

CLASS II, III, IV & V

	Class II (β - adrenoceptor blockers)	Class III (k^+ channel blockers) Prolong the AP duration & RP + Prolong phase 3		Class IV (Ca^{+} channel blockers)	Class V
	B- ADRENOCEPTOR BLOCKERS	AMIODARONE	IBUTILIDE (PURE CLASS III)	VERAPAMIL, DILTIAZEM	ADENOSINE
ACTIONS	<ul style="list-style-type: none"> ❖ block β_1- receptors in the heart \rightarrow \downarrow sympathetic effect on the heart causing : <ol style="list-style-type: none"> 1 - \downarrow automaticity of S.A. node and ectopic pacemakers 2 - slow conduction of the A.V node 	<ul style="list-style-type: none"> ❖ Main effect is to prolong AP duration and refractory period ❖ Additional actions of classes : 1, 2 & 4 ❖ vasodilating effects (due to α- and β-adrenoceptor blocking effects and calcium channel blocking effects) 	Causes QT interval prolongation , so it precipitates torsades de pointes.	<ul style="list-style-type: none"> ❖ main site of action is A.V.N & S.A.N (slow conduction & prolong effective refractory period). 	<ul style="list-style-type: none"> ❖ enhance potassium inward (K^+ channel opener) + inhibit cAMP that induced Ca influx \rightarrow marked hyperpolarization ❖ cause slowing of AV-conduction and prolongation of AV node refractory period
CLINICAL USES	1- atrial arrhythmias associated with emotion, exercise and thyrotoxicosis 2- WPW 3- digitalis-induced arrhythmias 4- e.g. Propranolol : it has an ability to prevent ventricular arrhythmias, that's why it used for reducing the incidence of sudden arrhythmic death after myocardial infarction	Broad spectrum antiarrhythmic 1- serious resistant Vent. arrhythmias 2- maintenance of sinus rhythm after D.C. cardioversion of atrial flutter and fibrillation 3- resistant supraventricular arrhythmias 4- Re-entry arrhythmia	the acute conversion of atrial flutter or atrial fibrillation to normal sinus rhythm.	1- atrial arrhythmias 2- re-entry supraventricular arrhythmias 3- NOT effective in ventricular arrhythmias	drug of choice for acute management of: paroxysmal supraventricular tachycardia ■ preferred over verapamil – safer and does not depress contractility ■ given 6 mg I.V. bolus followed by 12 mg if necessary
ADVERSE EFFECTS	-----	1-bradycardia, heart block and heart failure. 2- Pulmonary fibrosis. 3- hyper- or hypothyroidism (since Amiodarone contains iodine). 4- photodermatitis and skin deposits (patients should avoid exposure to the sun). It may cause bluish discoloration of the skin. 5- Tremor, headache, ataxia (loss of muscles coordination, especially in extremities), paresthesia. 6- Constipation. 7- corneal microdeposits.	-----	-----	flushing in about 20% of patients ■ shortness of breath and chest burning in 10% of patients (bronchospasm) ■ AV block (contraindicated in heart block) ■ hypotension, nausea, paresthesia

		In long use: 8- Hepatocellular necrosis. 9- peripheral neuropathy.			
Pharmacokinetics	-----	extremely long $t_{1/2}$ = 13 - 103 DAYS	rapid I.V. infusion	-----	half-life= less than 10 sec.
Drug Interactions		reduce renal clearance of several drugs e.g. quinidine, warfarin, procainamide, flecainide	-----		-----

BRADYARRHYTHMIAS

ATROPINE

- can be used in sinus bradycardia after myocardial infarction and in heart block
- in emergency heart block isoprenaline may be combined with atropine