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Campus

For healthcare professional use only

# Management of common functional gastrointestinal disorders (FGIDs) and related symptoms in infancy

Guide for parental reassurance and education



# Abbreviation list

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<b>AR</b>	anti-regurgitation
<b>ESPGHAN</b>	European Society for Paediatric Gastroenterology, Hepatology and Nutrition
<b>FGIDs</b>	functional gastrointestinal disorders
<b>GER</b>	gastroesophageal reflux
<b>GERD</b>	gastroesophageal reflux disease
<b>GI</b>	gastrointestinal
<b>NASPGHAN</b>	North American Society for Pediatric Gastroenterology, Hepatology and Nutrition
<b>NICE</b>	National Institute for Health and Care Excellence (UK)
<b>OTC</b>	over-the-counter (drugs)
<b>RCT</b>	randomized controlled trial
<b>scGOS/lcFOS (9:1)</b>	prebiotic mixture of short-chain galacto-oligosaccharides (scGOS) and long-chain fructo-oligosaccharides (lcFOS) in a ratio of 9:1
<b>WHO</b>	World Health Organization

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**Important notice:** Breast milk is the best food for infants. The World Health Organization recommends exclusive breastfeeding for the first six months of life. Unnecessary introduction of bottle feeding or other food and drinks will have a negative impact on breastfeeding. After six months of age, infants should receive age-appropriate foods while breastfeeding continues for up to two years of age or beyond.

# Contents

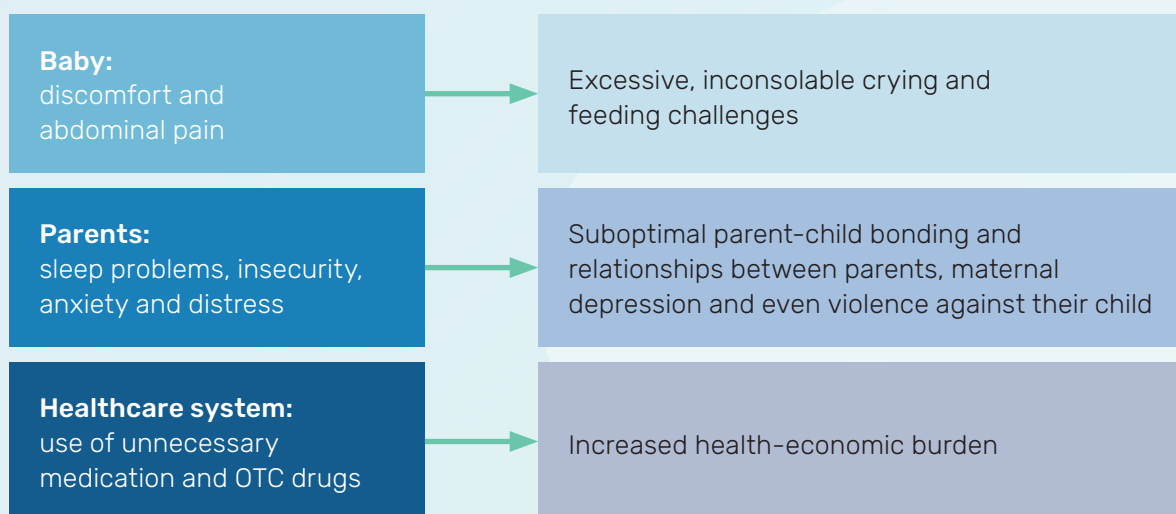
<b>Abbreviation list</b> .....	<b>2</b>
<b>Contents</b> .....	<b>3</b>
<b>Foreword</b> .....	<b>4</b>
<b>1. Introduction to FGIDs, the related symptoms and their impact</b> .....	<b>6</b>
1.1 What are FGIDs and how common are they?.....	6
1.2 Family and social impact.....	7
1.3 Long-term health impact.....	8
1.4 Economic impact.....	8
1.5 What is the role of breastfeeding in common FGIDs?.....	10
1.6 What do experts recommend?.....	10
<b>2. Parental advice on infant reflux and regurgitation</b> .....	<b>13</b>
2.1 What is it?.....	13
2.2 What is the prevalence?.....	14
2.3 What are the potential causes?.....	14
2.4 Major feeding tips.....	15
2.5 Further feeding tips.....	15
2.6 Positioning.....	15
2.7 Other tips.....	15
<b>3. Parental advice on infantile colic</b> .....	<b>16</b>
3.1 What is it?.....	16
3.2 What is the prevalence?.....	17
3.3 What are the potential causes?.....	17
3.4 Feeding tips.....	17
3.5 Social support.....	17
3.6 Tips based on practical experience.....	17
<b>4. Parental advice on signs and symptoms of functional constipation</b> .....	<b>18</b>
4.1 What is it?.....	18
4.2 What is the prevalence?.....	19
4.3 What are the potential causes?.....	19
4.4 Toilet training.....	20
4.5 Feeding tips.....	20
<b>Summary</b> .....	<b>21</b>
<b>References</b> .....	<b>22</b>

# Foreword

Functional gastrointestinal disorders (FGIDs) are very common in infancy. More than half of babies show at least one FGID symptom during the first year of life, on average.<sup>1,2</sup>



FGIDs and related symptoms often cause both immediate and later life burden for babies, their families and the healthcare system:



