

Defeating Cholera: Clinical Presentation and Management for Haiti Cholera Outbreak, 2010

- Rapid high-volume rehydration will save lives
- Many patients can be rehydrated entirely with oral rehydration solution (ORS)
- Even if the patient gets intravenous (IV) rehydration, he/she should start drinking ORS as soon as he/she is able

Most persons infected with the cholera bacterium have mild diarrhea or no symptoms at all. Only about 7% of persons infected with *Vibrio cholerae* O1 have illness requiring treatment at a health center.

Cholera patients should be evaluated and treated quickly. With proper treatment, even severely ill patients can be saved. Prompt restoration of lost fluids and salts is the primary goal of treatment.

SYMPTOMS OF MODERATE OR SEVERE CHOLERA

Profuse, watery diarrhea
Vomiting
Leg cramps

SIGNS AND SYMPTOMS OF DEHYDRATION

Some dehydration

- Restlessness and irritability
- Sunken eyes
- Dry mouth and tongue
- Increased thirst
- Skin goes back slowly when pinched
- Decreased urine
- Infants: decreased tears, depressed fontanel

Severe dehydration

- Lethargy or unconsciousness
- Very dry mouth and tongue
- Skin goes back very slowly when pinched (“tenting”)
- Weak or absent pulse
- Low blood pressure
- Minimal or no urine



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ORAL REHYDRATION

Dehydrated patients who can sit up and drink should be given oral rehydration salts (ORS) solution immediately and be encouraged to drink. It is important to offer ORS solution frequently, measure the amount drunk, and measure the fluid lost as diarrhea and vomitus. Patients who vomit should be given small, frequent sips of ORS solution, or ORS solution by nasogastric tube. ORS solution should be made with safe water. Safe water means the water has been boiled or treated with a chlorine product or household bleach.

Guidelines for treating patients with some dehydration

Approximate amount of ORS solution to give in the first 4 hours to patients with some dehydration. Use the patient's age only when you do not know the weight:

Age	<4 mo.	4-11 mo.	12-23 mo.	2-4 yr.	5-14 yr.	>15 yr.
Weight (kg)	<5	5-7	8-10	11 -15	16-29	>30
ml	200-400	400-600	600-800	800-1200	1200-2200	2200-4000

- The approximate amount of ORS (in milliliters) can also be calculated by multiplying the patient's weight in kg by 75.
- A rough estimate of oral rehydration rate is 100cc ORS every five minutes, until the patient stabilizes.
- If the patient requests more than the prescribed ORS solution, give more.
- Older children and adults should be offered safe water in addition to ORS solution. Safe water means the water has been boiled or treated with a chlorine product or household bleach.
- For Infants:
 - » Encourage the mother to continue breast-feeding.
 - » Give infants under 6 months of age who are not breast-fed an additional 100-200 ml of safe water during this period. Safe water means the water has been boiled or treated with a chlorine product or household bleach.

Notes:

1. The volumes and time shown are guidelines based on usual needs. If necessary, amount and frequency can be increased, or the ORS solution can be given at the same rate for a longer period to achieve adequate rehydration. Similarly, the amount of fluid can be decreased if hydration is achieved earlier than expected.
2. During the initial stages of therapy, while still dehydrated, adults can consume as much as 1000 ml of ORS solution per hour, if necessary, and children as much as 20 ml/kg body weight per hour.
3. Reassess the patient after 1 hour of therapy and then every 1 to 2 hours until rehydration is complete.
4. Resume feeding with a normal diet when vomiting has stopped.

INTRAVENOUS REHYDRATION

Patients with severe dehydration, stupor, coma, uncontrollable vomiting, or extreme fatigue that prevents drinking should be rehydrated intravenously.

