



In the Name of God



Approach to chronic diarrhea in children

Normal defecation pattern

Chronic diarrhea with growth failure

Congenital diarrhea

Toddler's diarrhea

Persistent diarrhea



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Normal Defecation Pattern in children

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Timing of the 1st meconium stool

- > 99% of term newborns pass meconium in the 1st 48 h of life
 - 90%: within the 1st 24 hours of life.
- The only significant factor that affected the timing of meconium passage: the **gestational age**:
 - preterm: a delay in the passage of the first stool
- age at first feeding?
- mode of delivery?

Stool frequency & consistency

- The number of stools per day in the 1st month of life is **significantly higher** than in other months of life: median: **6** (0.5–12).
- **breastfed** vs **formula-fed**
- Breastfed:
 - As few as one stool daily
 - As many times as drinking milk
 - Once every two weeks
- Formula-fed: variation between formulas.
 - soy formulas: harder and less frequent stools
 - hydrolyzed casein formulas: looser and more frequent stools

Breastfed vs Formula-fed:

BF:

- Significantly higher Frequency : prot & oligosacch
- Softer stool

FF:

- Frequency: lower
- Consistency: harder

Hard stool in only 1% of exclusively breastfed, and 9% of infants fed with both breast milk and formula

Stool frequency & consistency:

- More frequent feeding: stimulation of the gastrocolic reflex: more frequent defecation.
- The difference in the frequency: disappeared at age 4- 6 months.
- Breast milk in conjunction with other foods does not affect the number of stools in children aged 1–4 years
- Among infants aged 2 months, the frequency of stools per day: lower in those with infantile colic

Stool frequency & consistency:

- **In the 2nd month:** once a day and remained almost the same until the end of 2 years of life.
- Interestingly, in the second month, > one third of infants passed less than one stool each day.
- Once every 3–4 days, although the stool consistency is normal.
- The stool frequency decreased to half after the first month both in breast-fed and formula-fed infants
- The high frequency of defecation in early life is thought to be related to immaturity of the gut and breast feeding
- The age-related decline in the frequency of stools: maturation of the water-conserving capacity of the gut.

Stool frequency & consistency:

- **Toddlers:** By two years of age, the mean number of bowel movements falls to just under two per day.
- **Children:** After four years of age, the mean number of bowel movements is slightly more than one per day
- The gradual decrease in bowel movement frequency with advancing age correlates with changes in **transit time** and varying patterns of colonic motility. The mean total gastrointestinal transit time:
 - 8.5 hours at 1 to 3 months of age
 - 16 hours at 4 to 24 months
 - 26 hours at 3 to 13 years of age
 - 30 to 48 hours after puberty
- **Dietary intake:** fiber and hydration, comorbidities, and medications.

Cases:

A 20-day-old neonate is brought with the chief complaint of diarrhea: 15 times/day

- Feeding
- Volume
- Wt gain
- Condition
- dehydration

A 1.5-month-old infant with the complaint of constipation: stool passing every 10 days

- Mec passage
- Consistency
- Feeding
- Neonatal screening
- Abdominal exam
- Rectal exam

The challenge:

**Difficulty in the diagnosis of diarrhea
in newborns:**

No comparison to previous

Wt gain

Hydration

Diarrhea definition:

- Diarrhea is a symptom, not a disease: one of the leading causes of mortality worldwide in children < 5 years of age
- Resulting from a variety of pathologic or nonpathological conditions
- WHO: passing > 3 liquid stools per day: most patients describe diarrhea in terms of consistency
- In general, infants pass around 10 mL/kg/day and adults up to 200 g/day of stool.

Classification:

- Time:
 - Acute
 - Non-acute: persistent vs chronic
- Pathophysiology:
 - Secretory
 - Osmotic
 - Inflammatory
 - fatty diarrhea