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Letter to the Editor

Targeted coronavirus disease 2019 (COVID-19) surveillance for elective procedures: Lessons for resource conservation during a pandemic and beyond

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To the Editor—The coronavirus disease 2019 (COVID-19) pandemic has disrupted healthcare delivery worldwide. In mid-March 2020, hospitals across the United States temporarily suspended all elective procedures to mitigate risk of severe acute respiratory syndrome coronavirus virus 2 (SARS-CoV-2) transmission and to preserve resources to meet clinical demand and ensure workforce preservation (eg, surge planning, employee testing).[1,2] Although deemed "elective" in that they are nonemergent, elective procedures are essential for patient health and solvency of the nation's healthcare system.[3]

As elective procedures resume, the downstream consequences of their initial delay are becoming apparent. Disruption to patient care may negatively impact outcomes,[4] and the backlog of elective procedures needing to be rescheduled will inevitably present a logistical challenge.[5] Moving forward, it will be important for hospital systems to implement measures balancing infection control with conserving limited resources, meeting patient needs, and preempting additional bottlenecks in scheduling. Given these considerations, we describe our institution's approach to targeted COVID-19 surveillance of patients in need of elective procedures.

The following preprocedural COVID-19 assessment guidelines were implemented at MetroHealth, an urban, safety-net healthcare system located in Cuyahoga County in northeastern Ohio. The first diagnosis of COVID-19 at MetroHealth was made on March 9, 2020, and elective procedures were suspended by the Ohio Department of Health on March 18, 2020. Procedures not requiring hospital stay resumed in late April, and all procedures resumed in early June.[6]

Testing for SARS-CoV-2 was performed with nasopharyngeal swabs in viral transport media. Reverse-transcription polymerase chain reaction (RT-PCR) was performed by the MetroHealth on-site laboratory.

Our preprocedural COVID-19 assessment guidelines are outlined in Figure 1. For patients with a history of COVID-19, assuming completion of isolation (>14 days) prior to intended date of their procedure, persistent contagion or reinfection was deemed unlikely, and no preprocedural testing was pursued.

A risk assessment tool was utilized for patients without prior COVID-19, qualifying risk elevation based upon intended procedure and/or underlying host status. For patients whose procedures involved oral, nasal, esophageal, or thoracic mucosal disruption, we hypothesized that concurrent asymptomatic infection with SARS-CoV-2 could worsen surgical outcome and heighten risk of transmission to the procedural team.[7] If the preprocedural test was negative, COVID-19 personal protective equipment (PPE) was recommended due to test sensitivity limitations, limited treatment options for acute COVID-19 should transmission to healthcare workers occur, and absence of primary infection prevention in the pandemic's early months. Elevated risk populations included cancer patients undergoing postneoadjuvant chemotherapy, patients with gastrointestinal malignancies, and patients at high risk of sustained postoperative intubation. We hypothesized that asymptomatic infection in this population may complicate post-surgical course due to underlying serious conditions. In addition, for patients in need of solid tumor resection or debulking, we hypothesized that prolonged delay of an intended procedure could worsen cancer outcome. If 1 or more elevated risk criteria were met, a SARS-CoV-2 RT-PCR test was obtained 24–48 hours prior to the procedure.

A symptom assessment tool was utilized for low-risk patients, including the following criteria: fever >38°C within the previous 24 hours; cough, sore throat, or other respiratory symptoms within the previous 24 hours; and cohabitation with someone diagnosed SARS-CoV-2 positive within the previous 14 days. If none of these criteria were met, the patient was considered low risk and preprocedural testing was not pursued. Symptomatic patients underwent testing for acute COVID-19. Potentially exposed patients were tested only if symptomatic; otherwise, their procedures were delayed to allow adequate incubation time and convalescence.

Targeted COVID-19 surveillance for elective procedures was implemented from May 1 to July 8, 2020. During this time, 3,771 elective procedures were scheduled. Of these cases, 1,049 (27.8%) qualified for preprocedural SARS-CoV-2 testing according to our surveillance protocol. Among these patients, 19 (1.8%) tested positive.

We assume conservative estimates for sensitivity and specificity of RT-PCR for SARS-CoV-2 at 90% and 95%, respectively.[8] Universal screening of 3,771 elective procedures at 3% prevalence would have resulted in 285 patients delayed at least 2 weeks after suspension of elective procedures. With our protocol, we delayed elective procedures for only 19 patients over 2 months, thus

