

# research snapshot

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## The Effects of Intraventricular Hemorrhage and White Matter Injury on Cerebellar Growth

### What is this research about?

Premature birth puts infants at risk of having problems with movement, thinking, and behaviour. Brain development starts 4 weeks after conception and continues until age 2. White matter injury (WMI) and intraventricular hemorrhage (IVH) are 2 injuries of the cerebrum that can affect development. WMI does not allow signals to be transmitted from one region of the brain to another. IVH is a common complication that causes bleeding inside and around the space of the brain that contains spinal fluid. Although the cerebrum has been the main focus of brain research, the cerebellum is a less understood part of the brain that is also important for development. The cerebellum is a region of the brain that plays an important role in motor development, as well as language and behaviour. A variety of outcomes from prematurity may result from cerebellar dysfunction.

### What did the researchers do?

172 preterm newborns that were admitted to intensive care nurseries were studied. They were examined with serial magnetic resonance imaging (MRI) scans. Custom MRI incubators

### What you need to know:

The cerebellum helps control coordination, cognition and motor skills. This area grows rapidly after birth. Preterm infants are at a high risk of having a small brain size. Brain injury in preterm infants can lead to difficulties with movement, thinking and behavior.

were used to provide a quiet and well-monitored environment. This minimized movement and improved the signal-to-noise ratio. Interactive tools were used to find the volumes of the brain regions. Routine ultrasound scanning took place at 7 days of life and again at 4 weeks of life. Cerebellum injury was determined by a single pediatric neuroradiologist at each study site. The neurologist was unaware of the patient's history.

### What did the researchers find?

The main findings were:

- The cerebellum grows at a steady rate after preterm birth.
- Preterm newborns with IVH have a slower growth of their cerebellum.

- More severe bleeding from IVH is associated with a worse growth of the cerebellum
- Since other forms of injury to the cerebellum (WMI) did not have the same effect, it was suspected that blood in the spinal fluid may affect the growth of the cerebellum.
- Cerebellar volume changes can be observed much earlier than previously reported in term-equivalent brains.

### How can you use this research?

Policymakers can learn the need to better understand how brain injury to pre-term infants affects development. This will help to identify program and services needed to support these infants.

Practitioners can use this information to understand the impact of brain injury to pre-term infants. Identifying risk factors for impaired brain growth can help us find ways to prevent or decrease the impact of these factors. With further research this information could help to create new interventions for infants with brain injuries.

### About the Researchers

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### Keywords

Cerebellum, Hemorrhage, Intraventricular hemorrhage, White matter injury

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