

FUSSY INFANTS

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In the first 3 months of life, crying is a tool that a baby uses to communicate with others—to inform them if the infant is wet, hungry, and too warm or cold for example. Crying in infants is considered within normal limit if no longer than 2-3 hours per day. Infantile colic differs from excessive crying in its onset; which is unrelated to what occurs before crying commences. The infant's cry in colic is thought to be higher in tone, pitch, and generally more intense, with the infant appearing to be screaming rather than just crying. Studies attempting to correlate the incidence of crying with presence of organic disease in relation to age – both before and after treatment have found that regardless of presence of disease or not, crying peaks at 2-3 months of age and then declines. The manageable causes of excessive crying which caregivers are advised to check for in infants are: hunger, pain or irritation, fatigue or overstimulation, food sensitivity or intolerance, gastroesophageal reflux disease and difficult stooling.

Physicians who deal with children presenting with problems of fussiness should also consider issues of child abuse, maternal depression, and other family problems. A theory to explain the phenomenon of infant crying is that at birth, there are high levels of serum serotonin-like peptides in infants. This has the effect of increasing the intensity of gut motility. The serotonin-like

peptide levels decline after 3 months of age, in association with increased levels of melatonin, which is well known for its soothing properties. This consequently encourages improved infant sleep, the presumed reason for reduced crying.

'Fussiness' in infants has been defined as any time babies are unsettled, irritable, fractious, and requires the mother to soothe them to be calm, such as being held, by rocking, or comforting (Rome Foundation, 2006). The Rome criteria is a system developed to classify the functional gastrointestinal disorders (FGIDs), disorders of the digestive system in which symptoms cannot be explained by the presence of structural or tissue abnormality, based on clinical symptoms (Rome Foundation, 2006).

The Rome III definition of 'colic' is a healthy baby that suddenly develops excessive crying for more than 3 hours per day, more than 3 days per week, and lasting more than 1 week. The crying starts with no identifiable stimulus, crying can occur at any time of day, but has a propensity for nighttime.

'Infantile dyschezia' is defined as excessive crying and straining for more than ten minutes before successfully passing soft stool in an otherwise healthy infant of less than six months of age. This is considered a functional state in infants.

Dyschezia is contrasted by constipation, which according to the Rome III criteria, is defined as the passing of two or fewer stools per week, stool retention once a week, large stools in the rectum or soiling once a week.

Recent epidemiological surveys on infant fussiness suggest that after 5-6 weeks of age, even if severe, crying will subside, and in most cases is not a major problem (Rao *et al*, 2004). However, excessive crying beyond 3 months of age, mostly nighttime crying, has been reported to be predictive of multiple regulatory problems later in life, including eating and sleeping disturbances, hyperactivity, discipline problems, and lower cognition (Rome Foundation, 2006; Shinohara and Kodama, 2012).

Symptoms of colic are thought to include: paroxysms of excessive and inconsolable crying, a tense abdomen, flexion of legs towards the abdomen, and flushing of the face, with symptoms peaking between ages 3-6 weeks, with resolution by 3 months of age. There are many digestive disorders that can cause such symptoms, including constipation, gastroesophageal reflux, cow's milk allergy, and excess gas due to lactose malabsorption.

The important question for clinicians to answer is: How can functional symptoms be distinguished from pathological ones? (Fig 1). The noting of red flag signs is often helpful in recognizing babies in whom there is presence of an organic disease, including frequent vomiting, regurgitation or cough, Sandifer's position (neck spasms), family history of atopy, respiratory or dermatological symptoms of atopy/eczema, wheezing, evidence of GI bleeding, failure to thrive, and abdominal distension with or

without diaper rash. If none of the aforementioned red flag signs are present, the caregiver(s) should be evaluated and correct feeding techniques established.

If, however, red flag signs are found to be present, the baby should have appropriate workup for the suspected organic disease(s) present. Caregivers should be advised of the technique of swaddling a baby, which can help to stop crying or fussing (Fig 2). Arguments for the use of this technique are that the baby cannot move their arms or legs, which can be injurious. It is also thought to reduce maternal stress by reducing infant crying, and thus the incidence of 'shaken baby syndrome.'

