

# Electrotherapy and electrophysiology procedures during the coronavirus disease 2019 pandemic: an opinion of the Heart Rhythm Section of the Polish Cardiac Society (with an update)

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## KEY WORDS

coronavirus disease 2019, electrophysiology, electrotherapy

**Update** Due to the ongoing pandemic of coronavirus disease 2019 (COVID-19) and the dynamically changing epidemic situation, and taking into account the growing body of knowledge on the disease itself as well as predictions of its further spread, the Board of the Heart Rhythm Section supplements the previous opinion dated March 23, 2020<sup>1</sup> with the following information:

The number of invasive electrotherapy and electrophysiology procedures has drastically fallen in the recent weeks. It applies both to urgent and elective procedures. According to the analysis of unpublished data collected from 10 main electrotherapy centers in Poland comparing the number of procedures in the previous and current year in the period from March 15 to April 14, the number of electrotherapy procedures has dropped by 41%, including implantation of pacemakers by 39%, placement of implantable cardioverter-defibrillators (ICD) by 52%, and resynchronization therapy devices by 35%. A remarkable reduction in the number of corrective surgeries of lead extraction (by 43%) was also observed. Moreover, the number

of performed ablations has decreased considerably (by 74%), especially in case of pulmonary vein isolation (by 80%).

Restrictions in performing procedures that can be safely postponed by a few months without any harm to those awaiting are entirely justified by the need to limit the risk of potential infection of patients and medical personnel in healthcare centers by the undiagnosed carriers. However, the delay in emergency and urgent procedures may result in significant health deterioration or may even lead to immediate life-threatening situations.<sup>2</sup>

On the one hand, the current epidemic situation in Poland indicates the rising number of infected individuals, which increases the potential risk of new infections in healthcare centers. On the other hand, the constantly rising number of tests excluding the infection enables to minimize this risk. The course of epidemic and the estimated time necessary for its reduction remain unknown.<sup>3,4</sup>

For that reason, the periodic reevaluation of the urgency of indications to perform invasive

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procedures is necessary, as postponing them to the uncertain future may cause in the long run a significant deterioration in patients' health and prognoses. It mostly applies to patients with indications for urgent treatment. The emergency course of action was clearly defined in the previous opinion, and these patients should be catered for immediately.

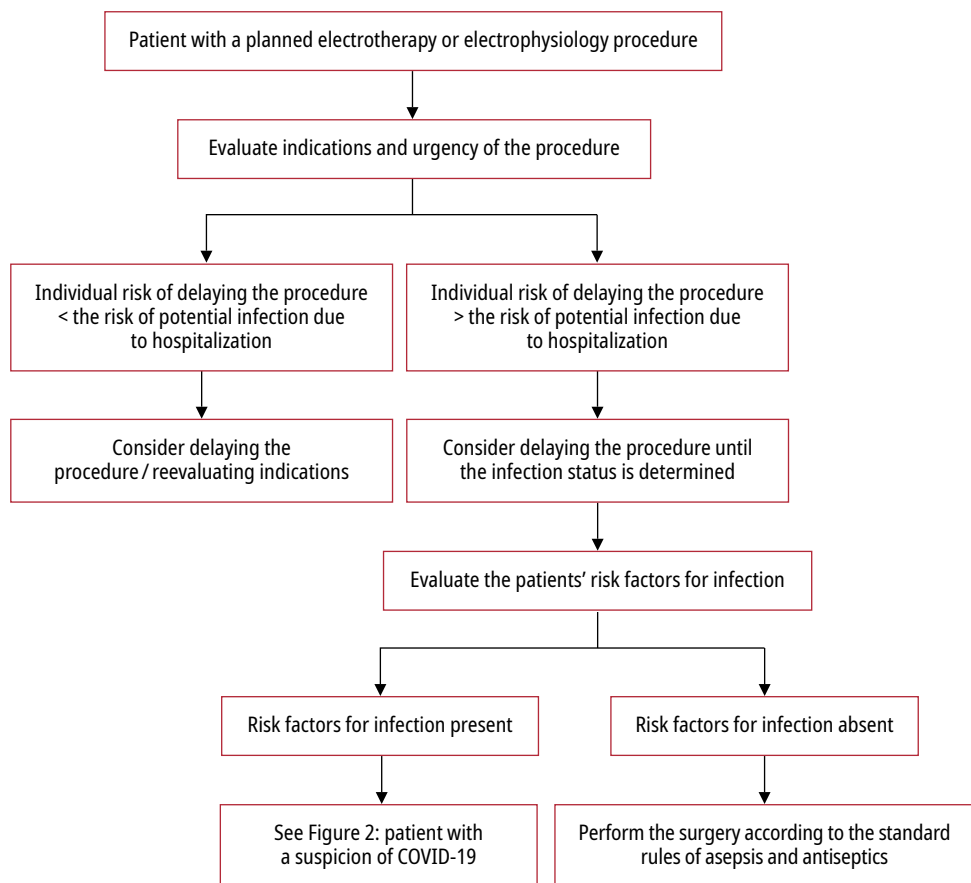
The urgent course of action indicates that as much as the invasive procedure does not need to be performed promptly, postponing it until some indefinite point in the future, in weeks or even months, might be dangerous for the patient, and the related risk may outweigh the risk of infection and its potential consequences. The indications in this group include: placement of ICD in the primary prevention of sudden cardiac death in patients with particular risk of ventricular arrhythmia (especially in case of ischemic etiology), implantation of resynchronization therapy devices in case of advanced heart failure, replacement of pacemakers and defibrillators due to pending battery depletion, or ablations of recurrent pharmacotherapy-resistant incessant arrhythmias requiring frequent hospitalizations.<sup>5,6</sup>

