The First Year of Life

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GROWTH AND GROWTH CHARTS

Weight and head circumference

The size of the normal infant at birth is determined mainly by the mother's size. The greatest changes to adjust for other hereditary factors take place during the first three months of life. Although children tend to attain a stature between those of their parents, some children take after one parent, grandparent, or an even more remote member of the family. All these children are perfectly healthy. It may be difficult to distinguish these normal adjustments of growth from disease, especially during the first few months of life. Growth charts are therefore essential for diagnosis during this period and helpful in discussions with parents.

Length (or height) is difficult to measure accurately in a very young baby, and for several years we have used the head circumference as a reference measurement for comparison with the weight. The use of the head circumference in this way is only valuable in the first two years of life. The head circumference is measured round the occipitofrontal circumference (the largest circumference), which should be determined with a disposable paper tape measure or a fibreglass tape measure. Linen tape measures stretch and produce inaccurate results.

Normal growth and short normal infants

An infant usually has a similar centile at birth for both head circumference and weight. Children of large parents tend to be towards the 90th centile and those of small parents near the 10th centile. Most of these children remain on the same centiles for the rest of their lives. Plotting these measurements on a chart in routine clinics helps to confirm that the child is receiving adequate food and is growing normally.

One of the most common problems in paediatric outpatient clinics is the infant of short parents who consider that he does not eat enough. Plotting growth measurements on a chart from measurements already recorded at the local clinic confirms to the doctor and the parents that the child is normal and that his final size will be similar to that of his parents (chart a). Charts are better than cards for recording growth. The differences between boys and girls are so slight that one chart can be used for both.

This chart can be used for both boys and girls

GIRLS

Name.....
 Gestational age..... Date of birth.....

Taking after mother and father

Some children are more similar to one parent than the other in final size. If only their weights are recorded they may appear to be either failing to thrive if the father is small (chart b) or gaining weight excessively if the father is tall (chart c). If both weight and head circumference are plotted on a chart the weight centile line and head circumference centile line can be seen to be running in parallel. In other words, the whole of the child's size is approaching that of a particular parent.

Getting fat

Poor lactation and failure to thrive

Growth charts give an early warning of obesity. Chart d shows that at the age of 4 months this child's weight centile started deviating upwards although the head circumference centile remained the same. If the mother had been shown the growth chart at the age of 4 months she might have been able to have prevented the phenomenon seen at 6 months.

The increasing incidence of breast-feeding has resulted in a few infants receiving insufficient milk as a result of their mothers not recognising poor lactation. This can be detected at an early stage by weighing infants regularly, although normal breast-fed infants may not regain their birth weights before the age of 2 weeks. The onset of full lactation is extremely variable, and this must be taken into account when considering the adequacy of weight gain (chart e). Plotting the infant's weight on a growth chart is the first investigation required to diagnose whether failure to thrive is present and also to give a presumptive diagnosis of the cause (chart f).

A convenient growth chart for low-birth-weight infants is that devised by Gairdner and Pearson, which starts at the gestational age of 28 weeks. By the time most of these infants have left hospital they have nearly reached the date at which they would have been delivered at term. For these infants the Northwick Park chart can be used by starting week 0 at the expected date of delivery. When these infants reach home, whether they were born early or after intrauterine malnutrition (light-for-dates), they may gain weight rapidly, when they will cross the centile lines for both weight and head circumference in parallel (chart g). Preterm infants may have a relatively large head measurement because of the head's discoid shape, but values parallel with weight measurements show that the head is normal.

Low birth weight

Infant of diabetic mother

The infant of the diabetic mother may be grossly obese at birth but, by a mechanism that is not understood, slims down to a reasonable size within a few months of birth (chart h). These infants may not gain any weight at all for the first two months of life and the mother may be accused of starving the infant.

Progressive hydrocephalus can be confirmed by showing a head circumference centile which progressively increases while the weight centile shows no change (chart i). Most of these infants will have associated myelomeningocele. This condition must be differentiated from familial large head, where the head circumference centile remains constant and is parallel to the weight centile.

Progressive hydrocephalus

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What the newborn baby can do

Many mothers, especially those having their first baby, believe that newborn babies are blind until they are 6 weeks old. It is not surprising that these mothers treat their babies like inanimate dolls and feel ashamed when an unexpected visitor catches them talking to the baby. Normal newborn infants can see, hear, and appreciate pain immediately after birth, even if the mother has received heavy sedation. During the hour after birth the infant is often wide awake, looking round for a feed before going to sleep for a few hours.

The distance between the eyes of the mother and the infant when the mother is breast-feeding is the distance at which infants can best focus on an object. This eye-to-eye contact provides the first means of communication between mother and infant and is probably the reason why mothers find that covering the infant's eyes during phototherapy disturbs them. Mothers of blind infants have difficulty in feeling close to their infants. A newborn infant will become alert, frown, and gradually try to focus on a red object dangled about 12 inches before him. He will stare intently at the object and will follow it with short jerking movements of his eyes if it is moved slowly from side to side. The infant is also sensitive to the intensity of light and will shut his eyes tightly and keep them shut if bright light is turned on. He can discriminate shapes and patterns and the arrangement of lines from birth. He prefers patterns to dull or bright solid colours and looks longer at stripes and angles than at circular patterns.

Newborn infants can hear. They respond to sound by blinking, jerking their limbs, or drawing in breath. They may stop feeding. Mothers often speak to their infants in a high-pitched voice and the infant responds more consistently to his mother's than his father's voice. Infants of 3 days of age show preference for sweet and dislike of bitter flavoured fluid. At about the same age they can differentiate smells and distinguish between their own mother's and other mothers' breast pads.

Analysis of sound films shows that both listener and speaker are moving in time to the words of the speaker, creating a type of dance. For example, as the speaker pauses for breath or accentuates a syllable, the infant may raise an eyebrow or lower a foot. The mother notices these changes and this may encourage her to continue speaking. At a few weeks or even a few days after birth the infant may mimic gestures such as tongue protrusion, lip protrusion, or opening the mouth.

If the doctor talks to the baby while examining him the mother will not feel foolish when she does it herself.