Ventricular Arrhythmias · SCD Prevention

VT, VF & SCD risk in adults · point-of-care reference for internal medicine

2017 AHA/ACC/HRS
VA & SCD Guideline
JACC 2018;72:e91–220

● Class I — recommended ● IIa — reasonable ● IIb — may consider ● III: Harm — do not use

1 First: rule out the two traps

⚠ Wide-QRS tachycardia = VT until proven otherwise

Any wide-complex tachycardia of unclear origin is presumed VT [I]. Prior MI / structural heart disease raises pre-test probability further. Do NOT reach for adenosine or AV-nodal agents to "test" the rhythm.

⚠ Verapamil / diltiazem in wide-QRS = HARM

CCBs in wide-QRS of unknown origin can cause **haemodynamic collapse** [III: Harm], particularly post-MI. Exception: known verapamil-sensitive interfascicular VT in a structurally normal heart — rarely identifiable at first presentation.

2 Acute Rx — sustained VA

Unstable / pulseless VA ⇒ DC shock + CPR [I]
VF, pulseless VT or unstable VT ⇒ immediate **defibrillation / cardioversion** per ACLS.

▼ refractory after max shock

IV amiodarone → re-shock [I]
IV lidocaine is a reasonable alternative for shock-refractory VF / polymorphic VT [IIa].

▼ STEMI substrate

Polymorphic VT/VF + STEMI ⇒ emergent angio [I]
Revascularisation is definitive Rx; assume coronary occlusion even without classic ECG signs.

▼ stable monomorphic VT

IV procainamide (first-line) [IIa]
Amiodarone or sotalol if procainamide unavailable / contraindicated [IIb]. Torsades ⇒ IV magnesium.

▼ ischaemic polymorphic VT / storm

IV beta-blocker [IIa]
First-line for polymorphic VT driven by ischaemia & for VT/VF storm post-MI; deep sedation if refractory.

3 Acute doses (IV)

Amiodarone	300 mg IV push (arrest)
then 150 mg q3–5 min PRN · 1 mg/min × 6 h then 0.5 mg/min infusion · stable VT: 150 mg over 10 min	
Lidocaine	1–1.5 mg/kg IV bolus
repeat 0.5–0.75 mg/kg q5–10 min (max 3 mg/kg); 1–4 mg/min infusion	
Procainamide	20–50 mg/min IV
until VT terminates / QRS ↑ >50% / hypotension / 17 mg/kg given; maintain 1–4 mg/min; avoid if QT↑ or LVEF severely ↓	
Magnesium	2 g IV over 1–2 min
repeat to 4–6 g for TdP; no benefit in refractory VF not due to TdP [III]	
Metoprolol / esmolol	5 mg IV q5 min × 3
esmolol 0.5 mg/kg load → 50–200 µg/kg/min · favoured in ischaemic storm	
Epinephrine	1 mg IV q3–5 min
high-dose (>1 mg) not beneficial [III] · vasopressin no longer recommended	

4 ICD indications — meaningful survival >1 year assumed for all rows

PREVENTION	SUBSTRATE	CRITERIA	COR
Secondary	Any structural heart disease	Survived SCA from VT/VF, or sustained VT (unstable or stable) not due to reversible cause	[I] (exclude reversible)
Secondary	IHD + unexplained syncope	Inducible sustained monomorphic VT on EP study	[I]
Primary (IHD)	Post-MI ≥40 d, post-revasc ≥90 d, on GDMT	LVEF ≤35% with NYHA II–III or LVEF ≤30% with NYHA I	[I]
Primary (IHD)	Prior MI, LVEF ≤40%, NSVT	Inducible sustained VT/VF on EP study	[I]
Primary (NICM)	NICM, on GDMT ≥3 months	LVEF ≤35% with NYHA II–III	[I]
Primary (NICM)	NICM, on GDMT ≥3 months	LVEF ≤35% with NYHA I	[IIb]
Bridge	NYHA IV awaiting transplant / LVAD	Ambulatory candidate for advanced therapy	[IIa]
Not indicated	NYHA IV medication-refractory HF	Not a candidate for transplant, LVAD, or CRT-D	[III]

5 Pharmacological SCD prevention

HFrEF (LVEF ≤40%): beta-blocker + MRA + (ACEi or ARB or ARNI) — reduces SCD & all-cause mortality [I].

Recurrent VA on ICD: amiodarone or sotalol; mexiletine, ranolazine or catheter ablation as add-ons / alternatives [IIa].

Channelopathies & CPVT: non-selective beta-blocker is cornerstone; flecainide added in CPVT. Avoid QT-prolonging agents in long-QT syndromes.

Electrolytes: K^+ 4.0–5.0 mmol/L & Mg^{2+} repletion during diuresis & post-MI.

6 Do *not* use — III: Harm / No Benefit

- [III] **CCBs (verapamil, diltiazem)** in wide-QRS tachycardia of unknown origin.
- [III] **Class IC (flecainide, propafenone)** in patients with prior MI / structural heart disease.
- [III] **Prophylactic lidocaine or high-dose amiodarone** in suspected AMI for VT prevention.
- [III] **IV magnesium** in refractory VF not due to torsades.
- [III] **High-dose epinephrine (>1 mg)** in cardiac arrest — no benefit.
- [III] **ICD before VA control** in incessant VT/VF — risks repeated shocks.
- [III] **Revascularisation alone** for recurrent monomorphic VT in IHD — ineffective.