

Acute Diarrhoea

Diarrhoea is the passage of unusually loose or watery stools, usually at least three times in a 24 hour period.

Assessing Dehydration

Hydration status should be classified as severe dehydration, some dehydration or no dehydration (See below) and appropriate treatment given.

Table 9,22 Classification of the severity of dehydration in children with diarrhoea

	A	B	C
Look at: Conditiona Eyesb Thirst	Well, alert Normal Drinks normally. not thirsty	Restless, irritable Sunken Thirsty, drinks eagerly	Lethargic orunconscious Sunken Drinks poorly, ornot able to drink
Feel: Skin pinchc	Goes back quickly	Goes back slowly	Goes back very slowly
Decide	The patient has No signs of Dehydration	If the patient has two or more signs in B, there is Some dehydration	If the patients has two or more signs in C, there is Severe dehydration
Treat	Use Treatment Plan A	Weigh the patient, if possible, and use Treatment Plan B	Weigh the patient and use Treatment Plan C Urgently
<p>Being lethargic and sleepy are not the same. A lethargic child is not simply asleep: the child's mental state is dull and the child cannot be fully awakenedthe child may appear to be drifting into unconsciousness.</p> <p>In some infants and children the eyes normally appear somewhat sunken. it is helpful to ask the mother if the child's eyes are normal or more sunken than Usual. The skin pinch is less useful in infants or children with marasmus orkwashiorkor, or obese children. Other signs may be altered in children withs ere malnutrition.</p>			

Suspect hypernatraemic dehydration if there are any of the following:

- Jittery movements
- Increased muscle tone
- Hyperreflexia

- Convulsions
- Drowsiness or coma

Laboratory investigations

- Perform stool microbiology if:
 - There is blood and/or mucus in the stool
 - The child is immunocompromised.
- Consider performing stool microbiology if:
 - The child has recently been abroad or
 - The diarrhoea has not improved by day 7 or
 - Uncertain about the diagnosis of gastroenteritis.
- Other Tests-Blood for complete picture, urea and creatinine,
- When sepsis is suspected perform screening tests for sepsis including blood culture

Severe Dehydration

- Rapid IV rehydration with close monitoring, which is followed by oral rehydration once the child starts to improve sufficiently
- In areas where there is a cholera outbreak, give an antibiotic effective against cholera

Treatment

- Start IV fluids immediately. While the drip is being set up, give ORS solution if the child can drink.

Note: The best IV fluid solution is Ringer's lactate Solution. If Ringer's lactate is not available, normal saline solution (0.9% NaCl) can be used

- Give 100 ml/kg of the chosen solution divided as shown in Table 2

Table 9.23 Administration of iv fluid to a severely dehydrated child

Give 100 ml/kg of Ringer's lactate solution divided as follows		
Age	First give 30 ml/kg in:	Then give 70 ml/kg in:
Infants (under 12 months)	1 hour	5 hours
Older	30 minutes	2½ hours
<ul style="list-style-type: none"> • Reassess the patient every 1-2 hours. If hydration is not improving, give the IV drip more rapidly • After six hours (infants) or three hours (older patients), evaluate the patient using the assessment chart. Then choose the appropriate treatment plan (A, B or C) to continue treatment <ul style="list-style-type: none"> ○ If Ringer's Lactate Solution is not available, normal saline may be used ○ Repeat once if radial pulse is still very weak or not detectable 		

Monitoring

- Reassess the child every 15-30 minutes until a strong radial pulse is present
- If hydration is not improving, give the IV solution more rapidly
- If signs of severe dehydration are still present, repeat the IV fluid infusion as outlined earlier
- If the child is improving but still shows signs of some dehydration, discontinue IV treatment and give ORS solution for 4 hours
- If there are no signs of dehydration, follow the guidelines for no dehydration

Some Dehydration

Children should be given ORS solution, for the first 4 hours at a clinic while the child is monitored.

