

Risk of Clostridioides Difficile Infection After Kidney Transplant

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Background

- *Clostridioides difficile* is a toxin producing bacteria that can cause diarrhea, gastrointestinal inflammation, and even death in severe cases.
- Risk factors for developing *Clostridioides difficile* infection (CDI) include antibiotics, gastric acid suppressants, age > 65 years, and increased length of hospital stay.
- When looking at patients with a history of CDI, there is a reported 20 – 30% increased risk of experiencing a reinfection, suggesting that a prior history of CDI could be another risk factor
- There are currently no recommendations from the IDSA and SHEA CDI guidelines for the prevention of reinfection with CDI, stating there is a lack of evidence

Purpose

- To identify risk factors for the recurrence of CDI 90 days after receiving a kidney transplant

Study Design and Methods

- A single-center, retrospective cohort study comparing kidney transplant recipients with a history of CDI prior to transplant surgery to controls
- Controls were randomized to CDI arm in a 2:1 fashion
- CDI was identified via *Clostridioides difficile* toxin assay, culture growth, or noted history of CDI with an administration of medications (oral vancomycin, fidaxomicin, metronidazole) indicated for CDI treatment
- Medical records reviewed from 148 patients within the UCHealth system
- Information collected: demographics, transplant details, length of hospital stay, RRT, CMV serology, post-transplant immunosuppression, steroid withdrawal, immunosuppression and antibiotics pre/post-transplant, antibiotic indication, antibiotic duration, CDI pre/post-transplant, CDI treatment, and severity of post-transplant CDI

Inclusion Criteria

Age > 18 years
Kidney transplant recipient
CDI was identifiable with aforementioned criteria

Exclusion Criteria

Death during index hospital stay
Dual transplant
Transplanted at a different institution

Results

Table 1. Patient Baseline Characteristics

	Total Population (n = 146)	Control (n = 102)	Pre-Transplant CDI (n = 46)	p-value
Gender				0.81
Male, n	79 (53.4%)	53 (52%)	26 (56.5%)	
Female, n	68 (45.9%)	48 (47.1%)	20 (43.5%)	
Other, n	1 (0.7%)	1 (1%)	0 (0%)	
Age, mean (range), years	51.20 (20– 77)	50.52 (20 - 75)	52.72 (22 - 77)	0.41
Race, n				
Caucasian	115 (77.7%)	83 (81.4%)	32 (69.6%)	0.17
Hispanic or Latino	39 (26.4%)	28 (27.5%)	11 (23.9%)	0.80
Black	10 (6.8%)	2 (2%)	8 (17.4%)	0.001
Other	26 (17.6%)	16 (15.7%)	10 (21.7%)	0.51
RRT, n	121 (81.8%)	79 (77.5%)	42 (91.3%)	0.07
Thymoglobulin Ind., n				0.16
4.5mg/kg	93 (76.9%)	68 (82.9%)	25 (64.1%)	
2.25mg/kg	8 (6.6%)	4 (4.9%)	4 (10.3%)	
1.5mg/kg	7 (5.8%)	4 (4.9%)	3 (7.7%)	
6mg/kg	7 (5.8%)	3 (3.7%)	4 (10.3%)	
3mg/kg	5 (4.1%)	3 (3.7%)	2 (5.1%)	
Other	1 (0.8%)	0 (0%)	1 (2.6%)	

Continuous variables are reported as mean values, with ranges in parentheses. Categorical variables are reported as the absolute number of participants, followed by the percentage of the patient population in parentheses.

