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NH DIVISION OF Public Health Services
Improving health, preventing disease, reducing costs *for all*
Department of Health and Human Services

Shiga Toxin-producing *E. coli* (STEC) O157:H7 Outbreak in Vermont

Key Points and Recommendations:

1. There is an ongoing STEC outbreak associated with a restaurant in Vermont. A food source of this outbreak has not yet been identified.
2. Healthcare providers should be alert to the possibility of a foodborne STEC infection in patients presenting with acute onset of abdominal cramping and diarrhea, especially bloody diarrhea.
3. Stool should be tested for Shiga Toxin-Producing *E. coli* by both culture and Shiga toxin assay in patients with suspect STEC infection.
4. For patients suspected of having STEC diarrheal infection, healthcare providers should NOT prescribe antibiotics for the diarrhea unless other clinical manifestations necessitate their use (e.g. sepsis). Antibiotics may increase production and release of the Shiga toxin and put patients at higher risk of developing serious complications like hemolytic uremic syndrome (HUS), and they have not been shown to improve illness.
5. Report all suspected and confirmed cases of STEC to the Division of Public Health Services (DPHS) within 24 hours at 603-271-4496 (after hours 1-800-852-3345, x5300).

Epidemiology

An outbreak of STEC has been identified with cases in New Hampshire and Vermont associated with a particular restaurant in eastern Vermont. The source of the infections has not yet been identified. New Hampshire has one confirmed and two probable cases associated with the outbreak. New Hampshire cases report dates of exposure from August 27, 2015 through September 26, 2015 with illness onset from September 5, 2015 through October 1, 2015. The outbreak investigation continues with possible continuing exposure.

The primary reservoir for STEC are ruminants (cattle, goats, deer etc.) with cattle being the most important. Pathogenic *E. coli* can also survive for long periods of time in the environment contaminating water and other food sources, including vegetables. Consumption of undercooked meat is a major risk factor for development of STEC, but infection can also develop after eating other contaminated food and water, from petting zoos, and from person-to-person transmission in settlings of poor hand or environmental hygiene.

Clinical Overview

Escherichia coli (*E. coli*) is one of the most common bacteria found in normal human bowel flora, but certain pathogenic strains can produce an infectious diarrhea. There are various mechanisms by which pathogenic *E. coli* can cause symptoms, and they often are classified by their pathotype. Shiga Toxin-Producing *E. coli* (STEC) are the name for *E. coli* that induce diarrhea through production of cytotoxins called Shiga toxins. *E. coli* O157:H7 is part of this group of bacteria, but other non-O157 strains of *E. coli* can also produce the Shiga toxin.

STEC infections can cause a variety of symptoms, including: watery or bloody diarrhea, hemorrhagic colitis, hemolytic-uremic syndrome (HUS), and even death. Most persons infected with STEC develop diarrhea that is often bloody, abdominal cramps and vomiting 3 to 4 days after infection, with a range of 1-10 days. The illness usually lasts 5 to 7 days, and most persons recover without treatment. Approximately 5-10% of individuals diagnosed with STEC infection, however, will go on to develop a life-threatening complication of HUS. HUS is a syndrome caused by microangiopathic hemolytic anemia that can lead to small and/or large vessel thrombosis and tissue ischemia. The kidneys are most often affected leading to renal insufficiency or failure. HUS can lead to long-term impairment or even death. The elderly and children under five years of age are more likely to have a severe illness.

Unlike infections with other pathogenic *E. coli*, treatment for STEC is entirely supportive and use of antibiotics in STEC is contraindicated as they may induce expression and release of Shiga toxin, and be associated with a higher risk of developing HUS.

Laboratory Testing for STEC

Any patient presenting with a significant diarrheal illness should have a thorough clinical and epidemiological history performed. Any patient suspected of having STEC infection, especially those with bloody stools, fever, and/or systemic illness, should be evaluated for STEC infection. Stool should also be submitted for culture and simultaneously tested for non-O157:H7 STEC with a test that detects Shiga toxins or the genes encoding these toxins.

Clinical laboratories should report and send *E. coli* O157 isolates and Shiga toxin-positive samples to the state public health laboratories (PHL) as soon as possible for additional characterization.

Specimens or enrichment broths in which the Shiga toxin or STEC bacteria are detected, but from which O157 STEC are not recovered, should also be forwarded as soon as possible to the PHL so that non-O157 STEC isolation can be performed.

Often, by the time a patient presents with HUS, the causative STEC can no longer be easily isolated from a stool specimen. For any patient with HUS without a culture-confirmed STEC infection, stool can be sent to the PHL for immunomagnetic separation (IMS) techniques that can increase the sensitivity of culture. In addition, with prior approval, serum can be sent through the PHL to CDC for serological testing for antibodies to some STEC serogroups.

For additional information on STEC please refer to:

1. The NH DHHS website at: http://www.dhhs.nh.gov/dphs/cdcs/documents/ecoli_O157H7.pdf
2. The Centers for Disease Control at: http://www.cdc.gov/ecoli/general/index.html
3. For more information on treatment and testing of STEC: http://www.cdc.gov/ecoli/clinicians.html

For any questions regarding the contents of this message, please contact NH DHHS, DPHS, Bureau of Infectious Disease Control at 603-271-4496 (after hours 1-800-852-3345 ext.5300).

To change your contact information in the NH Health Alert Network please call Thom Flynn at 603-271-4596 or email tdflynn@dhhs.state.nh.us

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Originating Agency:	NH Department of Health and Human Services, Division of Public Health Services

Attachments: Shiga Toxin-producing *E. coli* (STEC) O157:H7 Outbreak in Vermont