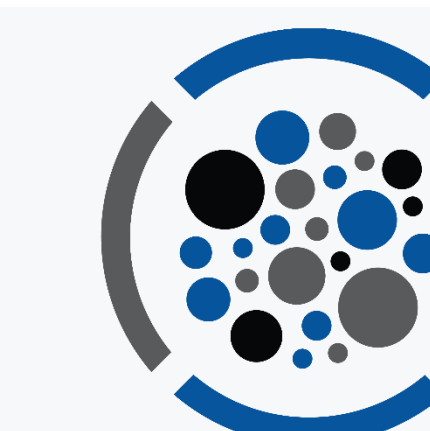


Pediatric Antibiotic Use in the Duke Antimicrobial Stewardship Outreach Network



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Abstract

Background: The Duke Antimicrobial Stewardship Outreach Network (DASON) was established in 2013 to provide antimicrobial stewardship resources to community hospitals in the Southeast. Pediatric patients in community hospitals may benefit from antimicrobial stewardship program (ASP) activities.

Methods: Antibacterial use (AU) was reviewed using the DASON Antimicrobial Stewardship Assessment Portal, which includes filters for National Healthcare Safety Network (NHSN) unit types. We performed a retrospective review of AU in pediatric units from 1/1 – 12/31/2017. AU was summarized by days of therapy (DOT) and percent of total DOT for specific unit types and agents. AU rates were reported by DOT/1000 patient days.

Results: A total of 41 pediatric units were included from the 28-hospital DASON cohort: 11 Neonatal Critical Care or Step Down Nurseries, 8 Pediatric Medical/Surgical Wards, and 22 Well Baby Units. There were no pediatric (non-neonatal) critical care or oncology units. A total of 21,731 antibiotic DOT were attributable to pediatric units, accounting for 1.6% of all AU in the cohort. These include 5585 (26%) DOT in Neonatal Critical Care (Level II/III) Units, 4898 (23%) in Pediatric Medical/Surgical Units, 3910 (18%) in Well Baby Units, 3307 (15%) in Neonatal Critical Care (Level III) Units, 3217 (15%) in Step Down Neonatal Nurseries (Level II), and 814 (4%) in Pediatric Medical Wards. Ampicillin (7229 DOT, 33%), gentamicin (6320 DOT, 29%), ceftriaxone (1750 DOT, 8%) and vancomycin (1462, 7%) were the most common antibiotics administered. AU rates were 219 DOT/1000 patient days in children as compared to 979 in adults. Unit-specific rates ranged from 65 (Well Baby Units) to 1081 DOT/1000 pt days (Pediatric Medical/Surgical Units). Rates in level II and III nurseries ranged from 302-697 DOT/1000 patient days.

Conclusion: Pediatric patients accounted for a small proportion of AU in community hospitals. AU rates on pediatric medical/surgical units were comparable to adult units. Although rates were lower in neonatal units, these units accounted for 75% of pediatric AU. Antibiotic exposure in the neonatal period has been associated with short- and long-term outcomes including necrotizing enterocolitis, obesity, and atopy. This population would benefit from a dedicated focus from community hospital ASPs.

Background

- Inpatient pediatric antimicrobial stewardship efforts have focused mostly on freestanding children's hospitals or children's hospitals within larger hospitals. However, the majority of pediatric hospitalizations occur in non-children's hospitals
- The Duke Antimicrobial Stewardship Outreach Network (DASON) provides stewardship resources to 28 community hospitals which may benefit from dedicated pediatric stewardship activities