Patients qualified for procedures in the urgent course of action should be treated in a way

enabling maximal limitation of the risk of spreading the potential infection between them and the healthcare personnel, mainly by means of tests excluding the coronavirus infection already at hospital admission.<sup>6</sup>

The remaining text of the opinion remains unchanged.

**Introduction** Current COVID-19 pandemic is caused by the RNA severe acute respiratory syndrome coronavirus 2 virus (SARS-CoV-2). The infection is airborne or direct; however, considering the currently available body of knowledge, other ways of infection cannot be excluded.<sup>7</sup> Due to the rapid spread of the epidemic, the Heart Rhythm Section of the Polish Cardiac Society presents the opinion on electrotherapy or electrophysiology procedures during the COVID-19 pandemic in patients with confirmed infection, individuals in quarantine, as well as patients from the general population. The primary aim of the publication is to limit the risk of spreading the infection onto healthy patients by the medical personnel, and the protection of electrotherapy and electrophysiology teams from infection or the unnecessary contact with those with SARS-CoV-2 infection or the ones in the group at risk for infection.



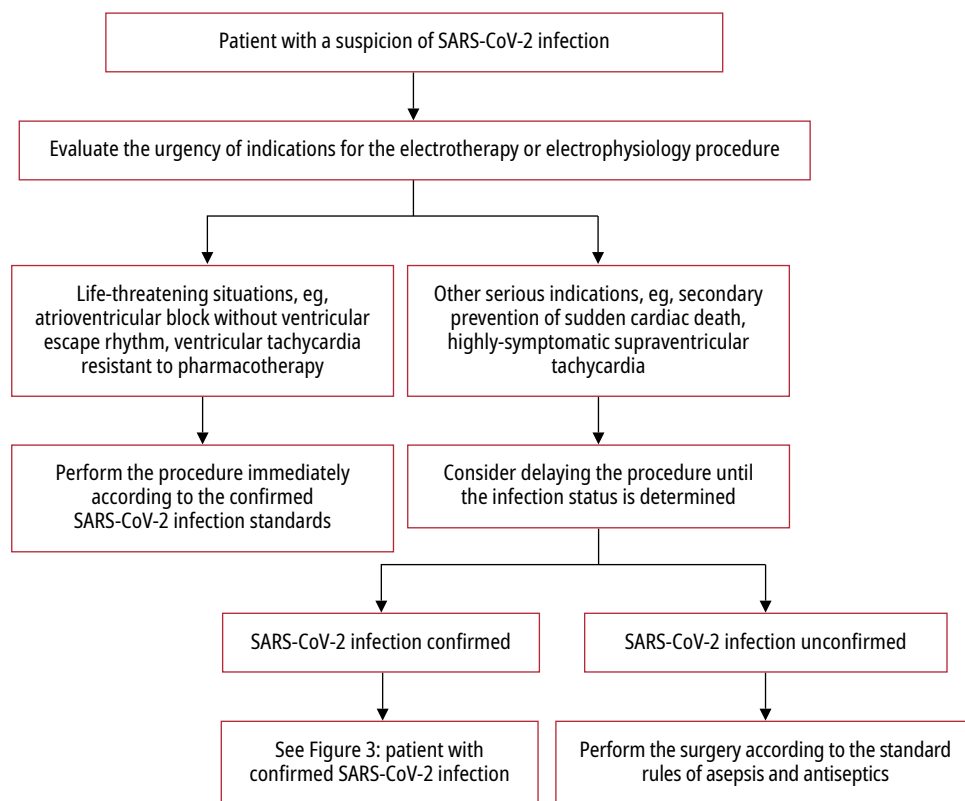
**FIGURE 1** Flowchart showing steps to be taken in a patient from the general population with indications for electrotherapy or electrophysiology procedures

**Indications for cardiac electrotherapy and electrophysiology procedures and the course of action**

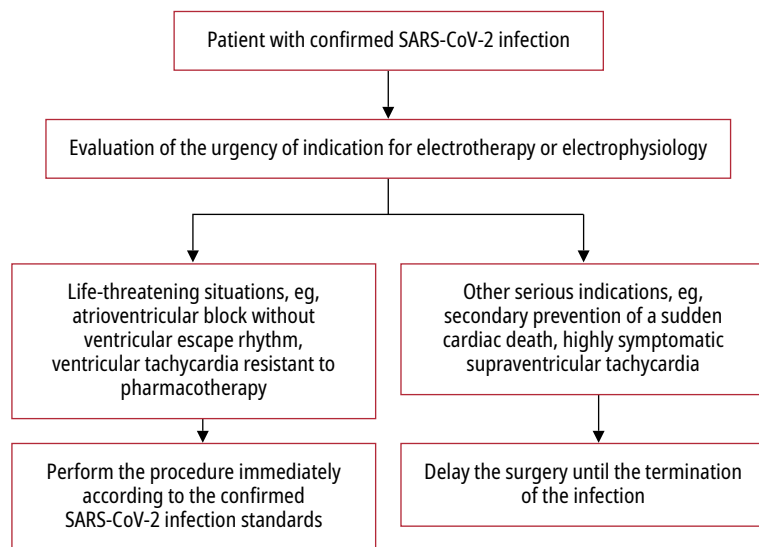
**General population** The general population is understood as individuals without confirmed SARS-CoV-2 infection and a negative history of risk factors for infection. During the epidemic, it seems justifiable to postpone elective procedures such as: implantation of pacemakers in case of mildly symptomatic bradycardia, upgrading of the pacing systems, placement of ICDs in the primary prevention of sudden cardiac death, ablations of supraventricular arrhythmias and benign ventricular arrhythmias relatively well-tolerated by the patient which do not require immediate hospitalization. The aim behind this is to protect the patients from the contact with healthcare personnel, which may pose a potential threat of infection.<sup>8</sup> The procedures with emergency indications should be performed with accordance to the previous protocols (FIGURE 1). These procedures include: implantation of a pacemaker due to the second- or third-degree atrioventricular block, placement of ICD in the secondary prevention of sudden cardiac death, exchange of pacing systems and ICDs due to battery depletion or damage to the leads, removal of pacing/ defibrillation systems because of infections and ablations of incessant and resistant to other forms of treatment life-threatening supraventricular arrhythmias as well as dangerous recurrent chronic ventricular arrhythmias.

