Circulation: Cardiovascular Interventions

RESEARCH LETTER

# Impact of a 10 Rules Protocol on COVID-19 Hospital-Related Transmission

## Insights From Padua University Hospital, Italy

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Hospitals are vulnerable to the introduction and spread of coronavirus disease 2019 (COVID-19), both for patients and operators. As a matter of fact, in Wuhan 41% of COVID-19 cases resulted from hospital-related transmission.[1] The issue of in-hospital infection is of utmost importance in a Cardiology Department, considering the vulnerability to COVID-19 of patients with underlying cardiovascular disease[2] and the impossibility to easily replace highly trained specialists, such as interventional cardiologists.

When the first Italian COVID-19 case was confirmed, at the Cardiology Department of Padua University (which serves an area with over 13 000 confirmed cases as of April 8, 2020) we drafted and then implemented (March 7, 2020) an internal COVID-19 protocol to minimize the risk of nosocomial transmission. We then prospectively recorded the rate of COVID-19 cases among attendings, fellows and nurses, and compared it with that of a nearby cardiovascular COVID-free division of our hospital without a dedicated protocol. Herein are the basic principles of our protocol: (1) share your COVID-19 protocol with all units (cardiology ward, cardiac intensive care unit, catheterization laboratory, anesthesiology service) and with the emergency department. (2) Identify one room where patients will be isolated while waiting for the result of COVID-19 testing. Until then, healthcare professionals should behave as if patients were positive. Terminal cleaning should be performed in case of confirmed infection. Confirmed cases should be transferred to dedicated COVID-19-only units. (3) Reduce the number of elective hospitalizations, prioritizing higher risk patients. This will provide room to isolate suspected COVID-19 patients and the possibility to redeploy part of the staff for implementation of specific infection control measures. (4) Patients scheduled for elective hospitalization should be screened the day before admission for coronavirus-related symptoms. If symptomatic, refer them to their primary care physician (in our experience, this happened in 7% of cases). If asymptomatic, test them for COVID-19 before admission. All patients coming from the emergency department need to be tested and isolated in a dedicated room until the result is available. At our hospital, testing is performed by Diasorin and in-house real-time polymerase chain reaction detection of COVID-19 in samples from nasopharyngeal swabs, which require 90 to 360 minutes and have over 80% sensitivity. (5) As a general rule, patients should be transferred to the catheterization laboratory only after testing negative. As patients with ST-segment–elevation myocardial infarction or non–ST-segment–elevation myocardial infarction and cardiogenic shock might not have an available negative test, emergent coronary angiography should be performed with appropriate personal protective equipment. Fibrinolysis can be considered based on balance between staff exposure and expected patient benefit, particularly in stable patients at low-bleeding risk. (6) Organize check-points at the entrance of each unit, where patients and healthcare professionals will be assessed for fever and respiratory symptoms. Approximately 3% of patients were found to have symptoms before entering our division. (7) Patients and healthcare operators should always wear surgical masks. Staff taking care of COVID-positive patients or patients

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with unavailable test result should wear recommended personal protective equipment, including FFP2/FFP3 facemask and eye protection. Health operators are advised to respect social distancing also after duty. (8) Train the team in doffing and donning personal protective equipment,[3] to ensure that these procedures run smoothly in emergent situations. (9) Identify a separated team of physicians taking care of COVID-19 patients. (10) Ensure active surveillance is provided to healthcare operators. Every staff member developing a fever or upper respiratory infection symptoms should be tested. Healthcare operators who had contact with a confirmed COVID-19 case without wearing proper personal protective equipment should also be tested, even in the absence of symptoms. In fact, asymptomatic subjects account for over 30% of COVID-19 cases and are believed to be responsible for a large proportion of infections.[4] Confirmed COVID-19 operators are re-introduced to work after a 14-day quarantine only if asymptomatic and with 2 consecutive negative swab testing at least 48 hours apart.

The first COVID-19 case in our department was recorded on March 11, 2020. On the same day, a physician of the nearby division without a COVID-19 dedicated protocol tested positive. After 3 weeks (Figure), the rate of COVID-infection among health care providers was 1.2% (2/159) in our department as compared with 12.5% (12/96) in the division without a protocol ($P<0.001$). Moreover, in the latter division, 2 patients were found to be COVID-19 positive (on day 6 and 12 after index case), whereas no infection was recorded among subjects hospitalized in our department. While these results are limited by the small sample size, the nonrandomized design of the study, and the impossibility to definitively rule out community acquired infections, they suggest that implementation of dedicated protocols might be more effective than general protection measures in reducing in-hospital COVID-19 transmission. Authors will not make their data, analytic methods, and study materials available to other researchers. These findings have important clinical implications, as the application of such protocols might ensure that essential life-saving procedures are provided to our patients minimizing the risk of in-hospital outbreak. Now that Italy seems to be turning the tide on coronavirus after

