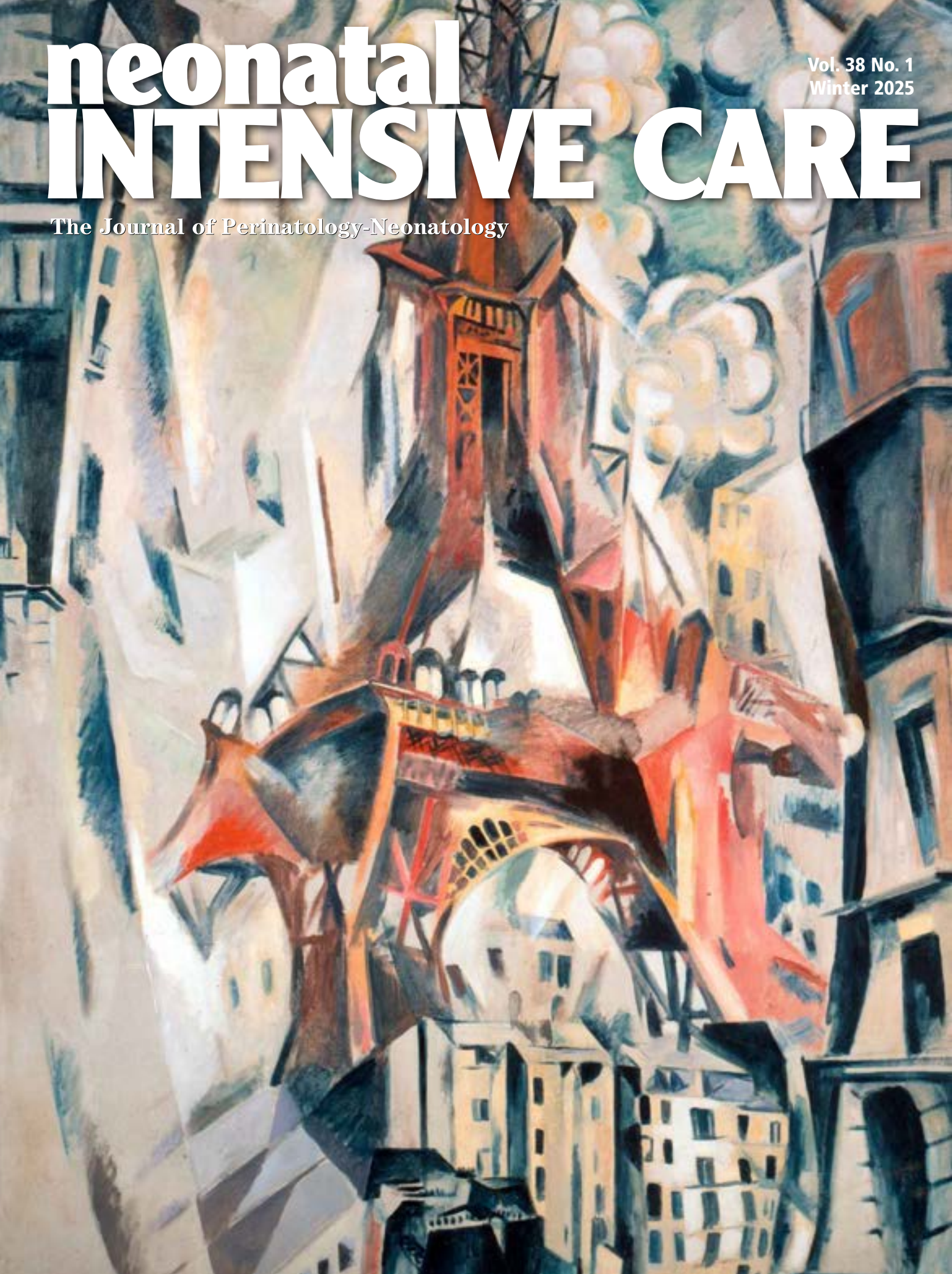


# neonatal INTENSIVE CARE

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# Harnessing the Power of Algorithms and AI in the NICU Space

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The transformative potential of artificial intelligence (AI) and machine learning (ML) has begun to ripple across industries, and healthcare is no exception. In the highly specialized and emotionally charged environment of the Neonatal Intensive Care Unit (NICU), these technologies are poised to revolutionize both the education of healthcare professionals and the care of the tiniest and most vulnerable patients. From reshaping medical school education to enhancing clinical practice and improving outcomes, AI and ML are becoming indispensable tools in neonatal care.

