



Bangladesh Society of Cardiovascular Intervention (BSCI)

Preface

On behalf of the Bangladesh Society of Cardiovascular Intervention, it is our tremendous pleasure to inform you that, a clinical guidance for the management of cardiac patients in COVID 19 pandemic is launched on 15th April 2020. We look forward to engaging with you through this clinical guidance and encourage your contribution and enhancing the patients' care in COVID 19 pandemic. We believe it will serve as a clinical practice guideline for cardiovascular healthcare professionals, with a focus on modifying standard practice of care during the COVID 19 pandemic. This is an evolving document based on currently available global data and is tailored to healthcare systems in Bangladesh. We are grateful to our esteemed cardiologists for their outstanding contribution. We request every cardiologist/hospital who will treat COVID 19 with cardiovascular diseases to follow this clinical guidance as stipulated by national guidelines on clinical management of Coronavirus Diseases 2019(COVID 19) published by the the Director General of Health Services, Ministry of Health and Family Welfare of Bangladesh. This evolving document will regularly be updated and cardiologists are advised to keep up-to-date with current data from various parts of the world. We welcome every suggestion and feedback on this document.

BSCI is committed to serving people through all cardiologist of Bangladesh at the most affordable way while providing best in class expertise and best personalized practice care. We also want to acknowledge your commitment to combat this COVID 19 pandemic battle.



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A clinical guidance for the management of cardiac patients in the COVID-19 pandemic

Version 1.0 (15th April 2020)

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1. ABSTRACT:

Since the first recorded case of SARS-CoV-2 in Bangladesh on 8th March 2020, COVID-19 has spread widely through different regions of the country, resulting in a necessity to re-evaluate the delivery of cardiovascular services, particularly procedures pertaining to interventional cardiology in resource-limited settings. Given its robust capacity for human-to-human transmission and potential of being a nosocomial source of infection, the disease has specific implications on healthcare systems and health care professionals faced with performing essential cardiac procedures in patients with a suspected or confirmed diagnosis of COVID-19. The limited resources in terms of cardiac catheterization laboratories that can be designated to treat only COVID positive patients, are further compounded by the additional challenges of unavailability of widespread rapid testing on-site at tertiary cardiac hospitals in Bangladesh. This document prepared for our nation by the Bangladesh Society of Cardiovascular Interventions (BSCI) is intended to serve as a clinical practice guidance for cardiovascular health care professionals, with a focus on modifying standard practice of care during the COVID-19 pandemic, in order to ensure continuation of adequate and timely treatment of cardiovascular emergencies avoiding hospital-based transmission of SARS-COV-2 among healthcare professionals and the patients. This is an evolving document based on currently available global data and is tailored to healthcare systems in Bangladesh with particular focus on, but not limited to, invasive cardiology facilities (cardiac catheterization, electrophysiology & pacing labs). This guidance is limited to the provision of cardiovascular care, and it is expected that specific targeted pharmacotherapeutics against SARS-CoV-2 be prescribed as stipulated by the National Guidelines on Clinical Management of Coronavirus Disease 2019 (COVID-19) published by the Director General of Health Services, Ministry of Health and Family Welfare of Bangladesh.¹

Keywords: Coronavirus disease; SARS-CoV-2, Cardiovascular disease; practice guidance ; interventional cardiology; Bangladesh.

2. Introduction

Following its first recorded case of SARS-CoV-2 virus on 8th March 2020, Bangladesh has witnessed an escalation of cases of COVID-19 in different regions of the country, particularly in

the cities of Dhaka and Narayanganj. As a result of this rapidly spreading outbreak and ensuing situation of emergency, routine activities have been altered and elective procedures curtailed in most cardiac catheterization and electrophysiology laboratories in the country, in order to limit transmission of the infection to the public and healthcare workers and efficiently deliver care in cases of cardiac emergencies. Despite the challenges, the BSCI recognizes the importance of continuing to deliver emergency and essential cardiovascular services to the people of the country with minimum burden on the nation's healthcare services, in a manner that does not compromise overall infection prevention and control practices among the public and health care workers. In addition to general responsibilities of physicians in ensuring continuous cardiac care, the BSCI understands the need to make our commitment to public and to adapt our practice to the best practices in the current world context, with the active engagement of management and clinical teams planning the local response in our hospitals. While this guidance offers a basic strategy, it must be emphasized that this is an evolving document that will be regularly updated, and physicians are advised to keep up to date with current data and prescription practices coming in from various parts of the world.

