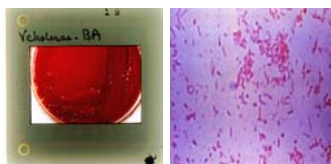


## Cholera Information for Professionals

**Agent:** *Vibrio cholerae*, a gram-negative comma-shaped rod, would serve as an effective biological weapon if the organisms were used to contaminate a large supply of the drinking water or food.



Cholera blood agar and gram stain.

### Reporting Requirements for Disease:

Report any suspect cases of cholera to your local health authority within one working day; or, call the Texas Department of State Health Services at 1-800-252-8239. Case clusters or multiple cases should be reported immediately. Physicians should complete a [Cholera and Other Vibrio Illness Surveillance Report](#) provided by the Centers for Disease Control and Prevention.

**Infection Control:** Standard Precautions should be employed. Use Contact Precautions for diapered or incontinent children < 6 years of age for duration of illness. Hospital grade disinfectants provide adequate decontamination.

**Incubation Period:** 4 hours-5 days

**Signs/Symptoms:** Persons infected with *V. cholerae* may be asymptomatic (75%), have mild diarrhea (18%), moderate diarrhea (5%), or fulminant disease (2%) characterized by sudden onset of vomiting and abdominal distension followed by profuse watery diarrhea. After several watery bowel movements the stools take on a "rice-water" appearance. Hypotension may

become apparent within an hour of onset. Hypovolemic shock can occur in as little as one hour with fulminant disease followed by death in two to three hours. Acute renal failure may occur from two hours to several days after the onset of symptoms, particularly in the elderly. Signs and symptoms are associated with fluid/electrolyte loss.

### Diagnosis:

**Differential Diagnosis:** Other causes of watery diarrhea to be ruled out are enterotoxigenic *Escherichia coli*, viruses such as rotavirus or Norwalk, other *Vibrio species*, or food poisoning due to ingestion of preformed toxins such as those produced by *Clostridium perfringens*, *Staphylococcus aureus*, or *Bacillus cereus*. Fecal smears from persons with shigellosis, salmonellosis, or campylobacteriosis typically have polymorphonuclear leukocytes, whereas fecal smears from cholera patients usually lack polymorphonuclear leukocytes. Infection with *Cyclospora* species or *Cryptosporidium parvum* should also be considered. Since few persons in a non-endemic area would have immunity to cholera, in the event of deliberate contamination one would expect to see all age groups affected, with the very old and very young being more seriously ill.

**Diagnostic Tests:** Dark-field microscopy of stool specimen from patients with cholera reveal large numbers of *Vibrio* organisms (short, curved rods) with a characteristic motility that gives the appearance of shooting stars. Cultures can be made directly from stool or from a rectal swab; rectal swabs must be

transported in Cary-Blair medium.

*Specimen Submission:* All specimens must be triple contained, cold not frozen, in an approved shipping container and have biohazard labels. Before transport is arranged, the receiving laboratory must be alerted prior to transport by calling (800) 252-8239 ("press 1"). Newly available diagnostic tests may be discussed at that time. Specimens must be accompanied by a Specimen Submission Form ([G-1A](#)) and submitted to the DSHS Laboratory, 1100 West 49th Street, Austin, TX 78756.

*Additional Tests:* Stool samples seldom will have red or white cells on microscopic examination. Acidosis and renal failure may accompany severe dehydration. Serum electrolytes may demonstrate hypokalemia, or in the case of inappropriate fluid replacement may show hypernatremia or hyponatremia.

**Treatment:** Treatment should be instituted prior to laboratory confirmation. Intravenous treatment with lactated Ringer's (LR) solution should be instituted immediately for patients with persistent vomiting or high rates of stool loss (>10ml/kg/hr). IV solution should be given rapidly until the patient's blood pressure is normal. LR solution should be infused so that about two liters is given in the first 30 minutes. Hydration status should be reassessed at 30 minutes, then every 1 to 2 hours until rehydration is complete. If the patient's condition improves, the infusion can be slowed to deliver approximately 100 ml/kg of body weight within the first four hours of therapy. Children in shock should receive LR solution at a rate of 30 ml/kg of body weight/hour in the first hour, and 20 ml/kg/hr over the next two hours. Oral rehydration solution (ORS) should be added to the treatment as soon

as possible. ORS should be administered even if vomiting is present; however, the solution must be administered slowly and persistently. World Health Organization solution (3.5g NaCl, 2.5g NaHCO<sub>3</sub>, 1.5g KCL and 20g glucose per liter) is effective for oral rehydration and can be used in mild to moderate cases. Other oral rehydration solutions include Ricelyte® and Rehydralyte®. Most over-the-counter infant rehydration solutions do not contain the proper electrolyte balance for treatment of cholera. Mild and moderately dehydrated patients should be instructed to drink ORS until they are no longer thirsty. Estimated fluid losses should be replaced at 100ml/5 minutes. Daily oral replacement volume should include ongoing losses plus 1 liter; patients may need over 5 liters of fluid. The patient's rehydration status should be reassessed every 1 to 2 hours.

Antibiotic therapy (tetracycline 500 mg q6h for 3 days, or doxycycline 300 mg one time or 100 mg q12h for 3 days) will shorten the duration of diarrhea, and reduce fluid losses. Other antibiotics that can be considered because tetracycline resistance is widespread include ciprofloxacin 1000 mg po one time or ciprofloxacin 500 mg po q12 h for 3 days. Norfloxacin 400 mg po q12h for 3 days may also be used. Children may be treated with tetracycline 50 mg/kg/d divided into 4 doses po for 3 days. Alternates include erythromycin 40 mg/kg/d divided into 4 doses po for 3 days, trimethoprim (8 mg) and sulfamethoxazole (40 mg)/kg/d po divided into 2 doses for 3 days, and furazolidone 5 mg/kg/d divided into 4 doses po for 3 days. Pregnant women can be treated with erythromycin 500 mg q 6 h po for 3 days or furazolidone 100 mg q 6 h po for 3 days.