

Cryptosporidiosis Investigation Guideline

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Cryptosporidiosis

Disease Management and Investigative Guidelines

CASE DEFINITION (CDC 2009)

A. Clinical Description for Public Health Surveillance:

- An illness characterized by watery diarrhea, abdominal cramps, loss of appetite, low-grade fever, nausea and vomiting. The disease can be prolonged and life-threatening in severely immunocompromised persons.

B. Laboratory Criteria for Case Classification:

- Laboratory-confirmed cryptosporidiosis shall be defined as the detection of a member of the genus *Cryptosporidium* by one of the following methods:
 - Organisms in stool, intestinal fluid, or tissue or biopsy specimens
 - Antigens in stool or intestinal fluid, or
 - Nucleic acid by PCR in stool, intestinal fluid, or tissue or biopsy specimens.

C. Case Classification:

- Confirmed: A case that meets the clinical description and at least one of the criteria for laboratory-confirmation as described above.
- Probable: A case that meets the clinical description and that is epidemiologically linked to a confirmed case.
- Suspect (KDHE definition for internal data management):
 - A case that meets the clinical description that is not epidemiologically linked to a confirmed case or laboratory confirmed.
 - A confirmatory laboratory report without clinical symptoms reported.

D. Laboratory Testing:

- Collection: Parasite (O & P) Feces Mailer. The traditional two vial system is preferred but the commercially available one vial system is accepted.
- Specimen: Feces, marble size, mixed well in 10% formalin and PVA bottles
- Timing of specimens: Because parasites may be passed intermittently, the collection of three specimens within a 10-day period is recommended. This should occur while a person is symptomatic or within the 2 week period after the resolution of diarrheal symptoms.
- Do not refrigerate the preserved samples. If there is a delay in obtaining the preservatives, refrigerate untreated stool specimens at 4°C (do not freeze) for up to 48 hours. Once preserved, the specimens can be stored and transported at room temperature.
- The Kansas Health and Environment Laboratory (KHEL) will provide testing upon request for a case meeting at least one of the following criteria: watery diarrhea, immuno-suppressed, < 5 years of age, institutionalized, or contact of a known case.
 - Performed ONLY when the R/O *Cryptosporidium* box is checked on the laboratory request form.
 - Contact KHEL at 785-296-3718 before sending.
- For additional information and/or questions concerning isolate submission, and laboratory kits call (785) 296-1620 or refer to online guidance at http://www.kdheks.gov/labs/lab_ref_guide.htm

E. Bioterrorism Potential: None.

F. Outbreak Definition:

- Two or more cases clustered in time and space with a suspected common source.

INVESTIGATOR RESPONSIBILITIES

A. Investigation Related Tasks and Activities:

- 1) Confirm diagnosis with appropriate medical provider.
 - Before contacting the patient or family, discuss what they have been told about his/her evaluation for disease.
 - Obtain information that supports clinical findings in the case definition and information on the onset date of the symptoms.
 - Obtain information on any laboratory tests performed and results.
 - For hospitalization, obtain medical records, including admission notes, progress notes, lab report(s), and discharge summary.
- 2) Conduct case investigation to identify potential source of infection.
- 3) Conduct contact investigation to locate additional cases and/or contacts.
 - Determine if case is involved in a high-risk occupation or if another special situation is involved (i.e. diapered child, daycare, food handler)
 - Assure proper examinations are completed for contacts (i.e., stool samples) if they exhibit symptoms.
- 4) Identify sources of significant public health concern (e.g., public and/or recreational water, daycare facilities) and prevent further transmission.
- 5) Initiate control and prevention measures to prevent spread of disease.
 - Follow-up on restrictions of daycare attendees and food handlers.
 - Follow-up on treatment of water sources.
- 6) Report all confirmed cases to the KDHE Office of Surveillance and Epidemiology, using established methods.

B. Notifications:

- 1) There are no special notifications or additional reporting requirements.
- 2) As appropriate, use the notification letter(s) and the disease fact sheet to notify the case, contacts and other individuals or groups.

EPIDEMIOLOGY

Cryptosporidiosis has a worldwide distribution. In the United States, children < 2 years of age, animal handlers, travelers to endemic areas, men who have sex with men, immunocompromised individuals and those in close contact with infected individuals are most likely to be infected. Outbreaks have been associated with daycares, public drinking water, swimming pools and other contaminated bodies of water. Cryptosporidium is resistant to chlorine and filtration systems are critical for the safety of public water supplies. Most swimming pools sand filters will not remove oocysts from contaminated water.

DISEASE OVERVIEW

A. Agent:

Many species of *Cryptosporidium* exist that infect humans and a wide range of animals. Although *Cryptosporidium parvum* and *Cryptosporidium hominis* (formerly known as *C. parvum anthroponotic* genotype or genotype 1) are the most prevalent species causing disease in humans, infections by *C. felis*, *C. meleagridis*, *C. canis*, and *C. muris* have also been reported.

B. Clinical Description:

A parasitic infection characterized by profuse and watery diarrhea. Additional symptoms include weight loss, stomach cramps, nausea, vomiting, and low-grade fever. If left untreated, symptoms may occur intermittently for weeks and/or months. Persons that are immunodeficient, especially with HIV, are often unable to clear the parasite and may have a prolonged clinical course that may contribute to death.

C. Reservoirs:

Humans, cattle and other domestic animals.

D. Mode(s) of Transmission:

Fecal-oral, including: person-to-person, animal-to-person, waterborne and foodborne. The oocysts are resilient and may survive in the environment for months. They are resistant to concentrations of chlorine and other disinfectants commonly used in the treatment of drinking water but may be killed by heat or removed by adequate filtration.

E. Incubation Period:

Range 2-12 days; average 7 days.

F. Period of Communicability:

A case is considered communicable as long as oocysts are being shed in their stools, typically ≤ 7 days but may last weeks. Oocysts may remain infective outside the body for 2-6 months under ideal environmental conditions.

G. Susceptibility and Resistance:

It is unknown if reinfection and/or latent infection with reactivation can occur.

H. Treatment:

A 3-day course of nitazoxanide oral suspension is recommended for treatment of children 12 months of age and adults. In immunocompromised patients with cryptosporidiosis, oral administration of Human Immune Globulin or bovine colostrum has been beneficial.

Immunocompetent Persons Nitazoxanide Dosages diarrhea caused by <i>Cryptosporidium</i>		
Adult dosage	500 mg BID x 3 days	Nitazoxanide tablets (500 mg; patients ≥ 12 years of age)
Pediatric dosage 1-3 years:	100 mg BID x 3 days	Nitazoxanide oral suspension (100 mg/5ml; patients ≥ 1 year of age)
4-11 years:	200 mg BID x 3 days	

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Standard investigation activities include the following:

- 1) Confirmation of diagnosis using case definition.
- 2) Collection of demographic data (birth date, county, sex, race/ethnicity)
- 3) Collection of clinical data.
- 4) Determination of risk factors and transmission settings (i.e. recreational water use, further documented spread, travel outside of country)
- 5) Investigation of epi-links among cases (cluster, household, co-workers, etc).

Standard investigation **includes** completion of the General Investigation Form and Enteric Supplemental Form. Further investigative activity should include:

A. Case Investigation - Identify Potential Source of Infection:

Focus within the period of 2 weeks prior to symptom onset for:

- History of exposure(s), note association to:
 - Exposure to animal or feces; note if animals were ill; when and where.
 - Exposure to known carrier or persons with diarrhea; when and where.
 - Sexual contacts within incubation period.
 - History of colonic irrigation; when and where.
 - Consumption or exposure to non-potable drinking water.
 - Recreational water use. (e.g. ponds, lakes, rivers, aquatic parks, pools, hot tubs, fountains)
 - If yes, note location and date.
 - Note activities. (e.g. face in water, swimming, wading, slide, hot tub)
- Food/drink history (if case has recall issues focus on 1 week prior to onset):
 - Restaurant/public gatherings attended, include location and dates.
 - Food history (especially fresh fruits, vegetables); type and source.
 - Source of water for drinking or cooking.
- Travel history, with dates of exit from and reentry into Kansas.
 - Include travel history with dates of travel.
- Case finding and transmission setting:
 - Identify diarrheal illnesses among household members and guests, neighbors, schoolmates, and other possible transmission setting(s).
 - Residence in a facility for the developmentally disabled; note specific dates and places.
 - Attendance in daycare; note specific dates and places.
- Note occupation of the case and household members.

