

ANMCO POSITION PAPER: Considerations on in-hospital cardiological consultations and cardiology outpatient clinics during the COVID-19 pandemic

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Infections by SARS CoV2 - COVID-19 have become in a short time a worldwide health emergency. Due to cardiovascular implications of COVID-19 and to very frequent previous cardiovascular disorders of COVID-19 patients, it is presently crucial that Cardiologists are fully aware of COVID-19 related epidemiological, pathophysiological and therapeutic problems, in order to manage at best the present emergency by appropriate protocols developed on the basis of the competences acquired and shared on the field.

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The aim of this document is to propose algorithms for the management of cardiovascular diseases during COVID-19 emergency with the objective of providing patients with optimal care, minimizing contagion risk and appropriately managing personal protective equipment.

Introduction

Over a short period of time, COVID-19 infection has become a worldwide problem and a health emergency.¹ Today it is crucial that cardiologists know this disease in its epidemiology, pathophysiological, and therapeutic aspects, in order to better manage the ongoing emergency through protocols proposed on the basis of shared experiences.

The reasons underlying the importance of COVID-19 infection for cardiologists are as follows:

- It is a pandemic that affects everyone, especially cardiovascular patients, as shown by Chinese cases²⁻⁶;
- COVID-19 patients may have cardiovascular complications, although they are not so frequent^{7,8};
- Cardiovascular disease continues to be prevalent in the general population and patients with acute coronary syndrome may at the same time be positive for COVID-19.^{9,10}

The objective of this document is to propose management algorithms for cardiovascular disease during the COVID-19 emergency, in order to optimize cardiological assistance for the benefit of patients by minimizing the possibility of contagion, safeguarding healthcare personnel, and rationalizing the use of personal protective equipment (PPE).^{11,12}

All patients who come for cardiological evaluation must be screened for COVID-19 infection and should result negative on the diagnostic test (unless it is an emergency).

In many regions (see also Ministry of Health Circular prot. 7422-16/03/2020) only outpatient activities with U and B priorities were maintained (moreover, in many hospitals access is restricted to only type U priorities due to regulations).

Obviously, all activities possible through telephone consultation or better by telemedicine must be promoted.

General indications

- Clinical staff should contact patients scheduled for appointments the day before to confirm appointments and give precise instructions on how to carry them out and to propose a COVID-19 screening.
- Every effort should be made to minimize the number of patients present at the same time by distancing appointments and providing large waiting rooms with adequate social distance (see also National Institute of Health (NIH) and regional indications).
- During the appointment or the diagnostic test, it is important to minimize the exposure of healthcare

personnel and always provide a surgical mask for the patient to wear.

- Try to avoid redundancy of medical exams and diagnostic tests.
- Try to facilitate access for priority U patients at local level outpatient treatment centres to reduce the burden on hospitals.

Urgent evaluation is needed (referring to priorities U or B in the case of patients with (also referring to regional RAO):

De novo presentation of:

- chest pain or equivalent with high a priori risk of coronary heart disease;
- dyspnoea or equivalent with suspected heart failure (warning–dyspnoea is also a COVID-19 symptom, so it is necessary to ask the patient before access to clinic);
- palpitations with syncope and/or signs of poor haemodynamic tolerance; and
- syncope of suspected cardiac origin.

Exacerbation or refractoriness of:

- angina pectoris
- heart failure
- arrhythmia

In the case of a suspected COVID-19 patient, it is always necessary to try to postpone the medical exam or the appointment (if a cardiac patient cannot wait, refer them to the emergency room which has appropriate access points and safety procedures in place) or manage with the available PPE according to the risk of contagion following specific safety procedures, remembering to disinfect spaces and equipment after the exam/appointment according to local protocols.

Management algorithm on in-hospital cardiology consultations of suspected or positive COVID-19 patients

Patient with COVID-19 and no history of cardiovascular disease

Cardiology consultations are not necessary for COVID-19 patients with no previous medical history indicative of cardiovascular disease. This case requires an electrocardiogram (ECG) with telematic reading and telematic consultations for any therapeutic advice on cardiological drugs and on drugs that prolong the QTc interval.

Table 1 Potentially deferrable activities

| Clinical area | Potentially deferrable activities |
|--|---|
| Electrophysiology and electrostimulation | <ul style="list-style-type: none"> • Election check in of PM/ICD carrier (in presence) in the absence of new cardiovascular symptoms • CVE in asymptomatic stable patients • Electrophysiological test in stable patients • Tilt test • LRI implantation in the absence of cryptogenetic stroke • PM implantation for sinus node dysfunction or non-advanced Grade II BAV, without syncope • ICD implantation in primary prevention in stable low-risk patients (limited to outpatient); evaluate availability of temporary protection with wearable defibrillator • CRT upgrade in stable patients • Left auricle closure/occlusion with mechanical device • Ablation of atrial fibrillation and/or flutter in stable patients • Ablation of supraventricular tachycardias in stable patients • Ablation of ventricular extrasystole in stable patients • Removal/explantation of electrodes/generator not related to infection and/or system malfunction stimulation |
| Stress test cardioimaging | <ul style="list-style-type: none"> • Stress testing (also with possible imaging) for suspected stable ischaemic heart disease • TCP for functional evaluation • Transthoracic echocardiogram (outpatient only) • Transoesophageal echocardiogram for stable patients • Cardiovascular TC (outpatient only) • Cardiovascular NMR (outpatient only) • SPECT and PET • Vascular imaging for asymptomatic carotid disease • Vascular imaging for claudication • Screening imaging (e.g. calcium score, AAA screening) |