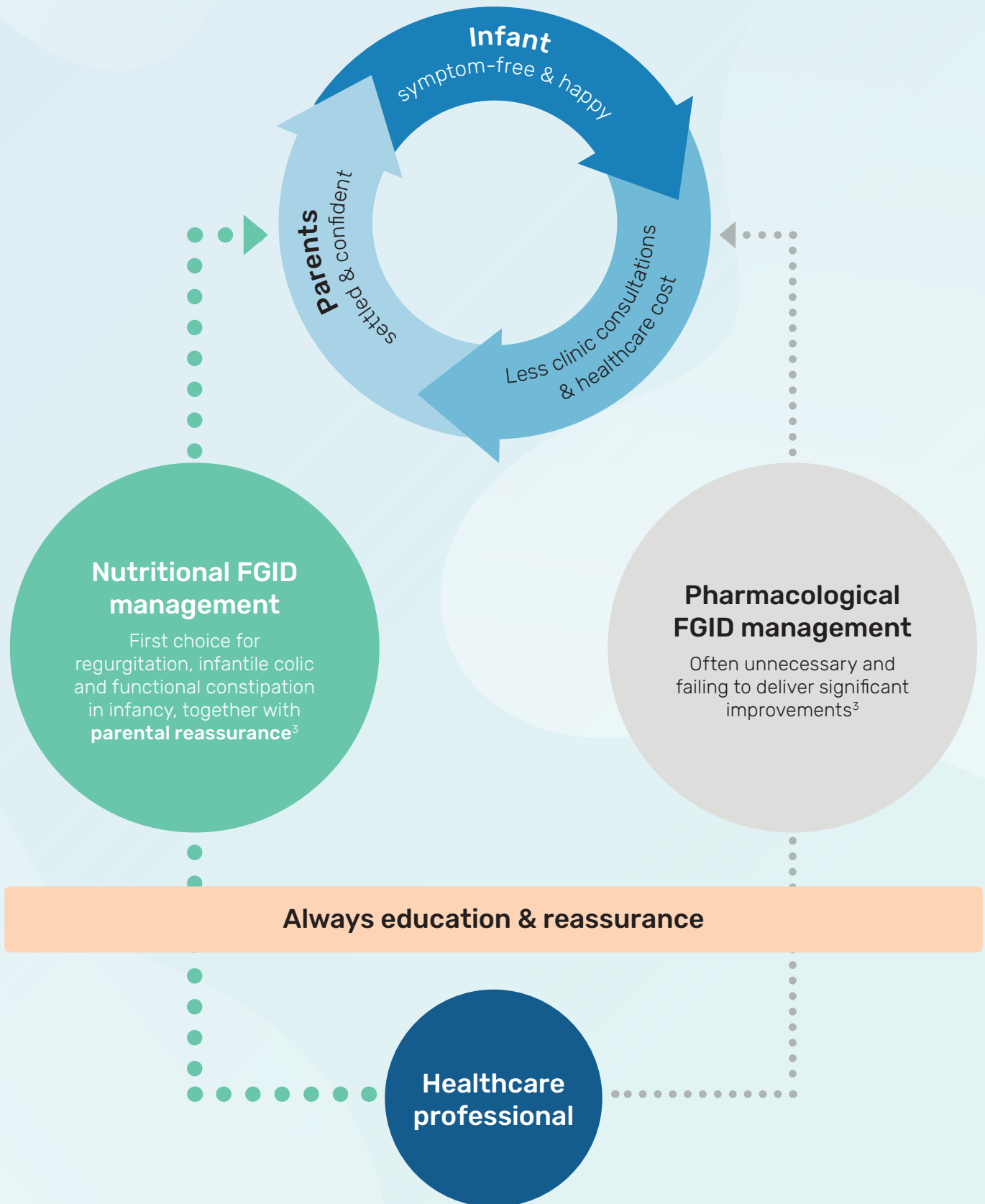
Healthcare professionals are in a key position to provide parents with information and support to help them understand and manage GI symptoms of their baby.

To support healthcare professionals advising parents, leading pediatric gastroenterology and nutrition groups published guidelines and expert consensus for the management of FGIDs in infancy.

In these guidelines and expert consensus, **parental education and reassurance together with nutritional advice** are introduced as the first line of management for common gastrointestinal problems, such as regurgitation, infantile colic and functional constipation.

For these FGIDs, pharmacological therapy was often not effective or even produced adverse effects.<sup>3</sup>

This monograph aims to support healthcare professionals to educate and reassure parents about the common FGIDs, in order to break the vicious circle of crying infants and stressed parents, and reaching a 'virtuous circle' of symptom-free infants, settled parents and reduced unnecessary medication and healthcare costs.





# 1. Introduction to FGIDs, the related symptoms and their impact

Gastrointestinal (GI) health is vital for the baby's overall health, growth and wellbeing.<sup>3</sup> However, the GI system and functions are still developing and maturing, which physiologically may lead to transient or permanent GI problems, such as functional gastrointestinal disorders (FGIDs) and related symptoms in early life.

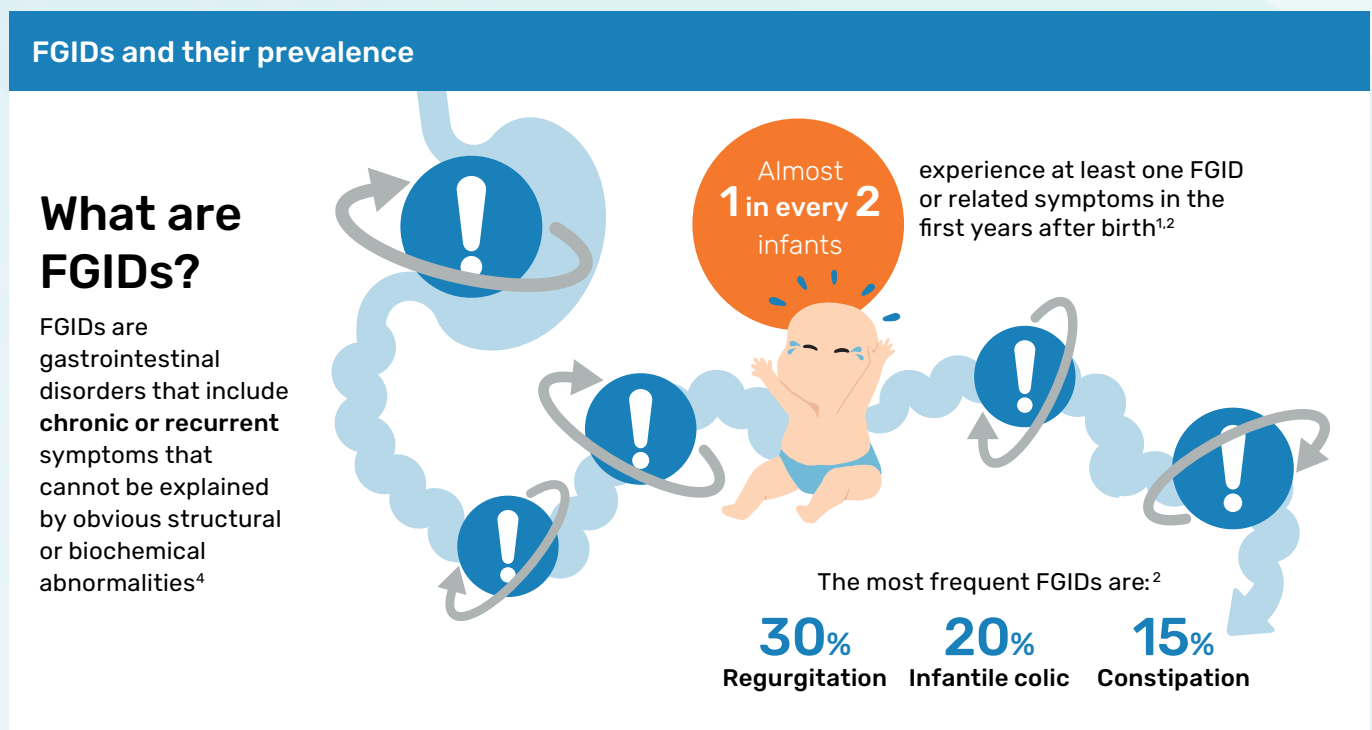
## 1.1 What are FGIDs and how common are they?

