Carbamazepine

Carbamazepine is an anticonvulsant drug used as a first line agent against seizure and trigeminal neuralgia. It is sometimes used as a mood stabilizer in bipolar disorder as well. Carbamazepine works by blocking Na⁺ channel activation, stabilizing channels in an inactivated state, in a mechanism similar to phenytoin.This drug is associated with Stevens-Johnson syndrome, which is a dangerous hypersensitivity reaction affecting skin and mucous membranes. Administration has also been known to cause hepatotoxicity, by affecting the glutathione pathway, and blood dyscrasias such as anemia and agranulocytosis. Carbamazepine is an inducer of cytochrome P450, and is also a teratogen, causing neural tube defects and many other birth defects.



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Indications

First-line Seizure Medication
First-place Caesar
Carbamazepine is the first line treatment for simple and complex partial seizures. Of note, it is a second line medication for tonic-clonic generalized seizures. It also has use in treating neuropathic pain and as a mood stabilizer.

First Line for Trigeminal Neuralgia
First-place Tri-gem Nerve-algae
In addition to its role as an anticonvulsant, carbamazepine is the first line treatment for trigeminal neuralgia, and is used for other neuropathic pain syndromes.

Mechanism of Action

Stabilizes Inactive State of Na+ Channels
Stabilized Inactive Salt-shaker in Channel
Carbamazepine acts by stabilizing the inactivated state of voltage-gated sodium channels, leaving cells less excitable and decreasing conductance. This drug has a similar mechanism of action to phenytoin.

Side Effects

Stevens-Johnson Syndrome
Steve-Johns
A rare adverse side effect of carbamazepine includes severe rashes and fatal skin reactions as seen with Stevens-Johnson syndrome. This is a hypersensitivity complex involving the skin and mucous membranes.

Induce Cytochrome P450
Side-toe-chrome Pea-450-rocket
Carbamazepine induces cytochrome P450, thus increasing its own metabolism and reducing its half life. It also may accelerate the clearance of other drugs and decrease their action.

Teratogen
Tarantula-gem
Carbamazepine is teratogenic and is associated with birth defects, including spina bifida, craniofacial abnormalities, and cardiovascular and urinary tract anomalies.

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Hepatotoxicity

Liver with Toxic-green-glow

An adverse side effect is hepatotoxicity, possible due to disturbances in glutathione metabolism, which may occur as a result of accumulated toxic metabolites. Drug-induced liver injury may be severe or fatal, but can be rapidly reversed by stopping therapy.

Blood Dyscrasias

Blood-cell Disc-razor

A rare side effect of carbamazepine includes blood dyscrasias, such as agranulocytosis and aplastic anemia.

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