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Does a bigger brain make for a smarter child in babies born prematurely?

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New research suggests the growth rate of the brain's cerebral cortex in babies born prematurely may predict how well they are able to think, speak, plan and pay attention later in childhood. The research is published in the October 12, 2011, online issue of *Neurology*, the medical journal of the American Academy of Neurology. The cerebral cortex is the outer layer of the brain covering the cerebrum, and is responsible for cognitive functions, such as language, memory, attention and thought.

"In babies born preterm, the more the cerebral cortex grows early in life the better children perform complex tasks when they reach six years old," said study author A. David Edwards, DSc, of Imperial College in London. "The period before a full-term birth is critical for brain development. Problems occurring at this time have long-term consequences, and it appears that preterm birth affects brain growth."

The study looked at brain growth rates of 82 infants who were born before 30 weeks gestational age using MRI scans of their brain between 24-44 weeks. Brain scans were collected repeatedly from immediately after the babies were born until their full-term due date. Their cognitive abilities were tested at two years old and again at six years old.

The study found that the faster the rate of cerebral cortex growth in infancy, the higher their scores were on the developmental and intelligence tests as children. A five to 10 percent reduction in the surface area of the cerebral cortex at full-term age predicted

approximately one standard deviation lower score on the intelligence tests in later childhood. Motor skills were not correlated with the rate of cerebral cortex growth, and the overall brain size was not related to general cognitive ability.

"These findings show we should focus on the growth of specific regions of the brain like the cortex when trying to understand or diagnose potential problems in babies and fetuses," said Edwards.

Provided by American Academy of Neurology