

## NICCS Network for Inherited Cardiac Conditions Scotland

### **Investigation and referral pathway following resuscitated VF arrest of unknown cause\***

Patients with a clear precipitant (e.g. acute coronary syndrome, drug toxicity or overdose, major electrolyte imbalance) should be managed individually according to the underlying cause and usually will not require all of these investigations.

#### **1) For all patients:**

- 12-lead ECG, telemetry, electrolytes inc.  $\text{Ca}^{2+}$  /  $\text{Mg}^{2+}$ , cardiac enzymes, TFTs and transthoracic echo
- Repeat ECG inc. consideration of LQTS, type 1 Brugada pattern, ventricular pre-excitation, early repolarization\* (all of which may be intermittent)
- High-lead ECG (V1/V2 in 2<sup>nd</sup> ICS) for type 1 Brugada pattern
- Family history of sudden cardiac death (SCD) / syncope / seizures

#### **2) If no diagnosis apparent from echo / ECG:**

- CTCA or coronary angiography for CAD / anomalous coronaries
- CMR esp. if cardiomyopathy suspected but not diagnosed on echo
- Adenosine challenge for latent accessory pathway (AP) - record 12-lead ECG during adenosine administration
- ETT for induction of arrhythmia, CPVT (bidirectional PVCs/VT or polymorphic VT), features of LQTS ( $\text{QTc} > 480\text{ms}$  in 4<sup>th</sup> minute of recovery)
- Ajmaline challenge (V1/V2 in 2<sup>nd</sup> ICS)

#### **3) Additional investigations which may be useful (discuss with EP / ICC team)**

- Holter monitor for PVC burden  $\pm$  morphology<sup>†</sup> if frequent PVCs
- Signal-averaged ECG where there is clinical suspicion of arrhythmogenic cardiomyopathy but diagnostic criteria are not reached

#### **4) Referrals for genetic testing**

- Send sample<sup>‡</sup> for specific genetic testing if inherited cardiomyopathy / channelopathy is diagnosed or strongly suspected.
- Send sample<sup>‡</sup> for full arrhythmia gene panel in idiopathic VF patients with a family history of SCD / channelopathy OR where circumstances of VF highly suggestive of concealed channelopathy (exercise, emotion, auditory stimuli, rest).
- If there is a family history of cardiomyopathy OR any suspicion of cardiomyopathy (i.e. non-specific ECG or echo abnormality), request a cardiomyopathy gene panel in addition to the full arrhythmia panel.

### If sending sample for genetic testing:

- **Also** refer to ICC service (*inc. family history and confirm next of kin*)
- **Consider** first-degree relatives:  
Appropriate clinical screening can be arranged through the ICC service but first-degree relatives with red-flag symptoms (syncope / seizures) should be evaluated as a priority:
  - 12-lead ECG and high-lead ECG (V1/V2 in 2<sup>nd</sup> ICS)
  - Further investigations based on symptoms / ECG findings / circumstances of arrest

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\* Should only be a diagnosis of exclusion after full investigation and EP team discussion

† consider multi-lead Holter or telemetry with a view to planning PVC ablation

‡ EDTA sample labelled as per blood transfusion to clinical genetics, if consent or type of testing is unclear DNA can be extracted and saved

‡‡ protocol available at <https://www.niccs.scot.nhs.uk/>

*\* This pathway is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to pathway recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.*