TABLE. Reasons Given by Survey Respondents for Declining Influenza Vaccination

Reason	No. (%) of repondents		
	Overall (n = 265)	With direct patient contact (n = 86)	Without direct patient contact (n = 179)
The vaccine gives me "flulike" symptoms	78 (29.4)	19 (24.4)	59 (75.6)
I don't believe in vaccines	53 (20.0)	22 (41.5)	31 (58.5)
I just hate shots	33 (12.5)	10 (30.3)	23 (69.7)
I am not at risk for getting the flu	24 (9.1)	5 (20.8)	19 (79.2)
I fear needles	23 (8.7)	3 (13.0)[a]	20 (87.0)[a]
I was already vaccinated at my doctor's office	19 (7.2)	5 (26.3)	14 (73.7)
I am not a risk to any patients or coworkers	10 (3.8)	2 (20.0)	8 (80.0)
I already had the flu	10 (3.8)	4 (44.4)	5 (55.6)
I have an egg allergy	8 (3.0)	5 (62.5)	3 (37.5)
I might consider it if mobile vaccination carts were available for expanded access	6 (2.3)	1 (16.7)	5 (83.3)
I can never find the time to get vaccinated	5 (1.9)	0 (0)	5 (100)
I was vaccinated last year	5 (1.9)	2 (40.0)	3 (60.0)
I was already vaccinated at a pharmacy or clinic	4 (1.5)	1 (25.0)	3 (75.0)

[a] P = .027, Fisher exact test.

plicates our understanding of true institutional rates of immunization. Despite the survey results, the proportion of employees who were vaccinated against influenza increased to 2,203 (44.1%) of 5,000 in the 2006-2007 season. A more aggressive campaign to educate all healthcare workers about the facts and myths of the influenza vaccine will be stressed in subsequent seasons.

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Noreen H. Chan-Tompkins, PharmD; Andrew Sahud, MD; Deborah Pucci, RN, BSN, CCM; Cheryl Herbert, RN, CIC

From the Department of Pharmacy (N.H.C.-T.), the Division of Infectious Diseases (A.S.), Employee Health (D.P.), and the Department of Infection Prevention (C.H.), Allegheny General Hospital; the Mylan School of Pharmacy, Duquesne University (N.H.C.-T.), Pittsburgh, and the College of Medicine, Drexel University, Philadelphia (A.S.), Pennsylvania.

Address reprint requests to Noreen H. Chan-Tompkins, PharmD, Department of Pharmacy, Allegheny General Hospital, 320 East North Avenue, Pittsburgh, PA 15212 (ntompkin@wpahs.org).

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Is Diarrhea Enough to Assess the Severity of *Clostridium difficile*–Associated Disease?

TO THE EDITORS—The most common cause of nosocomial infectious diarrhea in adults is *Clostridium difficile*.[1] Recent reports suggest that *C. difficile* colitis may be evolving into a more severe disease. Both the frequency and severity of *C. difficile* colitis are increasing.[2-4]

We read the article by Dubberke et al.[5] with interest. The authors developed a severity grading system for *Clostridium difficile*–associated disease (CDAD) by modifying the criteria given for grading diarrhea and colitis in the National Cancer Institute's Common Terminology Criteria for Adverse Events (CTCAE), version 3.0. The authors conclude that this CDAD

TABLE. Literature Review of Studies in Which Patients With Severe *Clostridium difficile*–Associated Disease Who Required Colectomy for Fulminant Disease Included a Percentage of Patients Without Diarrhea

Study	Year	Type of study	No. of patients	Patients without diarrhea, %	Postoperative 30-day mortality, %
Koss et al. [9]	2006	R	14	21	35.7
Longo et al. [2]	2004	R	67	37	48
Dallal et al. [3]	2002	R	44	20	57
Grundfest-Broniatowski et al. [6]	1996	R, RV	12	25	41.7
Lipsett et al. [7]	1994	R	13	8	38
Medich et al. [8]	1992	R	10	50	33

NOTE. R, retrospective study; RV, review article.

severity grading system identified patients at high risk for adverse outcomes after CDAD on the basis of presenting symptoms. By the authors' own admission, their sample size limits the generalizability of their conclusion.

Despite the fact that diarrhea is the hallmark of *C. difficile* colitis, it may be absent as a result of severe colonic dysmotility (Table),[2,3,6-9] making fulminant colitis difficult to diagnose. Several recent studies reported that 8%-50% of patients who required total abdominal colectomy for severe *C. difficile* colitis did not have diarrhea at all. Multiple studies have described an association between an immunocompromised state and susceptibility to this opportunistic organism, as well as poorer outcomes.[2-3] Immunosuppressed patients who have undergone solid organ transplantation and patients with an impaired antibody-mediated immune response to *C. difficile* toxins are at an increased risk of fulminant *C. difficile* colitis.[3] Patients who have immunosuppression, a prior history of successfully treated *C. difficile* colitis, and/or who have recently undergone surgical procedures are at the highest risk of developing fulminant *C. difficile* colitis.[3]

Severe fulminant *C. difficile* colitis presents with a systemic inflammatory syndrome that includes abdominal pain, fever, hypotension, tachypnea, leukocytosis, with or without diarrhea.[2-9] Abdominal signs range from distention to generalized tenderness with guarding and acute surgical abdomen.[2-9] Patients usually present with strikingly high white blood cell (WBC) counts, often greater than 20×10^9 cells/L.[2-9] *C. difficile* colitis can account for several serious complications, including perforation, prolonged ileus, megacolon, and death.[2-9] In some patients, life-threatening systemic toxicity can develop despite appropriate and timely medical therapy.[2,3]

