

Weight gain and weight loss in breastfed babies

"..enthusiastic promotion of breastfeeding and encouragement to mothers needs to be matched by skilled assistance during early feeds, ...proficient evaluation of breastfeeding effectiveness and application of interventions that preserve breastfeeding"²³ .

Baseline considerations:

Most newborn babies lose some weight during their first week of life, and there is a general expectation that the baby will be back to birth weight by 10-14 days.

There is less agreement about how great a weight loss is within the bounds of what is normal or acceptable.

Although the figure of 10% of body weight lost is often cited as the upper limit of normal, there is little evidence to support a figure as high as this. Data from 9 reports and/or controlled studies conducted between 1986 and 1999 suggests a normal range of 3% - 7%¹⁻⁹.

The five reports that gave the *age* of the baby at maximum weight loss were all in agreement - between 2 and 3 days of age.

Only one⁵ reported reliably on the age at which birth weight was regained, which for the 200 infants in the study was an average of 5 -6 days.

All these findings are supported by a set of weighings that were made in the John Radcliffe Maternity Hospital in 2003, as part of a research project¹⁰.

41 breastfed, 27 bottle fed and 26 mixed fed babies were weighed at birth and at three days in the JR. Subsequent weights were taken from the Community midwives' records. By Day 3 breastfed babies had lost a greater proportion of their birth weight than their formula fed counterparts (6.8% vs.3.2%) but by day 5 the differences were no longer significant (3.3% vs. 2.7%).

In both groups, exclusively breastfed or exclusively bottle-fed, most had regained their birth weight by day 7. This was not the case for babies who were being both breast and bottle fed, the majority of whom were still below birth weight by day 10.

Most of the weight lost during the first three days will be due to the passage of meconium, and this, according to a 1926 textbook¹¹, accounts for 200 - 600gms. Some will be due to urine output, although this is low in the first 24 hours.

The earlier the baby feeds, and the more often the baby feeds, (provided that attachment is good) the less weight will be lost,^{2,3,12} and this argues for skin contact at birth, an early first feed and unrestricted access to the breast thereafter.

In these circumstances the average volume of breastmilk consumed per 24 hours rises sharply between 72-96 hours after birth, (Average: 408mls range: 98-

775mls/24hrs aged 48-72 hours; average 625mls range 378-876mls/24hrs aged 72-96 hours)¹³, and weight should start to be regained.

(See also "milk volume from Birth" elsewhere on this website)

When should babies be weighed?

There is general agreement that the weight at birth needs to be accurate. Thereafter there is little consensus as to when the baby should next be weighed. There are those who argue that weighing the baby at 72 hours of age (day 3-4) and again at 120 hours (day 5-6) will demonstrate that the 5-day-old baby is now growing, assuming that the second weight is higher than the first^{14, 15, 23}. If it is not, it will be clear by day five that feeding needs attention and action can be taken.

If infant weight is going to be a useful tool for detecting feeding problems, delaying the first postnatal weight will make effective intervention to support the establishment of breastfeeding more difficult²³.

There are others who argue that telling a mother that her baby has lost weight, no matter how carefully the physiology of the phenomenon is explained, only serves to undermine confidence in breastfeeding¹⁶. They point out that weighing is only one aspect of the assessment of feeding adequacy¹⁷, which could also include watching the mother put her baby to the breast, and observing the baby's urine and stool output and colour. The stool of a breastfed baby will take longer than that of a formula fed baby to change from black to yellow, but should nevertheless be starting to change by 48 hours and should be yellow by 72-96 hours¹¹.

(See "what's in a Nappy?" elsewhere on this website)

Recording and interpreting weight

In 1994 the WHO Working Group on Infant Growth published their research findings, which demonstrated that breast-fed and formula fed babies had different growth trajectories at different ages, and that it was inappropriate to plot the growth of breastfed babies on charts that had been compiled using data from formula fed babies. Almost a decade later, growth charts specifically designed to reflect the normal growth of breast fed babies were produced by the Child Growth Foundation and were incorporated into the child health record book carried by the mother¹⁸.

These have now been superseded by the WHO Growth charts which were launched in May 2009.

This time, infants were only included in the data collection if they were healthy and born at term, were breastfed exclusively for at least 4 months, with continued partial breastfeeding for a year and weaning solids started by 6 months. Mothers had to be non-smoking and to be living in comfortable economic circumstances.

Data were collected from birth to age five in 6 countries (USA, Norway, India, Ghana, Brazil, Oman) and very similar growth patterns were found in all 6 centres.

Further information, or to download teaching materials, go to:-
www.growthcharts.rcpch.ac.uk

There is less emphasis on the 50th centile line; it is the same weight as all the other lines. The chart label (e.g. "weight" "height") will be written along the curve of the 50th centile line to make it easy to find.

