

# Handshake Stewardship: Interdisciplinary Rounds as a Tool to Spread Antimicrobial Stewardship Led by Hospitalist-Pharmacist Teams

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## Short Research Report

**Keywords:** Handshake stewardship, antimicrobial stewardship, interdisciplinary rounds, pharmacist, hospitalist

**Posted Date:** February 1st, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-177932/v1>

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# Abstract

## Background

Over the past decade there has been a greater emphasis on optimizing antimicrobial stewardship. Most stewardship models rely upon a central team, often led by infectious disease doctors and pharmacists to oversee institutional prescribing. We believe there is opportunity to complement this model by incorporating stewardship into interdisciplinary rounds.

## Objective

To assess feasibility and acceptance of antimicrobial stewardship into interdisciplinary rounds.

## Method

We piloted a stewardship model driven by hospitalists and pharmacists through interdisciplinary rounds on four medicine units. We hypothesized that our process would not hamper existing tasks of interdisciplinary rounds. We surveyed team members to understand how the initiative was experienced.

## Results

Many clinicians reported that antimicrobial prescribing was 'often' or 'always' discussed, and the process was 'not too burdensome' to incorporate. These responses varied based on the type of provider. A majority of the advanced practice providers (88%) reported the model prompted them to reconsider their individual antimicrobial prescribing. A 28.1% overall reduction of target antibiotic utilization was realized, however, there may be other contributors to this reduction.

## Conclusion

We believe interdisciplinary rounds can provide a good platform to extend hospital-based antimicrobial stewardship. It was not felt to disrupt the efficiency of achieving other goals of interdisciplinary rounds.

## Impact On Practice Statements

- Our antimicrobial stewardship experience adds to the emerging practice of actively engaging frontline clinicians in antimicrobial stewardship activities
- Our take on handshake stewardship can be utilized to expand stewardship practices and expand the role of existing personnel if there are limited resources for stewardship programs

## Introduction

Over the past decade, antimicrobial resistance, *Clostridioides difficile*, and their associated costs triggered a greater reliance on antimicrobial stewardship programs (ASP), with goals of promoting judicious use of antibiotics and reducing patient harm [1]. ASP strategies such as formulary restriction, review and

feedback, and antimicrobial cycling have shown to improve patient outcomes, reduce adverse events, and improve rates of antibiotic susceptibilities [1, 2]. Not all institutions may be able to sustain or expand an ASP team dedicated to antimicrobial stewardship, however, there may be an opportunity to expand on the roles of existing personnel [3].

A summary of the *Antimicrobial Stewardship: 2018 Leading Practices Conference* recognized active engagement of frontline clinicians as an emerging practice and a key suggested intervention in improving stewardship programs [4]. Also referred to as “handshake stewardship”, this intervention was described as an effective strategy involving a rounding-based, in-person approach carried out by a pharmacist-physician team [5].

Most stewardship models rely upon a central team, often led by an infectious disease (ID) doctor, and an ID pharmacist to oversee institutional prescribing. However, by adding handshake stewardship on a local level through IDR, we aimed to bring decisions about antimicrobial prescribing into the daily decision-making process among front-line care providers.

## **Aim of the Study**

The principal aim was to assess feasibility and acceptance of the model while a secondary goal was to reduce overall antibiotic use.

## **Ethics Approval**

According to the policy activities that constitute research at our institution, this work met criteria for quality improvement activities exempt from ethics review.

## **Method**

### *Setting*

The intervention took place over 12 months from January 2018 to December 2018 at an 850-bed quaternary-care teaching hospital. For the first 3 months, the intervention was developed and tested on two medicine units, and was expanded to include two additional medicine units for the remaining 9 months from April 2018 to December 2018.

At our hospital, each medicine unit has an IDR team comprised of a hospitalist, nursing staff, clinical pharmacist, case managers, and either advance practice providers (APP) or medical residents. Most medicine units at our facility are mainly employed by APP, which include nurse practitioners and physician assistants, with the exception of one unit that is driven by medical residents on hospitalist-led teams. Hospitalists provide oversight of IDR, though the attending-of-record for a given patient may be different.

