

ANTIRETROVIRAL THERAPY CONSIDERATIONS AND DRUG INTERACTIONS* (Part 1 of 9)

Generic	Brand	Contraindications and Drug Interactions*
CCR5 CO-RECEPTOR ANTAGONISTS		
maraviroc (MVC)	Selzentry	<ul style="list-style-type: none"> • Severe renal impairment or ESRD (CrCl <30mL/min) patients taking concomitant potent CYP3A inhibitors or inducers. • Concomitant St. John's wort: not recommended. • May affect, or be affected by, CYP3A inhibitors or inducers and drugs affected by p-glycoprotein (eg, potentiated by ketoconazole, lopinavir/ritonavir, ritonavir, darunavir/ritonavir, saquinavir/ritonavir, atazanavir; antagonized by rifampin, etravirine, efavirenz). • Caution with antihypertensives.
FUSION INHIBITORS		
enfuvirtide (ENF, T-20)	Fuzeon	<ul style="list-style-type: none"> • May cause false (+) ELISA test for HIV. • Increased risk of post-injection bleed with concomitant anticoagulants.
HIV-1 INTEGRASE STRAND TRANSFER INHIBITORS		
dolutegravir	Tivicay	<ul style="list-style-type: none"> • Concomitant dofetilide. • May be affected by drugs that induce or inhibit UGT1A1, UGT1A3, UGT1A9, BCRP, and P-gp enzymes or transporters. • Avoid concomitant nevirapine, oxcarbazepine, phenytoin, phenobarbital, carbamazepine, St. John's wort. • Avoid etravirine unless co-administered with atazanavir/ritonavir, darunavir/ritonavir, or lopinavir/ritonavir. • Concomitant efavirenz, fosamprenavir/ritonavir, tipranavir/ritonavir, or rifampin: adjust dose to 50mg twice daily. • Concomitant cation-containing antacids, laxatives, sucralfate, oral iron/calcium supplements, and buffered drugs: give dolutegravir 2hrs before or 6hrs after. • Concomitant metformin; monitor closely and adjust metformin dose if necessary.
elvitegravir	Vitekta	<ul style="list-style-type: none"> • Consult full labeling for co-administered protease inhibitor and ritonavir. • Concomitant Stribild, efavirenz, nevirapine, protease inhibitor and cobicistat, other potent CYP3A inducers (eg, rifampin, rifapentine), St. John's wort: not recommended. • Potentiated by atazanavir/ritonavir, lopinavir/ritonavir. • May potentiate ketoconazole (max 200mg daily). • Reduced efficacy with concomitant boceprevir, telaprevir: not recommended. • Antagonized by phenobarbital, phenytoin, carbamazepine, oxcarbazepine, corticosteroids; consider alternatives. • Concomitant rifabutin: reduce rifabutin dose by at least 75% of usual (300mg/day); monitor. • Concomitant didanosine: give at least 1hr before or 2hrs after elvitegravir. • Separate dosing of antacids by at least 2hrs. • Discontinue use of bosentan at least 36hrs prior to initiation; after at least 10 days following initiation, resume bosentan. • May antagonize ethinyl estradiol: use alternative methods of non-hormonal contraception.
raltegravir (RAL)	Isentress	<ul style="list-style-type: none"> • Antagonized by rifampin, possibly other strong UGT1A1 inducers. May be potentiated by UGT1A1 inhibitors. • Caution with other drugs that can cause myopathy (eg, statins).
NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NNRTIS)		
delavirdine mesylate (DLV)	Rescriptor	<ul style="list-style-type: none"> • CYP3A substrates that may cause serious events if blood levels are elevated (eg, cisapride, pimozide, alprazolam, midazolam, triazolam, ergots). • Concomitant lovastatin or simvastatin, NNRTIs: not recommended. • May increase levels of antiarrhythmics (eg, bepridil, quinidine), calcium channel blockers (eg, nifedipine), clarithromycin, rifabutin, indinavir, saquinavir, maraviroc (monitor ALT/AST), amprenavir, amphetamines, trazodone, warfarin, sildenafil, atorvastatin, fluvastatin, immunosuppressants, methadone, fluticasone (long-term use); serious or life-threatening adverse reactions may occur with some of these drugs (avoid or adjust dose). • Delavirdine levels may be decreased by phenytoin, phenobarbital, carbamazepine, rifabutin, rifampin, chronic H₂ antagonists or PPIs, dexamethasone, St. John's wort: not recommended; didanosine and vice versa (separate dosing by at least 1hr). • Delavirdine levels increased by fluoxetine, ketoconazole. • Absorption reduced by antacids (separate dosing by at least 1hr). • Reduce indinavir dose (consider indinavir 600mg three times daily).
efavirenz (EVF)	Sustiva	<ul style="list-style-type: none"> • Concomitant bepridil, cisapride, ergots, midazolam, triazolam, pimozide, St. John's wort. • Avoid concomitant other efavirenz-containing products (eg, Atripla), atazanavir (treatment-experienced), posaconazole, alcohol, psychoactive and/or other hepatotoxic drugs. • Caution with drugs metabolized by, or that affect activity of, CYP2C9, CYP2C19, CYP3A4. (<i>entry continues</i>)

