



## A new source of *Escherichia coli* infection

*Escherichia coli* O157:H7 has recently appeared in unpasteurized apple juice and apple juice blends sold in British Columbia, California, Colorado and Washington, apparently causing illness in at least 45 people.<sup>1</sup> *E. coli* infection typically causes diarrhea and is thought to be responsible for at least 85% of cases of hemolytic uremic syndrome. (Non-O157 toxin-producing *E. coli* are responsible for the remaining cases.<sup>2</sup>) Physicians should include *E. coli* infection in the differential diagnosis of diarrheal illness, even when the usual risk factors are not present.

### The organism

The pathogenicity of *E. coli* O157:H7 results from its production of Shiga-like toxin I and II (also known as verotoxin 1 and 2). The main reservoir of infection is the gastrointestinal tract of cattle. The organism has been found in other animals living on or near farms, such as sheep, dogs and deer. Poultry has not been identified as a reservoir.<sup>2</sup>

### Transmission

The meat of infected animals can become contaminated during slaughter; in the case of ground beef, the microbe becomes distributed throughout the meat rather than being concentrated on the surface, where it is likely to be destroyed during cooking. *E. coli* infection is therefore most frequently seen in people who have eaten undercooked hamburgers or have failed to wash their hands immediately after handling uncooked meat.

Transmission has occurred through other foods such as apple juice, mayonnaise, dry-cured salami and leaf lettuce. *E. coli* O157:H7 survives well in acidic foods, which is untypical of bacteria. Unpasteurized milk has also been identified as a source.<sup>2</sup>

Outbreaks have been associated with the consump-

tion of untreated drinking water and with swimming at crowded freshwater beaches; evidently these water sources had become contaminated by an animal or human vector. Person-to-person spread also occurs in households and childcare centres. Asymptomatic cases can occur during outbreaks or in close contacts of people with *E. coli* infection or hemolytic uremic syndrome, leading to further transmission.<sup>2</sup>

### Clinical disease and management

Symptoms usually begin within 3 to 4 days after ingestion of the organism. Exceedingly low doses can cause disease; in such cases the incubation period is longer (up to 8 days). The main symptom is diarrhea, which can be severe and bloody. Diagnosis can be made only by stool culture; because some laboratories do not routinely test stool samples for *E. coli* O157:H7 this must be specifically requested.

Fluid and electrolyte replacement therapy should be given to patients with watery diarrhea or signs of dehydration. The role of antibiotic therapy is uncertain; there is some evidence that treatment with trimethoprim-sulfamethoxazole can lead to complications such as hemolytic uremic syndrome.<sup>3</sup> In most cases the illness resolves spontaneously.

Infected people should be excluded from food handling and from the care of children and others until the diarrhea resolves and negative results have been obtained for 2 successive stool cultures. The disease should be reported to the local public health authority to facilitate investigation of patient contacts.

### References

1. Outbreak of *Escherichia coli* O157:H7 infections associated with drinking unpasteurized commercial apple juice — British Columbia, California, Colorado, and Washington, October 1996. *MMWR* 1996;45:975.
2. Armstrong GL, Hollingsworth J, Morris JG. Emerging foodborne pathogens: *Escherichia coli* O157:H7 as a model of entry of a new pathogen into the food supply of the developed world. *Epidemiol Rev* 1996;18:29-51.
3. Benenson AS, editor. *Control of communicable disease manual*. 16th ed. Washington: American Public Health Association, 1995:141-4.