

## E. coli (*Escherichia coli*) Infection, Shiga toxin-producing Investigation Overview

The following guidelines provide a brief overview of the steps of a shiga toxin-producing E. Coli (STEC) investigation. Infection with STEC is caused by a bacterium that produces shiga toxins. Many types of E. coli bacteria normally live in the intestines of people and animals and most are harmless, but those producing shiga toxin are pathogenic and reportable in North Carolina. Most illnesses likely occur due to consumption of contaminated food, consumption of unpasteurized (raw) milk, consumption of water that has not been disinfected, contact with certain animals like goats, sheep, or cattle, or contact with the feces of infected people. High risk foods also include unpasteurized apple cider and soft cheeses made from raw milk. Health officials recommend these foods be avoided completely.

For additional support, consult the NC Communicable Disease Branch at (919) 733-3419.

### Basic Steps of an E. Coli Investigation

1. Ensure case definition is met	<ul style="list-style-type: none"> <li>Clinical criteria are required for probable STEC cases.</li> <li>Laboratory evidence is sufficient to meet case definition for confirmed and suspect cases.</li> </ul>
2. Collect clinical information	<ul style="list-style-type: none"> <li>Use information collected from medical records and/or speak with the case</li> <li>Identify epidemiologic linkages to similarly ill people and other risk factors that may warrant public health intervention/action (e.g. petting zoo exposure or common food)</li> <li>If 2 or more cases are identified report as an outbreak</li> </ul>
3. Determine the incubation period	<ul style="list-style-type: none"> <li>Incubation period: 3-4 days (range, 1-10 days)</li> <li>Duration: 5-10 days</li> </ul>
4. Manage the case	<ul style="list-style-type: none"> <li>Assess clinical information and to see if the case also meets criteria for Hemolytic Uremic Syndrome (HUS); if criteria is met a separate event must be entered into NCEDSS                             <ul style="list-style-type: none"> <li>Contact the enterics team to assist you; we can copy your STEC event to create a HUS event (this will save you from double entry!)</li> </ul> </li> <li>Interview the case and complete the Part 2 Form/risk history and clinical packages in NCEDSS</li> <li><b>Those in high-risk settings</b> (i.e., healthcare, food employees, or childcare attendee/staff) <b>require 2 negative stools <i>cultures</i> before returning to those settings.</b></li> <li>Most people with <i>E. Coli</i> infection recover without specific treatment</li> </ul>
5. Identify contacts of case during the infectious period	<ul style="list-style-type: none"> <li>Symptomatic contacts to a case who do not have laboratory confirmation of illness should be investigated as “probable” cases</li> <li>Exclusion for high risk setting also apply to symptomatic contacts</li> </ul>
6. Identify source of exposure	<ul style="list-style-type: none"> <li>If source of exposure is suspected to be restaurant related, involve Environmental Health Specialist.</li> <li>If exposure is suspected from livestock, the North Carolina Department of Agriculture (NCDA) must be notified. The state public health veterinarian can assist with contacting these agencies (919) 733- 3419.</li> <li>Obtain additional information including travel, exposure to livestock and other animals, consumption of raw/undercooked meat</li> </ul>
7. Manage high risk cases/contacts*	<ul style="list-style-type: none"> <li>Those in high-risk settings (i.e. healthcare, food employees, or childcare attendee/staff) require 2 negative stools before returning to those settings.</li> </ul>
➤ Symptomatic Contacts	<ul style="list-style-type: none"> <li>Provide control measures</li> </ul>
➤ Asymptomatic cases	<ul style="list-style-type: none"> <li>Those in high-risk settings (i.e. healthcare, food employees, or childcare attendee/staff) require 2 negative stools before returning to those settings.</li> <li>Environmental Health Specialist (EHS) should be consulted regarding return criteria for food employees</li> </ul>

<ul style="list-style-type: none"> <li>➤ Implement Control Measures</li> </ul>	<ul style="list-style-type: none"> <li>• Due to small infective dose exclude the following: <ul style="list-style-type: none"> <li>• Food handlers, healthcare and childcare workers until asymptomatic and 2 consecutive negative stool cultures collected 24 hours apart and not sooner than 48 hours after completion of antibiotic.</li> </ul> </li> <li>• <b>Childcare centers</b> (single case) – Exclude until asymptomatic and 2 consecutive negative stool cultures collected 24 hours apart and not sooner than 48 hours after completion of antibiotic. <ul style="list-style-type: none"> <li>• <b>Childcare attendees or workers identified with <i>E. coli</i> O157 infection require immediate attention due to the potential life-threatening consequences of HUS in young children.</b></li> <li>• <b>Outbreak</b> (two or more cases in the same facility) - Ill children should be excluded until asymptomatic and 2 negative stool cultures at least 24 hours apart and not sooner than 48 hours after completion of antibiotic. Strict hand hygiene should be followed. The childcare center should be closed to new admissions during the outbreak. Also, prevent transfer of exposed children to other centers. Environmental Health Specialist should perform assessment of practices associated with diapering, hand washing and food handling.</li> </ul> </li> <li>• Involve Environmental Health Specialist to ensure appropriate disinfection of contaminated areas of restaurant, childcare center or long-term care facility if involved.</li> </ul>
<ul style="list-style-type: none"> <li>➤ Risk Communication</li> </ul>	<ul style="list-style-type: none"> <li>• Individual cases do not usually warrant risk communication</li> <li>• Outbreaks of cases may need NC HAN alerts, EPI-X reports, MD alerts, and/or a press release. The state foodborne team is available to assist with these activities.</li> </ul>
<p>*High-risk contacts include individuals at high-risk for severe illness or complications, healthcare workers, childcare workers and food handlers</p> <ul style="list-style-type: none"> <li>➤ Resources – <a href="https://www.cdc.gov/ecoli/">https://www.cdc.gov/ecoli/</a></li> </ul>	
<h2>Critical Elements for NCEDSS</h2>	
<ul style="list-style-type: none"> <li>➤ Document if high risk (food worker, childcare or healthcare)</li> <li>➤ Document if patient resides or has been in a congregate living situation (LTFC, Assisted Living, Camp, etc.)</li> </ul>	