

# Antimicrobial Stewardship Program in NICU: Lessons Learned

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## Background

The Neonatal Intensive Care Unit (NICU) at the Children's Hospital of Eastern Ontario (CHEO) is a level 3b surgical unit with 19 beds servicing a region that spans >1000 kms in Eastern Ontario, Western Quebec, and Northern Ontario. CHEO's NICU are treating patients from 22-40 weeks gestation. There has been a trend in neonatal medicine for smaller preterm infants to survive with multiple pathologies. These infants are at increased risk of severe infections and adverse effects of antibiotic use. Antibiotic Stewardship Program (ASP) in CHEO NICU was introduced in 2016, to help improve use of antimicrobials on our unit.

We have seen a recent increase in Extended-spectrum beta-lactamases (ESBL) and other resistant pathogens highlighting the importance of judicious use of antibiotics.

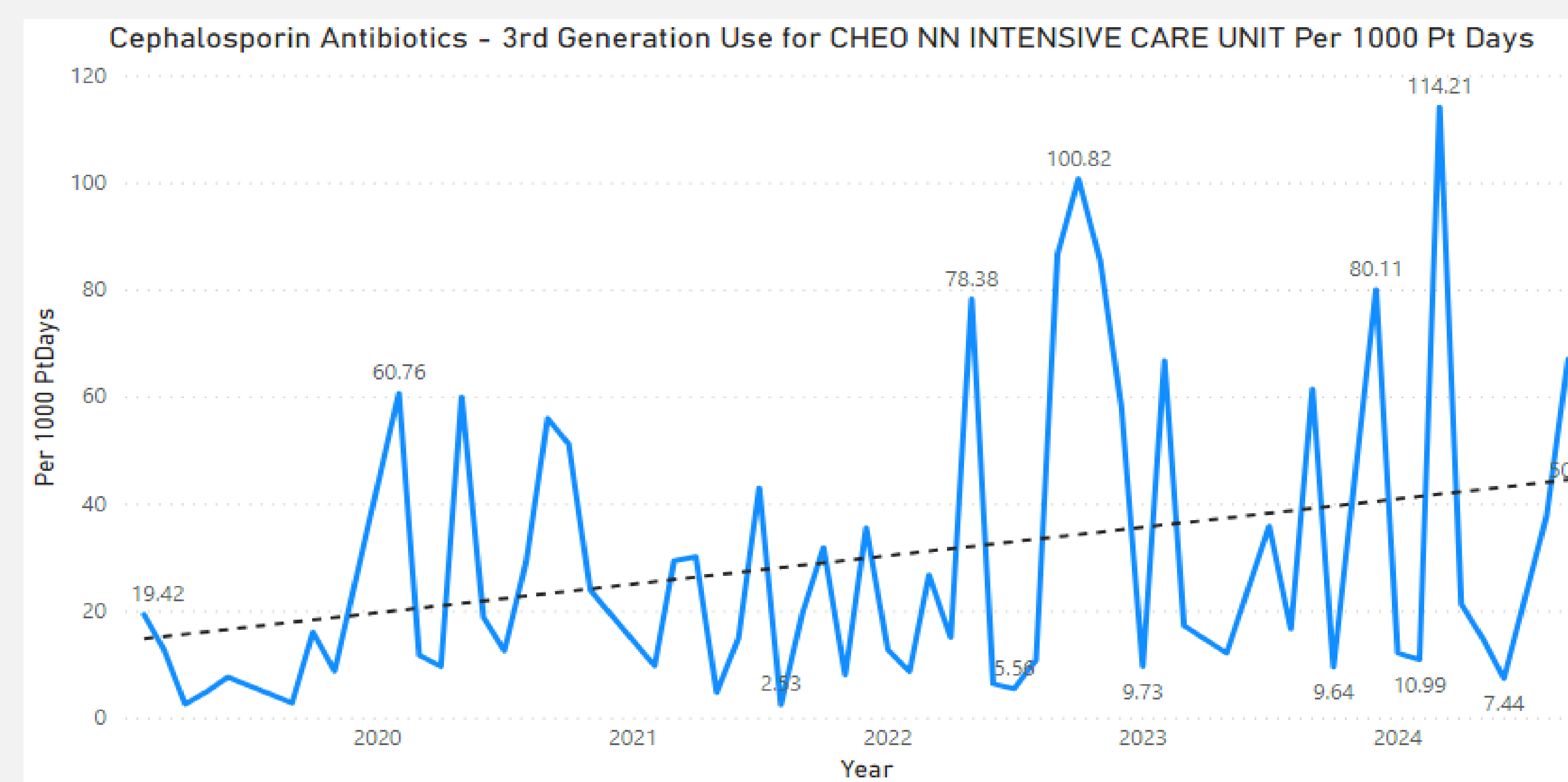
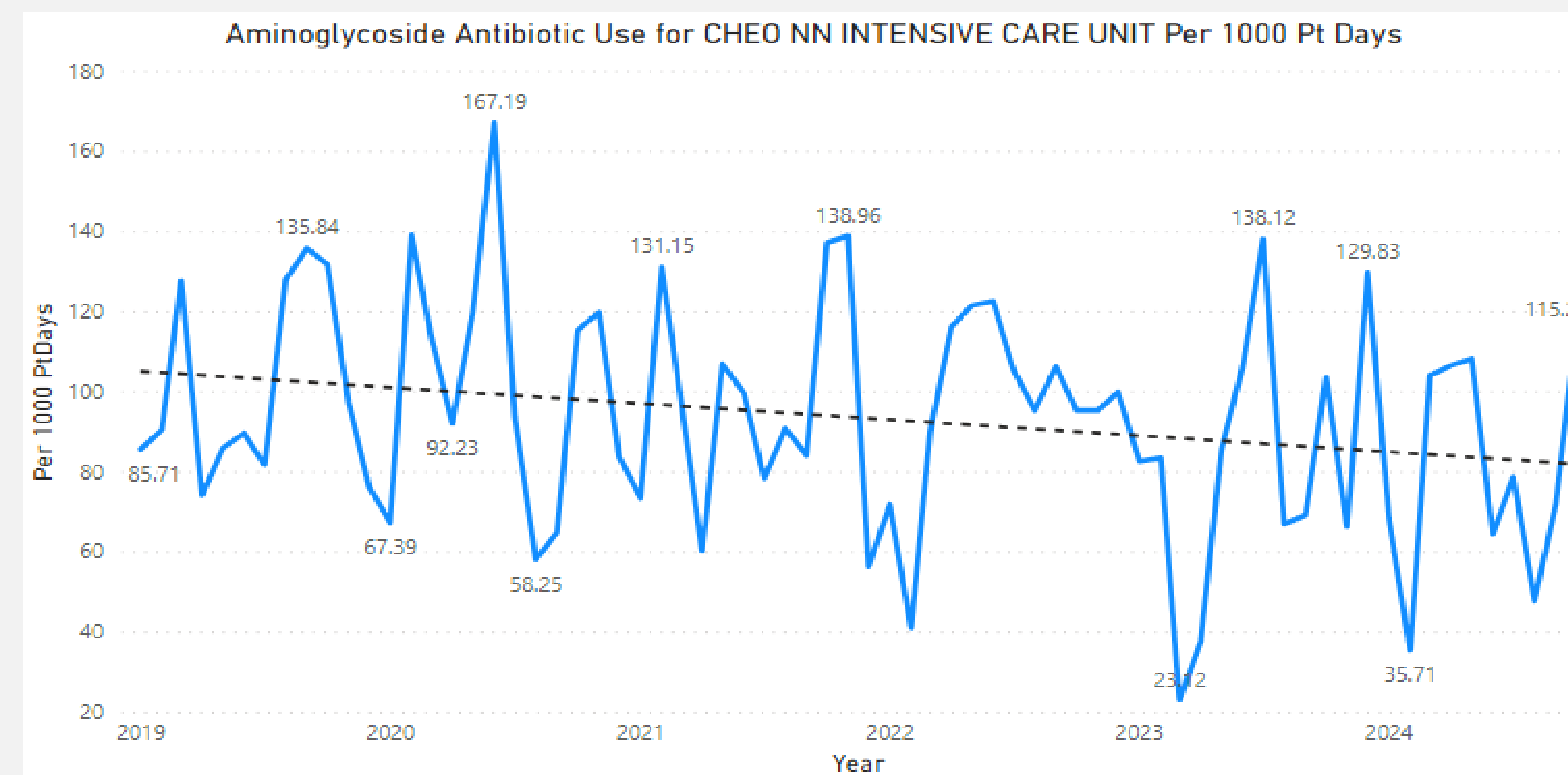
## Aim