**Suspected coronavirus disease 2019** Individuals with a suspicion of SARS-CoV-19 infection are defined as those in quarantine, waiting for the test results, and with medical history indicating the possibility of infection. In all cases, procedures should be postponed, if possible, until the confirmation or exclusion of the infection. After the exclusion of the infection, these individuals should be treated as patients from the general population (see section General population above). In case of a confirmed infection, see section Confirmed coronavirus disease 2019 below. If an immediate life-threatening situation occurs (eg, third-degree atrioventricular block without efficient ventricular escape rhythm, an electrical storm without pharmacological possibility to control the arrhythmia), individuals with an uncertain epidemiologic status should be subject to the procedures immediately, possibly in dedicated centers having the possibility to isolate such a patient and enabling the adequate protection of the personnel. Protocols prepared for patients with confirmed infection should be followed during these procedures (FIGURE 2)

**Confirmed SARS-CoV-2 infection** Individuals with confirmed SARS-CoV-2 infection should be treated in dedicated hospitals with an electrotherapy lab. Only patients with an immediate life-threatening condition should be qualified for



**FIGURE 2** Flowchart showing steps to be taken in a patient with suspected severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection with indications for electrotherapy or electrophysiology procedures



**FIGURE 3** Flowchart showing steps to be taken in a patient with confirmed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection with indications for electrotherapy or electrophysiology procedures

treatment. The remaining procedures should be postponed until the recovery from SARS-CoV-2 infection (urgent procedures) or until the termination of the epidemic (the remaining elective surgeries) (FIGURE 3).

### Arrangement of electrotherapy and further care in a patient with an unclear epidemic status

Arrangement of electrotherapy and further patient care in hospitals performing procedures in patients with a confirmed SARS-CoV-2 infection and in other centers in case of an unclear epidemic status of the patient is as follows:

- 1 The best place for performing invasive procedures is the operating theatre. The operating room should be ventilated by means of negative pressure. Positive pressure used in operating rooms encourages the spread of the infection.<sup>9</sup> Performing procedures in electrophysiology or interventional radiology labs that do not meet the standards of the operating room requires the introduction of appropriate procedures encompassing patient transport, disinfection procedures, and disposal of the waste.
- 2 Reusable equipment should be limited to an absolute minimum.<sup>9</sup>
- 3 The personnel should be limited to an absolute minimum. Optimally, there should be 2 persons, an operator and a nurse. In justified cases, additionally, an X-ray technician and an auxiliary nurse could also be present.
- 4 Personnel should be equipped with personal protection equipment in compliance with the European Centre for Disease Prevention and Control guidelines.<sup>10,11</sup> The personnel should be fully dressed upon the patient's arrival.
- 5 An instrument table and all required items should be prepared before the patient's arrival.

6 The patient should wear a disposable outfit with a surgical facemask and headwear.<sup>9</sup>

7 Activities such as placement of the electrodes or administration of the intravenous drip should be performed before entering the operating theatre in order to limit the scope of activities in the operating room to an absolute minimum.

8 Disinfection of the surgical site: tinted solution of alcohol intended for the disinfection of the surgical site; perioperative antibiotic therapy: according to the existing guidelines.

9 The pacemaker check as well as programming and entering data should take place in the operating room.

10 After the procedure, once the patient has left the operating room, the personnel takes off the protective equipment in the operating room, except for the facemask (the risk of aerosol aspiration in the operating room), which should be taken off in the airlock.

11 Postoperative pacemaker check as well as postoperative radiology and echocardiography should be postponed, if possible, until the epidemic status of the patient is clear. If it is not possible, assessments should be carried out with accordance to the established internal procedures of the center regarding the care for the patient with SARS-CoV-2 infection.

### CORRECTIONS

This article was corrected on January 25, 2021. The list of corrections is available at [www.mp.pl/kardiologiapolska](http://www.mp.pl/kardiologiapolska).

### SUPPLEMENTARY MATERIAL

The Polish version of the paper is available at [www.mp.pl/kardiologiapolska](http://www.mp.pl/kardiologiapolska).

### ARTICLE INFORMATION

**CONFLICT OF INTEREST** None declared.

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