

PAIN MANAGEMENT

Opioids		
Medication	Brand Name	Tested Pathways ²
Alfentanil	Alfenta	CYP3A4/5
Buprenorphine	Buprenex, Suboxone, Subutex	CYP3A4/5
Codeine* (Prodrug)	Tylenol#3, Tylenol#4	CYP2D6, CYP3A4/5
Dihydrocodeine (Prodrug)	Synalgos, Novocodin, Drocode, Paracodeine, Parzone	CYP2D6, CYP3A4/5
Fentanyl	Duragesic, Actiq	CYP3A4/5, ABCB1
Hydrocodone* (Prodrug)	Vicodin, Hydrocet, Norco, Lortab, Lorcet	CYP2D6, CYP3A4/5, ABCB1
Loperamide	Imodium	CYP3A4/5, ABCB1
Methadone	Dolophine, Methadose	CYP2C19, CYP3A4/5, ABCB1
Meperidine	Demerol	CYP3A4/5
Morphine	MSContin, Avinza, Kadian, Roxanol, MSIR, Oramorph	ABCB1
Oxycodone* (Prodrug)	Percocet, OxyContin	CYP2D6, CYP3A4/5
Propoxyphene	Darvon	CYP3A4/5
Sufentanil	Sufenta	CYP3A4/5
Tramadol* (Prodrug)	Ultram, Ryzolt, ConZip	CYP2D6, CYP3A4/5, ABCB1
NSAIDs		
Medication	Brand Name	Tested Pathways ²
Aceclofenac	Acebid, Nofenac	CYP2C9
Celecoxib*	Celebrex	CYP2C9
Diclofenac	Voltaren	CYP2C9
Etodolac	Lodine	CYP2C9
Flurbiprofen*	Ansaid	CYP2C9

PAIN MANAGEMENT (cont.)

NSAIDs (cont.)		
Medication	Brand Name	Tested Pathways ²
Ibuprofen	Advil	CYP2C9
Indomethacin	Indocin	CYP2C19, CYP2C9
Ketoprofen	Orudis, Oruvail, Actron	CYP2C9
Lornoxicam	Zornica	CYP2C9
Mefenamic acid	Ponstel	CYP2C9
Meloxicam	Mobic	CYP2C9
Naproxen	Aleve, Naprosyn, Anaprox, Naprelan	CYP2C9
Oxaprozin	Daypro	CYP2C9
Piroxicam	Feldene	CYP2C9
Tenoxicam	Oxicam, Tilcotil	CYP2C9
Valdecoxib	Bextra	CYP3A4/5, CYP2C9

Muscle Relaxants		
Medication	Brand Name	Tested Pathways ²
Carisoprodol*	Soma	CYP2C19
Cyclobenzapine	Flexeril	CYP3A4/5
Metaxalone	Skelaxin	CYP2D6, CYP3A4/5
Oxybutynin	Ditropan XL, Urotrol	CYP3A4/5
Orphenadrine	Norflex, Norgesic	CYP3A4/5

PSYCHIATRY/NEUROLOGY

Antidepressants		
Medication	Brand Name	Tested Pathways ²
Amitriptyline*	Amitril, Elavil, Endep	CYP2D6, CYP2C19, CYP3A4/5, ABCB1
Amoxapine	Asendin	CYP2D6
Atomoxetine*	Strattera	CYP2D6
Buspirone	Buspar	CYP3A4/5

Antidepressants (cont.)

Medication	Brand Name	Tested Pathways ²
Citalopram *	Celexa	CYP2C19, CYP3A4/5, ABCB1
Clomipramine *	Anafranil	CYP2D6, CYP2C19, CYP3A4/5
Desipramine *	Norpramin	CYP2D6, CYP3A4/5, ABCB1
Doxepin *	Silenor, Sinequan	CYP2D6, CYP2C19, CYP3A4/5
Duloxetine	Cymbalta	CYP2D6
Fluoxetine *	Prozac, Symbyax	CYP2D6, CYP3A4/5, CYP2C9, ABCB1
Escitalopram *	Lexapro	CYP2C19, CYP3A4/5, ABCB1
Imipramine *	Tofranil, Tofranil-PM	CYP2D6, CYP2C19, CYP3A4/5
Levomilnacipran	Fetzima	CYP3A4/5
Moclobemide *	Aurorix	CYP2D6, CYP2C19
Mirtazapine	Remeron	CYP2D6, CYP3A4/5
Nortriptyline *	Aventyl, Pamelor	CYP2D6, CYP3A4/5, ABCB1
Paroxetine *	Brisdelle, Paxil, Pexeva	CYP2D6, ABCB1
Reboxetine	Edronax, Norebox, Prolift, Solvex, Davedax, Vestra	CYP3A4/5, ABCB1
Sertaline *	Zoloft	CYP2C19, CYP3A4/5, ABCB1
Symbyax *	Olanzapine, Fluoxetine	CYP2D6
Trazodone	Desyrel, Oleptro	CYP3A4/5
Trimipramine *	Surmontil	CYP2D6, CYP2C19, ABCB1
Venlafaxine *	Effexor XR	CYP2D6, ABCB1
Vilazodone	Viibryd	CYP3A4/5
Vortioxetine *	Brintellix	CYP2D6, CYP3A4/5

