Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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have made an important attempt toward fair cardiac surgery resource allocation.

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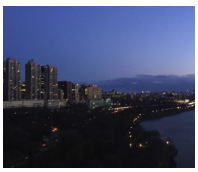

LOW RATE OF HEALTH CARE-ASSOCIATED TRANSMISSION OF CORONAVIRUS DISEASE 2019 (COVID-19) IN THE EPICENTER

To the Editor:

As New York City emerged as a hotspot in the coronavirus disease 2019 (COVID-19) pandemic, elective procedures were stopped statewide,[1] and hospitals prepared to expand intensive care unit (ICU) capacity.[2] Before the pandemic, NewYork-Presbyterian/Columbia University Irving Medical Center (NYP/CUIMC), a quaternary referral center in northern Manhattan, had approximately 117 ICU beds. Additional ICU capacity was created using nontraditional space, including 13 operating rooms repurposed as an 80-bed ICU. At the height of the pandemic in mid-April, a maximum of 255 patients was present in the ICU, of whom 236 were patients with COVID-19.

The approach to bed allocation at NYP/CUIMC began with identifying specific ICUs and floors as "COVID-19 units" in early March 2020. When possible, rooms in COVID-19 units were retrofitted for negative pressure to minimize exposure of health care workers. Use of these rooms was prioritized for patients undergoing aerosol-generating procedures, such as endotracheal intubation or use of noninvasive ventilation.

Policies were also implemented and updated in an iterative fashion. These included contact and droplet isolation precautions for patients with COVID-19 and patients under investigation; use of N95 respirators prioritized for use during aerosol-generating procedures first for patients with COVID-19 and later for allowable all patients; universal health care worker "masks on" policy starting March 25, 2020; and routine preadmission testing of all patients starting April 4, 2020.

As the number of admitted patients with COVID-19 continued to grow, the bed-allocation strategy shifted from designation of "COVID-19 units" to designation of "COVID-19–free units," which would not admit patients positive for COVID-19. The main cardiothoracic ICU (Unit 1) and the cardiac surgical stepdown and floor unit (Unit 2) were designated "COVID-19–free," owing to their substantial populations of immunosuppressed patients. The only other COVID-19–free unit was an 18-bed oncology unit. Nursing staff was dedicated to these units, although respiratory therapists could be reassigned between COVID-19 units and COVID-19–free units on a daily basis, and physician attendings in the ICU were assigned to Unit 1 for a week at a time. Staff adhered to hospital infection-control policy (eg, "masks on" at all times starting March 25, 2020) whether working in a COVID-19 unit or a COVID-19–free unit. Units 1 and 2 were on the fifth floor. COVID-19 units were located on floors 3 through 9, including several units also on the fifth floor. COVID-19 units were contiguous to Unit 1 and Unit 2, including 2 units directly connected by sets of doors to Unit 1.

Even in the epicenter of the pandemic, NYP/CUIMC continued to provide surgical care on an emergency basis. All surgical patients negative for COVID-19 requiring ICU care were admitted to Unit 1. In anticipation of the reanimation of the cardiac surgical program, the Cardiothoracic Surgery Quality Assurance Committee reviewed all patients admitted from March 1 to April 27, 2020. The intent was to characterize health care–associated acquisition of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in these COVID-19–free units in an effort to determine the safety of performing surgery on a potentially vulnerable population in a hospital with a high census of patients with COVID-19.

For patients admitted to Unit 1 and Unit 2 during the study period, the electronic medical record was reviewed for all SARS-CoV-2 viral polymerase chain reaction

TABLE 1. COVID-19 testing in COVID-19–free units

	Unit 1: ICU	Unit 2: stepdown/floor
Hospital preadmission test positive	**1**	0
Hospital preadmission test negative	51	130
Subset of patients with positive tests, likelihood of acquisition on unit		
Likely	0	**2***
Possible	**1**	0
Unlikely†	**1***	**2**
Not possible	0	**5**
No hospital preadmission test	38	91
Subset of patients with positive tests, likelihood of acquisition on unit		
Likely	0	0
Possible	0	0
Unlikely†	**1**	0
Not possible	**1**	**4**
Total positive tests	**5**	**13**
Total admitted patients	90	221
Unit nosocomial acquisition rate (including likely)	0%	0.9%
Unit nosocomial acquisition rate (including likely, possible)	1.1%	0.9%

Bolded values represent patients positive for COVID-19. *ICU*, Intensive care unit. *One patient falls in 2 categories: "unlikely" for Unit 1 and "likely" for Unit 2. †Reasons for "unlikely": acquisition likely before unit admission (n = 3), acquisition likely after unit discharge (n = 1).

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(PCR) results and time–course of infection. An independent infectious disease specialist assessed every positive PCR and classified the infection as "unlikely," "possible," or "likely" health care–associated infection based on clinical course and timing of potential exposures. (Table 1) For patients in Unit 2, the disposition after hospital discharge was also reviewed.

