

Emergency Resuscitation: Focus on Antiarrhythmics

Updated October 2025



Drug	Place in Therapy	ADULT Dosing	Evidence	Comments
Preferred				
Amiodarone	V Fib or pV Tach, after initial shocks and use of epinephrine as the first med. ¹⁰ (alternative: lidocaine. ¹⁰)	300 mg x 1 (first dose); 150 mg x 1 IV or IO (if second dose needed).¹⁰	Survival to discharge among patients with bystander-witnessed arrest was 27.7% vs 22.7% for placebo for out-of-hospital arrest. For EMS-witnessed arrest, survival was 38.6% vs 16.7% for placebo.² Survival with amiodarone did not differ significantly from survival with lidocaine [Evidence level A-1].²	- Advantage over lidocaine: dosing is NOT weight-based. - May cause hypotension (especially with formulations containing polysorbate 80 or benzyl alcohol),^{10,14} which may be relevant post-arrest.
Lidocaine	V Fib or pV Tach, after initial shocks and use of epinephrine as the first med (alternative: amiodarone). ¹⁰	1 to 1.5 mg/kg IV or IO (first dose); 0.5 to 0.75 mg/kg IV or IO (if second dose needed).¹⁰	- Survival to discharge among patients with bystander-witnessed arrest was 27.8% vs 22.7% for placebo for out-of-hospital arrest. For EMS-witnessed arrest, survival was 23.3% vs 16.7% for placebo.² Survival with lidocaine did not differ significantly from survival with amiodarone [Evidence level A-1].² - For in-hospital arrest, lidocaine is associated with higher chance of ROSC, 24-hour survival, survival to discharge, and favorable neurological outcome compared to amiodarone [Evidence level B-3].^{12,15}	- Requires weight-based dosing, but is available in a prefilled syringe for rapid administration. - Consider over amiodarone for ischemic arrest [Evidence level B-3],^{12,16} or history of serious amiodarone adverse effect (e.g., pulmonary toxicity).
Not preferred (unclear benefit¹⁰)				
Bretylium (unavailable at time of writing)	Consider for V Fib or pV tach refractory to standard treatment. ^{10,17}	In a past ACLS guideline, dose was 5 mg/kg IV or IO, then 10 mg/kg every 5 minutes to a total of 30 to 35 mg/kg.¹⁷ (Dose not included in current ACLS guidelines.)	- In a small study in out-of-hospital V Fib, more lidocaine-treated patients converted to an effective rhythm.⁷ - Short-term mortality benefit vs placebo for V Fib and asystole (combined endpoint) in a small study about 40 years ago, but many bretylium-treated patients also received lidocaine, possibly due to bretylium-associated arrhythmias.⁴	Compared to amiodarone for recurrent, hemodynamically unstable V Tach or V Fib, bretylium posed a higher risk of hypotension than amiodarone. (This may be relevant post-arrest.) Arrhythmia event rates were similar between treatments [Evidence level B-1].³
Beta-blocker	Consider for V Fib or pV Tach refractory to standard treatment. ^{5,9,10}	Consider esmolol 500 mcg/kg loading dose followed by a continuous infusion of up to 100 mcg/kg/min.^{5,9}	Esmolol improves odds of ROSC and survival to critical care admission, but it has not shown a statistically significant increase in odds of long-term survival or favorable neurological outcome, perhaps due to the sequelae of prolonged resuscitation.⁹	Risks include hemodynamic instability, worsening heart failure, and bradyarrhythmias.¹³ These may be relevant post-arrest.
Procainamide	Consider for V Fib or pV Tach refractory to standard treatment. ¹⁰	- In a past ACLS guideline, dose was 17 mg/kg (max) at a rate of 20 to mg/min.⁵ (Dose not included in current ACLS guidelines). - One study used 500 mg "rapid infusion," repeated as needed to max dose of 17 mg/kg.¹¹	In refractory witnessed, out-of-hospital V Fib or pV Tach, procainamide did not improve survival to discharge [Evidence level B-3].¹¹	- Not for patients with QT prolongation.¹ - Avoid in patients already given sotalol, except with expert consultation.¹ - Rate-dependent risk of hypotension and myocardial depression.⁸ These may be relevant post-arrest. - Stop infusion if arrhythmia is suppressed, hypotension occurs, QRS widens by 50%, or max dose reached.⁸
Sotalol	Consider for V Fib or pV Tach refractory to standard treatment. ¹⁰	In past ACLS guidelines, dose was 1 to 1.5 mg/kg at a rate of 10 mg/min.⁵ (Dose not included in current ACLS guidelines).	In patients with refractory out-of-hospital V Fib, sotalolol did not improve survival vs lidocaine [Evidence level B-1].⁶	- Not for patients with QT prolongation.¹ - Avoid in patients already given procainamide, except with expert consultation.¹ - Risks include torsades de points or other arrhythmias.⁸ Hypotension and bradycardia may be relevant post-arrest.

Abbreviations: ACLS = advanced cardiovascular life support; IO = intraosseous; IV = intravenous; pV Tach = pulseless ventricular tachycardia; ROSC = return of spontaneous circulation; V Fib = ventricular fibrillation; V Tach = ventricular tachycardia

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Levels of Evidence

Level	Definition	Study Quality
A	Good-quality patient-oriented evidence.*	1.High-quality randomized controlled trial (RCT) 2.Systematic review (SR)/Meta-analysis of RCTs with consistent findings 3.All-or-none study
B	Inconsistent or limited-quality patient-oriented evidence.*	1.Lower-quality RCT 2.SR/Meta-analysis with low-quality clinical trials or of studies with inconsistent findings 3.Cohort study 4.Case control study
C	Consensus; usual practice; expert opinion; disease-oriented evidence (e.g., physiologic or surrogate endpoints); case series for studies of diagnosis, treatment, prevention, or screening.	

*Outcomes that matter to patients (e.g., morbidity, mortality, symptom improvement, quality of life).

[Adapted from Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician 2004;69:548-56. <https://www.aafp.org/pubs/afp/issues/2004/0201/p548.html>.]

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