

“Taking Off” with Antimicrobial Intervention Rounds (AIR): Successes of a Pilot Stewardship Service at a Tertiary-Care VA Medical Center

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ABSTRACT

Background: Prospective audit and feedback (PAF) is one of the core strategies of an antimicrobial stewardship program (ASP). Here, we hypothesized that the addition of AIR to our extant ASP would enhance appropriate use of parenteral (IV) antibiotics (ABs) on a large inpatient medical service.

Methods: Adult patients on medicine wards beginning in 10/2017 and not followed by the Infectious Diseases (ID) service were included for stewardship intervention if they were on IV ABs ≥48 hours. Recommendations were classified into: 1) duration of therapy; 2) dose adjustment; 3) IV to oral conversion; 4) adverse event prevention; 5) AB avoidance; 6) anti-pseudomonal or 7) vancomycin de-escalation; 8) AB discontinuation; 9) ID consult; 10) Δ alternative AB; 11) allergy assessment; or 12) diagnostics. Early impact of the interventions was assessed after 3 months via the Standardized Antimicrobial Administration Ratio (SAAR) and compared to the 3-month, pre-AIR period. The SAAR is used to benchmark facilities’ AB use against those of similar complexity; SAAR = 1 indicates that observed = predicted use.

Results: For 158 interventions made, the most common syndromes were pneumonia (47%), skin & soft tissue (29.4%) and urinary tract infection (17.7%). Intervention categories other than 4, 9 and 11 had acceptance rates >85% (Figure 1). The SAAR decreased from the pre- to post-AIR period in terms of agents for: broad-spectrum use in HAI (SAAR relative ratio [RR]: 0.80, 95% CI [0.73-0.88]), MRSA (SAAR RR: 0.81, 95% CI [0.73-0.91]), and all ABs (SAAR RR: 0.86, 95% CI [0.82-0.90]). During the same periods, surgical wards without AIR showed no Δ in AB use.

Conclusion: The majority of AB use recommendations delivered by a pharmacist-physician stewardship team were highly accepted by medical providers and led to a 15-20% decrease in overall AB use, without adverse effect during the immediate post-intervention period. Potential clinical benefits, such as decreased rates of *Clostridium difficile* disease, will need to be measured as the AIR program advances. It is worth noting that interventions for AB allergy assessment were least accepted by providers, possibly due to time required to comply. Design of prospective audit and feedback programs may need to address this potential deficiency.

INTRODUCTION

- Prospective audit and feedback increases stewardship program visibility & provider interactions, while respecting provider autonomy
- Prospective audit and feedback may encompass a variety of interventions, and can affect stewardship outcome metrics
- We assessed reception of our new Antibiotic Intervention Rounds (AIR) service and used the Standardized Antimicrobial Administration Ratio (SAAR) to illustrate the impact of AIR interventions

HYPOTHESIS

We expected a moderate (50%) acceptance rate by providers for recommendations made by the new AIR service

METHODS

Primary Objective:

- To evaluate the proportion of AIR recommendations accepted by primary inpatient providers across 12 stewardship categories

Study Design:

Inclusion Criteria:

- Adult veterans admitted to medical-surgical wards on IV antibiotics for >48 hours
- Not followed by ID Consult service at time of AIR recommendation