(continued)

ANTIRETROVIRAL THERAPY CONSIDERATIONS AND DRUG INTERACTIONS* (Part 2 of 9)

Generic	Brand	Contraindications and Drug Interactions*
NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NNRTIS) (continued)		
efavirenz (EVF) (continued)	Sustiva (continued)	<ul style="list-style-type: none"> • Efavirenz levels decreased by carbamazepine, phenytoin, phenobarbital, rifampin, rifabutin. • May decrease levels of indinavir (increase indinavir to 1g every 8hrs), amprenavir, atazanavir, clarithromycin, calcium channel blockers (eg, diltiazem, felodipine, nifedipine, nifedipine, verapamil), itraconazole, ketoconazole, lopinavir (adjust dose: see literature), maraviroc, raltegravir, bupropion, methadone, rifabutin (increase dose: see literature), sertraline, simvastatin, atorvastatin, pravastatin, progestins (eg, norelgestromin, levonorgestrel), etonogestrel, immunosuppressants (eg, cyclosporine, sirolimus, tacrolimus). • Efavirenz increases nelfinavir plasma levels. • May affect or be affected by voriconazole (adjust dose). • Levels of both drugs increased with ritonavir (monitor liver function and for adverse events). • Levels of both drugs are decreased with telaprevir, or saquinavir (do not use as sole protease inhibitor). • Closely monitor warfarin, anticonvulsants (esp. phenytoin, phenobarbital, carbamazepine), rifabutin, others. • May cause false (+) cannabis screening test (CEDIA DAU multi-level THC assay).
etravirine (ETR)	Intelence	<ul style="list-style-type: none"> • Concomitant tipranavir/ritonavir, fosamprenavir/ritonavir, atazanavir/ritonavir, PIs without ritonavir (eg, atazanavir, fosamprenavir, nelfinavir, indinavir), ritonavir (600mg twice daily), NNRTIs (eg, efavirenz, nevirapine, delavirdine): not recommended. • Avoid rifampin, rifapentine, St. John's wort, carbamazepine, phenytoin, phenobarbital; rifabutin with darunavir/ritonavir. • May affect, or be affected by, drugs that induce or inhibit, or that are substrates of, CYP3A4, CYP2C9, CYP2C19 (eg, azole antifungals, immunosuppressants); monitor. • Potentiated by lopinavir/ritonavir. • May antagonize antiarrhythmics (eg, amiodarone, bepridil, disopyramide, flecainide, lidocaine, mexiletine, propafenone, quinidine) (monitor), sildenafil. • May potentiate warfarin, diazepam. • May be antagonized by anticonvulsants, dexamethasone. • Clarithromycin (consider azithromycin for treating MAC). • Adjust statin dose (except pravastatin, rosuvastatin). • Rifabutin (adjust dose with etravirine monotherapy).
nevirapine (NVP)	Viramune Viramune XR	<ul style="list-style-type: none"> • Moderate-to-severe hepatic impairment. • Potentiated by fluconazole (monitor). • Antagonizes ketoconazole, oral contraceptives: not recommended (use nonhormonal contraception), clarithromycin (consider alternative). • Antagonized by St. John's wort, rifampin: not recommended. • May antagonize methadone (monitor for withdrawal symptoms; increase methadone dose if needed), or drugs metabolized by CYP3A4 or CYP2B6. • Monitor warfarin, rifabutin, other CYP450 substrates.
rilpivirine	Edurant	<ul style="list-style-type: none"> • Concomitant carbamazepine, oxcarbazepine, phenobarbital, phenytoin, rifampin, rifapentine, esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole, dexamethasone (more than single dose), St. John's wort. • Concomitant NNRTIs: not recommended. • Antagonized by CYP3A inducers (see Contraindications). • May be potentiated by CYP3A inhibitors (eg, azole antifungals [monitor for breakthrough fungal infections], clarithromycin, erythromycin, telithromycin [consider azithromycin use]). • Concomitant methadone; monitor. • Separate antacids (by ≥ 2hrs before or ≥ 4hrs after) and H₂-receptor antagonists (by ≥ 12hrs before or 4hrs after). • Drugs that increase gastric pH may result in decreased plasma concentrations. • Caution with drugs with a known risk for torsades de pointes.
NUCLEOSIDE/NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTIS)		
abacavir sulfate (ABC)	Ziagen	<ul style="list-style-type: none"> • See full labeling regarding fatal hypersensitivity reactions (which may include fever, rash, fatigue, nausea, vomiting, diarrhea, abdominal pain, or respiratory symptoms); discontinue as soon as suspected; do not restart, regardless of HLA-B*5701 status. • Moderate or severe hepatic impairment. • May antagonize methadone. • May be potentiated by ethanol. • Concomitant other abacavir-containing products: not recommended.