Prior to the implementation of the intervention, the existing ASP activities at our institution included review of sterile site cultures for appropriate antibiotic prescribing, prospective audit and feedback focusing on costly agents or those reserved for resistant pathogens, and IV to PO conversions conducted by clinical pharmacists for select antibiotics with good oral bioavailability. This central approach allows for oversight of prescribing at our institution and track trends.

### *The Intervention: Handshake Stewardship*

We implemented a version of handshake stewardship that was different than that of Hurst et al [5]. In their study, the pharmacist-physician ID team would physically locate the teams during unit rounds (15 teams total), and communicated recommendations to providers. In our study, the hospitalist and clinical pharmacist who are non-ID, unit-based clinicians would serve as the stewards on each unit, and thus we had four groups implementing ASP interventions simultaneously.

The goals of our intervention were similar to those cited in the literature: discontinuation of antimicrobials when a source of infection is not present, reduction in excess duration of antimicrobials, and antimicrobial de-escalation based on culture data.

Potential targets for intervention included patients with uncomplicated cystitis, community-acquired pneumonia, or patients on empiric therapy who were stabilized without a clear infection after approximately 3 days. These were identified prior to the intervention by the central ASP team as having the highest potential for improving antibiotic utilization, but did not exclude other opportunities for antibiotic de-escalation.

Following a process map developed by the central ASP team (figure 1), pharmacists reviewed patients who were prescribed antibiotics using a criteria-based list on the electronic medical record. These lists were reviewed manually to monitor antibiotics used, culture results, and therapy duration. This review is conducted prior to IDR, so that the pharmacist can present this information during IDR.

The hospitalist leads IDR as an opportunity to discuss the overall plan for antibiotics. After IDR, the APP, resident, or pharmacist would communicate stewardship recommendations to the attending-of-record.

### *Analysis*

A 10-question survey was distributed to clinicians that comprise IDR teams on each of the units to understand how subgroups rated the impact of the initiative.

We also measured the change in target inpatient antibiotic utilization (antibiotic days per 1000 patient days) on each of the 4 medicine units before and after intervention (2017 vs 2018). This was a composite measure of the 16 antibiotic agents selected for observation in all groups (figure 3).

## **Results**

A total of 115 surveys were completed. Not every question from each survey was answered (table 1). Eighty-three percent of respondents reported that the ASP initiative helped raise awareness of the importance of stewardship. Forty-three percent of respondents noted that antimicrobials were 'always' discussed during IDR. Furthermore, 67% of respondents reported that the process was 'not too burdensome' to incorporate, while 28% reported uncertainty and 5% as 'burdensome'. A majority of the APP (88%) reported that the stewardship project prompted them to reconsider individual antibiotic prescribing.

The overall reduction of target antibiotic utilization of the four study units from 2017 to 2018 ranged from 15.6% to 32.6% (figure 2). On average this decrease was about 28.1% (monthly average 662 vs 476 antibiotic days per 1000 patient days, respectively). A similar reduction was observed among the different antibiotic drug classes analyzed (figure 3).

## Discussion

The main focus of our work was to demonstrate that antimicrobial stewardship could be integrated into IDR without adding a significant burden to IDR teams attempting to focus on other aspects of care delivery. By surveying several members of the IDR teams we learned that the integrated stewardship process was simple, embraced, and sustainable – at least among the groups of clinicians that are always practicing on the same medicine units. This included the APP, pharmacists, and nursing staff.

The results were less favorable for the medical residents and hospitalists, and we believe that this was more a reflection of their rotating on different medicine units – many of which did not have this IDR-based stewardship model yet implemented. It is also notable that residents do not routinely attend IDR except one unit, which is uniquely modeled with solely medical residents on hospitalist-led teams. The nursing staff group had variable responses in the survey results as well. Their response to whether 'ASP is not burdensome to incorporate into IDR' may be reflective of their perception of the value of antimicrobial stewardship overall. The perception and understanding of antimicrobial stewardship in these groups may be an area of focus for the central ASP team going forward. Similar to a previous study, it may be essential to incorporate a bundled educational intervention to improve awareness and acceptance of ASP initiatives [6].