FGIDs are a 'variable combination of symptoms in otherwise healthy individuals, which cannot be explained by obvious structural or biochemical abnormalities'.<sup>4</sup>

FGIDs include (prevalence range in neonates and toddlers):<sup>a</sup>

- infantile regurgitation (3–87%)<sup>2</sup>
- infantile colic (2–73%)<sup>2</sup>
- functional constipation (0.05–39.3%)<sup>2</sup>
- functional diarrhea (2–4.1%)<sup>2</sup>
- infantile dyschezia (0.9–5.6%)<sup>2</sup>
- infantile rumination syndrome (1.9%)<sup>4</sup>
- cyclic vomiting syndrome (3.4%)<sup>4</sup>

On average, 54.9% of babies display at least one FGID symptom during their first year.<sup>1</sup> The most common FGIDs are regurgitation (30%), infantile colic (20%) and functional constipation (15%).<sup>2</sup>



<sup>a</sup> Range caused by variability of study designs, populations investigated and definition of the symptoms.<sup>2</sup>

## 1.2 Family and social impact

While some FGIDs are harmless and grow out with normal development, some may cause discomfort and pain, accompanied with excessive crying of the baby. As a consequence, FGIDs and related symptoms are not only affecting the babies themselves, but also their parents and the interaction between parents and babies.

For this reason, the healthcare visit is not only about the child's symptom, but also about the family's fears. The physician must not only make a diagnosis, but also recognize the impact of the symptom on the family's emotions and ability to function.<sup>4</sup>

### Effect of FGIDs and related signs on infants and toddlers:

- Feeding difficulties in infants with infantile colic (e.g. arrhythmic jaw movements and difficulty coordinating sucking, swallowing and breathing in babies)<sup>5</sup>
- Premature breastfeeding cessation in infants with infantile colic<sup>6</sup>
- Switching between infant formulas due to infant regurgitation, vomiting and restlessness<sup>7</sup>
- Behavior problems in the first two years of life in children with crying, fussing and sleep problems<sup>8</sup>
- Feeding problems (e.g. frequent feeding refusal) at one-year follow-up in children with regurgitation during infancy<sup>9</sup>
- Mental health problems and mental disorders in school-age children following persistent crying in infancy<sup>10</sup>

### Effect of FGIDs and related signs on parents and family:

- Tiredness and fatigue in mothers due to infant crying<sup>11</sup>
- Family distress and less satisfactory family life at three-year follow-up due to colic in infancy<sup>12</sup>
- More postpartum maternal depressive symptoms associated with infantile colic and crying<sup>8,13,14</sup>
- Lower physical, emotional, social, cognitive and communication scores for caregivers with children with functional constipation aged three to six years<sup>15</sup>
- Loss of parental working days<sup>16</sup>

### Effect of FGIDs and related signs on parent-baby interaction:

- Less synchrony in mother-infant interaction due to excessive infant crying<sup>17</sup>
- Insecure mother-child attachment<sup>13</sup>
- Less optimal parent-child interaction, most pronounced between the fathers and excessively crying babies<sup>18</sup>
- Mothers less responsive, stimulating, visually attentive and controlling of the behavior of their crying babies<sup>19</sup>
- Lower threshold for shaking the baby and other forms of abuse due to excessive infant crying<sup>20-22</sup>

Therefore, any intervention plan must attend to both the child and the family. Effective management depends on securing a therapeutic alliance with the parents.<sup>4</sup>

### 1.3 Long-term health impact

FGIDs not only immediately impact the baby's health, they may also be accompanied with unfavorable health outcomes later in life.

Infantile colic and persistent crying may lead to:

- higher prevalence of FGIDs later in life<sup>16,23</sup>
- more frequent abdominal pain<sup>24,25</sup>
- more allergic disorders at ten years<sup>24</sup>
- more sleeping problems in later years<sup>12,24</sup>
- more difficulty with emotional regulation, frequent temper tantrums and a more impulsive cognitive style<sup>12,24,26</sup>
- more behavioral problems across childhood<sup>27-29</sup>
- higher prevalence of mental health problems at school-age<sup>10</sup>

Infantile regurgitation may lead to:

- risk of reflux symptoms at nine years of age<sup>30</sup>
- remaining esophagus damages after one year<sup>31</sup>

Functional constipation may lead to:

- relapse in up to 50% of babies within five years<sup>32,33</sup>

### 1.4 Economic impact

Healthcare professionals are the first help parents turn to for support when their baby is crying a lot. This burdens health-economics by increasing numbers of healthcare visits and (often unnecessary and even inappropriate) prescriptions for medications<sup>34</sup>

#### Examples for healthcare expenditures are:

**UK example:** At least £72.3 million per year for treating babies with infantile colic, regurgitation and functional constipation (UK total cost of illness in 2014 and 2015):<sup>35</sup>

- £49.1 million National Health Service expenditure, including:
  - prescriptions for medications (£5.8 million) and milk formulas (£0.9 million)
  - health visitor appointments (£3.5 million)
  - general practitioner appointments (£26.0 million)
  - admitted patient care (£9.3 million)
  - accident and emergency department visits (£3.6 million)
- £23.2 million parents' costs, through purchase of over-the-counter remedies

#### **US example I:**

Increase of total mean cost per discharge for FGIDs from US\$6,115 to US\$18,058 (from 1997 to 2009), despite relatively stable length of stay. Constipation and abdominal pain were the most common FGID discharge diagnoses<sup>36</sup>

