

Tarascon Pocket Pharmacopoeia®

2014 Classic Shirt-Pocket Edition



28TH EDITION

"Desire to take medicines ... distinguishes man from animals."

—Sir William Osler

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The cover woodcut is *The Apothecary* by Jost Amman, Frankfurt, 1574.

Last year we left you doing a procedure without adequate lighting... you needed to solve the dilemma of the three lights with three unmarked light switches all the way across the room. The best way to do this is to first label the switches 1, 2, and 3. Turn switch 1 on for 1 minute, then shut it off and turn on switch 2. Now walk to the bedside and feel the lights. The warm light is 1, the light that is on is 2, and the cold light is 3. Now get a sharpie and label the lights before you forget!

This year's puzzler centers on a daily frustration – commuting to work. One morning, you are headed to work in heavy traffic and reaching the halfway point, you notice that your average speed was 10 mph. You know that to be on time your average speed was supposed to be 20 mph. How fast would you have to travel over the second half of the commute to bring your average speed up to 16 mph? How fast would you have to travel to be on time for work?

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PREFACE TO THE TARASCON POCKET PHARMACOPOEIA®

The *Tarascon Pocket Pharmacopoeia*® arranges drugs by clinical class with a comprehensive index in the back. Trade names are italicized and capitalized. Drug doses shown in mg/kg are generally intended for children, while fixed doses represent typical adult recommendations. Brackets indicate currently available formulations, although not all pharmacies stock all formulations. The availability of generic, over-the-counter, and scored formulations is mentioned. We have set the disease or indication in red for the pharmaceutical agent. It is meant to function as an aid to find information quickly. Codes are as follows:

▶ **METABOLISM & EXCRETION:** **L** = primarily liver, **K** = primarily kidney, **LK** = both, but liver > kidney, **KL** = both, but kidney > liver.

♀ **SAFETY IN PREGNANCY:** **A** = Safety established using human studies, **B** = Presumed safety based on animal studies, **C** = Uncertain safety; no human studies and animal studies show an adverse effect, **D** = Unsafe - evidence of risk that may in certain clinical circumstances be justifiable, **X** = Highly unsafe - risk of use outweighs any possible benefit. For drugs that have not been assigned a category: **+** Generally accepted as safe, **?** Safety unknown or controversial, **-** Generally regarded as unsafe.

▶ **SAFETY IN LACTATION:** **+** Generally accepted as safe, **?** Safety unknown or controversial, **-** Generally regarded as unsafe. Many of our “+” listings are from the AAP policy “The Transfer of Drugs and Other Chemicals Into Human Milk” (see www.aap.org) and may differ from those recommended by the manufacturer.

© **DEA CONTROLLED SUBSTANCES:** **I** = High abuse potential, no accepted use (eg, heroin, marijuana), **II** = High abuse potential and severe dependence liability (eg, morphine, codeine, hydromorphone, cocaine, amphetamines, methylphenidate, secobarbital). Some states require triplicates. **III** = Moderate dependence liability (eg, *Tylenol #3*, *Vicodin*), **IV** = Limited dependence liability (benzodiazepines, propoxyphene, phentermine), **V** = Limited abuse potential (eg, *Lomotil*).

§ **RELATIVE COST:** Cost codes used are “per month” of maintenance therapy (eg, antihypertensives) or “per course” of short-term therapy (eg, antibiotics). Codes are calculated using average wholesale prices (at press time in US dollars) for the most common indication and route of each drug at a typical adult dosage. For maintenance therapy, costs are calculated based upon a 30-day supply or the quantity that might typically be used in a given month. For short-term therapy (ie, 10 days or less), costs are calculated on a single treatment course. When multiple forms are available (eg, generics), these codes reflect the least expensive generally available product. When drugs don’t neatly fit into the classification scheme above, we have assigned codes based upon the relative cost of other similar drugs. *These codes should be used as a rough guide only*, as (1) they reflect cost, not charges, (2) pricing often varies substantially from location to location and time to time, and (3) HMOs, Medicaid, and buying groups often negotiate quite different pricing. Check with your local pharmacy if you have any questions.