B. Contact Investigation – Identify Exposed Individuals / Populations:

- Consider case activities since diarrhea began (up until 1 month after onset):
 - Recreation water use (location, date, activities)
 - Food handling (location, date, activities)
 - Sexual contacts
 - Daycare attendance
- Contacts are defined as sexual partners, household members, daycare workers and attendees and those that may have consumed food, water or

other beverage or bathed in a recreational water body that is known to be a source of infection.

- Follow-up symptomatic contacts as suspect cases.

C. Isolation, Work and Daycare Restrictions

- Cryptosporidiosis is not a disease considered for quarantine or isolation under Kansas Administrative Code; however, the following guidelines are suggested:
 - Children with diarrhea may not attend daycare until symptoms have resolved for 24 hours.
 - Food handlers are restricted from handling food, or are excluded from work when they serve high risk groups, until diarrhea has resolved for 24 hours.
 - Healthcare workers involved in direct patient care (feeding patients, handling or dispensing medications, ect.) are considered food handlers and are subject to food handling restrictions.
 - Cases should not swim or engage in other form of recreational water use until 2 weeks after symptoms resolve.

D. Case Management, Including Follow-up of cases:

- Generally not indicated unless the case works in a daycare and/or food service position (including direct patient care); in which case, follow-up is recommended to ensure compliance with control recommendations.

E. Contact Management, Including Protection of Contacts:

- Contacts at risk of serious complications from disease or who pose an increased risk to others because of their activities (i.e., daycare attendees, immunocompromised, and/or frequent swimmers) should be informed of the signs and symptoms of illness, to seek medical attention if symptoms develop and to avoid activities during illness that may spread the disease.

F. Environmental Measures:

- More than one case associated with a childcare facility requires an inspection of the facility. 3% hydrogen peroxide is the disinfectant of choice for prevention of crypto in child-care facilities. See Managing Special Situations for Childcare settings.
- More than one case associated with an aquatic facility requires an inspection of the facility. Hyper-chlorination of water may be needed. See Managing Special Situations for Swimming Pools and Aquatic Facilities.
- For cases associated with a public water supply, see Managing Special Situation for Public Water Supplies. Precautions include using only water for drinking, washing or cooking that has been:
 - Purified by boiling for 1 minute;
 - Distilled; or
 - Filtered with filters that are labeled as able to remove crypto; reverse osmosis; absolute pore size of 1 micron or smaller; and/or tested and certified by NSF Standard 53 for cyst removal or cyst reduction.

G. Education:

- Provide basic instruction in fecal-oral modes of transmission and personal hygiene, emphasizing proper hand washing techniques.
- Household members should be advised to thoroughly wash their hands after toileting, changing diapers, and assisting a child with toileting; as well as, before preparing, serving and eating meals. Serve food individually and not family style.
- Discuss risks associated with drinking untreated surface water, including private water supplies and water from streams or lakes. Generally, persons should be informed about the risks of both giardiasis and cryptosporidiosis.

MANAGING SPECIAL SITUATIONS

A. Evaluating a Significant Increase in Crypto Cases for Community

- Determine the total number of crypto cases reported for the month.
- Create a 5 year history report, based on following variables:
 - For a 5-year period ending the previous year.
 - By month; from the current month; through the current month.
 - Case status = Confirmed, probable, and/or suspect
 - Disease = Cryptosporidiosis
 - For chosen geographic area (i.e., county or region)
- Determine the median number of cases for the previous five years.
- If the current number of cases is greater than 2x the median number of the previous 5 years (disease action threshold), investigate as a possible outbreak.

B. Outbreak (and Significant Increase in Disease) Investigation:

- Initial notifications:
 - Notify KDHE immediately, 1-877-427-7317.
 - Notify internal and local partners – including representatives from different disciplines (i.e. environmental health specialists, laboratories)
 - Notify and mobilize all community partners that may be impacted; instruct them to intensify control measures.
 - Aquatics operators/managers
 - Child care programs
 - Immunocompromised persons
 - Schools
 - Nursing homes / extended care facilities
 - Restaurants and hotel/motels
 - Providers of public water supplies (PWSs)
 - Other important community partners that might be impacted
- Consult KDHE Foodborne Illness and Outbreak Investigation Manual for outbreaks involving food.
- Consult KDHE Control of Enteric Outbreaks in Child-Care Facilities for outbreaks involving child-care.
- Identify a team leader for local case investigators. The team leader is

responsible for tracking of new cases in the jurisdiction; noting what needs to be done; and providing updates to local, regional and state partners.

- Communicate with other health departments and agencies:
 - Use periodic, regularly scheduled conference calls with key contacts to keep informed, plan next steps and share information.
 - Decide how to maintain and share information outside of the calls. (i.e., e-mail, fax, website). Make sure communication method is effective.
 - After reviewing resources and contingency plans, request assistance as needed from regional partners or state health department.
- Organize and maintain all data related to outbreak
 - Keep logs of phone calls regarding the outbreak.
 - Document the number of hours spent on outbreak for future reference in budgeting and resource allocation.
 - Create and maintain a line listing of cases that includes:
 - KS-EDSS ID;
 - Name and DOB (or age);
 - Symptoms;
 - Onset date;
 - Source of exposure (i.e., setting; animal contact; recreational water; drinking water source; travel; restaurant);
 - Specimen collection date;
 - Lab results;
 - Case status (i.e., confirmed, probable, suspect)
- Evaluate findings and all relevant information to identify population(s) at risk of infection based on scope and intensity of the outbreak;
 - Use the information collected to define:
 - Person: who is getting ill (i.e., age, gender, immunocompromised, occupations); associations to drinking water sources, daycares, recreational water or animal exposure 2 weeks before onset.
 - Place: where are the cases; to what settings are they associated; use plot maps.
 - Time: when did it start and is it still going on; use epi curves
 - Establish an official case definition to assist with counting cases and monitoring the outbreak.
- Active case-finding and surveillance should be activated at the beginning of the outbreak to classify as many confirmed cases as possible to help identify the source of the outbreak.
 - Contact medical providers about need to consider crypto testing and reporting of all suspected cases with watery diarrheal symptoms.
 - Survey hospitals, emergency departments, and physician's offices for suspect cases of watery diarrheal illness.
 - Examine records of patients with diarrhea at nursing homes.
 - Examine reports of school absenteeism for diarrheal illness.
 - Inquire about diarrheal illness in day-care facilities.
 - If possible, establish a hotline for outbreak-related calls. (i.e., self reported cases)

- If no association is identified: consider the need for additional laboratory testing to rule out false-positive tests; as well as, using additional surveys and more intensive epidemiological studies to evaluate the situation.
- Engage media to help disseminate public health messages.
 - Establish contact points with media sources.
 - If needed, form a working group to establish a relationship with media.
 - Use fact sheets and prepared press releases to reinforce educational efforts on healthy swimming and hand washing basics.
 - Send out frequent updates to keep media correctly informed.
- After the increase in cases or outbreak is under control:
 - Active surveillance continues for two incubation periods (i.e., 4-6 weeks) after case numbers have fallen below the disease action threshold; any increases in disease should be examined to determine if new groups are being affected and/or if response modifications are needed.
 - Assist state in collecting data needed to complete the required reports of waterborne, foodborne or person-to-person disease to the CDC.
 - Contact all impacted community partners:
 - Notify them that the significant increase in cases or outbreak has been controlled,
 - Debrief to identify barriers to control measures and brainstorm how to address,
 - Discuss how well communication worked between partners, and
 - Examine the effectiveness of the distributed health messages to the public.
 - As needed, modify control strategies and revise/distribute health communication messages based on debriefings and the overall evaluation of response.
 - Share lessons learned with local, state, and national partners.
- Important references for outbreak situations:
 - Cryptosporidiosis Outbreak Response & Evaluation Guidelines. http://www.cdc.gov/crypto/pdfs/core_guidelines.pdf
 - Recreational Water Illness Outbreak Response Toolkit: http://www.cdc.gov/healthyswimming/rwi_outbreak.htm
 - Cryptosporidium and Water: A Public Health Handbook (1997). Chapter 5. <http://www.cdc.gov/ncidod/diseases/crypto/crypto.pdf>

C. Public Drinking Water Supply:

- The National Primary Drinking Water Regulations (NPDWR) (141.2) define a waterborne disease outbreak as the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the appropriate local or State agency.
- Upon learning of a waterborne disease outbreak, public water suppliers (PWSs) are required to issue a Tier 1 public notice as soon as practical or within 24 hours via radio, hand delivery, posting or other method specified by the state to reach all persons served by the PWS (not just billing

customers). PWSs must initiate consultation with KDHE within 24 hours for all Tier 1 situations. PWSs may consult either with 1) KDHE District Office Staff; or 2) KDHE Bureau of Water, Public Water Supply Section staff in Topeka.