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ANTIRETROVIRAL THERAPEUTICS AND DRUG INTERACTIONS (Part 3 of 9)

Generic	Brand	Contraindications and Drug Interactions*
NUCLEOSIDE/NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTIS) (continued)		
abacavir (ABC)/lamivudine (3TC)	Epzicom	<ul style="list-style-type: none"> • See literature re: fatal hypersensitivity reactions; signs/symptoms include: fever, rash, nausea, vomiting, diarrhea, abdominal pain, malaise/fatigue, or respiratory symptoms; discontinue as soon as suspected; do not restart, regardless of HLA-B*5701 status. • Hepatic impairment. • Avoid concomitant zalcitabine or other forms of abacavir, lamivudine. • Do not combine with other nucleoside/nucleotide reverse transcriptase inhibitors as part of a triple-drug regimen. • Potentiated by ethanol, TMP/SMX, nelfinavir. • May antagonize methadone. • Monitor for treatment-associated toxicities with interferon-alpha with or without ribavirin.
abacavir (ABC)/lamivudine (3TC)/zidovudine (ZDV)	Trizivir	<ul style="list-style-type: none"> • See literature re: fatal hypersensitivity reactions; signs/symptoms include: fever, rash, nausea, vomiting, diarrhea, abdominal pain, malaise/fatigue, or respiratory symptoms; discontinue as soon as suspected; do not restart, regardless of HLA-B*5701 status. • Hepatic impairment. • Avoid zalcitabine, stavudine, doxorubicin, ribavirin, emtricitabine, tenofovir, other forms of abacavir, lamivudine, or zidovudine. • Abacavir may antagonize methadone. • TMP/SMX, nelfinavir may increase lamivudine levels. • Ethanol may increase abacavir levels. Atovaquone, fluconazole, methadone, nelfinavir, probenecid, ritonavir, valproic acid may affect zidovudine levels; monitor. • Increased hematologic toxicity with ganciclovir, other bone marrow suppressants or cytotoxic agents. • Triple therapy (once daily regimen) with tenofovir or with didanosine + tenofovir: high rate of early viral non-response (see literature). • Monitor for treatment-associated toxicities with interferon-alpha with or without ribavirin.
didanosine (ddl)	Videx Videx EC	<ul style="list-style-type: none"> • Concomitant allopurinol or ribavirin. • Avoid with hydroxyurea and stavudine. • Potentiated by ganciclovir, tenofovir (reduce dose of didanosine; monitor). • Antagonized by methadone. • For pediatric pwt: caution with magnesium- or aluminum-containing antacids. • Separate dosing of delavirdine, indinavir, nelfinavir by 1hr; give drugs affected by gastric pH (eg, ketoconazole, itraconazole) 2hrs prior. • May antagonize quinolones, tetracyclines. • Give at least 6hrs before or 2hrs after ciprofloxacin. • See literature for dosing with concomitant tenofovir.
emtricitabine (FTC)	Emtriva	<ul style="list-style-type: none"> • Avoid concomitant drugs that contain emtricitabine or lamivudine.
emtricitabine (FTC)/tenofovir disoproxil fumarate (TDF)	Truvada	<ul style="list-style-type: none"> • Avoid concomitant drugs that contain emtricitabine, tenofovir, lamivudine, or adefovir dipivoxil. • Potentiates didanosine toxicity (>60kg; reduce dose of didanosine); discontinue didanosine if toxicity develops. • Monitor drugs that reduce renal function or compete for renal tubular secretion (eg, adefovir dipivoxil, cidofovir, acyclovir, valacyclovir, ganciclovir, valganciclovir). • Avoid concomitant or recent use of nephrotoxic agents. • Potentiated by lopinavir/ritonavir, atazanavir; monitor for toxicity. • Concomitant atazanavir: must give with ritonavir. • Caution with triple nucleoside-only regimen (high rate of early viral non-response); monitor and consider alternative therapy. • See literature for dosing of concomitant didanosine or ritonavir.
lamivudine (3TC)	Epivir	<ul style="list-style-type: none"> • Concomitant zalcitabine: not recommended. • Avoid concomitant drugs that contain lamivudine or emtricitabine. • Caution with drugs eliminated by active organic cationic secretion (eg, trimethoprim). • Triple therapy (once daily regimen) with abacavir + tenofovir or with didanosine + tenofovir: high rate of early viral non-response (see full labeling). • Monitor for treatment-associated toxicities with interferon-alpha with or without ribavirin.
lamivudine (3TC)/zidovudine (ZDV)	Combivir	<ul style="list-style-type: none"> • Avoid concomitant other forms of zalcitabine, stavudine, doxorubicin, ribavirin. • Bone marrow suppression increased by ganciclovir, interferon-alpha, cytotoxic drugs. TMP/SMX, atovaquone, fluconazole, methadone, probenecid, valproic acid, possibly others may affect lamivudine or zidovudine blood levels (clinical significance unknown); monitor. • Triple therapy (once daily regimen) with abacavir + tenofovir or with didanosine + tenofovir: high rate of early viral non-response (see literature). • Monitor for treatment-associated toxicities with interferon-alpha with or without ribavirin.