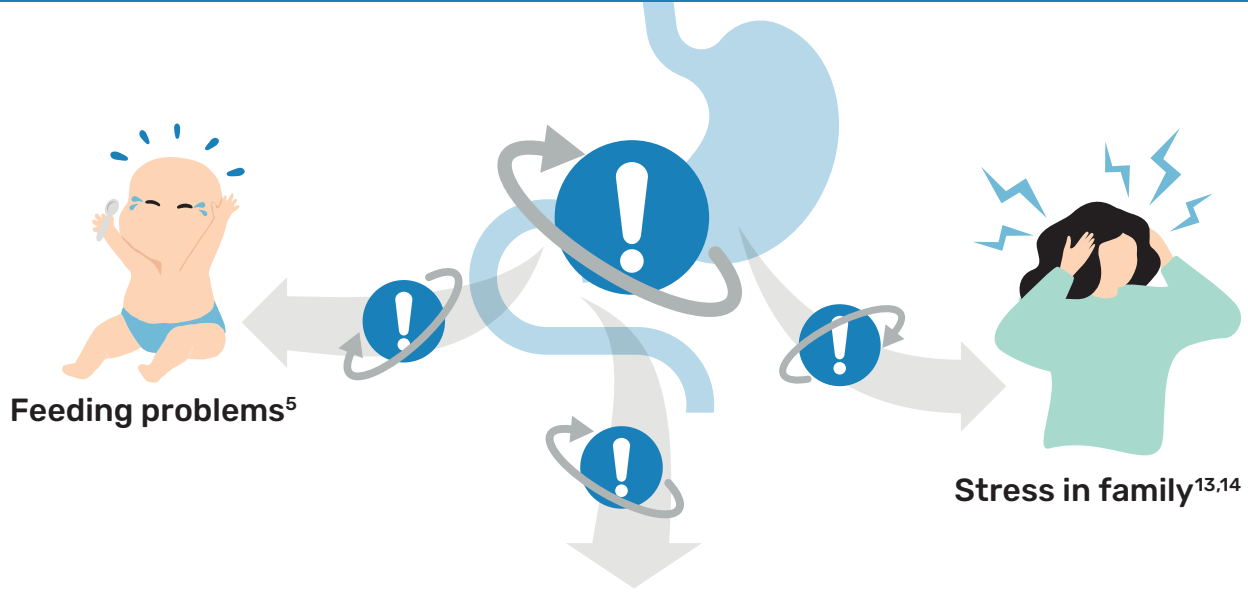
#### **US example II:**

Increase of total national cost of constipation-related emergency department visits by 121%, from US\$ 7.33 billion in 2006 to US\$ 1.62 billion in 2011<sup>37</sup>

To summarize, while some FGIDs are harmless and physiologically grow out in the first year of life, some may lead to both immediate and later life problems.



## Immediate impact of FGIDs



**Health-economic burden:**  
For acute constipation, infants have the highest rate of emergency hospital visits in US (average cost: US\$ 2,306/patient)<sup>37</sup>

Sleeping and crying problems account for £65 million health care costs in UK per year<sup>38</sup>

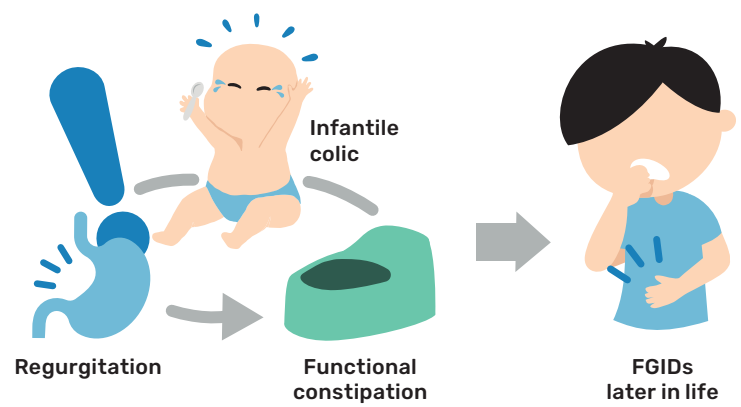
## Later-life impact of functional gastrointestinal disorders

### Challenged quality of life for the family<sup>10,12</sup>



FGIDs during infancy are associated with **unfavorable health outcomes later in life**<sup>2</sup>

Infants who have suffered from **infantile colic**, **regurgitation** or **functional constipation** are more likely to develop FGIDs later in life<sup>16,23</sup>



**28%** of infants with infantile colic develop functional **gastrointestinal problems** by the age of 13 years<sup>23</sup>

## 1.5 What is the role of breastfeeding in common FGIDs?

Breast milk is the best food for babies, also in case of common GI problems. Research has shown that breastfeeding protects babies from functional constipation in the first three months of life.<sup>39</sup>

In general, infants who are breastfed experience a measure of protection against various disorders, the best documented of which are infectious diarrhea and acute otitis media.<sup>40-42</sup> In addition, a systematic review and meta-analysis by the WHO on the long-term effects of breastfeeding on infants concluded that breastfeeding also reduces the risk of:<sup>43</sup>

High blood pressure

Elevated cholesterol

Type II diabetes

Overweight and obesity

Academic/ learning difficulties

Furthermore, breast milk contains many substances supporting a healthy GI and gut microbiota development:<sup>44</sup>

- Human milk provides the infant with lipids that have specific functionality, such as essential fatty acids, phospholipids and cholesterol which are important for the development of both the digestive and nervous systems<sup>45</sup>
- It contains high amounts of indigestible human milk oligosaccharides (HMOS), which are known for their prebiotic effect, supporting the growth of beneficial bacteria, such as bifidobacteria and lactobacilli<sup>46,47</sup>
- A healthy gut microbiota may protect from infantile colic, since colicky babies have shown to have less bifidobacteria and lactobacilli at the beginning of their life, which are known to dominate in the gut of breastfed infants<sup>48,49</sup>

## 1.6 What do experts recommend?

To provide healthcare professionals with guidance on the management of GI symptoms in early life, guidelines and expert views have been published by:

- American Academy of Pediatrics (AAP)<sup>50</sup>
- North American and European Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN and ESPGHAN)<sup>51-53</sup>
- UK National Institute for Health and Care Excellence<sup>54-57</sup>
- an expert group of pediatricians and pediatric gastroenterologists<sup>3</sup>
- American Academy of Family Physicians<sup>58</sup>

In these recommendations, several measures of FGID management are described and validated with reference to scientific and clinical evidence, including parental education and reassurance, as well as nutritional and pharmacological approaches.

