

Improving Newborn Antibiotic Stewardship at Silver Cross Hospital

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Problem

- As a member of the ILPQC, our global aim is to implement the right antibiotics for the right babies for the right duration in a standardized manner.
- Our primary SMART aim is to:
 - To decrease the percentage of newborns born at 35 weeks and above who receive antibiotics to <4% or by 20%
- Our secondary SMART aim is to:
 - To decrease the percentage of newborns born at 35 weeks and above with a negative blood culture who receive antibiotics longer than 36 hours by 20%
- Silver Cross Hospital has >3000 deliveries per year and has a level IIE NICU.
- Our QI team includes:
 - Tina O’Sullivan – Clinical Nurse Educator
 - Mary Sue – Registered Nurse
 - Colleen Malloy – Neonatologist
 - Jordan Silberg – Hospitalist

Project Implementation

- This QI team was formed in January 2021.
- Baseline data was collected by chart review from October 2020 through December 2020
- The QI project data collection started January 2021 and is ongoing.
- Developing a key driver diagram led to seven different interventions to support our aim. We have started to address four of these interventions.
 - Implementing a newborn sepsis pathway
 - Utilizing and documenting a sepsis risk calculator
 - Optimizing blood culture processing
 - Creating a sepsis order set that included clear antibiotic dosing and stop times
- Countermeasures to these interventions include delayed antibiotic initiation, emergent transfer, and neonatal death.

Acknowledgements/Hospital Team

- Thank you to the hospital IT team for helping with EMR changes in a timely manner as well as laboratory team for explaining blood culture protocols.
- Thank you to the pediatric hospitalist and neonatologist groups for adopting these improvement changes.

Results

- The percentage of newborns with blood cultures drawn is down from 12% to 8%, on average.
- The percentage of newborns on antibiotics is down trending, and is more consistently below our goal of <4%.
- The percentage of newborns receiving antibiotics >36 hours is variable.
- No negative outcomes of any of our three countermeasures during the past 9 months.
- Successes:**
 - The hospital IT department was receptive to developing a newborn sepsis order set and was able to have a usable order in the EMR within 8 weeks of submitting for approval. Most importantly, the order set included 36hr stop times on antibiotics.
 - The hospital laboratory explained the process of blood cultures, from collection to results, and recently hired new technicians to keep up with demand
 - Average time from collection to incubation for blood cultures per month ranged from 1.96 to 2.62 hours.
- Challenges:**
 - Although the sepsis calculator is used by most physicians, the documentation of the use of the sepsis calculator is poor. Frequent reminders have not changed the use. A recent intervention is an alert in the sepsis order set to document the calculator score in a physician note. We have considered a way to utilize delivery nurses in score calculation based on feedback from other ILPQC sites
 - We initially focused on establishing standardized chorioamnionitis diagnosis criteria, however have not been able to get all OB providers to support one standardized criteria. With the establishment of the calculator to guide decision making, we decided that this was less important to our smart aims in this project, but is important to overall perinatal health at our hospital.

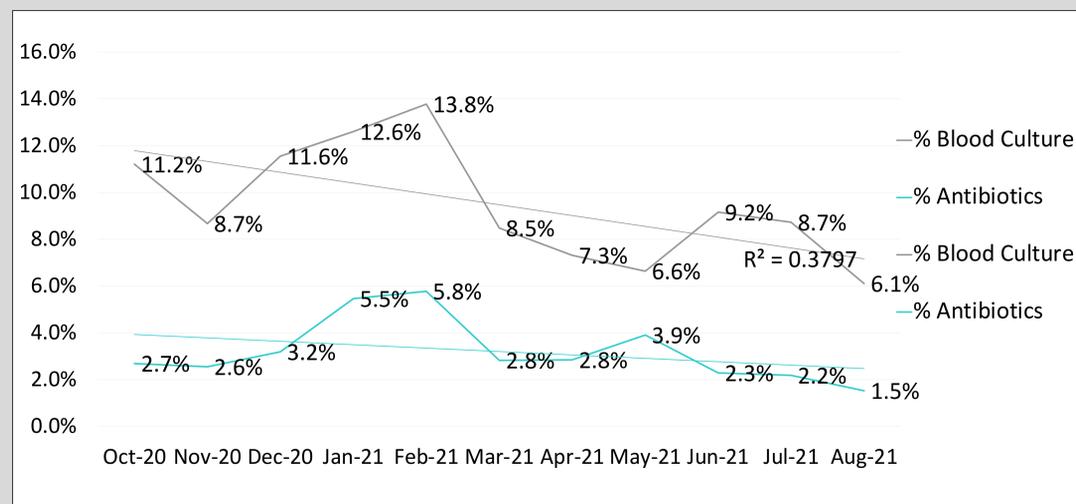


Figure 1. The percentage of newborns with 1) Blood cultures collected and 2) antibiotics initiated by month. Trendlines demonstrating linear change from baseline data to current day.



Figure 2. The percentage of newborns on antibiotics that were continued past 36 hours without a clear indication. Trendline demonstrating linear change from baseline data to current day.

Conclusions

- Our QI team at Silver Cross Hospital has been able to decrease the amount of blood cultures collection on newborns above 35 weeks over the last 9 months compared to our baseline while the percentage of newborns receiving antibiotics has remained stable. The percentage of newborns on antibiotics past 36 hours without a clear indication is variable but possibly down trending.
- During this time, we have not had any significant morbidity or mortality as of result of our interventions, including adoption of a Kaiser sepsis calculator.
- Our next steps will be to improved documentation of sepsis calculator, utilize order set to decrease antibiotic duration past 36 hours, and adapt to any changes that will come from transition to level III NICU.