3. COVID-19 and cardiovascular diseases

Although the clinical manifestations of COVID-19 are dominated by respiratory symptoms, some patients have been seen to have severe cardiovascular damage.¹ Furthermore, among those with COVID-19, there is a higher prevalence of cardiovascular disease and more than 7% of patients suffer myocardial injury from the infection (and upto 22% of the critically ill).² Myocardial injury (defined by elevated cardiac biomarkers) associated with SARS-CoV-2 was also commonly noted among hospitalized patients with COVID-19 in Wuhan, China, and is associated with higher risk of in-hospital mortality.¹ Managing cardiac patients suffering from COVID-19 must be done in conjunction with a multidisciplinary team involving all relevant specialities according to National Guidelines on Clinical Management of Coronavirus Disease 2019 (COVID-19) published by the Director General of Health Services, Ministry of Health and Family Welfare of Bangladesh.³ This guidance specifically focuses on defining emergency cardiac services, particularly those requiring catheterization, and best practices in effectively delivering cardiac care with minimum risk of transmission of infection among healthcare workers.

4. Maintaining cardiovascular services during the COVID-19 pandemic

4.1 Essential considerations and principles of treatment:

- Epidemic control is the first priority and risk of transmission must be absolutely minimized
- Prompt risk assessment of presenting cases in terms of:
 - Cardiac risk
 - COVID-19 status
- Preference for conservative medical therapy over intervention, wherever possible
- Strict measures to limit infection spread within the hospital and to healthcare workers
- Coordination and collaboration between multidisciplinary health care teams particularly among patients that may require intubation and mechanical ventilation
- Presence of cardiac catheterization laboratories and isolation facilities on-site
- Consider at least level II Personal Protective Equipment (PPE) and preference for type III PPE for all staff during interventional procedures, especially during those that may be aerosol generating procedures.

4.2 Challenges in cardiovascular services in COVID-19 pandemic

The BSCI recognizes unique national challenges to managing cardiovascular diseases and in particular cardiac emergencies in this pandemic, that precludes most algorithms.

1. Limited access to rapid testing and thus limitation to a rule-in/ rule-out algorithm in STEMI care
2. Lack of availability of negative pressure ventilation cardiac catheterization laboratories (CCL) in the country
3. Limitations of resources and health care personnel
4. Potential scarcity of Personal Protective Equipment (PPE) in some centres
5. Unavailability of facilities for primary PCI at all hospitals in the country
6. Limitations to transfer of suspected COVID-19 patients between hospitals for care

4.3 Risk assessment

It is important to assess and classify ALL patients presenting to the emergency department for symptoms of COVID-19 according to National Guidelines on Clinical Management of Coronavirus Disease 2019 (COVID-19). All patients should also be assessed for severity of

cardiovascular presentation and haemodynamic stability to decide if they warrant necessary emergency admission for treatment. The purpose of risk assessment is to carefully weigh the relative advantages and disadvantages of treating cardiovascular disease while preventing the risk of SARS-CoV-2 transmission. While risk assessment might result in delays in time-sensitive treatment (door to needle time in STEMI etc) and compromise optimum treatment protocols, it is important to minimize risk of virus transmission and make maximum efforts to treat cardiovascular emergencies in a timely manner.

