



**Recommendations of the Eurasian Arrhythmology Association
(EURA) for the diagnosis and treatment of patients with
arrhythmias and conduction disorders during the COVID-19
pandemic**

On behalf of the organizing and scientific committees and the Board of Trustees of Eurasian Arrhythmology Association (EURA) with support of the Russian Society of Specialists in Heart Failure (OSSN), European Cardiac Arrhythmia Society (ECAS), Alliance for the treatment of atrial fibrillation (ALFA).

Belenkov Yury. N. (Moscow, Russia), RSC Vice-President, Academician of the Russian Academy of Science and Russian Academy of Medical Science, Professor, Vice-Rector at the Lomonosov State University

Snezhitskiy Viktor A. (Grodno, Belarus), MD, rector of Grodno State Medical University, professor of the first chair of internal diseases

Ardashev Andrey V (Moscow, Russia), MD, Lomonosov State University, Chief of Department of Arrhythmology

Abzaliyeva Symbat. A. (Almaty, Kazakhstan), MD, Deputy Director of scientific-innovative work and international relations Higher School of Medicine

Cappato Ricardo (Milan, Italy), Chief of the Arrhythmia and Electrophysiology Center at Humanitas Research Hospital

Karpenko Jury. I. (Odessa, Ukraine), MD, Head of regional Odessa Center of Cardiosurgery

Konev Aleksey.V. (Moscow, Russia), MD Federal Science and Clinical Center of FMBA, Head of cardiology unit

Nechepurenko Anatoly A. (Astrakhan, Russia), MD, FSBI Federal Center for Cardiovascular Surgery of the Ministry of Health of Russia, Chief of Department of Arrhythmology

Puodziukynas Aras (Kaunas, Lithuania), MD, Head of the Unit of Cardiac Arrhythmias Dpt. of Cardiology Hospital of the Lithuanian University of Health Sciences “Kauno klinikos”

Raviele Antonio (Venice, Italy), MD, Chief of Department of Cardiology, Arrhythmia Center and Center for Atrial Fibrillation, Umberto I Hospital,

Sayganov Sergey. A. (Saint-Petersburg, Russia), MD, rector of North-Western State Medical University named after I.I. Mechnikov

Santini Luca (Rome, Italy), MD, Chief of cardiology of Hospital Giovan Battista Grassi, Ostia lido

Shugaev Pavel. L. (Chelyabinsk, Russia), Federal Center for Cardiovascular surgery, Head of the unit surgical treatment of heart rhythm disturbance and cardiac pacing

Yakovleva Marina. V. (Moscow, Russia), MedElect Clinic, Head of Medical Department

Yuzvinskevitch Sergey. A. (Saint-Petersburg, Russia), head of the city South-Western center for interventional Arrhythmology, head of the Department of the city hospital No. 26

Zateyschikov Dmitry. A. (Moscow, Russia), MD, Head of Vascular Center of City Hospital #51

Zhelyakov Evgeny. G. (Moscow, Russia), Lomonosov State University, cardiologist of Department of Arrhythmology

Introduction:

The beginning of 2020 was characterized by the development of a new coronavirus pandemic (COVID-19). Information about the epidemiology, etiology, pathogenesis, clinical and laboratory diagnostics, as well as prevention and therapy for this disease is constantly being expanded and reviewed. The COVID-19 pandemic creates the need for the emergence of new conditions of specialized care for patients with heart rhythm and conduction disorders [1]. These recommendations are intended for general practitioners, internists, cardiologists, electrophysiologists/arrhythmologists, cardiovascular surgeons, functional diagnostics doctors, anesthesiologists-resuscitators, laboratory diagnostics specialists, health care organizers in the system of organizations and healthcare institutions that provide specialized care to patients with heart rhythm and conduction disorders.

