Center-level variability in broad-spectrum antibiotic prescribing for children undergoing hematopoietic cell transplantation for acute leukemia.

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Background. Patient-directed education that aims to lower patients’ expectations for antibiotics is a promising strategy to reduce antibiotic usage for viral upper respiratory tract infections (URTIs). We aimed to test three posters on a patient population to see whether the messages were comparable in reducing expectations for antibiotics to treat URTI.

Methods. We developed three posters about antibiotic treatment of URTI (fig. 1). The first indicated that antibiotics are not helpful (futility), the second indicated that antibiotics can cause personal harm (ADR), and the third indicated that antibiotic usage promotes the development of antimicrobial resistance (resistance). We surveyed hospital inpatients over the age of 15 years to measure their expectations to receive antibiotic treatment if they had a hypothetical URTI. We then showed each participant one of the three posters selected randomly, and after 20–30 minutes completed a follow-up survey.

Results. 299 participants completed both surveys. There was a statistically significant association between participants’ responses and highest education level (P < 0.001). Eighty-one/299 (27%) expected their doctor to prescribe antibiotics for a "bad cold or flu" and this reduced to 38/299 (13%) after viewing the posters (P < 0.01). This result did not vary between posters, but participants shown poster 2 (ADR, n = 101) and 3 (resistance, n = 100) were less likely to agree that “antibiotics are safe” compared with participants shown poster 1 (futility, n = 98) (P < 0.001). The majority of the participants thought the information would affect their future behaviour (192/299, 64%) and that they would be likely to discuss this information with their friends and families (232/299, 78%). The overall opinions of participants shown poster 2 (ADR) and poster 3 (resistance) were significantly different from the opinions of participants shown poster 1 (futility) (P < 0.01).

Conclusion. Our brief, inexpensive intervention reduced expectations to receive antibiotics for a hypothetical URTI. Information about personal harms (ADR) and public harm (resistance) might have more impact than information solely about futility. This result did not vary between posters, but participants shown poster 2 (ADR, n = 101) and 3 (resistance, n = 100) were less likely to agree that “antibiotics are safe” compared with participants shown poster 1 (futility, n = 98) (P < 0.001). The majority of the participants thought the information would affect their future behaviour (192/299, 64%) and that they would be likely to discuss this information with their friends and families (232/299, 78%). The overall opinions of participants shown poster 2 (ADR) and poster 3 (resistance) were significantly different from the opinions of participants shown poster 1 (futility) (P < 0.01).

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767. The Development and Assessment of a Physician-Specific Antibiotic Usage and Spectrum Feedback Tool

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Background. Measuring antimicrobial usage is a hallmark of antimicrobial stewardship programs. Service-level antimicrobial consumption data is easily obtained but offers limited value to individual clinicians. More specific data via spot audit is resource intensive to collect and may not reflect true practice. Additionally, though clinicians may prescribe antimicrobials with differing frequency, there may also be variability in the choice and spectrum of antimicrobials prescribed. We developed an individualized multidimensional tool using available prescribing and dispensing data to enhance peer comparison and feedback on antimicrobial prescribing.

Methods. Development was conducted in a 442-bed academic acute care hospital in the largest of General Internal Medicine in Toronto, Canada. Physician-specific antibiotic consumption data (DDD/100 patient days and DOT/100 patient days) was obtained between February 15th and August 24th, 2016. Summative spectrum of activity was calculated using a metric assigning a value from 0 to 60 to each antimicrobial and obtaining a weighted average of total antimicrobial prescribing by clinician (spectrum scoremetric, modified from Madaras-Kelly et al 2014).

Results. Mean antimicrobial consumption was 39.1 ± 135 DDD/100 patient days and 38.5 ± 8.4 DOT/100 patient-days. There was significant variability between the lowest and highest prescribers in both the DDD and DOT (3.3-fold difference DDD/100 patient days, 2.2-fold difference DOT/100 patient days). Mean spectrum score was 23.7 ± 1.8 (approximating Second generation cephalosporins). Variability was also pronounced in the minimum prescriber being 19.5 (equivalent to cefazolin) and maximum being 26.7 (more broad than ceftriaxone). Feedback of this data were given individually to clinicians with other prescribers de-identified. Physicians found the data to be easy to understand and acceptable for further use.

