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Neonatal Prediction Models: Estimating Survival for Preterm Infants

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Predictive modeling design and validation is an important yet complex topic.

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Predictive modeling design and validation is an important yet complex topic. In general, prediction models are developed to guide clinical decision-making and to inform individuals about their risks of having or developing a particular clinical outcome of interest. While not a substitute for clinical experience, if used correctly, these models have the potential to provide objective data and reduce bias in clinical decision-making.

In the neonatology domain, well known prediction models are the Clinical Risk Index for Babies (CRIB) II score,[1] Score for Neonatal Acute Physiology-II (SNAP-II),[2] and the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) tool.[3,4] As predictive models continue to emerge, it is critical that new and updatedmodels reflect improved levels in neonatal care over time.

Until recently, existing prediction formulas for neonatal survival had been mostly developed in the 1990's or the 2000's. In this issue of *Pediatrics* (10.1542/peds.2020-004812), Dr. Hye Won Park and colleagues present a new model to predict in-hospital mortality after 24 hours of life in very low birth weight infants. The authors use a prospective registry of infants born between 2013 and 2017 to develop the prediction formula. The model is based on data from the Korean Neonatal Network and uses multiple perinatal factors obtained within 1-2 hours after birth. Despite some limitations to the study, the authors took steps to comprehensively validate the formula with both an internal cohort and independent external population. To find out how the model performed, link to this interesting study to learn more.

Moving forward, as we update and build on the last 20 years of neonatal mortality prognostic models, it is imperative that we, the scientific community, develop and implement processes to determine when and how these new methods should be used. While it is impossible to study all prediction models, additional research should focus on validation of existing models, and an evaluation of the impact of a chosen prediction model on clinical decision-making and neonatal outcomes.

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