PRESS RELEASE

Nutritional plans “custom-designed” by AI for preterm infants

The study, published in the *Journal of Perinatology*, was jointly conducted by researchers at the scientific institute for hospitalisation and care IRCCS San Gerardo dei Tintori Foundation and the Politecnico di Milano

Milan, 16 February 2026 – Artificial intelligence becomes a predictive tool that can provide assistance in defining a nutritional plan for preterm infants. This is the concept of an innovative study recently published in the *Journal of Perinatology*, part of the *Nature* portfolio. It is the joint work of researchers from the IRCCS San Gerardo dei Tintori Foundation (FSGT) and the Department of Electronics, Information and Bioengineering (DEIB) of the Politecnico di Milano.

Neonatologists **Maria Luisa Ventura, Valentina Bozzetti, Valeria Cavalleri, Lucia Iozzi** and engineers **Emanuela Zannin and Paola Coglianese** participated for the FSGT. Professor **Simona Ferrante** with engineers **Linda Greta Dui and Silvia Riccò** contributed for the DEIB, Politecnico di Milano.

The paper addresses one of the most delicate moments in the care of the extremely preterm infant, precisely **the transition from intravenous (parenteral) to oral (enteral) feeding. This is a crucial phase of "nutritional transition"** for growth and development. Today it is managed without standard procedures supported by robust scientific evidence. During this phase, **an excessive, insufficient or unbalanced intake of nutrients can lead to complications,** thus contributing to slowing down *extrauterine growth, a condition known as Extrauterine Growth Restriction* (EUGR).

The results of the research show that adequate protein and lipid intake in the early days of life, together with the growth rate in the first week, are key factors for predicting EUGR. The study also significantly improved the approach to this condition by dividing patients according to different preterm profiles. Indeed, it emerged that needs and nutritional intakes differ in the various groups, paving the way for greater personalisation of care.

«Growth is not just a numerical indicator in large preterm infants. A drop in the rate of extrauterine growth can have long-term consequences with possible repercussions even on neurocognitive development», says neonatologist **Valentina Bozzetti**. «This is why studying the nutritional transition means focusing on “enhancing growth”, while also supporting the overall quality of development. However, to achieve this, we need to understand what happens in the most delicate days of life, when every choice can make a difference».

«This is where the power of data comes into play. We had the opportunity to draw on a **wealth of data** for this study», says **Maria Luisa Ventura**. «Indeed, we analysed over a thousand electronic medical records of large preterm infants followed in a single centre. Each record provided extensive clinical and nutritional information. Placing this resource in the hands of artificial intelligence means being in a position to address a complex issue that traditional studies are unable to explore with the same degree of attention to detail».

«Artificial intelligence enables us to integrate large volumes of heterogeneous clinical data in order to convert them into useful tools for research, and to gradually support clinical decisions», says **Simona Ferrante**. «The value comes from the convergence of skills, such as a strong methodological approach and the ability to interpret complex data, besides possessing the clinical know-how required to understand numbers, thus leading to the right questions. This is how models become accurate, can be interpreted, and potentially transferred into practice».

«The research translated this integration into models capable of **predicting EUGR** during the nutritional transition by recognising patterns and combinations of clinical-nutritional variables that help to describe a particularly critical phase in greater detail», concludes **Linda Greta Dui**. «The aim is not to replace clinical judgement, but to offer an additional tool, which helps to anticipate the needs of the individual patient, and to guide increasingly custom-designed strategies studied for the different preterm severity profiles».

LINK TO THE STUDY HERE

LINK TO IMAGES HERE

FOR MORE INFORMATION:

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