Most Common Indications for Transplant

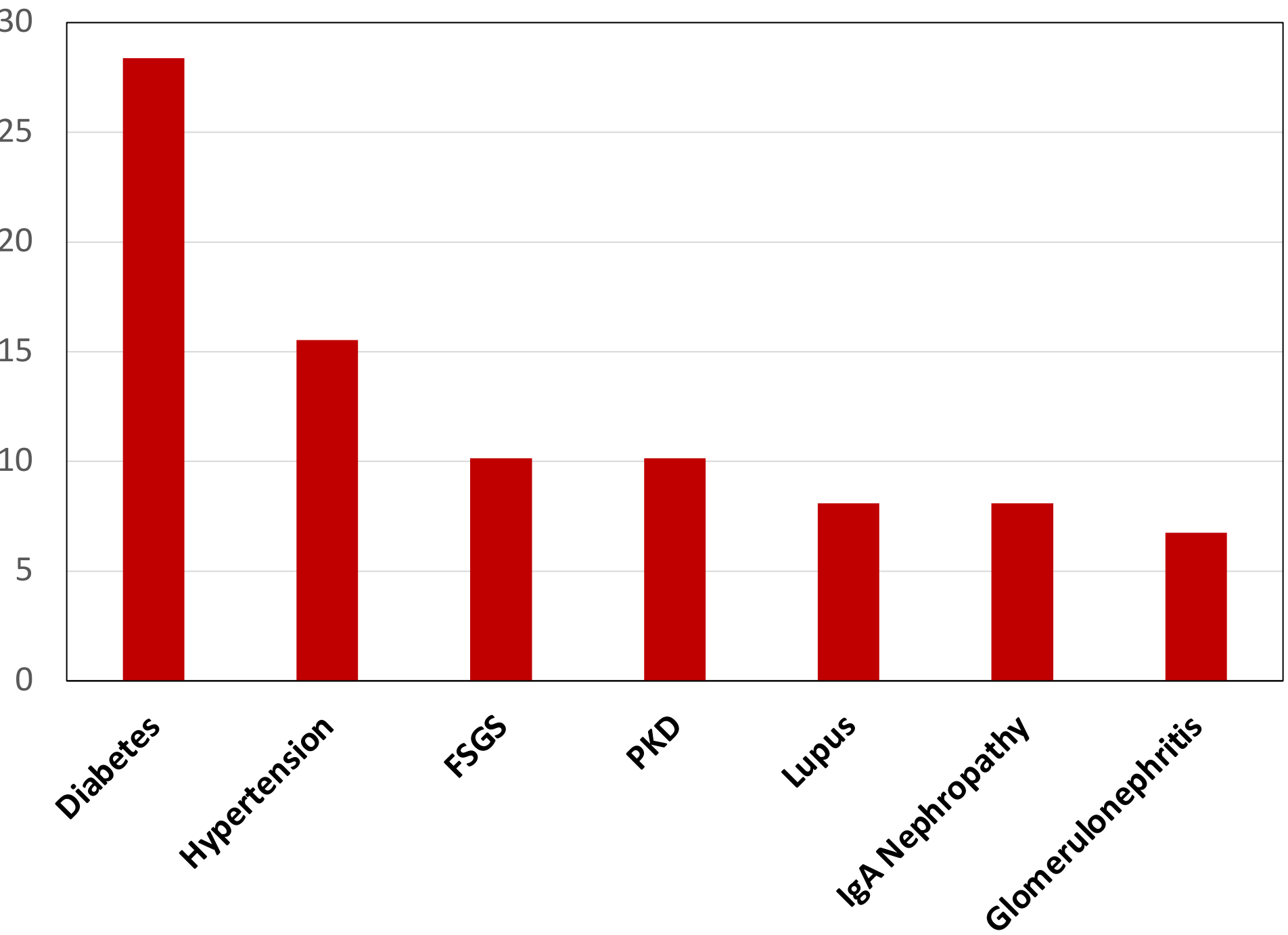


Figure 1. Most common indications for transplant. Many patients had more than one indication, in which case they were reported more than once. Other indications include pyelonephritis, RCC, HUS, reflux nephropathy, ANCA vasculitis, and Wegner's disease

Statistical analysis

Data type	Test used
Count Data	Fisher's Exact Test
Continuous Data	Welch Two Sample t-test
Categorical Data	Chi-Squared test w/ Yates Continuity Correction

