

Clinical Update– Necrotizing Enterocolitis
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Necrotizing enterocolitis (NEC) remains a substantial contributor to neonatal morbidity and mortality for premature infants despite national trends showing improvement in rates of both medical and surgical NEC in recent years.¹ Georgia has rates of NEC higher than the national average, signifying an opportunity for targeted intervention in our state.

While the etiologies for the elevated incidence of NEC in Georgia are almost certainly multifactorial, sociodemographic differences between our region and others likely contribute. Racial disparities in NEC incidence for Georgia infants were first described by Wilson et al. in 1981, with two-fold higher rates of NEC for Black versus White infants with birthrates less than 1000 grams.² Recent national data shows that those disparities persist, with Black and Hispanic infants more likely to develop NEC and to die as a result.³ This reflects broader disparities in infant mortality and NICU outcomes, with roughly two-thirds of the gap in US infant mortality between Black and White infants explained by higher premature birth rates for Black mothers and worse outcomes for very low birth weight Black infants.^{4,5}

It is increasingly recognized that addressing persistent racial disparities in infant mortality and NEC outcomes begins with robust quality improvement initiatives at a local institutional level.^{6,7} Variability in NICU quality has been demonstrated regionally and nationally, with Black infants more likely to be cared for in hospitals with lower NICU quality scores.^{8,9}

Robust quality improvement to reduce rates of NEC could begin with any number of evidence-based interventions. The gold standard for NEC reduction has been early provision of human milk to very low birth weight infants, with protocolized slow advancement of enteral volumes and careful monitoring of feeding tolerance.^{10,11} Utilization of colostrum swabs for oral care, provision of donor human milk when mothers' own milk is unavailable, and avoidance of early formula supplementation have been other keys in achieving NEC reduction for many units.^{12,13} Recognizing and mitigating racial and socioeconomic barriers to human milk provision in NICUs (e.g. holistic breastfeeding education/support), may also improve NEC outcome disparities.^{14,15}

Additional quality improvement strategies to reduce NEC have included adopting conservative feeding strategies during blood transfusion,^{11,13} implementing antibiotic stewardship protocols¹³, and considering benefits for routine probiotic administration after weighing potential risks.¹⁶ One, some, or all of these strategies could be instrumental in achieving NEC reduction for a given NICU. Improvement in NEC rates in Georgia will continue as we personalize strategies to mitigate local NEC incidence and consider areas where quality improvement initiatives could optimize outcomes. Let's continue to work together to reduce NEC and achieve equitable NICU outcomes for all infants in Georgia!

References

- 1) Han SM, Hong CR, Knell J, et al. Trends in incidence and outcomes of necrotizing enterocolitis over the last 12 years: a multicenter cohort analysis. *J Ped Surg.* 2020; 55(6):998-1001.
- 2) Wilson R, Kanto WP, McCarthy BJ, and Feldman RA. Epidemiologic characteristics of necrotizing enterocolitis (NEC) in Georgia. *Pediatr Res.* 1981; 15:523.
- 3) Jammeh ML, Adibe OO, Tracy ET et al. Racial/ethnic differences in necrotizing enterocolitis incidence and outcomes in premature very low birth weight infants. *J Perinatol.* 2018; 38(10):1386-1390.
- 4) Elder, TE, Goddeeris JH, Haider SJ, and Paneth N. The changing character of the black-white infant mortality gap, 1983-2004. *Am J Public Health.* 2014; 104(S1):S105-S111.
- 5) Matoba, N and Collins JW. 2017. "Racial disparity in infant mortality." *Semin Perinatol.* 2017; 41(6):354-359.
- 6) Ravi D, Sigurdson K, and Profit J. Improving quality of care can mitigate persistent disparities. *Pediatrics.* 2019; 144(3):e20192002.
- 7) Nathan AT, Ward L, Schibler K, et al. A quality improvement initiative to reduce necrotizing enterocolitis across hospital systems. *J Perinatol.* 2018; 38(6):742-750.
- 8) Horbar JD, Edwards EM, Greenberg LT, et al. Racial segregation and inequality in the neonatal intensive care unit for very low-birth-weight and very preterm infants. *JAMA Peds.* 2019; 173(5):455-461.
- 9) Profit J, Gould JB, Bennet M, et al. Racial/ethnic disparity in NICU quality of care delivery. *Pediatrics.* 2017. 140(3):e20170918.
- 10) Gephart SM, Wetzel C, and Krisman B. Prevention and early recognition of necrotizing enterocolitis, a tale of two tools: eNEC and GutCheck^{NEC}. *Adv Neonatal Care.* 2014; 14(3):201-210.
- 11) Talavera MM, Bixler G, Cozzi C, e al. Quality improvement initiative to reduce the necrotizing enterocolitis rate in premature infants. *Pediatrics.* 2016; 137(5):E20151119.
- 12) Kantorowska A, Wei JC, Cohen RS, et al. Impact of donor milk availability on breast milk use and necrotizing enterocolitis rates. *Pediatrics.* 2016; 137(3):e20153123.
- 13) Gephart SM and Quinn MC. Relationship of necrotizing enterocolitis rates to adoption of prevention practices in US neonatal intensive care units. *Adv Neonatal Care.* 2019; 19(4):321-332.
- 14) Goldstein GP, Pai VV, Liu J et al. Racial/ethnic disparities and human milk use in necrotizing enterocolitis. *Pediatr Res.* 2020; 88(Suppl 1):3-9.
- 15) Patel AL, Johnson TJ and Meier PP. Racial and socioeconomic disparities in breast milk feedings in US neonatal intensive care units. *Pediatr Res.* 2021; 89(2):344-352.
- 16) Poindexter B and Committee on Fetus and Newborn. Use of probiotics in preterm infants. *Pediatrics.* 2021; 147(6):e2021051485.