Interventional Treatment for HFrEF Patients with VT Episode

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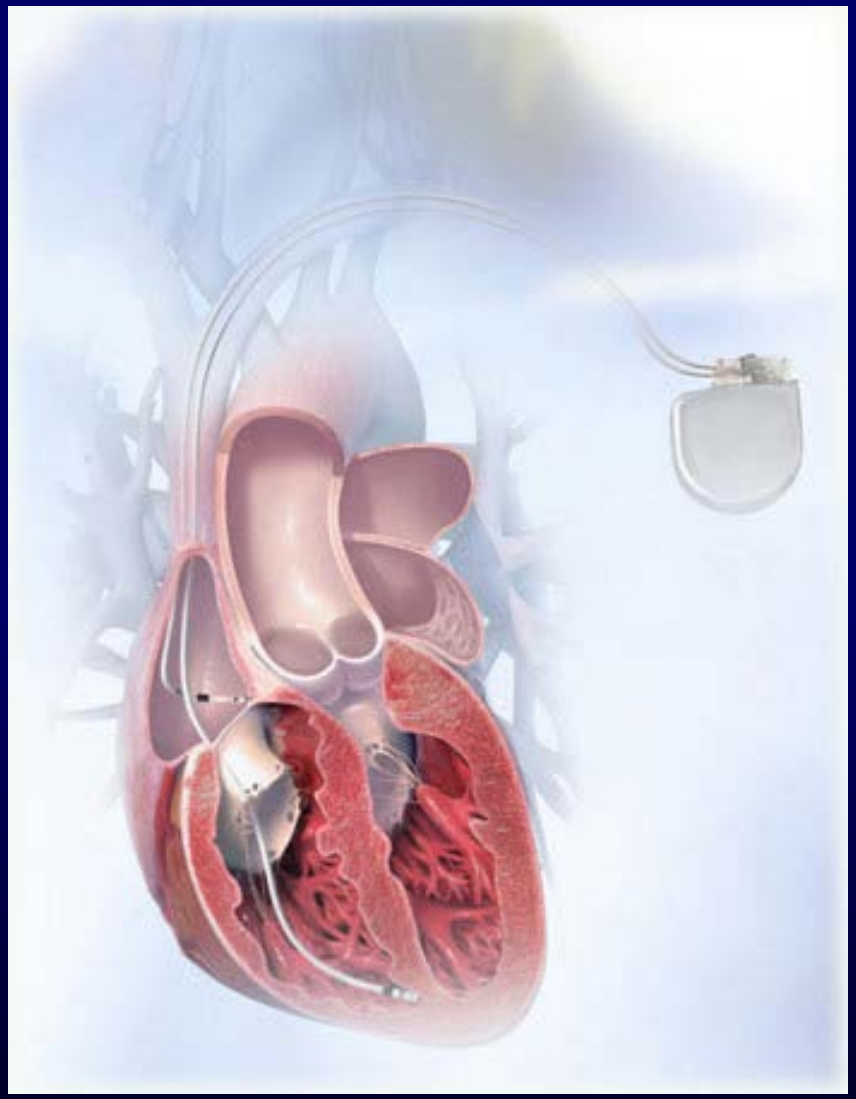
Electrical storm, also referred to as arrhythmic storm, refers to multiple recurrences of ventricular arrhythmias over a short period of time.

Electrical storm is most commonly associated with acute MI and AHF.



In patients without ICDs, electrical storm has been variously defined as;

"the occurrence of two or more hemodynamically stable ventricular tachyarrhythmias within 24 hours, VT occurring immediately after termination, or sustained and non-sustained tachycardia resulting in a total number of ventricular ectopic beats greater than sinus beats in a 24 hour period."

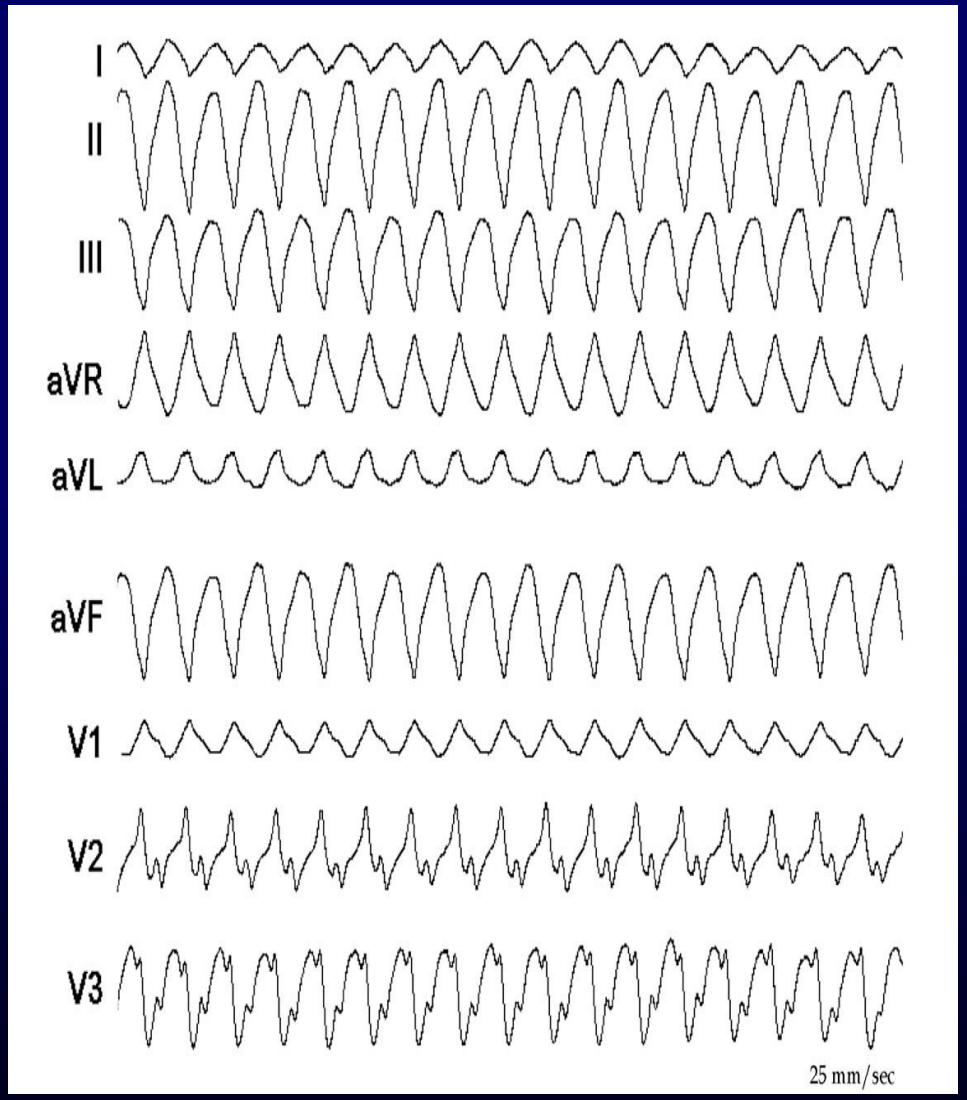
In patients with ICDs, the most widely accepted definition of electrical storm is;