Of 90 patients admitted to Unit 1 during the study period, 5 had positive PCR. Of these 5, none had "likely" acquisition during the Unit 1 stay. One had "possible" acquisition in Unit 1, and another had "likely" acquisition after the Unit 1 stay while in Unit 2. Three additional patients were determined to have acquired COVID-19 before admission to Unit 1, including a patient inadvertently admitted from the emergency department with a positive preadmission test and 2 postoperative patients. In these 3 cases, the patients were transferred to an appropriate COVID-19 unit when the positive test was noted. The rate of health care–associated acquisition of COVID-19 in Unit 1 was between 0% and 1.1% (0-1 of 90 patients) during the entire study period. The rate of health care–associated acquisition of COVID-19 from April 1 to April 27, 2020, was between 0% and 2% (0-1 of 50 patients).

Of 221 patients admitted to Unit 2 during the study period, 13 had positive PCR for SARS-CoV-2. Of these 13, 9 were noted to be positive on testing performed immediately before admission or immediately after admission, meaning acquisition on this unit was not possible. Of these 9, 6 were from the emergency department, 2 transferred from the floor with known COVID-19, and 1 was postsurgical. Of the 13, the other 4 tested positive after discharge from the hospital, and only 2 of these 4 were concerning for health care–associated acquisition based on having spent substantial time in the unit. The rate of health care–associated acquisition of COVID-19 in Unit 2 was 0.9% (2 of 221 patients). The rate of health care–associated acquisition of COVID-19 from April 1 to April 27, 2020, was 0% (0 of 106 patients).

Our study period from March 1 to April 27, 2020, included many changes to processes in care. These included facility upgrades for negative-pressure rooms, bed-allocation strategy shifts, and updated infection prevention and workflow policies that affected health care worker behavior. For example, signage was placed at connecting doors between Unit 1 and the adjacent COVID-19 units to discourage foot traffic. In addition, improved turnaround time for PCR tests meant that patients in the later portion of the study period stayed in their current location until the test resulted, rather than being admitted as a "patient under investigation." Given a sensitivity thought to be in the 60% to 70% range, 2 consecutive negative PCR tests were required to consider a patient under investigation as negative for COVID-19. This study's methods cannot separate the relative impact of each intervention. It is noteworthy that subgroup analysis of patients admitted after April 1, 2020, once the majority of these changes were implemented, was not significantly different from previously ($P = .55$).

In conclusion, we have observed a very low rate of health care–associated transmission of SARS-CoV-2 in

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a large academic center in the epicenter of the COVID-19 pandemic. We have also observed that this low rate was present throughout a time period that spans all of the institutional mitigation efforts through the surge of patients with COVID-19. Notably, this very low rate of transmission was achieved in COVID-19–free units surrounded—above, below, and beside—by COVID-19 units.

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REPLY: KEEPING SURGICAL PATIENTS SAFE DURING THE CORONAVIRUS DISEASE 2019 (COVID-19) PANDEMIC: LOS ANGELES VERSUS NEW YORK CITY

Reply to the Editor:

The epidemiologic characteristics of the pandemic caused by the severe acute respiratory syndrome coronavirus 2 virus have been strikingly different in Los Angeles and New York, yet the effect and carnage have been equally abhorrent. The huge tsunami of cases and death in New York seem to have subsided, while the unrelenting barrage of coronavirus disease 2019 (COVID-19) on Los Angeles continues. As we now write, our intensive care unit bed census is greater than 90%, and personnel from the Department of Defense are at our doorstep to provide assistance.

While the dynamics have been different, early on, we apprehensively watched and communicated with our colleagues in New York, especially regarding our common desire to safely care for patients with non-COVID-19–related surgical disease. The necessity of this was made apparent to the authors on April 2, 2020, when we learned (while operating) that a patient seen in clinic 2 weeks earlier with multivessel coronary disease presented to the emergency department in cardiac arrest. At first impression, it was hard to believe the cause was COVID-19. But it was; if not for COVID-19, we may already have performed the coronary bypass. The effect of COVID-19 goes far beyond those who have this virus.

Hastie and colleagues[1] from New York Presbyterian/Columbia University Irving Medical Center in New York report that the rate of hospital-acquired transmission of COVID-19 can be kept to very low levels, despite the rendering of care in closed units while being virtually surrounded by viral infection. This is consistent with reports from surgical colleagues in other countries, such as Greece and Italy, where the infection rates were high at earlier time points than in the United States. It appears that carefully crafted infection control efforts within health care facilities do work to limit transmission of viral infection.

Like other facilities, we cancelled all but urgent or emergent operations on March 16, 2020. By the end of April, we implemented universal testing of patients admitted to the hospital. We also started to increase the number of scheduled procedures to include those in which surgeons thought needed to be done within 1 month. It was not until May 26, 2020, that we were able to establish a universal preoperative testing protocol of outpatients for COVID-19. We currently are still limiting scheduled operations to those which need to be done within 1 month, and our operating room volumes are at about 50% of pre–COVID-19 workflow.

Hastie and colleagues should be commended for their pioneering work and dedication to caring for both patients with and without COVID-19 and for facilitating the safe care of surgical patients without COVID-19. COVID-19 may not be a surgical disease, but it is incumbent on every physician, regardless of training, to apply their skills to this pandemic. We challenge everyone to do their part to contribute. This is our