

Implementation of Veterans Affairs outpatient antimicrobial stewardship interventions for asymptomatic bacteriuria and acute respiratory infections, a stepped wedge randomized study

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BACKGROUND

Antimicrobial resistance is a growing threat

- Antibiotic use in the US occurs in the outpatient setting **60** %
- **50%** Outpatient antibiotic prescriptions inappropriate

30% Outpatient antibiotics prescriptions unnecessary

Antimicrobial stewardship initiatives are needed for outpatients

Effective methods of outpatient stewardship are not well defined

OBJECTIVE

To design, implement and evaluate the impact of antimicrobial stewardship interventions focused asymptomatic bacteriuria (ASB) and acute respiratory infections (ARI) in the outpatient setting.



METHODS				BASELINE CHARACTERISTICS								
	Inclusion			Exclusion	1		Characteristic	;	Pre (n=405)	Post (n=482)	Significance	
AdultsPCP vis	 Adults PCP visit Complicated infection Immunosuppressed 		Cluster, n (%)								
• Uncomp	olicated ARI		COPD (fe	or ARI)		1			156 (39)	248 (51)		
 Positive 	urinary cultur	e		al urologic ana	atomy (for	2			109 (27)	159 (33)	<0.0001	
Data colle	ASB)			3			140 (35	75 (16)				
 Data collection was completed by retrospective chart review, utilization of existing VA dashboards, and existing patient satisfaction surveys Patients were identified for chart review based on microbiologic data for patients were authors and utilizing the VA ADI dealsh and for ADI. 			Visit Diagno	osis, n (%)								
			Acute bro	onchitis		112 (28)	98 (20)	NS				
positive u	positive urine culture and utilizing the VA ARI dashboard for ARIs			URI-NOS			112 (28)	154 (32)	NS			
	STEPPED WEDGE STUDY DESIGN		Uncomplicated sinusitis		89 (22)	142 (29)	NS					
	October	November	December	January	February	Asymptor	natic bacteriuria		2 (1)	4 (1)	NS	
Cluster 1		Intervention		DO	ст	Male sex, r	n (%)		355 (88)	396 (82)	0.0057	
Cluster 2	PF		Intervention	ΡU	51	Caucasian	race, n (%)		348 (86)	397 (82)	NS	
Cluster 3		KC		Intervention		Age, mean	(SD)		59 (18)	58 (16)	NS	
Pre-group = light purp	le, post-group = dark purp	ble				BMI, mean	(SD)		31 (7)	31 (6)	NS	
	mary Outco		Secor	ndary Outo	comes	CrCl, mean	n (SD)		94 (35)	95 (35)	NS	
presc	all antibiotic riptions as a ibiotic prescr SB	•	primaryPatient	ual compone outcome satisfaction crobial appro	n surveys	300 250 200	210	266	231			

STEPPED WEDGE STUDY DESIGN								
	October	November	December	January				
ster 1		Intervention		DO				
			Inton (option					

Primary Outcomes	Secondary Outcomes
 Overall antibiotic prescriptions as a composite of antibiotic prescriptions for: ASB acute bronchitis URI-NOS uncomplicated sinusitis uncomplicated pharyngitis 	 Individual components of the primary outcome Patient satisfaction surveys Antimicrobial appropriateness Composite safety endpoint within 4 weeks of: Hospital admission Return to clinic visit ED visit

BASELINE CHARACTERISTICS							
Characteristic	Pre (n=405)	Post (n=482)	Significance				
Cluster, n (%)							
1	156 (39)	248 (51)					
2	109 (27)	159 (33)	<0.0001				
3	140 (35	75 (16)					
Visit Diagnosis, n (%)							
Acute bronchitis	112 (28)	98 (20)	NS				
URI-NOS	112 (28)	154 (32)	NS				
Uncomplicated sinusitis	89 (22)	142 (29)	NS				
Asymptomatic bacteriuria	2 (1)	4 (1)	NS				
Male sex, n (%)	355 (88)	396 (82)	0.0057				
Caucasian race, n (%)	348 (86)	397 (82)	NS				
Age, mean (SD)	59 (18)	58 (16)	NS				
BMI, mean (SD)	31 (7)	31 (6)	NS				
CrCl, mean (SD)	94 (35)	95 (35)	NS				
VISI	T DIAGNOSES						
300 266 250 210 200 150 100 100 50 0	231	81	6				

Sinusitis

Acute bronchitis

INTERVENTION

Provider report cards

Provider education (~20 minutes)

Provider pocket card

Clinical decision support within EHR

Patient educational pamphlet

URI-NOS

CDC "Be Antibiotics Aware" educational materials

Overall antibioti ASB antibiotic **Bronchitis and URI-NOS** antib Sinusitis antibi Pharyngitis ant Composite safe ED visit or prima **Overall approp**

average score PRE

Appropriate und Appropriate unc

- No difference in composite safety outcome or patient satisfaction surveys
- Significant increase in appropriate prescribing, however overall numbers were small • Patients were ~ 5 x more likely to receive an appropriate prescription in the post-group • Add to evidence supporting antimicrobial stewardship interventions in the outpatient
- setting

ASB

Pharyngitis



Outcome	Pre (n=405)	Post (n=482)	P value
ic prescriptions n,%	225 (56%)	235 (49%)	NS
prescriptions n,%	12 (3%)	8 (2%)	.08
tibiotic prescriptions n,%	85 (19%)	61 (12%)	.0003
biotic prescriptions n,%	35 (9%)	27 (6%)	NS
iotic prescriptions n,%	69 (17%)	105 (22%)	NS
tibiotic prescriptions n,%	20 (5%)	23 (5%)	NS
ety outcome of related hospitalization, ary care visit within 4 weeks	38 (10%)	41 (9%)	NS
priate antibiotic prescriptions	5 (2%)	23 (10%)	.0004

PATIENT STATISFACTION SURVEYS (100 point score)



Outcome	OR	p-value	95% CI
complicated sinusitis prescription (post group)	4.961	0.0021	1.789-13.754
complicated pharyngitis prescription (post group)	5.359	0.0013	1.927-14.903

CONCLUSIONS

• No significant difference in overall antibiotic prescriptions

Significant decrease in bronchitis prescriptions

 Highly interactive and continual interventions are likely to be even more impactful based on current published evidence and feedback from providers

FUTURE DIRECTIONS

Evaluate risk factors for receipt of inappropriate prescriptions Continue active outpatient antimicrobial stewardship provider education Expanded education sessions to surgery, nursing and pharmacy services