Introduction
- Early neonatal antibiotic exposure causes disruption of the intestinal microbiome which may impact lifelong health consequences.1

**Antibiotic Associated Disruption of Neonatal Microbiome**
- Asthma
- Lung disease
- Obesity
- Inflammatory bowel disease

- Intrapartum and neonatal antibiotic use is prevalent, to battle infection and as a prophylactic intervention.3

- Standard practice at our site for well appearing neonates born to mothers with chorioamnionitis included a blood culture, complete blood count and 4 doses of antibiotics over 36 hours.

- Over a 5-year period, the percentage of well appearing infants with positive blood cultures in our hospital was zero. Unfortunately, each of these infants was treated with prophylactic and unnecessary antibiotics.

Methods
- April 2016: A nurse led process improvement project was implemented to decrease the incidence of chorioamnionitis. The elements of the project emphasized the need for improved pericare and a decrease in the number of vaginal exams during labor.

- December 2020: Education on the usage of the calculator was provided to the Advocate Health System obstetrical and pediatric teams.

- January 2021: A validated neonatal sepsis calculator was installed into EPIC and applied to all neonates born ≥35 weeks gestation within the first hour of life.

- Data points included: Gestational age, length of rupture of membranes, Group B Strept status, maternal antibiotics administered during labor, and highest maternal temperature.

Results

<table>
<thead>
<tr>
<th>Number of Women Diagnosed with Chorioamnionitis</th>
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<tr>
<td>Nurse led process improvement</td>
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Intervention: Decrease the number of vaginal exams and perform pericare care every two hours.

- Results: 40% reduction in chorioamnionitis. A review of the blood cultures of infants exposed to chorioamnionitis demonstrated that 100% were negative and the antibiotics received were unnecessary.

- The incidence of chorioamnionitis in term infants is 9.7/1000 births. This translates to approximately 35,000 infants born to mothers diagnosed with chorioamnionitis per year in the United States.2

- Universal implementation of the neonatal sepsis calculator among clinically well appearing neonates ≥35 weeks of gestation, born to mothers with chorioamnionitis throughout the US, would significantly reduce the number of newborns receiving antibiotics. Reducing chorio reduces fetal and neonatal exposure to antibiotics.

- The benefits of reducing antibiotic use in these infants would improve overall lifelong health, one without chronic diseases associated with early antibiotic exposure.

- The decrease in antibiotic administration at our institution led to a $1500 savings per infant.

- Labor and Delivery nurse-led protocols helped reduce the incidence of chorioamnionitis, but there were limits due existing CDC recommendations.

- For infants that are exposed to chorioamnionitis, the need for antibiotics should be evaluated using a neonatal sepsis calculator.

A Gap was Identified

- Research demonstrated the importance of neonatal gut health.

- Improved perinatal care and decreased vaginal exams reduced chorioamnionitis by 40%.

- However, asymptomatic infants with negative blood cultures were still being treated with antibiotics per CDC recommendations.

- The implementation of the neonatal sepsis calculator promoted the necessary practice change that led to a significant reduction in prophylactic antibiotic use.

- The use of this calculator was initiated in January 2021.

Results:
- Antibiotic use for asymptomatic infants decreased by 96%, protecting the microbiomes of these infants as well as saving thousands of health care dollars.

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References

2. CDC https://www.cdc.gov/nhsn/pdfs/norplan/nor57_0R_tables-508.pdf