5. Cardiology patient categories referred to in this document & patient selection for the catheterization laboratory

- **Emergency:** Patients with severe emergent CVD requiring hospitalization and treatment (either conservative or invasive). Emergency cases have been listed in *Table 1*.
- **Elective:** elective cardiology cases (coronary intervention, pacing, ICD, CRT-D etc) not requiring an urgent life-saving procedure. *Table 2* lists some of the cardiac interventional procedures that may be deemed non-emergency. It is recommended that admission of these elective cases be deferred unless absolutely necessary.
- **Outpatient:** Consideration should be given to the urgency of an outpatient appointment, need for a face-to-face appointment as well as diagnostic test or procedure that requires the patient to visit a hospital. Such cases warrant an outpatient visit. For all other cases and routine follow-up, appointments should preferably be made by means of telemedicine.

6. Management of STEMI patients

Various healthcare systems in different countries across the globe have recommended their approach to treatment of STEMI in the setting of COVID-19 pandemic.⁴⁻⁶ The basis for choosing between primary PCI and fibrinolysis as the default treatment strategy has been primarily based on rapid availability of primary PCI operators, speed of activating cath lab in order to maintain door-to-wire times, and presence of catheterization laboratories with negative pressure ventilation.

In Bangladesh, given limitations in personnel and resources in all hospitals, it is reasonable to consider a default conservative strategy with fibrinolysis, as the best compromise of prompt reperfusion for the patient with the least resource implications for the institution, while buying time for a complete clinical picture to be made. A subsequent pharmaco-invasive strategy may be further adopted in COVID negative cases, subject to confirmation by laboratory tests. PCI should only be done to the culprit artery. All COVID positive patients should be kept in isolation wards with monitoring, and minimum exposure of multiple staff members. A recommended step-by-step algorithm has been detailed in Figure 1.

7. Management of NSTEMI-ACS

In cases of suspected NSTEMI-ACS with stable haemodynamics, it is reasonable to allow time for COVID tests to return prior to cardiac catheterization.

8. Rapid turnover of patients and follow up

It is important to focus on rapid discharge of patients following treatment for any procedure. All follow-up visits should be via telehealth, and hospital visits should be limited to those with severe cardiac emergencies.

9. Essential considerations in cardiac catheterization laboratory

The following important points are emphasized to minimize transmission of infection from cath labs.

9.1 Negative pressure ventilation cath labs

Many patients may require aerosol-generating procedures (AGP) in the cath lab – viz. intubation, suctioning, or CPR, increasing likelihood of exposure to personnel. As such, all suspected COVID cases should be performed in cath labs with negative pressure ventilation systems, or as the last case of the day, so that terminal decontamination may be done. Terminal decontamination of the cath lab must be done following all suspected and confirmed COVID positive cases.

9.2 Dedicated COVID labs

Whenever possible, institutes are advised to perform confirm/suspected COVID cases in separate cardiac cath lab “dirty” lab, and negative cases in an alternative lab “clean” lab with separate staff so as to reduce the chance of transmission of infection.

9.3 Protection of healthcare workers

Health care staff working in cardiac cath labs and emergency room areas are faced with performing procedures in patients with a confirmed diagnosis of COVID-19 and with uncertainty in those with unconfirmed infection. In addition, interventional cardiology units are generally closed units with the same team members working closely together in these areas, representing a risk for health care delivery if quarantines are declared in entire units.

Given the heavily contagious nature of the virus, health care systems are urged to consider an alternating shift-based system with equal division of experts in each team, to ensure conservation of manpower and healthcare resources. This is applicable across all departments. For example, an alternating seven-day roster may be constructed wherein primary PCI operator, cath lab personnel (radiographers, scrub nurse and circulating nurses), middle grade doctors and residents are divided in equal numbers and asked to work for one week, while remaining at home (and thus away from potential exposure) the subsequent week. Even within the cath lab, exposure should be minimized to only essential personnel with priority given to rapid completion of the procedure over training.