"three or more appropriate therapies for ventricular tachyarrhythmias, including antitachycardia pacing or shocks."

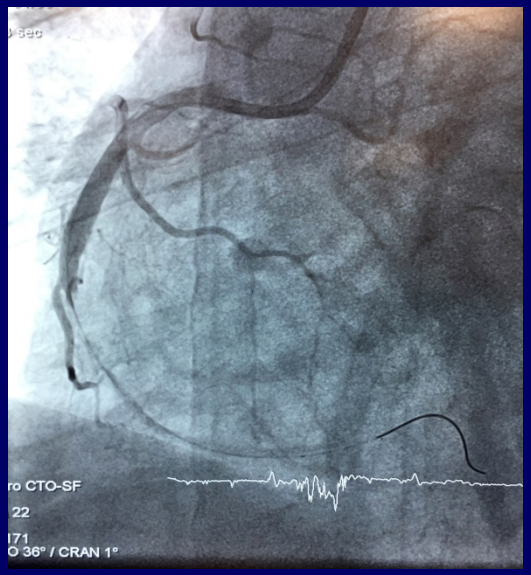
However, this definition may be somewhat inadequate as it fails to account for those ventricular tachycardias slower than the programmed detect rate of the device.

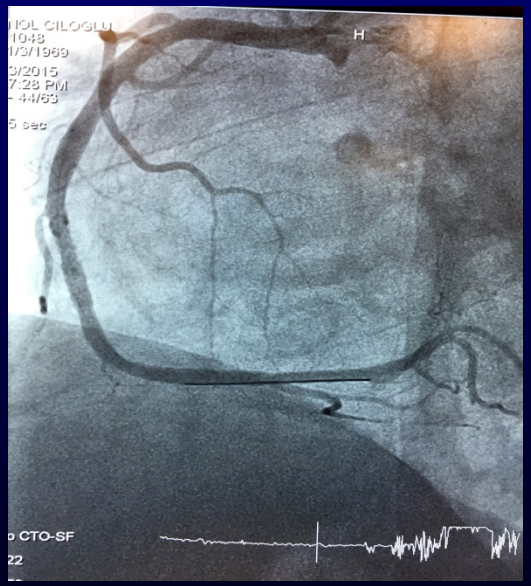
Causes of the Drug Resistant Sustained Ventricular Arrhythmias in HFrEF

- Acute heart failure
- Uncontrolled heart failure
- Ongoing ischemia
- Uncontrolled hypertension
- Electrolyte imbalance
- Enhanced sympathetic nervous system activity
- Errors in medication
- Proarrhythmic affects of antiarrhythmic drugs



