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COVID-19 Clinical Guidance For the Cardiovascular Care Team

Note: COVID-19 is a quickly evolving public health emergency. The guidance provided in this document is based on the best available published information and expert evaluation. This document is intended to supplement, not supersede, relevant guidance from the Centers for Disease Control and Prevention, state and local health authorities, and your institution's infectious disease containment, mitigation, and response plan.

To best serve your patients, protect yourself first! This is especially true for cardiovascular care team professionals that will be on the front line of the COVID-19 response. Use masks, gloves, and other personal protective equipment with discipline. Wash hands often. Decontaminate surfaces including stethoscope, cellular phones, computer peripherals, and other devices frequently.

Current COVID-19 Clinical Context

- The overall case fatality rate (CFR) of COVID-19 based on published reports remains low at 2.3%, with data indicating lower overall Chinese mortality outside of the outbreak epicenter in Hubei, Chinaⁱ
- Beyond China, real-time reporting indicates CFRs between 2.7% (Iran) and 0.5% (South Korea); however, this information is provisional and likely to changeⁱⁱ
- More than 80% of infected patients experience mild symptoms and recover without intensive medical interventionⁱ
- However, morbidity and mortality increase significantly with age, rising to 8.0% among patients 70-79 and 14.8% in patients over 80 in large-scale Chinese case reportingⁱ
- Published case reports from the Chinese Centers for Disease Control indicate patients with underlying comorbid conditions have a heightened risk for contracting COVID-19 and a worse prognosis; depending on the report, between 25% and 50% of COVID-19 patients present with underlying conditions^{i,iii}
- Case fatality rates for comorbid patients are materially higher than the average population:ⁱ
 - Cancer: 5.6%
 - Hypertension: 6.0%
 - Chronic respiratory disease: 6.3%
 - Diabetes: 7.3%
 - Cardiovascular disease: 10.5%



Acute Cardiac Complications of COVID-19

- In a recent case report on 138 hospitalized COVID-19 patients, 16.7% of patients developed arrhythmia and 7.2% experienced acute cardiac injury, in addition to other COVID-19 related complications^{iv}
- Published and anecdotal reports indicate cases of acute onset heart failure, myocardial infarction, myocarditis, and cardiac arrest; as with any acute illness, higher cardiometabolic demand can precipitate cardiac complications
- Current reporting does not yet describe prevalence of cardiac complications in CVD-naïve versus cardiac comorbid patients
- Cardiac complications of COVID-19 are approximately commensurate with SARS, MERS, and influenza analogs
- Cardiologists should be prepared to assist other clinical specialties in managing cardiac complications in severe cases of COVID-19
- Critical care and cardiology teams should confer to guide care for patients requiring extracorporeal circulatory support with veno-venous (V-V) versus veno-arterial (V-A) ECMO
- Patients demonstrating heart failure, arrhythmia, ECG changes or cardiomegaly should have echocardiography

COVID-19 Implications For Patients With Underlying Cardiovascular Conditions

- Make plans for quickly identifying and isolating cardiovascular patients with COVID-19 symptoms from other patients, including in the ambulatory setting
- Patients with underlying cardiovascular disease are at higher risk of contracting COVID-19 and have a worse prognosis
- It is reasonable to advise all cardiovascular patients of the potential increased risk and to encourage additional, reasonable precautions in accordance with CDC guidance
- It is important for patients with CVD to remain current with vaccinations, including the pneumococcal vaccine given the increased risk of secondary bacterial infection with COVID-19; CVD patients should be vaccinated against influenza in accordance with current ACC/AHA guidelines
- In geographies with active COVID-19 outbreaks, it may be reasonable to substitute telephonic or telehealth visits for in-person routine visits for stable CVD patients to avoid possible nosocomial COVID-19 infection; planning for emergency telehealth protocols should begin now
- It is reasonable to triage COVID-19 patients according to underlying cardiovascular, diabetic, respiratory, renal, oncological, or other comorbid conditions for prioritized treatment



- Providers are cautioned that classic symptoms and presentation of AMI may be overshadowed in the context of COVID-19, resulting in underdiagnosis
- For patients with heart failure or volume overload conditions, copious fluid administration for viral infection should be used cautiously and carefully monitored
- General immunological health remains important for both providers and patients, including eating well, sleeping and managing stress

Cardiac-specific Preparedness Recommendations For COVID-19

- In some settings, the cardiovascular care team (including physicians, nurses, technicians, etc.) may have limited training and experience with the acute management of pandemic disease; the routine transmission of COVID-19 to healthcare workers suggests that everyday infectious disease mitigation precautions are insufficient and healthcare workers in outbreak geographies must be prepared to adopt personal protection measures
- Protocols for the diagnosis, triage, isolation, and management of COVID-19 patients with cardiovascular complications and/or cardiovascular patients with COVID-19 should be developed in detail and rehearsed; CV-specific plans should be developed in collaboration with hospital-wide infectious disease response plans and in close collaboration with other medical specialties
- Cardiovascular care team members with limited experience and/or training in personal protective equipment (PPE) donning, usage, and doffing should be trained now in accordance with [CDC guidance](#)
- Specific protocols should be developed for the management of AMI in the context of a COVID-19 outbreak, both for patients with and without a COVID-19 diagnosis
 - Particular emphasis should be placed on acute PCI and CABG, including protocols to limit catheterization lab and OR personnel to a required minimum, pre-determining requirements for enhanced personal protection, and assessing post-procedural sterilization sufficiency
 - In extreme circumstances, clinical leadership may need to assess the risk-benefit ratio of acute MI intervention (given limited data on primary PCI benefit for type-2-MI from acute viral illness) against nosocomial infection risk

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ⁱ The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Disease (COVID-19). *China CDC Weekly* 2020. 2(8): 1

ⁱⁱ Coronavirus COVID-19 Global Cases by Johns Hopkins CSSE (March 3, 2020), retrieved from https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html?fbclid=IwAR29qGU1Zs2huweaWHXJA7sl_YnkDNreGxK eH7qMHVVqXvuymQVBDrsBg#/bda7594740fd40299423467b48e9ecf6

ⁱⁱⁱ Chen H, Zhou M, Dong X, et al. Epidemiological and Clinical Characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020; published online January 29. <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2930211-7>

^{iv} Wang D, Hu B, Hu C, et al. Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA*. Published online February 07, 2020. doi:10.1001/jama.2020.1585