

AAP DISTRICT VIII SECTION ON NEONATAL PERINATAL MEDICINE

2021 ANNUAL CONFERENCE QUALITY IMPROVEMENT ABSTRACT SUBMISSION FORM

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Title: Increased Adherence to a Neonatal Care Bundle Reduced the Rate of Severe Intraventricular Hemorrhage in Very Low Birth Weight Neonates

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Background: Very low birth weight (VLBW) infants are at higher risk of developing severe (grade III and IV) intraventricular hemorrhage (IVH) within the first 72 hours of life. Evidence-based neonatal care bundles have been implemented to decrease the occurrence of severe IVH.

Objective: To decrease the rate of severe IVH in VLBW infants by 50% from a baseline of 10.4% to 5% in our single-center, level III neonatal intensive care unit (NICU) over 2 years by improving adherence to our neonatal care bundle

Study Design/PDSA cycles: After assessing potential drivers of change, 5 point interventions were designed and implemented sequentially: (1) In-service training of nurses and respiratory therapists (2) Improve awareness by regular huddles and mnemonic use (3) Revise clinical care guidelines to improve adherence to care bundle (i.e. feeds over pump) (4) Initiate bundle in delivery room and check availability of equipment, and (5) Collect per nursing shift audit data (**Figure 1**). Adherence to the neonatal care bundle was scored on a novel, three-point system and compared using Kruskal-Wallis test (**Figure 2**). The incidence of severe IVH was tracked every month and was plotted on a control chart after fixing the mean from baseline data (2016-2018). Pre- and post-intervention groups were compared using Fisher's exact test and the Mann-Whitney U-test.

Results: Adherence to the neonatal care bundle improved from 24% to 90% over 2 years with completion of the sequential 5 PDSA cycles. The rate of severe IVH in VLBW infants decreased from 10.4% to 4.3% over 2 years (**Figure 3**). Baseline patient characteristics were similar in pre- and post-intervention groups (**Table 1**). In addition, an increased adherence score was correlated with reduction in severe IVH in VLBW infants. (**Figure 2**).

Conclusion: A multidisciplinary QI initiative of process improvement centered on enhanced adherence of an evidence-based neonatal care bundle successfully reduced the rate of severe IVH in VLBW infants.

Table 1 Patient Characteristics

	Pre-Intervention n =240	Post-Intervention n=185	p-value
Sex (male)	54.2% (130)	56.8% (105)	0.62
Singleton	89.6% (210)	87.0% (161)	0.88
Gestational Age (median)	28 0/7 wk	27 6/7 wk	0.41
Birth Weight (median)	980	1003	0.45
Invasive Ventilation	47.9% (115)	52.9% (98)	0.33