Urgent PCI



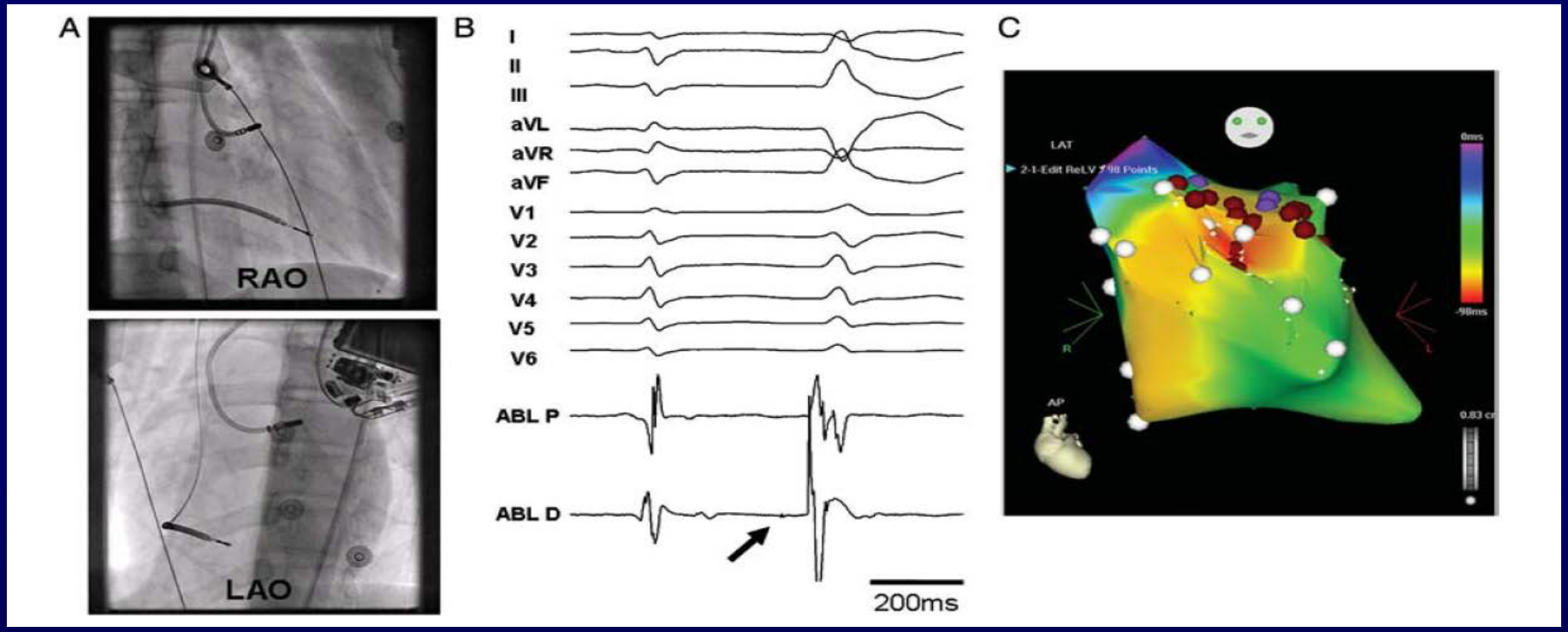


2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

Urgent reperfusion is the most important therapy, as acute ischaemia triggers arrhythmias.

European Heart Journal 2022; 43: 3997–4126

Catheter ablation



Catheter ablation has been used in a limited number of centres worldwide to target clearly identifiable EP triggers of VF and electrical storm, predominantly in the form of unifocal PVCs, with relatively good short-term success rates.

Europace 2012; 14.1687–1695

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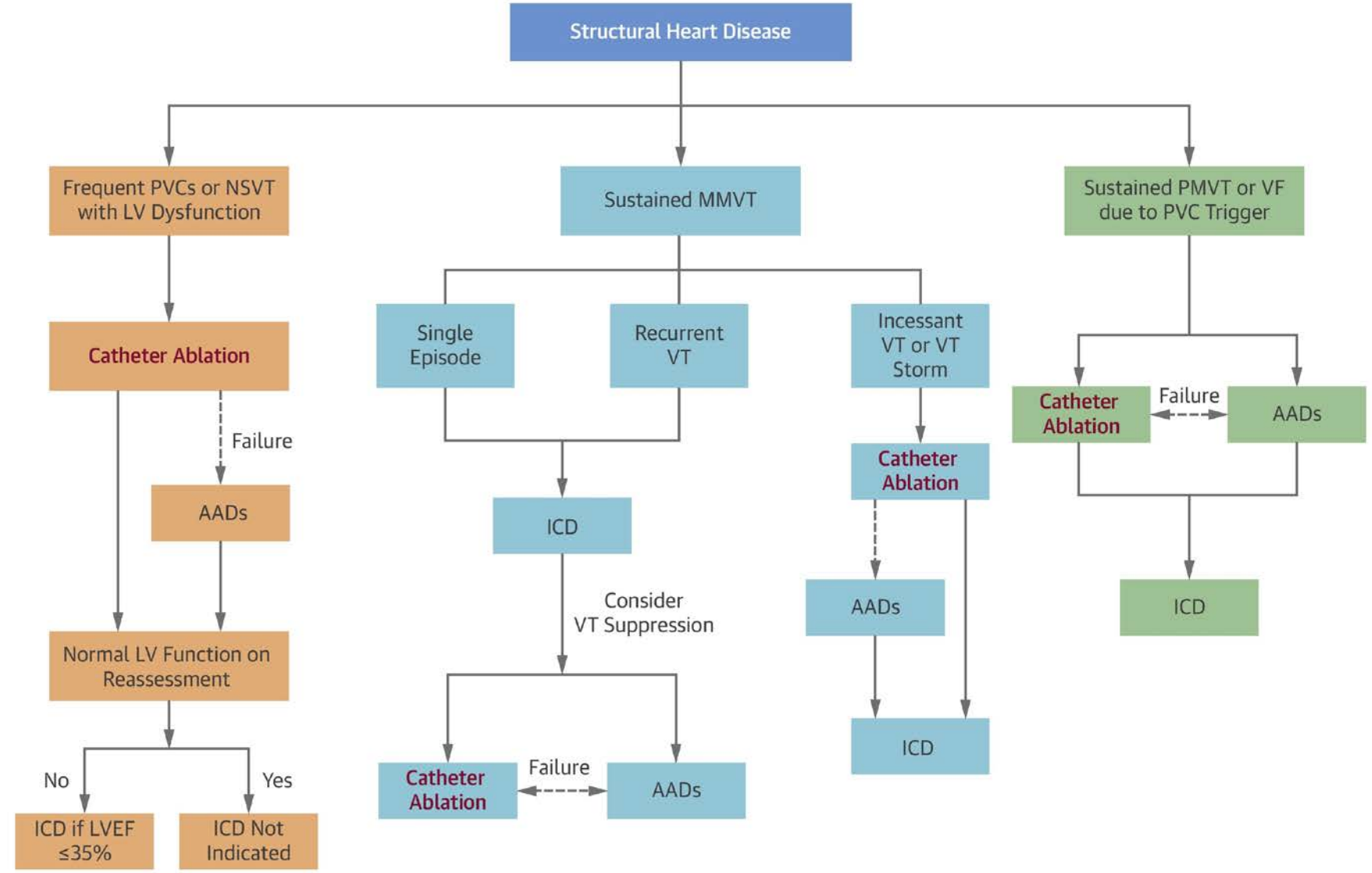
Catheter ablation is recommended in patients presenting with incessant VT or electrical storm due to SMVT refractory to AADs.[330,331]	I	B
Catheter ablation should be considered in patients with recurrent episodes of PVT/VF triggered by a similar PVC, non-responsive to medical treatment or coronary revascularization.[221,332,333]	IIa	C

European Heart Journal 2022; 43: 3997-4126

CENTRAL ILLUSTRATION: Role of Catheter Ablation in the Management of Patients With Structural Heart Disease



Dukkipati, S.R. et al. J Am Coll Cardiol. 2017;70(23):2924–41.