The levels of PPE have been defined in the literature along with the circumstances in which they should be adhered to (Table 3).⁷ Given that acute emergencies being treated in the cardiac cath labs are potentially aerosol generating procedures (AGP) and may require intubation, it is recommended that essential staff be in level 3 protection. In order to conserve PPE, it is recommended that only essential staff remain within the laboratory. All staff should be familiar with the appropriate use of PPE particularly the relevant steps of donning and doffing.

10 Necessity to remain up to date

As more data and evidence emerges globally, on best practices of cardiovascular disease in this pandemic, we emphasize the necessity of all physicians to remain up to date on emerging data and protocols. This is an evolving document that will be updated as and when new evidence comes to light.

Table 1. Cardiovascular emergencies mandating admission and treatment in COVID-19 pandemic

A) Clinical emergencies requiring admission and treatment

1. Acute coronary syndromes including all STEMI and high-risk NSTEMI-ACS
2. Acute heart failure (NYHA Class III-IV)
3. Malignant tachyarrhythmias (VT/VF)
4. Life-threatening AV blocks requiring pacing
5. Patients with uncomplicated Stanford type B aortic dissection
6. Patients with acute pulmonary embolism
7. Myocarditis/ myocardial injury
8. Cardiac tamponade

B) Procedural emergencies: Cardiovascular diseases requiring urgent or emergent interventional procedure or surgery in cardiac catheterization laboratories

1. Coronary intervention

- Acute STEMI with hemodynamic instability (Primary PCI, pharmaco-invasive/ rescue PCI)
- Life-threatening/high-risk NSTEMI indicated for urgent revascularization.

2. Pacing, devices and electrophysiology

a) Pacing

- Bradyarrhythmia complicated with syncope or unstable hemodynamics mandating implantation of a temporary pacing wire, or, if indicated, permanent pacemaker.

- Urgent generator replacements, e.g. for EoL with no underlying rhythm, should continue.

b) ICD implantation

- urgent ICD implants for secondary prevention following cardiac arrest or syncopal VT should continue

c) CRT implantation

- CRT-D implants for secondary prevention following cardiac arrest or syncopal VT should continue

d) **Others:** Stanford type A or complex Type B acute aortic dissection.

Table 2. Elective procedures that may reasonably be deferred

1. Coronary intervention

- **PCI:** elective PCI should be deferred.

2. Valve disease:

- Elective valve interventions (PTMC) should be deferred

3. Pacing, devices and electrophysiology

a) Pacing

- Pacemakers for sinus node disease can reasonably be deferred
- Most elective generator replacements can be deferred

b) ICD implantation

- Primary prevention implants should be risk assessed on a case-by-case basis but may be deferred, accepting that there is a finite risk associated with delay

c) CRT implantation:

- Elective CRT-P implants or upgrades can reasonably be deferred
- CRT for patients with unstable heart failure should be considered on a case-by-case basis
- CRT-D implants for primary prevention should be risk assessed on a case-by-case basis but may be deferred, accepting that there is a finite risk associated with delay

d) Ablation:

- For non-malignant arrhythmias can be deferred
- For rapidly conducted pre-excited AF in WPW patients, patients with heart failure secondary to tachycardia, and VT ablation for patients who are not controllable with medication can be considered on a case-by-case basis.

e) Device:

- Device closure for ASD/ VSD/ PDA should be deferred

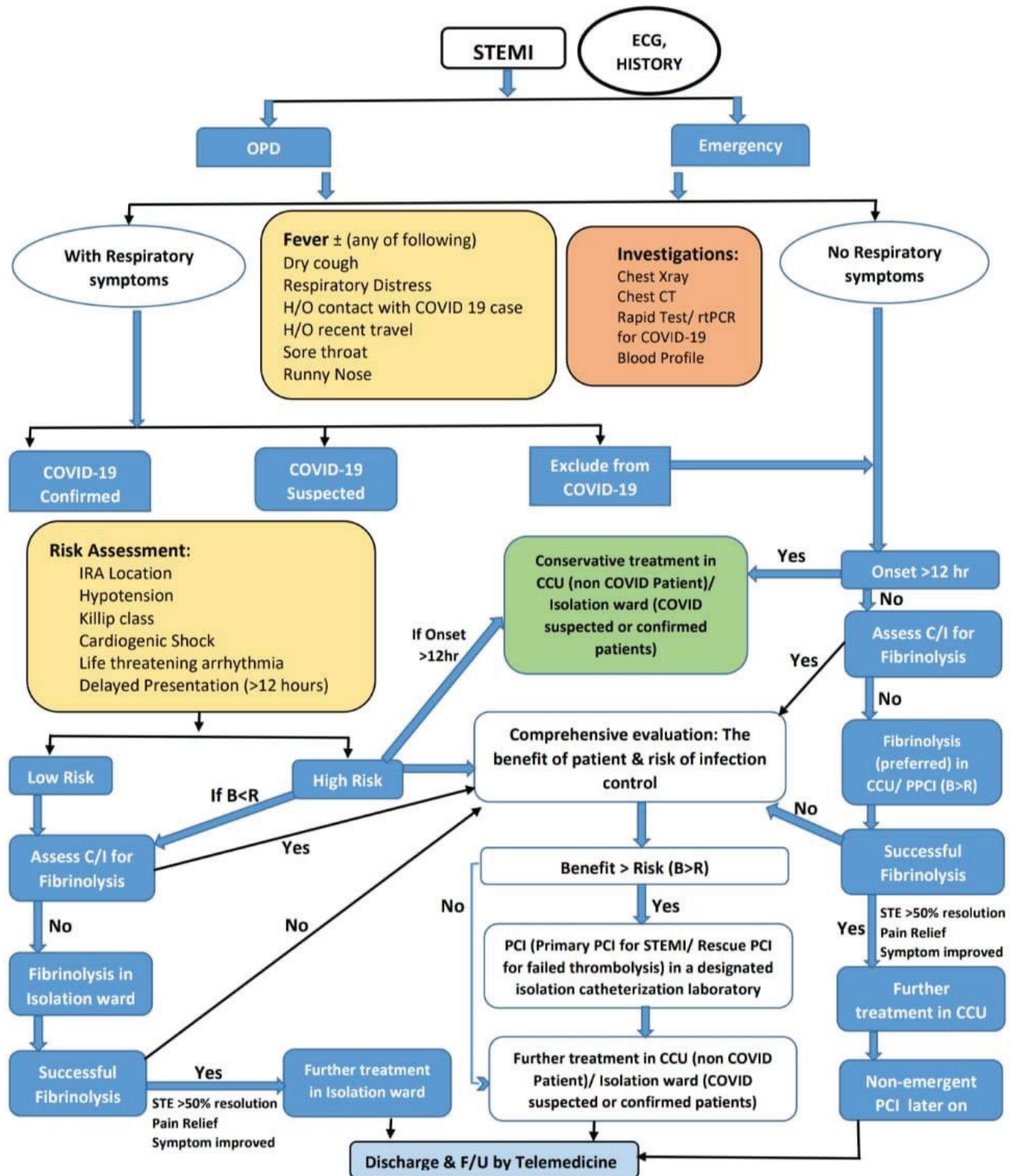
Table 3: Categories of PPE and their constituents

(1) Level 1 protection: surgical mask (or N95 respirator), disposable cap, disposable isolation gown (or white coat), medical gloves (if necessary), rapid hand disinfection solution

(2) Level 2 protection: disposable cap, goggles (or facemask), N95 respirator, disposable protective overall, medical gloves, disposable shoe covers, rapid hand disinfection solution

(3) Level 3 protection: disposable cap, particulate respirator (or comprehensive respiratory apparatus), N95 respirator, disposable protective overall, medical gloves (two layers), disposable shoe covers (or protective boots), disposable waterproof isolation gown, rapid hand disinfection solution

Figure 1: Algorithm for management of STEMI in COVID-19 pandemic



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