

### Background for Health Care Provider:

Carbamazepine is variably absorbed from the small intestine and has bioavailability in the range of 75-85% depending on the dosage form. In vitro testing indicates carbamazepine is approximately 75% protein bound in serum, suggesting little potential for clinically relevant protein binding displacement interactions. Carbamazepine is almost entirely metabolized by the CYP450 enzyme system in the liver to multiple metabolites of various pharmacologic activities, the most relevant of which is the 10,11 epoxide metabolite. This metabolite is pharmacologically active and is thought to be partially responsible for carbamazepine mediated adverse effects. Carbamazepine induces cytochrome P450 isozymes as well as UDP-glucuronyltransferase. Carbamazepine may also inhibit CYP 2C19. Carbamazepine undergoes autoinduction (via CYP 3A4), which is both time and dose dependent. The renal excretion of carbamazepine is minimal and is often clinically insignificant.

### Effect of Other Drugs on Carbamazepine Serum Levels:

#### Decrease Carbamazepine Serum Levels

- Felbamate
- Oxcarbazepine
- Phenytoin
- Phenobarbital
- Primidone
- St. John's Wort

#### Increase Carbamazepine Serum Levels

- |                |   |
|----------------|---|
| • Cimetidine   | • Metoclopramide                                  |
| • Danazol      | • Metronidazole                                   |
| • Diltiazem    | • Propoxyphene                                    |
| • Erythromycin | • Rifampin  |
| • Fluconazole  | • Ritonavir                                       |
| • Fluoxetine   | • Ticlopidine                                     |
| • Isoniazid    | • Verapamil                                       |
| • Ketoconazole | • Valproic acid (increases carbamazepine epoxide) |
| • Loxapine     |   |

### Effect of Carbamazepine on Other Drugs' Serum Levels:

#### Increase Other Serum Drug Levels

- Phenytoin

#### Decrease Other Serum Drug Levels

- |                 |                       |
|-----------------|-----------------------|
| • Alprazolam    | • Midazolam           |
| • Amitriptyline | • Nifedipine          |
| • Aripiprazole  | • Nimodipine          |
| • Bupropion     | • Olanzapine          |
| • Caspofungin   | • Oral Contraceptives |
| • Clomipramine  | • Phenobarbital       |
| • Clonazepam    | • Phenytoin           |
| • Clozapine     | • Primidone           |
| • Cyclosporin   | • Quetiapine          |
| • Diazepam      | • Rifampin            |
| • Ethosuximide  | • Risperidone         |
| • Felbamate     | • Tacrolimus          |
| • Fentanyl      | • Tiagabine           |
| • Haloperidol   | • Topiramate          |
| • Imipramine    | • Trazodone           |
| • Indinavir     | • Valproic Acid       |
| • Itraconazole  | • Warfarin            |
| • Lamotrigine   | • Zonisamide          |

Ryan F. Miller  
 Doctor of Pharmacy Candidate 2007  
 University of Wisconsin School of Pharmacy