Primary Endpoint

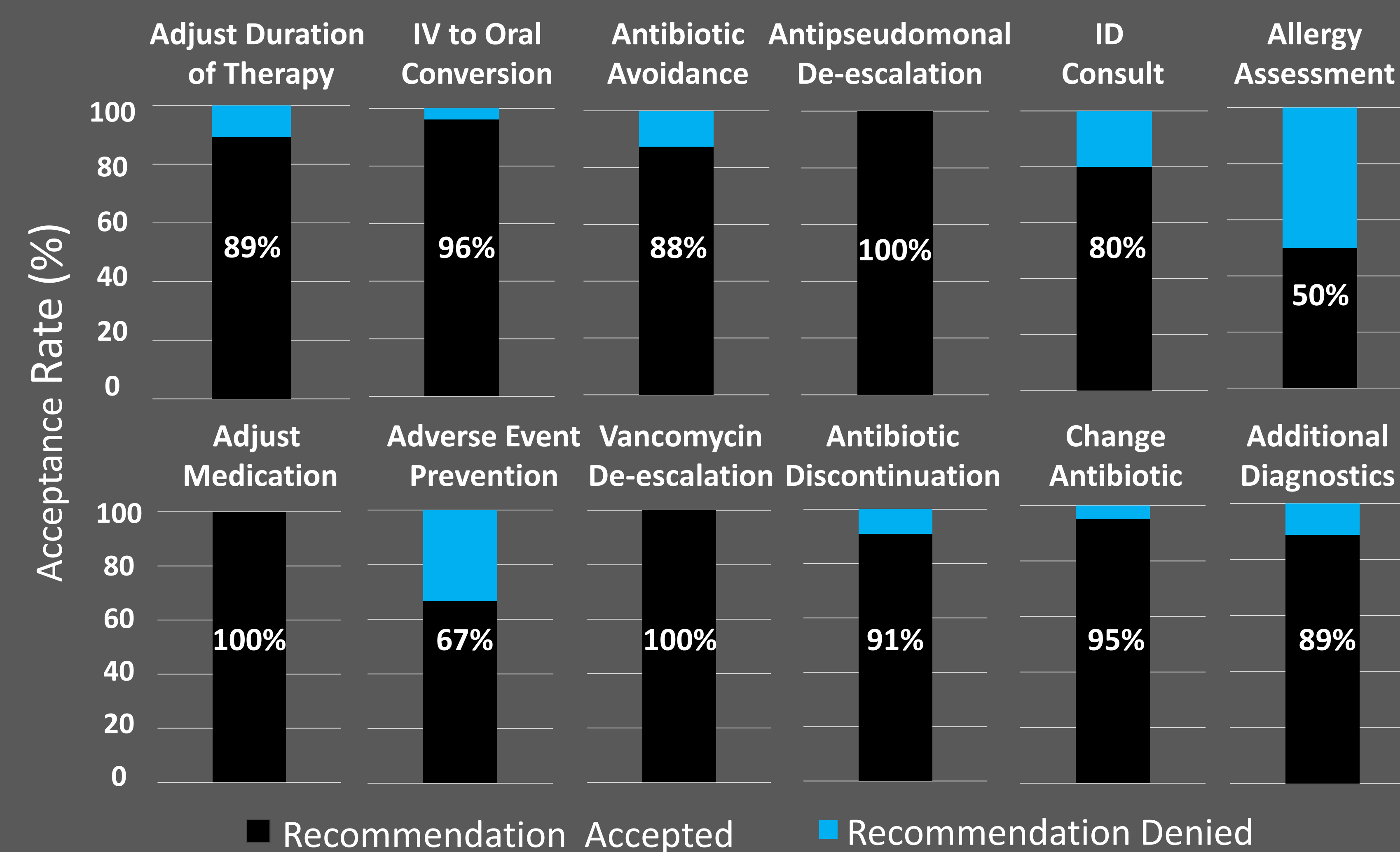
- At least 50% acceptance rate across 12 ASP intervention categories
(Adapted from VA Pharmacists Achieve Results with Medications Demonstration (PhARMMD) Tool: Antimicrobial Stewardship Surveillance)

Secondary Endpoints:

- Changes in antibiotic use after AIR service implementation (as measured by SAAR)
- Distribution of infectious syndromes monitored by AIR service

RESULTS

Majority of AIR Recommendations Highly Accepted Overall (n = 158)



Notably:

- Acceptance rates for vancomycin and anti-pseudomonal de-escalation after cultures resulted were 100%
- Fluoroquinolone adverse event prevention and appropriate allergy assessment were challenging areas
- Unnecessary agents for MRSA & MDRO infection significantly decreased

Authors have no actual/potential conflicts of interest in relation to this presentation