Nevertheless few babies continue on exactly the same centile from birth onwards. About 50% of babies cross at least one channel on the weight chart between six weeks of age and 12-18 months. 20% cross one channel downwards and 5% fall across two channels. Babies who are large at birth are more likely to show falls of this magnitude. On average small babies catch up and large babies catch down. This is explained by the phenomenon of "regression to the mean"¹⁹.

Compared with their formula fed counterparts, breastfed babies grow more quickly in the early weeks, so it might be appropriate to re-assess the feeding quality in a young breastfed baby who is regarded as growing slowly, bearing in mind that these babies may be adopting a growth trajectory that is normal for them.

Concerns about weight

The baby may be: -

- a) gaining slowly,
- b) not gaining at all,
- c) or losing weight.

Prolonged failure to gain weight or continued weight loss is likely to have serious implications¹⁹.

Static weight, or weight loss, at any time after the first week, is a cause for concern.

There are really only two main reasons why breastfed newborns don't grow - either they are not getting enough calories, which is the usual reason, or they are getting enough for growth in normal circumstances, but they have an increased need - i.e. they are dealing with some pathological condition, like a urine infection, reflux or a cardiac problem. If the baby seems unwell, refer to the GP.

It is rare that the weight chart is the only clue to a serious organic disorder affecting growth in infancy. Other signs or symptoms are nearly always present as well, and in their absence hospital admission is rarely helpful^{19, 20}.

Assessing feeding quality

- a) Listen to the mother - a history of very frequent feeds, very infrequent feeds, very long feeds, a baby restless at the breast, sore /damaged nipples, engorgement, mastitis - all indicate that attachment is less than ideal.

- b) Ask her about feed frequency; after the first week, most babies will ask for 6-8 feeds per day. If a (poorly growing) baby is asking for fewer than 6 feeds a day, perhaps extra feeds could be given²¹.
Ask her about breast use; is she restricting the baby to one breast per feed, or insisting on two breasts per feed?
Is she using a nipple shield - which has the potential to reduce milk transfer and thus infant growth?
Is she using a dummy - which may over-ride the baby's need to feed?
Ask her about medication - some, such as the combined pill, can affect milk production.

- c) Watch her feed her baby - If a breastfeeding mother and baby have a problem, ineffective attachment is almost always the root cause. This may be because the mother's technique leaves room for improvement, or because the baby is physically unable to draw in sufficient breast tissue or make an adequate seal between the tongue and the hard palate (e.g. tongue-tie, palate clefts).

- d) Weigh the baby - on scales that can be used consistently over the time it may take to help her resolve her problem, to give a baseline comparison for future weights. Weighing the baby also provides an opportunity to look at the baby.

- e) Look at the baby - there is more time available (in days) to deal with a well-covered, chubby baby that isn't growing well, than there is with a scrawny anxious looking baby.

What is done next depends on what has been seen and heard, and what is possible and acceptable as far as the mother is concerned.

If, having watched her feed, there is room for improvement in her feeding technique, work with her on that to start with.

1) If it seems to be the case that she has a good milk supply, and she can make the changes she needs to fairly easily and she notices a difference in her baby's behaviour as a result of making those changes, it may be enough to suggest that she just works on improving attachment over the next day or so, and then returns so that the baby can be re-weighed and it can be seen if her improvement in feeding technique has been sustained.

How does a mother or a health professional know if attachment is effective?

This list is also available as a stand alone document elsewhere on the website

- **It doesn't hurt.** This is not an infallible sign but the opposite is certainly true - if it does hurt it cannot be quite right.
- If her nipples have already been damaged, even effective attachment will hurt for 10 - 20 seconds, as the damaged tissue of the nipple is stretched to form the teat. After that it should improve considerably. If it does not, the attachment still needs improvement.
- The baby will **start sucking almost immediately**
- The baby's **sucking pattern will change** from quick short sucks to slow deep sucks.
- The baby will **pause from time to time**, and then start sucking again without having to be prodded or coaxed.
- The baby's body (and hands) will be **relaxed** and still until the very end of the feed.
- The baby will let go of the breast **spontaneously** when he has finished, or can be encouraged to fall away if the breast is gently raised.
- The feed takes a **reasonable length of time**. After the first week this should be less than 40 minutes per breast, most of the time.
- When the baby has finished feeding, the mother's **nipple** should be the same **shape** as it was before the feed. If it has obviously been compressed it was not far enough back in the baby's mouth.
- The **feed should be quiet**, although swallowing may be heard from time to time. Noisy gulping feeds suggest ineffective attachment.
- The baby can **breathe without difficulty** and without the breast being held back. The nose should hardly touch the breast
- The baby's **chin should be in close contact** with the breast
- If you can see the angle of the baby's mouth, it should be greater than 100 degrees i.e. wide open.
- If you can see any areola, there should be more visible beyond the top lip than beyond the bottom one.