Pharmacists and APP appeared to have a more positive experience with the initiative. In regards to APP, it is likely that this ASP initiative provides added support for the APP to streamline patient care. The overall consensus was that the process was not burdensome to incorporate into IDR and that it promoted more awareness around antibiotic prescribing.

The integration of antimicrobial stewardship appears to be a natural addition and may complement the overall IDR goal to optimize patient flow. Often a patient's hospital discharge is dependent upon completion of medications. Therefore IDR may serve as a natural 'time-out' point to reflect on antibiotic indication, duration, and transition to oral or outpatient infusion.

Rounds also facilitate a forum where bedside clinicians can engage in focused conversations of clinical strategy. Tang et al demonstrated that when compared to a non-intervention group, implementing a clinical pharmacist with stewardship training significantly decreased total antibiotic use by 33% [6]. Moreover, the authors acknowledged that face-to-face interactions among team members likely contributed to these reductions, which is a focus in handshake stewardship [5, 6].

We observed a similar 28.1% decrease of antibiotic use on the four test units from 2017 to 2018. Notably, four other non-intervention units (medicine/surgery/telemetry) in the hospital that did not have this pilot in place, also saw a decrease of about 25.9% in antibiotic prescribing during this timeframe.

Our study has several limitations. We could not define our initiative as the primary reason for the antibiotic reductions as several concomitant initiatives are in place at our hospital a control group was not clearly identified. Appropriateness of antibiotics was not evaluated in our study, but would be beneficial to collect this data in future studies. Further, this was a single-center study and the results may not speak to success at other hospitals. On the other hand, for hospitals that rely upon a similar IDR process, we believe that similar success with acceptance, implementation, and results would be demonstrated.

## **Conclusion**

We believe interdisciplinary rounds can provide a good platform beyond optimizing of patient flow and to extend hospital-based antimicrobial stewardship. It was not felt to disrupt the efficiency of achieving other goals of interdisciplinary rounds and may be essential for safe and effective healthcare delivery.

## **Declarations**

### **Acknowledgments**

We would like to thank the participating pharmacists, hospitalists, advanced practice providers, medical residents, and nurses for their involvement in this quality improvement project.

### **Conflicts of Interest**

All authors report no relevant conflicts of interest.

### **Funding**

No funding was received for conducting this study.

