

# Committee Recommendations for Resuming Cardiac Surgery Activity in the SARS-CoV-2 Era: Guidance from an International Cardiac Surgery Consortium

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## Abstract

Recommendations for the safe and optimized resumption of cardiac surgery care, research and education during the SARS-CoV-2 era were developed by a cardiovascular research consortium, based in 19 countries and representing a wide spectrum of experience with COVID-19. This guidance document provides a framework for restarting cardiac surgery in the outpatient and inpatient settings, in accordance with the current understanding of SARS-CoV-2, the risks posed by interrupted cardiovascular care, and the available recommendations from major societies. Keywords: Coronavirus, COVID-19, SARS-Cov-2, Cardiac Surgery, Pandemic

In a survey of 60 cardiac surgery centers in North and South America, Europe, Asia and Australia, undertaken on March 23rd 2020 during the peak of the COVID pandemic and encompassing over 600 cardiac surgeons, near complete cessation of elective cardiac surgery was reported.<sup>1</sup> The median reduction in cardiac surgery case volume was 50-75%, as most centers indicated not performing any elective surgery, 5% of centers performed no cardiac surgery at all, and a third of centers reported >50% reductions in intensive care capacity.<sup>1</sup> However, such acute disruptions, caused by a massive and unexpected spike in demand for critical care beds, an inadequate supply of therapeutic and personal protective equipment, and widespread risks of infection among patients and healthcare workers, are already shifting to a chronic state of disease prevalence -for which new ways of providing cardiac surgical care will be needed. The focus of the present document is, therefore, to provide guidance around safely resuming cardiac surgery, research and education in the above context. The recommendations presented in this article were developed by committee discussions within a cardiovascular research consortium, based in 19 countries and representing a broad international spectrum of cardiac surgery experience with COVID-19. We aimed to provide a framework for restarting cardiac surgery in the outpatient and inpatient settings, in accordance with the current understanding of SARSCoV-2, the risks posed by interrupted cardiovascular care, and the available recommendations from major societies.<sup>2-12</sup> Our practical recommendations, summarized in Tables 1 and 2, are intended to support local decision-making according to governmental requirements, regional disease prevalence, institutional

capacity, and ethics.

## A. Guidance on Restarting Cardiac Surgery Activity Class I Recommendations

1. The cardiovascular service line including cardiac surgery should be among the first clinical services supported to resume elective inpatient and outpatient care as soon as critical care capacity becomes available. (Level of Evidence: C) The incremental mortality associated with suspending all elective cardiac surgery within a wide geographic region for 6-8 weeks may be estimated from studies of healthcare systems where surgery is routinely deferred for many weeks because of lack of capacity. For example, in 5,864 patients waiting for elective or urgent coronary bypass surgery in Sweden the risk of death increased by 11% per month.<sup>13</sup> A New Zealand study demonstrated significant incremental operative mortality in the nearly 20% of patients readmitted with acute coronary syndromes while waiting for bypass surgery.<sup>14</sup> A coordinated approach with cardiology services including invasive cardiology is essential, since these are an integral part of the cardiovascular patient evaluation and management.

2. Triggers and contingency plans for modifying cardiac service line activity in response to government regulations, hospital capacity, and disease burden should be agreed upon and clearly communicated with clinicians to minimize adverse events due to abrupt changes in clinical practice. (Level of Evidence: C) A clear response framework, such as the one outlined in Table 2, enables the cardiac service line to adapt more safely and effectively to changes in governmental requirements, critical care capacity, and prevalence of disease in the community. If advisories conflict, federal and state mandates take priority over hospital policy and local assessment of disease burden. Cardiac specialists triaging patients within a resource allocation of critical care and floor beds, operating room and out-patient time, may allow a more efficient response to evolving constraints than attempting to redefine which patients should be prioritized at each stage. Reduced cardiac critical care capacity mandates safe and effective triage of elective cardiac surgery patients: such triage should be led by specialists in cardiac surgery, using formal guidelines as agreed by the Heart Team (Table 2). (Level of Evidence:

3) The incremental mortality in patients whose cardiac surgery is deferred during this pandemic may be partially mitigated by effective triage with careful attention to risk

factors such as symptoms, ventricular dysfunction, arrhythmias and age, considering percutaneous coronary or valve intervention, and optimizing medical therapy with frequent follow-up. For example, risk factors for death while waiting for coronary bypass included left main stem disease, reduced ejection fraction, unstable angina, and atrial fibrillation.<sup>13</sup> Untreated aortic stenosis is associated with higher mortality: in a recent analysis of 823 patients awaiting an average of 3 weeks for either transcatheter or surgical aortic valve replacement the mortality was 4% at 1 month in both groups.<sup>15</sup> Patients that died were significantly older, and more likely to have left ventricular dysfunction, or New York Heart Association class II or IV symptoms. Involving cardiac surgeons early in the development of specific guidance and triage committees is essential, particularly when cancer, trauma and other urgent care needs must be balanced, since the methods routinely used to allocate resources and prioritize patients across multiple specialties are aimed at optimizing normal daily resource utilization and are not designed to balance risks of deferring surgery. Very complex and high-risk cases should be performed when critical care capacity is adequate with resources for extended support, whereas if those resources are scarce the utility and ethics may be less justifiable.

4. Clear, accurate and timely information on the availability of cardiovascular services and how to access them should be provided to referring physicians, patients and the community. (Level of Evidence: C) The substantial decrease in elective and emergency cardiovascular presentations to out-patients and the emergency rooms observed in most centers can be attributed firstly to reduced access to primary care offices, secondly to necessary triage by emergency responders, and thirdly to high levels of patient concern about visiting hospitals. Initial reports suggest this may account for significant incremental nonCOVID cardiac mortality.<sup>16</sup> Consistent, accurate and effective communication with primary care and cardiology providers is essential to ensure that their approach is aligned with the availability of inpatient cardiac care, and patient concerns are allayed. This may usefully be supported by direct patient messaging: without which news stories in the lay media provide the sole information for patients making decisions about their healthcare options

#### Recommendations

1. A regional response is a reasonable strategy to ensure appropriate delivery of elective cardiac surgery. (Level of Evidence: C) A regional response entails a coordinated effort to increase and optimize critical care capacity, expertise and personnel between hospitals, preserving the ability of selected centers to provide cardiac surgery services on behalf of an expanded population while other

centers divert resources to managing SARSCoV-2. In Italy and the United Kingdom this type of regional response has enabled continuous provision of cardiac surgery at selected high-volume centers, and coordination of effort and experience for ECMO support.<sup>17</sup> In comparison, disaster planning in the U.S. is primarily organized at an individual hospital level, with governmental agencies issuing mandates to hospitals restricting elective surgery, leading to complete cessation of elective cardiac surgery for several weeks in most regions.

2. It is reasonable to substitute a less-invasive approach when insufficient hospital capacity precludes planned cardiac surgery, and when patient preference informed by a shared decision-making approach with the Heart Team also supports the balance of risks. (Level of Evidence: C) Most low-risk elective patients may safely wait up to four weeks for planned cardiac surgery.<sup>4-6</sup> However, mortality and complications may occur in apparently low risk patients.<sup>6</sup> If urgent surgery is not possible, any clinical deterioration indicating a need for more urgent intervention should trigger a discussion with the Heart Team, to review alternative therapeutic strategies including surgery at another peer center, or transcatheter valve intervention and / or percutaneous coronary intervention.