Cardiac arrhythmias in acute coronary syndromes: position paper from the joint EHRA, ACCA, and EAPCI task force

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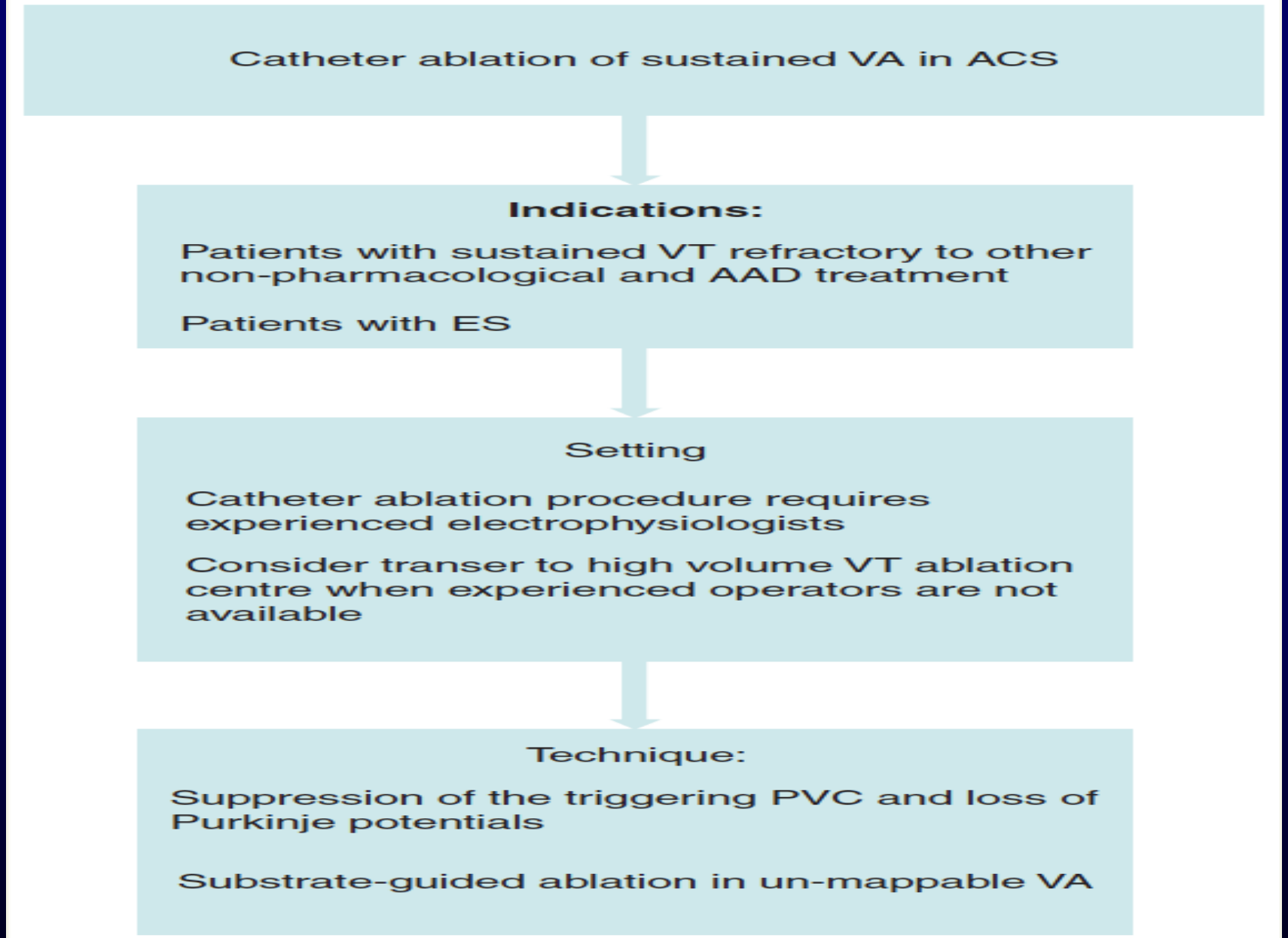
Europace 2014;16:1655-73



Europace 2014;16:1655-73

Temporary pacing

Repetitive MVT requiring overdrive pacing, which can terminate the arrhythmia until proper drug or ablative therapy can be instituted.

One commonly used method is to "burst" pace at progressively more rapid rates.

When using overdrive pacing for VT termination, backup defibrillation must be available since VF can be provoked.

If the patient has refractory PVT in the setting of bradycardia to a rate less than 60 beats per minute or a long QTc, temporary pacing at a higher rate may be instituted.