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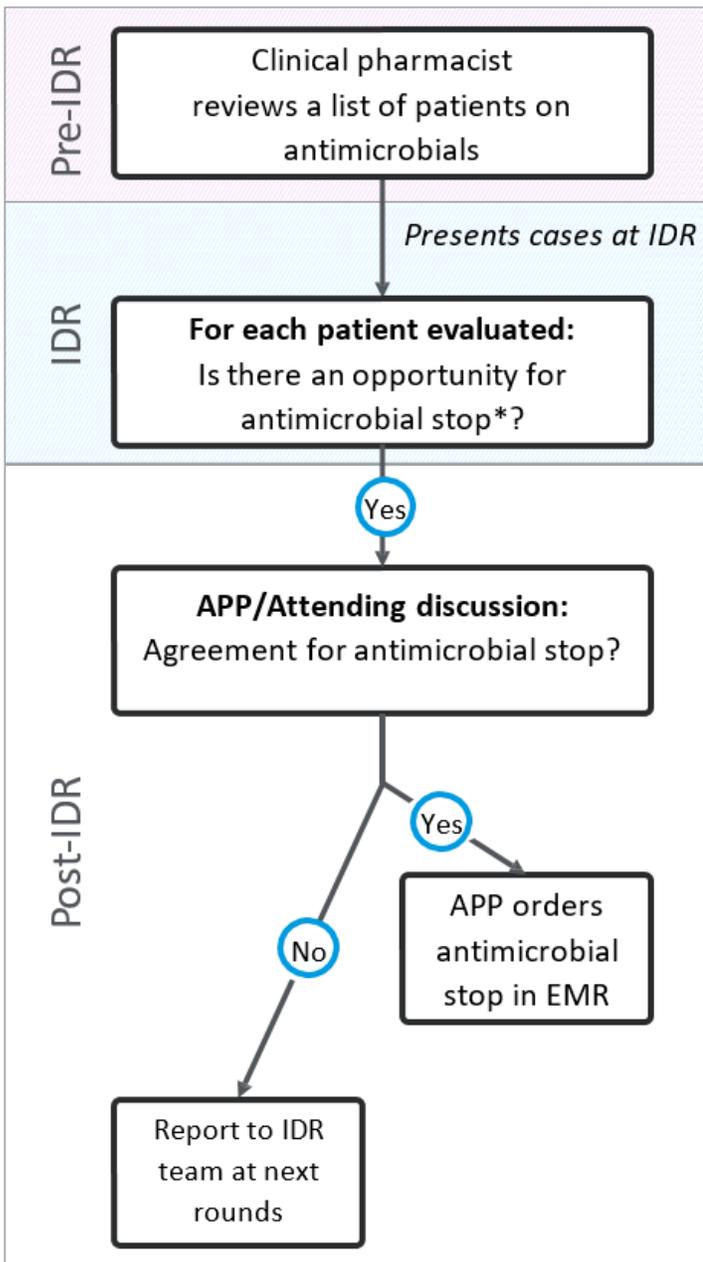
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## Tables

<b>Table 1. Antimicrobial Stewardship Project Survey Questions and Results<sup>a</sup></b>					
	<b>Hospitalists (n = 12)</b>	<b>Medical Residents (n = 38)</b>	<b>APP (n = 8)</b>	<b>Nursing Staff (n = 54)</b>	<b>Pharmacists (n = 3)</b>
How often are antibiotics discussed on IDR	Always: 5 of 11 (45%)	Always: 2 of 26 (8%)	Always: 6 of 8 (75%)	Always: 23 of 43 (53%)	Always: 3 of 3 (100%)
	Often: 2 of 11 (18%)	Often: 4 of 26 (15%)	Often: 2 of 8 (25%)	Often: 9 of 43 (21%)	Often: 0
	Sometimes: 4 of 11 (36%)	Sometimes: 16 of 26 (62%)	Sometimes: 0	Sometimes: 10 of 43 (23%)	Sometimes: 0
Aware of the ASP initiative on the units	8 of 12 (67%)	3 of 38 (8%)	5 of 8 (63%)	12 of 54 (22%)	3 of 3 (100%)
ASP initiative helped to raise awareness of the importance of antibiotic stewardship <sup>b</sup>	6 of 8 (75%)	2 of 3 (67%)	4 of 5 (80%)	11 of 12 (92%)	2 of 3 (67%)
ASP is not burdensome to incorporate in daily IDR/workflow	10 of 11 (91%)	25 of 38 (66%)	7 of 8 (88%)	29 of 51 (57%)	3 of 3 (100%)
ASP helped rethink antibiotic prescribing practice	5 of 10 (50%)	8 of 20 (40%)	7 of 7 (100%)	N/A	N/A
Abbreviations – ASP (antimicrobial stewardship program), APP (advanced practice provider), IDR (interdisciplinary rounds)					
a – ‘n’ reflects total surveys submitted in each group; % results are based on number of responses per question					
b – based on responses of those who were aware of the ASP initiative					

