2022

Essential Messages from ESC Guidelines

Clinical Practice Guidelines Committee

VA and SCD

Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

ESC
European Society of Cardiology
Essential Messages

2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

Developed by the Task Force for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death of the European Society of Cardiology (ESC). Endorsed by the Association for European Paediatric and Congenital Cardiology (AEPC).

Chairpersons

Katja Zeppenfeld
Department of Cardiology
Leiden University Medical Centre
Leiden, Netherlands
Email: K.Zeppenfeld@LUMC.nl

Jacob Tfelt-Hansen
Department of Cardiology
The Heart Centre
Copenhagen University Hospital, Rigshospitalet
Copenhagen, Denmark
Email: jacob.tfelt@regionh.dk

Task Force Members

Marta de Riva (Task Force Coordinator) (Netherlands), Bo Gregers Winkel (Task Force Coordinator) (Denmark), Elijah R. Behr (United Kingdom), Nico A. Blom1 (Netherlands), Philippe Charron (France), Domenico Corrado (Italy), Nikolaos Dagres (Germany), Christian de Chillou (France), Lars Eckardt (Germany), Tim Friede (Germany), Kristina H. Haugaa (Norway), Mélèze Hocini (France), Pier D. Lambiase (United Kingdom), Eloi Marijon (France), Jose L. Merino (Spain), Petr Peichl (Czech Republic), Silvia G. Priori (Italy), Tobias Reichlin (Switzerland), Jeanette Schulz-Menger (Germany), Christian Sticherling (Switzerland), Stylianos Tzeis (Greece), Axel Verstraal (Belgium), Maurizio Volterrani (Italy).

ESC subspecialty communities having participated in the development of this document

Associations: Association for Acute CardioVascular Care (ACVC), Association of Cardiovascular Nursing & Allied Professions (ACNAP), European Association of Cardiovascular Imaging (EACVI), European Association of Percutaneous Cardiovascular Interventions (EAPCI), European Heart Rhythm Association (EHRA), Heart Failure Association (HFA).

Working Groups: Cardiac Cellular Electrophysiology, Myocardial and Pericardial Diseases.

Patient Forum

Adapted from the 2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death
European Heart Journal; 2022 - doi: 10.1093/eurheartj/ehac262
ESSENTIAL MESSAGES FROM THE 2022 ESC GUIDELINES FOR THE MANAGEMENT OF PATIENTS WITH VENTRICULAR ARRHYTHMIAS AND THE PREVENTION OF SUDDEN CARDIAC DEATH

Table of contents

- Section 1 - Key messages
- Section 2 - Gaps in evidence
Key messages

General aspects

• Increased availability of public access defibrillators and community training in basic life support are key elements to improve survival of out-of-hospital cardiac arrest victims.

• Risk calculators for SCD and VA implemented in clinical practice need to meet agreed high standards for the development, external validation, and reporting of prediction models.

• Patients with genetic cardiomyopathies and arrhythmia syndromes require genetic testing as a routine part of their care.

• Genetic testing and counselling require access to an expert multidisciplinary team.

• A systematic workup of cardiac arrest survivors requires a multimodal approach.

• A comprehensive autopsy is recommended in all cases of sudden death under 50 years and is desirable in all sudden death victims.

• Clinical and genetic evaluation of SADS decedents and their families leads to a diagnosis of genetic heart disease in a substantial proportion of families.

• An electrical storm refractory to drug treatment requires the availability of advanced catheter ablation techniques, mechanical circulatory support, and autonomic modulation.

• When considering ICD therapy benefit, competing risk factors for non-arrhythmic death, and the patient’s wishes and quality of life need to be taken into account.

Structural heart disease

• Catheter ablation is recommended in CAD patients with recurrent symptomatic SMVT despite chronic amiodarone therapy.

• Catheter ablation is the first-line treatment for PVC-induced cardiomyopathy.

• In HNDCM/DCM patients, indication for primary prevention ICD implantation should not be restricted to a LVEF ≤ 35%. Additional risk factors (e.g. CMR and genetics) are important to consider.

• Patients with a LMNA mutation require specific risk stratification for SCD.

• ARVC patients have a high rate of appropriate ICD interventions which may not necessarily be classified as lifesaving.
Key messages

- A validated risk calculator (HCM Risk-Kids score) is useful to assess the risk for SCD in HCM patients younger than 16 years.

- Myotonic dystrophy patients with palpitations suspected of arrhythmia, syncope, or aborted sudden death need to be evaluated by invasive electrophysiological study.

- In patients with repaired Tetralogy of Fallot and monomorphic VT, catheter ablation is the preferred treatment.

Primary electrical disease

- Nadolol or propranolol are the preferred beta-blockers in LQTS and CPVT patients.

- In asymptomatic LQTS patients the arrhythmic risk (1-2-3 risk calculator) may be useful to calculate.

- A type 1 Brugada ECG pattern provoked by sodium channel blocker test in the absence of other findings does not diagnose the BrS.

- SCD risk stratification in asymptomatic BrS patients with a spontaneous type 1 pattern remains controversial.

- Routine catheter ablation is not recommended in asymptomatic BrS patients.

- The diagnosis of idiopathic VF requires exclusion of an underlying structural, channelopathic, or metabolic aetiology.

- ERP can be a benign finding and is distinct from ERS.