Treatment

- In the first 4 hours, give the child the following approximate amounts of ORS solution, according to the child's weight (or age if the weight is not known)

- Determine amount of ORS to give during first 4 hours

Age*	Up to 4 months	4 months upto 12 months	12 months upto 2 years	2 years up to 5 years
Weight	<6 kg	6 - <10 kg	10 - <12 kg	12 - <20 kg
Amount of fluid Over 4 hours in mls	200-400	400-700	700-900	900-1400

* 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.

However, if the child wants more to drink, give more.

- Show the mother how to give the child ORS solution, a teaspoonful every 1-2 minutes if the child is under 2 years; frequent sips from a cup for an older child
- Advise breastfeeding mothers to continue to breastfeed whenever the child wants
- If the mother cannot stay for 4 hours, show her how to prepare ORS solution and give her enough ORS packets to complete the rehydration at home plus enough for 2 more days
- Reassess the child after 4 hours, checking for signs of dehydration listed earlier

If there is no dehydration, teach the mother the four rules of home treatment:

- Give extra fluid
- Give zinc supplements for 10-14 days
- Continue feeding
- Return if the child develops any of the following signs:
 - Drinking poorly or unable to drink or breastfeed
 - Becomes more sick
 - Develops fever
 - Has blood in the stool

- If the child still has some dehydration, repeat treatment for another 4 hours with ORS solution, as above, and start to offer food, milk or juice and breastfeed frequently
- If signs of severe dehydration have developed, treatment for severe dehydration

No sign of Dehydration

Treatment

- Treat the child as an outpatient.
- Counsel the mother on the 4 rules of home treatment: (*See above*)
- Give extra fluid, as follows:
 - If the child is being breastfed, advise the mother to breastfeed frequently and for longer at each feed. If the child is exclusively breastfed, give ORS solution or clean water in addition to breast milk. After the diarrhoea stops, exclusive breastfeeding should be resumed, if appropriate to the child's age
 - In non-exclusively breastfed children, give one or more of the following:
 - ORS solution
 - Food-based fluids (such as soup, rice water and yoghurt drinks)
 - Clean water
 - For children <2 years, about 50-100 ml after each loose stool
 - For children 2 years or over, about 100-200 ml after each loose stool
- Tell the mother to give small sips from a cup. If the child vomits, wait 10 minutes and then give more slowly. She should continue giving extra fluid until the diarrhoea stops
- Give zinc supplements for 10-14 days
 - Up to 6 months 1/2 tablet (10 mg) per day

6 months and more 1 tablet (20 mg) per day

- Show the mother how to give the zinc supplements
 - Infants, dissolve the tablet in a small amount of clean water, expressed milk or ORS.
 - Older children, tablet can be chewed or dissolved

Antibiotics and Antidiarrhoeals

- Do not give antidiarrhoeals such as diphenoxylate, bismuth subsalicylate, loperamide etc.
- Do not routinely give antibiotics.
- Give antibiotics to children:
 - With suspected or confirmed septicaemia
 - With extra-intestinal spread of bacterial infection
 - Younger than 6 months with salmonella gastroenteritis
 - Who are malnourished or immunocompromised with Salmonella gastroenteritis
 - With Clostridium difficile-associated pseudomembranous enterocolitis, giardiasis, dysenteric shigellosis, dysenteric amoebiasis or cholera and signs of severe dehydration or shock, if cholera is present in the area.
- Assess and treat dehydration as for other acute diarrhoea.
- Give an oral antibiotic to which strains of V, cholerae in the area are known to be sensitive.

