



## **Newborn Growth**

### ***Assessing Early Risk***

The size of a newborn is a key measure of her overall health status while in the womb. Growth charts have been developed by the United States Centers for Disease Control and Prevention that allow for the comparison of a newborn's growth to that of other babies at birth. Copies of these growth charts can be found in this toolkit. The growth parameters of interest are the newborn's weight, length, and head circumference.

By using a growth chart, one can determine if a baby's growth falls in the normal range. For example, if the baby's weight plots out at the 25<sup>th</sup> percentile, this means that he weighs more than 25% of other male newborns his age. Strictly speaking, weight, length, and head circumference that plot out between 3<sup>rd</sup> and 97<sup>th</sup> percentile are considered normal. However, it should be noted that some clinicians view the 10<sup>th</sup> to 90<sup>th</sup> percentiles as the normal range, and some states use a definition of 5<sup>th</sup> to 95<sup>th</sup> percentile for being defined as "normal" growth.

One of the caveats of this assessment of growth is that children who are premature are going to be small. The following information is based on measurements for children born at full term (38 to 42 weeks). If a baby is premature, then the measurements must be adjusted for gestational age based on the duration of pregnancy. Generally, the rule of correction is to adjust for prematurity until the child is three years old when measuring length, until the child is two years old when measuring weight, and until 18 months for plotting head circumference.

### **Birth weight**

The average birth weight of full-term babies in the United States is 7 pounds 8 ounces, with a normal range down to approximately 5 pounds 8 ounces. Any baby weighing less than 5 pounds 8 ounces is a "low birth weight" baby. When reviewing medical records, you sometimes will see that a child has "intrauterine growth retardation." This term means essentially the same as low birth weight.

Low birth weight reflects poor growth in the womb and is a significant problem in many babies born overseas. Tobacco smoking or the use of alcohol or other drugs can significantly affect the fetus' growth, as can poor nutrition or generally poor health during pregnancy. Even though as the child grows, he usually "catches up" to a normal weight for age, low birth weight is a significant risk factor for developmental complications as the child gets older.

### **Birth length**

The average birth length of term babies is about 20 inches (52 cm), with a normal range down to about 18 inches. Typically, reduced length alone is not a significant marker of risk. However, if the baby is very short at birth, it might be an indication of some type of genetic disorder which would require further investigation.





### **Birth head circumference**

Head circumference (the size of the head) at birth is very important because it is a reflection of brain growth in the womb. The average head circumference at birth for a full term baby is about 35 cm (13 inches). A head circumference below about 32 cm (12.5 inches) at birth is small and is an indication of risk.

The growth of the baby's head is stimulated by the growth of the brain. Therefore, babies born with small heads often had poor brain growth in the womb. Alcohol, cocaine, and heroin are among the substances of abuse that have been shown to be most closely associated with poor brain growth. Genetic abnormalities and infections in the womb (toxoplasmosis, rubella, syphilis, cytomegalovirus, herpes) are other causes of small head size in a newborn. Additionally, many infants born overseas who are placed in orphanages, especially in Russia and other eastern European countries, have a small head circumference, although the reason for this has not been determined.

A small head circumference at birth is a significant marker of risk for poor developmental outcomes. Studies of newborns with small heads have shown that the head size does not usually catch up to the normal range, and if it does, it can occur as late as when the child is four to five years old. In some cases, especially if the mother drank alcohol during pregnancy, the head size continues to be small throughout early childhood and into adulthood.

### **Symmetric and asymmetric growth retardation**

The general long-term outlook for a child born too small can be assessed by comparing relative birth weight to head size. A small head size at birth accompanied by a low birth weight (symmetric growth retardation) reflects overall poor growth in the womb and represents a greater risk than that of children with only low birth weight. In cases where birth weight is normal, but the head is small or where both weight and head size are low, but the head circumference is proportionally more reduced than the birth weight (asymmetrical growth retardation), the risk to the child is even greater. This often is the case in babies whose mothers used heroin, cocaine, phencyclidine or alcohol during pregnancy and requires a full neurodevelopmental evaluation to assess the child's status and create an appropriate early intervention plan.