

ANTIARRHYTHMIC DRUGS (VAUGHAN-WILLIAMS CLASSIFICATION)

Drug	Dosage	Target Levels	Adverse Effects	Comments
CLASS IA Uses: APB and VPB suppression, SVT and VT suppression, AF or atrial flutter, and VF suppression				
Disopyramide	IV: Initially, 1.5 mg/kg over > 5 min, followed by an infusion of 0.4 mg/kg/h Oral immediate-release: 100 or 150 mg q 6 h Oral controlled-release: 200 or 300 mg q 12 h	2–7.5 g/mL	Anticholinergic effects (urinary retention, glaucoma, dry mouth, blurred vision, intestinal upset), hypoglycemia, torsades de pointes, ventricular tachycardia; negative inotropic effects (which may worsen heart failure or hypotension), torsade de pointes, ventricular tachycardia	Drug should be used cautiously in patients with impaired LV function. Dosage should be decreased in patients with renal insufficiency. Adverse effects may contribute to non-adherence. If QRS interval widens (> 50% if initially < 120 msec or > 25% if initially > 120 msec) or if QTc interval is prolonged > 550 msec, infusion rate or dosage should be decreased or drug stopped. IV form is not available in the US.
Procainamide	IV: 10–15 mg/kg bolus at 25–50 mg/min, followed by a constant IV infusion of 1–4 mg/min Oral: 250–625 mg (rarely, up to 1 g) q 3 or 4 h	4–8 g/mL	Hypotension (with IV infusion), serologic abnormalities (especially ANA) in almost 100% taking drug for > 12 mo, drug-induced lupus (arthralgia, fever, pleural effusions) in 15–20%, agranulocytosis in < 1%, torsades de pointes, ventricular tachycardia	Sustained-release preparations obviate the need for frequent dosing. If QRS interval widens (> 50% if initially < 120 msec or > 25% if initially > 120 msec) or if QTc interval is prolonged > 550 msec, infusion rate or dosage should be decreased or drug stopped.

**ANTIARRHYTHMIC DRUGS (VAUGHAN-WILLIAMS
 CLASSIFICATION)—Continued**

Drug	Dosage	Target Levels	Adverse Effects	Comments
Quinidine	Oral: 200–400 mg q 4–6 h	2–6 g/mL	Diarrhea, colic, flatulence, fever, thrombocytopenia, liver function abnormalities, torsades de pointes, ventricular tachycardia; overall adverse effect rate of 30%	If QRS interval widens (> 50% if initially < 120 msec or > 25% if initially > 120 msec) or if QTc interval is prolonged > 550 msec, infusion rate or dosage should be decreased or drug stopped.
CLASS IB Uses: Suppression of ventricular arrhythmias (VPB, VT, VF)				
Lidocaine	IV: 100 mg over 2 min, followed by continuous infusion of 4 mg/min (2 mg/min in patients > 65); 5 min after first dose, a 2nd 50-mg bolus is given	2–5 g/L	Tremor, seizures; if administration is too rapid, drowsiness, delirium, paresthesias; possibly increased risk of bradyarrhythmias after acute MI	To reduce toxicity risk, dosage or infusion rate should be reduced to 2 mg/min after 24 h. Extensive first-pass hepatic metabolism occurs.
Mexiletine	Oral immediate-release: 100–250 mg po q 8 h Oral slow-release: 360 mg po q 12 h IV: 2 mg/kg at 25 mg/min, followed by 250-mg infusion over 1 h, 250-mg infusion over next 2 h, and maintenance infusion of 0.5 mg/min	0.5–2 g/mL	Nausea, vomiting, tremor, seizures	Oral slow-release and IV forms are not available in the US.

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CLASS IC	Uses: APB and VPB suppression, SVT and VT suppression, AF or atrial flutter, and ventricular fibrillation suppression			
Flecainide	Oral: 100 mg q 8 or 12 h IV: 1–2 mg/kg over 10 min	0.2–1 g/mL	Occasionally, blurred vision and paresthe- sias	IV form is not avail- able in US. If QRS complex widens (> 50% if initially < 120 msec and > 25% if initially > 120 msec), dose must be decreased or drug stopped.
Propafenone	Oral: Initially, 150 mg tid, titrated up to 150–300 mg tid IV: 2-mg/kg bolus, followed by 2 mg/min infusion	0.1–1.0 g/mL	β -blocking activity, possible worsening of reactive airway disorders; occasion- ally, GI upset	Pharmacokinetics is nonlinear; increases in dose should not exceed 50% of previous dose. Bioavailability and protein binding vary; drug has sat- urable first-pass metabolism. IV form is not avail- able in the US.
CLASS II	Uses: Supraventricular tachyarrhythmias (APB, ST, SVT, AF, atrial flutter) and ventricular arrhythmias (often in a supportive role)			
β -Blockers				
Atenolol	Oral: 50–100 mg once/day	Drug levels not measured; dose adjusted to reduce heart rate by > 25%	GI disturbances, insomnia, night- mares, lethargy, erectile dysfunction, possible AV block in patients with AV node dysfunction	These drugs are contraindicated in patients with bron- chospastic airway disorders.
Carvedilol	Oral: Initially, 6.25 mg bid, followed by titration to 25 mg bid			