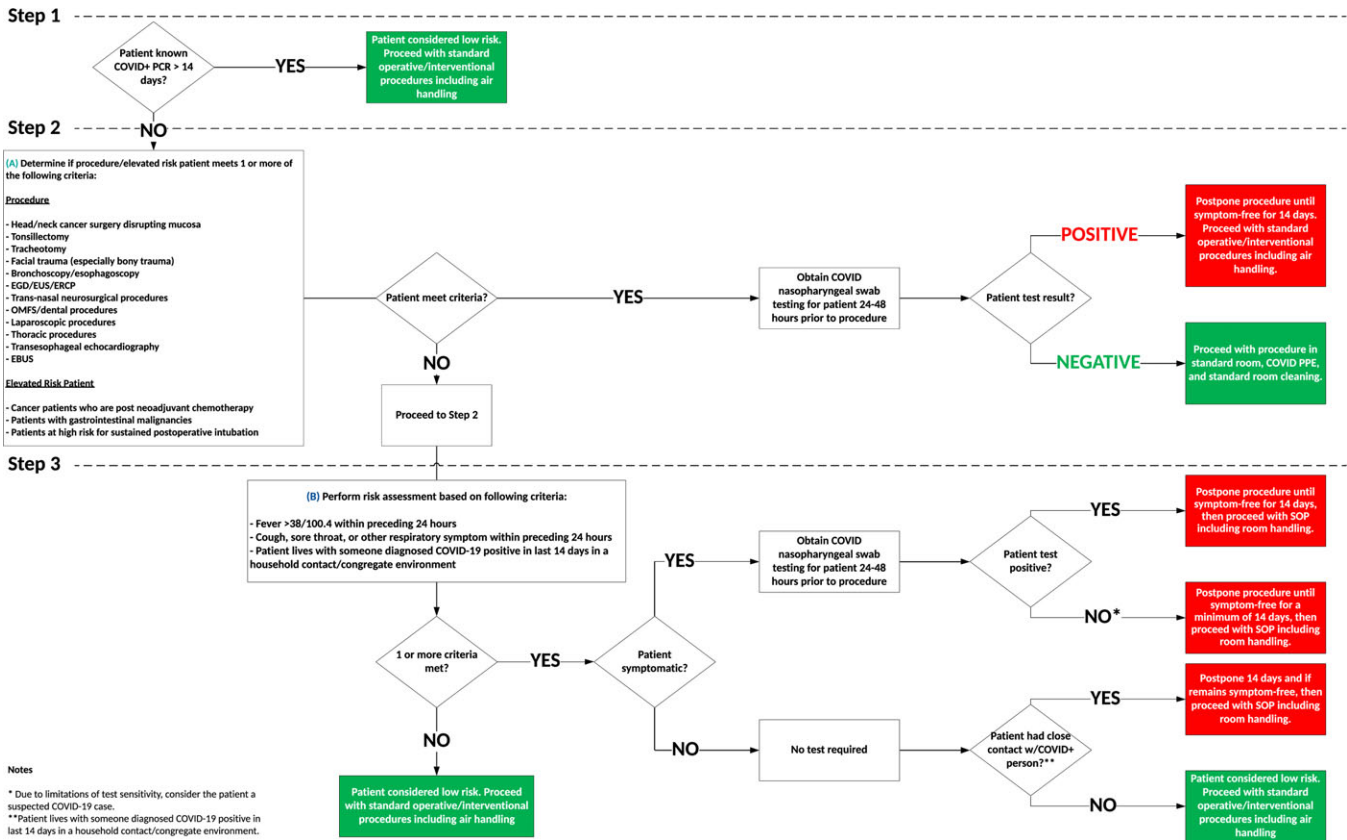**Author for correspondence:** David X. Zheng, E-mail: dxz281@case.edu

Fig. 1. Preprocedural COVID-19 assessment guidelines. The following guideline is intended to risk-stratify patients in need of elective procedures based upon 3 general considerations: (1) elevated COVID-19 exposure risk to healthcare workers due to anatomy of procedure, (2) elevated post-surgical complication risk to patient based upon underlying condition, and (3) elevated COVID-19 exposure risk to healthcare workers due to acute respiratory tract infection and/or patient exposure.

preventing delayed procedural care for 266 patients. Furthermore, given that we used only 1,049 RT-PCR tests, 2,722 were conserved.

Our protocol accounted for potential of elevated infection risk to healthcare workers due to procedural anatomy and patient exposure. Aerosol-generating procedures involving the oral, nasal, esophageal, or thoracic mucosa present elevated risk of SARS-CoV-2 exposure to healthcare workers.[7] Therefore, operative teams donned full PPE with N95 respirator regardless of SARS-CoV-2 test result. We also acknowledged that negative test results did not necessarily exclude SARS-CoV-2 infection, given the imperfect sensitivity of RT-PCR testing.[8]

We hypothesized that operating on patients with concurrent COVID-19 mucosal infection could worsen postoperative outcomes. Recent studies have shown high postoperative 30-day mortality rates (15.9%–23.9%) in COVID-19 patients undergoing surgery, as well as postoperative pulmonary complications in 51.2% of patients with perioperative SARS-CoV-2 infection.[9,10] Additionally, 30-day mortality has been shown to be lower in asymptomatic COVID-19 patients undergoing surgery (5.6%, compared to 23.1% in symptomatic patients; $P = .118$).[10] These data support the assumptions upon which our protocol was based.

We employed a strategy allowing for continued operation of elective procedures while mitigating risk for both patients and healthcare workers. We implemented our protocol when regional COVID-19 prevalence was relatively low (<5%),[6] and we acknowledge that adjustments may be necessary with higher SARS-CoV-2 prevalence and improved testing capacity. Our targeted surveillance protocol was successful in that it preserved limited testing capacity while simultaneously preventing a bottleneck in the scheduling of elective procedures.

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