- Left cardiac denervation plays an important role in the management of CPVT and LQTS patients.
Gaps in evidence

**General aspects**
- Accurate screening tests to detect heart conditions associated with SCD in asymptomatic individuals in the general population are required.
- In patients with SHD, the optimal time interval between repeated non-invasive and invasive prognostic tests, in case of a negative test, is unknown.
- Improved assessment of genetic variants of uncertain significance and likely pathogenic variants is needed.
- The utility of polygenic risk scores in patients at risk of SCD requires investigation.

**Structural heart disease – general**
- The long-term safety and efficacy of S-ICDs is unknown.
- The role of primary preventive ICD therapy in patients with SHD and mildly reduced or preserved ejection fraction has not been systematically studied.
- The optimal techniques to undertake VT substrate mapping and ablation in SHD remain to be determined.
- The role of ICD implantation in end-stage heart failure patients supported by current-generation, continuous-flow LVADs is unclear.

**Idiopathic PVCs/VT**
- The beneficial role of catheter ablation or antiarrhythmic drug treatment in patients with asymptomatic, frequent PVCs and preserved cardiac function needs to be determined.

**Coronary artery disease**
- It is unknown which patients with chronic CAD and severely impaired LVEF are at low risk for SCD.
- The role of LGE-CMR for risk stratification for SCD in chronic CAD is unclear.
- RCTs are needed to determine the role of ICDs after successful VT ablation in chronic CAD with mildly reduced or preserved LVEF.
Gaps in evidence

**Cardiomyopathies**
- It is unknown if PVC-induced cardiomyopathy is a diagnosis on its own or if an underlying predisposition is needed.
- The predictive value of LGE-CMR findings (e.g. pattern and amount of LGE) for individual risk stratification for SCD in patients with cardiac sarcoidosis, HCM, and DCM/HNDC is unclear.
- Studies are needed to determine the role of PES in patients with cardiac sarcoidosis and DCM/HNDC, who have a mildly reduced or preserved cardiac function and LGE on CMR.
- Prospective data on the association between intensity and duration of exercise and manifestation and severity of the phenotype in healthy ARVC mutation carriers are lacking.
- The beneficial role of ICDs after successful ablation in ARVC patients who present with haemodynamically tolerated VT needs to be studied.
- Data on clinical outcome, predictors for arrhythmic events, and indication for treatment, including ICD therapy, in patients with biventricular and left-dominant arrhythmogenic cardiomyopathy are required.

**Valvular heart disease**
- There is a lack of knowledge to identify patients with MVP at risk for VA and SCD.

**Congenital heart disease**
- There is a lack of knowledge regarding the absolute risk for VA and SCD in CHD that have undergone repair with contemporary surgical approaches.

**Primary electrical disease**
- Robust evidence is required to support the prophylactic use of the ICD on top of medical therapy with beta-blockers and gene-specific therapy in LQTS patients.
- More data are required to determine the role of LCSD and ICD in high-risk LQTS patients who do not tolerate medical therapy.
- Improved diagnostic and risk stratification tools for asymptomatic Brugada patients and suspected Early Repolarization syndrome are needed.
• The role of endo-epicardial mapping to identify localized structural alterations potentially related to IVF and targeted catheter ablation needs to be further studied.

• Long-term data are required on the efficacy of the ICD versus no ICD in CPVT survivors of cardiac arrest.

• It is poorly understood why women are at low risk of sport-related SCD.
Download the ESC Pocket Guidelines App
ESC clinical practice recommendations
Anytime. Anywhere

- All ESC Pocket Guidelines
- Over 140 interactive tools
  - Algorithms
  - Calculators
  - Charts & Scores
- Summary Cards & Essential Messages
- Online & Offline

Available on the iPhone App Store, Google Play, and Amazon.
The material was adapted from the 2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death (European Heart Journal; 2022 - doi: 10.1093/eurheartj/ehac262).

Post-publication corrections and updates are available at: www.escardio.org/guidelines

Copyright © European Society of Cardiology 2022 - All Rights Reserved.

The content of these European Society of Cardiology (ESC) Pocket Guidelines has been published for personal and educational use only. No commercial use is authorized. No part of the ESC Pocket Guidelines may be translated or reproduced in any form without written permission from the ESC. Permission can be obtained upon submission of a written request to ESC, Clinical Practice Guidelines Department, Les Templiers - 2035, Route des Colles Colles CS 80179 Biot - 06903 Sophia Antipolis Cedex - France. Email: guidelines@escardio.org

Disclaimer:

The ESC Guidelines represent the views of the ESC and were produced after careful consideration of the scientific and medical knowledge and the evidence available at the time of their publication. The ESC is not responsible in the event of any contradiction, discrepancy and/or ambiguity between the ESC Guidelines and any other official recommendations or guidelines issued by the relevant public health authorities, in particular in relation to good use of healthcare or therapeutic strategies. Health professionals are encouraged to take the ESC Guidelines fully into account when exercising their clinical judgment, as well as in the determination and the implementation of preventive, diagnostic or therapeutic medical strategies; however, the ESC Guidelines do not override, in any way whatsoever, the individual responsibility of health professionals to make appropriate and accurate decisions in consideration of each patient's health condition and in consultation with that patient and, where appropriate and/or necessary, the patient's caregiver. Nor do the ESC Guidelines exempt health professionals from taking into full and careful consideration the relevant official updated recommendations or guidelines issued by the competent public health authorities, in order to manage each patient's case in light of the scientifically accepted data pursuant to their respective ethical and professional obligations. It is also the health professional's responsibility to verify the applicable rules and regulations relating to drugs and medical devices at the time of prescription and to make sure whether a more recent version of this document exists prior to making any clinical decision.