- When the source of the crypto outbreak has not been identified but the association to the ingestion of water from a PWS has not been ruled out; the following steps are recommended:
 - Response should be determined by a task force that includes representatives from health departments, water regulation, water utilities and public information officers, who are supported, as needed, by advisory groups.
 - Information is needed to evaluate risk; examined in cooperation with local water treatment plant and KDHE Public Water Supply Section. It includes the following:
 - Identify source(s) and types of drinking water (i.e., spring, surface, well)
 - Determine type(s) of treatment.
 - Determine number of PWSs and coverage areas; compare to epidemiologic plot maps.
 - Review water quality data. Graph peak turbidity levels each day before and during the suspected outbreak period; compare to epidemiologic curves.
 - Any recent changes in treatment protocol, temporary malfunctions or treatment failures before cases began.
 - Any chronic filtration problems. (i.e., frequent turbidity spikes in the 0.3 – 1.0 NTU range.)
 - Any recent repairs to the plant or distribution system, vandalism or unauthorized access; examine case distribution with affected sites.
 - Determine whether system pressure recently fell to less than 5 psi.
 - Determine whether there have been any recent changes in the water shed (i.e., flood, drought, land use, sewage overflow) that may have increased chances for crypto contamination.
 - Response is based upon risk:
 - Health risk no longer suspected: event determined not to be associated to drinking water source; no further action.
 - Health risk indeterminate at current time: heighten water monitoring and surveillance activities for an agreed upon period and re-evaluate situation as needed; notifications to immunocompromised persons may be considered.
 - Health risk suspected (but epidemiological association is not strong and PWS is not deficient in treatment): considering releasing notifications based on local assessments of risk; modify notifications as needed based special populations at risk.
 - Health risk strongly suspected: issue Tier I notification with boil water advisories.
 - Suggested notifications to consider when there is not enough evidence

to support a Tier I notification:

- Health risk possible for immunocompromised persons: issue notice directed to immunocompromised that increased level of suspicion exists regarding possible presence of parasites in water.
- Health risk possible for general population: strongly recommend water use precautions for immunocompromised and advise public that they may wish to take precautions.
- Templates for notifications can be found in the following resources:
 - Cryptosporidium and Water. A Public Health Handbook (1997). Chapter 5. <http://www.cdc.gov/ncidod/diseases/crypto/crypto.pdf>
 - KDHE Public Water Supply Survival Guide for the Public Notification Rule. http://www.kdheks.gov/pws/download/public_notification_survival_guide.pdf
- After boil water advisories are rescinded; notices need to go out by proper media outlets to inform public water users how to restart and flush water-using fixtures. This includes private water lines, commercial ice makers, medical and dental equipment, and fixtures used in commercial establishments.

D. Child Care Settings:

Coordinate activities with school nurse and/or administration.

For a single case association in a child-care setting:

- Reinforce the practice of frequent and good hand washing techniques for all children and adults. (Crypto is not killed by alcohol gels or hand sanitizers.)
- Reinforce good diapering practices including keeping diaper changing areas separate from children's play areas and keeping diapering and food-handling areas and responsibilities separated.
- Educate staff and parents:
 - Inform all staff about the symptoms of crypto, how it is spread, and control measures to be followed.
 - Inform parents about the symptoms of crypto, how it is spread, outbreak control policies, and needed changes in hygiene and cleanliness.
 - Notify parents of children who have been in direct contact with a child or adult caregiver with diarrhea; informing them to contact the child's healthcare provider if their child develops diarrhea.
 - Inform parents of children and staff about crypto's potential to cause severe disease in immunocompromised persons. Immunocompromised persons should consult their healthcare provider for further guidance.
- Exclude any child with uncontrolled diarrhea, from the setting until the diarrhea has stopped for 24 hours. This includes children that have not been diagnosed with cryptosporidium.
 - Uncontrolled diarrhea: increased number of stools, increased stool water, and/or decreased form that is not contained by the diaper
- Children with or who had cryptosporidium that have no diarrhea (i.e., asymptomatic) may remain in the facility if extra precautions are taken for 2 weeks following the resolution of their diarrhea.
 - Observe all hand washing and assist when needed.
 - Ensure the child's hands are washed at appropriate times.

- Adults should ensure that they wash their hands after helping a child use the toilet or after diapering a child and before handling food.
- The child should not participate in water-play activities for 2 week period following diarrhea resolution.
- If the child requires diaper changes:
 - Use disposable gloves and paper over the diaper changing surfaces. Change gloves and papers after each diaper change.
 - Ensure clothing is worn over diapers.
 - If possible, those who change the diapers should not prepare or serve food.
- Handle soiled clothing appropriately. Do not rinse out, store in a labeled plastic container or bag before returning home with parents.
- Disinfect surfaces and objects used by the child, including but not limited to bathrooms, diaper-changing areas, food-prep area, tabletops, high chairs and toys with a solution of 3% hydrogen peroxide.
- Establish, implement and enforce polices on water-play that:
 - Exclude children with diarrhea from water-play or swimming activities.
 - Discourage children from getting the water in mouths.
 - For swimming activities, have children shower with soap before entering the water or have staff wash younger children, particularly the rear end.
 - Take children on frequent bathroom breaks or check diapers often.
 - Change diapers in a diaper changing area not by the water.
 - Do not use the fill and drain swimming pools.
- Move adults with diarrhea to jobs that minimize opportunities for spreading disease. (i.e., food or medicine handling; water-play)
- Active case-finding;
 - If the center includes diapered children, interview the operator and inspect attendance records to identify suspect cases among children or staff during the past month.
 - The day care operator should be instructed to call the health department immediately if new cases of diarrhea occur.
 - The facility should be called or visited once each week for 6 weeks after onset of the last case to verify that surveillance and appropriate preventive measures are being carried out.
 - Newly symptomatic children should be managed as outlined above.

For more than one case association to a child-care setting:

- Notify and mobilize operator.
 - Along with recommendations “For a single case association...” there will be a need to intensify control measures.
- A thorough inspection of the facility is needed. Examine situations that may encourage transmission and are not in line with recommendations.

Intensified control measures in a child-care setting:

- When enforcing good diapering practices, recommend the following:
 - Use of disposable gloves and paper over the diaper changing surfaces. Change gloves and papers after each diaper change.

- Clothing should be worn over diapers to reduce the chance of leaks.
- If possible, those who change diapers should not prepare or serve food.
- When educating the staff and parents, inform them about the outbreak.
- Encourage and educate on the need to exclude symptomatic children from child-care settings and that extra precautions are needed with asymptomatic children with crypto.
- Depending on the facilities capabilities, recently returning children can be grouped together in one classroom to minimize the exposure to uninfected.
- Terminate all water play or swimming activities – this includes any play or activities involving pool visits.
- Disinfect surfaces and objects with a 3% concentration of hydrogen peroxide. Soak contaminated surfaces for 20 minutes. This includes:
 - Bathrooms, diaper areas, food prep surfaces daily; including faucets and toilet handles.
 - Toys, tabletops, and high chairs more frequently (at least twice daily).
- Dishwasher-safe toys may be washed in a dishwasher with a dry cycle or a final rinse that exceeds 113°F for 20 minutes or 122°F for 5 minutes or 162°F for 1 minute.
- Cloth toys may be washed and heat-dried on the highest clothes dryer heat setting for 30 minutes.
- Put away toys that cannot be disinfected until the outbreak is over. Dispose of old play dough and use a new, individual container for each child.
- Closing day-care centers is not recommended, because infected children might be placed in other day-care centers.
 - If there is evidence of noncompliance and/or continued transmission within the center – it can be closed to new admissions.
- Continue active case-finding. Instructing all day care operator(s) to inform health department of new cases and calling or visiting those facilities with associated cases weekly for 6 weeks after onset of the last case.
- Refer to the [KDHE Control of Enteric Disease Outbreaks in Childcare Facilities](#) for additional information.

E. Swimming Pools and Aquatic Facilities:

The following are standard activities that are recommended before an increase of crypto is seen in your community; LHD's may perform these during National Recreational Water Illness (RWI) Week, the week before Memorial Day:

- Update e-mail, fax and/or phone list for aquatics operators/managers.
- Begin educational campaigns directed at patrons and staff of facilities on crypto, how it is spread, and how they can protect themselves and others.
 - Resources at: www.cdc.gov/healthyswimming/health_materials.htm and at http://www.kdheks.gov/bch/water_guidelines.htm.
- Ensure that diarrhea-exclusion policies are implemented and enforced at facilities, including:
 - Alerting swim coaches to suspend swimmers with diarrhea.
 - Reassignment of staff with diarrhea to duties that do not require them to enter the water.