CHOLERA

Suspect cholera in children over 2 years old who have acute watery diarrhoea and signs of severe dehydration, if cholera is present in the area

- Assess and treat dehydration as for other acute diarrhoea
- Give an oral antibiotics to which strains of V cholera in the area are known to be sensitive
- Prescribe zinc supplementation as soon as vomiting stops

Pathogen	Antibiotics	Total daily doses	No. of Doses/day	Duration
Salmonella Gastroenteritis (in high risk children) ^A	Amoxicillin	40-50 mg/kg	3	5 days
	Ceftriaxone	50 mg/kg	1	2-5 days
	Trimethoprim-Sulfamethoxazole	10/50 mg/kg	2	5 days
	Ciprofloxacin	5-10 mg/kg PO	2	5 days

		4-7 mg/kg IV	2	5 days
Campylobacter dysentery	Erythromycin	30-50 mg/kg	2	5 days
	Azithromycin	4-7 mg/kg IV	2	5 days
Cholera	Doxycyclines ^B	>8 kg: 4.4 mg/kg IV (300 mg as a single dose in adult)	1	Single dose
	Zithromycin	Day 1: 12 mg/kg Day 2-5: 6 mg/kg	1	3 days

Note:

A: High risk children include those with underlying immune deficiency, anatomical and functional asplenia, corticosteroid or immunosuppressive therapy, inflammatory bowel disease, achlorhydria, and neonates and young infants.

B: World Health Organization (WHO) does not recommend the use of doxycycline in children with cholera.

DYSENTERY

- Diarrhoea presenting with loose frequent stools containing blood
- Most episodes are due to Shigella and nearly all require antibiotic treatment

Diagnosis

- The diagnostic signs of dysentery are frequent loose stools with visible red blood
- Other findings
 - Abdominal pain
 - Fever
 - Convulsions
 - Lethargy
 - Dehydration
 - 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 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.

Follow-up

- Follow-up after two days
- Look for signs of improvement such as no fever, fewer stools with less blood, improved appetite
- If there is no improvement after two full days of treatment
 - Check for other conditions
 - Stop the first antibiotic
 - Give the child a second-line antibiotic which is known to be effective against Shigella in the area.
- If the two antibiotics, that are usually effective against Shigella in the area have each been given for 2 days and produced no signs of clinical improvement
 - Check for other conditions (Consult a standard pediatric textbook)
 - Otherwise treat as an outpatient for possible amoebiasis

- If amoebiasis is possible, give Metronidazole (10 mg/kg, 3 times a day) for 5 days
- Admit the child if there is an indication requiring hospital treatment.
- Young infants (<2 months)
 - Examine the young infant for surgical causes of blood in the stools (for example, intussusception and refer to a surgeon, if appropriate
 - Give IM/IV Ceftriaxone (100 mg/kg) once daily for 5 days

Infants and young children

Consider surgical causes of blood in the stools (for example, intussusception; and refer to a surgeon, if appropriate. Dysentery is unusual in neonates and young infants; therefore, consider life-threatening bacterial sepsis

Severely malnourished children

Treat as general management of severely malnourished children.

- Treat for Shigella first and then for amoebiasis on clinical grounds if laboratory examination is not possible.
- If microscopic examination of fresh stools in a reliable laboratory is possible, check for trophozoites of *Entamoeba histolytica* in red blood cells and treat for amoebiasis, if present, Also examine stools for trophozoites of *Giardia lamblia* and treat if present.

Supportive care

- Treatment of dehydration
 - Assess the child for signs of dehydration and give fluids according to treatment Plan A, B or C as appropriate
- Nutritional management
 - Ensuring a good diet is very important as dysentery has a marked adverse effect on nutritional status

Prevention

- Breastfeeding
- Improve feeding practices
- Use of safe water
- Handwashing

- Food safety
- Use of latrines and safe disposal of stool

Vaccines

- Rotavirus vaccines are part of routine universal vaccination programme in many countries in the world.
- First dose of primary vaccination should be given between the age of 6 and 12 weeks, and the full schedule (RotaTeg 3 doses and Rotarix 2 doses) should be completed by the age of 8 months for Rota Teg and 6 months for Rotarix.
- Both have been proven to be very safe and are highly effective in preventing severe dehydrating diarrhoea.

