

## Does preterm birth affect children's cognitive ability?

In the United States, 12% of babies are born prematurely, or before 37 weeks of gestation. A baby's gestational age is the time that has passed since the date of the mother's last menstrual period, and is approximately 40 weeks in normal infants. Exactly how early each baby is born and how much they weigh at the time of birth are important factors that impact their treatment course and outcome. The following table summarizes common terms used to describe newborn infants:

<b>Term used:</b>	<b>What it means:</b>
Preterm	Delivered before 37 weeks gestation
Moderately Preterm	Delivered between 32-35 weeks gestation
Very Preterm	Delivered before 32 weeks gestation
Low Birth Weight	Weight at birth less than 2500g
Very Low Birth Weight	Weight at birth less than 1500g
Extremely Low Birth Weight	Weight at birth less than 1000g
Small for Gestational Age	Birth weight less than 10 <sup>th</sup> percentile for gestational age
Large for Gestational Age	Birth weight greater than 90 <sup>th</sup> percentile for gestational age
Appropriate for Gestational Age	Birth weight between 10 <sup>th</sup> -90 <sup>th</sup> percentiles for gestational age

Adapted from Kelly (2006)

Survival rates for these infants have improved dramatically over the last 10-15 years. For example, 98% of infants born moderately preterm (32-35 weeks) survive the first year of life, while 80% of those born at 26 weeks gestational age also survive the first year. As medical advances continue to improve survival rates and push the age of viability back earlier and earlier, we are learning more about the long-term effects of preterm birth on these children and their families. This article will briefly review the available research examining the effects of preterm birth on children's learning abilities and social/emotional development.

A comprehensive review completed in 2002 (Bhutta, et al.) combined and "averaged" the results of many studies looking at the effects of preterm birth on children's cognitive ability (e.g., their ability to learn and process information, solve problems, etc. as measured by IQ tests). This

review concluded that there was an average difference of about 10 points on various standardized tests of cognitive ability. In many studies, the average IQ scores of children born preterm still fell in the average range of functioning, despite being lower than children born at term. Other more recent studies show a similar trend. For example, one study compared 5-year-old children born at term with those born extremely preterm or with extremely low birth weight. They found that the preterm children's cognitive scores fell approximately 12 points lower, on average, than those of children born at term. There did not seem to be any clear pattern of specific deficits associated with preterm birth and tests of memory, attention, and planning/organization (i.e., "executive functions"). Another study followed children until age ten. That study found a statistically significant difference in IQ scores between those born preterm and at term, with an average difference of about 12 points, although again the average score for preterm children was still within the average range. This study further divided the preterm children into those with and without school problems. They examined what factors at birth and in the first few months of life put children at higher or lower risk for later school problems within the preterm sample. Those without school problems were characterized by less serious neonatal difficulties, better drinking ability in the first month, faster early head growth, and better mental and motor development in the first year of life.

Epidemiological studies showed that children born preterm or at low birth rate are 50% more likely to be enrolled in special education services, and the research discussed above shows that preterm birth does have some impact on cognitive development. However, the individual outcome of any child born preterm is very difficult to predict and depends on many factors, including gestational age at birth, birth size, medical complications, family environment, and

access to and receipt of early intervention services. What can be done to help ensure the best outcome possible?

- Make sure your baby has appropriate developmental screenings starting during the first year of life.
- Discuss developmental milestones and the baby's progress in terms of speech and motor development with your pediatrician at each visit.
- Know what testing and intervention services are available if problems are suspected. For example, IDEA part C (Individuals with Disabilities Education Act) provides for locally available early intervention service for children from birth to age three for those who qualify. Infants born weighing less than 1200g are automatically eligible, and those born preterm may also be eligible depending on their physical and developmental status. It is important that intervention services be initiated as soon as a problem is suspected, as earlier interventions are associated with better outcomes.
- Learn more from resources such as the March of Dimes and the Center for Disease Control.

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The Maternal Substance Abuse and Child Development Project is funded in part by the Georgia Department of Behavioral Health & Developmental Disabilities (DBHDD).

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