



## Infectious Diseases, MMWR in Review, News Articles

### ***Campylobacter jejuni* infections linked to pet shop puppies**

by Deborah Bloch M.D., FAAP; Larry K. Pickering M.D., FIDSA, FPIDS, FAAP

**Authors' note:** *Puppies purchased from pet shops can transmit multidrug-resistant enteric organisms to humans. This article in Morbidity and Mortality Weekly Report emphasizes the need for hand hygiene when managing puppies, proper animal husbandry techniques, antimicrobial stewardship extension to veterinary practices and culture-guided therapy for ill children with *Campylobacter jejuni* infections associated with animal care.*

- Montgomery MP, et al. "Multidrug-Resistant *Campylobacter jejuni* Outbreak Linked to Puppy Exposure - United States, 2016-2018." *MMWR Morb Mortal Wkly Rep.* 2018;67:1032-1035, <http://dx.doi.org/10.15585/mmwr.mm6737a3>.

#### Article summary

An investigation by the Centers for Disease Control and Prevention (CDC) and local and state health officials found that 118 people in 18 states developed illness with quinolone- and macrolide-resistant *Campylobacter jejuni* from Jan. 5, 2016, to Feb. 4, 2018. Twenty-six people were hospitalized.

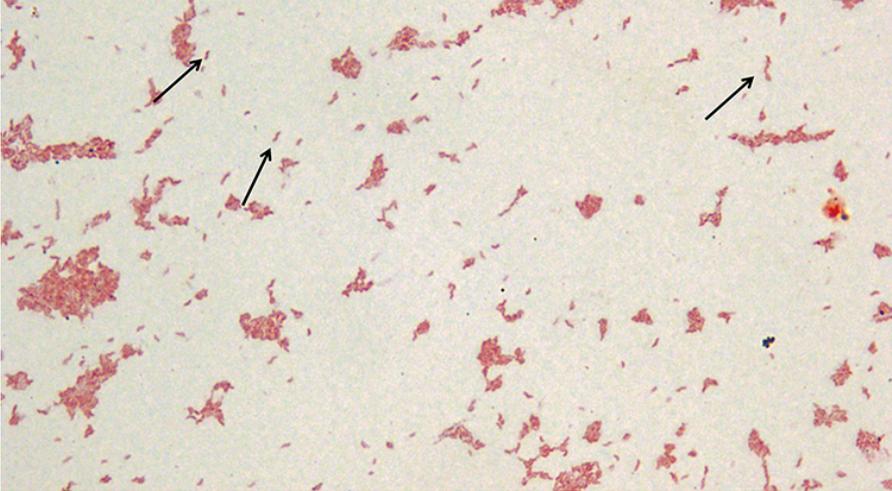
Puppies from six pet store companies were linked to the outbreak through *Campylobacter* culture and whole-genome multilocus sequence typing from human stool and from fecal samples from puppies. Ninety-five percent of the source puppies for which history of antibiotic therapy could be obtained had been given at least one course of antibiotics, which may have led to the multidrug-resistant *Campylobacter*. Antibiotics were given to the puppies for prophylaxis (55%), treatment (1%) or both (38%).

Metronidazole, sulfadimethoxine, doxycycline and azithromycin accounted for 81% of antibiotics administered, though tetracyclines, quinolones, aminoglycosides and chloramphenicol also were given.

The source of infection was not identified, because puppies mingled from the time they left the breeding site to when they were placed in a pet shop and eventually found homes.

In response to the outbreak, the CDC developed materials and messages on campylobacteriosis prevention aimed toward pet industry partners. The focus was on handwashing, using personal protective equipment while cleaning cages and separating human eating areas from animals. Additionally, an outbreak advisory was listed online urging culture and susceptibility-guided antimicrobial treatment when indicated for human and animal patients with *Campylobacter* infection.

## Infectious Diseases, MMWR in Review, News Articles



Black arrows show characteristic "sea-gull" or "comma" shape of *Campylobacter jejuni*, Gram stain 1000x. Courtesy of Deborah Bloch, M.D., FAAP

### Signs, sources, treatment of *Campylobacter* infections

*Campylobacter* infection causes diarrhea and abdominal pain that can mimic appendicitis, intussusception, inflammatory bowel disease, malaise and fever. Disease most frequently affects children under 5 years of age. Diarrhea can contain visible or occult blood and is sometimes the only symptom, or it can present with high temperatures, even resulting in febrile seizures. Bacteremia is uncommon in immunocompetent hosts, but immunocompromised hosts may have extraintestinal disease or prolonged or relapsing illness. Post-infectious complications include Guillain-Barré syndrome and reactive arthritis.

Sources of infection include animals, especially poultry, contaminated water sources and unpasteurized milk. Transmission of disease is through the oral-fecal route.

Growth of the organism from stool on culture requires a selective media incubated at 42 degrees Celsius, but organisms can be detected by enzyme-immunoassay and nucleic acid amplification tests.

Treatment generally is supportive, though azithromycin and erythromycin generally shorten duration of illness and excretion. However, with increasing resistance to antimicrobial agents, susceptibility-guided treatment is recommended. Antimotility agents are not recommended.

Adoption of puppies and dogs is an alternative to purchase, the authors commented.

**Question: Which of the following is correct about diarrhea outbreaks associated with puppies from breeders and distributors that are sold through pet stores?**

- A. Inappropriate use of antimicrobial agents in puppies occurs frequently.
- B. Multistate outbreaks linked to puppies from pet stores due to *C. jejuni* have been reported and are increasing.
- C. *C. jejuni* organisms isolated from puppies were highly resistant to commonly used antimicrobial agents including macrolides and quinolones.
- D. Antibiotic stewardship practices are needed in the commercial dog industry.



THE OFFICIAL NEWSMAGAZINE OF THE AMERICAN ACADEMY OF PEDIATRICS

# AAP News

## Infectious Diseases, MMWR in Review, News Articles

E. All of the above

*Answer: E*

*Dr. Bloch is a pediatric infectious diseases fellow at Emory University School of Medicine. Dr. Pickering is adjunct professor of pediatrics at Emory University School of Medicine and Children's Healthcare of Atlanta.*

### Related Content

- [Information on Campylobacter from the Centers for Disease Control and Prevention](#)
- [AAP Red Book chapter on Campylobacter infections](#)
- [Additional MMWR in Review columns](#)