2015 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

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)

Transvenous catheter overdrive stimulation should be considered if VT is frequently recurrent despite use of anti-arrhythmic drugs and catheter ablation is not possible.	**IIa**	C

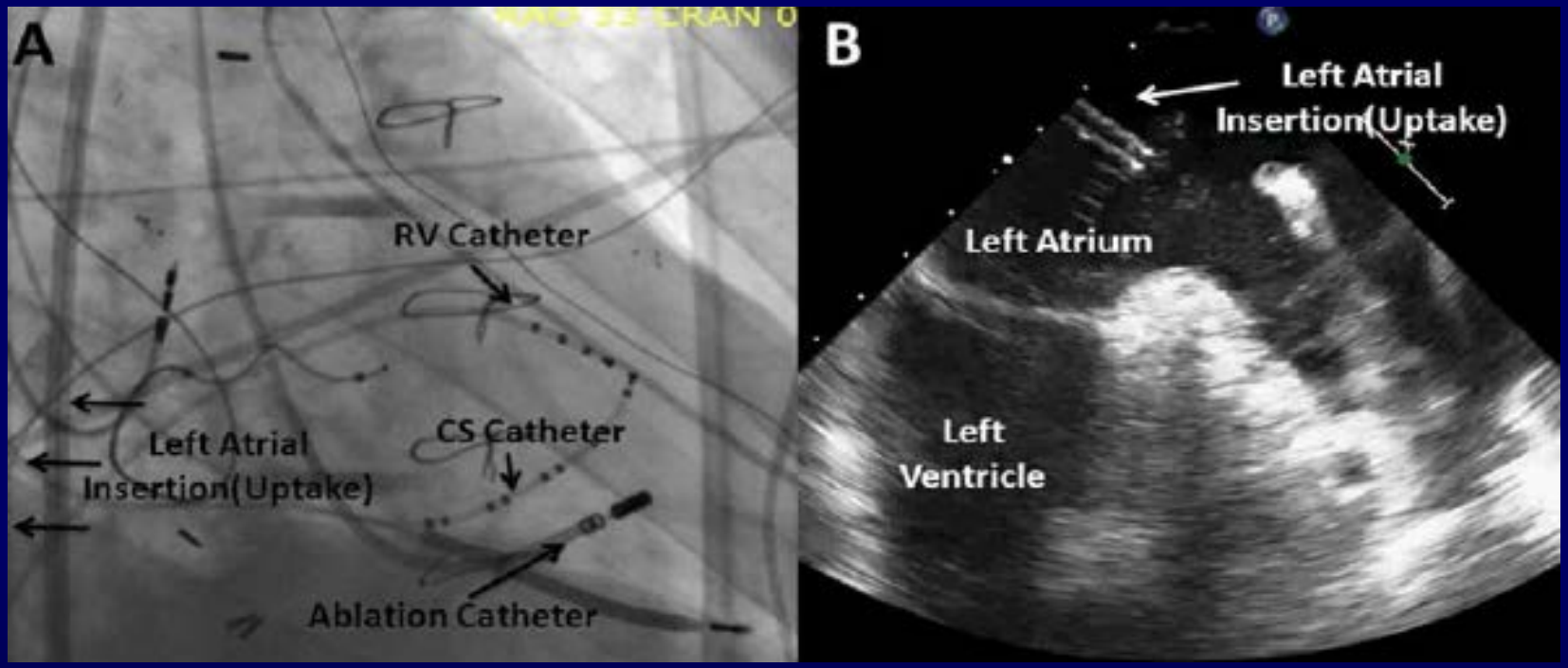
European Heart Journal 2015; 36: 2793–2867

Asist devices

	IABC Pre intervention	No IABC or IABC Post intervention	All Patients	p
Cardiogenic shock (n=119)	**12.9%**	**29.8%**	**21.0%**	**0.02**
CHF or low EF(≤30%) (n=119)	**0%**	**5.8%**	**5. 0%**	**0.32**
All high risk patient (n=238)	**10.3%**	**14.4%**	**13. 0%**	**0.38**

In high risk patients prophylactic use of IABC may decrease the incidence of VF, especially in patients with cardiogenic shock.

Am J Cardiol 1999;84:18-23



Impella and Tandem Heart use in VT ablation facilitates extensive activation mapping of several unstable VTs and requires fewer rescue shocks during the procedure when compared with using IABP.

Circ Arrhythm Electrophysiol 2014;7:244-250

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Institution of mechanical circulatory support may be considered in the management of drug-refractory electrical storm and cardiogenic shock.[335]	IIb	C

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Renal denervation

Renal Sympathetic Denervation as an Adjunct to Catheter Ablation for the Treatment of Ventricular Electrical Storm in the Setting of Acute Myocardial Infarction

