

# Length of stay in neonatal ICU can affect behavior of premature babies

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A study conducted by researchers at the University of São Paulo's Ribeirão Preto School of Medicine (FMRP-USP) in Brazil indicates that length of stay in the ICU is the factor that best explains some preterm babies' behavioral problems relating to emotional regulation, regardless of the degree of prematurity and the presence of bronchopulmonary dysplasia and retinopathy of prematurity (ROP).

According to the research, which was published in the journal *Early Human Development*, neonatal pain and stressful experiences can impair both early and later child [development](#). "Moreover, the neonatal ICU environment includes other factors that impair child development, such as high levels of noise and luminosity, repetitive tactile stimuli, and maternal separation," the authors write.

The sample population consisted of 100 preterm babies aged 18 to 36 months with differing levels of prematurity. The aim of the study was to find out how neonatal and socio-demographic factors influence early-childhood temperament and behavior. All the infants were born in FMRP-USP's hospital and enrolled in a multidisciplinary intervention program in its neonatal ICU. A number of tests were applied to evaluate temperament, stress and behavior, leading to scores for the relevant indicators.

## Predictors of behavioural patterns in adulthood

The study of 100 preterm babies showed that longer stays in the neonatal ICU were a risk factor for behavioral problems. According to Maria Beatriz Martins Linhares, an associate professor at FMRP-USP and principal investigator for the study, early childhood is a window of opportunity for regulation of the individual's lifelong development.

"Initial physiological and [emotional regulation](#) lays a foundation for several behavioral regulation processes," she said. "For this reason, it is important to recall that neonatal and childhood behavioral problems can point to the risk of behavioral problems in adulthood. These can potentially be prevented in the window between birth and about six years of age."

The self-regulation process is completed by the age of five, starting with emotional regulation up to the age of approximately 18 months and followed by behavioral regulation. "Self-control emerges at around three or four years of age, with development of the executive attention system, which is relevant to effortful control, enhancing the potential for behavior regulation," the authors write.

Temperament changes during the course of development. With typical [child development](#), therefore, "systems that are initially more reactive become increasingly regulated to the extent that the inhibition control systems directed toward fear and attention control become more mature," according to the authors.

Linhares stresses that cognitive development involves not only physical growth and language and motor skills; it also has affective, social and behavioral aspects. "Motor development, behavioral indicators and temperamental traits should be monitored."

According to the World Health Organization (WHO), Brazil has the world's 10th-highest rate of premature births.

However stressful a neonatal ICU may be for babies, they simply cannot survive without the support of the equipment and the multiprofessional team of specialists. The researchers say this finding confirms the need for developmental care programs in ICUs to reduce stressful and painful experiences for newborn infants and also to enhance protective strategies during their early development.

Mothers of these babies who met the criteria for inclusion, which included understanding the instrument used to report their infant's behavior, participated in interviews and responded to questionnaires. Babies with grade three or four intracranial hemorrhage, limited mobility or cognitively impaired mothers were excluded. Thirty-six had [bronchopulmonary dysplasia](#), and 63 had ROP, the most common diseases among preterm babies.

"Previous studies compared preterm and term babies, given that preterm [babies](#) are more likely to display [behavioral problems](#). Our study advances knowledge of development in [preterm babies](#). There are risks, but if we identify the risks, we can plan strategies for protection, prevention and intervention to improve the development of these children," said Rafaela Guilherme Monte Cassiano, a psychologist and one of the authors of the study.

**More information:** Rafaela Guilherme Monte Cassiano et al, Temperament and behavior in toddlers born preterm with related clinical problems, *Early Human Development* (2017). [DOI: 10.1016/j.earlhumdev.2017.06.003](#)

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