## Medical School Education: Laying the Foundation

Medical students are the future of healthcare, and their training needs to keep pace with advancements in technology. AI and ML offer unique opportunities to deepen understanding, streamline learning, and prepare students for the realities of modern medicine.

**1. Personalized Learning:** AI-driven platforms can assess individual learning styles and adapt content to suit specific needs. For example, an aspiring neonatologist might use AI tools to simulate complex neonatal cases, honing diagnostic and critical thinking skills in a risk-free environment.

**2. Enhancing Diagnostics Training:** Medical students can use AI to study neonatal imaging, such as X-rays or MRIs, with algorithms identifying patterns and abnormalities. This exposure helps students develop a sharper eye for diagnostics before encountering real-world cases.

**3. Summarizing Research:** Keeping up with the rapid advancements in neonatology is challenging, even for seasoned professionals. AI tools like natural language processing (NLP) systems can sift through vast amounts of medical literature, extracting key findings and trends to keep students informed. As highlighted in a recent review on AI in neonatal care,<sup>1</sup> NLP applications have already demonstrated the ability to streamline access to critical knowledge.

By integrating AI into their education, medical students gain not only technical proficiency but also the ability to critically evaluate and apply these tools in practice.

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Christopher Rand is the CEO of AngelEye Health. AngelEye Health is advancing NICU care by equipping care teams with tools that optimize workflow while empowering families through a comprehensive suite of engagement technologies.



Photo submitted.

## Practical Applications in the NICU

For practicing neonatologists, nurses, and other care team members, AI and ML present game-changing opportunities to enhance patient care. Here are several key applications:

**1. Streamlining Research Insights:** Healthcare professionals often face the daunting task of staying current with medical advancements. AI-powered systems can summarize recent research findings, highlighting actionable insights for the care team. For instance, algorithms can identify emerging treatments or interventions for preterm infants and present them in a digestible format. This aligns with findings that AI can efficiently synthesize complex datasets to improve clinical decision-making.<sup>1</sup>

**2. Enhancing Patient Monitoring:** AI can process and analyze vast amounts of data from neonatal monitors, detecting subtle changes that might indicate potential complications. Predictive analytics can alert clinicians to conditions such as sepsis or respiratory distress before they become critical. The aforementioned review also underscores the role of AI in early detection, emphasizing its potential to reduce mortality and morbidity rates in neonates.<sup>1</sup>

**3. Reviewing Medical Records:** Patient records in the NICU are often dense and complex. AI algorithms can comb through electronic medical records (EMRs), flagging potential issues such as medication interactions, abnormal lab results, or overlooked trends. While human oversight remains essential, AI serves as a powerful second set of eyes.

**4. Supporting Decision-Making:** Decision support systems powered by AI can help clinicians evaluate treatment options based on patient-specific data. These systems offer evidence-based recommendations, empowering the care team to make more informed choices.

The careful integration of AI into daily practice ensures that these tools augment, rather than replace, the expertise and empathy of healthcare professionals.

### AngelEye Health: Pioneering AI in the NICU

At AngelEye Health, we are committed to transforming neonatal care through the strategic application of algorithms, AI, machine learning, and camera vision. Building on our core mission to support NICU care teams and families, we are leveraging these technologies to create smarter, more effective solutions.

**1. Neuromotor Screening with EDNA:** With the recent acquisition of EDNA (Early Detection of Neuromotor Impairments), AngelEye is advancing the use of AI in assessing infant movement. By analyzing video footage of babies on a specialized mat, EDNA's algorithms identify subtle movement patterns that may indicate neuromotor risks. This innovative approach has the potential to detect issues earlier, enabling timely interventions and improving long-term outcomes.

**2. Camera Vision Applications:** AngelEye's existing NICU CameraSystem—which allows families to view their babies remotely—is being enhanced with AI capabilities. For instance, computer vision algorithms could analyze video streams to monitor infant activity and detect changes that may warrant clinical attention.