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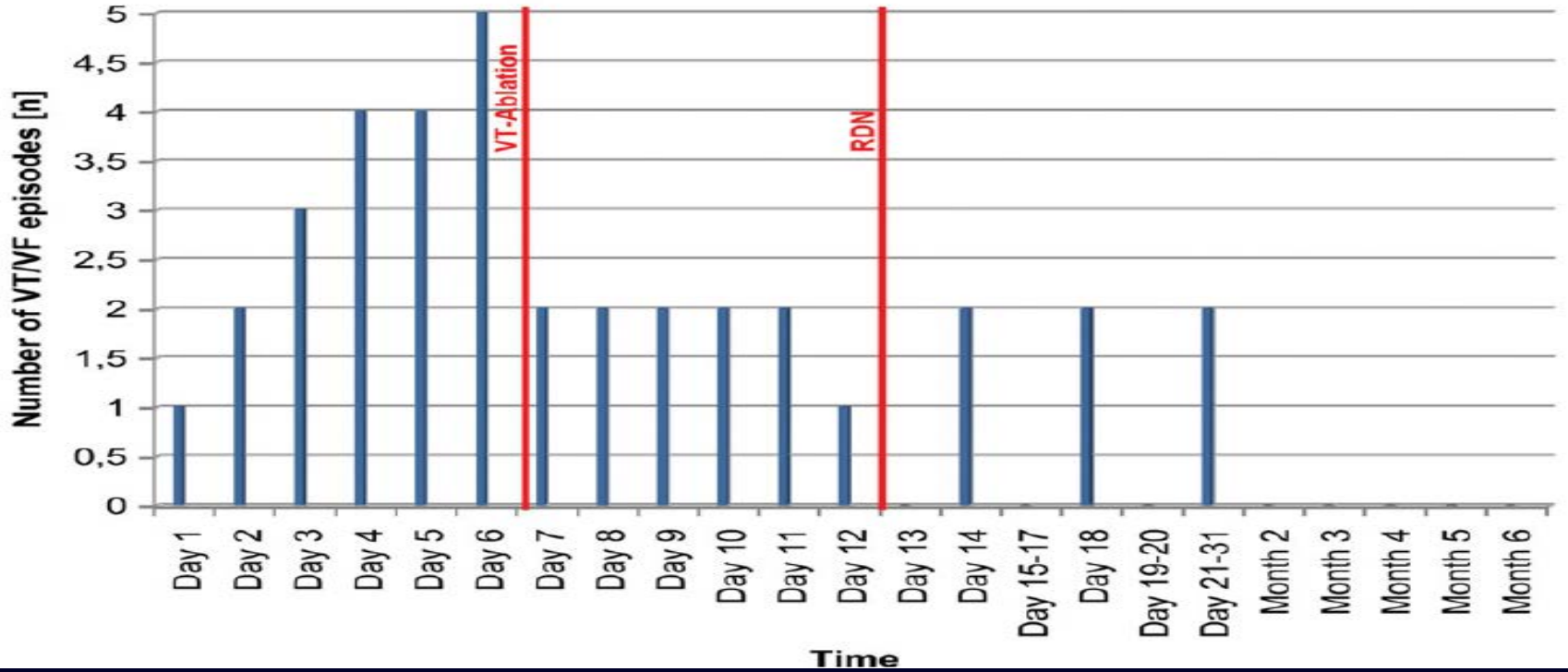
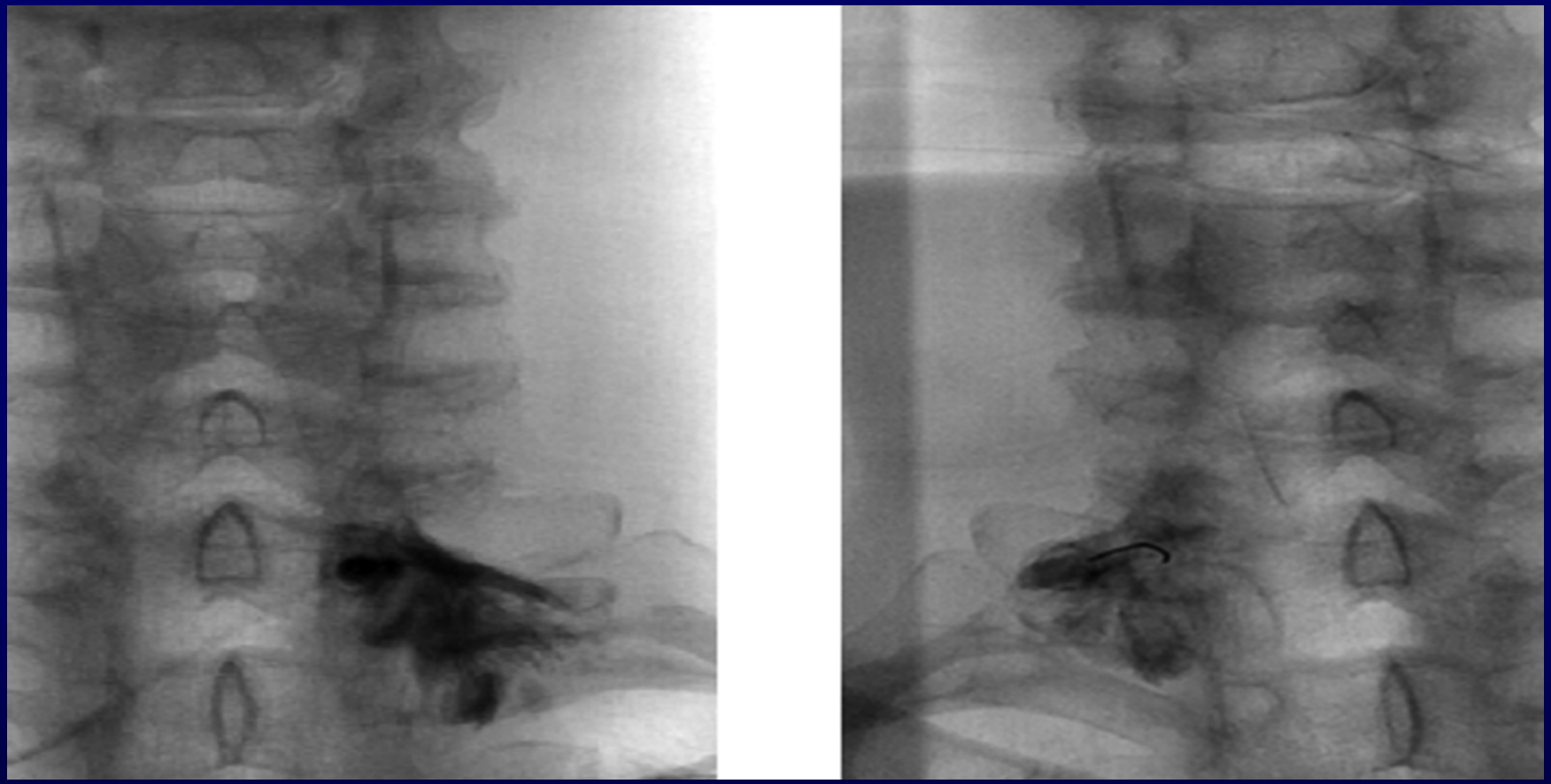


J Cardiovasc Electrophysiol 2013; 24: 1175-1178



Stellate ganglion block may be helpful although few centers have experience with this intervention.

