

The Impact of the Tennessee Initiative for Perinatal Quality Care

Chronic Lung Disease (CLD) Improvement Project



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PROBLEM

Chronic Lung Disease (CLD) or Bronchopulmonary Dysplasia (BPD) is defined as the need for oxygen or respiratory support at 36-weeks postmenstrual age. It remains the most common complication of prematurity. Infants who develop CLD have a higher incidence of mortality. Morbidities are also higher in infants that develop CLD and include long-term neurodevelopmental delays and late onset sepsis. Infants that develop CLD also have increased utilization of medical resources and are more likely to be readmitted to the hospital during the first year of life. The Vermont Oxford Network (VON) database revealed a median hospital rate of CLD to be 31.3%, for infants 22-29 weeks' gestational age in 2021. The median 2020 rate in the VON database for the ten hospitals in TIPQC was 41.7%.

ACTION

Level III and IV NICUs from across Tennessee came together to achieve a 25% relative reduction (from the respective facility's baseline over the past three years) in CLD in this population by June 2025.

The project was launched by four pilot teams in January 2024. Detailed educational instruction occurred at TIPQC's Annual Meeting, and the project was made available in July 2024, with an additional six Level III and IV NICUs joining. The participating hospitals were provided a toolkit, QI education, data collection tools, content education from nationally recognized experts, and a road map for implementation. Teams participated in monthly huddles, quarterly learning sessions, and annual state-wide meetings, as well as coaching calls from TIPQC. Based on their current practice, these teams implemented evidence-based procedures, protocols, and potentially best practices.

Monthly outcome measures captured by each facility include percent of CLD (by Grades 1-3) among targeted population (infants born at less than 30 weeks' gestational age at participating NICUs, including transfers admitted within 24 hours of birth), percent mortality of targeted infants with any CLD and Grade 3 CLD, percent of "final disposition" of infants with CLD, percent mortality of targeted infants prior to 36 weeks, and percent of infants discharged home on oxygen prior to 36 weeks. Monthly data capture began in January 2024 for the pilot teams and in July 2024 for the non-pilot teams. Data is shared in aggregate and by facility to evaluate current practices and opportunities for improvement.

Project Statistics

10

Level 3 & 4 NICUS

672

Completed Infant records

0

Infants Died

13.7%

Infants <24 weeks gestation

60%

Hospitals improve CLD

100%

Hospitals improve Grade 3 and mortality

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EXPLANATION OF IMPACT

Four pilot hospitals had a project mean of 41.0% during their 18 months (January 2024-June 2025) of participation with a 2020-2022 baseline mean of 45.5%. The six non-pilot hospitals had a project mean of 41.4% for their 12 months (July 2024-June 2025) of participation and a 2020-2022 baseline mean of 35.5%. This data is shown by Waves in Figure 1. As a collaborative, the project CLD mean was 41.2% and the 2020-2020 collaborative baseline CLD mean was 35.8% (Figure 2). Of note, 13.7% of infants cared for in this project were less than 24 weeks of gestation. Over half (60%) of participating hospitals saw a decrease in CLD comparing project mean to baseline mean. Future data is needed to assess a possible change outside of normal variation for this measure.

During the project, there were zero CLD deaths among participating hospitals compared to a 2020-2022 baseline mean of 2.6%. Additionally, Grade 3 CLD 2020-2022 baseline mean was 3.9% compared to a project mean of 3.5% (Figure 3). Again, future data is needed to assess a possible change outside of normal variation. However, all participating hospitals either decreased or maintained their Grade 3 and CLD mortality rates comparing 2020-2022 baseline mean data to project mean data.

WHO WAS RESPONSIBLE

The collaborative and statewide efforts of TIPQC and the participating hospitals have all contributed to this improvement. The participating hospitals are continuing their efforts to implement all of the best practices in the Tennessee Tiniest Babies bundle with the goal to further improve the process and outcome measures.

CONTACT

For more information, please contact Brenda Barker, TIPQC Executive Director, at brenda.barker@vumc.org, or visit the TIPQC website at <https://tipqc.org/project-chronic-lung-disease/>

Project Statistics

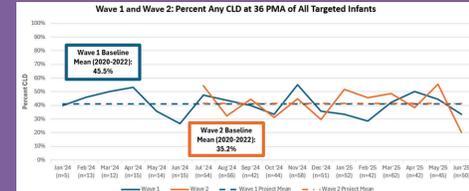


Figure 1: Percent CLD by Wave

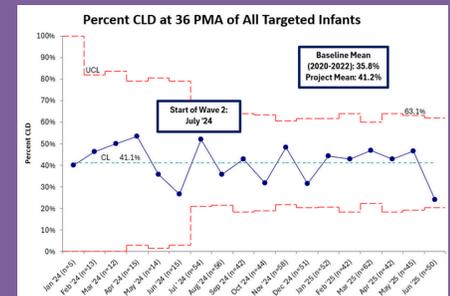


Figure 2: Percent of CLD

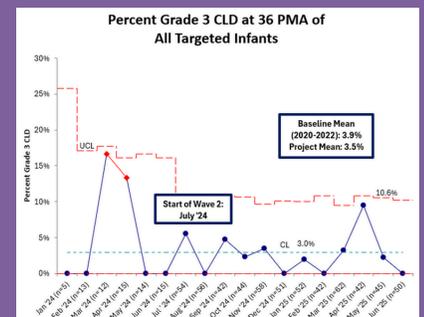


Figure 3: Percent Grade 3 CLD