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ANTIRETROVIRAL TREATMENT STRATEGIES AND DRUG INTERACTIONS* (Part 4 of 9)

Generic	Brand	Contraindications and Drug Interactions*
NUCLEOSIDE/NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTIS) (continued)		
stavudine (d4T)	Zerit	<ul style="list-style-type: none"> • Avoid concomitant zidovudine. • Increased risk of toxicity with neurotoxic, hepatotoxic, or pancreatotoxic drugs (eg, didanosine and/or hydroxyurea); avoid. • Caution with doxorubicin, ribavirin. • Monitor for treatment-associated toxicities with interferon-alpha with or without ribavirin.
tenofovir disoproxil fumarate (TDF)	Viread	<ul style="list-style-type: none"> • Avoid concomitant drugs that contain tenofovir or adefovir dipivoxil. • Avoid concomitant or recent use of nephrotoxic agents. • Potentiates didanosine toxicity (>60kg; reduce dose of didanosine); discontinue if toxicity develops. • Monitor drugs that reduce renal function or compete for renal tubular secretion (eg, cidofovir, acyclovir, valacyclovir, ganciclovir, valganciclovir). • Potentiated by lopinavir/ritonavir, atazanavir; monitor for toxicity. • Concomitant atazanavir: must give with ritonavir. • Caution with triple nucleoside-only regimens (high rate of early viral non-response); monitor and consider alternative therapy. • See literature for dosing of concomitant didanosine or ritonavir.
zidovudine (ZDV)	Retrovir	<ul style="list-style-type: none"> • Avoid stavudine, doxorubicin, ribavirin, other nucleoside analogues, other forms of zidovudine. • Caution with other cytotoxic or myelosuppressive drugs (eg, ganciclovir, interferon-alpha, ribavirin). • Fluconazole, atovaquone, lamivudine, probenecid, valproic acid, methadone increase zidovudine levels. • Monitor phenytoin. • May be antagonized by rifampin, ritonavir, nelfinavir. • Monitor for treatment-associated toxicities with interferon-alpha with or without ribavirin.
PHARMACOKINETIC ENHANCER		
cobicistat	Tybost	<ul style="list-style-type: none"> • Concomitant alfuzosin, dronedarone, rifampin, irinotecan (with atazanavir only), ergot derivatives, cisapride, St. John's wort, lovastatin, simvastatin, pimozide, nevirapine, sildenafil (as Revatio for PAH treatment), indinavir (with atazanavir only), triazolam, oral midazolam. • Concomitant nephrotoxic agent with cobicistat + tenofovir disoproxil fumarate: not recommended. • Concomitant darunavir 600mg twice daily or darunavir in combination with efavirenz, nevirapine, etravirine; atazanavir in combination with etravirine or efavirenz (in treatment-experienced); more than 1 antiretroviral that requires PK enhancement, other HIV-1 protease inhibitors (eg, fosamprenavir, saquinavir, tipranavir): not recommended. • Concomitant Stribild, lopinavir/ritonavir, other cobicistat- or ritonavir-containing drugs/regimens: not recommended. • Potentiated by concomitant CYP3A inhibitors. • May potentiate drugs metabolized by CYP3A or CYP2D6 or substrates of P-gp, BCRP, OATP1B1, or OATP1B3. • Antagonized by concomitant CYP3A inducers (eg, anticonvulsants, corticosteroids); may reduce efficacy and develop resistance; monitor. See full labeling.
PROTEASE INHIBITORS (PIS)		
atazanavir sulfate (ATV)	Reyataz	<ul style="list-style-type: none"> • Drugs metabolized by CYP3A or UGT1A1 that may cause serious events if blood levels are elevated (eg, alfuzosin, rifampin, irinotecan, oral midazolam, triazolam, ergots, cisapride, St. John's wort, lovastatin, simvastatin, pimozide, indinavir, nevirapine, sildenafil [Revatio; when used to treat PAH]). • Concomitant other protease inhibitors (excluding ritonavir and saquinavir), salmeterol, or fluticasone (atazanavir + ritonavir): not recommended. • Caution with drugs metabolized by UGT1A1 or CYP3A (eg, IV midazolam, calcium channel blockers, statins [eg, atorvastatin, rosuvastatin; use lowest dose necessary; max rosuvastatin dose is 10mg/day], immunosuppressants, PDE5 inhibitors: reduce doses of these to treat ED; max 25mg sildenafil in 48hrs; max 2.5mg vardenafil in 24hrs or 72hrs [atazanavir + ritonavir]; max 10mg tadalafil in 72hrs; tadalafil to treat PAH [see full labeling]), and CYP2C8 (eg, paclitaxel, repaglinide). • Potentiated by CYP3A inhibitors, telaprevir. • Antagonized by CYP3A inducers. • Use cautiously and monitor diltiazem, antiarrhythmics, others that affect conduction (esp. if metabolized by CYP3A). • Consider reducing diltiazem or clarithromycin dose by 50%; rifabutin dose by 75%. • Variable effects on clarithromycin; consider other drugs. (<i>entry continues</i>)

