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society at large, and the health care team.<sup>4</sup> Modeling studies from throughout the pandemic have further emphasized that it will take time for hospitals to clear their backlog, depending on their respective operative capacity in the post-COVID period<sup>5</sup> and the potential consequences that waiting could have on patients requiring more urgent operative care. We believe that a stepwise/tiered reopening approach that focuses on minimizing infection risk is prudent and will simultaneously ensure that patients in need of care are not endlessly caught in the crosshairs of surgeons' and hospitals' struggle with how best to answer the difficult question of when is the right time to operate or wait.

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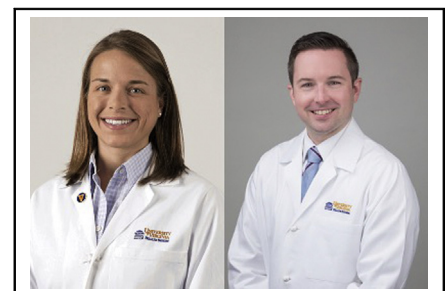
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## Commentary: Cardiac surgery in COVID patients: Figuring it out as we go

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Since the outbreak of the novel SARS-CoV-2 (COVID-19) viral pandemic in late 2019, the entire world has had to make decisions, ranging from how to treat the profound respiratory complications of COVID-19 pneumonia to how to maintain a globalized economy with significant travel and trade restrictions, based on very limited information. Despite our limited knowledge of this disease, many of those decisions have had an enormous impact on our day-to-day lives, forcing everyone to grapple with uncertainty and changing norms. Although our knowledge of this virus and how to manage it has grown exponentially over the last year, this brief communication by the Cardio-Thoracic

**CENTRAL MESSAGE**

COVID infection in patients undergoing cardiac surgery is associated with significant morbidity and mortality, but more information is needed to guide clinical decision making.

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Interdisciplinary Research Network and COVIDSurg Collaboration serves as a reminder of how little we know about COVID-19 and its sequelae.<sup>1</sup>

In this multicenter international observational cohort study, unadjusted outcomes of patients undergoing cardiac surgery with known COVID-19 infection within the perioperative period (7 days preoperatively up to 30 days postoperatively) were examined. Patients who contracted COVID-19 in the perioperative period exhibited higher than normal rates of respiratory complications, including prolonged mechanical ventilation and pneumonia.<sup>2</sup> The authors also report

a 20.8% mortality among patients who were diagnosed with COVID-19 within 30 days of surgery. These findings underscore the incredible clinical impact that COVID-19 infection can have, even among patients undergoing “minor” procedures. These data should give all cardiac surgeons pause, and highlight the importance of vigilance to prevent perioperative COVID-19 infection.

This study has some limitations, which are a reflection of its accelerated nature and a desire for timely results in the face of an oft-changing pandemic. The series includes only patients operated on before July 2020, relatively early in the pandemic, when our methods of diagnosing, treating, and preventing this disease were very much in their infancy. Furthermore, the study lacked a comparison group and risk stratification of the study population. Unfortunately, with this study design, it is unclear whether the patients who contracted COVID-19 were at higher risk for any pulmonary complication. Without a comparison group or risk stratification of the patients, it is also difficult to accurately interpret the high mortality rate, given that 64.7% of these operations were performed emergently, 70.0% of the patients were men, and 62.3% of the patients were over age 60, all of which are established risk factors for mortality.<sup>3-5</sup> The authors did, however, attempt to mitigate some of these confounders by including a subgroup analysis in which

they compared characteristics between survivors and nonsurvivors.

Despite its limitations in data and design, this study is a step toward a better understanding of COVID-19 and represents the start of this growing body of literature. The authors attempted to draw logical conclusions from their limited data and use that to make recommendations for improved patient care during this pandemic. We can use studies such as these as stepping stones and keep figuring things out as we go, just as everyone has had to do navigate this post-COVID world.

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