

Top Antimicrobial Stewardship Intervention Publications in 2020

A “Menu” of AS Interventions

Introduction

The number of annual publications in antimicrobial stewardship (AS) has increased over the past 10 years, with 1500 published last year alone! The Southeastern Research Group Endeavor (SERGE-45) network has methodically selected top AS articles for the past 4 years and 2020 is no exception. Using a modified Delphi technique, they identified AS publications from 2020 that included an actionable intervention, defined as an “AS strategy that was implemented in practice and resulted in measurable outcomes.” A total of 121 articles were reviewed and ranked by the SERGE-45 network and a final consensus on the top 13 articles was established.¹

This compilation of helpful articles with AS interventions can serve as a menu of sorts for potential interventions to be considered in our own facilities in the areas of outpatient and ED AS, diagnostic stewardship, and allergy delabeling. The robustness of the studies and the resources needed to implement will vary. This newsletter will summarize the studies included in this SERGE-45 article that may be of interest to you. We provide information on the area of AS of the intervention, the active intervention, results, and what kind of unique resources were needed. If there is an intervention that may serve an opportunity at your hospital please do not hesitate to discuss further with your DASON liaison.

Peer comparison-based intervention in the ED²

Stewardship target: Emergency department AS

Intervention: Physician education on common infections in the ED and monthly de-identified bar graphs comparing antibiotic prescribing to peers.

Results: Monthly prescription rate decreased by 10.4 prescriptions per 1000 ED visits, and the rate of prescriptions without an indication also decreased.

Resource needs: Time dedicated to create the de-identified feedback, need to obtain and adjust for shifts worked or visits seen per provider, and time to educate all the ED providers given the varying times of shift work.

Ambulatory care pharmacist-led intervention effect on antimicrobial prescribing³

Stewardship target: Ambulatory care AS

Intervention: Asynchronous bi-weekly prescriber feedback reports providing “positive reinforcement of prudent prescribing with constructive and supportive comments highlighting better options when available.”

Results: Increased guideline concordance for the 3 infection types chosen for intervention (UTI, SSTI, and URIs), 38.9% to 57.9% (P=0.001). Changed future prescribing behavior due to the asynchronous nature of the intervention.

Resource needs: Intervention performed by 2 dedicated pharmacists in the outpatient setting; however, neither were ID trained.

Clinical impact of rapid ID and susceptibility testing for Gram-negative bacteremia⁴

Stewardship target: Diagnostic stewardship

Intervention: Used the Accelerate Pheno[®] system that provides rapid phenotypic antimicrobial susceptibility results within hours of identifying growth on a culture combined with AS recommendations. Standard of care arm had MALDI-TOF for ID of isolate.

Results: Both control and intervention arm received AS recommendations. The intervention arm had a faster median time to first antibiotic change (6.3 hours; P=0.02). Median time to first Gram-negative antibiotic change was almost 25 hours faster. Appropriate antibiotic escalation (occurred in 15%) occurred 43.3

hours faster in the intervention group when a resistant isolate was discovered.

Resource needs: Accelerate Pheno[®] system, validation of results, ASP needs to be already providing real-time audit and feedback to clinicians on positive blood cultures during regular business hours. It should be noted that this intervention was in addition to an existing next generation platform (Maldi-TOF) and therefore may underrepresent potential gains in laboratories that have not yet implemented rapid diagnostics.

Impact of clinical decision support for urine studies⁵

Stewardship target: Diagnostic stewardship

Intervention: Embedded an orderset in the EMR that required prescribers to choose an indication for urine study orders (i.e., suspected UTI, noninfectious indication, or screening purposes or neutropenia), then directed the practitioner to the correct test based on indication. Choosing 'suspected UTI' directed prescriber to order a UA with reflex to culture and required documenting symptoms. Choosing 'noninfectious indication' lead to a UA order with or without microscopy without reflex to culture.

Results: Urine culture orders reduced by 38.5%, and monthly antibiotic DOT for UTI by 12.5%. They also reported a non-significant reduction in CAUTI SIR and cost associated with antibiotics for UTIs and urine cultures.