J Cardiovasc Electrophysiol.2013; 24,:926-928

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Autonomic modulation may be considered in patients with electrical storm refractory to drug treatment and in whom catheter ablation is ineffective or not possible.[326,328,340]	IIb	C

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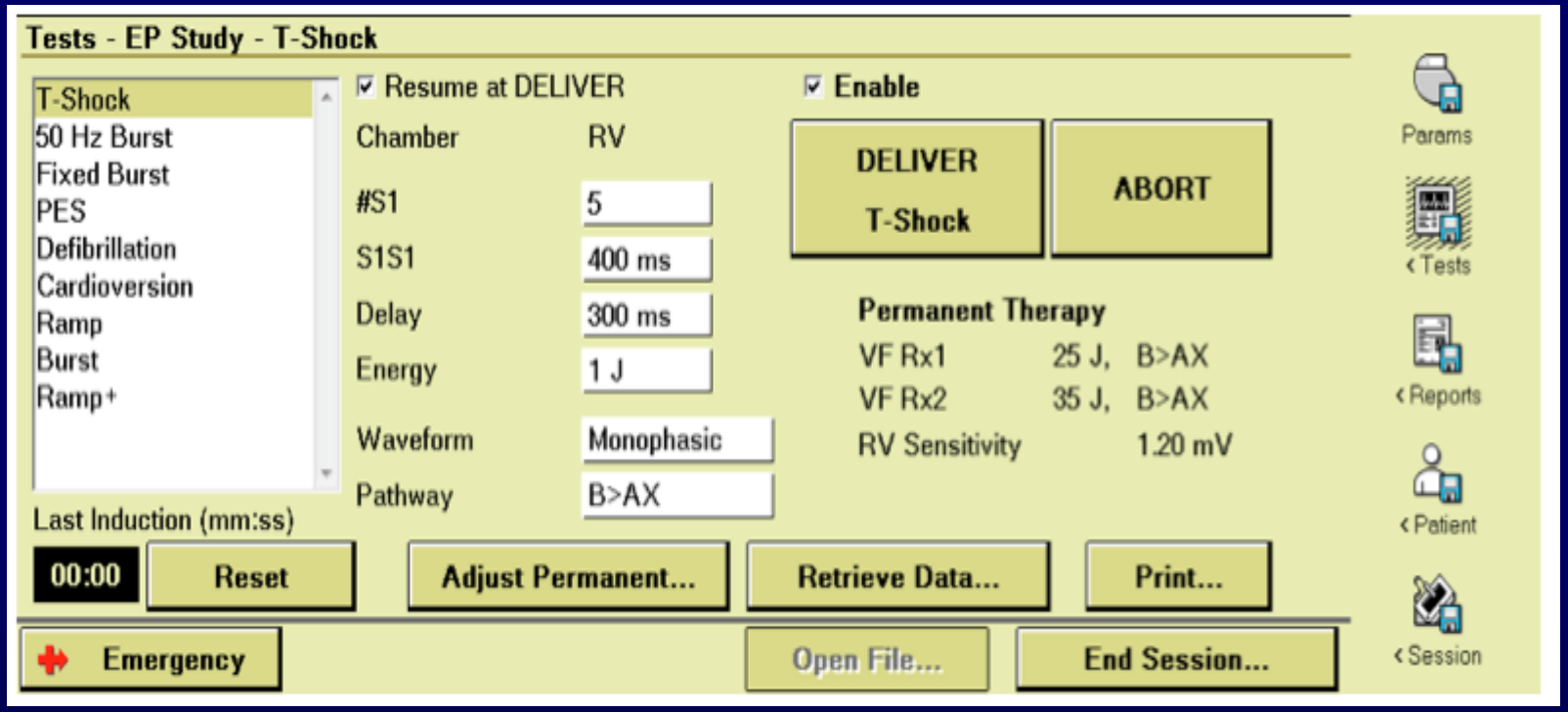
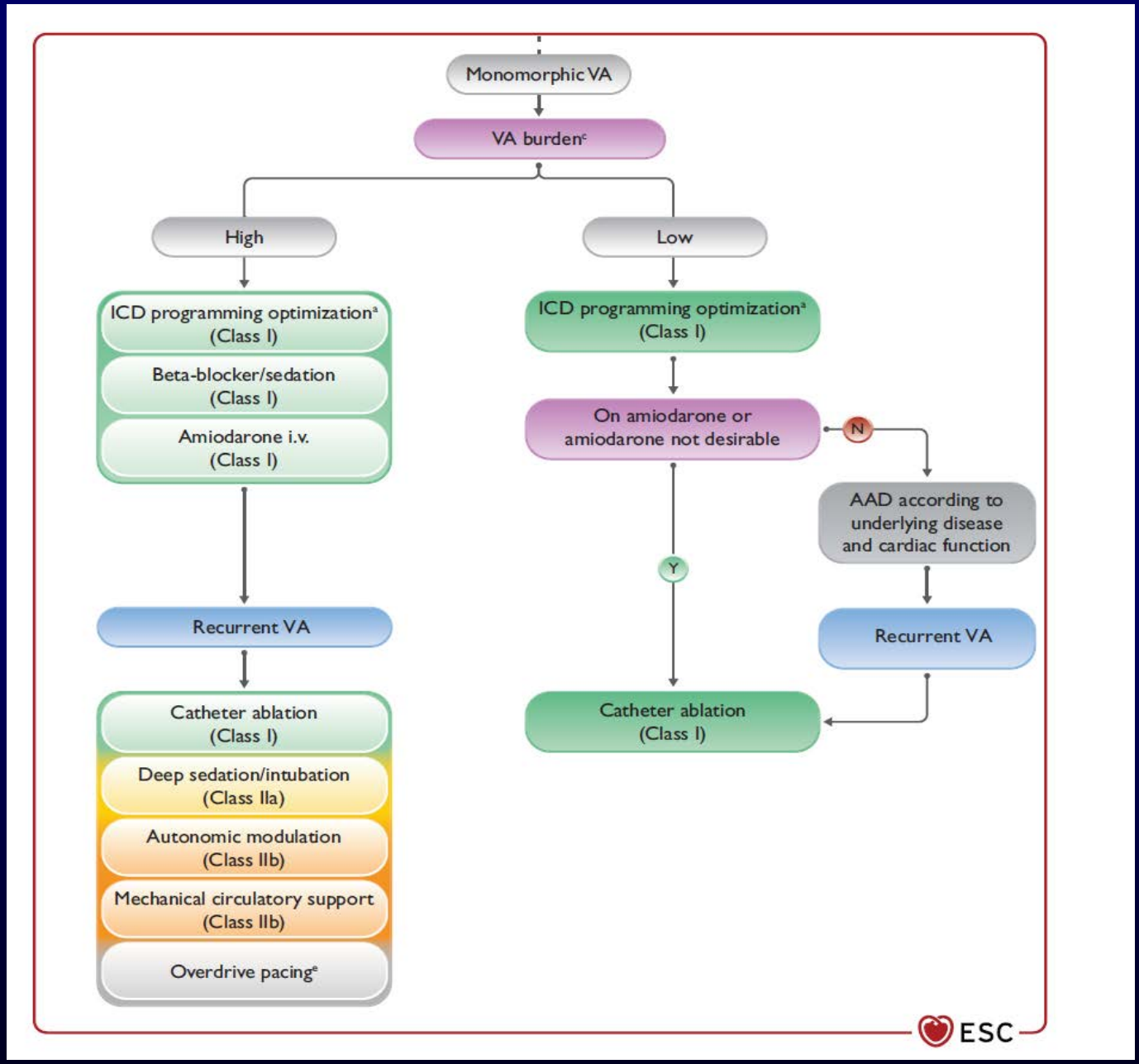
ICD reprogramming