- Review current rates of neonatal antibiotic use
- Limit days of therapy of empiric antibiotics
- Recognize the potential risks of antibiotic therapy
- Describe measures of antibiotic stewardship and identify the benefits and challenges of applying them in the unit

## Infection Rates

Since 2019, the CHEO NICU has had a total of 57 hospital acquired infections (including catheter-associated urinary tract infections, central line-associated bloodstream infections, hospital acquired viral respiratory tract infections, surgical site infections). The most common pathogens included Methicillin-Resistant Staphylococcus Aureus (17%), Methicillin-Susceptible Staphylococcus Aureus (17%), Coagulase-Negative Staphylococcus (10%), Escherichia Coli (8%) and Enterobacter cloacae (7%).

## Days of Therapy



## Challenges

- Rising Antibiotic Resistance
- Resistant organisms cause increased morbidity and mortality
- Impact on intestinal microbiome of term and preterm infants
- Rising appearance of cephalosporin-resistant Enterobacter cloacae and carbapenem-resistant Enterobacteriaceae.
- Complex infants requiring prolonged NICU stay
- Time and funding

## ASP Tools

FIRSTLINE APP- a real first in Antibiotic knowledge sharing!

- First developed at CHEO by Dr. Nicole Le Saux and team (pharmacy, MDs, RNs)
- Includes antimicrobial dosing, monitoring and guidelines, as well as information on specific pathogens and vaccines
- Now has guidelines from hospitals from all over Canada and the US
- Free to download and use, accessible to everyone
- Opening doors for different centers to compare and discuss their guidelines



## Next Steps

- Continue monitoring effect of ASP on ampicillin and tobramycin duration data
- Continue ASP Handshake rounds
- Increase efforts to limit the use of long-term/broad spectrum antibiotics
- Encourage discussions on the need of antibiotics post-surgery
- Aim to reduce cefotaxime usage
- Increase tracking of resistant microorganisms
- Epic functionality to have ASP dashboard reports
- Encourage nurses to get involved in ASP