

Shiga toxin-producing *Escherichia coli* (STEC)

(including *E. coli* serotypes O157:H7 and non-O157)

Disease Category: Enteric

Timeframe to follow-up: Within 1 working day

Signs and Symptoms	Diarrhea which may become bloody, severe cramps, vomiting, low or no fever. Asymptomatic or mild infections can occur Complications: hemolytic uremic syndrome (HUS), stroke, pancreatic injury.
Incubation	Usually 10 hours to 6 days for most <i>E. coli</i> strains; for <i>E. coli</i> O157, the incubation period is 3-4 days; range 1-10 days.
Case Classification	Clinical criteria: An infection of variable severity characterized by diarrhea (often bloody) and/or abdominal cramps, illness may be complicated by HUS (note that some clinicians still use the term thrombotic thrombocytopenic purpura [TPP] for adults with post-diarrheal HUS). Confirmed: - A person that meets the confirmatory laboratory criteria for diagnosis. Probable: - A person with isolation of <i>E. coli</i>/O156 from a clinical specimen without confirmation of H antigen, detection of Shiga toxin or Shiga toxin genes, OR - A clinically compatible illness in a person with identification of an elevated antibody titer against a known Shiga toxin-producing serogroup of <i>E. coli</i>, OR - A clinically compatible illness in a person with detection of Shiga toxin or Shiga toxin genes in a clinical specimen using a culture-independent diagnostic test (CIDT) and no known isolation of <i>Shigella</i> from a clinical specimen, OR - A clinically compatible illness in a person with detection of <i>E. coli</i> O157 or STEC/EHEC from a clinical specimen using a CIDT, OR - A clinically compatible illness in a person that is epidemiologically linked to a confirmed or probable case with laboratory evidence, OR - A clinically compatible illness in a person that is a member of a risk group as defined by public health authorities during an outbreak. Suspected: - Identification of an elevated antibody titer against a known Shiga toxin-producing serogroup of <i>E. coli</i> in a person with no known clinical compatibility, OR - Detection of Shiga toxin or Shiga toxin genes in a clinical specimen using a CIDT and no known isolation of <i>Shigella</i> from a

STEC

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	clinical specimen in a person with no known clinical compatibility, OR • Detection of <i>E. coli</i> O157 or STEC/EHEC in a clinical specimen using CIDT in a person with no known clinical compatibility, OR • A person with a diagnosis of post-diarrheal HUS/TPP
Differential Diagnosis	Campylobacteriosis, parasitic diarrhea, salmonellosis, shigellosis, vibriosis, viral gastroenteritis, yersiniosis
Treatment	Supportive with hydration. No antibiotics, no anti-diarrheal. Case fatality rate ~1%.
Duration	Varies with severity; may shed and transmit weeks to months, particularly in children.
Exposure	Contaminated food or water or contact with an infected person, fomite, or an infected animal.
Laboratory Testing	Multiplex nucleic acid amplification tests (NAATs) can test stool samples to detect multiple enteric pathogens. All presumptive <i>E. coli</i>/O157 isolates and Shiga toxin-positive specimens should be forwarded to Nevada State Public Health Laboratory (NSPHL) for confirmatory testing. • https://www.unr.edu/nevada-state-public-health-laboratory/directory-services/shiga-toxin-producing-e-coli Local Health Authority can arrange testing if an outbreak is suspected OR for contacts.
Control of Contacts	A contact residing in the same household of a STEC case shall not be working in a sensitive occupation unless authorized by the health authority.
Key areas of focus during investigation	Food history, water exposure, animal exposure, and travel history.
Public Health Actions	Reports of STEC cases must be made to the Local Health Authority during the regular business hours of the health authority on the first working day following the identification of the case. Local Health Authority to notify Office of State Epidemiology (dpbhepi@health.nv.gov) or call 775-684-5911/775-400-0333 (after hours) if outbreak suspected. For individual confirmed or probable cases: • Confirm diagnosis, if possible • Identify potential exposures • Identify symptomatic contacts and arrange testing • Prepare a case report and submit to the Chief Medical Officer (through OSE) within 7 days after completing the case investigation • Identify potential outbreaks from common sources • Provide education about how to prevent transmission

	To the best of the local health authority's ability, each step of the investigation should be completed within one working day or in alignment with NAC 441A .
Key Partner Agencies	• Local health authorities (LHA's) • NSPHL • Environmental Health • Animal Disease Laboratory

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SHIGA TOXIN-PRODUCING *ESCHERICHIA COLI* (STEC)

I. DISEASE REPORTING

A. Legal Reporting Requirements

A report to the health authority may be made by telephone; telecopy (in the form prescribed by the health authority); or any form of electronic communication identified by the health authority, following the specified format and procedure.¹

1. *Health Care Providers and Health Care Facilities*

Health providers and facilities must notify the health authority where provider is located within the first working day after identifying the case.¹⁻³

2. *Laboratories*

Laboratories must notify the health authority within the first working day after identifying the case.¹ If the lab is located outside of Nevada, notify the Nevada Chief Medical Officer through the Office of State Epidemiology (OSE) within the same timeframe.^{1,4}