Code	Cost
\$	< \$25
\$\$	\$25 to \$49
\$\$\$	\$50 to \$99
\$\$\$\$	\$100 to \$199
\$\$\$\$\$	≥ \$200

♣ **CANADIAN TRADE NAMES:** Unique common Canadian trade names not used in the US are listed after a maple leaf symbol. Trade names used in both nations or only in the US are displayed without such notation.

■ **BLACK BOX WARNINGS:** This icon indicates that there is a black box warning associated with this drug. Note that the warning itself is not listed.

ABBREVIATIONS IN TEXT

AAP – American Academy of Pediatrics	D5W – 5% dextrose dL – deciliter	kg – kilogram lbs – pounds	OA – osteoarthritis oz – ounces
ACCP – American College of Chest Physicians	DM – diabetes mellitus	LFT – liver function test	pc – after meals
ACT – activated clotting time	DPI – dry powder inhaler	LV – left ventricular	PO – by mouth
ADHD – attention deficit hyperactivity disorder	DRESS – drug rash eosinophilia and systemic symptoms	LVEF – left ventricular ejection fraction	PR – by rectum
AHA – American Heart Association	ECG – electrocardiogram	m ² – square meters	prn – as needed
Al – aluminum	EPS – extrapyramidal symptoms	MAOI – monoamine oxidase inhibitor	PTT – partial thrombo- plastin time
ANC – absolute neutrophil count	ET – endotracheal g – gram	mEq – milliequivalent	q – every
ASA – aspirin	GERD – gastroesophageal reflux disease	mg – milligram	RA – rheumatoid arthritis
BP – blood pressure	gtts – drops	Mg – magnesium	RSV – respiratory syncytial virus
BPH – benign prostatic hyperplasia	GU – genitourinary h – hour	MI – myocardial infarction	SC – subcutaneous
BUN – blood urea nitrogen	HAART – highly active antiretroviral therapy	min – minute	sec – second
Ca – calcium	Hb – hemoglobin	mL – milliliter	soln – solution
CAD – coronary artery disease	HCTZ – hydrochloro- thiazide	mm – millimeter	supp – suppository
cap – capsule	HIT – heparin-induced thrombocytopenia	mo – months old	susp – suspension
cm – centimeter	HSV – herpes simplex virus	MRSA – methicillin- resistant <i>Staphylococcus aureus</i>	tab – tablet
CMV – cytomegalovirus	HTN – hypertension	ng – nanogram	TB – tuberculosis
CNS – central nervous system	IM – intramuscular	NHLBI – National Heart, Lung, and Blood Institute	TCA – tricyclic antide- pressant
COPD – chronic obstructive pulmonary disease	INR – international normalized ratio	NPH – neutral protamine hagedorn	TNF – tumor necrosis factor
CrCl – creatinine clearance	IU – international units	NS – normal saline	TPN – total parenteral nutrition
CVA – stroke	IV – intravenous	N/V – nausea/vomiting	UTI – urinary tract infection
CYP – cytochrome P450	JRA – juvenile rheumatoid arthritis	NYHA – New York Heart Association	wt – weight
			y – year
			yo – years old

THERAPEUTIC DRUG LEVELS

<i>Drug</i>	<i>Level</i>	<i>Optimal Timing</i>
amikacin peak	20–35 mcg/mL	30 minutes after infusion
amikacin trough	<5 mcg/mL	Just prior to next dose
carbamazepine trough	4–12 mcg/mL	Just prior to next dose
cyclosporine trough	50–300 ng/mL	Just prior to next dose
digoxin	0.8–2.0 ng/mL	Just prior to next dose
ethosuximide trough	40–100 mcg/mL	Just prior to next dose
gentamicin peak	5–10 mcg/mL	30 minutes after infusion
gentamicin trough	<2 mcg/mL	Just prior to next dose
lidocaine	1.5–5 mcg/mL	12–24 hours after start of infusion
lithium trough	0.6–1.2 meq/l	Just prior to first morning dose
NAPA	10–30 mcg/mL	Just prior to next procainamide dose
phenobarbital trough	15–40 mcg/mL	Just prior to next dose
phenytoin trough	10–20 mcg/mL	Just prior to next dose
primidone trough	5–12 mcg/mL	Just prior to next dose
procainamide	4–10 mcg/mL	Just prior to next dose
quinidine	2–5 mcg/mL	Just prior to next dose
theophylline	5–15 mcg/mL	8–12 hours after once daily dose
tobramycin peak	5–10 mcg/mL	30 minutes after infusion
tobramycin trough	<2 mcg/mL	Just prior to next dose
valproate trough (epilepsy)	50–100 mcg/mL	Just prior to next dose
valproate trough (mania)	45–125 mcg/mL	Just prior to next dose
vancomycin trough ¹	10–20 mg/L	Just prior to next dose
zonisamide ²	10–40 mcg/mL	Just prior to dose

