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# COVID-19 pandemic—Some cardiovascular considerations from the trench



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By April 8, 2020, an estimated 60%-70% of every human and economic resource in the health care system in Northern Italy had been converted to caring for patients affected by coronavirus disease 2019 (COVID-19) disease.<sup>1</sup> In our hospital in Milan, the entire intensive care unit (ICU) and 80% of the coronary care units are dedicated to COVID patients; 69% of all beds have been converted. In our cardiovascular department, 85% of the cardiologists have been deployed to care for COVID patients in the COVID-dedicated team. Other hospitals in Milan have been converted entirely to COVID hospitals.

Some numbers may help to understand where we are now and where we are going. The estimated rate of short-term death from the virus ranges between 2% and 7%, depending on the number of patients tested in a specific region. A variable number of patients need hospitalization (10%-40%), with an average length of stay ranging between 2 and 3 weeks; 2 consecutive negative test results are required before discharge. Twelve percent of patients need ICU admission.<sup>2</sup> Occupancy of the ICU is very fluid; during April 3-6 in Lombardy, it reached between 90% and 95% of maximum occupancy.<sup>1</sup>

On this dramatic background, cardiovascular care in these regions has been significantly affected. In Lombardy, for example, hospitals have canceled office visits and routine elective diagnostic examinations (echocardiography, stress tests, coronary computed tomographic scans, etc). Many hospitals have canceled invasive procedures, and even in hospitals where these procedures are still taking place, the rate has dropped 80%-90%. Transcatheter aortic valve implantations are currently suspended across the region except for 3 centers, with only a few centers performing percutaneous aortic valvuloplasty as a bridge. Given these dramatic changes in the daily activities of the cardiovascular centers, it is imperative to anticipate the impact of these measures on the hard clinical outcomes of our patients with cardiovascular disease.

## Urgent procedures

On March 8, the regional health care system in Northern Italy identified 13 regional hub centers for primary percutaneous coronary intervention (PCI) of ST-elevation myocardial infarction (STEMI) and 41 spoke centers, which would be COVID-dedicated hospitals.<sup>3</sup> This means that the regional emergency system will send STEMI patients to the hub centers only. Patients who self-present at spoke centers will be transferred to a hub center. As a consequence, approximately 800 STEMI patients in 1 month in Lombardy would be managed by 13 centers instead of 54; each of these same centers managed an average of 16 primary PCIs in April 2018, projecting an estimated increase of >400% in the number of primary PCIs in each center in the COVID era.<sup>4</sup>

Importantly, amid the fear of contagion by many Italian patients, visitation to the emergency department was avoided by many, and there have been increasing reports of sudden cardiac deaths at home in our urban area.

It would not be a surprise that due to fear of the pandemic, with conversion of coronary ICU beds and closure of many catheterization laboratories, patients with urgent presentations of cardiovascular syndromes might not be given guideline-based therapies. This may result in 2 consequences: an increase in mortality from cardiovascular disease similar to the pre-ICU and pre-fibrinolysis era, and an increase in the occurrence of late-presented STEMI and heart failure patients. This has already been documented in the Hong Kong COVID-19 STEMI experience.<sup>5</sup>

We do not have the solution for this potential disaster and do not suggest diverting attention from COVID-19 patients. However, we expect that physicians and hospital systems dedicated to cardiovascular care will not suffer virus-related blindness but will provide the best possible evidence-based treatment to their patients.

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