3. *Local Health Authority (LHA)*

LHA's must notify the Office of State Epidemiology (OSE) within 7 days after completing the case investigation.⁵

II. THE DISEASE AND ITS EPIDEMIOLOGY

A. Background

More than 100 serotypes of *E. coli* produce Shiga or Shiga-like toxins. The most identified Shiga toxin-producing *E. coli* (STEC) in North America is *E. coli* O157:H7 (i.e., “*E. coli* O157” or “O157”) which was first identified in 1982. In the U.S., it is estimated that 70,000 infections per year are caused by *E. coli* O157. Persons of all ages are susceptible. The populations at higher risk for more severe disease include pregnant women, newborns, children, older people, and people with a weak immune system. Ground beef, apple cider, unpasteurized milk and other foods have been associated with outbreaks.^{6,7}

B. Etiologic Agent

The 5 pathotypes of diarrhea-producing *E. coli* have been distinguished by genetic, pathogenic, and clinical characteristics. Each pathotype is defined by the presence of virulence-related genes, and each comprises characteristic serotypes, indicated by somatic (O) and flagellar (H) antigens. Diarrhea is caused by the direct effects of the pathogens in the intestine. HUS is an infectious sequelae believed to follow Stx-induced vasculitis and systemic complement cascade activation.^{6,7}

C. Description of Illness

Symptoms of STEC include mild and non-bloody stools to stools of all blood, and severe abdominal cramps. Most severe symptom of STEC is hemolytic uremic syndrome (HUS), which is characterized by hemolytic anemia, thrombo-cytopenia, and acute renal dysfunction.⁶ Symptoms also often include severe stomach cramps, diarrhea (often bloody), and vomiting. Some people may have a fever, which usually is not very high (less than 101° F/38.5° C). Most people get better within 5 to 7 days. Some infections are very mild, but others are severe or even life-threatening.⁸

D. Disease Burden in Nevada

As of May 2026, there have been 36 reported cases of STEC in Nevada this year. Most cases occurred in Clark and Washoe counties. Cases occur throughout the year and tend to peak in the summer.

See the [Nevada Office of State Epidemiology Communicable Disease Dashboard](#) for Nevada specific data on STEC (Enteric section).

E. Reservoirs

Humans are the main reservoir for non-toxin producing *E. coli*. Intestinal tracts of animals (especially cattle and other ruminants) are the primary reservoir of STEC.⁹

F. Modes of Transmission

Fecal-oral route is the most common mode of transmission through contaminated food or water or contact with animal and feces. Transmission can also occur person-to-person transmission can also occur in same household, childcare centers, or school.⁷

G. Incubation Period

The incubation period is usually 10 hours to 6 days for most *E. coli* strains; for *E. coli* O157, the incubation period is 3-4 days; range 1-10 days.⁷

H. Period of Communicability

STEC can be spread if bacterial shedding is still occurring in stool, time varies from one to four weeks, even if symptoms are resolved.^{6,7}

I. Testing

Rapid immunologic assays (enzyme immunoassays [EIA] and immunochromatographic assays) and NAAT tests are commercially available to detect STEC.⁷ All presumptive stool samples should be forwarded on to NSPHL for STEC (<https://www.unr.edu/nevada-state-public-health-laboratory/directory-services/shiga-toxin-producing-e-coli>).

J. Treatment

Supportive care, including electrolyte-containing solution or intravenous therapy for dehydration, is recommended. Antimotility agents and antibiotics are not recommended due to an increased risk of developing HUS.⁷

Provide most current treatment guidelines from Red Book to the healthcare provider or refer case to physician for proper treatment for STEC.

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of STEC, step by step, within one working day of notification or in alignment with [NAC 441A](#).

A. Step 1: Review relevant information about the disease.

1. *Review scientific information in [Control of Communicable Diseases Manual](#), most recent edition.*
2. *Review [STEC](#) most recent case definition (2018).*

B. Step 2: Begin investigating the case.

1. *Contact Reporting Source and/or Reported Case*

Upon receiving an initial case report, review lab test results and available clinical details and epidemiologic factors. Please make three attempts to contact the case (text and phone calls) on separate days, at different times of the day (morning, afternoon, late afternoon). Document all attempts to contact a reporting source and/or reported case, preferably in the “Encounters” tab of EpiTrax. Please use case report forms (CRF) to gather accurate information about the case. Focus on the key data elements listed above. Filling out an electronic version of the CRF in EpiTrax (called a Confidential Morbidity Report (CMR) in EpiTrax) is preferred. If used, the completed PDF version should be attached to the CMR in EpiTrax. The CRF should be completed within 7 days of completing the investigation of the case.⁵

C. Step 3: Identify potential sources of infection

The investigation focuses on exposures in the 7 days before onset. Ask about any risk factors for infection : travel, food history, recreational water exposure, and exposure to animals.

