

## Commentary

# Finding the off-ramp: Rethinking severe acute respiratory coronavirus virus 2 (SARS-CoV-2) preoperative screening

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The coronavirus disease 2019 (COVID-19) pandemic has driven rapid changes in the management of patients in surgical and procedural settings including the use of PPE and, for many US hospitals, preprocedural testing protocols. The recent study by Tande et al<sup>1</sup> leveraged preoperative testing data to evaluate vaccine effectiveness against asymptomatic COVID-19 by reviewing >50,000 screening tests from an 8-month period in 2021 at healthcare settings in Minnesota. This study presented evidence of the sustained effectiveness of the current mRNA vaccines against COVID-19, but it also reported a low rate of positivity in both vaccinated and unvaccinated patients (0.30% and 1.23% respectively).<sup>1</sup> Although it is reassuring to see continued data supporting the efficacy of COVID-19 vaccinations, these very low prevalence rates also raise the question of the utility of preprocedural severe acute respiratory coronavirus virus 2 (SARS-CoV-2) testing in asymptomatic patients.

### What is the goal of preprocedural COVID-19 screening?

The goal of preprocedural screening is generally 2-fold: to prevent patient harm due to postprocedural complications related to COVID-19 infection<sup>2</sup> and to decrease potential exposure and transmission to healthcare personnel and other patients.<sup>3</sup> Not every procedure, however, poses a risk to the patient with unrecognized COVID-19 infection. If the patient has asymptomatic COVID-19 at the time of the procedure and is among the 33.3%<sup>4</sup> of individuals who never develop symptoms, the outcome of even a major surgery is not likely to be affected by the infection, and it is therefore in the patient's best interest to proceed with the procedure. Patients who are presymptomatic or are symptomatic but are not recognized as such at the time of the procedure stand to benefit most from testing, but only if the procedure itself would lead to a worse outcome than the infection would in the absence of the procedure. Those procedures are likely limited to those performed under general anesthesia that are either major in nature or are conducted on patients with comorbidities.<sup>2</sup> The efficacy of personal protective equipment (PPE) in protecting healthcare workers has been well demonstrated,<sup>5</sup> and many hospitals have maintained a policy of full PPE use, including N95 respirators, during all aerosol-generating procedures. Doing so is safer than relying on testing,

which is often conducted several days before the procedure, leaving time for the patient to develop infection in the interim.

### Designing appropriate preprocedural testing protocols

Preprocedural testing, particularly if applied in a universal fashion to all patient procedures, can be time consuming, inconvenient, and costly for the healthcare system and the patient. Throughout the pandemic, patients have had their care deferred (by choice) due to concerns of potential exposure to COVID-19 in healthcare settings and as a result of curtailing of routine services.<sup>6</sup> Placing additional barriers to treatment in the form of complicated testing protocols is a detriment to both individual and public health. Therefore, the primary goal of preprocedural testing should be reducing harm by identifying infection in patients likely to suffer poor outcomes were they to undergo a procedure in the setting of unrecognized COVID-19 infection.<sup>7</sup> In light of the effectiveness of COVID-19 vaccines at preventing severe disease, it is important that vaccination status be included in decisions regarding preprocedural testing. Emergence of novel variants with immune evading capacity should always prompt reconsideration of these protocols, particularly if they impact the efficacy of vaccines against severe disease.

Pretest probability, which is affected by both vaccination and/or immunity status and community prevalence of infection, affects the predictive value of the test, with an increased risk of false positive results, and subsequent cancellation of procedures, when the likelihood of positivity is low. Some professional society guidelines have incorporated this concept into their recommendations,<sup>8</sup> specifying community prevalence rates at which routine asymptomatic preprocedure testing should be paused. We support this approach, and we would also limit testing to unvaccinated or vaccinated but immunocompromised patients who are unlikely to mount a sufficient immune response to vaccination. An appropriate threshold at which to discontinue preprocedural testing is when pre-procedure asymptomatic test positivity reaches 1% and is sustained at that level. At this point, assuming a test specificity of 99%,<sup>9</sup> the positive predictive value drops to 50%, meaning that half of positive results are falsely positive. Determining when testing should be reinstated is more complicated. However, assuming that when community prevalence doubles, the asymptomatic prevalence does so also, using a protocol that resumes testing when the community case rate has doubled would improve positive predictive value to 66%.

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**Cite this article:** Penney JA and Doron SI. (2022). Finding the off-ramp: Rethinking severe acute respiratory coronavirus virus 2 (SARS-CoV-2) preoperative screening. *Infection Control & Hospital Epidemiology*, 43: 918–919, <https://doi.org/10.1017/ice.2022.2>

### Challenges of preprocedural testing: Deimplementation

Regardless of the existence of scientific evidence suggesting that a practice is ineffective or harmful, deimplementation of any entrenched protocol can be extraordinarily difficult.<sup>10–12</sup> Strategies that utilize more targeted testing protocols add additional logistical and communication complexities that poses challenges in deimplementation but would ultimately better serve our patients. Within healthcare, additional unique challenges that must be faced include fear and anxiety experienced by healthcare workers over the practice that is to be deimplemented, inaccurate perception regarding the importance of the practice, and lack of trust in the healthcare establishment.<sup>12</sup> These challenges have been especially prominent throughout the SARS-CoV-2 pandemic, given rapidly changing scientific discoveries, and they have been exacerbated by the PPE shortages that have led to front line workers to feel unprotected. Strategies to deimplementing preprocedural testing will therefore need to be multilevel and will need to involve support from leadership, to include education of clinicians, and to provide regular reminders about the importance of healthcare worker safety to hospital administration. Ultimately, the goal of preprocedural SARS-CoV-2 testing is to protect patients, and we can do this without increasing the risk to procedural staff. To achieve this goal, we must begin the process of changing practices that may ultimately cause harm.

**Acknowledgments.** The views and opinions expressed here belong to the authors alone; they do not necessarily reflect the official views or endorsement of their affiliated institution or the National Institutes of Health.

**Financial support.** This work was supported by the National Center for Advancing Translational Sciences (NCATS), National Institutes of Health (award no. TL1TR002546 to J.P.). This work was also supported by the Francis P.Tally, MD, Fellowship in the Division of Geographic Medicine and Infectious Disease and the Tufts University Clinical and Translational Science Institute.

**Conflicts of interest.** All authors report no conflicts of interest relevant to this article.

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