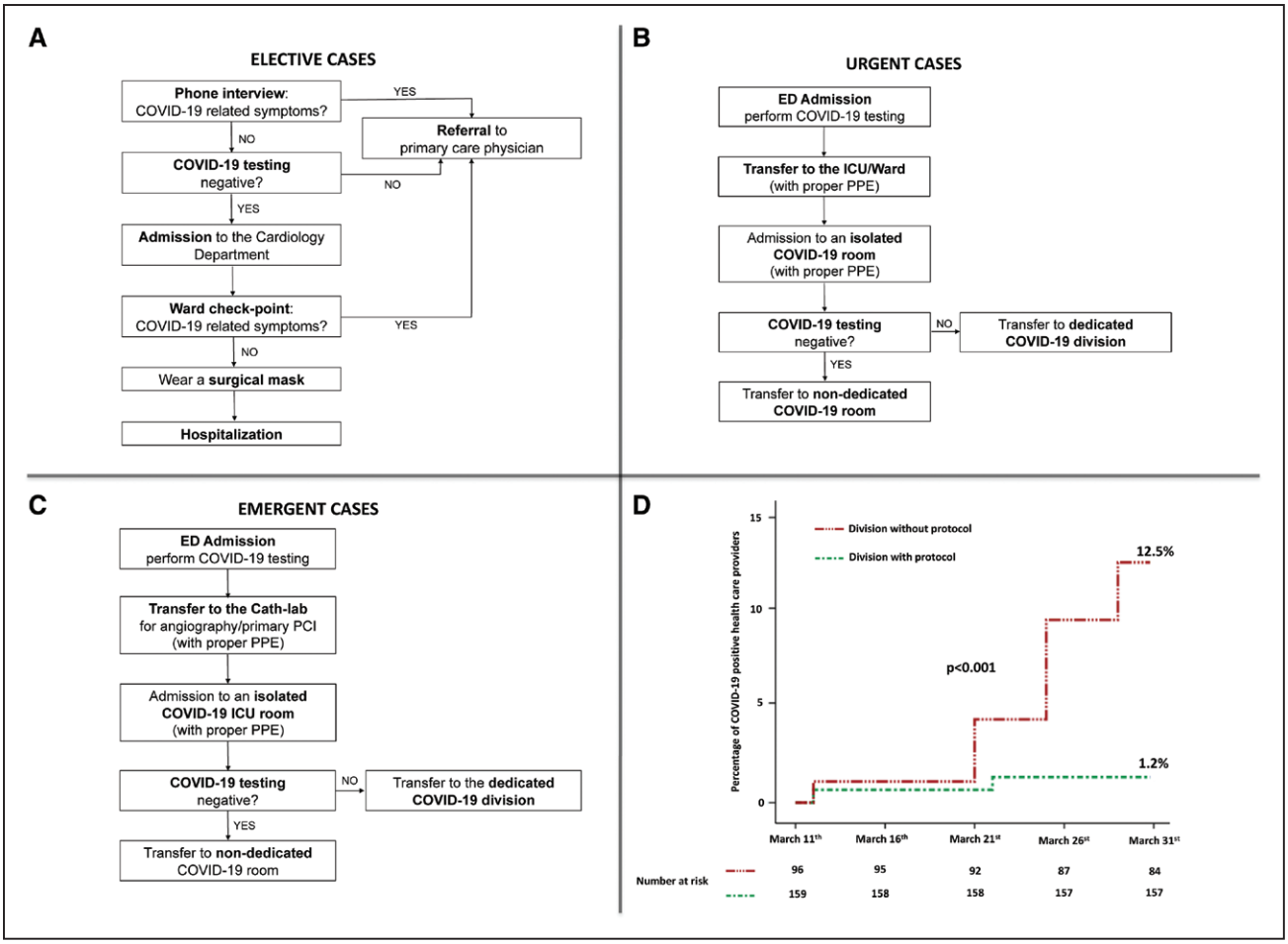


**Figure. Summary and effectiveness of our dedicated coronavirus disease 2019 (COVID-19) protection protocol.** Protocol summary for elective (**A**), urgent (**B**), emergent (**C**) cases. Incidence of COVID-19 cases among health care providers in divisions with or without infection control protocol (**D**). ED indicates emergency department; ICU, intensive care unit; PCI, percutaneous coronary intervention; and PPE, personal protective equipment.

the number of new cases decreased for the fifth day in a row, we hope that our experience might help others to sail safely through the storm.

## ARTICLE INFORMATION

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