Aim:

To provide information to employees of medical departments at any level and, above all, general practitioners that provide care to patients with heart rhythm and conduction disorders in the context of the COVID-19 pandemic. These include the provision of specialized care, such as invasive procedures related to heart catheterization, implantation of pacemakers, defibrillators and other devices, and catheter ablation.

These recommendations were prepared by the members of the organizational, scientific committees and the Board of Founders of the Eurasian Arrhythmological Association (EURA) with support of specialists from the Society for the treatment of heart failure (OSN), the European cardiac arrhythmias society (ECAS), the Alliance for the treatment of atrial fibrillation (ALFA), the Italian Association for Arrhythmology and pacing (AIAC).

The materials prepared take into account recently published interim guidelines from the Ministry of Health of the Russian Federation "PREVENTION, DIAGNOSIS AND TREATMENT of NEW CORONAVIRUS INFECTION

(COVID-19)" [1], Russian guidelines for the prevention of SCD of the Eurasian Arrhythmological Association [2], a number of foreign guidelines: Guidance for Cardiac Electrophysiology During the Coronavirus (COVID-19) Pandemic from the Heart Rhythm Society COVID-19 Task Force; Electrophysiology Section of the American College of Cardiology; and the Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology, American Heart Association [3], Gestión de salas de procedimientos invasivos cardiológicos durante el brote de coronavirus COVID-19. Documento de consenso de la Asociación de Cardiología Intervencionista y la Asociación del Ritmo Cardíaco de la Sociedad Española de Cardiología [4]

Topics:

This document provides recommendations for interventional procedures (device implantation, catheter ablation, endocardial electrophysiological studies, etc.), specifics of their preparation, dynamic monitoring of patients who have undergone interventional procedures, and primary consultations in patients with arrhythmias in the context of the COVID-19 pandemic.

Determination of indications for invasive procedures in the context of a coronavirus infection pandemic (COVID-19):

We recommend that when determining the indications for invasive procedures during pandemic, in addition to the provisions reflected in the current national and international regulatory documents (see above), be guided primarily by the principles of clinical feasibility, namely: a) the hemodynamic significance of arrhythmic syndrome (Table 2) [2] and b) characteristics of ECG phenomena to predict sudden cardiac death (Table 1).

Table 1. Risk of sudden cardiac death in patients with cardiac arrhythmia and conduction abnormalities (adapted from R. Fogoros, 2006) [2]

| |
|---|
| High |
| 1. Ventricular fibrillation |
| 2. Ventricular tachycardia |
| 3. III degree AV block with low rate escape rhythm |
| 4. WPW syndrome with anterograde conduction via accessory pathway in the setting of atrial fibrillation |
| Moderate |
| 1. Ventricular ectopy with structural heart disease |
| 2. II degree AV block |
| 3. III degree AV block with adequate rate escape rhythm |
| 4. Atrial fibrillation |
| Low |
| 1. Atrial ectopy |
| 2. Ventricular ectopy without structural heart disease |
| 3. Supraventricular tachycardia |
| 4. I degree AV block |

Note: WPW – Wolff–Parokinson–White, AV – atrioventricular

Arrhythmias should be considered hemodynamically significant and life-threatening if they are accompanied by the symptoms listed in table 2 [2]:

Table 2. Criteria of hemodynamic compromise of arrhythmia [2]

| |
|--|
| • <i>Syncope/pre-syncope;</i> |
| • <i>Dizziness;</i> |
| • <i>Acute left ventricular failure;</i> |
| • <i>Progression of symptoms of the chronic heart failure;</i> |
| • <i>Angina;</i> |
| • <i>Arterial hypotension</i> |

1A. Invasive procedures in patients with no clinical or laboratory signs of coronavirus infection (COVID-19 negative)

- Patients with a *high and moderate* risk of SCD [2] and no clinical or laboratory-confirmed signs of coronavirus infection (COVID 19 negative) should continue to receive specialized care as planned based on current national and international recommendations.