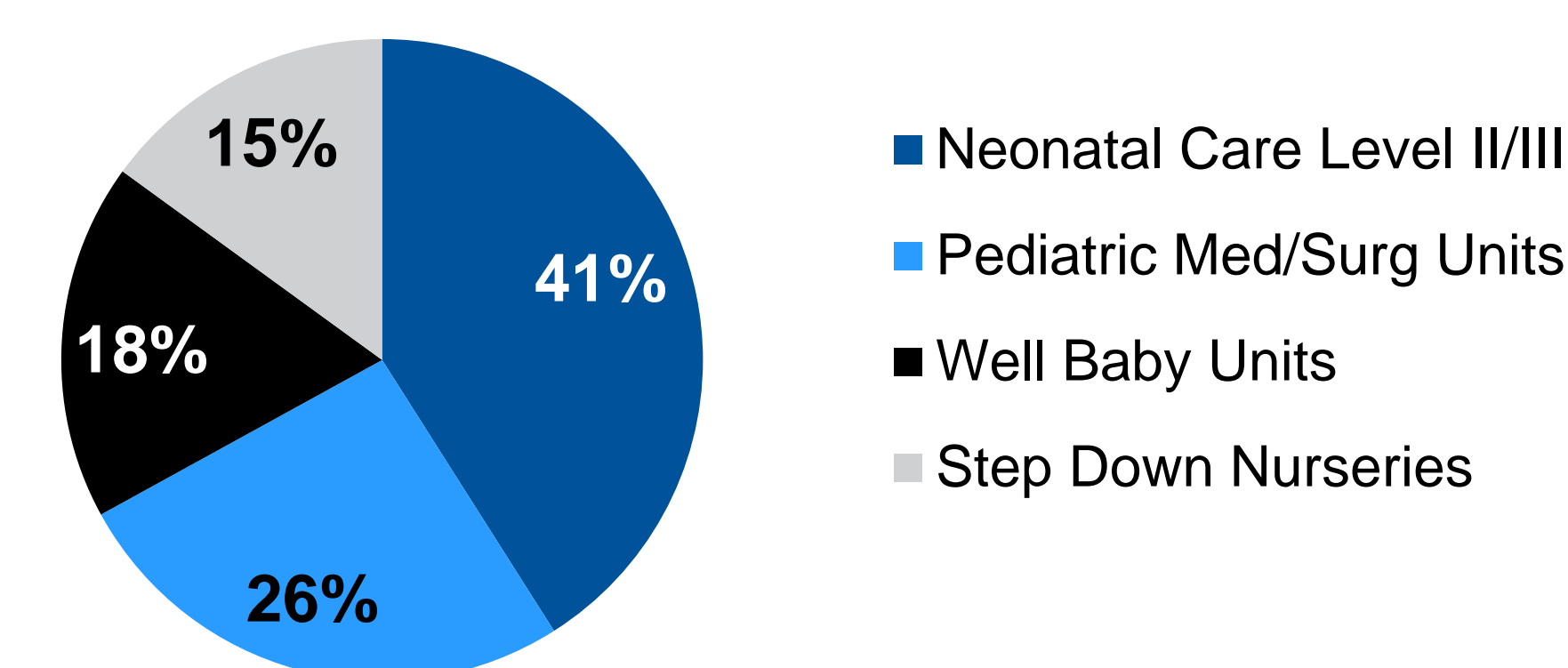
Methods

- Antibacterial Use (AU) on NHSN-defined pediatric units at 28 DASON hospitals from January 1st – December 31st, 2017
- AU was summarized by days of therapy (DOT) and stratified by unit type and specific antibacterial agent
- AU rates were reported as DOT/1000 patient days

Results

- 21,731 DOT were administered on 41 pediatric units: 11 neonatal critical care or step down nurseries, 8 pediatric medical/surgical wards, and 22 well-baby units (Figure 1)
- These units accounted for 1.6% of all DASON AU in 2017, ranging from 0 – 3.6% across the 28 hospitals

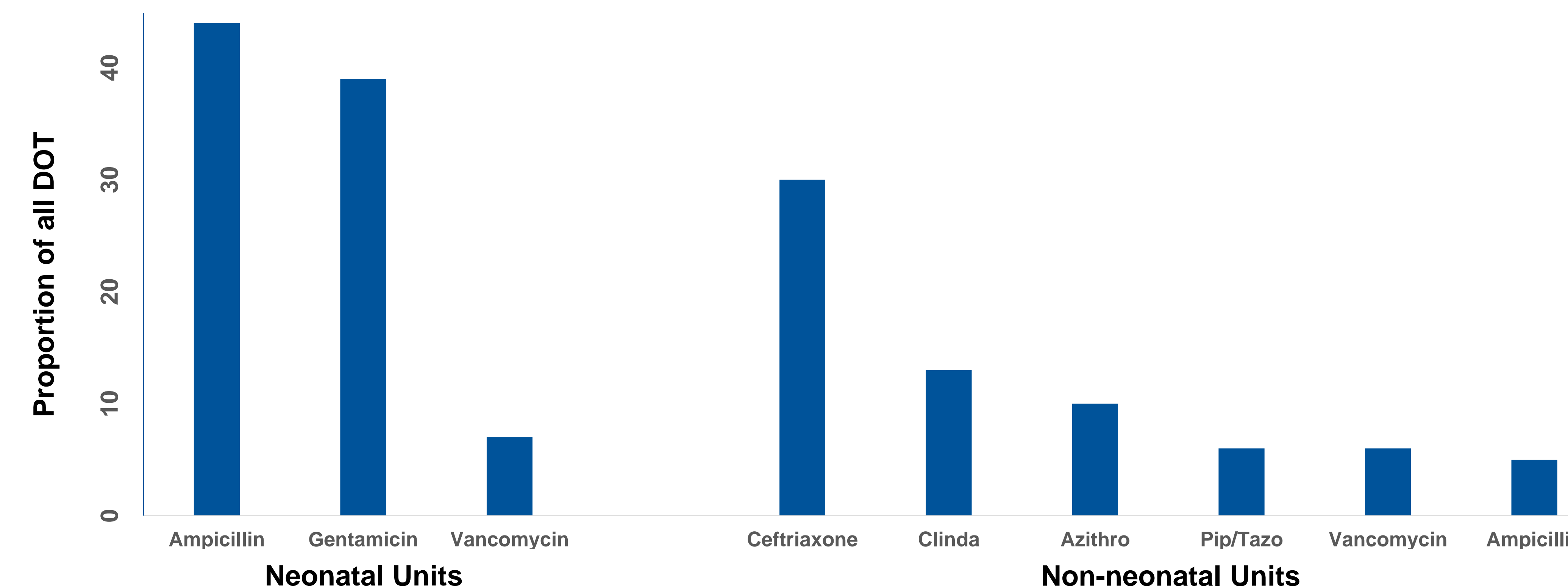
Figure 1: DOT by NHSN Unit Type



Results

- The most commonly administered antibiotics, stratified by unit type, are reported in Figure 2. Ampicillin and gentamicin accounted for 82% of all DOT on neonatal units. There was a wider variation of antibiotics administered on the non-neonatal units, with ceftriaxone (30% of all DOT) predominating
- AU rates were highest on pediatric medical/surgical units (1081 DOT/1000 patient days) and lowest on the well-baby units (65 DOT/1000 patient days)

Figure 2: Proportion of DOT Stratified by Neonatal Status



Conclusions

- Pediatric units contribute a small proportion of AU in the DASON network; the majority occurs on neonatal units. Although AU rates are lower on these units, there is significant antibiotic exposure at these hospitals with more than 17,000 neonatal DOT
- Neonatal antimicrobial stewardship efforts should include community hospitals; DASON is well-positioned to pilot such initiatives