## Figures



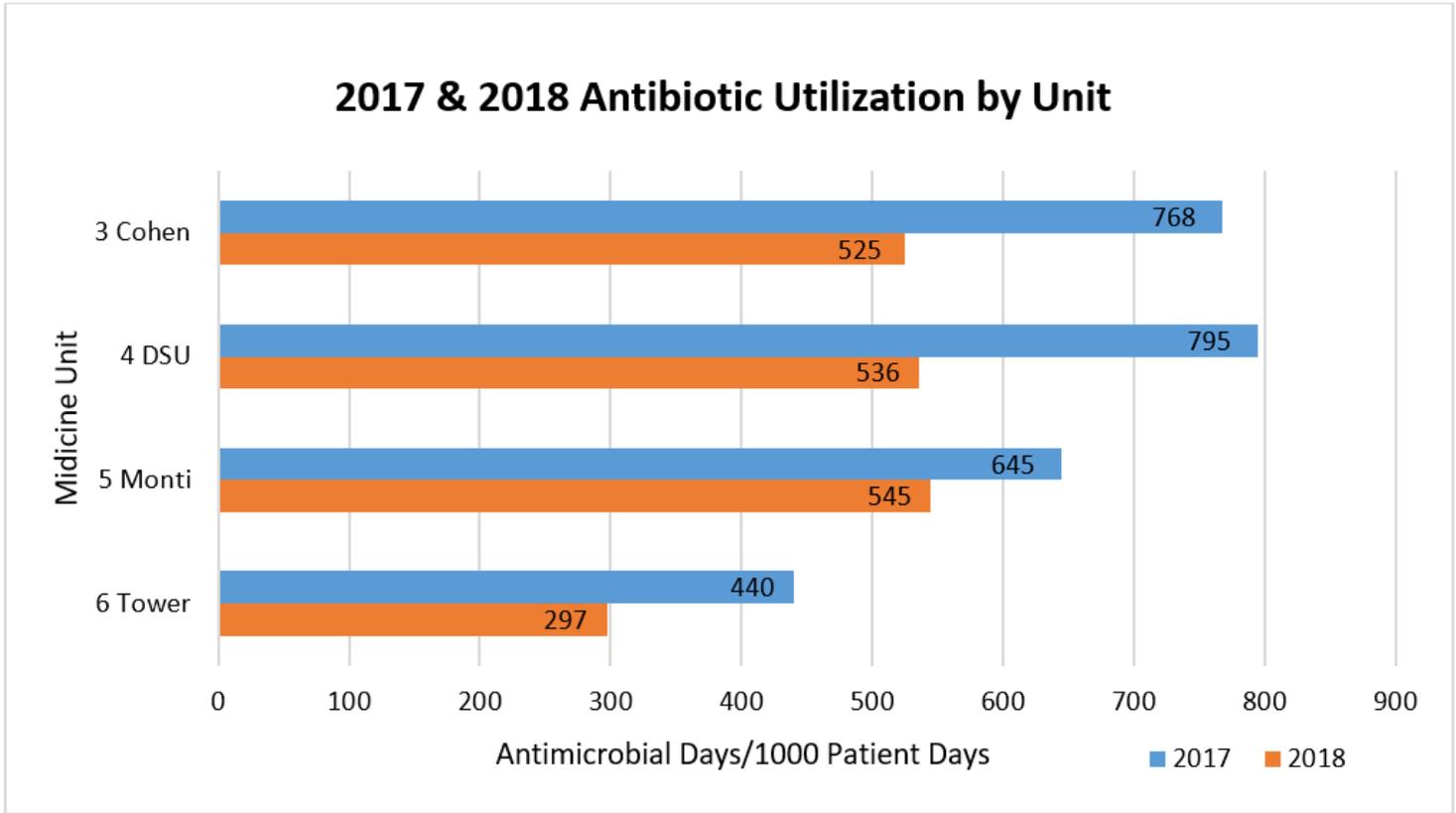
IDR – interdisciplinary rounds; APP – advanced practice provider;  
 EMR – electronic medical record

**\*Opportunity for Antimicrobial Stop Examples:**

1. Simple UTI – 5 days maximum
2. Community-acquired pneumonia – 7 days maximum
3. Empiric treatment for infection but negative ‘work-up’