¹Maintain trough >10 mg/L to avoid resistance; optimal trough for complicated infections is 15–20 mg/L

²Ranges not firmly established but supported by clinical trial results

x Outpatient Pediatric Drugs

PEDIATRIC DRUGS		Age	2mo	4mo	6mo	9mo	12mo	15mo	2yo	3yo	5yo
		Kg	5	6½	8	9	10	11	13	15	19
		Lbs	11	15	17	20	22	24	28	33	42
med	strength	freq	teaspoons of liquid per dose (1 tsp = 5 mL)								
Tylenol (mg)		q4h	80	80	120	120	160	160	200	240	280
Tylenol (tsp)	160/t	q4h	½	½	¾	¾	1	1	1¼	1½	1¾
ibuprofen (mg)		q6h	--	--	75 [†]	75 [†]	100	100	125	150	175
ibuorofen (tsp)	100/t	q6h	--	--	¾t	¾t	1	1	1¼	1½	1¾
amoxicillin or Augmentin (not otitis media)	125/t 200/t 250/t 400/t	bid	1 ½ ½ ¼	1¼ ¾ ½ ½	1½ 1 ¾ ½	1¾ 1 ¾ ½	1¾ 1 ¾ ¾	2 1¼ 1 ¾	2¼ 1½ 1¼ ¾	2¾ 1¾ 1¼ 1	3½ 2¼ 1¾ 1
amoxicillin, (otitis media)‡	200/t 250/t 400/t	bid	1 ¾ ½	1¼ 1¼ ¾	1¾ 1½ ¾	2 1½ 1	2 1¾ 1	2¼ 1¾ 1¼	2¾ 2¼ 1½	3 2½ 1½	4 3¼ 2
Auamentin ES‡	600/t	bid	?	½	½	¾	¾	¾	1	1¼	1½
azithromycin*§ (5-day Rx)	100/t 200/t	qd	¼ [†] --	½ [†] ¼ [†]	½ ¼	½ ¼	½ ¼	½ ¼	¾ ½	¾ ½	1 ½
Bactrim/Septa cefaclor*	--	bid	½	¾	1	1	1	1¼	1½	1½	2
"	125/t 250/t	bid	1 ½	1 ½	1¼ ¾	1½ ¾	1½ ¾	1¾ 1	2 1	2½ 1¼	3 1½
"	125/t 250/t	bid	½ ¼	¾ ½	1 ½	1 ½	1¼ ¾	1¼ ¾	1½ ¾	1¾ 1	2¼ 1
cefdirinir	125/t	qd	--	¾ [†]	1	1	1	1¼	1½	1¾	2
Cefixime	100/t	qd	½	½	¾	¾	¾	1	1	1¼	1½
cefprozil*	125/t 250/t	bid	--	¾ [†]	1	1	1¼	1½	1½	2	2¼
"	125/t 250/t	bid	--	½ [†]	½	½	¾	¾	¾	1	1¼
cefuroxime	125/t	bid	--	¾	¾	1	1	1	1½	1¾	2¼
cephalexin	125/t 250/t	qid	--	½	¾	¾	1	1	1¼	1½	1¾
"	125/t 250/t	qid	--	¼	¼	½	½	½	¾	¾	1
clarithromycin	125/t 250/t	bid	½ [†] --	½ --	½ --	½ ¼	¾ ½	¾ ½	¾ ½	¾ ½	1 ¾
"	62½/t	qid	½	¾	1	1	1¼	1¼	1½	1¾	2
dicloxacillin	25/t	qid	¼	½	½	½	½	¾	¾	¾	1
nitrofurantoin	25/t	qid	¼	½	½	½	½	¾	¾	¾	1
Pediazole	---	tid	½	½	¾	¾	1	1	1	1¼	1½
penicillin V**	250/t	bid-tid	--	1	1	1	1	1	1	1	1
cetirizine	5/t	qd	--	--	½	½	½	½	½	½	½
Benadryl	12.5/t	q6h	½	½	¾	¾	1	1	1¼	1½	2
prednisolone	15/t	qd	¼	½	½	¾	¾	¾	1	1	1¼
prednisone	5/t	qd	1	1¼	1½	1¾	2	2¼	2½	3	3¾
Robitussin	---	q4h	--	--	¼ [†]	¼ [†]	½	½	¾	¾	1
Tylenol w/ codeine		q4h	--	--	--	--	--	--	--	1	1