D. Step 4: Initiate control measures for case and/or for contacts (see Section IV – Section VI below).

E. Step 5: Provide Education and Prevention messaging to the case and/or contacts (see Section IX below).

IV. CONTROL OF CASE

1. *Management/Exclusions for Specific Groups or Settings*

Guidance for Cases	
Sensitive Occupation*	Exclude from work until 2 negative stool specimens have been collected within 24 hours apart and at least 48 hours after cessation of antimicrobial therapy (if given) OR asymptomatic and no indication of poor health hygiene.
Childcare Attendee	Exclude infant or child from attending facility until they have been asymptomatic for at least 24 hours. The health authority may require additional exclusion or testing to prevent further transmission.
School Attendee	No exclusion: children should not attend as long as they are experiencing diarrhea for at least 24 hours.
Case in a Healthcare Facility	Work with HAI team to contact the Infection Preventionist. Facility enforce enteric and standard precautions.
General Population	No exclusion

* NAC 441A.17 states a sensitive occupation includes but not limited to, "employment as a food and beverage handler, employment in a healthcare facility, employment in a school or employment in a childcare facility."

2. *Exclusion Notifications*

- Consult with communicable disease supervisor or epidemiologist to verify that case meets CSTE case definition.
- Obtain employer information and complete the exclusion notification letter and have signed by Rural Disease Investigator Specialist (DIS) Supervisor. Email copy of the signed letter to the case to give to their employer. If unable to print out, OSE will mail a copy of the letter to the case. Once the case meets return to work criteria, complete the release letter and have signed by Rural DIS Supervisor. Email the signed letter to the case to give to their employer.
- If the case is a healthcare worker, consult with communicable disease supervisor or epidemiologist. Notify infection prevention staff of diagnosis, most facilities handle their own worker exclusions and may have more stringent return to work criteria. Let the facility know that OSE is available to provide any assistance.
- If the case is in a childcare facility, contact the facility director and provide education of proper hand washing techniques and any infection control messaging.

3. *Additional Testing for Return to Work*

Work with the original ordering provider and inform them of the additional testing needed for the case to meet the return-to-work criteria.

V. CONTROL OF CONTACTS

Any contacts (e.g., household, intimate, other close contacts) to the case that are experiencing symptoms compatible with STEC should be referred to a healthcare provider

for assessment and testing. Any person that had contact with a probable or confirmed case is considered a probable case and need to be reported and investigated separately.

Any household contact of a known case shall not work in a sensitive occupation* unless authorized by the health authority.

VI. CONTROL OF CARRIERS

Carriers of STEC have been identified but are rare and thus no carrier-specific control measures are needed.

VII. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL

Coordinate with senior epidemiology staff to determine if an outbreak is occurring. If so, notify DPBH Environmental Health, local health authorities, or infection control, as appropriate.

A. Foodborne or waterborne outbreak

Determination of when to contact DPBH Environmental Health:

- If one complaint of foodborne injury, intentional contamination, or any unusual circumstance is received.
- If two complaints are received for the same facility from two separate individuals who do not know each other.
- If three complaints are received from the same facility from a group that ate together but are not related to each other.
- If four complaints are received for the same facility from a family or related group of individuals.

B. Healthcare facility residents

Determine if there has been any unusual incidence of diarrheal disease in the past month. If there is an increase in cases, coordinate with senior epidemiology staff and the HAI team to identify common-source outbreaks or continuing exposure to bacteria. An inspection may need to be conducted if cases continue to be reported.

VIII. PREVENTION¹⁰

- Wash hands before food preparation.
- Avoid eating raw or undercooked meat, especially hamburger. Ground beef should be cooked to an internal temperature of 160°F. Cook meat until there is no red or pink remaining and juices should be clear.
 - Wash hands after handling raw meat and raw poultry.
- Avoid cross-contamination with meat and other potentially contaminated food.
- Wash all fruits and vegetables thoroughly before consuming.
- Wash hands after caring for diapered or incontinent persons, after using the toilet, and after handling soiled clothing or linens.

- Wash hands after handling or cleaning up after pets, fowl, or other animals.
- Avoid drinking or swallowing unpasteurized milk or other unpasteurized products including soft cheeses, juices, and cider.
- Avoid drinking or swallowing untreated surface water. Water should be boiled or otherwise disinfected before consumption.
- Persons with diarrhea should not use recreational water venues (e.g., pools, lakes, interactive fountains, water parks, hot tubs) until 2 weeks after symptoms resolve.
- Persons with diarrhea should not handle or prepare food for others.

The investigator should reference the most recent [STEC](#) specific public educational materials from the CDC. The [Nevada OSE website](#) also provides information about STEC. Include a bullet point list for prevention tips.

IX. REFERENCES

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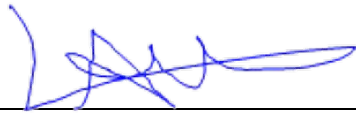
X. ACKNOWLEDGEMENTS

This document was developed based on the content and format of the disease investigation guidelines of several state and local health jurisdictions:

- Washington State Department of Health Reporting and Surveillance Guidelines
- Northern Nevada Population Health Division Investigation of Communicable Disease Manual

The Nevada Office of State Epidemiology would like to acknowledge the work of these great partners.

XI. UPDATE LOG



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7/31/26

Chief Medical Officer Approval Date