

# Diarrhoea

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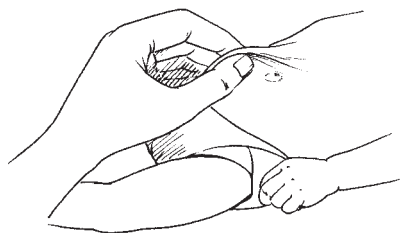
This chapter gives treatment guidelines on the management of acute diarrhoea (with severe, some or no dehydration), persistent diarrhoea and dysentery in children aged 1 week to 5 years. Assessment of severely malnourished children is described in sections 7.2 and 7.4.3 (pp. 198 and 203). The three essential elements in the management of all children with diarrhoea are **rehydration therapy**, **zinc supplementation** and counselling for **continued feeding and prevention**.

In diarrhoea, there is excess loss of water, electrolytes (sodium, potassium, and bicarbonate) and zinc in liquid stools. Dehydration occurs when these losses are not adequately replaced and there are deficits of water and electrolytes. The degree of dehydration is graded according to symptoms and signs that reflect the amount of fluid lost; see sections 2.3 (p. 43) and 5.2 (p. 127). The rehydration regimen is selected according to the degree of dehydration. All children with diarrhoea should receive zinc supplements.

During diarrhoea, decreased food intake and nutrient absorption and increased nutrient requirements often combine to cause weight loss and failure to grow. Malnutrition can make diarrhoea more severe, more prolonged and more frequent than in well-nourished children. This vicious circle can be broken by giving nutrient-rich foods during and continuing after the diarrhoea episode, when the child is well.

**Table 12. Classification of the severity of dehydration in children with diarrhoea**

Classification	Signs or symptoms	Treatment
<b>Severe dehydration</b>	Two or more of the following signs: <ul style="list-style-type: none"> <li>■ lethargy or unconsciousness</li> <li>■ sunken eyes</li> <li>■ unable to drink or drinks poorly</li> <li>■ skin pinch goes back very slowly (<math>\geq 2</math> s)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Give fluids for severe dehydration (see diarrhoea treatment plan C in hospital, p. 131)</li> </ul>
<b>Some dehydration</b>	Two or more of the following signs: <ul style="list-style-type: none"> <li>■ restlessness, irritability</li> <li>■ sunken eyes</li> <li>■ drinks eagerly, thirsty</li> <li>■ skin pinch goes back slowly</li> </ul>	<ul style="list-style-type: none"> <li>▶ Give fluid and food for some dehydration (see diarrhoea treatment plan B, p. 135)</li> <li>▶ After rehydration, advise mother on home treatment and when to return immediately (see pp. 133–4)</li> <li>▶ Follow up in 5 days if not improving.</li> </ul>
<b>No dehydration</b>	Not enough signs to classify as some or severe dehydration	<ul style="list-style-type: none"> <li>▶ Give fluid and food to treat diarrhoea at home (see diarrhoea treatment plan A, p. 138)</li> <li>▶ Advise mother on when to return immediately (see p. 133)</li> <li>▶ Follow up in 5 days if not improving.</li> </ul>



***Pinching the child's abdomen to test for decreased skin turgor***

## Chart 13. Diarrhoea treatment plan C: Treat severe dehydration quickly

→ Follow the arrows. If the answer is **YES**, go across. If **NO**, go down.

### START HERE

Can you give intravenous (IV) fluid immediately?

**YES**

- ▶ Start IV fluid immediately. If the child can drink, give ORS by mouth while the drip is being set up. Give 100 ml/kg Ringer's lactate solution (or, if not available, normal saline), divided as follows:

Age	First give 30 ml/kg in:	Then give 70 ml/kg in:
Infants (< 12 months)	1 h <sup>a</sup>	5 h
Children (12 months to 5 years)	30 min <sup>a</sup>	2.5 h

<sup>a</sup> Repeat once if radial pulse is still weak or not detectable

**NO**

Is IV treatment available nearby within 30 min?

**YES**

- Reassess the child every 15–30 min. If hydration status is not improving, give the IV drip more rapidly. Also watch for over-hydration.
- ▶ Also give ORS (about 5 ml/kg per h) as soon as the child can drink: usually after 3–4 h (infants) and 1–2 h (children).
- Reassess an infant after 6 h and a child after 3 h. Classify dehydration. Then choose the appropriate plan (A, B or C) to continue treatment.

**NO**

Are you trained to use a nasogastric tube for rehydration?

**YES**

- ▶ Refer **urgently** to hospital for IV treatment.
- ▶ If the child can drink, give the mother ORS solution, and show her how to give frequent sips during the trip.

**NO**

Can the child drink?

**YES**

- ▶ Start rehydration by tube (or mouth) with ORS solution: give 20 ml/kg per h for 6 h (total, 120 ml/kg).
- Reassess the child every 1–2 h:
  - If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly.
  - If hydration status is not improving after 3 h, send the child for IV therapy.
- After 6 h, reassess the child and classify dehydration. Then, choose the appropriate plan (A, B or C) to continue treatment.