* Dose shown is for otitis media only; see dosing in text for alternative indications.

† Dosing at this age/weight not recommended by manufacturer.

‡ AAP now recommends high dose (80-90 mg/kg/d) for all otitis media in children; with Augmentin used as ES only.

§ Give a double dose of azithromycin the first day.

**AHA dosing for streptococcal pharyngitis. Treat for 10 days.

tsp/t = teaspoon; q = every; h = hour; kg = kilogram; Lbs = pounds; ml = milliliter; bid = two times per day; qd = every day; qid = four times per day; tid = three times per day

PEDIATRIC VITAL SIGNS AND INTRAVENOUS DRUGS

Age		Pre- matr	New- born	2m	4m	6m	9m	12m	15m	2y	3y	5y
Weight	(kg)	2	3½	5	6½	8	9	10	11	13	15	19
	(lbs)	4¼	7½	11	15	17	20	22	24	28	33	42
Maint fluids	(mL/h)	8	14	20	26	32	36	40	42	46	50	58
ET tube	(mm)	2½	3/3½	3½	3½	3½	4	4	4½	4½	4½	5
Defib	(Joules)	4	7	10	13	16	18	20	22	26	30	38
)											
Systolic BP	(high)	70	80	85	90	95	100	103	104	106	109	114
	(low)	40	60	70	70	70	70	70	70	75	75	80
Pulse rate	(high)	145	145	180	180	180	160	160	160	150	150	135
	(low)	100	100	110	110	110	100	100	100	90	90	65
Resp rate	(high)	60	60	50	50	50	46	46	30	30	25	25
	(low)	35	30	30	30	24	24	20	20	20	20	20
adenosine	(mg)	0.2	0.3	0.5	0.6	0.8	0.9	1	1.1	1.3	1.5	1.9
atropine	(mg)	0.1	0.1	0.1	0.13	0.16	0.18	0.2	0.22	0.26	0.30	0.38
Benadryl	(mg)	-	-	5	6½	8	9	10	11	13	15	19
bicarbonate	(meq)	2	3½	5	6½	8	9	10	11	13	15	19
dextrose	(g)	1	2	5	6½	8	9	10	11	13	15	19
epinephrine	(mg)	.02	.04	.05	.07	.08	.09	0.1	0.11	0.13	0.15	0.19
lidocaine	(mg)	2	3½	5	6½	8	9	10	11	13	15	19
morphine	(mg)	0.2	0.3	0.5	0.6	0.8	0.9	1	1.1	1.3	1.5	1.9
mannitol	(g)	2	3½	5	6½	8	9	10	11	13	15	19
naloxone	(mg)	.02	.04	.05	.07	.08	.09	0.1	0.11	0.13	0.15	0.19
diazepam	(mg)	0.6	1	1.5	2	2.5	2.7	3	3.3	3.9	4.5	5
fosphenytoin*	(PE)	40	70	100	130	160	180	200	220	260	300	380
lorazepam	(mg)	0.1	0.2	0.3	0.35	0.4	0.5	0.5	0.6	0.7	0.8	1.0
phenobarb	(mg)	30	60	75	100	125	125	150	175	200	225	275
phenytoin*	(mg)	40	70	100	130	160	180	200	220	260	300	380
ampicillin	(mg)	100	175	250	325	400	450	500	550	650	750	1000
ceftriaxone	(mg)	-	-	250	325	400	450	500	550	650	750	1000
cefotaxime	(mg)	100	175	250	325	400	450	500	550	650	750	1000
gentamicin	(mg)	5	8	12	16	20	22	25	27	32	37	47

*Loading doses; fosphenytoin dosed in "phenytoin equivalents."