Conclusion. Individualized feedback of summative antimicrobial consumption and spectrum provides insight to clinicians. This data can be considered to promote peer comparison and reflection of antimicrobial prescribing. This tool may also be helpful for benchmarking antibiotic usage within and between institutions.

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768. An Opt-out Approach to Antimicrobial Stewardship Utilizing Electronic After-Hours Recommendations at a Community Hospital

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Background. Prospective audit and feedback is a primary tool for antimicrobial stewardship, but inefficient communication and provider non-participation can limit the impact. To address these issues, a customizable electronic alert system was created to deliver antimicrobial stewardship recommendations to providers upon opening the electronic medical record. If no provider declined the recommendation after 24 hours, the recommendation was implemented by the antimicrobial stewardship program per protocol. This study describes the experience of an opt-out antimicrobial stewardship pilot at a community hospital.

Methods. This is a pragmatic, quasi-experimental, single center study describing the frequency of accepted recommendations delivered during a 12 week intervention period. Recommendation responses are categorized by intent of the recommendation, day of antibiotic therapy, prescribed antibiotics, responding provider specialty, and clinical reasoning. Secondary outcomes are target antimicrobial days of therapy (DOT) per 1000 patient days and healthcare facility-onset Clostridium difficile infections (HO-CDI) per 10,000 patient days for the three months before, during, and three months after the intervention period.

Results. In total, 804 of 1170 (69%) antibiotic recommendations were accepted yielding an average of 10 accepted recommendations per day. Of those accepted, 113 (14%) recommendations were implemented by the antimicrobial stewardship program upon recall. Antibiotic prescriptions to discharge were accepted more than recommendations to discontinue therapy, 376/524 (72%) and 414/631 (66%), respectively. Target antibiotic DOT per 1000 patient days decreased from 775.2 in three months prior to 631 during the pilot (P = 0.05). HO-CDI per 10,000 patient days decreased from 16.24 to 11.70 (P = 0.12). After cessation of the intervention, anti-biotic DOT and HO-CDI rates increased, 681 and 15.55, respectively.

Conclusion. The combination of opt-out antimicrobial stewardship with electronic delivery of recommendations demonstrated an efficient and effective approach to prospective audit and feedback. Future applications are broad including antimicrobial stewardship telepharmacy.

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769. Center-level variability in broad-spectrum antibiotic prescribing for children undergoing hematopoietic cell transplantation for acute leukemia

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Background. Antibiotic exposure after allogeneic hematopoietic cell transplant (HCT) is common. Exposure to specific classes of antibiotics after HCT has been associated with mortality, relapse and graft-vs.-host disease. Exploring differences in antibiotic utilization across hospitals could provide opportunities for comparative effectiveness studies and quality improvement interventions.

Methods. We conducted a retrospective cohort study of patients undergoing HCT for acute leukemia using a dataset merged from two sources: the Pediatric Health Information System and the Center for International Blood and Marrow Transplant Research. Medication use data were obtained from the day of transplant through engraftment. Hospital antibiotic utilization rates were reported as antibiotic days/1000 neutrophen days. Adjusted rates were calculated using a poisson regression controlling for age, sex, race, graft characteristics and days of ICU-level care.

Results. After adjustment, hospital rates of anti-pseudomonal antibiotic use varied from 410 to 1037 antibiotic days/1000 neutrophen days (Figure 1A) and for Gram-positive antibiotic use from 109 to 771 antibiotic days/1000 neutrophen days (Figure 1B). As shown in Figure 1, within anti-pseudomonal antibiotics there was variation by hospital in the use of Fourth and 5th generation cephalosporins, anti-pseudomonal penicillins and carbapenems; variation in Gram-positive exposure
was driven by vancomycin. Gram-positive antibiotic use was moderately associated with days of ICU-level of care (Spearman correlation coefficient = .55) but anti-pseudomonal antibiotic use was not (Figure 2). There was no association between days of antibiotic exposure and 30-day mortality.

**Conclusion.** Among a homogenous population of children undergoing transplantation for acute leukemia, both the volume and spectrum of antibiotic exposure in the immediate post-transplant period varied widely. These data present an opportunity for hospitals to benchmark their antibiotic utilization practices and can be further leveraged to assess the clinical impact of differential antibiotic exposure.