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ANTIRETROVIRAL TREATMENT STRATEGIES AND DRUG INTERACTIONS* (Part 5 of 9)

Generic	Brand	Contraindications and Drug Interactions*
PROTEASE INHIBITORS (PIs) <i>(continued)</i>		
atazanavir sulfate (ATV) <i>(continued)</i>	Reyataz <i>(continued)</i>	<ul style="list-style-type: none"> • Plasma levels decreased by drugs that reduce gastric acidity (eg, H₂-blockers, antacids). • Give proton pump inhibitors 12hrs before atazanavir + ritonavir; avoid in therapy-experienced. • Give 2hrs before or 1hr after buffered or enteric coated didanosine. • Antagonized by efavirenz, bosentan, tenofovir (see dose). • Increased risk of lactic acidosis with nucleoside analogues. • Potentiates saquinavir, trazodone, fluticasone, oral contraceptives, ketoconazole, itraconazole, buprenorphine (reduce dose), colchicine (esp. renal or hepatic impaired; do not use). • Monitor warfarin, tricyclics, rifabutin, immunosuppressants.
darunavir (DRV)	Prezista	<ul style="list-style-type: none"> • Concomitant rifampin, alfuzosin, ergots, cisapride, St. John's wort, lovastatin, simvastatin, pimoziide, oral midazolam, triazolam, sildenafil (Revatio; only when used to treat PAH), dronedarone, colchicine (in renal and/or hepatic impairment), ranolazine. • Voriconazole, salmeterol, boceprevir, telaprevir: not recommended. • Avoid protease inhibitors other than those studied (lopinavir/ritonavir, saquinavir, indinavir, atazanavir), dexamethasone, fluticasone. • Potentiates carbamazepine, risperidone, thioridazine, trazodone, desipramine, IV midazolam, rifabutin, digoxin, HMG-CoA reductase inhibitors (eg, pravastatin, atorvastatin, rosuvastatin; use lowest dose necessary; max atorvastatin dose is 20mg/day), sildenafil, vardenafil, tadalafil (reduce their doses). • Potentiates, and is potentiated by, indinavir, ketoconazole, itraconazole. • Increases bosentan (see full labeling), maraviroc, nevirapine, tenofovir, efavirenz, colchicine (dose adjustments: see full labeling) levels. • Antagonizes sertraline, paroxetine, phenytoin, phenobarbital (monitor levels), ethinyl estradiol, norethindrone (use backup contraception). • Caution with antimalarials (artemether, lumefantrine). • Monitor carbamazepine, antiarrhythmics (eg, bepridil, systemic lidocaine, quinidine, amiodarone, flecainide, propafenone), calcium channel blockers, β-blockers, warfarin, digoxin, immunosuppressants (eg, tacrolimus, sirolimus, cyclosporine), buprenorphine, buprenorphine/naloxone, methadone (possible opiate withdrawal syndrome). • Reduce concomitant clarithromycin dose in renal impairment. • Separate dosing of didanosine.
fosamprenavir calcium (FOS-APV)	Lexiva	<ul style="list-style-type: none"> • Concomitant alfuzosin, cisapride, pimoziide, ergots, midazolam, triazolam, St. John's wort, rifampin, lovastatin, simvastatin, delavirdine, sildenafil (Revatio; when used for treating PAH). • Concomitant flecainide, or propafenone with ritonavir-boosted fosamprenavir. • Life-threatening arrhythmias possible with amiodarone, bepridil, lidocaine (systemic), quinidine. • Concomitant salmeterol, nevirapine without ritonavir: not recommended. • Reduce rifabutin dose by at least ½ (or by 75% if with ritonavir) and monitor for neutropenia (do weekly CBCs). • Potentiates sildenafil, tadalafil, vardenafil; reduce doses of these. • May potentiate fluticasone (consider alternative therapy), trazodone (reduce trazodone dose). • Monitor antiarrhythmics (eg, amiodarone), anticonvulsants (eg, phenytoin), H₂ blockers, immunosuppressants, tricyclics, warfarin, drugs that affect or are affected by CYP3A4 (eg, azole antifungals, benzodiazepines, calcium channel blockers, NNRTIs, protease inhibitors, statins, steroids). • May antagonize, or be antagonized by hormonal contraceptives (use non-hormonal methods), methadone, paroxetine. • Concomitant bosentan, colchicine (adjust doses; see literature).
indinavir sulfate (IDV)	Crixivan	<ul style="list-style-type: none"> • Concomitant alfuzosin, amiodarone, cisapride, lovastatin, simvastatin, oral midazolam, triazolam, alprazolam, pimoziide, ergots, sildenafil (as Revatio; for PAH treatment). • Rifampin, St. John's wort, atazanavir, salmeterol, fluticasone (w. concomitant potent CYP3A4 inhibitor): not recommended. • Caution with atorvastatin and rosuvastatin; titrate, use lowest necessary dose and monitor. • Potentiates PDE5 inhibitors, IV midazolam, trazodone, bosentan (reduce doses; see literature); antiarrhythmics, rifabutin, calcium channel blockers, clarithromycin, immunosuppressants, others metabolized by CYP3A4. • Plasma levels increased by itraconazole, ketoconazole, delavirdine, CYP3A4 inhibitors. • Plasma levels reduced by efavirenz, rifabutin, venlafaxine, phenobarbital, phenytoin, carbamazepine, other CYP3A4 inducers. • Avoid concomitant colchicine if renal or hepatic impairment; otherwise: reduce dose: see literature. • Separate dosing of indinavir and didanosine by at least 1hr and give both on empty stomach.

