

the CHARGE STUDY

GUIDED BY COMMUNITY MEMBERS

A

community advisory
council of parents, advocacy
organizations and service

providers meet biannually to
review progress and provide
input on the study.

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Uncovering environmental causes of autism

CHARGE (Childhood Autism Risks from Genetics and the Environment) was launched in 2003 as a study of 1,000 to 2,000 children with differing patterns of development. The goal is to better understand the causes and contributing factors for autism or developmental delay. Three groups of children are being enrolled in the CHARGE study: children with autism, children with developmental delay who do not have autism, and children from the general population. All of them are evaluated for a broad array of exposures and types of susceptibility.

Refining our understanding of environment-gene interactions

Little is known about what causes autism or developmental delay. We will learn how genes and the environment interact to change children's behaviors and skills. By studying a large number of children, we will discover which particular genes and/or environmental exposures are associated with non-typical patterns of development and special subtypes of autism or developmental delay.

The participants

Children enrolled in the study must:

- Be between 24 and 60 months of age
- Have been born in California
- Have parents who speak either English or Spanish
- Live with at least one biologic parent

Children with autism or other developmental delay are identified for the study through California Department of Developmental Services Regional Centers. Other children come from the community at large.

The assessments

Children are assessed for environmental toxins, medical history, diet and other aspects of their lives, both before and after birth. We look at physiologic factors that may affect brain development, including cells that are part of the immune system, chemicals in the body that regulate the nervous and immune systems, and lipids such as cholesterol. We also examine how cells communicate, how the body handles chemicals and how the immune system is activated.

Assessments are performed at the UC Davis M.I.N.D. Institute in Sacramento, and an extensive interview is conducted by telephone.

STUDY SPONSORS

CHARGE is supported by the National Institute of Environmental Health Sciences (grant number ES11269), the U.S. Environmental Protection Agency and the UC Davis M.I.N.D. Institute, with additional funding from Cure Autism Now.

THE RESEARCH TEAM

Irva Hertz-Picciotto, CHARGE principal investigator, is a world-renowned environmental epidemiologist whose research has addressed environmental chemicals—lead, arsenic, cadmium, pesticides and organochlorines—and their risks for adverse pregnancy outcomes and deficits in early childhood development. She founded the Center on Environmental Health and Susceptibility at the University of North Carolina, Chapel Hill, serves on the editorial board of several scientific journals, has chaired many National Academy of Science and Institute of Medicine committees and has been appointed to numerous state, national and international advisory committees, including the Food Safety in Europe Working Group of the International Life Sciences Institute, the U.S. EPA’s Scientific Advisory Board, and the California Carcinogen Identification Committee.

Robin Hansen has been a developmental-behavioral pediatrician and researcher with UC Davis since 1985. She is currently director of clinical programs at the M.I.N.D. Institute and has cared for countless children with neurodevelopmental disorders, including autism spectrum disorders, learning disorders and attention deficits. Hansen heads a multidisciplinary clinic that assesses and diagnoses children with neurodevelopmental disorders, plans and initiates intervention strategies, and works closely with the parents and families of her patients. She is also a co-investigator and consultant for several ongoing studies related to early markers and intervention trials for autism.

Lisa Croen is a perinatal epidemiologist with expertise in the epidemiology of autism and other neurodevelopmental disorders, environmental exposures and adverse perinatal outcomes. In addition to the CHARGE study, she is a co-principal investigator on the California Center of Excellence for Autism and Developmental Disabilities Research and Epidemiology funded by the CDC (California CADDRE), and co-investigator on the California Autism Twins Study (CATS) funded by NIMH. She is also principal investigator on an investigation of prenatal and neonatal biologic markers for autism, prenatal and perinatal risk factors for autism, longitudinal head circumference measurements in autism and an evaluation of the revised Social Communication Questionnaire.

EXPECTED OUTCOMES

The CHARGE study will expand knowledge of autism and childhood development in terms of:

- Differences in environmental exposures, medication use and illnesses during the prenatal period and early childhood
- Interactions between genetic susceptibility and environmental exposures
- Factors that may contribute to specific developmental patterns, such as early onset versus “regressive” autism
- Role of the immune system in the onset and severity of autism
- Relationships among clinical characteristics—gastrointestinal symptoms, sleep disruption, head growth, and cognitive and adaptive abilities—and autism

About the UC Davis M.I.N.D. Institute

The UC Davis M.I.N.D. (Medical Investigation of Neurodevelopmental Disorders) Institute is a unique, collaborative center bringing together parents, scientists, clinicians and educators for research on autism, fragile X syndrome, learning disabilities and other neurodevelopmental disorders.

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