



# **Saudi Society for Cardiac Surgeons (SSCS)**

## **Consensus Document on COVID-19**

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## **Introduction:**

The COVID-19 Pandemic represents an international health crisis that is challenging to all governments. Health practitioners in different fields has the duty to guide people and governments through to achieve safe health practices. The Saudi Society for Cardiac Surgeons recognizes that it is difficult to establish evidence-based guidelines for safe cardiac surgery practices in such a crisis since this is an unprecedented health pandemic. So we decided to work with our colleagues in other societies through reviewing different recommendations and safe practices issued by different health organizations and scientific societies in order to come up with recommendations that could guide hospitals, physicians and other members of the healthcare team on best available practices that are applicable to our community and that will not only ensure optimum patient care delivery but also protect healthcare workers from the risk of infection and to aid national effort in containing and managing this pandemic worldwide.

## **Rationale for developing protocols to minimizing cardiac surgery cases through prioritization of cases during COVID-19 pandemic**

The American College of surgeons have issued some general guideline principles (1) as a rationale for not performing certain procedures as follows:

- Minimize the potential for exposure of surgical and peri-operative staff to aerosol generating procedures on unrecognized and asymptomatic carriers of COVID-19.
- Minimize risk to all persons in the hospital environment from potential exposure to COVID-19, consistent with the key underlying principle of social distancing, for the purpose of reducing risk of infection.
- Minimize risk of exposure of surgical patients to COVID-19.
- Minimize use of critical supplies and equipment that can be redirected to care for more acute patients and for the care of COVID-19 patients. The conservation of personal protective equipments (PPE) and other equipment is critical. Reducing the rate at which we utilize these supplies will help ensure they are available for critical use.

- Blood conservation: The nation's blood supply is dropping due to the elimination of blood drives and other factors. Minimizing elective procedures which require blood will help to preserve this resource.
- Staffing: It may become necessary to re-deploy staff to help cover more acute case load if we begin seeing staff become infected with COVID-19.
- ICU and inpatient bed capacity: Canceling some elective cases which require inpatient resources will preserve those resources for acute needs.

## **Literature Review and International Benchmarking**

Many international health systems have implemented the policy of cancelling elective cases (2-6). This stresses the importance to have some guidance for elective vs. urgent cases. However, defining what is elective and what is urgent could be difficult and it is best left to the discretion of the treating physician (7) after applying general guidelines. The American College of Surgeons has published a general guideline to the definition of elective and urgent cases as follows (8):

***Emergent and urgent procedures:*** Those procedures that are deemed time sensitive as delaying the procedure would cause harm to the patient.

***Elective and non-urgent procedures:*** Those procedures that can be rescheduled to a future time as the timing of these cases is flexible and is unlikely to significantly impact the patient's health outcome.

The Canadian Cardiovascular Society have published a guidance for the hospital care and cardiac procedure use during the COVID-19 crisis (9). The society recommended that all inpatient procedures should be performed as soon as possible to facilitate treatment and discharge planning. This includes but is not limited to the following: surgical revascularization for acute ST elevation myocardial infarction (STEMI) cases that are not amenable to PCI, aortic dissection, infective endocarditis, and cardiogenic shock due to ischemic or valvular etiology, Surgery for symptomatic advanced valvular heart disease and urgent left ventricular assist device (LVAD) implantation or heart transplantation.

In United Kingdom, National Health System (NHS) have recommended a clinical guide for the management of cardiothoracic surgery patients during the Coronavirus pandemic that is based on the pandemic escalation frame work (10) (Appendix 1). The COVID-19 pandemic puts health services under escalating pressure with an increasing number of infected individuals. Decisions on whether or not to perform cardiac surgery will be easier in the low and medium escalation phase, while ICU beds are still available. However, continued escalation will make decisions on surgeries more difficult and it is important that when these decisions are made, both the decision process and the decision made are well documented and shared between the treating team and the administration. In a progressively escalating situation, routine elective cardiac surgery should be stopped and in-house urgent cases, which are at risk for adverse cardiac events if going home instead of staying in the hospital, might still undergo cardiac surgery at this time. However, one must consider the risk of exposing these patients to a possible COVID-19 infection during hospitalization and/or exposing health care workers to patients with potential COVID-19 infection. Most patients with COVID-19 have mild or no symptoms and therefore, it may be difficult to identify such patients in in-house urgent cases

Additionally, some leading cardiac institutions like Memorial Hermann Texas Center in Houston have published their prioritization lists to triage cardiovascular cases (11).