Intravenous solutions

Best	Ringer's Lactate Solution
Acceptable*	Normal saline*
Unacceptable	Plain glucose (dextrose) solution

**Acceptable in emergency, but does not correct acidosis and may worsen electrolyte imbalance.*

Guidelines for treating patients with severe dehydration

Start intravenous fluids (IV) immediately. If the patient can drink, give ORS solution by mouth while the IV drip is set up. Give 100 ml/kg Ringer's Lactate Solution divided as follows:

Age	First give 30 ml/kg IV in:	Then give 70 ml/kg IV in:
Infants (<12 mos.)	1 hour*	5 hours
Older (>1 yr.)	30 minutes*	2 ½ hours

**Repeat once if radial pulse is still very weak or not detectable.*

- Reassess the patient every 1-2 hours and continue hydrating. If hydration is not improving, give the IV drip more rapidly. 200ml/kg or more may be needed during the first 24 hours of treatment.
- Also give ORS solution (about 5 ml/kg per hour) as soon as the patient can drink.
- After 6 hours (infants) or 3 hours (older patients), perform a full reassessment. Switch to ORS solution if hydration is improved and the patient can drink.

Signs of adequate rehydration

- Skin goes back normally when pinched
- Thirst has subsided
- Urine has been passed
- Pulse is strong

ANTIBIOTICS

An antibiotic given orally will reduce the volume and duration of diarrhea. Treatment is recommended for severely ill patients. Do not give antibiotics to asymptomatic persons. Zinc given orally can reduce the duration of most infectious diarrhea in children. No drugs besides antibiotics and zinc for treatment of diarrhea or vomiting should be given.

Appropriate oral antibiotics (give one of these) ** ALL BY MOUTH**

- These recommendations are based on the antibiotic resistance profile of *V. cholerae* isolates from the Haiti cholera outbreak, as reported on October 28, 2010, and local drug availability.
- Multiple first choice and second choice options are presented. Selection of antibiotics should be based on individual case consideration and available medications.

Patient classification	First choice	Second choice
Adults (non-pregnant)	Doxycycline: 300 mg by mouth in one dose	Azithromycin: 1 gram in a single dose Tetracycline: 500 mg 4 times a day for 3 days Ciprofloxacin: 1 gram in a single dose* Erythromycin: 500 mg 4 times a day for 3 days
Pregnant women	Azithromycin: 1 gram in one dose	Erythromycin: 500 mg 4 times a day for 3 days
Children ≥12 months old and capable of swallowing pills and/or tablets	Azithromycin: 20 mg/kg in one dose Erythromycin: 12.5 mg/kg 4 times a day for 3 days Doxycycline: 2-4 mg/kg in one dose**	Ciprofloxacin: 20 mg/kg in one dose Tetracycline: 12.5 mg/kg 4 times a day for 3 days
Children <12 months old and others unable to swallow pills and/or tablets	Azithromycin oral suspension: 20 mg/kg in one dose Erythromycin oral suspension: 12.5 mg/kg 4 times a day for 3 days Doxycycline oral suspension: 2-4 mg/kg in one dose**	Ciprofloxacin oral suspension: 20 mg/kg in one dose Tetracycline oral suspension: 12.5mg/kg 4 times a day for 3 days

*Ciprofloxacin: 500 mg twice daily for three days for treatment of adults with cholera is widely practiced

** Doxycycline is safe for treatment of cholera in children at the recommended dose. The Pan American Health Organization recommends doxycycline as a second-line choice because of limited regional availability and to avoid future overuse in children.

Zinc supplementation

Zinc supplementation significantly reduces the severity and duration of most childhood diarrhea caused by infection. When available, supplementation (10-20 mg zinc per day) should be started immediately.

References:

1. World Health Organization. First steps for managing an outbreak of acute diarrhea. WHO/CDS/NCS/2003.7.Rev.1 http://www.who.int/topics/cholera/publications/en/first_steps.pdf, accessed October 25, 2010
2. World Health Organization. Management of the Patient with Cholera. Geneva, Switzerland: World Health Organization, Programme for Control of Diarrhoeal Diseases, 1992. (WHO/CDO/SER/15 rev 1)

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For further information, see:

<http://www.cdc.gov/cholera/>

<http://www.cdc.gov/healthywater/>

<http://www.cdc.gov/healthywater/global/household.html>