With regards to the issue of regurgitation in infants, up to the age of 3 months, approximately 15% of mothers consider this to be a problem. By the age of 6 months, this figure increases to 20%. The Rome III criterion for infant regurgitation considers regurgitation of 2-or-more times per day, for 3-or-more weeks to be abnormal, in otherwise healthy infants aged 3-12 months. The criterion specifies that the infant must have none of the following red flag signs: retching, hematemesis, aspiration, apnea, failure to thrive, feeding, or swallowing difficulties, or abnormal posturing (Lasekan *et al*, 2011). Therefore, if the infant is found to fit into this criterion it is advisable to increase supervision of caregiver feeding.

The symptoms of fussiness and gasiness accompanied by crying are also similarly assessed for possibility of an organic cause by noting the presence of red flag symptoms, including failure to thrive, frequent regurgitation, vomiting and 'cough episodes', Sandifer's position, a family his-

Infantile colic

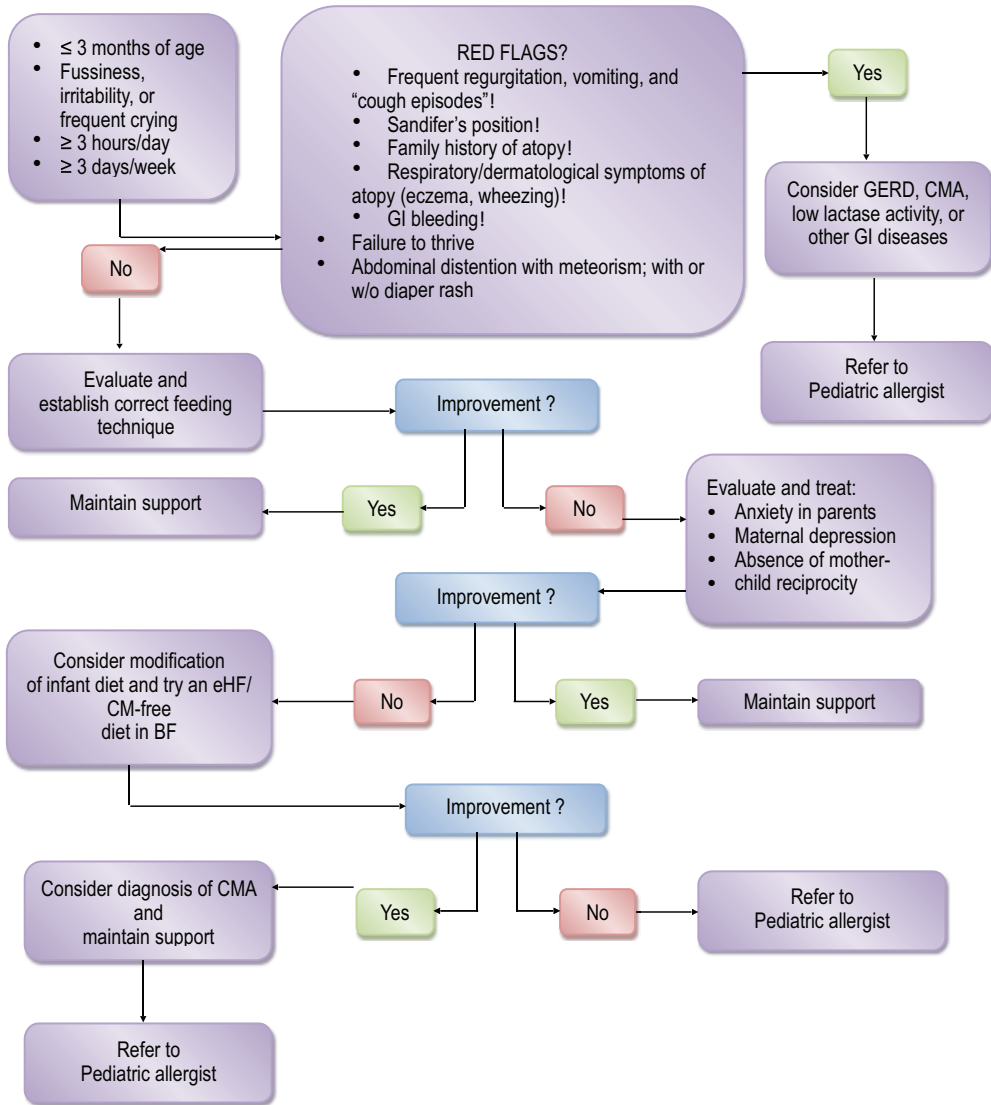


Fig 1—Diagram for approach infantile colic (Wolke *et al*, 2002).

tory of atopy, respiratory/dermatological symptoms of atopy or GI bleeding. If these features are present, it is advisable to refer the infant onto see a pediatric gastroenterologist. If not, it should be noted whether the infant has a diaper rash, diarrhea post

gastroenteritis, or reducing substances in the feces. If these features are present, they suggest the presence of lactose malabsorption, and infants who are formula fed are advised to temporarily change to a lactose free diet (Fig 3).

