

# Infant and toddler nutrition



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## Background

General practitioners (GPs) are often the first point of advice about nutrition and feeding concerns in infants and toddlers.

## Objectives

The aim of this article is to discuss the assessment of breastfed infants and address commonly presenting issues such as regurgitation, vomiting and bowel habits. Recommendations for starting solids and management of fussy eating are also outlined in this article.

## Discussion

Breastfeeding should be supported by all healthcare professionals. Intake is difficult to quantify, but can be assessed using growth and urine output, with support from lactation consultants and/or child and family health nurses. Regurgitation is common, and usually resolves itself. If there are clinical concerns about a child's vomiting, they should be investigated medically. Constipation can be caused by insufficient fluid intake and should be managed medically; dietary interventions are not recommended as first-line treatment. Solid foods should be introduced around six months of age, when the infant is developmentally ready. Delaying the introduction of solids or allergenic foods does not prevent allergies. Fussy eating is common in toddlers exerting their independence, and behavioural management is essential.

**B**reastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants.<sup>1</sup> If a mother cannot or chooses not to breastfeed, then infant formula is the only safe and suitable alternative.<sup>2</sup>

Assessing the adequacy of an infant's intake from breast milk can be difficult because the intake is not measurable. There are some key indicators that are useful in assessing the nutritional adequacy of a baby's intake, particularly if they are breastfed.

## Weight gain

A full-term infant will lose up to 12% of their body weight in their first week of life. Studies have found that breastfed babies lose more weight than their formula-fed counterparts.<sup>3</sup> The majority of breastfed infants will regain their birth weight in the first two weeks of life.<sup>4</sup> If a breastfed baby has not regained their birth weight by two weeks of age, there is benefit to enlisting the support of a lactation consultant and/or child and family health nurse.

More important than meeting weekly weight goals is to plot the infant's progress on the growth chart in the infant/childhood health record. Growth is individual and most babies will demonstrate reasonable growth velocity (ie tracking along a similar percentile to previous measures) when plotted on the growth chart.

Weight, length and head circumference should all be plotted to give a complete picture of the child's overall progress. Being on or just below the third percentile is not a problem in itself; some children will be proportionately small. Serial measures are needed to assess growth and progress over time. It is necessary to correct for prematurity (<37/40) until the child reaches two years of age. Fenton growth charts should be used to plot children until 50 weeks' gestation (ie 10 weeks corrected age).<sup>5</sup>

## Feeds

Infants tend to feed frequently in the newborn period (every two to three hours) and will sometimes 'cluster feed' in close time intervals.<sup>6</sup> Initially, infants will take approximately eight to 12 feeds per day.<sup>6</sup> As they get older, feeds decrease in time and frequency, while volume increases (ie they become more efficient at feeding).

The usual duration for a breastfeed is approximately 20–40 minutes,<sup>6</sup> but it can take up to an hour for the newborn to finish both sides. Observation of feeding may be useful to assess the infant's feeding abilities and techniques; a lactation consultant can be engaged for this. Usual fluid intake for newborns is approximately 140–180 ml/kg per day.<sup>7,8</sup> Babies are highly variable: the length of time between feeds, the number of feeds, and stretches of time where the infant is asleep can all vary significantly from one infant to the next.

## Output

Babies will have approximately five to eight wet nappies per day, and the urine should be pale yellow and not strong smelling. Parents should be asked about the number of wet nappies, how heavy the wet nappies are, and whether the urine is dark or a light straw colour. From clinical experience, some babies will have runny/mushy bowel motions with every feed, whereas others (particularly formula-fed infants) may have only one bowel motion every few days. Formula-fed babies tend to have more formed/pasty stools. The best way to assess this is to determine what is 'normal' for the individual infant. The colour of bowel motions can also vary between yellow, orange, green or brown.

Pale, creamy or white stools in infants should always be investigated, as well as stools that are mucousy, black or contain fresh blood. Watery stools with perianal excoriation may indicate lactose overload: a lactation consultant can help with techniques to reduce lactose overload in a breastfed baby. Formula-fed babies can be trialled on a lactose-free formula.

## Social factors

GPs should consider what support the infant's mother has. Are there other factors that may be affecting feeding? Consider, for example, first-time mothers who may not know what to expect, family supports, maternal anxiety, over-frequent weighing, a mother with postnatal depression or a refugee background.

