

# HOSPITAL PHYSICIAN®

## INFECTIOUS DISEASES BOARD REVIEW MANUAL

### STATEMENT OF EDITORIAL PURPOSE

The *Hospital Physician Infectious Diseases Board Review Manual* is a study guide for fellows and practicing physicians preparing for board examinations in infectious diseases. Each manual reviews a topic essential to current practice in the subspecialty of infectious diseases.

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## *Campylobacter jejuni* Infections

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Cover Illustration by Kathryn K. Johnson

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# *Campylobacter jejuni* Infections

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## INTRODUCTION

Campylobacteriosis is a food- and water-borne zoonotic diarrheal illness caused by bacteria of the genus *Campylobacter*, with most cases caused by *C. jejuni*. *Campylobacter* species have a worldwide distribution, and campylobacteriosis is a leading cause of acute diarrhea and enterocolitis throughout the world. In the United States, approximately 1 million symptomatic *Campylobacter* infections occur each year.<sup>1</sup> The majority of *Campylobacter* infections are acquired via the oral route after handling raw poultry or consuming undercooked poultry.

*Campylobacter* species were first recognized in 1906 by John McFadyean, who described comma-shaped spiral organisms associated with abortions in cattle and sheep. Initially named *Vibrio fetus*, this pathogen was reclassified as *Campylobacter fetus* in 1973.<sup>2,3</sup> Human disease was first described 1959, when organisms were isolated from the blood of children with acute dysentery.<sup>4</sup> *Campylobacter* was first isolated from fecal specimens of patients with acute enteritis in 1972.<sup>5</sup> These initial cases were followed by other sporadic cases worldwide, and community outbreaks due to contaminated water, unpasteurized milk, and community meals were identified.<sup>6-11</sup> In 1978, a large community outbreak associated with the town water system affected 3000 people in Bennington, VT.<sup>8</sup>

Although campylobacteriosis is typically a self-limiting disease in otherwise healthy persons, severe gastrointestinal disease can occur in immunocompromised persons. In addition, postinfectious complications of *Campylobacter* infection, including Guillain-Barré syndrome and reactive arthritis, can occur in both immunocompromised and immunocompetent persons. This manual provides an update on the presentation, diagnosis, and management of *Campylobacter* infection and its postinfectious complications.

## EPIDEMIOLOGY

More than 16 *Campylobacter* species have been identified, but most clinically recognized infections in immunocompetent adults are due to *C. jejuni* and, less

frequently, *C. coli*.<sup>12</sup> *Campylobacters* colonize the colon of farm and domestic animals, including cattle, sheep, goats, pigs, and particularly poultry, which serve as the main source of human infection.<sup>13-15</sup> In microbiologic surveys of raw meat products, broiler chicken appears to be a common source of contamination, with *C. jejuni* detected in 31% to 83% of samples.<sup>15,16</sup>

The incidence of *Campylobacter* infection varies throughout the world but appears to be declining in industrialized countries due to improvements in poultry processing. In the United States, the Foodborne Diseases Active Surveillance Networks reported a 30% decline in incidence between 1996 and 2007.<sup>17,18</sup> In 2007, 12.79 laboratory-confirmed cases of *Campylobacter* infection occurred per 100,000 persons, second only to *Salmonella* infections (14.92 cases per 100,000 persons) as a bacterial cause of food-borne disease.<sup>1</sup> In the United States, the incidence of *Campylobacter* infection is highest in Alameda and San Francisco counties of California, where incidence reaches 34.4 cases per 100,000 persons and infection accounts for 52% of all infective diarrhea.<sup>19</sup> Sporadic cases occur in 2 peak age-groups, 0 to 4 years and 20 to 39 years, and most cases occur during the spring and summer months.<sup>17</sup> Factors associated with increased risk of sporadic campylobacteriosis are related to poultry consumption, eating outside of the home, international travel, and exposure to animals (Table 1).<sup>20,21</sup>

The epidemiology and clinical manifestations of disease due to *C. jejuni* differs markedly in resource-poor countries. Estimates of incidence are incomplete, but rates are thought to be dramatically higher in such countries than in industrialized nations. Infection occurs without seasonal variability in warmer climates, and *C. jejuni* is often found with other copathogens.<sup>22</sup> Symptomatic disease in these settings appears most often in young children, and isolation of *Campylobacter* organisms in older individuals is inconsistently associated with symptomatic disease.<sup>22,23</sup> *Campylobacter* species account for 8% of diarrhea of bacterial origin in Western Kenya<sup>24</sup> and 14% in Bangladesh.<sup>22</sup>

*Campylobacter* is also an important cause of travelers' diarrhea, second in incidence to enterotoxigenic *Escherichia coli*. In a study of 322 visitors to Jamaica who experienced diarrhea, *C. jejuni* accounted for 6% of