**NO**

Refer urgently to hospital for IV or nasogastric treatment.

**Note:** If possible, observe the child for at least 6 h after rehydration to be sure the mother can maintain hydration by giving the child ORS solution by mouth.

- ▶ Give zinc and advise the mother how much to give:
  - ≤ 6 months: half tablet (10 mg) per day for 10–14 days
  - ≥ 6 months: one tablet (20 mg) per day for 10–14 days

## Feeding

Continuation of nutritious feeding is an important element in the management of diarrhoea.

- ▶ In the initial 4-h rehydration period, do not give any food except breast milk. Breastfed children should continue to breastfeed frequently throughout the episode of diarrhoea. If they cannot suck from the breast, consider giving expressed breast milk either orally from a cup or by nasogastric tube.
- ▶ After 4 h, if the child still has some dehydration and ORS continues to be given, give food every 3–4 h.
- ▶ All children > 6 months should be given some food before being sent home.

If the child is not normally breastfed, explore the feasibility of **relactation** (i.e. restarting breastfeeding after it was stopped, see p. 297) or give the usual breast milk substitute. If the child is ≥ 6 months or already taking solid food, give freshly prepared foods – cooked, mashed or ground. The following are recommended:

- cereal or another starchy food mixed with pulses, vegetables and meat or fish, if possible, with 1–2 teaspoons of vegetable oil added to each serving
- local complementary foods recommended by the IMCI in that area (see section 10.1.2, p. 299)
- fresh fruit juice or mashed banana to provide potassium.
- ▶ Encourage the child to eat by offering food at least six times a day. Give the same foods after the diarrhoea stops, and give an extra meal a day for 2 weeks.



## Chart 14. Diarrhoea treatment plan B: Treat some dehydration with oral rehydration salts

### GIVE THE RECOMMENDED AMOUNT OF ORS IN THE CLINIC OVER 4 H

#### ► Determine amount of ORS to give during first 4 h:

Age <sup>a</sup>	≤ 4 months	4 to ≤ 12 months	12 months to ≤ 2 years	2 years to ≤ 5 years
Weight	< 6 kg	6–< 10 kg	10–< 12 kg	12–19 kg
	200–400 ml	400–700 ml	700–900 ml	900–1400 ml

<sup>a</sup> Use the child's age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the child's weight (in kg) by 75.

If the child wants more ORS than shown, give more.

#### ► Show the mother how to give ORS solution.

- Give frequent small sips from a cup.
- If the child vomits, wait 10 min, then continue, but more slowly.
- Continue breastfeeding whenever the child wants.

#### ■ After 4 h:

- Reassess the child and classify him or her for dehydration.
- Select the appropriate plan to continue treatment.
- Begin feeding the child in the clinic.

#### ► If the mother must leave before completing treatment:

- Show her how to prepare ORS solution at home.
- Show her how much ORS to give to finish the 4-h treatment at home.
- Give her enough ORS packets to complete rehydration. Also give her two packets as recommended in plan A.
- Explain the four rules of home treatment:

1. Give extra fluid.
2. Give zinc supplements.
3. Continue feeding.
4. Know when to return to the clinic.

} See diarrhoea treatment plan A (p. 138) and mother's card (p. 322)

## Chart 15. Diarrhoea treatment plan A: Treat diarrhoea at home

**COUNSEL THE MOTHER ON THE FOUR RULES OF HOME TREATMENT:  
GIVE EXTRA FLUID. GIVE ZINC SUPPLEMENTS. CONTINUE FEEDING.  
KNOW WHEN TO RETURN TO THE CLINIC.**

### 1. Give as much extra fluid as the child will take.

- ▶ Tell the mother to:
  - Breastfeed frequently and for longer at each feed.
  - If the child is exclusively breastfed, give ORS or clean water in addition to breast milk
  - If the child is not exclusively breastfed, give one or more of the following: ORS solution, food-based fluids (such as soup, rice water and yoghurt drinks) or clean water.

***It is especially important to give ORS at home when:***

- the child has been treated according to plan B or plan C during this visit.
- the child cannot return to a clinic if the diarrhoea gets worse.
- ▶ Teach the mother how to mix and give ORS. Give the mother two packets of ORS to use at home.
- ▶ Show the mother how much fluid to give in addition to the usual fluid intake:
  - ≤ 2 years: 50–100 ml after each loose stool
  - ≥ 2 years: 100–200 ml after each loose stool

***Tell the mother to:***

- Give frequent small sips from a cup.
  - If the child vomits, wait 10 min. Then continue, but more slowly.
  - Continue giving extra fluid until the diarrhoea stops.
- ### 2. Give zinc supplements.
- ▶ **Tell the mother how much zinc to give:**
    - ≤ 6 months: half tablet (10 mg) per day for 10–14 days
    - ≥ 6 months: one tablet (20 mg) per day for 10–14 days
  - ▶ **Show the mother how to give zinc supplement:**
    - For infants, dissolve the tablet in a small amount of clean water, expressed milk or ORS in a small cup or spoon.
    - Older children can chew the tablet or drink it dissolved in a small amount of clean water in a cup or spoon.
  - ▶ **REMINDE THE MOTHER TO GIVE THE ZINC SUPPLEMENT FOR THE FULL 10–14 DAYS.**
- ### 3. Continue feeding.
- ### 4. Know when to return to the clinic.