- In patients with a *low* risk of SCD and the absence of clinical and laboratory-confirmed signs of coronavirus infection (COVID 19 negative), specialized treatment may be delayed, except in cases characterized by an adverse clinical course of arrhythmia due to its pronounced hemodynamic significance.

1B. Invasive procedures in patients with clinical and / or laboratory-confirmed signs of coronavirus infection (COVID-19 positive)

- In cases of confirmed coronavirus infection (COVID 19 positive), interventional procedures should not be postponed in the following cases:
- Ventricular tachycardia (VT) ablation for medically uncontrolled electrical storm in a hemodynamically compromised patient;
- Catheter ablation of incessant, hemodynamically significant, severely symptomatic tachycardia (SVT/AF/atrial flutter) not responding to antiarrhythmic drugs, rate control, and/or cardioversion;
- Catheter ablation for Wolff-Parkinson-White syndrome or pre-exciting AF with syncope or cardiac arrest;
- Lead revision for malfunction in a pacemaker-dependent patient or ICD patient receiving inappropriate therapy;
- Secondary prevention of sudden cardiac death;
- Generator change in pacemaker-dependent patients who are at elective replacement indicator (ERI) or at device end of life (EOL);
- Pacemaker implant for complete heart block, Mobitz II AV block, or high grade AVB with symptoms or severe symptomatic sinus node dysfunction with hemodynamic compromise (*see. Table 2*);
- Lead/device extraction for infection, including patients not responding to antibiotics or for endocarditis;

- Device pocket infection.

2A. Features of preparation and conduct of interventional procedures in patients with no clinical and laboratory signs of COVID-19

Activities that must be carried out in the period before the patient is admitted to the clinic:

- It is mandatory to interview the patient or accompanying medical staff at the pre-hospital stage on telephone and / or Internet mode for the presence of respiratory and other symptoms of infection, fever, possible contacts of the patient with infected persons before admission to the clinic. The "domestication" (transmission within the country) of the infection should be taken into account. In this regard, the provision on patient contacts with infected persons during foreign trips will lose its relevance.
- Mandatory temperature measurements for all patients prior to hospital admission

Guidelines for admission and hospital stay:

- A patient should be admitted to the clinic on the day of the procedure.
- Pre-procedural diagnostic tests should be performed either before the patient is admitted to the clinic or on the day of the intervention.
- Chest CT scan is obligatory before admission
- Patients admitted with severe hemodynamic compromise due to arrhythmia (see Tab. 2) should be directed to the operating room or CICU for urgent procedures immediately upon admission.
- During hospitalization patient must stay in the in single wards.
- Tracheal intubation, transesophageal echocardiography, and transesophageal electrophysiological study should be included in the list of high-risk infection procedures while in the clinic. The feasibility conducting transesophageal electrophysiological study in the context of the pandemic is questionable.

- Maximum coordination by medical staff to reduce patient's waiting time for and after intervention procedure.
- Mandatory use of surgical masks for all patients during their stay in the clinic.
- It is advisable to use in wards and operating rooms UV irradiators-recirculators of the DESAR type
- Patients' stay in the hospital after the intervention should not exceed 1-2 days.

2B. Features of preparation and conduct of interventional procedures in patients with clinical and / or laboratory-confirmed of COVID-19

* Medical staff who provide assistance to patients with coronavirus infection and persons who are suspected of having it should be provided with personal protective equipment (for working with microorganisms of 1-2 groups of pathogenicity or their equivalents).

- Only personnel directly involved in the procedure should be present in the operating room.
- The door to the operating room must be closed during the entire period of manipulation.
- All medications, supplies, tools and equipment must be ready for use before the patient arrives to the operating room in order to minimize the time spent in the operating room.
- * Personnel are not allowed to leave the operating room in contaminated protective clothing (dressing gown, mask, gloves, etc.) during the procedure;
- * Protective clothing of medical workers should be changed after each patient;
- * Consumables used during the procedure are disposed of in accordance with the established protocol. Disinfection of working surfaces and biological fluids of the patient should be carried out using disinfectants containing chlorine.

