CLASS 1 (Na+ channel blockers)

	1A		1B		1C	
Action	prolong action potential duration		shorten action potential duration & refractory period of ventricles		have no or little effect on action potential duration	
e.g.	**Quinidine**	**Procainamide**	**Lidocaine**	**Mexiletine**	**Flecainide**	**Propafenone**
Properties	▪ K+ channel blockers leading to: ✓ prolongation of AP duration ✓ prolongation of refractory period of atria & ventricles ▪ Depress cardiac contractility (-ve ionotropic) ▪ α-adrenergic blocking effect (vasodilatation→reflex sinus tachycardia) usually after I.V dose ▪ **ECG changes:** Prolong Q-T interval	Similar to **Quinidine** except: ▪ ↓toxic on the heart (-ve ionotropic) ▪ ↑effective in ventricular than in atrial arrhythmias ▪ ↓depressant on cardiac contractility ▪ no anticholinergic or α-blocking actions	-----	-----	-----	▪ Chemical structure similar to **propranolol** ▪ has weak β-blocking action
PK	Oral, rarely given I.V because of toxicity	I.V	I.V, $T_{1/2}$ (2hrs)	Oral, $T_{1/2}$ (10hrs)	-----	-----
Clinical uses	▪ almost all types of arrhythmias ▪ **common uses:** atrial flutter & fibrillation ▪ **can be used for**: ventricular tachycardia ▪ maintaining sinus rhythm after D.C Cardioversion	▪ atrial & ventricular arrhythmias ▪ second choice (after lidocaine) in ventricular tachycardia after acute myocardial infarction	▪ ventricular tachycardia in emergency ▪ NOT effective in atrial arrhythmias	▪ chronic ventricular arrhythmia ▪ digitalis-induced arrhythmias ▪ chronic pain e.g. diabetic neuropathy and nerve injury	▪ supraventricular arrhythmias in patients with **normal** hearts ▪ Wolff-Parkinson-White syndrome ▪ ventricular arrhythmias ▪ reserved for resistant arrhythmias	-----

Adverse effects	▪ Anticholinergic effect: ✓ ↑conduction through AV node→↑ventricular rate in atrial flutter (prevented by prior administration of a drug that slow AV conduction, e.g.: **digoxin**, **β adrenoceptor blockers** , **Ca^{++} channel blockers**) ▪ GIT: anorexia, nausea, vomiting, diarrhea ▪ CVS: ✓ torsades de pointes ✓ may lead to fatal ventricular fibrillation ▪ Cinchonism: tinnitus, headache, dizziness ▪ Hypotension ▪ cardiac arrest (at toxic dose)	▪ lupus erythematosus-like syndrome(long term therapy) ▪ hypotension ▪ torsades de pointes ▪ CNS: hallucination & psychosis	▪ Hypotension ▪ CNS: paresthesia, tremor, dysarthria (slurred speech), convulsions	▪ nausea , vomiting ▪ neurological ▪ hypotension	▪ CNS: dizziness, tremor, blurred vision, abnormal taste sensations, paraesthesia ▪ arrhythmias ▪ heart failure (due to -ve inotropic effect)	cause metallic taste and constipation
Drug interactions	Increase serum concentration of digoxin: ✓ Displacement from plasma proteins ✓ Inhibition of **digoxin** renal clearance	-----	-----	-----	-----	-----