

# Researchers use newborn blood data to study cerebral palsy

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A statewide team of researchers led by a Michigan State University epidemiologist are hoping Michigan's archive of newborn blood spots will help them uncover the causes of cerebral palsy, the most common disabling motor disorder in children with annual health costs of \$12 billion.

The research team, led by MSU's Nigel Paneth and recently awarded \$1.9 million in federal stimulus funding, will conduct a two-year case-control study using Michigan's newborn [blood](#) spot data, which have been collected and archived on all live births in the state since 1986. About 440 families are expected to participate, representing communities throughout Michigan's Lower Peninsula.

"Unfortunately, we have made very limited progress in finding the causes of [cerebral palsy](#)," Paneth said. "It is likely that a variety of different problems can lead to the disorder, most of these operating before birth. While much prior thinking has focused on birth injuries or other difficulties of labor and delivery, we think other factors must be important contributors."

Researchers will focus on three potential pathways to cerebral palsy, Paneth said:

- **Hormonal:** There is a suggestion that low levels of thyroid hormone at specific times in development may sometimes

increase the risk of cerebral palsy.

- Inflammation or infection: The team suspects that silent infections while the baby is in the womb may explain the causes of some cases of the disease.
- Blood-clotting: Some forms of cerebral palsy resemble adult [stroke](#), which is caused by bleeding or clot-formation in the brain. The team will analyze newborn tendencies for either bleeding or clot formation for their potential contribution to cerebral palsy.

Making the project possible is the newborn [genetic screening](#) program set up decades ago in Michigan, as in all states, to test [newborns](#) for [genetic abnormalities](#) that can lead to death or mental retardation. About 30 to 40 diagnostic tests are performed on every newborn in Michigan. These tests are performed on drops of blood collected for this purpose and spotted onto filter paper soon after birth.

Because of the foresight of Michigan public health officials and legislators, any drops of blood left over from this testing procedure are not discarded, and with permission of the parent, can be examined to see if they contain clues to the causes of disease.

"This leftover material is an invaluable pool of critical data," Paneth said. "In the past few years, we've discovered, to many people's surprise, that we can get very useful biological information from these tiny amounts of archived blood. Specifically, we can identify the expression of some genes just after the child's birth, which is an indication of the biological challenges the baby was facing at that time. We think these 'gene signatures' may provide clues to the causes of CP."

Much of the project's lab work with the blood spot data will be

performed at the Van Andel Institute in Grand Rapids.

"Michigan's blood spot data is a vast, underutilized resource," said James Resau, deputy director for special programs and director of the Division of Quantitative Sciences at Van Andel. "If a particular disease pops up in a specific segment of the population, you could use the data to look for causes, biomarkers and potential drug targets."

Children with cerebral palsy will be recruited in the Lansing, Grand Rapids and Ann Arbor areas. Besides the newborn blood data, after obtaining the participant's permission, researchers will interview mothers about pregnancy exposures and analyze health data recorded at birth.

Source: Michigan State University ([news](#) : [web](#))

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