3. Follow up of patients who have previously undergone interventional procedures

Interrogation of implantable devices:

- Planned interrogation / device testing in patients with no symptoms of COVID 19 should be postponed until the epidemiological situation in the region is normalized.
- Urgent testing of previously implanted devices should be performed in the event of symptoms or complaints from the patient indicating possible device dysfunction (syncope and other symptoms indicating hemodynamic compromise, as well as signs of diaphragmal stimulation and suspected episodes of inappropriate ICD shocks).

Follow up of patients who have previously undergone catheter manipulations:

- Follow up of patients who have undergone catheter ablation, in the absence of any symptoms, should be postponed until the epidemiological situation in the region is normalized;
- Patients receiving combined treatment associated with the appointment of preoperative or early postoperative antiarrhythmic therapy (AAT), and who have undergone catheter intervention for atrial fibrillation, should continue treatment on AAT until the epidemiological situation in the region normalizes. This is done regardless of the favorable clinical version of the course of arrhythmia in the postoperative period, provided that there are no side effects from the appointment of AAT.
- Patients receiving combined treatment associated with the appointment of oral anticoagulants (POAC) in the preoperative or early postoperative period, and who have undergone catheter intervention for atrial fibrillation, should continue anticoagulant treatment until the epidemiological situation in the region normalizes. This is done regardless of the favorable clinical version of the course of arrhythmia in the postoperative period, provided that there are no side effects from the appointment of POAC.

4. Initial consultations

Initial consultations of patients should be carried out using video or other Internet connection in order to avoid direct contact with the patient. The decision on the need and timing of interventional treatment should be made based on the assessment of the risk of SCD and the hemodynamic significance of arrhythmia.

CONCLUSIONS

The current COVID-19 pandemic is not a reason to stop providing specialized care to patients with cardiac arrhythmias and conduction disorders.

In this situation, indications for interventional procedures should first be based on the hemodynamic significance of the arrhythmic syndrome and the determination of the risk of sudden cardiac death in each specific clinical case.

This principle should be applicable both to patients without clinical and / or laboratory-confirmed signs of COVID-19, and to patients with COVID-19 infection diagnosed and confirmed by laboratory methods.

It is important to minimize face-to-face communication with patients during the pandemic, and to refrain from routine examinations and tests until the epidemiological situation normalizes. The need for remote consultation and monitoring of patients with arrhythmias comes to the fore.

Reference:

1. *Temporary guidelines of the Ministry of health of the Russian Federation "Prevention, diagnosis and treatment of new coronavirus infection (COVID-19)", version 4 of 27.03.2020. (In Russ.)*
2. *НАЦИОНАЛЬНЫЕ РЕКОМЕНДАЦИИ по определению риска и профилактике внезапной сердечной смерти / Е. В. Шляхто, Г. П. Арутюнов, Ю. Н. Беленков и др. // КАРДИОЛОГИЯ - НОВОСТИ, МНЕНИЯ, ОБУЧЕНИЕ. — 2019. — Т. 7, № 1. — С. 64–88.*
3. *Lakkireddy DR; Chung MK; Gopinathannair R; et al. Guidance for Cardiac Electrophysiology During the Coronavirus (COVID-19) Pandemic from the Heart Rhythm Society COVID-19 Task Force; Electrophysiology Section of the American College of Cardiology; and the Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology, American Heart Association. 10.1161/CIRCULATIONAHA.120.047063*
4. *Romaguera R, Cruz-González I, Ojeda S, et al. Gestión de salas de procedimientos invasivos cardiológicos durante el brote de coronavirus COVID-19. Documento de consenso de la Asociación de Cardiología Intervencionista y la Asociación del Ritmo Cardíaco de la Sociedad Española de Cardiología. REC Interv Cardiol. 2020. <https://doi.org/10.24875/RECICE>.*