## 1.6.1 Pharmacological therapy is often unnecessary for common FGIDs

Parents and caregivers often hope to find a 'pill' that will lead to rapid symptom relief.<sup>59</sup> As a result, healthcare professionals are often under pressure to reach for a pharmacological solution to remove symptoms.

### Limited pharmacological therapy recommendations

#### Regurgitation, reflux

- No pharmacological therapy recommended<sup>52</sup>
  - Proton pump inhibitors do not decrease infant regurgitation<sup>3</sup>
  - Potential adverse effects of currently available prokinetic agents (e.g. metoclopramide) outweigh their potential benefits<sup>52</sup>
- 
- When frequent regurgitation associated with marked distress continues despite nutritional management, an alginate therapy may be considered<sup>55</sup>

#### Infantile colic

- Pharmacological therapy (e.g. proton pump inhibitors, simethicone, dicycloverine) is not effective and some cause serious adverse events (e.g. dicyclomine)<sup>3,56</sup>
- 
- Lactase drops may help ease symptoms for some babies<sup>55</sup>

#### Functional constipation

- Evidence does not support the use of mineral oil, as this risks lipid pneumonia due to aspiration, or enemas, such as phosphate in young babies<sup>3</sup>
- 
- Lactulose may be considered as an intervention for functional constipation but may cause flatulence<sup>3</sup>
  - Macrogol (polyethylene glycol, PEG) may be considered as an intervention for functional constipation for babies over six months of age<sup>3</sup>
  - Rectal treatment with glycerine suppository should be restricted to providing acute relief in functional constipation<sup>3</sup>

Babies presenting with GI problems, such as regurgitation, infantile colic and/or defecation problems often undergo a series of unnecessary pharmacological treatments, which, overall, fail to deliver significant improvements in these conditions or may even have adverse effects.<sup>3</sup>

## 1.6.2 Parental assurance, education and nutritional advice are key in FGID management

In many cases, pharmacological therapy is not necessary, fails to deliver significant improvements or may even lead to adverse affects. This is why leading specialists of infant nutrition, such as NASPGHAN, ESPGHAN and NICE acknowledge parental education and reassurance, together with nutritional advice (and other practical tips), as the first line of FGID management<sup>3,53-57</sup>

Importantly, these expert groups agree that for all of these conditions, continuation of breastfeeding should be supported.

### FGID management



#### Reassurance

Reassure that it is of natural origin & has a self-limiting course



#### Education

Educate on symptoms, prevalence & potential causes



#### Practical tips

Give practical tips on feeding, lifestyle changes & social support

The following section provides management approaches for common FGIDs, such as infant regurgitation, infantile colic and hard and infrequent stools as associated signs and symptoms of functional constipation. They mainly include, but are not limited to, evidence based recommendations (in case of scientific substantiation, a reference is provided). Some others only have low or no scientific evidence but are based on practical experience. In many cases, these 'low scientific' recommendations may also support parents to actively combat their complicated situation.

## 2. Parental advice on infant reflux and regurgitation

### Regurgitation and reflux



#### Reassurance

Reassure that it is a normal physiological process, commonly observed within the first six months of life, and that gradually declines until twelve months.



#### Education

Educate on what it is, the prevalence and potential causes.



#### Practical tips

Give practical tips on feeding, positioning, exposure to cigarette smoke and clothing. Consider dietary option in formula-fed infants.

### 2.1 What is it?

According to ROME IV, regurgitation must include both of the following in otherwise healthy babies three weeks to 12 months of age:<sup>4</sup>

1. Regurgitation two or more times per day for three or more weeks
2. No retching, hematemesis, aspiration, apnea, failure to thrive, feeding or swallowing difficulties, or abnormal posturing

#### Reflux:

Reflux (or gastroesophageal reflux; GER) is the passage of gastric contents into the esophagus, pharynx or mouth.<sup>4</sup> It is effortless and non-projectile, although it may sometimes be forceful in babies.<sup>60</sup>

#### Regurgitation:

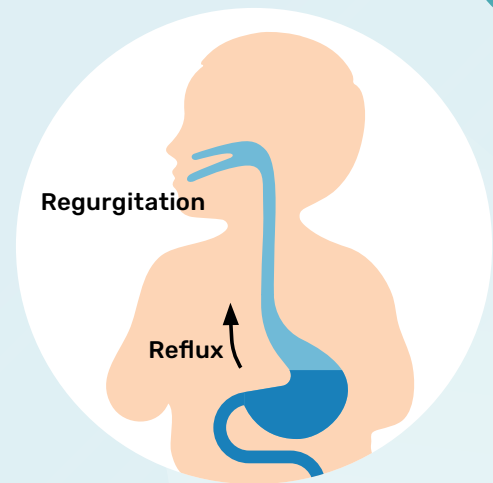
Regurgitation: When the reflux is visible, it is called regurgitation.<sup>4</sup> Regurgitation is sometimes referred to as 'spitting-up', 'possetting' or 'spilling'.<sup>52</sup> Infants with uncomplicated reflux are sometimes also called 'happy spitters'.<sup>3</sup>

Babies with regurgitation may cry and be hard to comfort, may arch their backs, fuss over feeds or refuse their feeds.<sup>55</sup>



Infant regurgitation and GER should be distinguished from:<sup>4</sup>

- **GERD (gastroesophageal reflux disease):** This is when reflux of gastric contents causes complications (e.g. esophagitis, obstructive apnea, reactive airway disease, pulmonary aspiration, feeding and swallowing difficulties or failure to thrive)
- **Vomiting:** When gastric contents is forcefully expelled through the mouth (because of coordinated movements of the small bowel, stomach, esophagus and diaphragm)
- **Infant rumination:** Return of previously swallowed food to the pharynx and mouth, chewed and swallowed again



