

## Creating Healthy Work Environments VIRTUAL 2021

### The Neonatal Early Onset Sepsis Calculator: Developing a Strategy for Project Sustainability

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**Purpose:** Neonatal Intensive Care Units (NICU) around the world are in a constant battle against Early Onset Sepsis (EOS), a devastating infection of the newborn's blood and/or cerebrospinal fluid (1) that results in death or major disability in 40% of affected infants (2). The Neonatal Early Onset Sepsis (NEOS) Calculator (3) was instituted in a single tertiary NICU in 2018 as a DNP Synthesis Project in order to examine the effects of the NEOS calculator on empiric antibiotic use (4,5), overall EOS evaluations, and provider adherence to the calculator while treating late preterm and term newborns.

**Methods:** A Pre/post interventional design was used, to include a retrospective baseline and post-interventional chart review. Primary outcome measures included: the mean number of empiric antibiotic treatment days and utilization rate, number of laboratory tests ordered (CBC, CRP, and blood culture), and a record of provider adherence/utilization of the calculator.

**Results:** During the project (prospective) period, empiric antibiotic use among newborns greater than or equal to 34 weeks gestation was reduced by 27.2%; the mean antibiotic utilization rate decreased by 64.9 days of therapy per 1000 patient days; the number of ancillary tests decreased by 86%; unwarranted antibiotic therapy beyond 48 hours was decreased by 74%, and provider (neonatologist) adherence to the calculator averaged 83%. During this time period, there were 36 opportunities to reserve empiric antibiotics by providers within the NICU (6). After the project period the provider adherence increased even further to 90%, however, there were an additional 25 occasions where clinicians were disinclined to follow the NEOS calculator recommendations.

**Conclusion:** The initiation of the NEOS calculator assisted with the alignment of evidence-based guidelines for antibiotic stewardship in the NICU. This quality improvement project has the potential to decrease antibiotic use and ancillary labs while reducing health system expenditures and improving the overall health of fragile newborns. There is evidence for continued use of the calculator, including the customization of EOS guidelines at the local hospital level (7). The sustainability of the project beyond initial implementation offers opportunities for the re-education of medical

(neonatologist) staff, nursing staff buy-in through education, and measures to ensure best practices across the entire hospital system.

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**Title:**

The Neonatal Early Onset Sepsis Calculator: Developing a Strategy for Project Sustainability

**Keywords:**

antibiotic stewardship, neonatal early onset sepsis and neonatal icu

**Abstract Summary:**

Use of the Neonatal Early Onset Sepsis Calculator in the Nicu has met with great success in year one of implementation. Year two brought more use, with even more challenges.

**References:**

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**Author Summary:** Dawn is a 20-year PICU/NICU RN and is passionate about innovation, education, and continuous learning for all nurses. She is a writer, preceptor, and newly inspired researcher.

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