Benzodiazepines

Medication	Brand Name	Tested Pathways ²
Alprazolam	Xanax	CYP3A4/5, CYP2C9
Bromazepam	Bromazanil, Dormoc, Gityl, Lexostad, Lexotanil, Normoc	CYP2C19, CYP3A4/5
Clobazam	Frisium	CYP2C19, CYP3A4/5
Clonazepam	Klonopin	CYP3A4/5
Diazepam *	Valium, Diastat	CYP2C19, CYP3A4/5,
Estazolam	ProSom, Eurodin	CYP3A4/5
Flurazepam	Dalmane, Dalmadorm	CYP3A4/5

Benzodiazepines (cont.)

Medication	Brand Name	Tested Pathways ²
Midazolam	Meberal	CYP3A4/5
Medazepam	Azepamid, Nobrium, Tranquirax, Rudotel, Raporan, Ansilan, Mezapam.	CYP2C19, CYP3A4/5
Nitrazepam	Serzone	CYP3A4/5
Oxazepam	Serax	CYP3A4/5
Quazepam	Doral, Dormali	CYP2C19, CYP3A4/5, CYP2C9
Prazepam	Centrax, Dementrin	CYP3A4/5
Temazepam	Restoril	CYP2C19, CYP3A4/5
Triazolam	Mellaril, Sonopax	CYP3A4/5

Hypnotics

Medication	Brand Name	Tested Pathways ²
Eszopiclone	Lunesta	CYP3A4/5, CYP2C9
Zolpidem	Ambien	CYP3A4/5

Antipsychotics

Medication	Brand Name	Tested Pathways ²
Aripiprazole*	Abilify	CYP2D6, CYP3A4/5, ABCB1
Chlorpromazine	Thorazine	CYP2D6, ABCB1
Clozapine*	Clozaril, Verzacloz	CYP2D6, CYP3A4/5, ABCB1
Fluphenazine	Prolixin	CYP2D6
Haloperidol	Haldol	CYP2D6, CYP3A4/5
Iloperidone	Fanapt	CYP2D6, CYP3A4/5
Lurasidone	Latuda	CYP3A4/5
Olanzapine/Fluoxetine*	Symbyax	CYP2D6, ABCB1
Paliperidone	Invega	CYP2D6, CYP3A4/5, ABCB1
Perphenazine*	Etrafon	CYP2D6, CYP3A4/5
Phenytoin*	Dilantil	CYP2C9, CYP2C19, ABCB1
Pimozide*	Orap	CYP2D6, CYP3A4/5
Quetiapine	Seroquel, Seroquel XR	CYP3A4/5
Risperidone*	Risperdal	CYP2D6, ABCB1
Tetrabenazine*	Xenazine	CYP2D6

Antipsychotics (cont.)

Medication	Brand Name	Tested Pathways ²
Thioridazine*	Halcion	CYP2D6
Ziprasidone	Geodon	CYP3A4/5
Zuclopenthixol*	Clopixol	CYP2D6

Barbiturates

Medication	Brand Name	Tested Pathways ²
Hexobarbital	Barbidorm	CYP2C19, CYP2C9
Mephobarbital	Versed	CYP2C19
Phenobarbital	Luminal	CYP2C19, CYP2C9, ABCB1

Anticonvulsants

Medication	Brand Name	Tested Pathways ²
Carbamazepine	Tegretol, Carbatrol	CYP3A4/5, ABCB1
Lamotrigine	Lamictal	ABCB1
Mephenytoin	Mesantoin	CYP2C19, CYP2C9
Phenytoin*	Dilantil	CYP2C19, CYP2C9
Primidone	Mysoline	CYP2C19
Zonisamide	Zonegran	CYP3A4/5

Treatment of Alzheimer's

Medication	Brand Name	Tested Pathways ²
Donepezil	Aricept	CYP2D6, CYP3A4/5
Galantamine	Razadyne	CYP2D6, CYP3A4/5

Treatment of migraine

Medication	Brand Name	Tested Pathways ²
Ergotamine	Replax	CYP3A4/5
Dihydroergotamine	Migranal, D.H.E 45	CYP3A4/5
Eletriptan	Relpax	CYP3A4/5

Other medications

Medication	Brand Name	Tested Pathways ²
Benzatropine	Cogentin	CYP2D6, CYP2C19
Cevimeline*	Evoxac	CYP2D6, CYP3A4/5
Modafinil*	Alertec, Provigil	CYP2D6, CYP3A4/5
NUEDEXTA*	NUEDEXTA	CYP2D6