## 2.2 What is the prevalence?

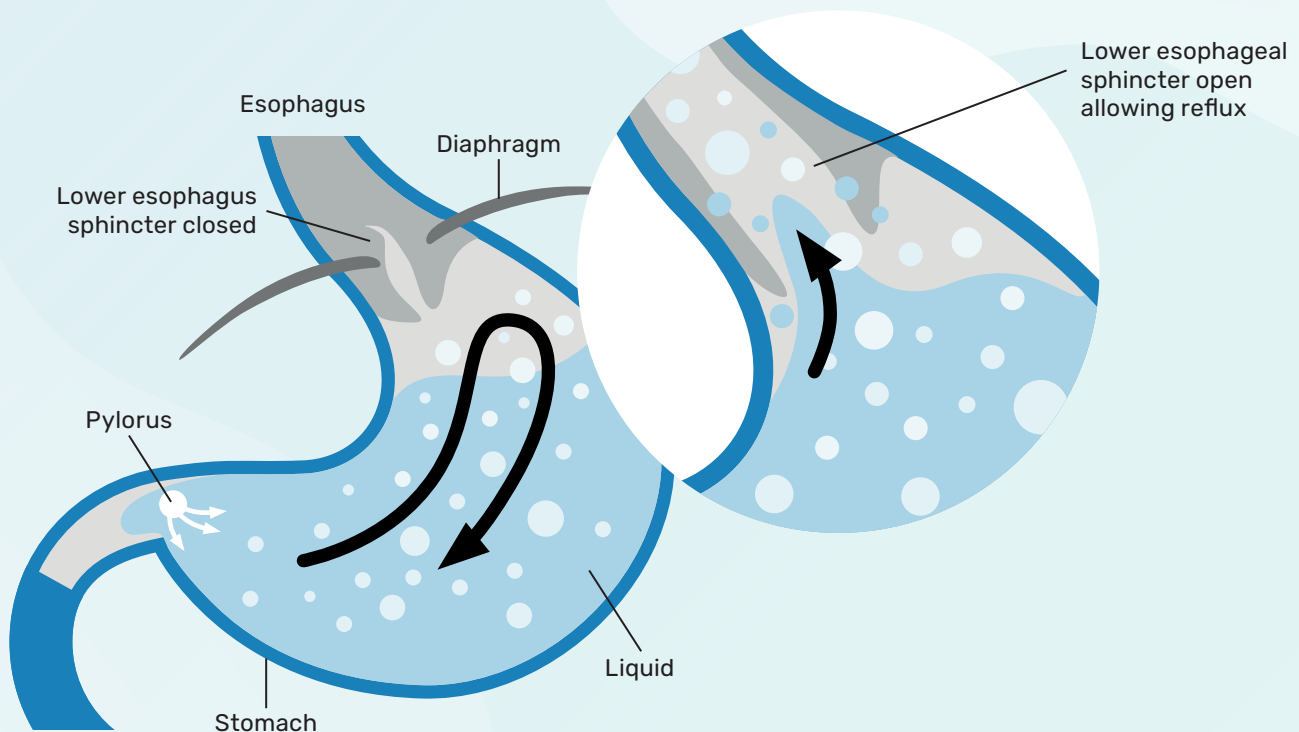
Infant regurgitation is considered a normal physiological process.<sup>50</sup> It is usually observed within the first six months of life and steadily diminishes until twelve months.<sup>61</sup>

**30%**

(range from 3–87%) of infants <12 months suffer from reflux and regurgitation<sup>2</sup>

## 2.3 What are the potential causes?

Reflux and regurgitation in infancy are caused by the immaturity of the esophageal sphincter, which is a valve mechanism that stops stomach contents from going back up into the esophagus.<sup>50</sup>



## 2.4 Major feeding tips

- If breastfed, carry out a breastfeeding assessment with a trained person, e.g. correcting for positioning and latching on<sup>55</sup>
- If bottle-fed, implement a stepped-care approach:<sup>55</sup>
  - review the feeding history, then
  - reduce the feed volumes only if excessive for the infant's weight, then
  - offer a trial of smaller, more frequent feeds (while maintaining an appropriate total daily amount of milk) unless the feeds are already small and frequent, then
  - offer a trial of thickened formula (e.g. containing rice starch, cornstarch, locust bean gum or carob bean gum)

## 2.5 Further feeding tips

- Burp the baby frequently before, during and after feeding<sup>62</sup>
- Ensure the baby is winded before, during and after feeds<sup>55</sup>
- Avoid over-feeding<sup>52</sup>
- Check the right teat size; practical experience shows that if the teat size is too small, it might cause the baby to gulp and take in too much air

## 2.6 Positioning

- Try to keep the baby in an upright position during feeding and for 30 minutes after feeding<sup>62</sup>

**Important:** Sleeping position should be flat on their back, since placing babies in a prone position may increase the risk of sudden infant death syndrome (SIDS).<sup>55</sup>



## 2.7 Other tips

- Avoid the baby's exposure to cigarette smoke as this can cause irritability<sup>52</sup>
- Practical experience shows benefits of ensuring the baby's clothing or nappy isn't too tight around their abdomen

## 3. Parental advice on infantile colic

### Infantile colic



#### Reassurance

Reassure that it is a common problem in babies that usually starts a few weeks after birth, peaks at about four to six weeks and then steadily diminishes by 12 weeks.



#### Education

Educate on what it is, the prevalence and potential causes.



#### Practical tips

Give practical tips on feeding, behavior, tools and social support. Consider dietary option in formula-fed infants.

### 3.1 What is it?

According to ROME IV, infantile colic must include all of the following:<sup>4</sup>

1. A baby who is younger than five months of age when the symptoms start and stop
2. Recurrent and prolonged periods of infant crying, fussing or irritability that occur without obvious cause and cannot be prevented or resolved by caregivers
3. No evidence of failure to thrive, fever or illness

Parents should know that a colicky baby shows bouts of recurrent and prolonged periods of crying, fussing or irritability, especially in the late afternoon and evening, that occur without obvious cause and cannot be prevented or resolved by caregivers.<sup>3,4</sup>

During each crying episode the child may:<sup>3,56,58</sup>

- draw the knees up to the chest
- arch its back
- clench its fists
- become red-faced and
- have episodes of bowel sounds



It is often difficult to tell the difference between 'normal crying behavior' and the excessive crying condition, known as infantile colic, because babies generally cry more during the first three months after birth than at any other time.<sup>63,64</sup>

Parents may get anxious and frustrated if they can't control their baby's crying, lowering their threshold for shaking the baby and other forms of abuse.<sup>4</sup>

### 3.2 What is the prevalence?

Colic is a common problem in babies, usually starting a few weeks after birth, peaking at about four to six weeks and then steadily diminishing by 12 weeks.<sup>63</sup>

