

Anti-Epileptic Drugs

Drug	Pharmacokinetics	MOA	Uses	Side effects
1st generation Carbamazepine	Blockade of Na⁺ channels: Reduce the propagation of abnormal impulses in the brain. Inhibit the generation of repetitive AP. Inhibit the release of glutamate .	Well absorbed orally . Strong enzyme inducer including its own metabolism. Metabolized → liver to active & inactive metabolites. Excreted → urine	Drug of choice in partial seizures. Tonic-clonic seizures (1ry & 2ry generalized) but Not in absence seizures. Neuropathic pain. Mood stabilizer.	GIT upset. Hypersensitivity reactions. Drowsiness, ataxia, headache & diplopia. Blood dyscrasia. Hyponatremia & water intoxication. Teratogenicity (neural tube defects). Induction of hepatic P ₄₅₀ .
Phenytoin	Blockade of Na⁺ channels. Interfere with the release of excitatory transmitters. Potentiate the action of GABA .	Well absorbed orally . I.V → emergency. Enzyme inducer Metabolized by the liver to inactive metabolites. Excreted → urine	Partial & generalized tonic-clonic seizures Not in absence seizure. In status epilepticus → IV. Cardiac arrhythmias.	A) dose-related: Nausea or Vomiting. Neurological like headache, vertigo, ataxia, diplopia, nystagmus. Sedation. B) Non -dose related: Gum hyperplasia. Coarsening of facial features. Hirsutism, Acne. Megaloblastic anemia. Osteomalacia. Teratogenic effect. Enzyme inducer.
Sodium Valproate (Broad spectrum antiepileptic)	Blockade of Na⁺ channels. Inhibits GABA -transaminase. Suppress Glutamate action. Blocks T-type Ca ²⁺ channels.	Capsules, Syrup, I.V. Metabolized by the liver (inactive) Enzyme inhibitor. Excreted → urine .	1)Epilepsy: All forms of epilepsy e.g. Generalized tonic-clonic seizures (1 ^{ry} or 2 ^{ry}). Absence seizures. Complex partial seizures. Myoclonic, Atonic. Photosensitive epilepsy. 2)other: Bipolar disorder and mania. Prophylaxis of migraine. Lennox-Gastaut syndrome.	Weight gain (↑appetite). Transient hair loss, with re-growth of curly hair. Thrombocytopenia. Hepatotoxicity. Teratogenicity (spina bifida). Enzyme inhibitor of P -450.
2nd generation Lamotrigine	Blockade of Na⁺ channels. Inhibits excitatory amino acid release (glutamate & aspartate).		As add-on therapy or as monotherapy in partial seizures. Lennox-Gastaut syndrome.	Influenza-like symptoms. Skin rashes (may progress to Steven -Johnson syndrome). Somnolence, Ataxia. Blurred vision, Diplopia.
Levetiracetam	Unknown	Taken orally (tablets or solutions). Not metabolized & excreted unchanged in urine. Does not affect liver enzymes. Drug interactions are minimal.	Adjunctive therapy in : Partial seizures. Generalized tonic-clonic seizures. Myoclonic seizures (used alone).	Ataxia. Dizziness. Somnolence. Pin & needles sensation in extremities. Blurred vision.

- ✓ In case of **Status epilepticus** use I.V of:
Lorazepam (drug of choice). or
Diazepam.
- ✓ **Vagal nerve stimulation** → used when no drug is affecting the patient.