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ANTIRETROVIRAL THERAPY (ART) DRUG INTERACTIONS (Part 6 of 9)

Generic	Brand	Contraindications and Drug Interactions*
PROTEASE INHIBITORS (PIs) <i>(continued)</i>		
lopinavir (LPV)/ ritonavir (RTV)	Kaletra	<ul style="list-style-type: none"> • Loss of virologic response or resistance with alfuzosin, rifampin, St. John's wort, lovastatin, simvastatin, sildenafil (Revatio), cisapride, ergots, pimozone, orally administered midazolam, triazolam. • Drugs metabolized by CYP3A that may cause serious events if blood levels are elevated. • Voriconazole, salmeterol: not recommended. • Potentiates bosentan and statins metabolized by CYP3A; use atorvastatin with caution and at the lowest necessary doses; do not exceed rosuvastatin 10mg daily. • Potentiates fentanyl, parenteral midazolam; monitor. • Potentiates anticancer agents (eg, vincristine, vinblastine, dasatinib, nilotinib); may need dose adjustment (see literature). • Potentiates colchicine; adjust dosing (see literature). Concomitant colchicine not recommended in renal or hepatic impairment. • Avoid oral soln with metronidazole, disulfiram. • Monitor other antiretrovirals, warfarin. • Increases levels of antiarrhythmics, dihydropyridine, calcium channel blockers, immunosuppressants (monitor); ketoconazole, itraconazole (avoid high doses); rifabutin (reduce rifabutin dose and monitor); clarithromycin (reduce clarithromycin dose in renal dysfunction), trazodone (reduce trazodone dose). • Give didanosine 1hr before or 2hrs after. • Decreases levels of atovaquone, methadone, estrogen-containing oral contraceptives (use other or back-up contraception). • Lopinavir levels decreased by anticonvulsants (eg, carbamazepine, phenobarbital, phenytoin), dexamethasone, efavirenz, nevirapine. • Lopinavir levels may be increased by delavirdine, CYP3A inhibitors. • May decrease zidovudine or abacavir levels.
nelfinavir mesylate (NFV)	Viracept	<ul style="list-style-type: none"> • CYP3A substrates that may cause serious events if blood levels are elevated (eg, cisapride, pimozone, oral midazolam, triazolam, lovastatin, simvastatin, ergots, amiodarone, quinidine, alfuzosin, rifampin, St. John's wort, sildenafil [Revatio; when used to treat PAH]). • Salmeterol: not recommended. • Potentiates CYP3A substrates (eg, dihydropyridine calcium channel blockers, cyclosporine, tacrolimus, sirolimus, rifabutin, rosuvastatin, atorvastatin [use lowest dose necessary; max atorvastatin dose is 40mg/day]), PDE5 inhibitors (adjust dose: see literature), phenytoin (monitor). • Potentiates fluticasone (caution and consider alternatives w. long-term use), trazodone (use lower dose), bosentan, colchicine (adjust dose: see literature). • Nelfinavir levels decreased by CYP3A inducers (eg, phenytoin, carbamazepine, phenobarbital) or CYP2C19 inducers. • Nelfinavir levels increased by CYP3A or CYP2C19 inhibitors. • Antagonizes methadone, oral contraceptives (use additional or alternative contraception). • Indinavir, ritonavir, saquinavir increase nelfinavir levels. • Concomitant azithromycin: monitor for azithromycin toxicity (eg, elevated liver enzymes). • Administer didanosine 1hr before or 2hrs after nelfinavir. • Monitor INR with warfarin. • Others: see literature.
ritonavir (RTV)	Norvir	<ul style="list-style-type: none"> • Concomitant alfuzosin, amiodarone, bepridil, flecainide, quinidine, propafenone, voriconazole, ergots, oral midazolam, triazolam, pimozone, cisapride, St. John's wort, lovastatin, simvastatin, sildenafil (Revatio; only when used to treat PAH). • Rifampin, high-dose or long-term meperidine: not recommended. • Potentiates other protease inhibitors, PDE5 inhibitors, tramadol, propoxyphene, colchicine, clarithromycin, bosentan (reduce doses; see literature); fluticasone and salmeterol (avoid). • May be affected by, potentiate, or antagonize drugs that are metabolized by or induce CYP3A4, 2D6, 2C9, 3A, 1A2 or glucuronyl transferase, including: delavirdine, maraviroc, opioids, antiarrhythmics (eg, disopyramide, lidocaine, mexiletine), digoxin, anticoagulants, anticonvulsants, most antidepressants (eg, SSRIs, tricyclics, nefazodone, bupropion), antiemetics (eg, dronabinol), antihypertensives (eg, calcium channel blockers, β-blockers), antiparasitics, corticosteroids, sulfonyleureas, immunosuppressants, neuroleptics, sedative/hypnotics, CNS stimulants, statins, vinca alkaloids (eg, vincristine, vinblastine; consider withholding ritonavir); monitor these and others closely. • Antagonizes theophylline, oral contraceptives, methadone. • Separate dosing of didanosine by 2½hrs. • Avoid metronidazole, disulfiram; itraconazole or ketoconazole >200mg/day. • Reduce rifabutin dose by at least ¾.

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ANTIRETROVIRAL THERAPY (ART) DRUG INTERACTIONS (Part 7 of 9)