- Ensure that a fecal incident response plan is in place at the facility and that all staff is well trained on the appropriate response.
- Encourage the use of supplemental disinfection systems or actions known to inactivate crypto.
- Encourage facilities to sign up for the crypto outbreak alert system at www.nspf.org/CryptoToolkit.html.

For one case associated to an aquatic setting:

- If a case used the facility within the 2 weeks prior to or after symptom onset:
 - Alert the facility operator to the situation.
 - Review the standard activities listed above with the operator.
 - Attempt to identify any potential cases that were not previously reported.
 - Consider the need for further action, including hyper-chlorination, based on the potential risk of transmission and the level of crypto activity in the community.
 - Utilize the Sample Letter for Pool Operators, as needed.

For more than one case association to an aquatic setting:

- Notify and mobilize operator:
 - Review the standard activities (listed above) with operator.
 - Inform of the need to intensify control measures.
- A thorough inspection of the facility is needed, examining situations that encourage transmission and practices that are not in line with recommendations.
 - The CDC’s “Environmental Health Outbreak Investigation Survey: Swimming Pool Venue” should be used to inspect the aquatic facility.
 - Ensure that operators maintain and monitor pH and free residual chlorine levels to prevent transmission of most waterborne pathogens.
 - Consult with the Office of Epidemiology on the need to collect water samples. Instructions on collection will be provided, as needed.
- If a period of possible contamination is identified, examine facility records during that period for events (i.e., swim meets) and other group activities, especially those involving high-risk groups (i.e., child care groups)
- Contact groups, as needed, to make them aware of signs of illness, to stop further transmission of disease and to identify new cases.

Intensified Crypto Control Measures for Aquatic Facilities include:

- Reinforce efforts to educate patrons about crypto, how it is spread in the water, and how they can protect themselves and others
- Reinforce diarrhea-exclusion policies for patrons and staff
 - Post diarrhea-exclusion messages that can be seen and understood.
 - Alert swim coaches to suspend swimmers who are ill with diarrhea.
 - Reassign staff ill with diarrhea to duties not requiring entry into water.
- Hyper-chlorinate the water (when not being used) to levels that will inactivate crypto (contact time of 15,300). See chart below for chlorine levels needed in parts per million (ppm) based on the amount of time the free chlorine levels are maintained (disinfection time).

Chlorine Levels (ppm)	Disinfection Time
10	25.5 hours
20	12.75 hours
40	6.5 hours

- If hyper-chlorination has not occurred since the cases were at the facility, instruct operator to perform hyper-chlorination immediately.
- Recommend hyper-chlorinating weekly as a preventive measure.
- Clean or dispose of materials used in water that may retain water (i.e. porous mats or toys).
- Discuss with operator(s) other possible steps to prevent transmission such as suspending group events, closing “kiddie pools” and/or limiting access to diapered/toddler-aged children.
- Release information by an appropriate media outlet that those at risk for serious illness should consider not swimming during an outbreak.

F. Animals in Public Settings:

- Consult with the Office of Surveillance and Epidemiology.
- Refer to “Animals in Public Places Compendium.”

DATA MANAGEMENT AND REPORTING TO THE KDHE

- A.** Organize, collect and report data with the “General Investigation Form(s)” and “Enteric Supplemental Form”.
- B.** Report data electronically via KS-EDSS or by fax, include:
- At a minimum, data collected during the investigation that helps to confirm or classify a case. (For epi-linked cases, please include the KS-EDSS investigation ID of the related case.)
 - All information collected on the General Investigation and supplemental form(s).

ADDITIONAL INFORMATION / REFERENCES

- A. **Treatment / Differential Diagnosis:** American Academy of Pediatrics. 2006 Red Book: Report of the Committee on Infectious Disease, 27th Edition. Illinois, Academy of Pediatrics, 2006.
- B. **Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 18th Edition. Washington, DC, American Public Health Association, 2004.
- C. **Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: http://www.cdc.gov/ncphi/diss/nndss/casedef/case_definitions.htm
- D. **Kansas Regulations/Statutes Related to Infectious Disease:** <http://www.kdheks.gov/epi/regulations.htm>
- E. **Kansas Primary Drinking Water Regulations:** http://www.kdheks.gov/pws/regs/drinking_water_regs.pdf
- F. **KDHE Public Water Supply Survival Guide for the Public Notification Rule.** http://www.kdheks.gov/pws/download/public_notification_survival_guide.pdf
- G. **KDHE Foodborne Illness and Outbreak Investigation Manual:** Available at: http://www.kdheks.gov/epi/download/kansas_foodborne_illness_manual.pdf
- H. **KDHE Control of Enteric Disease Outbreaks in Childcare Facilities:** [http://www.kdheks.gov/epi/download/Enteric Disease in Day care centersver 4.pdf](http://www.kdheks.gov/epi/download/Enteric_Disease_in_Day_care_centersver4.pdf)
- I. **KDHE Recreational Water Toolkit:** http://www.kdheks.gov/bch/water_guidelines.htm
- J. **Animals in Public Places Compendium:** http://www.kdheks.gov/epi/human_animal_health.htm
- K. **Cryptosporidiosis Outbreak Response & Evaluation (CORE) Guidelines (CDC):** http://www.cdc.gov/crypto/pdfs/core_guidelines.pdf
- L. **Cryptosporidium and Water.** A Public Health Handbook (1997) Chapter 5. <http://www.cdc.gov/ncidod/diseases/crypto/crypto.pdf>
- M. **Environmental Health Outbreak Investigation Survey: Swimming Pool Venue (CDC):** [http://www.cdc.gov/healthyswimming/pdf/Environmental Health Investigation form 07 2006.pdf](http://www.cdc.gov/healthyswimming/pdf/Environmental_Health_Investigation_form_07_2006.pdf)
- N. **Fecal Incident Response Recommendations for Pool Staff (Revised August 2008):** [http://www.cdc.gov/healthyswimming/pdf/Fecal Incident Response Recommendations for Pool Staff.pdf](http://www.cdc.gov/healthyswimming/pdf/Fecal_Incident_Response_Recommendations_for_Pool_Staff.pdf)
- O. **Recreational Water Illness Outbreak Response Toolkit (CDC):** http://www.cdc.gov/healthyswimming/rwi_outbreak.htm
- P. **Additional Information (CDC):** <http://www.cdc.gov/health/default.htm>

Kansas Disease Investigation Guidelines

General Investigation Form

Investigation Information		
Case Type: <input type="checkbox"/> Human Case <input type="checkbox"/> Non-human Case	Disease Name: _____	
Classification: <input type="checkbox"/> Suspect <input type="checkbox"/> Probable <input type="checkbox"/> Confirmed	KS-EDSS Investigation ID: _____	
Outbreak: <input type="checkbox"/> Yes <input type="checkbox"/> No	Outbreak Name: _____	Outbreak #: _____
Onset Date: _____	Diagnosis Date: _____	Report Date: _____
Assigned to (Investigator): _____	Patient Died: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	
Patient Information		
Name Type: <input type="checkbox"/> Default/Common <input type="checkbox"/> Legal <input type="checkbox"/> Maiden <input type="checkbox"/> Nickname		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Sex: <input type="checkbox"/> Failure to Report <input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Other <input type="checkbox"/> Transexual <input type="checkbox"/> Unknown		
Race: <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Unknown		
Hispanic / Latino Ethnicity: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Date of Birth: _____	Age: _____	Age Unit: <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months <input type="checkbox"/> Years
Parent Information (if under 18)		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Work / Occupation or School / Grade		
Worksites / School: _____		
Occupations / Grade: _____		
Travel History		
1st	Destination: _____	Depart Date: _____ Return Date: _____
2nd	Destination: _____	Depart Date: _____ Return Date: _____
3rd	Destination: _____	Depart Date: _____ Return Date: _____
4th	Destination: _____	Depart Date: _____ Return Date: _____

Supplemental Laboratory Report Form

Lab Reports

Laboratory Name: _____

Lab Report Date: _____

Ordering Provider Name: _____

Phone: _____

Facility: _____

Specimen Accession Number: _____

Specimen Collection Date: _____

Organism Name: _____

Organism Species: _____

Organism Serogroup: _____

Organism Serotype: _____

PFGE Results

Pattern 1 KS: _____

Other State: _____

CDC: _____

Pattern 2 KS: _____

Other State: _____

CDC: _____

Pattern 3 KS: _____

Other State: _____

CDC: _____

Additional Results Information

Reported Test Name:

Coded Result:

Text Result:

Numeric Result:

Comments:

Supplemental Contact Form

Contacts

Last: _____ **First:** _____ **Middle:** _____

Street: _____ **City/State:** _____ **Zip:** _____

Evening Phone #: _____ **Daytime Phone #:** _____ **E-mail:** _____

Sex: Failure to Report Female Male Other Transexual Unknown

Race: American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander White Unknown

Hispanic / Latino Ethnicity: Yes No

Date of Birth: _____ **Age:** _____ **Age Unit:** Days Weeks Months Years

Worksites / School: _____

Occupations / Grade: _____

Exposure Information

Contact Type: Household Sexual Other: _____ **Partner / Cluster Code:** _____

Date of First Exposure: _____ **Date of Last Exposure:** _____ **Frequency:** _____

Nature of Exposure: _____ **Comments:** _____

Testing and Treatment Information

Clinic Code: _____ **Examination Date:** _____

Examination Test: _____ **Examination Result:** _____

Prophylaxis/empiric treatment date: _____ **Drug / Dosage:** _____

Provider (Name / Facility): _____

Disposition and Diagnosis Information

Initiation Date: _____ **Disposition Date:** _____ **Disposition:** _____

Diagnosis: _____ **Referral Type:** Patient Provider **Post-test Counseled :** Yes No

Currently Assigned To: _____ **Follow-up Date:** _____

Risk Factors

Pregnant: Yes No **If Yes, # of Weeks:** _____

Risk factors for complications in contact: None Pregnant Woman HIV Seropositive Unimmunized Index case is a super-spreader

Child younger than 5 Age > 65 Otherwise immunosuppressed (s/p transplant, high dose steroids, etc)

Enteric Disease Supplemental Form

Kansas Department of Health and Environment

Epidemiologic Case History

Condition	
<i>Calicivirus/Norwalk-like virus (norovirus)</i>	<i>Campylobacter Infection (Campylobacter spp.)</i>
<i>Cryptosporidiosis (Cryptosporidium parvum)</i>	<i>Enterohemorrhagic Escherichia coli (EHEC)</i>
<i>Enterohemorrhagic Escherichia coli O157:H7</i>	<i>Enterohemorrhagic Escherichia coli shiga toxin positive (not serogrouped)</i>
<i>Enterohemorrhagic Escherichia coli shiga toxin positive (serogroup non-O157)</i>	<i>Giardiasis (Giardia lamblia)</i>
<i>Salmonellosis (Salmonella spp.)</i>	<i>Shigellosis (Shigella spp.)</i>
<i>Cyclosporiasis (Cyclospora cayetanensis)</i>	<i>Hepatitis A</i>
<i>Listeriosis (Listeria monocytogenes)</i>	

* indicates required fields

Case Type*		Classification*					
<i>Human Case</i>	<i>Non Human Case</i>	<i>Confirmed</i>	<i>Not a Case</i>	<i>Probable</i>	<i>Suspect</i>	<i>Deleted</i>	<i>Unknown</i>

Supplemental Form Status				
<i>Not Done</i>	<i>Form Complete</i>	<i>Form in Progress</i>	<i>Form Approved</i>	<i>Form Sent to CDC</i>

Report Date*
mm/dd/yyyy

Date Investigation Started
mm/dd/yyyy

Patient Demographic Information

* indicates required fields

Last Name*	First Name*	Middle Name	Name Type*	Age
-------------------	--------------------	--------------------	-------------------	------------

Age Unit <i>Days Weeks Unknown Months Years</i>	Date of Birth <small>mm/dd/yyyy</small>
---	---

Race*
(Check all that apply)

American Indian or Alaska Native Asian Black or African American
Native Hawaiian or Other Pacific Islander White Unknown

Ethnicity*
Hispanic or Latino Not Hispanic or Latino Unknown

Sex*
Failure to Report Female Male Other Transexual Unknown

Street Address

City	County	State	Zip
-------------	---------------	--------------	------------

Evening Phone <small>###-###-####</small>	Daytime Phone <small>###-###-####</small>
---	---

Occupation

High Risk Potential:
(Check all that apply)

<i>Contact to a confirmed case _____</i>	<i>Contact to a suspected case _____</i>
<i>Daycare attendee _____</i>	<i>Food handler _____</i>
<i>Direct patient care worker _____</i>	<i>Institutional resident or staff _____</i>
<i>Daycare worker _____</i>	<i>Animal handler _____</i>
<i>Other _____</i>	

If enrolled in day care, please complete the information below.

Name of Facility	Evening Phone <small>###-###-####</small>
-------------------------	---

Street Address	City
-----------------------	-------------

County	State	Zip
---------------	--------------	------------

Person Providing Report

Name of Reporting Facility*

Clinical and Laboratory Data

Individual diagnosed with <i>Hemolytic Uremic Syndrome (HUS) Thrombotic Thrombocytopenic Purpura (TTP)</i>	Was a stool specimen collected? <i>Yes No</i>
---	--

Diarrhea? <i>Yes No Unknown</i>	Number of Stools <i>0 - 2 3 - 10 11 and above</i>	Blood in Stool? <i>Yes No Unknown</i>	Vomiting? <i>Yes No Unknown</i>
---	---	---	---

Nausea? <i>Yes No Unknown</i>	Abdominal Cramps? <i>Yes No Unknown</i>	Muscle Ache? <i>Yes No Unknown</i>	Other Symptoms? <i>other _____</i>
---	---	--	--

What was the first Symptom	Date of Onset <small>mm/dd/yyyy</small>	Time of Onset
-----------------------------------	---	----------------------

Clinical and Laboratory Data cont.

Fever? <i>Yes No Unknown</i>	If Yes, specify highest temperature:
--	---

Physician Information	
Was a physician consulted for this illness? <i>Yes (please complete the information below) No</i>	Name of physician:

Evening Phone ###-###-####	Street Address		
City	County	State	Zip

Antibiotic Information			
Was case treated with antibiotics anytime in the 14 days prior to illness? <i>Yes No Unknown</i>	Type of treatment/antibiotic	Reason for taking	Date started mm/dd/yyyy

Date completed mm/dd/yyyy	Was case treated with antibiotics for this illness? <i>Yes No Unknown</i>	Type of treatment:	Date Started: mm/dd/yyyy
-------------------------------------	---	---------------------------	------------------------------------

Date completed: mm/dd/yyyy	Was organism resistant to antibiotics? <i>Yes No Unknown</i>	If yes, specify resistance pattern:
--------------------------------------	--	--

Is the patient on any medication or receiving any treatment which may suppress their immune system (i.e. Corticosteroids or Cancer Chemotherapy)? <i>Yes No Unknown</i>	If yes please specify medication or treatment:
---	---

Did patient recover? <i>Yes No Unknown</i>	Recover Date mm/dd/yyyy	Recover Time
--	-----------------------------------	---------------------

Exposure/Transmission

Did anyone else (in your family ..) recently have similar symptoms? <i>Yes (please complete below) No Unknown</i>

Name	Age	Sex	Relationship to Case	Occupation	Symptoms	Date of Onset
						mm/dd/yyyy

Any restaurant, commercial food establishments, or group gatherings visited within the 7 days prior to onset of illness? <i>Yes (please complete below) No Unknown</i>
--

Name of Establishment	City, County, State	Foods eaten	Date of Exposure
			mm/dd/yyyy

Travel History

Did the patient Travel prior to the onset of illness?

Yes No Unknown

If yes, please complete below:

Where:	Departure Date: <small>mm/dd/yyyy</small>	Return Date: <small>mm/dd/yyyy</small>
Where:	Departure Date: <small>mm/dd/yyyy</small>	Return Date: <small>mm/dd/yyyy</small>

Water Exposure

Possible water sources:

(Check all that apply)

Municipal Water System _____ *Bottled Water* _____ *Private Well* _____
Rural Water System _____ *Other (specify):* _____

Did patient drink water from other than a treated municipal system (i.e., stream, well)?

Yes No Unknown

Other Possible Exposure Information

Was there contact with pets or animals within 7 days prior to onset?

Yes No Unknown

If yes, please indicate below:

(Check all that apply)

Caged Birds Cats Cattle Chickens Dogs Ducks
Frogs Goats Guinea Pigs Hamsters Horses Lizards
Mice Parakeets Pigeons Pigs Poultry Rabbits
Rats Sheep Snakes Turkeys Turtles Other _____

Other Exposure Information

Other Birds?	If yes, please specify	Other Reptiles?	If yes, please specify
<i>Yes No Unknown</i>		<i>Yes No Unknown</i>	

Other Animals?

Yes No Unknown

If yes, please specify

Were any of these animals ill near the time of onset

Yes No Unknown

If yes, please describe:

Where were the animals located?