## Regurgitation or vomiting in infancy

Regurgitation or 'possets' of small amounts (eg 1–2 tablespoons) of milk are very common in babies. More than half of infants are reported to have gastro-oesophageal reflux during the first three to six months. This is usually benign and resolves in the majority of infants by the age of 12–15 months<sup>7,9–11</sup> due to lengthening of the oesophagus and development of the gastro-oesophageal sphincter.<sup>7</sup>

It is essential to rule out potential medical causes of persistent vomiting.<sup>7</sup> Concerning symptoms include forceful vomiting of large amounts of feed, poor growth, vomiting several times during the one feed, respiratory symptoms during feeding or vomit containing brown/red flecks. Careful medical investigation is warranted.

There is no evidence that stopping breastfeeding is beneficial for infants with gastro-oesophageal reflux.<sup>6</sup>

## Constipation

Constipation is defined as difficulty passing a stool because it is hard or painful. Constipation is not diagnosed from a once-off hard stool, but persistence of hard stools for at least one month.<sup>12</sup> It is uncommon in infancy, particularly in breastfed babies.<sup>13,14</sup> Some discomfort and straining is normal when passing a stool.

In older children, constipation is a common problem, with reported prevalence rates of 1–30%.<sup>15</sup> Constipation is the principal complaint in 3–5% of all visits to paediatric outpatient clinics and as many as 35% of visits to paediatric gastroenterologists.<sup>7,16</sup> Organic causes of constipation are rare. Functional constipation is the most common manifestation, with the peak onset being around the time of toilet training,<sup>7</sup> when the child can associate pain with defaecation.

In infants, constipation may be an indication of inadequate fluid intake. It is important to assess a breastfed baby's intake as outlined above. If a baby is formula-fed:

- first, check fluid intake
- second, check that the parents are making up the formula according to instructions.

Frequent swapping of formula brands can lead to confusion about the recipe, as standard dilutions have different scoop sizes to water volume (eg one scoop formula with 60 ml of water versus one scoop formula with 30 ml of water). Some parents anecdotally report that different formula brands have relieved constipation in their child. It is important to note that standard infant formulas contain similar ingredients and have very similar nutritional composition, so there is no evidence for recommending one brand over another.

Managing constipation in infants (prior to starting solids) may require maintenance with stool softeners over several months<sup>7</sup> (eg parachoc, lactulose, movicol half). Parents should be reassured by the prescribing doctor that this is safe for their child. Laxatives need to be used in a dose that produces soft stools. Stimulant laxatives are not recommended for long-term use as they can result in dependence. In children who have started solids, constipation can sometimes be helped by including foods that contain natural laxatives, such as prunes, pears, apples and kiwifruit. If these are not effective, stool softeners may be necessary.

Evidence does not support dietary measures (increasing fluid beyond age-appropriate requirements, giving additional fibre, or prebiotics or probiotics) in the treatment of functional constipation for older children.<sup>12</sup>

## Introduction of solids

The World Health Organization (WHO) recommends exclusive breastfeeding until six months of age.<sup>1</sup> The National Health and Medical Research Council's (NHMRC's) infant feeding guidelines<sup>2</sup> use the term 'around 6 months', which allows for some flexibility. On the basis of current evidence, Australian, European and North American guidelines recommend introduction of complementary

foods between four and six months of age.<sup>17</sup> For Australian children, it is recommended that the median age of 4.7 months is when they should commence solid foods.<sup>18</sup> The introduction of solid foods is an important step in meeting the baby's changing nutritional needs.

It is important to remember that infant feeding guidelines are designed to guide the general population, and there will be individual variation as every baby is different. Generally, we advise parents to monitor signs of developmental readiness for starting solids, such as:

- good head and neck control
- ability to sit upright when supported
- being interested in food eaten by others
- wanting to put things in their mouth
- appearance of increased appetite – for example, hungry after feeds or demanding more frequent feeds (some infants).