**Figure 1**

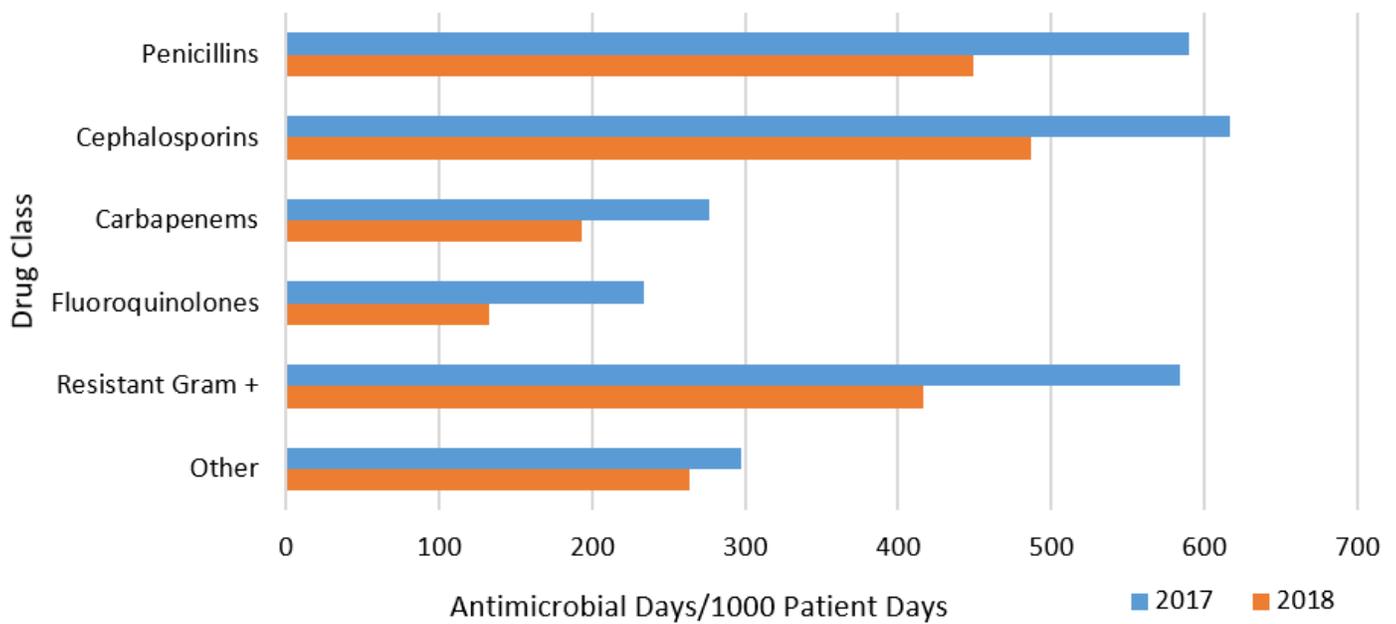
Handshake Stewardship Process Map Demonstrates the process followed by hospitalist and pharmacist in implementing handshake stewardship before, during, and after IDR.



**Figure 2**

Antibiotic utilization of select agents in antibiotic days per 1000 patient days on the four units in 2017 vs. 2018. All of the listed units are medicine units. Sixteen antibiotic agents were selected for observation in all groups. Of note, the intervention period on 3 Cohen and 4 DSU was between January to December 2018, while in 5 Monti and 6 Tower it was between April to December 2018. An overall reduction of 28.1% was observed.

## 2017 & 2018 Antibiotic Utilization of Target Agents by Drug Class



**Figure 3**

Antibiotic utilization by drug class in antimicrobial days per 1000 patient days on the four medicine units in 2017 vs. 2018. Sixteen antimicrobial agents were selected for observation. These included penicillins (ampicillin/sulbactam, piperacillin/tazobactam), cephalosporins (cefazolin, ceftriaxone, cefepime), carbapenems (ertapenem, imipenem/cilastatin, meropenem), fluoroquinolones (ciprofloxacin, levofloxacin), resistant gram + (vancomycin, daptomycin, linezolid), and other (aztreonam, azithromycin, metronidazole).