# **The Recommendations of the Saudi Society for Cardiac Surgeons (SSCC) Regarding The COVID-19 pandemic**

## **First: Triageing patients**

Patients should be triaged based on Saudi Center for Disease Prevention & Control (SCDC) Weqaya visual triage form (Appendix 2) where a score of 5 is given to history of travel to areas with presumed ongoing community transmission of COVID-19, or any updated information added on SCDC website (12). Or a close physical contact in the past 14 days prior to symptom onset with a confirmed case of COVID-19 OR working in or attended a healthcare facility where patients with confirmed COVID-19 were admitted. In addition, a risk score of 1 each is given if any of the following is present; Fever, Cough (new or worsening), Shortness of breath (new or worsening) or Sore throat and/or runny nose. The score therefore can be as low as zero or as high as 9. Therefore, cases suspected to be high risk COVID-19 if they score 5 or more. Low risk COVID-19 must score 4 or less. Additionally, any patient who has suspicious CXR or chest CT findings should be considered a high-risk patient regardless of his score.

## **Second: Prioritization of cardiac surgery cases**

### **General Precaution:**

For patients who are confirmed COVID-19 positive or high score COVID-19 negative patients (score > 4), preoperative preparation and anesthesia induction should be done in a negative pressure room (if available) as recommended by the Anesthesia Patient Safety Foundation (APSF) and the American Society of Anesthesiologists (13). All the OR team has to use universal precautions using PPE. Then the patient is moved to a positive pressure room for the primary cardiac procedure to avoid risk of surgical wound infection and to do terminal cleaning after each confirmed or suspected COVID-19 case.

At the end of the procedure the patient should be moved to a negative pressure ICU room until extubated. If not available a portable HEPPA filter should be placed near the patient head inside the procedure room and the ICU room.

### **Category A: Life threatening conditions**

The following life-threatening conditions should be swabbed for COVID-19 virus and then taken to the operating room on emergency bases (within 24 hours). These cases should be considered positive until the results of the COVID-19 test comes back. This category includes:

- 1) Acute Type A Dissection
- 2) Complicated Acute Type B Dissection
- 3) Acute myocardial infarction with mechanical complications (Ischemic VSD, Ruptured LV, Ruptured papillary muscle)
- 4) Acute myocardial infarction with cardiogenic shock not Amenable to PCI
- 5) Acute Aortic Regurgitation after infective endocarditis with cardiogenic shock
- 6) Obstructed Mechanical Valve
- 7) Obstructive Cardiac Tumors
- 8) Life threatening Cardiac Traumas
- 9) Acute myocarditis requiring mechanical support
- 10) Acute massive pulmonary embolism with cardiogenic shock
- 11) Status 1A transplant patients
- 12) All lesions with ductal dependent circulation requiring prostaglandin PGE, to keep the ductus patent.
- 13) Patients with cyanotic lesions who are having repeated cyanotic spells
- 14) Shunted pediatric patients with evidence of stenosing or occluded shunt with deep cyanosis
- 15) Any congenital heart lesion causing hemodynamic instability

## **Category B: Non-Life-Threatening Urgent Cases**

All Patients with non-life-threatening urgent conditions requiring cardiac surgical procedure should undergo COVID-19 Swab and should obtain the results before proceeding to surgery. This group need to be performed urgently during same hospitalization or not more than 30 days from initial presentation according to patient's condition and the availability of hospital resources based on the escalation status.

The ACS and the American Society of Anesthesiologists (ASA) recommend that decisions on surgery cases be made on a daily basis, no later than the day before surgery, by a leadership team representing surgery, anesthesiology, and nursing (14).

A Surgical Review Committee, composed of surgery, anesthesiology, and nursing personnel is essential to provide defined, transparent, and responsive oversight. This committee can lead the development and implementation of guidelines that are fair, transparent, and equitable for the hospital or system in consideration of rapidly evolving local and regional issues.