Introducing solids too early (before four months of age) can disrupt breastfeeding or expose the infant's immature gut to pathogens and allergens, which may increase the risk of developing allergies.<sup>1</sup>

Introducing solids too late (after six months of age) can cause growth faltering as breast milk or formula alone is no longer sufficient for the baby. This can result in micronutrient deficiencies (especially iron, zinc), delay development of oro-motor skills, and there is some evidence that it can increase the risk of developing allergies.<sup>15</sup> There is no evidence that delaying the introduction of allergenic foods prevents the development of allergies.<sup>17</sup>

First foods should be iron-rich (eg fortified rice cereal, meat, chicken, fish, cooked tofu or legumes).<sup>2</sup> Vegetable, fruit and dairy products can also be included.<sup>2</sup> There is no set 'order' for introducing solids; however, it is advisable to start one new food every two to three days to observe possible reactions.<sup>17</sup>

### Box 1. Useful strategies for toddlers' mealtimes

- Sit young child securely in a high chair
- Do not offer too many alternatives
- Do not allow them to fill up between meals on fluids and unhealthy snacks
- Limit distractions – turn off all screens
- Serve small amounts initially – they can ask for more if they are hungry
- Encourage the child to eat independently and to their appetite<sup>20</sup>
- Do not force feed or pressure the child to eat<sup>20,22</sup>
- Expect (and allow) mess and food play
- Eat family foods together – parents are very important role models<sup>22–24</sup>
- Keep meal times happy and relaxed<sup>25</sup>
- Involve children in food preparation<sup>22</sup>
- Have routine times for meals and snacks
- Keep meal times shorter rather than longer (≤30 minutes)
- Keep offering a range of nutritious foods<sup>24</sup>
- Control the foods available<sup>26</sup>
- Provide variations on favourite foods or preferred textures<sup>27</sup>

First foods are usually smooth purees, with no lumps, which gradually increase in texture as the child gets older and develops eating skills. Some families choose to do 'baby-led weaning' where the baby is offered soft-cooked pieces of finger food to explore and learn to eat at their own pace.

## Fussy eating in toddlers

During the toddler years, growth slows down and children start to develop a sense of independence. This is a time of great learning, while appetite and food intake can be erratic.

Food neophobia is generally regarded as a reluctance to eat, or the avoidance of, new foods. By contrast, 'picky/fussy' eaters are usually defined as children who consume an inadequate variety of foods through rejection of a substantial amount of foods that are familiar (as well as unfamiliar) to them.<sup>19</sup>

There are many reasons why children may not eat. Often, the children:

- are distracted
- have other things to do
- are too tired
- are feeling harassed by their parents
- are asserting their independence
- are simply not hungry.

It is rare that fussy eating is a symptom of an underlying problem; it is usually behavioural. Parental management is the key to moulding positive eating habits.

Mealtimes should not be a battleground. The 'division of responsibility' at mealtimes is where the parent decides what foods are served and when they are served, while the child decides if they will eat and how much they eat.<sup>20</sup> Studies have shown that, over time, children regulate their intake very well. Even if they have a bad meal, a bad day or a few bad days, they will recover this over time.<sup>21</sup> This can help to give parents realistic expectations and priorities (useful strategies for mealtimes are listed in Box 1).

Consider referral to other healthcare professionals if a child has poor growth or is crossing centiles, has poor oro-motor skills, avoids textures/whole food groups, or has oral aversions, anxiety with new foods or nutritional deficiencies (eg iron deficiency).

*All young children are more-or-less picky about food. What they eat one day, they don't the next. They eat a lot one day, little the next. They don't eat some of everything that is on the table, but eat only one or two foods ... They warm up slowly to unfamiliar foods and may have to see, watch you eat, touch or taste a food ... 15 or 20 (or even more) times before they learn to like it.* – Ellyn Satter Institute.<sup>20</sup>

## Key points

- Breastfeeding provides ideal food for infants.
- Evaluating a breastfed infant's growth in conjunction with wet nappies can be a good guide to assess intake.

- Serial measures are needed to interpret growth.
- Constipation is a common problem in childhood and less common in infancy.
- Solids should be commenced at around six months of age depending on developmental signs of readiness.
- Iron-rich foods are recommended as the first foods to offer, but foods can be commenced in any order, with one new food being offered every two to three days.
- Fussy eating is common as toddlers assert their independence.
- Parental management is the key to creating positive mealtimes and managing the behavioural aspects of fussy eating.

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