

TABLE
ANNUAL RATES OF *CLOSTRIDIUM DIFFICILE*-ASSOCIATED DIARRHEA

	Cases	Discharges	Rate per 1,000	
			Discharges	Patient Days
1982	149	15,018	9.9	211,185
1983	122	15,771	7.7	203,290
1984	81	16,509	4.9	202,530
1985	116	16,274	7.1	195,264
1986	86	15,666	5.5	187,384
1987	83	15,809	5.3	179,013
1988	59	16,412	3.6	179,695
1989	50	15,753	3.2	166,478
1990	62	15,736	3.9	164,972
1991	100	15,704	6.4	162,379

to 1991, and no single REA type accounted for more than 10% of CDAD cases in 1990. In 1988 and 1989, REA types Y1 and L1 accounted for 13% and 18% of CDAD cases, respectively.

Delay in changing gloves also may account for this increase in CDAD cases, but we have no data to support this hypothesis, nor are any presented by Manian and Meyer. However, we do have data to indicate that a change in the *C. difficile* organisms occurred in 1991. Our data suggest a decreased or low CDAD rate in 1988, 1989, and 1990 (the first years of body substance isolation and presumed increased glove use) and an increased rate in 1991 (double the rate of 1989). To support inappropriate use of gloves as a causative factor in our institution, we would have to postulate a breakdown in usage practice in 1991 that did not occur from 1988 through 1990, an hypothesis that is possible but difficult to prove.

We also have typed *C. difficile* strains from the peak CDAD incidence months of 1982 to 1987 and have shown that during the high incidence years of 1982, 1983, and 1985 (Table), two closely related REA types, B1 and B2, accounted for 64% of all CDAD cases.² Types B1 and B2 were never found after mid-1986. These data lead us to postulate that changes in epidemic or endemic *C. difficile* organisms may account for the variability in CDAD rates from year to year, although we cannot rule out changes in infection control practices as also

possibly playing a role in these changing CDAD rates.

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REFERENCES

1. Clabots CR, Bettin KM, Olson MM, et al. An increased rate of *Clostridium difficile*-associated diarrhea caused by appearance of a new *C. difficile* strain. Presented at the 32nd Interscience Conference on Antimicrobial Agents and Chemotherapy; October 11-14, 1992; Anaheim, California. Abstract 481.
2. Clabots CR, Pearson AC, Bettin K, et al. Typing of *Clostridium difficile* strains responsible for epidemics in a hospital with a high endemic incidence of *C. difficile*-associated diarrhea. Presented at the 31st Interscience Conference on Antimicrobial Agents and Chemotherapy; September 29-October 2, 1991; Chicago, Illinois. Abstract 1520.

Defining Catheter-Related Infections

To the Editor:

I want to congratulate Dr. Raad et al (1994;15:231-238) for their important article on the prevention of central venous catheter-related infections by using maximal sterile barrier precautions during insertion.

However, there does appear to be a contradiction in the article. On page 235, they report that 25% of the catheter-related septicemias in the MSB arm

occurred during the first 2 months of follow-up, but in the table on page 236, the only septicemia occurring in that arm of the study appears to have occurred 98 days after insertion.

They use reasonable definitions of significant colonization of catheters and catheter-related septicemias. However, it would have been more appropriate in the abstract of the article to refer to numbers of patients with catheter colonization or catheter-related septicemia rather than referring to both groups together as catheter-related infections. Their definition of catheter-related infections can only be inferred from the article.

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The author replies.

We appreciate the comments and correction by Dr. Nafziger. The issue raised here is very important and relates to the definitions of catheter-related infections. In the past, significant colonization (≥ 15 colony-forming units per catheter segment) was referred to as local catheter infection.^{1,2} In this article, we tried to differentiate catheter-related septicemia (infection) from significant colonization. Because significant colonization was considered a prelude for septicemia, we often used the term "catheter-

related infection/colonization" (page 235, paragraph 4, and page 237, paragraph 1) to refer to either septicemia or significant colonization. Although we often referred to the two entities together as "infection/colonization" (page 236, paragraph 2), we never referred to colonization alone as infection or "referred to both groups together as catheter-related infections." We agree with the correction made by Dr. Nafziger (page 235, para-

graph 3, line 5) that none of the catheter-related septicemias in the MSB group (rather than 25%) occurred in the first 2 months after insertion. This will make the difference between the two groups more significant.

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2. Maki DG, Cobb L, Garman JK, Shapiro JM, Ringer M, Helgerson RB. An attachable silver-impregnated cuff for prevention of infection with central venous catheters: a prospective randomized multicenter trial. *Am J Med* 1988;85:307-314.