CONVERSIONSTemperature:

F = (1.8) C + 32

C = (F - 32)/1.8

Liquid:

1 fluid ounce = 30 mL

1 teaspoon = 5 mL

1 tablespoon = 15 mL

Weight:

1 kilogram = 2.2 lbs

1 ounce = 30 g

1 grain = 65 mg

INHIBITORS, INDUCERS, AND SUBSTRATES OF CYTOCHROME P450 ISOZYMES

The cytochrome P450 (CYP) inhibitors and inducers below do not necessarily cause clinically important interactions with substrates listed. We exclude in vitro data which can be inaccurate. Refer to the *Tarascon Pocket Pharmacopoeia* drug interactions database (PDA edition) or other resources for more information if an interaction is suspected based on this chart. A drug that inhibits CYP subfamily activity can block the metabolism of substrates of that enzyme and substrate accumulation and toxicity may result. CYP inhibitors are classified by how much they increase the area-under-the-curve (AUC) of a substrate: weak (1.25-2 fold), moderate (2-5 fold), or strong (≥ 5 fold). A drug that induces CYP subfamily activity increases substrate metabolism and reduced substrate efficacy may result. CYP inducers are classified by how much they decrease the AUC of a substrate: weak (20-50%), moderate (50-80%) and strong ($\geq 80\%$). A drug is considered a sensitive substrate if a CYP inhibitor increases the AUC of that drug by ≥ 5 -fold. While AUC increases of $>50\%$ often do not affect patient response, smaller increases can be important if the therapeutic range is narrow (eg, theophylline, warfarin, cyclosporine). This table may be incomplete since new evidence about drug interactions is continually being identified.

CYP1A2

Inhibitors. *Strong:* ciprofloxacin, fluvoxamine. *Moderate:* methoxalan, mexiletine, oral contraceptives, phenylpropanolamine, vemurafenib, zileuton. *Weak:* acyclovir, allopurinol, caffeine, cimetidine, disulfiram, echinacea, famotidine, norfloxacin, propafenone, propranolol, terbinafine, ticlopidine, verapamil. *Unclassified:* amiodarone, atazanavir, citalopram, clarithromycin, deferiasirox, erythromycin, estradiol, isoniazid, peginterferon alfa-2a.

Inducers. *Moderate:* montelukast, phenytoin, smoking. *Weak:* omeprazole, phenobarbital. *Unclassified:* carbamazepine, charcoal-broiled foods, rifampin, ritonavir, tipranavir/ritonavir.

Substrates. *Sensitive:* caffeine, duloxetine, melatonin, ramelteon, tacrine, tizanidine. *Unclassified:* acetaminophen, amitriptyline, asenapine, bendamustine, cinacalcet, clomipramine, clozapine, cyclobenzaprine, estradiol, fluvoxamine, haloperidol, imipramine, loxapine, mexiletine, mirtazapine, naproxen, olanzapine, ondansetron, pomalidomide, propranolol, rasagiline, riluzole, roflumilast, ropinirole, ropivacaine, R-warfarin, theophylline, zileuton, zolmitriptan.

CYP2B6

Inhibitors: *Weak:* clopidogrel, prasugrel, ticlopidine.

Inducers. *Moderate:* efavirenz, rifampin. *Weak:* nevirapine. *Unclassified:* baicalin (ingredient of Limbrel).

Substrates: *Sensitive:* bupropion, efavirenz. *Unclassified:* cyclophosphamide, ketamine, methadone, nevirapine, prasugrel.

CYP2C8

Inhibitors. Strong: gemfibrozil. **Moderate:** deferasirox. **Weak:** fluvoxamine, ketoconazole, trimethoprim.

Inducers. Moderate: rifampin. **Unclassified:** barbiturates, carbamazepine, rifabutin.

Substrates. Sensitive: repaglinide. **Unclassified:** amiodarone, carbamazepine, dabrafenib, ibuprofen, isotretinoin, loperamide, montelukast, paclitaxel, pioglitazone, rosiglitazone, trestonil.