**3. Integration with EHR Data:** Through our NICU2Home application, AngelEye provides families and care teams access to extensive EHR data. By combining this data with insights from AI-powered video analytics, we can deliver a more holistic view of an infant's health. This integration paves the way for new applications, such as tracking feeding patterns, identifying pain indicators, and monitoring hyperbilirubinemia levels.

**4. Partnership with Researchers:** AngelEye recognizes the value of collaboration. We are actively engaging with researchers to explore new applications for AI and computer vision in neonatology. By partnering with academic and clinical institutions, we aim to commercialize cutting-edge technologies and bring them to the bedside.

### Looking Ahead

The future of AI in the NICU is bright and full of promise. By empowering medical students with AI tools, enhancing the capabilities of care teams, and pioneering innovative applications, we can ensure better outcomes for neonates and their families. AngelEye Health is proud to be at the forefront of this transformation, harnessing the power of algorithms and AI to create a brighter, healthier future for the most vulnerable among us.

### Reference

1 PMC Article: <https://pmc.ncbi.nlm.nih.gov/articles/PMC38097685/>

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bilirubin levels within the exchange transfusion thresholds; 14 of these cases were identified using early 24-hour bilirubin screening, and three were identified using early jaundice detection. The total serum bilirubin levels in six of the 17 neonates exceeded the exchange transfusion thresholds, with four cases identified using bilirubin screening. "These data suggest that visual assessment of jaundice is of limited value as a surveillance tool to consistently detect hyperbilirubinemia meriting treatment at  $\leq 24$  hours after birth," the authors of the study wrote. "Our findings support routine birth hospitalization bilirubin screening and suggest screening no later than 24 hours may be beneficial," they added.

### Live Rotavirus Vaccine Safe for Newborns of Biologic-Treated Moms With IBD

More evidence suggests there is little risk in administering the live rotavirus vaccine to the babies of mothers on biologics during pregnancy for inflammatory bowel disease (IBD). No adverse events or impairment of the immune system emerged in babies at 7 days, 1 month, and 9 months postvaccination, in findings from a small Canadian study published in *Clinical Gastroenterology and Hepatology*. The study found normal extended immune function testing in infants despite third-trimester maternal biologic therapy and regardless of circulating drug levels. The data provide reassurance about live rotavirus vaccination in this population and may also offer insights into the safety of other live vaccines in biologic-exposed individuals, wrote investigators led by gastroenterologist Cynthia H. Seow, MD, a professor in the Cumming School of Medicine at the University of Calgary in Calgary, Alberta, Canada. "Despite the well-established safety and effectiveness of non-live vaccination in individuals with IBD, including those on immunomodulators and biologic therapy, vaccine uptake in pregnant women with IBD and their infants remains suboptimal," Seow said in an interview. This largely arises from maternal and physician concerns regarding transplacental transfer of IBD therapies and their impact on the safety of vaccination. "These concerns were heightened after reports emerged of five fatal outcomes following the administration of the live Bacille Calmette-Guérin [BCG] vaccine in biologic-exposed infants. However, it had already been reported that inadvertent administration of the live oral rotavirus vaccine, a very different vaccine in terms of target and mechanism of action, in biologic-exposed individuals had not been associated with significant adverse effects," she said.

### Infant's Rash Defies Most Likely Diagnoses

Clinicians should consider zinc deficiency in premature infants having an erythematous, scaly, sharply demarcated rash that does not respond to treatments for the most likely diagnoses. Investigators report the case of a 5-month-old infant born prematurely, at 26 weeks of gestation, brought to the emergency department with a rash. The rash consisted of erythematous, scaly, crusted skin lesions of the head, neck, and perineal and genital areas; other symptoms included irritability and diarrhoea. The initial differential diagnosis included eczema, allergy, and infection. The infant's history was noteworthy for exclusive breastfeeding, chronic lung disease of prematurity, recent bronchiolitis, and psoriasis in a paternal aunt. The rash was non-responsive to systemic antibiotics (for suspected superinfected eczema), exclusion of dairy from the mother's diet (cow's milk protein allergy), topical emollients and steroids (eczema), topical miconazole and oral nystatin (fungal infection), oral aciclovir (viral infection), and repeated oral co-

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