} See mother's card (p. 322)

ORS solution is effective for most children with persistent diarrhoea. A few children, however, may have impaired glucose absorption, and ORS solution may not be as effective. When these children are given ORS, their stool volume increases markedly, thirst increases, signs of dehydration develop or worsen, and the stools contain a large amount of unabsorbed glucose. These children require IV rehydration until ORS solution can be taken without causing the diarrhoea to worsen.

Routine treatment of persistent diarrhoea with antibiotics is not effective and should not be done. Some children, however, have non-intestinal or intestinal infections that require specific antibiotic therapy.

- *Examine every child with persistent diarrhoea for non-intestinal infections such as pneumonia, sepsis, urinary tract infection, oral thrush and otitis media, and treat appropriately.*
- ▶ Give micronutrients and vitamins as shown in the box on p. 141.
- ▶ Treat persistent diarrhoea with blood in the stools with an oral antibiotic effective for *Shigella*, as described in section 5.4, p. 143.
- ▶ Give oral metronidazole at 10 mg/kg three times a day for 5 days only if:
  - microscopic examination of fresh faeces reveals trophozoites of *Entamoeba histolytica* within red blood cells; **or**
  - trophozoites or cysts of giardia are seen in the faeces, **or**
  - two different antibiotics that are usually effective for *Shigella* locally have been given without clinical improvement.
  - if stool examination is not possible, when diarrhoea persists for > 1 month.

## Feeding

Careful attention to feeding is essential for all children with persistent diarrhoea. Breastfeeding should be continued for as often and as long as the child wants. Other food should be withheld for 4–6 h only for children with dehydration who are being rehydrated following treatment plan B or C.

### Hospital diet

Children treated in hospital require special diets until their diarrhoea lessens and they are gaining weight. The goal is to give a daily intake of at least 110 calories/kg.

### Infants aged < 6 months

- Encourage exclusive breastfeeding. Help mothers who are not breastfeeding exclusively to do so.

**Table 14. First diet for persistent diarrhoea: a starch-based, reduced-milk (low-lactose) diet**

The diet should contain at least 70 calories/100 g, provide milk or yoghurt as a source of animal protein, but no more than 3.7 g lactose/kg per day and should provide at least 10% of calories as protein. The following example provides 83 calories/100 g, 3.7 g lactose/kg per day and 11% of calories as protein:

■ full-fat dried milk (or whole liquid milk: 85 ml)	11 g
■ rice	15 g
■ vegetable oil	3.5 g
■ cane sugar	3.0 g
■ water to make up	200 ml

**Table 15. Second diet for persistent diarrhoea: a reduced-starch (cereal) no-milk (lactose-free) diet**

The diet should contain at least 70 calories/100 g and provide at least 10% of calories as protein (egg or chicken). The following example provides 75 calories/100 g:

■ whole egg	64 g
■ rice	3 g
■ vegetable oil	4 g
■ glucose	3 g
■ water to make up	200 ml

Finely ground, cooked chicken (12 g) can be used in place of egg to give a diet providing 70 calories/100 g

### Supplementary multivitamins and minerals

Give all children with persistent diarrhoea daily supplementary multivitamins and minerals for 2 weeks. These should provide as broad a range of vitamins and minerals as possible, including at least two recommended daily allowances of folate, vitamin A, zinc, magnesium and copper.

As a guide, one recommended daily allowance for a child aged 1 year is:

- folate, 50 µg
- zinc, 10 mg
- vitamin A, 400 µg
- iron, 10 mg
- copper, 1 mg
- magnesium, 80 mg



## Diagnosis

The diagnostic signs of dysentery are frequent loose stools mixed with visible red blood. Other findings on examination may include:

- abdominal pain
- fever
- convulsions
- lethargy
- dehydration (see section 5.2, p. 127)
- rectal prolapse.

## Treatment

Most children can be treated at home.

- ▶ Admit to hospital:
  - young infants (< 2 months old)
  - severely ill children, who look lethargic, have abdominal distension and tenderness or convulsions
  - children with any another condition requiring hospital treatment.
- ▶ Give an oral antibiotic (for 5 days) to which most local strains of *Shigella* are sensitive.
  - Give ciprofloxacin at 15 mg/kg twice a day for 3 days if antibiotic sensitivity is unknown. If local antimicrobial sensitivity is known, follow local guidelines.
  - Give ceftriaxone IV or IM at 50–80 mg/kg per day for 3 days to severely ill children or as second-line treatment.
- ▶ Give zinc supplements as for children with watery diarrhoea.

**Note:** *There is widespread Shigella resistance to ampicillin, co-trimoxazole, chloramphenicol, nalidixic acid, tetracycline, gentamicin and first- and second-generation cephalosporin, which are no longer effective. There is also already reported resistance to ciprofloxacin in some countries.*