CYP2C9

Inhibitors. Moderate: amiodarone, fluconazole, miconazole, oxandrolone. **Weak:** capecitabine, cotrimoxazole, etravirine, fluvastatin, fluvoxamine, metronidazole, sulfapyrazole, tigecycline, voriconazole, zafirlukast. **Unclassified:** cimetidine, fenofibrate, fenofibric acid, fluorouracil, imatinib, isoniazid, leflunomide,

Inducers. Moderate: carbamazepine, rifampin. **Weak:** aprepitant, bosentan, elvitegravir (in *Stribild*), phenobarbital, St John's wort. **Unclassified:** rifapentine.

Substrates. Sensitive: celecoxib. **Unclassified:** azilsartan, bosentan, chlorpropamide, diclofenac, etravirine, fluoxetine, flurbiprofen, fluvastatin, formoterol, glimepiride, glipizide, glyburide, ibuprofen, irbesartan, losartan, mefenamic acid, meloxicam, montelukast, naproxen, nateglinide, ospemifene, phenytoin, piroxicam, ramelteon, sildenafil, tolbutamide, toremide, vardenafil, voriconazole, S-warfarin, zafirlukast, zileuton.

CYP2C19

Inhibitors. Strong: fluconazole, fluvoxamine, ticlopidine. **Moderate:** esomeprazole, fluoxetine, moclobemide, omeprazole, voriconazole. **Weak:** armodafinil, carbamazepine, cimetidine, etravirine, felbamate, human growth hormone, ketoconazole, oral contraceptives. **Unclassified:** chloramphenicol, isoniazid, modafinil, oxcarbazepine.

Inducers. Moderate: rifampin. **Unclassified:** efavirenz, St John's wort.

Substrates. Sensitive: lansoprazole, omeprazole. **Unclassified:** amitriptyline, bortezomib, carisoprodol, cilostazol, citalopram, clobazam, clomipramine, clopidogrel, clozapine, cyclophosphamide, desipramine, dexlansoprazole, diazepam, escitalopram, esomeprazole, etravirine, formoterol, imipramine, lacosamide, methadone, moclobamide, nelfinavir, pantoprazole, phenytoin, progesterone, proguanil, propranolol, rabeprazole, sertraline, voriconazole, R-warfarin.

CYP2D6

Inhibitors. Strong: bupropion, fluoxetine, paroxetine, quinidine.

Moderate: cinacalcet, dronedarone, duloxetine, mirabegron, terbinafine.

Weak: amiodarone, asenapine, celecoxib, cimetidine, desvenlafaxine, diltiazem, diphenhydramine, echinacea, escitalopram, febuxostat, gefitinib, hydralazine, hydroxychloroquine, imatinib, methadone, oral contraceptives, propafenone, ranitidine, ritonavir, sertraline, telithromycin, venlafaxine, vemurafenib, verapamil. **Unclassified:** abiraterone, chloroquine, clobazam, clomipramine,

cobicistat (in *Stribild*), fluphenazine, haloperidol, lorcaserin, lumefantrine, metoclopramide, moclobamide, perphenazine, quinine, ranolazine, thioridazine.

Inducers: None known.

Substrates. Sensitive: atomoxetine, desipramine, dextromethorphan, metoprolol, nebivolol, perphenazine, tolterodine, venlafaxine. **Unclassified:** amitriptyline, aripiprazole, carvedilol, cevimeline, chlorpheniramine, chlorpromazine, cinacalcet, clomipramine, codeine*, darifenacin, dihydrocodeine, dolasetron, donepezil, doxepin, duloxetine, fesoterodine, flecainide, fluoxetine, formoterol, galantamine, haloperidol, hydrocodone, iloperidone, imipramine, loratadine, loxapine, maprotiline, methadone, methamphetamine, metoclopramide, meclizine, mexiletine, mirtazapine, morphine, nortriptyline, ondansetron, paroxetine, promethazine, propafenone, propranolol, quetiapine, risperidone, ritonavir, tamoxifen, tetrabenazine, thioridazine, timolol, tramadol*, trazodone.

* Metabolism by CYP2D6 required to convert to active analgesic metabolite; analgesia may be impaired by CYP2D6 inhibitors.

