vs. rural 16 (29%) (P = 0.1)). The commonest perceived barriers to successful AMS for all hospitals were lack of dedicated infectious diseases and microbiology services (64 (60%)), lack of dedicated pharmacy resources (62 (59%)), and a lack of education for clinicians in antibiotic use (53 (50%)).

Conclusion. Australian hospitals have implemented some AMS activities for children, but most lack resources—this was much more evident in regional/rural than metropolitan hospitals. Barriers to successful AMS include a lack of infectious diseases and pharmacy resources and education, which need to be addressed in workforce planning.

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258. Variation in Antibiotic Use Among Neonates Hospitalized in United States Academically Affiliated Centers
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Background. Antibiotics are often necessary in high-risk patients such as neonates. However, exposure to broad-spectrum antibiotics has been associated with adverse neonatal outcomes. Variation in antibiotic use across neonatal intensive care units has been demonstrated on a regional level, but little is known about United States nationwide antibiotic use among hospitalized neonates. Prior studies have measured antibiotic use rates (AUR; antibiotic therapy days as a portion of days present) rather than antibiotic days of therapy per 1,000 patient-days (DOT/1,000 patient-days), the preferred metric in antimicrobial stewardship practice.

Methods. Hospitals participating in the Vizient (formerly University HealthSystem Consortium) Clinical Database/Resource Manager with >100 neonatal discharges from January to December 2016 were identified. Facility-level clinical outcomes, diagnoses, and antibiotic utilization data from 118 hospitals were included. The primary antibiotic utilization metric was DOT per 1,000 patient-days; AUR and antibiotic spectrum index (ASI) per antibiotic day were also evaluated according to previously published methods.

Results. The number of neonatal discharges per facility in 2016 ranged from 228 to 15,773 (median 2,578, interquartile range [IQR] 1,314–3,927). Of the 118 hospitals, 94 (80%) provided care to neonates with birthweight less than 1,500 g, 77 (65%) performed major surgical procedures, 32 (27%) performed cardiac surgery, and 19 (16%) performed extracorporeal membrane oxygenation. Across all hospitals, there was 71-fold variation in antibiotic DOT/1,000 patient-days with range from 7.9 to 560.7 (median 271.1; IQR 181.7–347.5) and 85-fold variation in AUR with range from 0.4% to 34.1% of days present (median 16.7%; IQR 10.7–20.8%). The ASI per antibiotic day ranged from 2.0 to 7.4 (median 6.2; IQR 5.8–6.5).

Conclusion. There is substantial variation in antibiotic use among neonates hospitalized in academically affiliated United States centers. Variation in days of exposure is greater than variation in spectrum of activity per day of therapy. Understanding sources of variation in antibiotic use at the facility level will be important to provide informative benchmarking of neonatal antimicrobial management.

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259. A Retrospective Cross-Sectional Comparison of the Neonatal Gut Microbiota After Antimicrobial Exposure: Implications for Stewardship
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Background. The development of the infant gut microbiota influences the maturation of the host immune system and has been implicated in both short- and long-term health outcomes. In a healthy infant, the initial stages of gut microbiota development are characterized by the progressive acquisition and proliferation of anaerobes. In the neonatal intensive care unit (NICU), infants are often exposed to antibiotics which disturb the normal development of the gut microbiota. In this retrospective cross-sectional study, we aimed to evaluate the effects of three different antibiotic regimens on the gut microbiota of infants in the NICU, focusing on the effect on anaerobe colonization.

Methods. From November 1, 2014 to April 30, 2015, stool swabs were collected from NICU patients at The Hospital for Sick Children. Infants were included in the study if they received any dose or duration of the following antibiotics: ampicillin and amoxicillin (AT), ampicillin and cefotaxime (AC), or ampicillin, tobramycin, and metronidazole (ATM). DNA was extracted from stool swabs and subject to Illumina sequencing of the V4 hypervariable region of the 16S rRNA gene. Infants were stratified by gestational age (term or preterm). The first samples taken within 1 week after antibiotic exposure were analyzed for diversity measures, taxonomic composition, and anaerobe relative abundance.

Results. A total of 64 NICU infants were included in the study, 46 (71.9%) received AT, 11 (17.2%) received ATM, and 7 (10.7%) received AT (P = 0.005). Shannon diversity was not statistically significant between term infants receiving AT and AC or preterm infants receiving AT and ATM. However, the relative abundance of anaerobes was significantly decreased after exposure to ATM in comparison to preterm infants receiving AT (P < 0.005).

Conclusion. Within 1 week after ATM therapy, the relative abundance of gut anaerobes in preterm infants were significantly decreased in comparison to preterm infants receiving a course of AT. Therefore, limiting the use of ATM in preterm infants may protect the developing gut microbiota.

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260. Effect of Antibiotic Indications on Clinician Documentation and Pharmacy Workflow in Hospitalized Children
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Background. Documentation of antibiotic indication at the time of order entry is mandated by the Centers for Disease Control and Prevention. We evaluated the effect of this mandate on the accuracy of clinician documentation and pharmacy workflow in hospitalized children.

Methods. Documentation of indication at our institution was required beginning March 30, 2017. All patients ≤18 years old that received ≥1 dose of intravenous (IV) vancomycin (VAN) or IV/intramuscular ceftriaxone (CTX) during a 1 month pre-intervention period and three post-intervention study periods (at 0, 3, and 6 months following implementation) were included. Patients were only included once per study period. Data included timing of antibiotic administration, indication for use, infection at body site requiring potential dosing modification, dosing modification, and agreement between order and progress note.

Results. Median age of patients was 4.2 years. Most common indications for VAN (total: 789) were sepsis syndrome (26%, N = 204), febrile neutropenia (12%, N = 95), and suspected catheter-related bloodstream infection (10%, N = 77) and for CTX (total: 1,071) were sepsis syndrome (12%, N = 127), perforated appendicitis (12%, N = 25), and urinary tract infection (10%, N = 77).

Table: Changes in Workflow and Documentation Pre/Postintervention

| CTX | Baseline | Period 2 | Period 3 | Period 4 | P |
|-----|----------|----------|----------|----------|---|
| N = 202 | N = 173 | N = 142 | N = 142 | | |
| Median time to administration (minutes) | 70 | 63 | 47 | 40 | <0.001 |
| Order-progress note agreement | – | 46% | 33% | 44% | |
| Infection with potential dose modification | 31% | 49% | 45% | 51% | <0.001 |
| Dose modified | 6% | 17% | 15% | 15% | 0.01 |
| VAN | N = 107 | N = 111 | N = 113 | N = 109 | |
| Median time to administration (minutes) | 73 | 83 | 78 | 84 | 0.49 |
| Order-progress note agreement | – | 45% | 50% | 43% | |
| Infection with potential dose modification | 42% | 50% | 50% | 58% | 0.14 |
| Dose modified | 28% | 27% | 17% | 38% | 0.01 |

Conclusion. Agreement between orders and progress notes was less than 50% during the preintervention period for both antibiotics. Median time to administration decreased for CTX, but not VAN. Antibiotic modifications were more common in the postintervention periods.

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