Class IA Antiarrhythmics (Na+ Channel Blockers)

Class IA Antiarrhythmics are used to treat arrhythmias through blockage of Na⁺ channels, prolonging action potentials, and are effective for both atrial and ventricular arrhythmias. These can also be used for reentrant and ectopic supraventricular and ventricular tachycardia, as well Wolff-Parkinsons-White syndrome. These affect the rhythm by increasing action potential duration (AP), effective refractory period (ERP) and QT interval. Commonly used Class IA antiarrhythmic drugs include disopyramide, procainamide, which has been known to cause drug-induced lupus, and quinidine, which can cause cinchonism. Shared side effects of this drug class include thrombocytopenia and torsades de pointes.



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Indications

Arrhythmias
Broken Arrhythmia-drum
These drugs are used to treat arrhythmias, especially, ventricular tachycardia and reentrant and ectopic supraventricular arrhythmias, such as Wolff-Parkinson-White syndrome.

Mechanism of Action

Increase AP, ERP, and QT interval.
Up-arrow Action-clapper-P, Ear-P, Elongated QT-heart
These drugs increase AP (action potential) duration, ERP (effective refractory period), and QT interval.

Drugs

Disopyramide
Disco-pyramid
Disopyramide is similar in action to quinidine, and has the longest half life of drugs in this class. It is indicated for ventricular arrhythmias, but has pronounced anticholinergic side effects, and can possibly worsen heart block and cause severe heart failure.

Procainamide
Pro-cane
Procainamide is similar in action to quinidine, but has less GI side effects and is safer to be used intravenously.

Drug-induced Lupus
Loopy Pill-butterfly
Procainamide may often lead to drug induced lupus, an autoimmune disease which can be catalyzed by medication. Patients with drug-induced lupus typically show anti-histone antibodies.

Quinidine
Queen-dine
Quinidine is indicated for supraventricular and ventricular arrhythmias, and also may be used for prevention. It causes a state-dependant block, meaning at higher heart rates, the block increases, while at lower heart rates, the block decreases.

Cinchonism
Sing-cone
Cinchonism is an adverse effect of quinidine use, which presents as dizziness, ringing in the ears, and diarrhea.

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Shared Side Effects

Thrombocytopenia

Trombone-side-toe-peanut

Thrombocytopenia may be induced with quinidine, possibly due to the destruction of platelets by antibodies developed in response to protein-quinine complexes in the circulation.

Torsades de Pointes

Tortoise with Points

Torsades de Pointes can quickly transform into ventricular fibrillation, which may lead to sudden death in minutes. Torsades is a ventricular tachycardia which presents with shifting sinusoid waveforms on ECG. It may occur due to the increase in QT interval associated with this drug class.

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