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Drug	Dosage	Target Levels	Adverse Effects	Comments
Acebutolol	Oral: 200 mg bid			
Betaxolol	Oral: 20 mg once/day			
Bisoprolol	Oral: 5–10 mg once/day			
Esmolol	IV: 50–200 g/kg/min			
Metoprolol	Oral: 50–100 mg bid IV: 5 mg q 5 min up to 15 mg			
Nadolol	Oral: 60–80 mg once/day			
Propranolol	Oral: 10–30 mg tid or qid IV: 1–3 mg (may repeat once after 5 min if needed)			
Timolol	Oral: 10–20 mg bid			
CLASS III	Uses: Any tachyarrhythmia except torsades de pointes VT			
Membrane-stabilizing drugs				
Amiodarone	Oral: 600–1200 mg/day for 7–10 days, then 400 mg/day for 3 wk, followed by a maintenance dose (ideally, ≤ 200 mg/day) IV: 150–450 mg over 1–6 h (depending on urgency), followed by a maintenance dose of 0.5–2.0 mg/min	1–2.5 g/mL	Pulmonary fibrosis (in up to 5% of patients treated for > 5 yr), which may be fatal; QTc prolongation; torsades de pointes (rare); bradycardia; gray or blue discoloration of sun-exposed skin; sun sensitivity; hepatic abnormalities; peripheral neuropathy; corneal microdeposits (in almost all treated patients), usually without serious visual effects and reversed by stopping the drug; changes in thyroid function; slow clearance possibly prolonging adverse effects	Drug has noncompetitive β -blocking, Ca channel blocking, and Na channel blocking effects, with a long delay in onset of action. By prolonging refractoriness, drug may produce homogeneous conditions of repolarization throughout the heart. IV form can be used for conversion.

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Drug	Dosage	Target Levels	Adverse Effects	Comments
Azimilide	Oral: 100–200 mg once/day	200–1000 ng/mL	Torsades de pointes VT	—
Bretylum*	IV: Initially, 5 mg/kg, followed by 1–2 mg/min as a constant infusion IM: Initially, 5–10 mg/kg, which may be repeated to a total dose of 30 mg/kg IM maintenance dose of 5 mg/kg q 6–8 h	0.8–2.4 g/mL	Hypotension	Drug has class II properties. Effects may be delayed 10–20 min. Drug is used to treat potentially lethal refractory ventricular tachyarrhythmias (intractable VT, recurrent VF), for which it is usually effective within 30 min of injection.
Dofetilide	IV: 2.5–4 g/mL Oral: 500 mg bid if CrCl > 60 mL/min; 250 mg bid if CrCl is 40–60 mL/min; 125 mg bid if CrCl is 20–40 mL/min	N/A	Torsades de pointes VT	Drug is contraindicated if QTc > 440 msec or if CrCl < 20 mL/min.

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Drug	Dosage	Target Levels	Adverse Effects	Comments
Ibutilide	IV: For patients 60 kg, 1 mg infusion or, for patients < 60 kg, 0.01 mg/kg over 10 min, with dose repeated after 10 min if the first infusion is unsuccessful	N/A	Torsades de pointes VT (in 2%)	Drug is used to terminate AF (success rate, about 40%) and atrial flutter (success rate, about 65%).
Sotalol	Oral: 80–160 mg q 12 h IV: 10 mg over 1–2 min	0.5–4 g/mL	Similar to class II; possible depressed left ventricular function and torsades de pointes VT	Racemic [D-L] form has class II (beta-blocking) properties, [D] form does not. Both forms have class III activity. Only racemic sotalol is available for clinical use. Drug should not be used in patients with renal insufficiency.

CLASS IV Uses: Termination of SVT and slowing of rapid AF or atrial flutter

Ca channel blockers

Diltiazem	Oral slow-release (diltiazem CD): 120 mg to 360 mg once/day IV: 5–15 mg/h for up to 24 h	0.1–0.4 g/mL	Possible precipitation of VF in patients with VT, negative inotropy	IV form is most commonly used to slow ventricular response rate to AF or atrial flutter.
Verapamil	Oral: 40–120 mg tid or, for sustained-release form, 180 mg once/day to 240 mg bid IV: 5–15 mg over 10 min Oral prophylaxis: 40–120 mg tid	N/A	Possible precipitation of VF in patients with VT, negative inotropy	IV form is used to terminate narrow-complex tachycardias involving the AV node (success rate, almost 100% with 5–10 mg IV over 10 min).

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Drug	Dosage	Target Levels	Adverse Effects	Comments
OTHER ANTIARRHYTHMICS				
Adenosine	6 mg rapid IV bolus, repeated twice at 12 mg if needed; flush bolus with additional 20 mL saline	N/A	Transient dyspnea, chest discomfort, and flushing (in 30–60%), transient bronchospasm	Drug slows or blocks AV nodal conduction. Duration of action is extremely short. Contraindications include asthma and high-grade heart block. Dipyridamole potentiates effects.
Digoxin	IV loading dose: 0.5 mg Oral maintenance dose: 0.125–0.25 mg/day	0.8–1.6 g/mL	Anorexia, nausea, vomiting, and often serious arrhythmias (VPBs, VT, APBs, atrial tachycardia, 2nd-degree or 3rd-degree AV block, combinations of these arrhythmias)	Contraindications include antegrade conduction over an accessory AV connection pathway (manifest Wolff-Parkinson-White syndrome) because if AF occurs, ventricular responses may be excessive (digoxin shortens refractory periods of the accessory connection).

*Availability uncertain.

AF = atrial fibrillation; ANA = antinuclear antibody; APB = atrial premature beat; AV = atrioventricular; CrCl = creatinine clearance; LV = left ventricular; QTc = QT interval corrected for heart rate; SVT = supraventricular tachycardia; VF = ventricular fibrillation; VPB = ventricular premature beat; VT = ventricular tachycardia.