**Figure 1** Antibiotic use among children undergoing HSCT for acute leukemia at 27 pediatric hospitals, adjusted for age, gender, race, graft source and days of ICU level care. A: Anti-pseudomonal antibiotics: B: Gram positive antibiotics: cefepime, ceftazidime, piperacillin-tazobactam, ticarcillin-clavulanate, meropenem, imipenem-clizstatin, etarapen, daptomycin, linezolid.

**Figure 2** Scatter plot highlighting the lack of correlation between hospitals’ days of anti-pseudomonal antibiotic therapy and days of ICU level care.


770. Nurse Prompting for Prescriber-Led Review of Antimicrobial Use in the Critical Care Unit: A Quality Improvement Intervention with Controlled Interrupted Time Series Analysis

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**Session:** 75. Stewardship: Program Implementation

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**Background.** Audit-and-feedback (A&F) is a core strategy for antimicrobial stewardship programs (ASPs). However, it is resource-intensive, and may not be practical in every setting. Recent guidelines support the non-ASP-led review of antimicrobials by prescribers (AM-REV) on a routine basis. A sustainable strategy for AM-REV in a critical care unit (CrCU) may improve antimicrobial utilization without additional ASP resources.

**Methods.** Using a quality improvement framework, a prompt for AM-REV strategy was created. The primary outcome was antimicrobial utilization defined by days of therapy/1000 patient-days (AM-DOT). A secondary process outcome was the proportion of relevant cases for which an antimicrobial prompt was provided to the prescriber (AM-PRT). Balancing measures included CrCU mortality rates, length of stay, and 48-hours re-admission rates. Utilization data of a control class of medications (proton-pump inhibitors) was also collected. AM-DOT was collected for 34 months pre- and 14 months post-intervention. AM-PRT was collected for 3 months pre- and 12 months post-intervention. Segmented regression analysis was used for the primary outcome, with a descriptive analysis of secondary outcomes.

**Results.** CrCU nurses were recruited to prompt AM-REV during CrCU rounds. A standardized script was developed to insert day of antimicrobial therapy into rounds; prescribers were trained to respond with affirmation, rationale, and clinical outcomes. Plan-Do-Study-Act (PDSA) cycles further refined the intervention to include nursing reminders from CrCU pharmacists and increased engagement of nurses during formal A&F rounds. Prior to the intervention, monthly AM-DOT was 804 with a positive trend (7.3 DOT/1000PD, P < 0.05). Post-intervention resulted in an initial reduction of 217 DOT/1000 PD (P < 0.05) with a non-significant negative AM-DOT trend, representing a 20% (95% CI –15%, –25%) reduction in AM-DOT per month. There was no significant change in utilization of the control class of medications. The ABX-PRT increased from 17% to 50% during the intervention period. Balancing measures were comparable pre and post-intervention.

**Conclusion.** Nurse prompting of AM-REV can lead to significant reductions in antimicrobial utilization, providing a non-ASP mechanism of sustaining antimicrobial awareness.

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771. Implementation of a Centralized Telehealth-based Antimicrobial Stewardship Program (ASP) for 16 Small Community Hospitals (SCHs)

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**Background.** Innovative strategies are needed for ASP implementation in SCHs (<200 beds). Most SCHs lack ASPs that meet Joint Commission (JC) requirements and CDC core elements. Telehealth can help extend infectious diseases expertise and stewardship resources to such facilities.

**Methods.** The Infectious Diseases Telehealth (IDt) program provides consultation and ASP support to 16 Intermountain SCHs (18-150 beds). Key stakeholders were identified at each site to establish formal ASPs. An IDt physician and pharmacist attended local meetings as ASP members to provide guidance. Centrally tracked antibiotic usage and resistance data were reviewed with each program to identify opportunities for improvement. Daily stewardship responsibilities were shared: front-line pharmacists were trained to review charts for appropriateness using automated electronic alerts, while the IDt pharmacist reviewed high priority alerts (e.g., positive blood cultures). Recommendations were made to local staff, or to the IDt physician in cases needing telehealth consultation.

**Results.** ASPs were formed at 15/16 hospitals (1/16 had an existing ASP). Members included: local physician (15/16), local pharmacist (15/16), infection preventionist (16/16), quality representative (15/16), nursing (5/16), and administration (5/16). Collaborative data review led to 16 planned projects to improve antimicrobial prescribing. Eleven targeted specific drugs (carbapenems (n = 6), piperacillin-tazobactam (n = 1), fluoroquinolones (n = 2), vancomycin (n = 2)), and five aimed to improve