AAA, abdominal aortic aneurysm; BAV, atrioventricular block; CRT, cardiac resynchronization therapy; CVE, electrical cardioversion; ICD, implantable defibrillator; LRI, implantable loop recorder; PET, positron emission tomography; PM, pacemaker; RMN, nuclear magnetic resonance; SPECT, single photon emission computed tomography; TC computerized tomography; TCP, cardiopulmonary stress test.

Patient with COVID-19 and cardiac disease in pharmacological treatment

An ECG and telematic consultations on pharmacological therapy are necessary for patients with COVID-19 and cardiovascular disease. During consultation, it is important to inform the patient about drug therapy, in particular about protease inhibitor therapy that interacts with some cardiovascular drugs such as new oral anticoagulant drugs¹³⁻¹⁵ and drugs that prolong the QTc interval.

Patient with COVID-19 and heart failure in pharmacological treatment

An ECG and dosage of N-terminal fragment of the propeptide of brain natriuretic, along with telematic consultations on specific pharmacological therapy are necessary for patients hospitalized for COVID-19 with known heart disease and heart failure already undergoing pharmacological treatment.

Patient with COVID-19 and symptoms of high-risk non-ST-segment elevation myocardial infarction

Telematic cardiology consultations and troponin I and N-terminal pro-B-type natriuretic peptide dosages are

necessary in cases of patients with COVID-19 and symptoms of high-risk non-ST-segment elevation myocardial infarction. If the cardiologist, in the presence of a favourable risk/benefit ratio, considers it useful to perform an echocardiogram, the operator must be protected with total protection PPE and FFP3 masks (maximum protection). Please refer to specific Acute Heart Failure (AHF) protocols.

Patient with COVID-19 and serious haemodynamic impairment with circulatory shock

If the critical care physician and cardiologist are in agreement and in presence of a favourable risk/benefit ratio, an echocardiogram may be administered to rule out severe myocardial damage. The operator must be protected with total protection PPE and FFP3 masks (maximum protection). Keep in mind the frequent increase in troponin in COVID-19 patients, expression of non-ischaemic acute myocardial injury.

Patient with COVID-19 and arrhythmia

Arrhythmias are relatively frequent in COVID-19 patients. The cardiac evaluation may be performed telematically,

after possible telephone contact with the referring doctor, for therapeutic advice. Please refer to specific arrhythmology protocols.

Cardiology consultation in the emergency room or in other hospital wards

Before carrying out cardiology consultations in the emergency room or in other wards, it is necessary to perform a quick telephone interview about the presence of flu and/or respiratory symptoms in the patient. In the case of suspected symptomatology and if it is not possible to wait for the swab results, the patient must be considered positive for COVID-19 and maximum protection measures must be taken.

In all other cases, it is necessary to make consultations with disposable gowns and surgical masks, making sure that the patient always wears a surgical mask.

Instrumental exam requests

In COVID-19 patients, only cardiology consultations may be requested, when indicated. Instrumental exams will be ordered by the cardiologist.

COVID-19 patients with cardiac complications during hospitalization

For COVID-19 patients who develop cardiac complications (from arrhythmias to myocardial infarction), the hospitalization must be located in the COVID area based on the need for care (low, sub-intensive, intensive) and not on the basis of medical specialization regarding the possible complication. In other words, the area intended for COVID-19 patients, structured according to the level of needed care, should host COVID-19 patients regardless of associated comorbidity as it is unconceivable that every specialty ward be equipped with a mini isolation unit.

Potentially deferrable activities

Potentially deferrable activities are shown in *Table 1*. Obviously, the choice to defer procedures/tests must always be made after rigorous evaluation of the clinical condition of the individual case and after careful evaluation of the risk/benefit ratio.¹⁶⁻¹⁸

Interventional cardiology

After rigorous evaluation of the clinical condition of the individual case and after careful evaluation of the risk/benefit ratio, the following procedures are potentially deferrable (among others):

- coronary angiography/angioplasty for stable coronary artery disease;
- preoperative coronary angiography for non-cardiac surgery;
- interventions for chronic total coronary occlusions; and
- transcatheter aortic valve implantation for asymptomatic patients

Data availability

The data that support the findings of this study are available from the corresponding author, SV, upon reasonable request.

Disclaimers

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