

First Do No Harm: Moving Beyond Universal Preprocedural Testing for COVID-19

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Preprocedural testing for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was introduced early in the pandemic in an effort to protect health care workers, direct appropriate use of personal protective equipment (PPE), and improve patient outcomes. In light of our appreciation for the efficacy of PPE and the nuances associated with interpretation of polymerase chain reaction testing for SARS-CoV-2, particularly as community transmission decreases, we call for a re-evaluation of universal preprocedural testing. We propose a transition to a patient-centered approach, focusing on testing patients whose outcomes would be improved by a delayed procedure in the event of a positive test and a greater reliance on appropriate PPE rather than preprocedural test results. We recommend that a community infection rate threshold be set at which point preprocedural testing is discontinued, understanding that there is an inflection point at which testing downsides outweigh the benefits.

Keywords. COVID-19; preprocedure; SARS-CoV-2; testing.

The coronavirus disease 2019 (COVID-19) pandemic has forced a rapid evolution in the use of personal protective equipment (PPE) and testing strategies for the detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In March 2020, US hospitals canceled all but the most urgent surgeries anticipating increased inpatient care needs. “Reopening” plans of many hospitals include preprocedural testing protocols in some form to protect providers and guide use of the limited supplies of PPE. In light of improved PPE supplies and effective vaccines, we must now ask ourselves if universal preprocedural SARS-CoV-2

testing is in the best interest of our patients or necessary for the optimal safety of our health care providers.

UNDERSTANDING AEROSOL-GENERATING PROCEDURES

While current guidelines recommend surgical mask and eye protection for all clinical care [1] due to the possibility that a patient could develop COVID-19 infection at any time, this is considered insufficient should a patient undergo an aerosol-generating procedure (AGP) [1]. These procedures are defined as those that generate aerosols that travel >6 feet from the patient and potentially circumvent standard surgical masks, thus requiring the use of an N95 for safety [2]. The list of procedures that should qualify as AGPs remains controversial [3], with data supporting that the highest-risk scenarios are not, as was thought early on, procedures such as intubation [4] or high-flow oxygen administration [5], but those involving prolonged close contact with coughing patients [6]. Confusion over AGPs has led to the use of preprocedure testing and/or N95s in contexts that are lower risk such as endoscopies and the second stage of labor. Given the complexities of AGP classification

and viral transmission, and with current preprocedure testing practices across the country that are not necessarily targeted to the highest-risk situations, we must re-evaluate our use of testing to maximize the benefit for both providers and patients.

WHAT WE KNOW ABOUT SARS-COV-2 TESTING

A screening test represents a single snapshot in time. Negative test results can provide a false sense of security to clinicians, as patients may be in the incubation period. Furthermore, positive test results do not always equate to infectivity, as the median duration of polymerase chain reaction (PCR) positivity is 34 days, while the window of infectivity is usually no more than 12 days [7]. This means that ~60%–70% [8] of positive test results in asymptomatic preprocedural patients do not represent transmissible infection. PCR tests are also not perfect, with an estimated sensitivity of 87.8% [9]. Frequently performed within 72–96 hours before a procedure, the test’s negative predictive value decreases with increasing time between test and procedure. Even during periods of high community transmission of SARS-CoV-2,

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preprocedural positivity rates are low [8], and when community rates decline, the rate of positive preprocedural tests drops even further, and with it the positive predictive value of the test [8].

EFFICACY OF PPE

The reliability of PPE in infection prevention in health care settings has been consistently demonstrated. Screening of asymptomatic hospital employees has shown SARS-CoV-2 rates similar to the community, presumably due to the wearing of PPE [9]. Other studies have demonstrated the effectiveness of PPE in preventing infection after exposure to an AGP [8, 10]. Thus, reliance on the use of PPE, regardless of the patient's COVID-19 status, is a safer strategy for health care workers than using preprocedure testing to determine necessary PPE.