Risk of CDI 90 and 365 days after Kidney Transplant

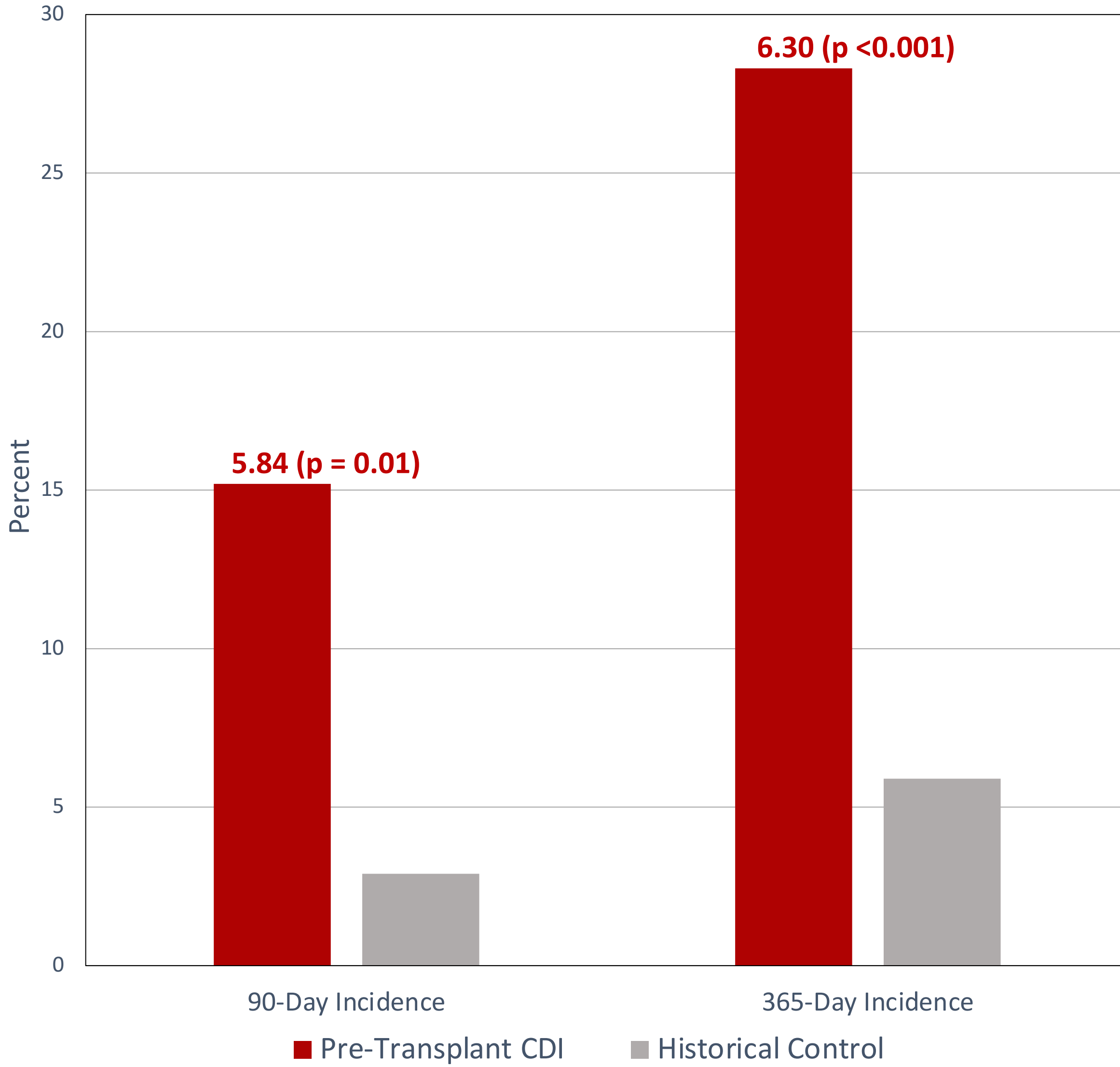


Figure 2. Study outcomes within 90 days and 365 days of kidney transplant. Numbers listed are the odds ratios with p-values in parentheses. Bold-faced and maroon-colored values indicate statistical significance.

Results

Table 2. Subgroup Analysis

	Control (n = 102)	Pre-Transplant CDI (n = 46)	p-value
Delayed Graft Function, n	9 (8.8%)	12 (26.1%)	0.01
PPI use 90-days post-transplant, n	63 (61.8%)	32 (69.6%)	0.46
Duration of post-transplant antibiotics, mean (range), days	30.29 (1 - 97)	23.92 (2 - 61)	0.08
Length of Hospital stay, mean (range), days	5.21 (3 - 18)	5.93 (3 - 17)	0.11

Limitations

- Small sample size of convenience for exploring a rather rare patient population
- Single centered study

Conclusions

- Kidney transplant recipients with a history of CDI prior to transplant have a significantly increased risk of CDI 90 days and 365 days after transplant
- Antibiotic prophylaxis should be evaluated in this population
- Further investigation regarding the association with pre-transplant CDI and delayed graft function is warranted.

Affiliations & Disclosures

No conflicts of interest or financial disclosures to report

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