Resource needs: Need an EMR with these types of clinical decision algorithm capabilities, then will need prescriber and laboratory champions to help with implementation. However, it does seem to be very practical as a diagnostic stewardship intervention with minimal maintenance needs after initially setting up the orderset.

Impact of an ASP pharmacist during microbiology rounds⁶

Stewardship target: Diagnostic stewardship

Intervention: An AS pharmacist participated in review of antimicrobial susceptibility testing requests from inpatient and outpatient providers. They also assisted with selective reporting to guide appropriate

antimicrobial prescribing and served as a direct liaison between the micro lab and clinicians.

Results: There was approval of 47.8% of susceptibility requests, education to providers occurred in 43.4% of the cases and there was decreased work up and treatment of contaminants.

Resource needs: Robust AS team, even this academic center called their intervention, "enhanced AS program" suggesting this was an extra time intensive intervention for the AS pharmacist. However, there may be ways to fine tune triaging requests to optimize pharmacist involvement.

Impact of an EMR nudge on reduced testing for hospital-onset CDI⁷

Stewardship target: Diagnostic stewardship

Intervention: EMR 'nudge' or pop-up notification to encourage cancellation of CDI order in patients who received a laxative within the past 24 hours, implemented in 4 different hospitals.

Results: There was a significant decrease in the proportion of orders for *C. difficile* testing placed after hospital day 3 and within 24 hours of laxative administration (8% during the preintervention period vs 6% during the postintervention period; $P < .001$). There was a decrease in HO-CDI LabID events in all hospitals, but this finding was only significantly different in the hospital that also performed audits of HO-CDI cases.

Resource needs: Very low resource need other than the upfront IT time. Many EMRs have the ability to detect administration of laxatives or stool softener and can trigger a pop-up alert. However, the triggers will need to be validated and minimized to only those orders associated with a laxative administration will cause an alert given that many hospitalized patients have as needed orders for these medications.

Penicillin allergy delabeling by multi-disciplinary team⁸

Stewardship target: Allergy delabeling

Intervention: Nursing, pharmacy, and medical staff were trained to use the previously validated Antibiotic Allergy

Assessment Tool (AAAT) to risk stratify adult inpatients reporting penicillin allergy. Low-risk patients were then either delabeled, offered oral penicillin, or referred for outpatient allergy assessment.

Results: 29% of penicillin allergies reported by patients were considered low risk, 45% of these had direct delabeling and 55% were delabeled after oral challenge. They found increased use of narrow spectrum penicillins and reduced use of broad spectrum cephalosporins and restricted antibiotics in delabeled patients. They also reported cost savings to the health system by avoiding po challenges and outpatient allergy assessments in many patients.

Resource needs: Time and subject matter expertise requirements for education of multidisciplinary team, allocate dedicated staff time to perform these assessments.

Improving decision making in empiric antibiotic selection for Gram-negative bacteremia⁹

Stewardship target: Handshake stewardship

Intervention: Prior to intervention, this site used formulary restriction and approvals for high cost and certain broad-spectrum agents. Intervention program added daily rounds, education, and dissemination of local guidelines for 2 years.

Results: Post intervention there was a 13.7% reduction in carbapenem use, 69% reduction in tigecycline use, and a non-significant reduction in colistin use. As expected, antibiotic costs decreased 25%, but remarkably, the rate of nosocomial carbapenem resistant Gram-negative bacteremia also decreased by 34.8%!

Resource needs: This intervention is considered high resource from the standpoint of personnel commitment. Dedicated personnel who can consistently be present are key to success. Unlike many other interventions with a high resource requirement for set up and then minimal resources needed to maintain, this intervention will require ongoing personnel support consistently.

Conclusion

- Of the top 13 antimicrobial stewardship intervention studies published in 2020, we chose 8 that described actions potentially feasible in many DASON sites and had clearly measured outcomes.
- The resource availabilities, opportunities and priorities at your hospital will vary and therefore all of these interventions may not be as valuable to your hospital as they were in these studies.
- If any of these areas of AS concern become priorities in your hospital please do not hesitate to reach out to your DASON liaison for further information and feasibility discussion.

References

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