CYP3A4

Inhibitors. Strong: boceprevir, clarithromycin, cobicistat (in *Stribild*), conivaptan, indinavir, itraconazole, ketoconazole, lopinavir-ritonavir, nefazodone, nelfinavir, posaconazole, ritonavir, saquinavir, telaprevir, telithromycin, voriconazole. **Moderate:** aprepitant, atazanavir, crizotinib, darunavir-ritonavir, diltiazem, dronedarone, erythromycin, fluconazole, fosamprenavir, grapefruit juice (variable), imatinib, verapamil. **Weak:** alprazolam, amiodarone, amlodipine, atorvastatin, bicalutamide, cilostazol, cimetidine, cyclosporine, fluoxetine, fluvoxamine, ginko, goldenseal, isoniazid, ivacaftor, lapatinib, nilotinib, oral contraceptives, ranitidine, ranolazine, ticagrelor, tipranavir-ritonavir, zileuton. **Unclassified:** danazol, miconazole, quinine, quinupristin/dalfopristin, sertraline.

Inducers. Strong: carbamazepine, phenytoin, rifampin, rifapentine, St Johns wort. **Moderate:** bosentan, efavirenz, etravirine, modafinil, nafcillin. **Weak:** aprepitant, armodafinil, clobazam, echinacea, fosamprenavir, pioglitazone, rufinamide. **Unclassified:** artemether, barbiturates, dexamethasone, ethosuximide, griseovulvin, nevirapine, oxcarbazepine, primidone, rifabutin, ritonavir, vemurafenib.

Substrates. Sensitive: alfentanil, aprepitant, budesonide, buspirone, conivaptan, darifenacin, darunavir, dasatinib, dronedarone, eletriptan, eplerenone, everolimus, felodipine, fluticasone, indinavir, ivacaftor, lomitapide, lopinavir, lovastatin, lurasidone, maraviroc, midazolam, nisoldipine, quetiapine, saquinavir, sildenafil, simvastatin, sirolimus, tipranavir, tolvaptan, triazolam, vardenafil. **Unclassified:** alfuzosin, aliskiren, almotriptan, alprazolam, amiodarone, amlodipine, apixaban, aripiprazole, armodafinil, artemether (in *Coartem*), atazanavir, atorvastatin, avanafil, axitinib, bedaquiline, boceprevir, bortezomib, bosentan, bosutinib, brentuximab, bromocriptine, buprenorphine, cabozantinib, carbamazepine, cevimeline, cilostazol, cinacalcet, cisapride, citalopram, clarithromycin, clomipramine, clonazepam, clopidogrel, clobazam, clozapine, cobicistat

(in *Stribild*), colchicine, corticosteroids, crizotinib, cyclophosphamide, cyclosporine, dabrafenib, dapsone, desogestrel, desvenlafaxine, dexamethasone, dextansoprazole, diazepam, dihydroergotamine, diltiazem, disopyramide, docetaxel, dofetilide, dolasetron, domperidone, donepezil, doxorubicin, dutasteride, efavirenz, elvitegravir (in *Stribild*), ergotamine, erlotinib, erythromycin, escitalopram, esomeprazole, eszopiclone, ethinyl estradiol, etoposide, etravirine, fentanyl, fesoterodine, finasteride, fosamprenavir, fosaprepitant, galantamine, gefitinib, guanfacine, haloperidol, hydrocodone, ifosfamide, iloperidone, imatinib, imipramine, irinotecan, isradipine, itraconazole, ixabepilone, ketamine, ketoconazole, lansoprazole, lapatinib, letrozole, lidocaine, loratadine, loxapine, lumefantrine (in *Coartem*), methylergonovine, mifepristone, mirtazapine, modafinil, mometasone, nateglinide, nefazodone, nelfinavir, nevirapine, nicardipine, nifedipine, nilotinib, nimodipine, ondansetron, ospemifene, oxybutynin, oxycodone, paclitaxel, pantoprazole, pazopanib, pimozone, pioglitazone, pomalidomide, ponatinib, prasugrel, praziquantel, quinidine, quinine, rabeprazole, ramelteon, ranolazine, regorafenib, repaglinide, rifabutin, rifampin, ritonavir, rivaroxaban, roflumilast, romidepsin, ruxolitinib, saxagliptin, sertraline, silodosin, solifenacin, sufentanil, sunitinib, tacrolimus, tadalafil, tamoxifen, telaprevir, telithromycin, temsirolimus, testosterone, tiagabine, ticagrelor, tinidazole, tofacitinib, tolterodine, tramadol, trazodone, verapamil, vilazodone, vinblastine, vincristine, vinorelbine, voriconazole, R-warfarin, zaleplon, ziprasidone, zolpidem, zonisamide.