Hemodynamic data, as well as respiratory and urinary output data, have been used for severity assessment among patients with *C. difficile* colitis. Dallal et al.[3] classified patients who had systolic blood pressure greater than 100 mm Hg, heart rate greater than 90 beats per minute, moderate tachypnea, and decreasing volume of urinary output that responds to fluid resuscitation as patients with moderate disease; patients who required vasopressors, had a heart rate greater than 120 beats per minute, required mechanical intubation, and had severe oliguria were classified as patients with fulminant disease. Important factors for predicting worse outcomes in such severely ill patients included a higher WBC count,[2-4] renal insufficiency,[4] a preoperative need for vasopressors,[3,9] and age.[3] Pepin et al.[4] report that a high WBC count (20×10^9 cells/L or greater) and an elevated creatinine level (200 mmol/L) were strongly associated with adverse outcomes. Patients who maintained hemodynamic stability without vasopressor therapy prior to surgery had a better survival rate than patients who required vasopressors preoperatively.[3,9] In addition, the survival rate was higher among patients without multiorgan failure, compared with those who experienced multiorgan failure[9]; APACHE II and III scores were higher among nonsurvivors, compared with survivors.[3,10] A lactate level higher than 5 mmol/L was associated with increased mortality.[10]

Thus, we believe that in addition to the grading system developed by Dubberke et al.,[5] one also needs to factor in the above-mentioned clinical, hemodynamic, and laboratory parameters when assessing the severity of CDAD.

M. Raffat Jaber, MD; Mark Reeves, MD, PhD; James Couperus, MD

From the Department of Medicine (M.R.J., J.C.), the Division of Infectious Diseases (J.C.), and the Department of Surgery (M.R.), Loma Linda University Medical Center, Loma Linda, California.

Loma Linda University Medical Center, 11370 Anderson St., Room 1513, Loma Linda, CA 92354 (Mjaber@llu.edu).

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Reply to Jaber et al.

TO THE EDITOR—We appreciate the comments of Jaber et al.[1] regarding our *Clostridium difficile*–associated disease (CDAD) severity grading system.[2] We agree that although diarrhea is the hallmark symptom of CDAD, a comprehensive CDAD severity grading system must also incorporate many of the symptoms that Jaber et al.[1] mention. In fact, only 31 (84%) of 37 patients in our study had diarrhea that was clinically important enough to be documented in their medical charts within 48 hours of CDAD diagnosis, despite the fact that all of them had unformed stool samples collected for *C. difficile* toxin testing.

We would like to emphasize that our CDAD severity grading system is based on the National Cancer Institute's Common Terminology Criteria for Adverse Events (CTCAE), version 3.0, for both diarrhea and colitis.[3] Because of space limitations, we were unable to list all of the CTCAE in our article.[2] In this letter, we provide a Table that details how the CTCAE are used in our grading system. Many of the signs and symptoms mentioned by Jaber et al.[1] are part of the CTCAE for colitis. Grade 2 colitis includes abdominal pain and mucus or blood in stool. Grade 3 colitis includes fever, ileus, and peritoneal signs. Grade 4 colitis includes perforation, gastrointestinal bleeding, ischemia, necrosis, and toxic megacolon. In our patient sample, 24% of patients experienced abdominal pain within 48 hours of CDAD diagnosis, 8% had bloody stool, and 2% had ileus. None of the patients in our study experienced peritoneal signs, perforation, ischemia, necrosis, or toxic megacolon within 48 hours of CDAD diagnosis. Hypotension was captured by the need for intravenous fluids, which is a criterion for grade 2 or 3 diarrhea. Vasopressor use is a component of hemodynamic collapse (which is a criterion for grade 4 diarrhea). In addition

TABLE. Proposed *Clostridium difficile*–Associated Disease (CDAD) Severity Grading System

Condition, source of criteria	System components, by severity category		
	Mild	Moderate	Severe
Colitis			
CTCAE	Grade 1: Asymptomatic; pathologic or radiographic findings only	Grade 2: Abdominal pain; mucus or blood in stool	Grade 3: Abdominal pain, fever, change in bowel habits with ileus; peritoneal signs Grade 4: Life-threatening consequences (ie, perforation, bleeding, ischemia, necrosis, and/or toxic megacolon) Grade 5: Death
Additions	...	...	Hypothermia
Diarrhea			
CTCAE	Grade 1: Increase of <4 stools per day over baseline, mild increase in ostomy output compared to baseline	Grade 2: Increase of 4-6 stools per day over baseline, IV fluids indicated <24 hours, moderate increase in ostomy output compared to baseline, not interfering with ADL	Grade 3: Increase of ⩾7 stools per day over baseline, incontinence, IV fluids indicated ⩾24 hours, hospitalization, severe increase in ostomy output compared to baseline, interfering with ADL Grade 4: Life-threatening consequences (ie, hemodynamic collapse) Grade 5: Death
Additions	Grade 1 or ⩽500 mL intestinal output per day	Grade 2 or 501-1,000 mL intestinal output per day	CTCAE grade 3 or 1,001-2,000 mL intestinal output per day **or** CTCAE grade 4 or ⩾2,000 mL intestinal output per day

NOTE. ADL, activities of daily living; CTCAE, Common Terminology Criteria for Adverse Events; IV, intravenous.

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