Generic	Brand	Contraindications and Drug Interactions*
PROTEASE INHIBITORS (PIs) (continued)		
saquinavir mesylate (SQV)	Invirase	<ul style="list-style-type: none"> • Congenital long QT syndrome. • Refractory hypokalemia or hypomagnesemia. • Complete AV block without implanted pacemakers, or those who are at high risk. • Severe hepatic impairment. • Use in combination with drugs that both increase saquinavir plasma concentrations and prolong the QT interval. • Concomitant alfuzosin, amiodarone, bepridil, cisapride, dofetilide, ergots, flecainide, lidocaine, oral midazolam, pimozide, propafenone, quinidine, rifampin, sildenafil (Revatio; when used to treat PAH), lovastatin, simvastatin, trazodone, triazolam. • Limit dose of atorvastatin to 20mg daily. • Concomitant tipranavir/ritonavir, fluticasone, salmeterol, St. John's wort, garlic caps: not recommended. • Plasma levels reduced by efavirenz, nevirapine, rifabutin, other CYP3A4 inducers (eg, carbamazepine, phenobarbital, phenytoin, dexamethasone). • Plasma levels increased by clarithromycin (see literature), atazanavir, indinavir, nelfinavir, lopinavir/ritonavir, ritonavir, delavirdine. • Antagonizes methadone, oral contraceptives. • Potentiates CYP3A4 substrates (eg, calcium channel blockers, atorvastatin, rosuvastatin, warfarin, cyclosporine, tacrolimus, rapamycin, sildenafil, vardenafil, tadalafil), maraviroc, bosentan, colchicine, ketoconazole, itraconazole; monitor their effects; may need reduced doses. • Caution with digoxin, ibutilide, sotalol, tricyclics, benzodiazepines, neuroleptics (eg, clozapine, haloperidol, thioridazine), omeprazole, erythromycin, halofantrine, pentamidine, others (see literature).
tipranavir (TPV)	Aptivus	<ul style="list-style-type: none"> • Moderate to severe hepatic insufficiency (Child-Pugh B–C). • Concomitant potent CYP3A inducers or substrates (eg, alfuzosin, amiodarone, bepridil, flecainide, propafenone, quinidine, rifampin, ergots, cisapride, St. John's wort, lovastatin, simvastatin, pimozide, sildenafil, oral midazolam, triazolam). • Concomitant salmeterol, fluticasone, fosamprenavir, lopinavir, saquinavir, atazanavir, fluconazole, ketoconazole, itraconazole $\geq 200\text{mg/day}$: not recommended. • Avoid metronidazole, disulfiram. • May be synergistic with enfuvirtide. • Potentiates PDE5 inhibitors (eg, sildenafil, tadalafil, vardenafil), trazodone, desipramine; reduce dose: see literature. • Avoid concomitant colchicine if renal or hepatic impairment; otherwise: reduce dose: see literature. • Reduce rifabutin dose by 75%. • Antagonizes estrogens (use non-hormonal contraceptives), methadone, valproic acid, omeprazole. • Antagonized by carbamazepine, phenobarbital, phenytoin. • Potentiates atorvastatin, rosuvastatin: use lowest possible dose. • Monitor hypoglycemics, immunosuppressants, tricyclics, SSRIs, warfarin, drugs that affect or are affected by CYP3A4 (eg, azole antifungals, calcium channel blockers, clarithromycin, NNRTIs, PIs, statins). • Increased risk of bleeding with concomitant anticoagulants, antiplatelet agents, high-dose Vit.E. • Separate dosing of didanosine, antacids. • Oral soln: avoid high-dose Vit.E supplements.

