

Can Clinicians Predict Outcomes for Babies with Hypoxic Ischemic Encephalopathy?

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In a recently released article in *Pediatrics* ([10.1542/peds.2020-048678](https://doi.org/10.1542/peds.2020-048678)), Dr. Namasivayam Ambalavanan and colleagues, representing the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Neonatal Research Network (NRN), compare and update prediction models for outcomes of infants with moderate or severe hypoxic-ischemic encephalopathy. Having the ability to potentially predict disability or death among this group of very ill infants is important both for clinical purposes and also for grouping infants by risk for enrollment in intervention and outcomes research. This article is a good read not just for neonatologists but for general pediatricians too, since we are likely to care for survivors of hypoxic-ischemic encephalopathy.

The authors conducted a secondary analysis of data from a multi-center NRN trial that had randomized 364 neonates of ≥ 36 weeks gestational age with moderate or severe hypoxic-ischemic encephalopathy to one of 4 groups: whole body cooling to 33.5°C for either 72 or 120 hours, or whole-body cooling to 32.0°C for either 72 or 120 hours. The main outcome was death or moderate/severe disability at 18-22 months and the secondary outcome was death during the initial hospitalization. The authors compared the performance and prognostic value of older scoring systems based on a previous neonatal cooling trial (conducted by the NRN over a decade earlier) to revised and new systems based on the recent trial data. The older scoring system and Classification and Regression Tree (CART) model were based on clinical data available at <6 hours of age; these systems were updated and revised in this study.

What I found enlightening is how critically important early clinical information is to good outcome prediction. The new models, with defined cut points, could correctly classify 78% of infants (death and moderate/severe disability- primary outcome) and 68% of infants (death during initial hospitalization-secondary outcome) respectively. Two clinical variables (spontaneous activity and 5-minute Apgar score) endured in both the earlier and newer scoring system for the primary outcome, while three new variables (emergency Cesarean section, seizures, and absent suck) replaced older ones (posture, preeclampsia/chronic hypertension, and base deficit on first arterial blood gas), creating a clinically anchored updated predictive score. I've described just one of the scoring systems - when you read the article you will learn about the other scoring systems. The graphics and tables are incredibly helpful to understanding how the models were created and how they compare. I hope you enjoy this article as much as I did.

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