(Check all that apply)

Home Farm School Pet Store Zoo Petting Zoo Other _____

Other Possible Exposure Information cont.

Within 7 days prior to onset of illness, did the patient participate in:

Activity	Participation	Date <small>mm/dd/yyyy</small>	Location
Outdoor Activities			
Swimming			
Chlorinated Pool			
Wading Pool			
River/Lake/Pond			

Food History

Did case eat any of the following within 7 days prior to the onset of illness?

Food Product	Consumed	City, County, State	Variety or Brand(s)	Supplier	Supplier City
1. Chicken					
2. Hamburger					
3. Sausage					
4. Hot Dogs					
5. Lunch Meat					
6. Eggs					
7. Milk raw					
8. Milk past.					
8. Fresh juice					
10. Fresh berries					
11. Fresh melon					
12. Other fresh fruit					
13. Lettuce					
14. Alfalfa Sprouts					
Other fresh vegetables		Other Food Item 1		Other Food Item 2	

At what store(s) do you regularly shop for groceries?

MEMORANDUM

Date:

To: ___ County Daycare Providers

From:

Re: Outbreak of Cryptosporidium

This is to inform you that there have been ___ positive cases of cryptosporidium in ___ County. Cryptosporidium is a parasite that causes diarrhea. ___ of the ___ cases are in children under the age of 18. Enclosed is a fact sheet about cryptosporidium and a flyer for distribution to parents.

Because even an adequately chlorinated pool can be contaminated with cryptosporidium allowing the parasite to be transmitted to others, it is important to keep any of your children out of swimming/wading pools when they have any evidence of loose stools. They should continue to stay out of swimming/wading pools until they have had no loose stools for 2 weeks.

According to the Guidelines for Exclusion, children with uncontrolled diarrhea, that is, increased number of stools, increased stool water, and/or decreased form that is not contained by the diaper should be excluded from care until diarrhea stops.

If you are seeing an increased incidence of diarrhea symptoms among the children in your care, please contact the Health Department at _____ and ask for a Communicable Disease nurse.

Control Measures for the Child Care Setting During an Outbreak of Cryptosporidiosis

Cryptosporidiosis is a gastrointestinal illness, caused by the parasite, *Cryptosporidium*. This disease is a common cause of diarrhea in children, especially in child care settings. The hallmark symptom of cryptosporidiosis is watery diarrhea, which might be accompanied by stomach ache, nausea and vomiting, fever, and a general sick feeling. Healthy people who contract cryptosporidiosis almost always get better without any treatment but treatment is available by prescription. An unusual feature of cryptosporidiosis is that some people seem to get better only to have the diarrhea come back in a few days. Symptoms can come and go for up to 30 days, but usually subside in 1 to 2 weeks. However, cryptosporidiosis can cause severe illness in persons with compromised immune systems, such as those with HIV infection or those taking drugs that suppress the immune system.

Because *Cryptosporidium* is in feces, anything that gets contaminated by feces can potentially spread the parasite. As a result, the parasite can be spread directly from person to person, through contact with contaminated objects (e.g., toys), or swallowing contaminated food or water (drinking and recreational). Cryptosporidiosis outbreaks in child care settings are most common during late summer/early fall (August/September) but might occur at any time. The spread of cryptosporidiosis is highest among young children who are not toilet trained and their caregivers (those who change diapers).

Cryptosporidium is resistant to chlorine disinfection so it is tougher to kill than most disease-causing organisms. The usual disinfectants, including most commonly used bleach solutions, have little effect on the *Cryptosporidium* parasite. An application of either hydrogen peroxide or ammonia seems to work best. Hydrogen peroxide is probably the best choice in the child care setting, because ammonia has a strong odor and produces hazardous gas when mixed with bleach or other chlorinated solutions.

With an outbreak of cryptosporidiosis in the community or in the child-care setting:

- Educate staff and parents
 - Inform all staff about ongoing outbreak and control measures to be followed.
 - Inform parents about ongoing outbreak, outbreak control policies, and needed changes in hygiene and cleanliness.
 - Notify parents of children who have been in direct contact with a child or an adult caregiver with diarrhea. Parents should contact the child's healthcare provider if their child develops diarrhea.
 - Inform parents of children and staff about *Cryptosporidium*'s potential to cause severe disease in immunocompromised persons. Immunocompromised persons should consult their healthcare provider for further guidance.
- Exclude symptomatic children and restrict staff.
 - Exclude children with uncontrolled diarrhea until diarrhea has stopped for 24 hours.
 - Isolate an ill child from their peers until a parent arrives for pick-up.
 - Move adults with diarrhea to jobs that minimize opportunities for spreading infection (for example, administrative work instead of food preparation).
- Children infected with *Cryptosporidium*
 - Children infected with *Cryptosporidium* but without diarrhea may be allowed to return.
 - Recently returning children can be grouped together in one classroom to minimize exposure to uninfected children.
- Terminate all water play or swimming activities (water tables, inflatable or rigid temporary swimming pools, public pool visits). This water can become contaminated and facilitate the spread of infections.

- Practice routine good hygiene that is especially important during outbreaks.
 - Enforce good hand washing technique for all children and adults.
 - **Note:** *Cryptosporidium* is not killed by alcohol gels and hand sanitizers so these materials are of little use in controlling an outbreak.
 - Use disposable towels.
 - Good hand washing means:
 - Wet your hands with clean running water and apply soap.
 - Rub hands together to a lather and scrub all surfaces.
 - Continue rubbing hands for 20 seconds (imagine singing “Happy Birthday” twice).
 - Rinse hands well with water.
 - Dry hands with paper towels or an air dryer. If possible, use a paper towel to turn off the faucet.
 - For children:
 - Observe hand washing or assist when needed. Wash children’s hands when they arrive at the child care facility, after they use the toilet, after having their diapers changed, and before eating snacks or meals.
 - For adults:
 - Wash hands after using the toilet, after helping a child use the toilet, after diapering a child, and before preparing or serving food. (**Note:** Where staffing permits, people who change diapers should not prepare or serve food).
 - Improve diaper changing practice.
 - Separate diaper changing areas from children’s play and food preparation areas.
 - Use disposable gloves and change them after each diaper change.
 - Use disposable paper over the diaper changing surfaces and change it after each diaper change.
 - Ensure children wear clothing over their diapers to reduce the opportunity for leakage.
 - Wash hands: both yours and the child’s
 - Handle soiled clothing appropriately.
 - Do not rinse out.
 - Store in plastic bag or container and return home with parents.
 - Instruct parents to wash hands carefully after handling soiled items.
- Disinfect surfaces and objects
 - Disinfect bathrooms and food preparation surfaces daily.
 - Disinfect toys, tabletops, and high chairs more frequently than usual (at least twice daily).
 - Instead of a bleach solution, use a 3% (99% kill rate) or, if available, 6% (99.9% kill rate) concentration of hydrogen peroxide to soak contaminated surfaces for 20 minutes.
 - Ammonia can also be used (5% solution for 18 hours) but it has a strong odor and, if accidentally mixed with bleach or other chlorine-containing solutions, produces hazardous chlorine gas.
 - Dishwasher-safe toys can be disinfected in a commercial dishwasher that has a dry cycle or a final rinse that exceeds 113°F for 20 minutes or 122°F for 5 minutes or 162°F for 1 minute. Cloth toys may be washed and heat-dried on the highest clothes dryer heat setting for 30 minutes.
 - Dispose of old playdough, and use a new, individual container for each child.
 - Put away toys that cannot be disinfected until the outbreak is over.
 - These are not routine measures, but they are necessary during an cryptosporidiosis outbreak
- Notify the state or local health department about an excessive level of diarrhea or any *Cryptosporidium* infections, a reportable disease, in the daycare.

Sample Letter to Daycare Parents - Confirmed Case

To Parents of children at _____ day care:

Dear Parent/Guardian:

A child who attends the ____ day care has been diagnosed with cryptosporidiosis, a disease caused by the protozoan *Cryptosporidium parvum*. The symptoms of cryptosporidiosis include diarrhea, abdominal cramps, fever, nausea and vomiting. *Cryptosporidium* is spread through contact with the stool of infected persons or animals, consumption of contaminated food or water, and by person-to-person or animal-to-person contact.

Children or any member of your household who develop any of these symptoms should contact their physician. If your physician decides to do testing, specimen kits are available through the _____ Health Department or you may do testing through the physician's laboratory. Children should be excluded from daycare until after their symptoms have completely resolved for 24 hours.

An information sheet of cryptosporidiosis is enclosed. If you have questions, please contact your physician or _____ Health Department at _____.