(There is no need to check whether the bottom lip is curled back. It is not the best guide and looking for it often detaches the baby.)

2) If the mother finds it difficult to make the changes in technique that are being advocated, and /or her baby is behaving at the breast in a way that seems to indicate that the milk supply is no longer generous, suggest that she express milk after as many daytime breastfeeds as she can manage and give her own milk to her baby as an extra feed, once or possibly twice a day.

This seems to work better than topping up after every feed, which risks impacting on the number of breastfeeds the baby asks for in 24 hours.

This should improve the baby's intake of milk, while giving the mother the time she needs to improve attachment.

If the mother is giving the milk by bottle - see "[How do I give my baby a bottle?](#)" (pdf, 25 KB)

A stand-alone page taken from the UNICEF-UK BFI booklet "A guide to infant formula for parents who are bottle feeding " below, as the principles apply equally to mothers giving their expressed breast milk by bottle

She will need access to an efficient breast pump, probably an electrical one, and she will need to be shown how to use it and how to clean the components effectively. (See "Cleaning breast pump kits" on the home page).

Double pumping usually more effective, and quicker, than single pumping. (See "How to use an electric pump" on the home page)

Declining weight after an initial period of good growth.

Some otherwise well babies grow well initially and then the rate of growth declines to the point where it causes concern. Quite often the mother appears to have plenty of milk and the baby feeds frequently. These babies are sometimes colicky as well.

Again it is usually the case that there is room for improvement with breastfeeding technique.

Babies who are not well attached but feed often may keep milk production high by stimulating prolactin release. The baby may be able to induce the release of good volumes of milk via the let down reflex and so may be well hydrated. However, the poorly attached baby will not be able to access the higher fat milk that comes towards the end of the feed.

Provided that the baby can physically hold a sufficient volume of low fat milk he can get the calories he needs to grow.

Babies who can actually manage this may also have severe colic because of all the lactose that the gut bacteria are fermenting, but they are still growing well.

Babies who cannot physically hold enough low fat milk gradually grow less well.

Again, the solution is usually simple - improve attachment and the baby can then remove the fat rich (calorie rich) milk that comes at the end of the feed.

(See "Colic in the breastfed baby" on the home page)

If the mother does not appear to have plenty of milk, or the baby feeds infrequently, reduced milk production as opposed to ineffective milk transfer, may be the cause of the poor growth.

If milk removal is not good when control of milk production starts to tip from endocrine to autocrine control; that is to say it starts to become milk removal driven rather than prolactin driven, then milk production slows as the whey peptide inhibitor (FIL or the Feedback inhibitor of Lactation) repeatedly accumulates. This is a reversible process in most women.

As a last resort, a dopamine antagonist that does not cross the blood/brain barrier and is approved by the American Academy of Paediatrics for use in breastfeeding mothers, Domperidone (Motilium) may be helpful, in combination with other methods of improved milk removal. (See Action Plan below.) Domperidone works by increasing prolactin levels and can "re-prime" milk production, but this is only translated into increased milk yield if good milk removal is sustained.^{22, 24, 25}

If increased milk intake is not reflected in improved growth, the baby should be referred to a paediatrician.

Summary:

The evidence suggests that when babies are breastfeeding effectively:

- Maximum weight loss occurs by 72 hours: "Day 3".
- Maximum percentage of bodyweight lost is 6-8%
- Birth weight is regained by 5-7 days of life

Action plan:

If the otherwise well, breastfed baby's weight is causing concern, in the absence of other clinical symptoms or signs: -

1. Improve breastfeeding management - no restrictions on feed frequency or duration; no nipple shields, no dummies.
2. Improve breastfeeding technique
3. Improve technique and suggest double pumping after daytime feeds and topping up with the expressed milk.
4. Improve technique, suggest double pumping after daytime feeds, topping up with the expressed milk - and consider a 10 day course of Domperidone (10mgs 3x day for 10 days). (see UKMI 2014)
5. Improve technique, suggest double pumping after daytime feeds and topping up with the expressed milk - and in addition give a small amount of formula once or twice a day, as an extra feed. (If there is a strong family history of atopic disease, you might consider the use of hydrolysate formula; although the evidence base for this is no longer as strong as it was once thought to be. (Nice guidelines 2008)
6. In situations 3-5, stop the top-ups as soon as weight gain is satisfactory and see if growth is maintained.

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