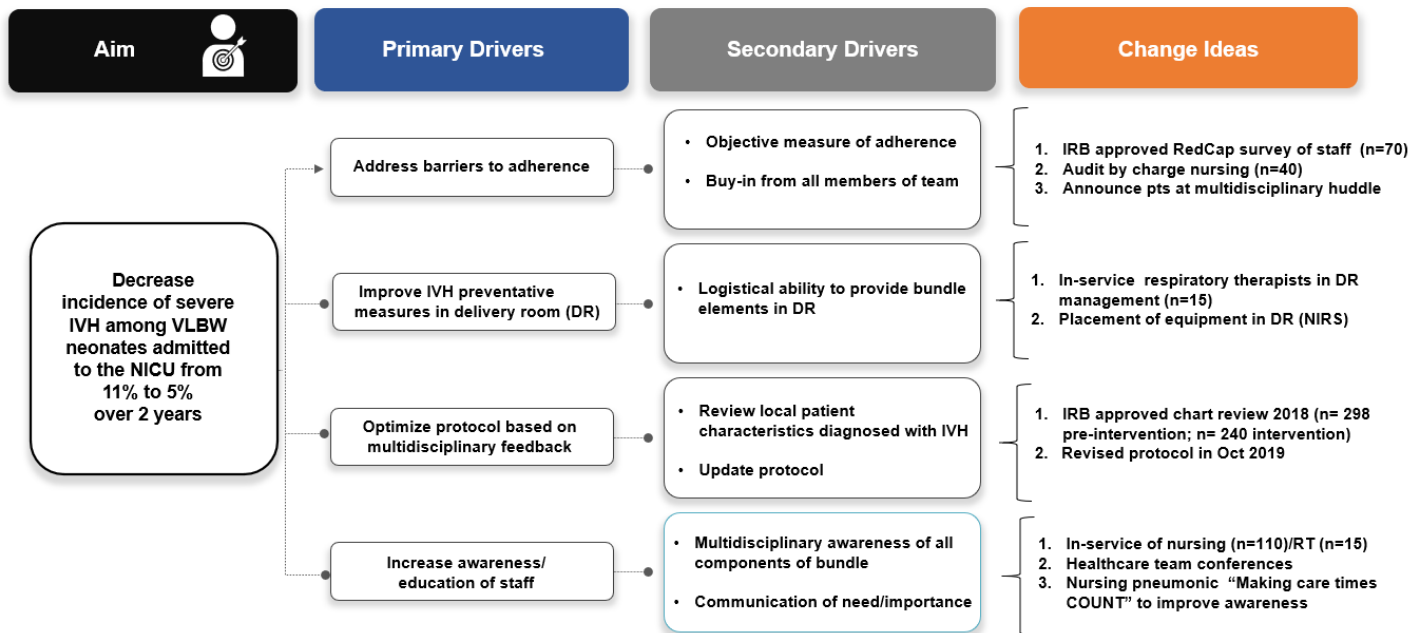


Figure 1: Driver diagram of IVH prevention bundle QI study. The primary aim to decrease incidence of severe IVH among VLBW neonates admitted to the NICU from 10.4% to 5% over 2 years (July 2018 to June 2020). Based on this aim primary drivers, secondary drivers and change ideas were identified by multiple stakeholders with a focus on how to identify and address barriers to adherence to the protocol. Change ideas were implemented with subsequent PDSA cycles based on identified areas of improvement.

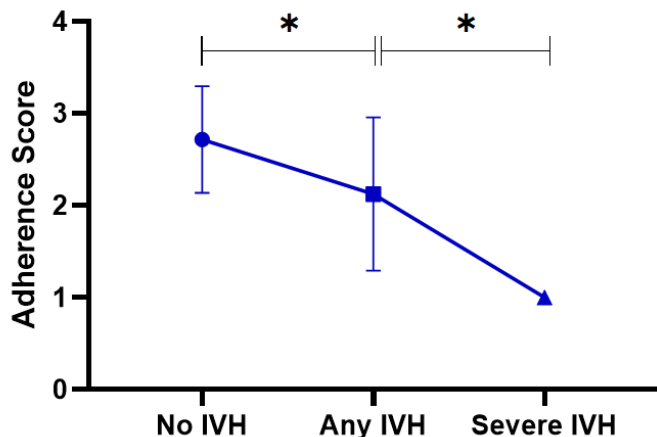


Figure 2: Adherence score with IVH prevention bundle was associated with severity of IVH in the patients that underwent an audit (n=40). *denotes significance cross all three groups (p=0.016); Kruskal-Wallis test.

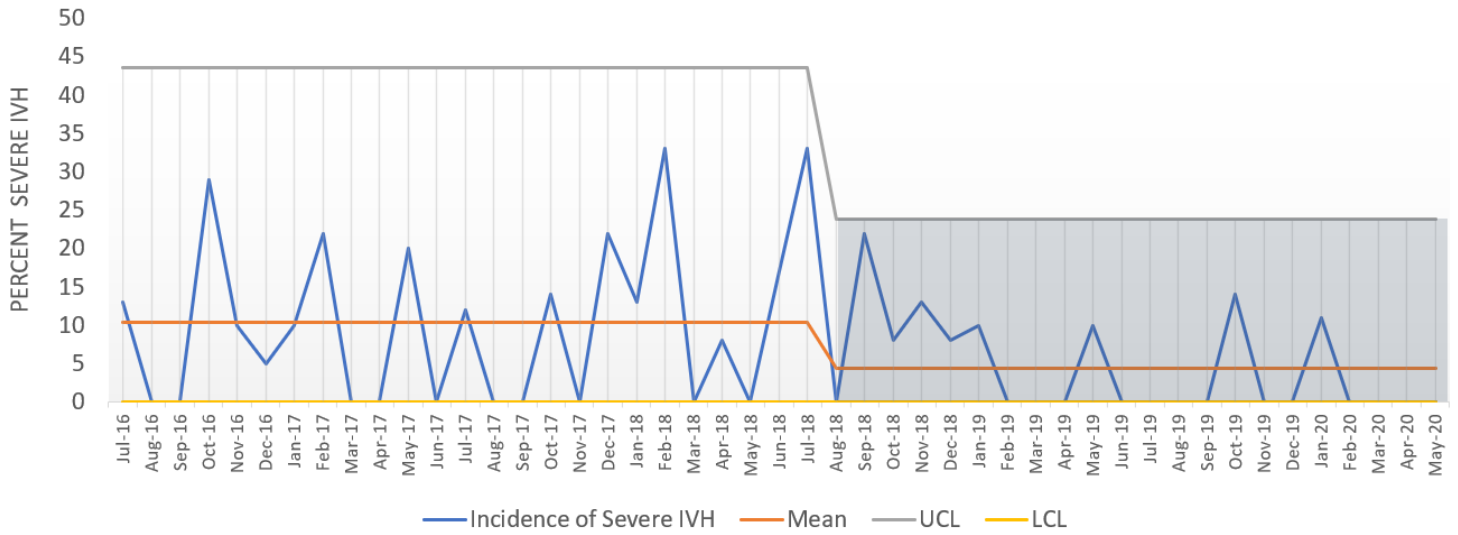


Figure 3: Control chart of incidence of severe IVH over 4-year period (June 2016-June 2020). In 2018, when the QI project was initiated the mean incidence of severe IVH was 10.4% (June 2016 to June 2018) after implementation of QI study (shaded area) the rate of severe IVH has dropped to 4.3% over a 2-year period of time (July 2018-June 2020); below the goal rate of 5%.