Sincerely,

Public Health Notice

Attention Parents

The _____ Health Department has determined an outbreak of Cryptosporidium in the community. In order to stop the outbreak from spreading further, it is important that we all work together.

- Cryptosporidium is a parasite that causes diarrhea.
- An individual becomes infected with the Cryptosporidium parasite by accidentally swallowing feces-contaminated food or water or having contact with other feces-contaminated objects.
- Cryptosporidium is easily spread person-to-person.
- In daycare settings, diapering, sharing toys, hand-to-mouth contact and incomplete hand washing can allow transmission of the germ between children.
- A common occurrence with Cryptosporidium is for symptoms to return after a person has started to recover.
- Cryptosporidium can still be spread for two weeks after symptoms have subsided.

How to protect yourself, your family, your daycare provider, and other children in care:

- Do not bring your child to daycare if he/she has diarrhea.
- Consult your health care provider if your child is ill and you need clinical advice for managing illness.
- Contact the Health Department if your child develops symptoms.
- Have your child tested for Cryptosporidium if indicated.
- Inform your daycare provider if your child has symptoms or tests positive for Cryptosporidium.
- Practice good hygiene. Wash your hands with soap and water after using the toilet, after handling soiled clothing or changing diapers and before eating or preparing food.
-

For more information call:

_____ Health Department at _____



IF YOU HAVE DIAPERED CHILDREN IN YOUR CHILD CARE PROGRAM:

Always use this method for changing diapers. This is the best way to stop diseases that spread through the intestinal tract.

1. CHECK to make sure the supplies you need are ready.
 - fresh diaper or clothes;
 - freshly dampened paper towels or pre-moistened towelettes; and
 - plastic bag for soiled diaper
2. PLACE roll paper or a disposable towel on the part of the diapering table where the child's bottom will be.
3. HOLD the child AWAY from your body when you pick him up. When you know a child has soiled his diaper use only your hands to carry him. LAY the child on the paper or towel.
4. REMOVE soiled diaper or clothes.
 - Put disposable diapers in a plastic bag or a plastic lined receptacle.
 - Put soiled clothes in a plastic bag for parents to take home with the child at the end of the day.

Tell the parents that washing or rinsing clothes soiled with stool at the day care center might cause disease germs to spread.
5. CLEAN the child's bottom with:
 - a pre-moistened disposable towelette, or
 - a damp paper towel.

Put the used towelette or paper towel in the plastic bag or plastic-lined receptacle.
6. REMOVE the paper or towel from beneath the child and dispose of it in the plastic bag or plastic-lined receptacle.
7. WIPE your hands with a pre-moistened disposable towelette or a damp paper towel and dispose of it in the plastic bag or plastic-lined receptacle. If you are wearing a glove, dispose of it now.
8. DIAPER or dress the child.

Now you can hold him close to you.
9. WASH the CHILD'S hands:

IMPORTANT: If you must walk from the diapering table to the sink

 - be sure the child cannot fall, or
 - carry him with you.
10. RETURN the child to his CRIB.
11. CLEAN and DISINFECT
 - diapering area;
 - equipment or supplies touched; and
 - soiled crib or cot, if necessary.
12. WASH your hands.

MEMORANDUM

Date:

TO: _____ County Physicians

FROM:

RE: Cryptosporidium in _____ County

To date there have been ## laboratory-confirmed cases of cryptosporidiosis in _____ County. Of these cases ## are children age 18 and younger. ## are adults.

It is important that we all work together to stop the outbreak from spreading further. Please help us educate patients not to swim while having diarrhea and for 2 weeks after symptoms subside. Children should not attend daycare while having diarrhea, and for 24 hours after diarrhea stops. Staff of restaurant, daycare, and healthcare facilities should not work if having diarrheal illness, and for 24 hours after diarrhea stops.

Based on consultation with the Centers for Disease Control and Prevention, Division on Parasitic Diseases, we recommend using hydrogen peroxide (3%), instead of chlorine bleach, to disinfect diapering areas, faucet handles, toilet handles, table tops, high chairs, and toys that cannot go into the dishwasher. This new method of disinfection should be implemented immediately.

Daycare providers in _____ County are being provided these recommendations and are being instructed to keep the hydrogen peroxide in the brown bottle that it comes in. Exposure to light will cause hydrogen peroxide to lose its effectiveness. A spray pump may be attached to the bottle. If a pump is not available to fit the original bottle, the peroxide should be poured directly from the bottle onto the surface. The hydrogen peroxide should not be shaken, according to instructions on the bottle.

Rapid loss of fluids because of diarrhea can be managed by fluid and electrolyte replacement. Infection in healthy, immunocompetent persons is self-limited. Nitazoxanide has provided some encouraging results in the management of cryptosporidial diarrhea in immunocompetent patients. Immunocompromised persons and those in poor health are at highest risk for severe illness. For persons with AIDS, anti-retroviral therapy, which improves immune status, will also reduce oocyst excretion and decrease diarrhea associated with cryptosporidiosis.

When symptoms are persistent or do not respond to supportive therapy, three days of treatment with nitazoxanide may be useful for treating cryptosporidial diarrhea in **immunocompetent** patients. The drug is now licensed by FDA for treatment in **immunocompetent** children.

DOSAGE AND ADMINISTRATION:

Age 12-47 months: 5 ml (100 mg nitazoxanide) every 12 hours for 3 days.

Age 4-11 years: 10 ml (200 mg nitazoxanide) every 12 hours for 3 days.

Age 12 years and older: 25ml nitazoxanide every 12 hours for 3 days.

Thank you very much for your cooperation and assistance in this public health matter.

MEMORANDUM

Date:

To: ___ Pool Operator

From:

Re: Outbreak of Cryptosporidium / Cryptosporidium Case Associated to Facility

This is to inform you that there have been ___ positive cases of cryptosporidium in ___ County. Cryptosporidium is a parasite that causes diarrhea. ___ of the ___ cases in your county have occurred in children under the age of 18. Enclosed is a fact sheet about cryptosporidium and recommendations for response to a fecal accident.

A person with probable / confirmed cryptosporidium has reported swimming at your facility in the two weeks prior to onset of symptoms. As a result, your facility may be at risk for contamination with cryptosporidium. In order to prevent possible transmission of cryptosporida and protect patrons from possible infection, you should hyper-chlorinate your facility. Persons should not enter the water until decontamination (hyper-chlorination) procedures are completed.

Hyper-chlorination consists of sustaining a specific concentration of chlorine for the required period of time that has been proven to destroy infectious organisms. Hyper-chlorination is measured by contact time (CT). Contact time is calculated by the concentration of free residual chlorine in parts per million (PPM) multiplied by the time, in minutes, for which that concentration is sustained. The minimum CT value for cryptosporidium inactivation is 15,300. The following chlorine levels and disinfection times will achieve the necessary CT value of 15,300.

Table: Cryptosporidium Inactivation Chlorine Levels and Time

Chlorine Levels (ppm)	Disinfection Time
10	25.5 hours
20	12.75 hours
40	6.5 hours

Guidelines for Pool Operators

Response to Cryptosporidium Outbreak

- Have a written fecal accident response policy.
- Keep records of all fecal accidents, chlorine and pH level measurements, and any major equipment repairs or changes.

You may have little control over a toddler's soiling your kiddie pool, but you do have control over how you document and respond to this occurrence. This may help you respond more efficiently to any problems.

- Help parents get their children to the bathroom by scheduling an hourly break for swimming pool disinfectant testing and bathroom use. Let patrons know that this break provides optimal timing for bathroom use.

If parents ask, tell them this policy not only reduces fecal contamination but also should reduce the amount of urine in the pool that uses up disinfectant that could be killing germs.

- To prevent transmission of germs, ensure that the bathrooms are clean, that they are stocked with toilet paper, and that they have ample soap for hand washing.

- Report all fecal accidents to _____ County Health Department:

Call () 8:30 a.m. – 5:00 p.m., Monday – Friday

Call () after hours and on weekends

- If a fecal accident occurs, close the pool immediately and disinfect the water following the CDC guidelines for fecal accidents.

Until we can feel comfortable that the prevalence of infection in the community and disease transmission have decreased below levels of concern, this is the most prudent approach.

Public Health Notice Regarding Cryptosporidium

- Cryptosporidium is a parasite that causes diarrhea.
- An individual becomes infected with the Cryptosporidium parasite by accidentally swallowing feces-contaminated food or water or having contact with other feces-contaminated objects.
- Cryptosporidium is easily spread person-to-person.
- A common occurrence with Cryptosporidium is for symptoms to return after a person has started to recover.
- Cryptosporidium can still be spread for two weeks after symptoms have subsided.
- Once introduced into a community, Cryptosporidium can be spread for months if the public is not vigilant about the key hygiene measures needed to stop the spread of the germ.