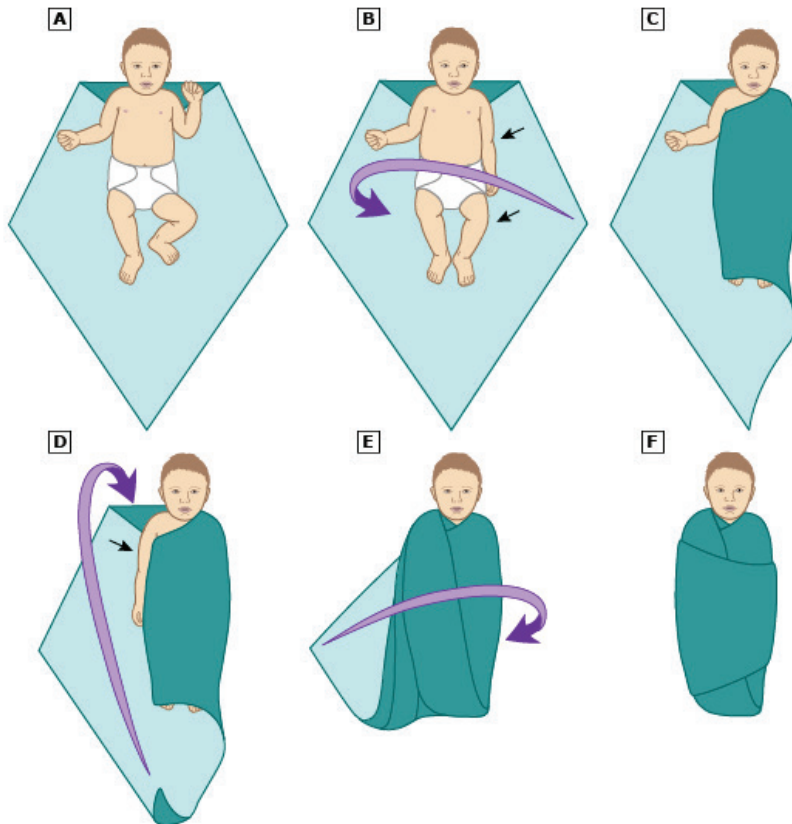


Fig 2—Technique to swaddle a baby. A: Put a baby on a large blanket that has the top corner folded down. B and C: Bring the left side of the blanket tightly across the baby's shoulder and chest, and tuck it snugly under the right side of the body. D: Pull up the bottom of the blanket and tuck it snugly behind the baby's right shoulder. E: Pull the right side of the blanket tightly across the baby's chest and tuck it snugly under the left side of the body.

Gas in the gastrointestinal system is considered normal if the source is from swallowed air, or the normal breakdown products of undigested foods. However, the presence of fermented gas is considered abnormal, and can be present from the causes of lactose malabsorption and sorbitol in fruit juices. In a study looking at reduced lactose and digestive tolerance, it was found that when reduced lactose products were used, symptoms of diarrhea, constipation, regurgitation, vomiting, gassiness and fussiness in infants were

found to be less frequent (Lasekan *et al*, 2011). Lactose malabsorption can lead to symptoms of loose stool, a red anus, abdominal distention, and poor weight gain, and for infants with such symptoms; such a cause should be kept in mind.

Digestive intolerance due to oral intake of other substances is also notable; protein can cause delayed gastric emptying time, and casein can cause stools to be harder. Carbohydrates can cause lactose intolerance, leading to diarrhea and gassiness. Fats can lead to delayed gastric emptying

