



ECHO

Environmental influences
on Child Health Outcomes

A program supported by the NIH

Study Summary

ECHO Researchers Characterize Children Born Preterm into Four Neurobehavioral Profiles

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Who sponsored this study?

The Environmental influences on Child Health Outcomes (ECHO) Program, Office of the Director, National Institutes of Health supported this research.

Why was this study needed?

Birth outcomes for infants born very preterm have steadily improved over the past several decades. More children born at earlier gestational ages are surviving into childhood, however, it is unclear how being born very preterm may influence neurodevelopmental or behavioral problems.

Outcomes of children born at a gestational age of less than 33 weeks (“very pre-term”) vary significantly, with some children showing few neurodevelopmental concerns and others showing significant impairment. Most prior research has looked at single outcomes—for example, whether a child born preterm had a lower neurodevelopmental score or higher levels of behavior problems. Understanding how these different outcomes may group together can help researchers and healthcare providers provide more comprehensive treatment plans for children born very preterm.

What were the study results?

Researchers found evidence for four different neurobehavioral profiles based on different combinations of cognitive, motor, and behavioral outcomes of children at the age of two. These profiles range from few or no developmental concerns to severe impairment in one or more domains. The study placed most children (about 85%) into one of two groups with no/mild developmental delay and a low prevalence of behavioral problems. The remaining 15% fell into one of two profiles with more serious neurodevelopmental problems with (5%) or without (10%) co-occurring behavior problems.

Footnote: Results reported here are for a single study. Other or future studies may provide new information or different results. You should not make changes to your health without first consulting your healthcare professional.

What was the study’s impact?

This study helps researchers better understand outcomes for children following a very pre-term birth. The different groups of children this study described might require different types of follow-up services or interventions.

Who was involved?

This study included more than 2,000 babies who were born at less than 33 weeks gestational age and were evaluated at the age of two years. Pre-term children from three ECHO research sites in the U.S. were included in this analysis.

What happened during the study?

Researchers recruited children born less than 33 weeks gestational age into the ECHO Program shortly after they were born. When these children reached age two years, researchers conducted a neurodevelopmental assessment and a motor exam; parents completed questionnaires about their children's behavior. ECHO researchers looked for patterns in these data to understand whether there were groups of children with similar strengths and weaknesses.

What happens next?

More research is needed to understand why some preterm children develop neurodevelopmental and/or behavioral problems and others do not. To do this, future studies may study risk factors in pregnancy, the perinatal period, and in early infancy.

Where can I learn more?

Access the full journal article, titled "Neurodevelopmental and behavioral outcomes of very preterm infants: latent profile analysis in the Environmental influences on Child Health Outcomes (ECHO) Program," in [Pediatric Research](#).

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