How to protect yourself, your family, and others:

- Wash your hands regularly with soap and water, especially after using the bathroom and before preparing or eating food.
- Wash your hands after changing diapers, even if wearing gloves.
- Take extra care to wash hands and clean surfaces if caring for someone with diarrhea, especially diaper-or toddler aged children.
- Do not bring your child to day care or school if he/she has diarrhea.
- Do not swim when ill with diarrhea or for two weeks after the end of diarrhea.
- Avoid close personal contact with persons with weakened immune systems if ill with diarrhea. If persons with weakened immune systems become infected, Cryptosporidium can be a life-threatening disease.
- Consult your health care provider if ill and need clinical advice for managing illness.
- Contact the Health Department if you or your child develop diarrhea.

For more information call:

_____ Health Department at _____

Public Health Fact Sheet

Cryptosporidiosis

What is cryptosporidiosis?

Cryptosporidiosis is a diarrheal disease caused by microscopic parasites, *Cryptosporidium*. Both the disease and the parasite are commonly known as "Crypto." The parasite is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it very resistant to chlorine-based disinfectants. During the past 2 decades, Crypto has become recognized as one of the most common causes of waterborne disease (recreational water and drinking water) in humans in the United States.

How is cryptosporidiosis spread?

An infected person or animal sheds Crypto parasites in the stool. Millions of Crypto germs can be released in a bowel movement from an infected human or animal. Shedding of Crypto in the stool begins when the symptoms begin and can last for weeks after the symptoms stop. You can become infected after accidentally swallowing the parasite. *Cryptosporidium* may be found in soil, food, water, or surfaces that have been contaminated with the feces from infected humans or animals. Crypto is not spread by contact with blood. Crypto can be spread:

- By putting something in your mouth or accidentally swallowing something that has come into contact with stool of a person or animal infected with Crypto.
Note: You may not be able to tell by looking whether something has been in contact with stool.
- By swallowing recreational water contaminated with Crypto. Recreational water is water in swimming pools, hot tubs, Jacuzzis, fountains, lakes, rivers, springs, ponds, or streams. Recreational water can be contaminated with sewage or feces from humans or animals.
- By swallowing water or beverages contaminated with stool from infected humans or animals.
- By eating uncooked food contaminated with Crypto.
- By touching your mouth with contaminated hands. Hands can become contaminated through a variety of activities, such as touching surfaces (e.g., toys, bathroom fixtures, changing tables, diaper pails) that have been contaminated by stool from an infected person, changing diapers, caring for an infected person, and handling an infected cow or calf.
- By exposure to human feces through sexual contact.

This fact sheet is for information only and is not intended for self-diagnosis or as a substitute for consultation. If you have any questions about the disease described above or think that you may have an infection, consult with your healthcare provider. This fact sheet is based on the Centers for Disease Control and Prevention's Health and Safety topic fact sheets.

What are the symptoms of crypto?

The most common symptom of cryptosporidiosis is watery diarrhea. Other symptoms include: stomach cramps or pain, dehydration, nausea, vomiting, fever or weight loss.

Some people with Crypto will have no symptoms at all.

How long after infection do symptoms appear?

Symptoms of cryptosporidiosis generally begin 2 to 10 days (average 7 days) after becoming infected with the parasite.

How long will symptoms last?

In persons with healthy immune systems, symptoms usually last about 1 to 2 weeks. The symptoms may go in cycles in which you may seem to get better for a few days, then feel worse again before the illness ends.

Who is most at risk for cryptosporidiosis?

People who are most likely to become infected with *Cryptosporidium* include:

- Children who attend day care centers, including diaper-aged children
- Child care workers
- Parents of infected children
- People who take care of other people with cryptosporidiosis
- International travelers
- Backpackers, hikers, and campers who drink unfiltered, untreated water
- People who drink from untreated shallow, unprotected wells.
- People, including swimmers, who swallow water from contaminated sources
- People who handle infected cattle
- People exposed to human feces through sexual contact

Who is most at risk for getting seriously ill with cryptosporidiosis?

Although Crypto can infect all people, some groups are likely to develop more serious illness.

- Young children and pregnant women may be more susceptible to the dehydration resulting from diarrhea and should drink plenty of fluids while ill.
- If you have a severely weakened immune system, you are at risk for more serious disease. Your symptoms may be more severe and could lead to serious or life-threatening illness. Examples of persons with weakened immune systems include those with AIDS; cancer and transplant patients who are taking certain immunosuppressive drugs; and those with inherited diseases that affect the immune system.

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How is the cryptosporidiosis diagnosed?

Cryptosporidiosis is diagnosed by identifying the parasite in a stool sample.

What is the treatment for cryptosporidiosis?

Most people who have healthy immune systems will recover without treatment. Diarrhea can be managed by drinking plenty of fluids to prevent dehydration. Nitazoxanide has been FDA-approved for treatment of diarrhea caused by *Cryptosporidium* in people with healthy immune systems and is available by prescription. Consult with your health care provider for more information.

Can cryptosporidiosis be prevented?

The following steps can be taken to minimize your chance of getting and spreading infection:

- Always use good hand washing practices after using the toilet, changing diapers and before handling food.
- Wash your hands after contact with wild and domestic animals.
- Avoid drinking raw milk, other unpasteurized dairy products or apple cider made from unwashed apples.
- Do not drink directly from streams, brooks or lakes when hiking or camping.
- Avoid sexual practices that may involve direct contact with feces (stool).
- Consider the use of a home water filtering system with a very fine filter (with an absolute pore size of 1 micron or smaller). Such filters include: reverse osmosis filters; filters labeled as “absolute” 1 micron filters; and those labeled as meeting National Sanitation Foundation (NSF) standard # 53 for cyst removal.
- Avoid swallowing water when swimming. Lakes, streams and swimming pools may be contaminated with *cryptosporidium* and chlorination is not effective in eliminating the parasite.

Good hand washing means to:

1. Wet your hands with clean running water and apply soap. Use warm water if it is available.
2. Rub hands together to make lather and scrub all surfaces.
3. Continue rubbing hands for 20 seconds. Need a timer? Imagine singing “Happy Birthday” twice through to a friend!
4. Rinse hands using a disposable paper towel or air dryer.
5. Use your disposable paper towel, if possible, to turn off the faucet.

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I have been diagnosed with Cryptosporidium, should I worry about spreading the infection to others?

Yes, Cryptosporidium can be very contagious. Infected individuals should follow these guidelines to avoid spreading the disease to others:

1. Wash your hands frequently with soap and water, especially after using the toilet, after changing diapers, and before eating or preparing food.
2. Do not swim in recreational water (pools, hot tubs, lakes, rivers, oceans, etc.) if you have cryptosporidiosis and for at least 2 weeks after the diarrhea stops. You can pass Crypto in your stool and contaminate water for several weeks after your symptoms have ended. You do not even need to have a fecal accident in the water. Immersion in the water may be enough for contamination to occur. Water contaminated in this manner has resulted in outbreaks of cryptosporidiosis among recreational water users. Even chlorinated recreational water venue (e.g., swimming pool, water park, splash pad, spray park) should be avoided because Cryptosporidium is chlorine-resistant and can live for days in chlorine-treated water.
3. Avoid sexual practices that might result in oral exposure to stool (e.g., oral-anal contact).
4. Avoid close contact with anyone who has a weakened immune system.
5. Children with diarrhea should be excluded from child care and school settings until the diarrhea has stopped for 24 hours.

Are there any restrictions for people with cryptosporidiosis?

Yes. Because cryptosporidiosis is a disease that can easily spread to other people, health care providers are required by law to report cases of cryptosporidiosis to the health department. In order to protect the public, workers at food-related businesses who have diarrhea must not work with food until they don't have diarrhea for 24 hours. If they work in a food-related business that serves those who are at high risk for severe disease, they may not be allowed at work until they don't have diarrhea for 24 hours. Children with diarrhea may not attend daycare until diarrheal symptoms have resolved for 24 hours.

Where can you get more information?

- Your Local Health Department
- Kansas Department of Health and Environment, Epidemiologic Services Section at (877) 427-7317
- <http://www.cdc.gov/health/default.htm>
- A Guide to Water Filters: <http://www.cdc.gov/crypto/factsheets/filters.html>
- Well Water Testing: <http://www.cdc.gov/healthywater/drinking/wells/testing.html>
- Your doctor, nurse, or local health center

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