***This category is divided into 3 main groups According to COVID-19 status and Patient triage scoring:***

***First Group:*** COVID-19 negative low-risk patients (score less than 5 with no high-risk features in CXR or Chest CT). This group will be approached in a routine fashion and it includes the following patients:

### **A) Ischemic Heart Disease:**

- 1) Critical anatomy (including LM disease > 60%, critical three vessel disease including proximal LAD)
- 2) Patients with ongoing chest pain
- 3) Patients with refractory heart failure
- 4) Any patient requiring surgery who is on IABP

**B) Valvular Heart Disease:**

- 1) Symptomatic Severe Valvular Disease
- 2) Any Complication of Prosthetic heart valves (excluding stable patients with degenerative valves).
- 3) Endocarditis

**C) Aortic Disease:**

- 1) Acute non-complicated Type B Dissection
- 2) Traumatic Aortic Transection
- 3) All aortic aneurysms that has an indication for surgery

**D) Cardiac Tumors:**

- 1) All Myxomas
- 2) Benign tumors causing obstruction or embolization

**E) Pericardial Disease:**

All pericardial diseases with refractory heart failure that cannot be managed otherwise.

**F) Trauma:**

All Cardiac traumas

**G) Congenital Cases:**

- 1) Patients with septal defects / large shunts with severe heart failure or failure to thrive / poor weight gain despite maximum medical therapy
- 2) Patients with severe mitral valve regurgitation and heart failure despite maximal medical therapy (e.g. a previously repaired AV septal defect with severe MR)
- 3) Cyanotic patients with increasing cyanosis and rising Hg
- 4) Congenital severe MV stenosis with heart failure.
- 5) Endocarditis



**Second Group:** COVID-19 positive patients who are free of symptoms and signs of upper respiratory tract infection (URTI) or pneumonia or High-risk COVID-19 negative patients (score of 5 or more or CXR or chest CT high-risk features). This group need to be performed following the same general precautions mentioned above. Operating on this group is limited to the following conditions:

**A) Ischemic Heart Disease:**

- 1) Critical anatomy (including LM disease > 60%, critical three vessel disease including proximal LAD) not amenable to PCI
- 2) Patients with ongoing chest pain not amenable for PCI
- 3) Patients with refractory heart failure not amenable for PCI
- 4) Any patient requiring surgery who is on IABP not amenable for PCI

**B) Valvular Heart Disease:**

- 1) Symptomatic Severe Valvular Disease and intractable heart failure not amenable for TAVI or any other interventional procedures
- 2) Active Endocarditis not responding to antibiotics and heart failure therapy

**C) Cardiac Tumors:**

Benign tumors causing obstruction or embolization

**D) Pericardial Disease:**

Any pericardial disease causing cardiac tamponade that cannot be drained percutaneously.

#### **H) Congenital Cases:**

- 1) Patients with septal defects / large shunts with severe heart failure or failure to thrive / poor weight gain despite maximum medical therapy
- 2) Patients with severe mitral valve regurgitation and heart failure despite maximal medical therapy (e.g. a previously repaired AV septal defect with severe MR)
- 3) Cyanotic patients with increasing cyanosis and rising Hg
- 4) Congenital severe MV stenosis with heart failure
- 5) Active Endocarditis not responding to antibiotics and heart failure therapy

**Third Group:** COVID-19 positive patients with symptoms and signs of upper respiratory tract infection or pneumonia. This group should not undergo cardiac surgery given the high fatality rate in such patients. At least a period of two weeks should lapse before considering surgery provided the the Pneumonia or the URTI is resolved.

#### **Category C: Non-Urgent Cases**

All other cardiac surgery patients who are not included above should be considered as non-urgent cases and should be postponed until the COVID-19 Pandemic is cleared. Assessment and close follow up of patients deemed to be non-urgent is critical and assessment should be revised based on any change in the risk-benefit analysis or if the patient condition changed or worsened (15). Appendix 3 summarizes the prioritization flow chart for cardiac surgery cases.

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- 12) moh.gov.sa/CCC/healthp/regulations/Documents/SuspectedCOVID19Supplement.pdf
- (13) <https://www.sts.org/sites/default/files/Letter%20to%20professional%20societies%20Ventilators-final.pdf>
- 14) <https://www.facs.org/covid-19/clinical-guidance/triage>