Antiarrhythmics

Medication	Brand Name	Tested Pathways ²
Amiodarone	Cordarone	CYP3A4/5
Dronedarone*	Multaq	CYP3A4/5
Flecainide*	Tambocor	CYP2D6
Lidocaine	Xylocaine	CYP3A4/5
Propafenone*	Rythmol	CYP2D6, CYP3A4/5
Quinidine	Quinidex	CYP3A4/5
Sparteine	Spal	CYP2D6

Cardiac Glycosides

Medication	Brand Name	Tested Pathways ²
Digitoxin	Digibind	CYP3A4/5, ABCB1
Digoxin	Digitek, Lanoxin	CYP3A4/5, ABCB1

Antianginal

Medication	Brand Name	Tested Pathways ²
Ivabradine*	Bradid, Ceralan	CYP3A4/5
Perhexiline	Pexsig	CYP2D6
Ranolazine	Ranexa	CYP2D6, CYP3A4/5, ABCB1

Hypotensives: Beta Blockers

Medication	Brand Name	Tested Pathways ²
Alprenolol	Atenenol	CYP2D6
Carvedilol*	Coreg	CYP2D6, CYP2C9
Metoprolol*	Lopressor, Toprol XL	CYP2D6
Nebivolol	Bystolic	CYP2D6
Propranolol*	Inderal, Inderal LA	CYP2D6
Timolol	Blocarden	CYP2D6

Hypotensives: Calcium Channel Blockers

Medication	Brand Name	Tested Pathways ²
Amlodipine	Norvasc	CYP3A4/5
Diltiazem	Cardizem, Tiazac	CYP3A4/5
Felodipine	Plendil	CYP3A4/5

Hypotensives: Calcium Channel Blockers (cont.)

Medication	Brand Name	Tested Pathways ²
Lercanidipine	Landip, Larpin, Lerka	CYP3A4/5
Mibefradil	Posicor	CYP3A4/5, ABCB1
Nifedipine	Adalat, Procardia	CYP3A4/5
Nimodipine	Nimotop, Nymalize	CYP3A4/5
Nisoldipine	Sular	CYP3A4/5
Nitrendipine	Balodopine	CYP3A4/5
Verapamil	Calan, Verelan, Calan SR, Isoptin	CYP3A4/5, CYP2C9, ABCB1

Other Hypotensives

Medication	Brand Name	Tested Pathways ²
Aliskiren*	Tekturna	ABCB1
Bosentan	Trasleer	CYP2C9, CYP3A4/5
Candesartan	Atacand	CYP2C9
Clonidine	Catapres-TTS, Jenloga	CYP2D6
Conivaptan	Vaprisol	CYP3A4/5
Debrisoquine	Declinax	CYP2D6
Eplerenone	Inspra	CYP3A4/5
Irbesartan	Avapro	CYP2C9
Losartan	Cozaar	CYP3A4/5, CYP2C9, ABCB1
Tolvaptan	Samsca	CYP3A4/5, ABCB1
Valsartan	Diovan	CYP2C9

Antiplatelet agents

Medication	Brand Name	Tested Pathways ²
Clopidogrel (Prodrug)*	Plavix	CYP2C19, ABCB1
Prasugrel (Prodrug)	Effient	CYP2C19, CYP3A4/5, CYP2C9
Ticagrelor*	Brilinta	CYP3A4/5

Anticoagulant therapy

Medication	Brand Name	Tested Pathways ²
Warfarin*	Coudamine, Jantoven	CYP2C9, VKORC1
Acenocoumarol	Sintrom, Sinthrome	CYP2C19, CYP2C9, VKORC1
Phenprocoumon	Marcoumar, Marcumar	CYP3A4/5, CYP2C9, VKORC1

Diuretics

Medication	Brand Name	Tested Pathways ²
Indapamide	Lozide	CYP2D6, CYP3A4/5, CYP2C9
Torsemide	Demadex	CYP2C9

Statins

Medication	Brand Name	Tested Pathways ²
Atorvastatin	Lipitor	CYP3A4/5, ABCB1
Fluvastatin	Lescol, Lescol XL	CYP2C9
Lovastatin	Mevacor	CYP3A4/5
Simvastatin	Zocor	CYP3A4/5, ABCB1

GASTROENTEROLOGY

Proton Pump Inhibitors

Medication	Brand Name	Tested Pathways ²
Dexlansoprazole	Dexilant, Kapidex	CYP2C19
Esomeprazole*	Nexium	CYP2C19, CYP3A4/5
Lansoprazole*	Prevacid	CYP2C19, CYP3A4/5
Omeprazole*	Prilosec	CYP2C19, CYP3A4/5, ABCB1
Pantoprazole*	Protonix	CYP2C19, CYP3A4/5, ABCB1
Rabeprazole	Aciphex	CYP2C19

NOTES

* Medications with Pharmacogenetic information in FDA drug label and/or published Clinical Guidelines.

- (1) This metabolism chart is based on information obtained from pharmacokinetic databases www.drugbank.ca, www.pharmgkb.org, and published scientific research.
- (2) The chart only includes information on major drug metabolizing enzymes/transporters for which testing is available. Note that listed drugs may undergo metabolism via additional metabolic pathways.



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