

PUBLIC HEALTH

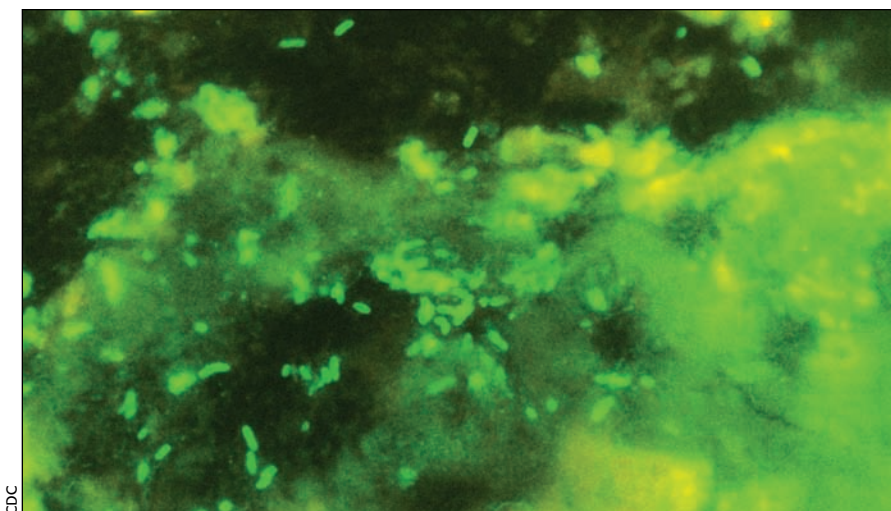
***E. coli*— sporadic case
or an outbreak?**

Background and epidemiology: One of the many unfortunate consequences of the Walkerton tainted-water tragedy has been a lingering association of *Escherichia coli* O157:H7 with large-scale outbreaks. Lost somewhere among the lessons learned is an appreciation that *E. coli* can be much more subtle.

Most incidents of *E. coli* O157:H7 infection reported to and investigated by public health personnel are isolated and sporadic. The province of Ontario receives some 20–50 reports monthly of verotoxigenic *E. coli* (VTEC) infections. VTEC cases come to the attention of public health when they fall on the severe side of the infection's wide clinical spectrum and involve infants or elderly people admitted to hospital with serious outcomes such as hemolytic uremic syndrome (HUS), thrombotic thrombocytopenia purpura or hemorrhagic colitis. Cases of milder forms of infection often fall below the public-health radar.

Public health officials are responsible to ascertain whether each case reported is isolated, with a limited setting and source, or a harbinger of wider exposure and continued public-health risk. Since the data available for these rapid assessments are often imperfect and incomplete, it is important for physicians, public health officials and laboratories to work together to maximize the possible harvest from the available information.

Epidemiological investigations are complicated by the many potential sources of exposure to virulent strains of *E. coli*. The route of exposure is invariably ingestion, by means of any number of vehicles (food, water, dirty hands) contaminated with animal or human fecal matter. Undercooked ground beef, unpasteurized milk or cider, salami, alfalfa sprouts, lettuce and contaminated water are notorious culprits,¹ but virtually any exposure to unhygienic food practices or livestock, such as play around manure or attendance at a petting zoo, carries some potential for transmission.² The infectious dose for *E. coli* O157:H7



Escherichia coli in a section of intestine from an 8-month-old child with chronic diarrhea.

is low (about 100 organisms); person-to-person transmission is common.

Clinical management: The spectrum of illness caused by *E. coli* O157:H7 ranges from mild nonbloody diarrhea to serious bloody diarrhea with severe abdominal cramping. Fever is typically either low-grade or absent, which can help the clinician to distinguish VTEC infections from those caused by other enteric pathogens. The incubation period averages about 4 days, but ranges from 1 to 10 days. Adults typically shed the bacteria for about a week after infection; young children, for up to 3 weeks. Treatment is, for the most part, supportive. The bulk of the existing evidence suggests that antibiotic treatment is not indicated and in some cases may increase the risk of HUS.³

Because enteric disease may be caused by bacteria, viruses or parasites, physicians should test patients with diarrheal illness for all 3. Routine bacterial examination of stool specimens includes tests for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia* and *E. coli* O157. Strains of *E. coli* O157 are differentiated by serotyping and molecular methods using pulse-field gel electrophoresis (PFGE).¹

The National Laboratory for Enteric Pathogens maintains passive surveillance on all confirmed cases and provides information on the prevalence of strains of *E. coli* across Canada. The co-incidence of uncommon strains among epidemiologically linked cases may in-

dicate a common source of exposure. Identification of the same strain in associated food, water or environmental samples can establish the source, but negative test results do not automatically rule these out as infective sources because of the multitude of factors that can interfere with accurate sampling.

Prevention and control: Preventing this infection is difficult because the pathogen is ubiquitous. Prevention efforts focus on food safety, personal hygiene and the rapid identification of active cases. All suspected and confirmed cases should be reported to the local medical officer of health. People with suspected or confirmed infection who interact with vulnerable populations (e.g., children) or who handle food should refrain from these occupational activities until 2 stool samples have tested negative for *E. coli*.

Erica Weir

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REFERENCES

1. Woodward DL, Clark C, Caldeira R, et al. Verotoxigenic *Escherichia coli* (VTEC): a major public health threat in Canada. *Can J Infect Dis* 2002;13:321–30.
2. Centers for Disease Control and Prevention. Outbreaks of *Escherichia coli* O157:H7 associated with petting zoos — North Carolina, Florida, and Arizona, 2004 and 2005. *MMWR* 2005;54(50):1277–80.
3. Tarr P, Gordon C, Chandler W. Shiga-toxin-producing *Escherichia coli* and haemolytic uraemic syndrome [review]. *Lancet* 2005;365:1073–86.