**20%**

(range from 2–73%) of infants <12 months suffer from infantile colic<sup>2</sup>

### 3.3 What are the potential causes?

The exact causes of infantile colic are not fully understood. However, it is thought that it could be due to GI problems, such as an immature digestive system and imbalanced gut microbiota.<sup>65,66</sup>

Parents should also know that excessive crying may also be a sign of hunger and fatigue, disturbed family structure and regularity, or a difficult baby temperament.<sup>3,66</sup>

Importantly, when a baby cries, it does not mean that it is rejecting their parents.<sup>56</sup>

### 3.4 Feeding tips

If exclusively breastfed, some babies benefit from:

- the lactating mother excluding dairy products for two to four weeks from her diet and then reintroducing them<sup>3</sup>
- the use of *L. reuteri* DSM 17938<sup>3</sup>

If formula-fed:

- babies without cow's milk protein allergy may benefit from partially hydrolyzed formula with reduced lactose (or lactose-free) and containing prebiotics or probiotics and  $\beta$ -palmitate<sup>3</sup>

### 3.5 Social support

Understanding infantile colic requires an appreciation of the development of the infant, the relationship with the caregiver and the family and social milieu in which they exist.<sup>67</sup> In more than 90% of cases, treatment consists not of 'curing the colic', but of helping the caregivers get through this challenging period in their baby's development.<sup>68</sup>

**Caregivers should be motivated to:**

↓  
Ask family and friends for support<sup>4,56</sup>

↓  
Involve the father during pregnancy and after birth to support the mother<sup>69</sup>

### 3.6 Tips based on practical experience

The following tips have low or no scientific evidence, but are based on practical experience:<sup>58</sup>

- Early parental response to crying
- Gentle soothing motions
- Avoidance of overstimulation
- Use of a pacifier
- Holding the infant through the crying episode
- Prophylactic holding and carrying
- Use of an infant carrier
- Maintenance of day-night orientation
- Placing a colicky infant near a clothes dryer or vacuum cleaner (for the 'white noise')
- Specific 'colic holds' that put pressure on the infant's abdomen
- Taking the infant for a ride in a car or stroller
- Withdrawing from stimulation of the infant

# 4. Parental advice on signs and symptoms of functional constipation

## Infantile colic



### Reassurance

Reassure that it is a common problem in babies that usually starts a few weeks after birth, peaks at about four to six weeks and then steadily diminishes by 12 weeks.



### Education

Educate on what it is, the prevalence and potential causes.



### Practical tips

Give practical tips on feeding, behavior, tools and social support. Consider dietary option in formula-fed infants.

### 4.1 What is it?

According to ROME IV, functional constipation must include one month of at least two of the following in babies up to four years of age:<sup>4</sup>

- Two or fewer defecations per week
- History of excessive stool retention
- History of painful or hard bowel movements
- History of large-diameter stools
- Presence of a large fecal mass in the rectum

Parents should know that signs and symptoms of functional constipation in babies include abnormal, delayed or infrequent passage of dry, hard stools. Parents may say that their baby has had fewer than two complete stools in a week or that the stools look like a large sausage or rabbit droppings.<sup>53,70</sup>

Other symptoms they may describe:<sup>54</sup>

- Foul smelling wind and stools
- Excessive flatulence
- Poor appetite, lack of energy
- Baby being unhappy and irritable
- Pain or straining when trying to pass stools

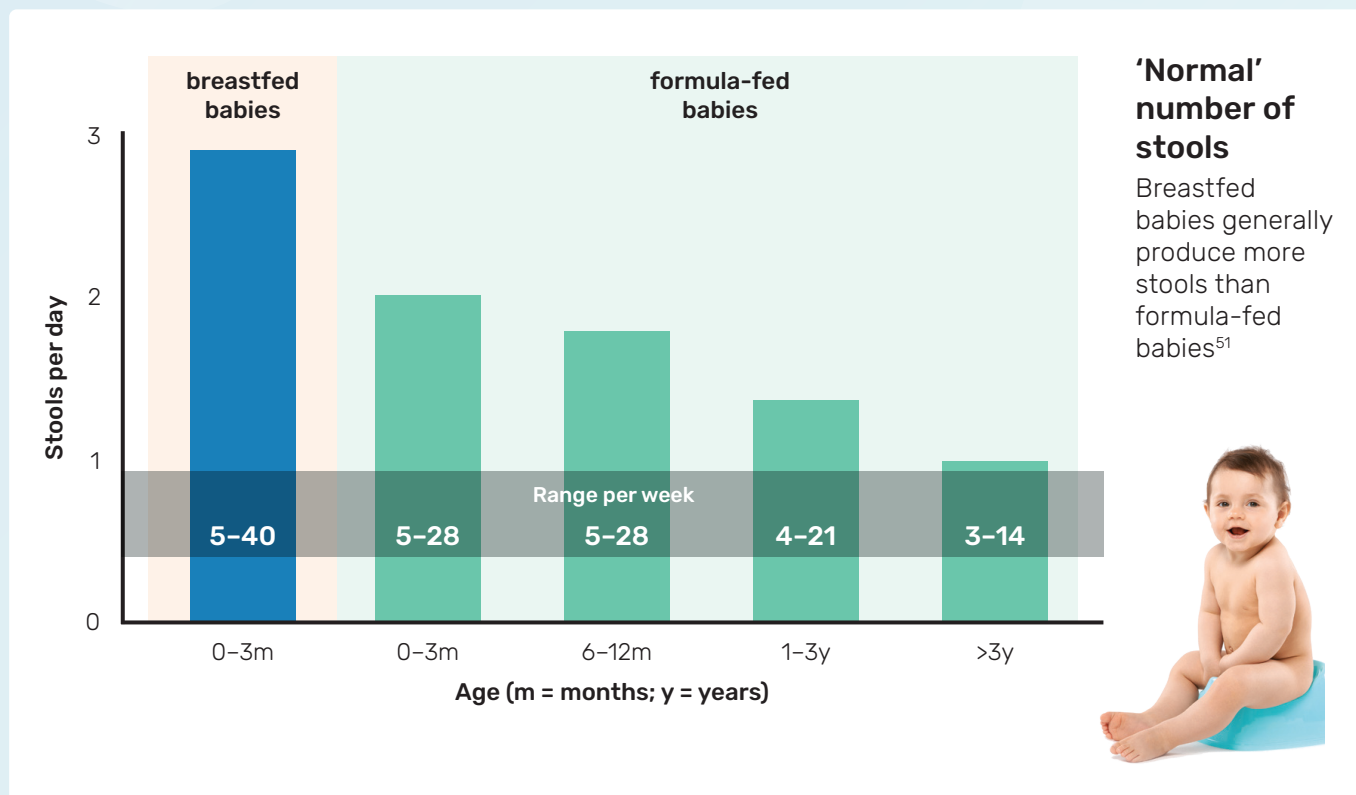
Functional constipation is distinct from infant dyschezia. This condition occurs in babies older than six months, with at least ten minutes of straining and crying before successful passage of soft stools, in the absence of other health problems.<sup>53</sup>