## Appendix 1:

Phase	Preparation	Escalation	Crisis (compensated)	Crisis (uncompensated)	Resolution	Recovery	Normal Working
<b>Likely prevalence</b>	Low	Medium	High	Very High	Reducing	Normal post-endemic levels	Normal post-endemic levels
<b>Impact</b>	Normal winter pressures Business as usual	Limited ITU Limited beds	No ITU Theatre ITU pods No beds Emergency discharges	Severe pressure across the health service Staff, skill, equipment, capacity shortages Emergency surgery limited Isolation limited	Health services under severe pressure but improving	Enhanced working levels	Normal working Business as usual
<b>Stage</b>	Prepare to respond	Stop routine elective	Major incident (compensated) Prioritise very urgent/emergency	Major incident (uncompensated) Absolutely essential only, prioritised use of resources supported by ethical/legal framework	De-escalation; capture improved working	De-escalation; capture improved working	Normal working with learnt improvements
<b>Elective operating</b>	Normal but focus on priority patients and non-vulnerable patients	In-house urgent cardiac surgery and patients deteriorating from home/peripheral hospitals. Urgent thoracic surgery and cancers that can't wait Increase day-case, alternative pathways/management Increase day-case Expedite urgent transfers, priority cases from clinics	All elective surgery stops Ambulatory management, non-operative management only	All elective surgery stopped Only life-threatening in-house cardiac surgery.  Cardiothoracic surgeons may need to support intensive care patients being cared for in anaesthetic rooms / theatres	Recommence elective surgery for priority cases only Recommence elective ie all the in-house patients that were sent home, delayed cancer patients	Enhance elective surgery capacity to manage backlog	Normal elective capacity
<b>Emergency operating</b>	Normal	Emergency surgery possible but consider using alternative pathways	Emergency surgery limited, if possible, use alternative pathways	Only very selected emergency surgery, prioritised use of resources supported by ethical/legal framework	Emergency surgery possible but consider using alternative pathways	Normal emergency surgery	Normal emergency surgery
<b>Elective clinics</b>	Maximise use of telephone/video conferencing Minimise face-to-face appts, postpone non-urgent referrals, follow-ups Reduce number of clinics to free senior staff for planning, in patient management	Maximise clinic reduction - stop review appointments unless there are problems. No new patients unless urgent.	Cancel all elective clinics	Cancel all elective clinics	Restart limited clinic resources as capacity permits	Enhanced clinic capacity	Normal clinic capacity

## Appendix 2: Saudi Center for Disease Prevention & Control (SCDC) Weqaya Visual Triage Form



### Visual Triage Checklist Visual Triage Checklist for Acute Respiratory Illnesses

Date: \_\_\_\_\_ Time \_\_\_\_\_ MRN: \_\_\_\_\_  
Name: \_\_\_\_\_ ID#: \_\_\_\_\_ Hospital: \_\_\_\_\_

Circle the number reflecting the patient's condition (exposure and clinical picture) and calculate the final score:

Risks for Acute Respiratory Illnesses	Score		
<b>A. Exposure Risks</b>	<i>Any Patient (Adult or Pediatric)</i>		
1. Had a history of travel abroad or to the identified high-risk area in the Kingdom (Qatif) <b>OR</b> A close physical contact in the past 14 days prior to symptoms onset with a confirmed case of COVID-19 <b>OR</b> Working in or attended a health care facility where patients with confirmed COVID-19 were admitted.	5		
2. Exposure to a confirmed MERS case in the last two weeks	3		
3. Exposure to camel or products (direct or indirect*) in the last two weeks	2		
4. Visit to a healthcare facility that had MERS case in the last two weeks	1		
<b>B. Clinical Signs and Symptoms</b>	<i>Adult Patient with Exposure Risk No. 1</i>	<i>Patient with or without Exposure Risk No. 2, 3 or 4</i>	
		<i>Pediatric</i>	<i>Adult</i>
1. Fever	1	1	2
2. Cough (new or worsening)	1	1	2
3. Shortness of breath (new or worsening)	1	1	2
4. Sore throat and/or runny nose	1	-	1
5. Nausea, vomiting and/or diarrhea	-	-	1
6. Chronic renal failure, CAD/heart failure	-	-	1
<b>Total Score</b>			

\* Patient or household

A score  $\geq 4$ , place patient in an isolation room and inform MD for assessment. MERS-CoV testing should be done only according to case definition.

A score  $\geq 6$ , place patient in an isolation room and inform MD for assessment. COVID-19 testing should be done only according to case definition.

Staff name: \_\_\_\_\_ ID number: \_\_\_\_\_

### Appendix 3: Prioritization of cardiac surgery cases Flow Chart