MORBIDITY AND MORTALITY ASSOCIATED WITH COVID-19 AFTER DIAGNOSTIC AND INTERVENTIONAL PROCEDURES

Preprocedural testing is also intended to prevent morbidity and mortality that might result from performing a procedure in the setting of unrecognized COVID-19. Postoperative pulmonary complications are most common, with high associated mortality [11, 12]. The highest-risk procedures are those performed on older patients, those using general anesthesia, and those undergoing major or emergency procedures [12]. Nevertheless, many hospitals test all preprocedural patients, regardless of their associated risk.

Furthermore, delaying procedures due to positive SARS-CoV-2 tests can be associated with negative health outcomes, as is the case with procedures to diagnose or treat cancer [13] or other progressive conditions. Unfortunately, the impact of these delayed surgeries as a result of testing has not been studied or quantified. Establishing a shared decision-making practice that clearly outlines the risks and benefits of proceeding with the scheduled procedure without testing

may result in better outcomes than universal testing.

LOGISTICAL CONSIDERATIONS AND IMPACT ON MEDICAL CARE

The operational aspects of preprocedural testing can be time-consuming, inconvenient, and costly for the health care system and the patient. For elective procedures, coordination of the appropriate timing of testing can be frustrating for all parties. For urgent and emergent procedures, waiting for test results can delay necessary care. The Infectious Diseases Society of America recommends against the use of antigen tests for preprocedure testing due to their low sensitivity [14]. And while newer rapid PCR testing can mitigate the delay, their supply remains constrained. While health care workers can protect themselves with PPE, another concern is the safety of other patients in the postanesthesia recovery unit (PACU). We suggest maintaining 6 feet of space between beds in the PACU and the use of private spaces or aerosol containment devices [15] when unvaccinated patients undergo AGPs in the same room as other patients.

Throughout the pandemic, patients have been delaying care due to concerns of potential exposure to COVID-19 in health care settings [16]. Delaying treatment further through complicated testing protocols is a detriment to the health of our patients.

RECOMMENDATIONS FOR PREPROCEDURAL SARS-COV-2 TESTING IN THE COMING ERA

We must re-evaluate our reliance on preprocedural SARS-CoV-2 testing, particularly now, in the era of vaccination. From a public health standpoint, we agree [17] that increasing the capacity and reach of testing is paramount to address this pandemic. However, universal preprocedural testing does not improve the outcomes of our patients or the safety of health care providers. Further, effective vaccines have been demonstrated to prevent symptomatic disease and

hospitalizations [18], and vaccination status should be considered in the testing algorithm.

First, we must ensure that urgent and emergent procedures are never delayed while awaiting test results. Second, we must acknowledge the fears of procedural staff, while educating them on the efficacy and appropriate use of PPE. If PPE supplies are sufficient, the *safest* approach for staff is to treat all patients as if they could have COVID-19 by using appropriate PPE, rather than relying on test results to dictate precautions. Third, we must consider which patient populations stand to benefit the most from preprocedural testing because their recovery would be affected by unrecognized infection. This likely includes only those unvaccinated patients undergoing major surgery under general anesthesia given their risk for morbidity and mortality if infected [12]. Patients who are vaccinated but immunocompromised might reasonably still be tested. Fourth, we must regularly report preprocedural test positivity rates to staff so they have a sense of the risk of workplace exposure. Anticipating decreasing prevalence of infection with widespread vaccination, we should set and publicize a threshold at which preprocedural testing should be stopped because the associated cost and burden would outweigh potential benefits. This threshold should be chosen based on local rates of transmission, taking into account vaccination rates, and could be tied to COVID-19 hospitalization rates. A reasonable rate might be 1–3 COVID-19 hospitalizations in the state per 100 000 population, keeping in mind that there may be regional differences in rates within states. At the same time, hospitals should adopt an informed consent process for patients that describes the potential impact of unrecognized infection on recovery. It is vital that while the system acknowledges the uncertainty and fear felt by our medical staff, whose safety remains a top priority, we must remember the most important principle in medicine: first do no harm.

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