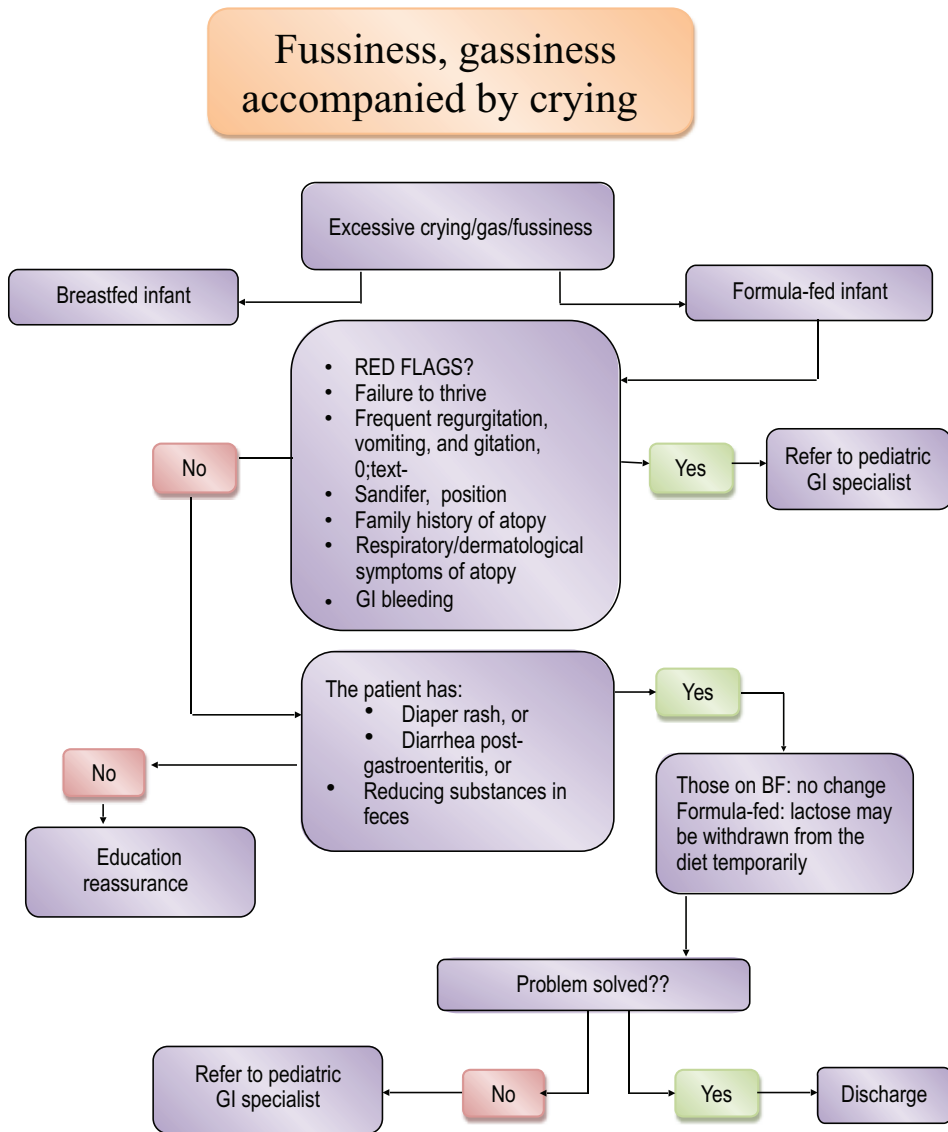


Fig 3—Diagram for management of fussiness, gassiness accompanied by crying (Wolke *et al*, 2002).

time and hard stools. A study of digestive tolerance and whey proteins found that milk proteins formed predominantly of whey proteins were found to produce softer stools than those with predominantly casein (Vivatvakin *et al*, 2010). This is an

important industrial consideration in the production of milk formulas that attempt as much as possible to imitate the benefits of breast milk. This study also found that casein in comparison to whey produces a longer gastric emptying time, which leads

to more abdominal distention and thus fussier infants.

A study on the feeding tolerance characteristics and bowel habits in preterm newborns fed formula with placebo, formula with *Lactobacillus reuteri* (probiotic) or breast milk, and found that infants who consumed formula with probiotics cried for shorter periods of time and also had fewer episodes of regurgitation compared to those who consumed formula without probiotics (Indrio *et al*, 2008). Newborns who consumed probiotics with formula also appeared in this study to have more stools than those who consumed formula alone. This study suggests that probiotics are an effective solution to solving the digestive difficulties and also fussiness of infants.

The physician should be suspicious of gastroesophageal reflux (GERD) when the infant has any of the following signs or symptoms: frequent regurgitation (>5 per day during the screening period); feeding refusal with anorexia; insufficient weight gain or failure to thrive; blood stained vomitus; recurrent choking or gagging; coughing without signs of infection.

In such cases, life style modification advice for caregivers, such as small but frequent feeds, sleeping with head elevation, avoidance of smoke and fumes, and the use of thickened foods or formulas can be helpful.

In summary, in approaching the fussy baby, it is advisable to consider the presence of any red flag signs prior to making a definitive diagnosis and attempting treatment.

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