In patients with a pre-existing ICD device programming should be reviewed to determine the appropriateness of therapy and the need for device reprogramming (optimizing anti-tachycardia pacing and ICD shocks).



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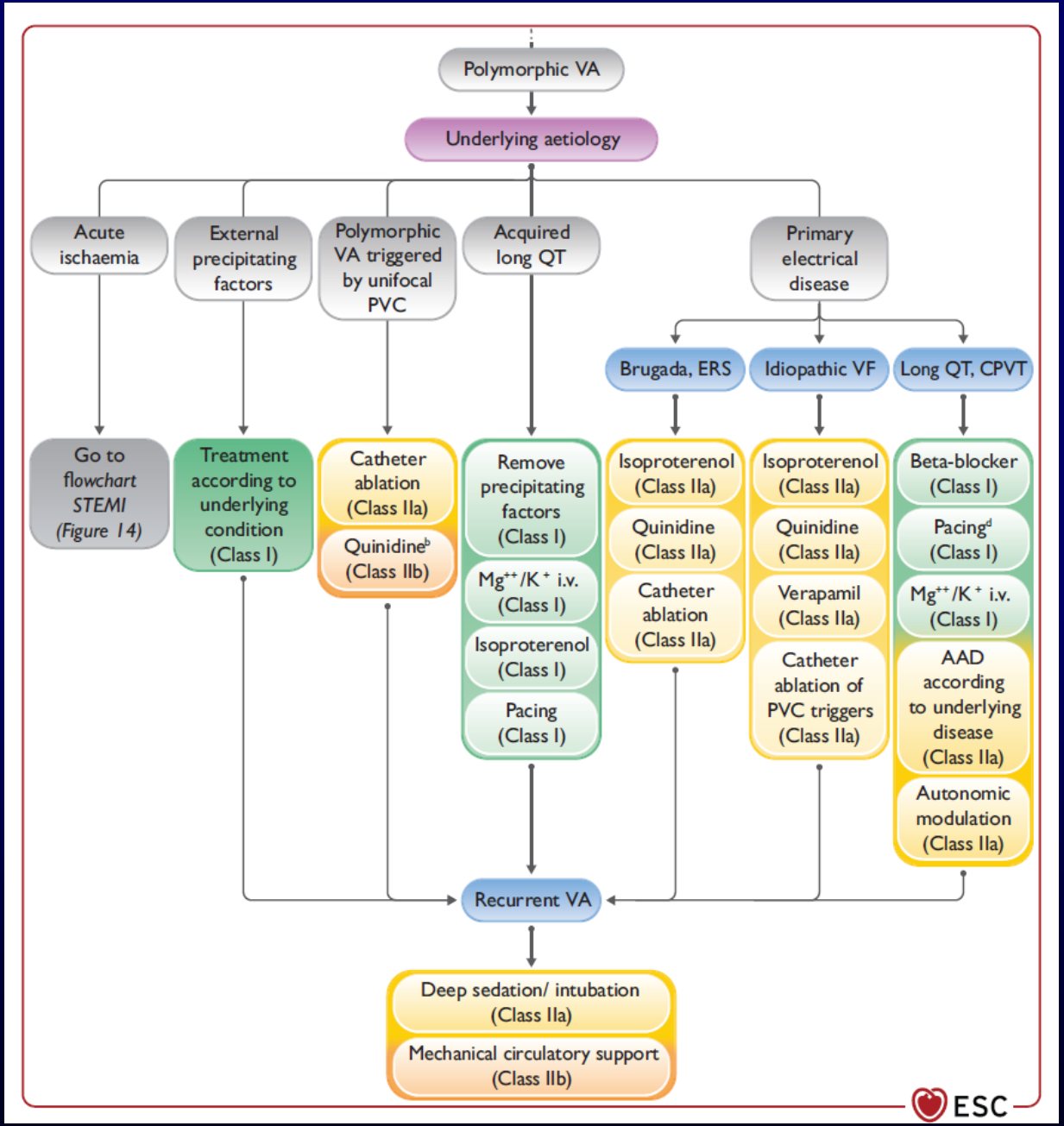

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Porsuk River, Eskisehir