### 'Normal' stool pattern of babies

There is a wide variability of the number of stools between babies, with breastfed babies generally producing more and softer stools than formula-fed babies.<sup>70,71</sup> During the first week of life, babies have a mean of four stools per day. This frequency gradually declines to an average of 1.8 stools per day at one year of age and 1.4 stools per day between one and three years of age.<sup>51</sup>



### 4.2 What is the prevalence?

Functional constipation affects on average 15% of infants under one year of age.<sup>2</sup>

**15%**

(range from 0.05–39.3%) of infants <12 months suffer from functional constipation<sup>2</sup>

### 4.3 What are the potential causes?

It can be hard to find the exact cause of constipation. Hypotheses include:<sup>4,54,72</sup>

- inadequate fluid intake (especially dehydration)
- dietary changes (e.g. those causing calcium soaps in the stool)
- psychological reasons
- pain, fever, medicines
- toilet training with excessive caregiver pressure
- use of regular toilets that do not allow sufficient leg support
- organic causes, e.g. anal fissure

## 4.4 Toilet training

Behavioral interventions, such as enhanced toilet training, in combination with laxatives, aim to reduce the level of emotional distress and to restore normal bowel habits by positive reinforcement.<sup>73</sup>

For a successful toilet training, a toddler needs to be able to sense the urge to go, be able to understand what the feeling means and then be able to verbalize that it needs the parents help to make it to the toilet and actually go. Waiting until the child is truly ready will make the experience much faster and more pleasant for everyone involved.<sup>74</sup>

Caregivers must understand that forceful toilet training tactics are likely to backfire into a struggle for control, potentially leading to constipation.<sup>4</sup>

## 4.5 Feeding tips

- If exclusively breastfed, continue breastfeeding, since symptoms are probably normal (evaluate after two to four weeks)<sup>53</sup>
- If not exclusively breastfed, check:<sup>57</sup>
  - infant formula preparation being in accordance to the dilution instruction on the packaging
  - quantity of total fluid uptake
- If formula-fed, note that:<sup>3</sup>
  - harder stools are frequent in babies fed with formulas containing a fat blend that is rich in  $\alpha$ -palmitate (but poor in  $\beta$ -palmitate), favoring calcium soaps
  - a formula with a partial hydrolysate containing a prebiotic and  $\beta$ -palmitate showed a trend for softer stool consistency
  - constipation may be related to the intake of cow's milk protein, although there is no consensus that extensively hydrolyzed formula or soy formula are indicated for all constipated babies
  - to prepare infant formula, there is no evidence that the use of mineral water rich in magnesium above the recommended level could help treating constipation.
- If complementary feeding has already commenced:
  - ensure dietary fiber and fluid intake meet normal requirement<sup>53</sup>
  - note that fruit juices containing sorbitol, such as prune, pear and apple juices, may decrease constipation but induce a risk of unbalanced nutrition<sup>b,51</sup>



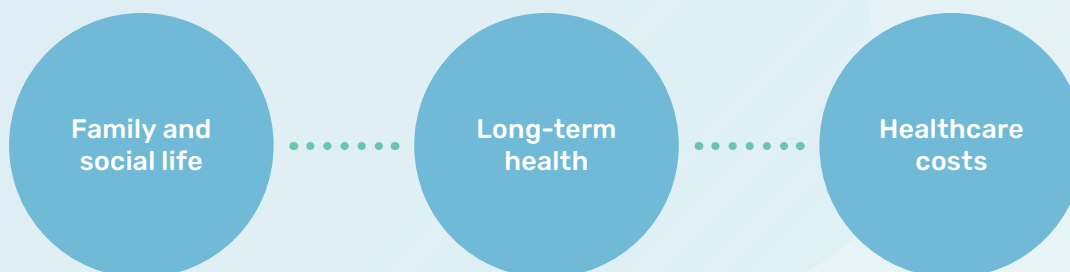
The American Academy of Pediatrics (AAP) states there is no nutritional indication to give fruit juice to infants younger than six months and that it is optimal to completely avoid the general use of juice in infants before one year of age.<sup>75</sup> However, in case of constipation, they suggest trying 30ml a day for every month of life up to about four months (a 3-month-old baby would get 90ml).<sup>76</sup>

<sup>b</sup>AAP states:<sup>75</sup> Offering juice before solid foods are introduced into the diet could risk having juice replace human milk or infant formula in the diet, which can result in reduced intakes of protein, fat, vitamins and minerals. When juice is medically indicated for an infant older than six months, it is prudent to give the juice to the infant in a cup instead of a bottle, due to the risk of dental caries. Infants can be encouraged to consume whole fruit that is mashed or pureed.

# Summary

More than half of infants display at least one symptom of FGIDs during the first year after birth.<sup>1</sup> Although FGIDs are generally considered to be physiological, they can cause discomfort and pain to the baby resulting in excessive crying.

As a consequence, parents often are overstrained with that situation and repeatedly approach healthcare professionals for help. Indeed, research confirms that FGIDs may impact:



To provide healthcare professionals with the appropriate management tools for GI symptoms in early life, guidelines and expert views have been published with parental education and reassurance, together with nutritional advice, as the first line of FGID management.



**Reassurance**



On natural origin & self-limiting course of the disease



**Education**



On symptoms, prevalence & potential causes



**Practical tips**



On feeding, lifestyle changes & social support

In many cases, treatment consists not of curing the symptoms, but of helping the caregivers get through this challenging period in their baby's development.<sup>68</sup> Understanding FGIDs and related symptoms requires an appreciation of the development of the infant, the relationship with the caregiver and the family and social milieu in which they exist.<sup>68</sup>

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