INHIBITORS, INDUCERS, AND SUBSTRATES OF P-GLYCOPROTEIN

The p-glycoprotein (P-gp) inhibitors and inducers below do not necessarily cause clinically important interactions with substrates listed. We attempt to exclude in vitro data which can be inaccurate. Refer to the Tarascon Pocket Pharmacopoeia drug interactions database (PDA edition) or other resources for more information if an interaction is suspected based on this chart. P-gp is an efflux transporter that pumps drugs out of cells. In the gut P-gp, reduces drug absorption by pumping drugs into the gut lumen. In the kidney, it increases drug excretion by pumping drugs into urine. P-gp inhibitors can increase exposure to P-gp substrates, potentially increasing their risk of toxicity. P-gp inducers can reduce exposure to P-gp substrates, increasing their risk of treatment failure. Some drugs are dual inhibitors of P-gp and CYP 3A4 (e.g. clarithromycin, dronedarone, erythromycin, itraconazole, ketoconazole, verapamil), while others are dual inducers of P-gp and CYP 3A4 (e.g. carbamazepine, phenytoin, rifampin, St John's wort).

Inhibitors: Amiodarone, atorvastatin, azithromycin, captopril, carvedilol, clarithromycin, cobicistat (in *Stribild*), conivaptan, cyclosporine, darunavir-ritonavir, dipyridamole, dronedarone, erythromycin, etravirine, everolimus, felodipine, indinavir, isradipine, itraconazole, ketoconazole, lapatinib, lomitapide, lopinavir-ritonavir, nifedipine, nilotinib, posaconazole, quinidine, ranolazine, ritonavir, saquinavir-ritonavir, telaprevir, ticagrelor, verapamil.

Inducers: Carbamazepine, fosamprenavir, phenytoin, rifampin, St John's wort, tipranavir-ritonavir.

Substrates: Aliskiren, ambrisentan, apixaban, boceprevir, clobazam, colchicine, cyclosporine, dabigatran, digoxin, diltiazem, docetaxel, etoposide, everolimus, fexofenadine, fosamprenavir, imatinib, indinavir, lapatinib, linagliptin, loperamide, lovastatin, maraviroc, morphine, nadolol, nilotinib, paclitaxel, pomalidomide, posaconazole, pravastatin, propranolol, ranolazine, rivaroxaban, romidepsin, saquinavir, saxagliptin, silodosin, sirolimus, sitagliptin, tacrolimus, telaprevir, tolvaptan, topotecan, vinblastine, vincristine.

DRUG THERAPY REFERENCE WEBSITES (selected)*Professional societies or governmental agencies with drug therapy guidelines*

AAP	American Academy of Pediatrics	www.aap.org
ACC	American College of Cardiology	www.acc.org
ACCP	American College of Chest Physicians	www.chestnet.org
ACCP	American College of Clinical Pharmacy	www.accp.com
ADA	American Diabetes Association	www.diabetes.org
AHA	American Heart Association	www.heart.org
AHRQ	Agency for Healthcare Research and Quality	www.ahrq.gov
AIDSinfo	HIV Treatment, Prevention, and Research	www.aidsinfo.nih.gov
AMA	American Medical Association	www.ama-assn.org
APA	American Psychiatric Association	www.psych.org
APA	American Psychological Association	www.apa.org
ASHP	Amer. Society Health-Systems Pharmacists Drug Shortages Resource Center	www.ashp.org/shortages
ATS	American Thoracic Society	www.thoracic.org
CDC	Centers for Disease Control and Prevention	www.cdc.gov
CDC	CDC bioterrorism and radiation exposures	www.bt.cdc.gov
IDSA	Infectious Diseases Society of America	www.idsociety.org
MHA	Malignant Hyperthermia Association	www.mhaus.org

Other therapy reference sites

Cochrane library	www.cochrane.org
Emergency Contraception Website	www.not-2-late.com
Immunization Action Coalition	www.immunize.org
QDrug lists	www.crediblemeds.org/
Managing Contraception	www.managingcontraception.com