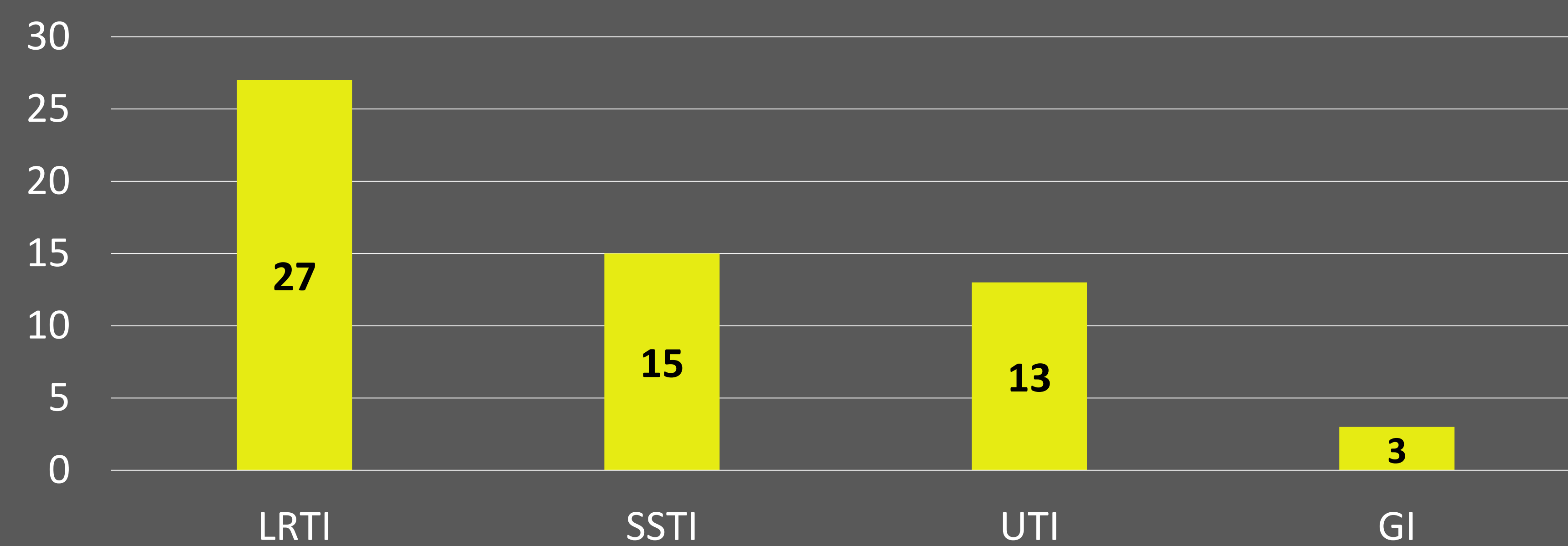
Medical Ward SAARs Were Reduced after AIR Implemented

High-Yield Indicator	Pre-AIR 2017Q3	Post-AIR 2017Q4	Relative Ratio 95% CI
All Antibiotic Agents	0.994	0.852	0.857 (0.815 to 0.901)
High-Level Targets			
Broad-spectrum agents for healthcare-associated infection	1.242	0.996	0.802 (0.728 to 0.884)
Broad-spectrum agents for community-acquired infection	0.967	0.888	0.918 (0.826 to 1.021)
Anti-MRSA agents	1.234	1.002	0.812 (0.725 to 0.91)

Surgical Ward SAARs Were Unchanged without AIR Service

High-Yield Indicator	No AIR 2017Q3	No AIR 2017Q4	Relative Ratio (95% CI)
All Antibiotic Agents	0.888	0.95	1.07 (0.984 to 1.164)
High-Level Targets			
Broad-spectrum agents for healthcare-associated infection	1.076	1.016	0.944 (0.79 to 1.127)
Broad-spectrum agents for community-acquired infection	0.373	0.436	1.169 (0.894 to 1.522)
Anti-MRSA agents	0.972	1.148	1.181 (0.978 to 1.426)

Pneumonia Was the Most Monitored Syndrome on the AIR Service



CONCLUSIONS

- Majority of AIR recommendations had a ≥85% acceptance rate, including broad-spectrum agent de-escalation, IV to oral conversion, antibiotic discontinuation and guideline-based duration of therapy
- A 15 to 20% decrease in antibiotic use was observed
- Allergy assessment remains a key area for improvement for AIR

FUTURE DIRECTIONS

- Monitoring impact of AIR on clinical outcomes, i.e., *C. difficile* incidence
- Developing methods to facilitate efficient, comprehensive and safe allergy history assessments during inpatient hospital stay