



Preface

Understanding the WHEN, WHAT, and WHY of Neonatal Transfusion Medicine



Ravi Mangal Patel, MD, MSc Amy Keir, MBBS, MPH, PhD
Editors

What an exciting time in neonatal transfusion medicine! It has been over 8 years since the last issue of *Clinics in Perinatology* on neonatal hematology and transfusion medicine was published.¹ Much has happened in the intervening years. We are honored to serve as Guest Editors of this exciting issue on Neonatal Transfusion Medicine.

We've learned much about red blood cell transfusion thresholds in extremely preterm neonates through two recent trials: TOP² and ETTNO.³ These important trials have provided critical evidence on *when* to transfuse extremely preterm neonates and are discussed in detail in the article, "Thresholds for Red Blood Cell Transfusion in Preterm Infants: Evidence to Practice," by Andersen and colleagues. However, tolerating anemia with more restrictive practices than studied may also have consequences, and the article, "Anemia, Iron Supplementation, and the Brain," by Gisslen and colleagues discusses some considerations about the effects of anemia and iron supplementation on the brain. Clinical evidence alone may not be sufficient to change practice⁴; the article, "Patient Blood Management in Neonates," by Chapman and Keir discusses the role of patient blood management in translating research findings into routine neonatal care to improve blood utilization. Looking ahead to improving the precision of guiding red blood cell transfusion beyond a hemoglobin measurement and *why* we transfuse neonates, the article, "Near-Infrared Spectroscopy to Guide and Understand Effects of Red Blood Cell Transfusion," by Bailey and Mally explores the use of near-infrared spectroscopy to identify the need for and understand the effects of red blood cell transfusion. Our field needs more evidence on transfusion in populations of term infants. One such population is neonates receiving extracorporeal membrane oxygenation (ECMO), among the highest utilizers of blood products, which is

reviewed in “Transfusion in Neonatal Extracorporeal Membrane Oxygenation: A Best Practice Review” by Dantes and Keene.

For platelet transfusion, a big jolt to neonatal transfusion medicine came with the findings of the PlaNeT-2 trial.⁵ This trial supports lower platelet transfusion thresholds, often much lower than those being used in routine practice.⁶ “Prophylactic Platelet Transfusions: Why Less Is More” by van der Staaij and colleagues discusses this trial in detail, and “Hemostatic and Immunologic Effects of Platelet Transfusions in Neonates” by Davenport and colleagues provides mechanistic insights on the biological effects of platelet transfusions.

Beyond just *when* to transfuse is understanding the impact of *what* is being transfused. The articles “Blood Donor Sex and Outcomes in Transfused Infants” by Salem and Patel and “Neonatal Blood Banking Practices” by Crowe and colleagues discuss the potential importance of the characteristics of the blood products and their donors that are used for neonatal transfusion. We round out this series with the article, “Allogenic Cord Blood Transfusion in Preterm Infants” by Teofili and colleagues, which reviews allogenic cord blood transfusion in preterm infants. This could be a pioneering new strategy to change *what* we transfuse.⁷

We would like to express our sincere gratitude to the authors of this issue, who are respected colleagues and experts in the field. We hope you share our excitement of the recent progress in neonatal transfusion medicine that is summarized in this issue.

DISCLOSURES

Dr R.M. Patel receives funding from the National Institutes of Health and unrestricted equipment support from Medtronic. Dr A. Keir receives funding from the Australian National Health and Medical Research Council (NHMRC) (APP1161379).

Ravi Mangal Patel, MD, MSc
Emory University School of Medicine and
Children’s Healthcare of Atlanta
2015 Uppergate Drive NE
Atlanta, GA 30322, USA

Amy Keir, MBBS, MPH, PhD
South Australia Health and
Medical Research Institute
72 King William Road
North Adelaide, SA 5006, Australia

E-mail addresses:
rmpatel@emory.edu (R.M. Patel)
amy.keir@adelaide.edu.au (A. Keir)

REFERENCES

1. Christensen RD, Juul SE, Del Vecchio A. The expanding evidence base to guide neonatal hematology and transfusion medicine practice. Preface. *Clin Perinatol* 2015;42(3):xix–xxx. <https://doi.org/10.1016/j.clp.2015.05.002>.
2. Kirpalani H, Bell EF, Hintz SR, et al. Higher or Lower Hemoglobin Transfusion Thresholds for Preterm Infants. *N Engl J Med* 2020;383(27):2639–51.
3. Franz AR, Engel C, Bassler D, et al. Effects of liberal vs restrictive transfusion thresholds on survival and neurocognitive outcomes in extremely low-birth-weight

- infants: the ETTNO randomized clinical trial. *JAMA* 2020;324(6):560–70. <https://doi.org/10.1001/jama.2020.10690>.
4. Keir A, Grace E, Stanworth S. Closing the evidence to practice gap in neonatal transfusion medicine. *Semin Fetal Neonatal Med* 2021;26(1):101197. <https://doi.org/10.1016/j.siny.2021.101197>.
 5. Curley A, Stanworth SJ, Willoughby K, et al. Randomized Trial of Platelet-Transfusion Thresholds in Neonates. *N Engl J Med* 2019;380(3):242–51.
 6. Patel RM, Hendrickson JE, Nellis ME, et al. Variation in neonatal transfusion practice. *J Pediatr* 2021;235:92–9.e4. <https://doi.org/10.1016/j.jpeds.2021.04.002>.
 7. Teofili L, Papacci P, Orlando N, et al. BORN study: a multicenter randomized trial investigating cord blood red blood cell transfusions to reduce the severity of retinopathy of prematurity in extremely low gestational age neonates. *Trials* 2022; 23(1):1010.