

ECHO DINE Research Findings

Environmental Influences on Child Health Outcomes - Developmental Impact of NICU Exposures

Quick facts about the ECHO DINE study

Study goal

To find out how the development and long-term health of your child and children like yours, who are born premature, is affected by their environment.

Our participants

600 children ages 3-12 enrolled in DINE!

There are 8 ECHO DINE sites across the US:



- Cincinnati Children's Hospital Medical Center – *Cincinnati, OH*
- Children's Minnesota – *Minneapolis, MN*
- Kravis Children's Hospital at Mount Sinai – *New York, NY*
- Oishei Children's Hospital – *Buffalo, NY*
- UF Health Jacksonville – *Jacksonville, FL*
- Golisano Children's Hospital – *Rochester, NY*
- Vanderbilt Children's Hospital – *Nashville, TN*
- Brenner Children's at Wake Forest Baptist Health – *Winston-Salem, NC*

Our contribution to the ECHO program

Only 3 out of the 32 ECHO study groups are preterm birth cohorts, DINE being one of them. Our preterm population has unique features that can contribute to evidence-based improvements in pediatric care – both for all children and for NICU graduates.

Findings: What we have learned from our participants

Infants who are hospitalized for bronchiolitis – a common respiratory infection – are more likely to develop asthma.

This is important to know because childhood asthma is a major public health problem in the US. Knowing that a child has been hospitalized with bronchiolitis may help identify children at risk for asthma.



Nanishi, Makiko et al. "Association of Severe Bronchiolitis during Infancy with Childhood Asthma Development: An Analysis of the ECHO Consortium." *Biomedicine* vol. 11,1 23. 22 Dec. 2022, doi:10.3390/biomedicine11010023



ECHO
Environmental influences
on Child Health Outcomes

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Findings: What we have learned from our participants

As you may know, the NICU can be a stressful environment for preterm infants who are hospitalized. **Stress experienced very early in life may impact a baby's brain development.** This includes certain areas of their neurodevelopment such as learning abilities, focusing abilities, social skills, and other functions.

This matters because preterm infants are at higher risk of multiple types of long-term medical conditions, including neurodevelopmental disorders. Care practices in the highly controlled NICU environment could be changed to decrease stress and therefore reduce potential effects on the brain.



Zhang, Xueying et al. "NICU-based stress response and preterm infant neurobehavior: exploring the critical windows for exposure." *Pediatric research* vol. 92,5 (2022): 1470-1478. doi:10.1038/s41390-022-01983-3

Multiple factors may increase a child's risk of developing behavioral and emotional challenges:

- Being born prematurely
- Experiencing very stressful events during childhood
- Having parents with psychological and substance use challenges

This matters because behavioral and emotional challenges experienced during childhood may develop into more serious disorders – such as anxiety and depression – in adulthood. It is important to provide families and children with the right tools to regulate their emotions.

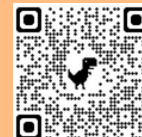


Hofheimer JA et al. "Assessment of Psychosocial and Neonatal Risk Factors for Trajectories of Behavioral Dysregulation Among Young Children From 18 to 72 Months of Age." *JAMA Network Open* (2023). doi:10.1001/jamanetworkopen.2023.10059

For a full list of all ECHO findings, please visit <https://echochildren.org/echo-program-publications/> or scan the QR code.

Results reported here are for a single study. Other or future studies may provide new information or different results.

You should always consult with a qualified healthcare provider for diagnosis and for answers to your personal questions.



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