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New research finds slower growth of preterm infants linked to altered brain development

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(Medical Xpress)—Preterm infants who grow more slowly as they approached what would have been their due dates also have slower development in an area of the brain called the cerebral cortex, report Canadian researchers in a new study published today in *Science Translational Medicine*.

The cerebral cortex is a two to four millimetre layer of cells that envelopes the top part of the brain and is involved in cognitive, behavioural, and motor processes.

Researchers analyzed MRI brain scans of 95 preterm infants born eight to 16 weeks too early at BC Women's Hospital & Health Centre between 2006 and 2009. Infants were scanned soon after birth and a second time close to what would have been their due date, the ninth month of pregnancy. These MRI scans allowed researchers to measure the pattern of water movement inside the brain, which normally changes between scans as the brain matures. The researchers also assessed the babies' weight, length, and head size. They found that preterm infants with slower growth had delayed development in the cerebral cortex compared to those infants who grew more quickly between scans.

"These results are an exciting first step because understanding the importance of growth in relation to the brain in these small babies may eventually lead to new discoveries that will help us optimize their brain development," says Dr. Steven Miller, the study's co-lead. Dr. Miller is head of neurology at The Hospital for Sick Children (SickKids), the

Bloorview Children's Hospital Chair in Paediatric Neuroscience, professor in the department of Paediatrics at the University of Toronto, affiliate professor in the department of Pediatrics at the University of British Columbia (UBC), and affiliate investigator at the Child & Family Research Institute (CFRI) at BC Children's Hospital. He led the study with Dr. Ruth Grunau, a professor in the UBC Department of Pediatrics and CFRI senior scientist.

"More research needs to be done to understand what is the optimal growth rate for the brain development of these babies," says Jillian Vinall, the study's first author and a UBC PhD student co-supervised by Dr. Grunau and Dr. Miller.

"We're especially grateful to the families for their generous and ongoing participation in this study," says Dr. Miller. The researchers are following the babies through childhood to understand how preterm brain development is associated with their neurodevelopment outcomes.

Provided by Child & Family Research Institute

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