Oxcarbazepine (Trileptyl®)

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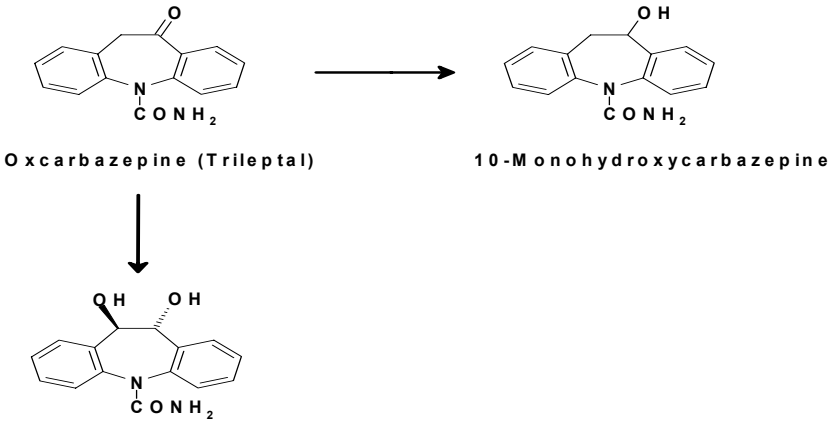
Structure:



Oxcarbazepine (Trileptal) — 10-Monohydroxycarbazepine

10,11-Dihydro-10,11-trans-dihydroxycarbamazepine

Manufacturer: Novartis Pharma AG; Basel, Switzerland

FDA Status: January 14, 2000 for treatment adjunctive and monotherapy in adults and adjunctive therapy for children ages 4-16 with partial epileptic seizures.
Available in 150, 300, and 600 mg tablets and as an oral suspension of 300 mg/5 mL (60 mg/mL).

CAS registry number: 28721-07-5

Chemical Name: 10,11-Dihydro-10-oxo-5*H*-dibenz[b,*f*]azepine-5-carboxamide

Molecular Formula: $C_{15}H_{13}N_2O_2$

Molecular Weight: 252.29

Therapeutic Category: Anticonvulsant or antiepileptic drug (AED). The exact mechanism by which oxcarbazepine exerts its antiseizure activity is unknown. However, it is believed that it produces a blockage of voltage-sensitive sodium channels, resulting in stabilization of hyperexcited neural membranes, inhibition of repetitive neural firing, and diminution of propagation of synaptic impulses.

Metabolism: Cytosolic enzymes rapidly reduce oxcarbazepine to its active metabolite, 10-monohydroxycarbazepine (MHD) in the liver. MHD is further metabolized by conjugation with glucuronic acid. Oxcarbazepine is also oxidized to a minor (<4% of dose) inactive metabolite, 10,11-dihydro-10,11-trans-dihydroxycarbamazepine (DHD).

Bio-availability: Based on MHD concentrations following administration of Trileptyl® tablets or suspension, both the parent and active metabolite have similar bio-availability.

Protein Binding: MHD-40% (predominantly albumin).

Volume of Distribution: 49 L

Half-Life ($T_{½}$): Oxcarbazepine- 2 hours
MHD- 9 hours

Therapeutic Serum Concentration: 4-9 mg/L

Specimen Preparation: Oxcarbazepine (weak acid/neutral) and its active metabolite, MHD, can be extracted from specimens using solid-support, liquid-liquid extraction utilizing Varian Chem Elut™ extraction columns followed by derivatization with MTBSTFA with 1% TBDMCS.

Analysis: Oxcarbazepine and MHD can be analyzed using gas chromatography coupled with flame ionization detection (GC/FID) and/or gas chromatography/mass spectrometry (GC/MS). With GC/FID, MHD (RRT 1.03) elutes directly after the chosen internal standard, *p*-methylphenobarbital and oxcarbazepine follows (RRT 1.16). GC/MS quantification ions include **323**, 266, and 423 m/z for oxcarbazepine and **211**, 193, and 311 m/z for MHD. Underivatized oxcarbazepine ions include 180, 209, 252, 151 m/z. The inactive metabolite, DHD, can not be analyzed by this methodology because of gas chromatographic degradation.