 2015-16 (P<0.01).**
- **There was a significant increase in appropriateness of prescribing when comparing standard and extensive interventions (P<0.01).**

30-day Respiratory Related Returns

Table 4. Return visits from both interventions stratified by whether treated appropriately. Derived from manual chart review

Extensive Bundle (n=122)	12%	
Appropriate (n=83)	8%	P=0.03
Inappropriate (n=39)	21%	
Standard Bundle (n=133)	12%	
Appropriate (n=91)	8%	P=0.03
Inappropriate (n=42)	19%	

- **There was no difference between interventions in safety endpoint. Patients were significantly more likely to return when treated inappropriately with antibiotics.**

CONCLUSION

- There was a facility-wide reduction in antibiotic use, and this was primarily seen from reduction in use of antibiotics for diagnoses which rarely require antibiotics (bronchitis, common cold)
- The distribution of diagnoses were changed from diagnoses which sometimes require antibiotics to predominantly those that do not typically require antibiotics.
- Individualized academic detailing coupled with audit and feedback promotes a reduction in inappropriate antibiotic prescribing for ARIs more than education or the availability of ARI specific order menus alone.

DISCLOSURES

This quality improvement project was performed to improve patient care and is not generalizable outside of the VA. This project was reviewed by VA research staff and leadership and was determined to meet non-research quality improvement project guidelines. The views expressed in this abstract and poster are solely those of the authors and do not necessarily reflect the position or policy of the US Department of Veterans Affairs. This work is supported with resources of the Boise VA Medical Center and George E. Wahlen VA Medical Center.