MULTICLASS FIXED-DOSE COMBINATION

abacavir/dolutegravir/lamivudine	Triumeq	<ul style="list-style-type: none"> • Presence of HLA-B*5701 allele. Previous hypersensitivity reaction to any of the components. Concomitant dofetilide. Moderate or severe hepatic impairment. • Concomitant other abacavir- or lamivudine-containing products: not recommended. • Ethanol may increase abacavir levels. • Abacavir may increase clearance of methadone. • Dolutegravir may be affected by drugs that induce or inhibit UGT1A1, CYP3A, UGT1A3, UGT1A9, BCRP, and P-gp enzymes or transporters. • Avoid concomitant nevirapine, oxcarbazepine, phenytoin, phenobarbital, carbamazepine, St. John's wort. • Potentiates metformin; consider reducing metformin dose. Concomitant etravirine without atazanavir/ritonavir, darunavir/ritonavir, or lopinavir/ritonavir: not recommended. • Concomitant efavirenz, fosamprenavir/ritonavir, tipranavir/ritonavir, rifampin: requires extra dolutegravir dose (see Adults). (<i>entry continues</i>)
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ANTIRETROVIRAL TREATMENT STRATEGIES AND DRUG INTERACTIONS* (Part 8 of 9)

Generic	Brand	Contraindications and Drug Interactions*
MULTICLASS FIXED-DOSE COMBINATION <i>(continued)</i>		
abacavir/ dolutegravir/ lamivudine <i>(continued)</i>	Triumeq <i>(continued)</i>	<ul style="list-style-type: none"> Concomitant cation-containing antacids or laxatives, sucralfate, buffered drugs, oral calcium/iron supplements, multivitamins; give Triumeq 2hrs before or 6hrs after; alternatively, oral calcium/iron can be used at the same time when taken with food. Monitor for toxicities with IFN-α \pm ribavirin (consider reducing dose or discontinue one or both drugs).
atazanavir/ cobicistat	Evotaz	<ul style="list-style-type: none"> Concomitant alfuzosin, ranolazine, dronedarone, colchicine (in renal/hepatic impaired), rifampin, irinotecan, lurasidone, triazolam, oral midazolam, ergots, cisapride, St. John's wort, lovastatin, simvastatin, pimozide, nevirapine, sildenafil (for PAH), indinavir. Separate dosing with concomitant H2 receptor antagonists, PPIs (not recommended in treatment-experienced), antacids, enteric-coated didanosine. Concomitant tenofovir DF with concomitant or recent nephrotoxic agents, other antiretrovirals that require CYP3A inhibition (eg, HIV protease inhibitors, elvitegravir), atazanavir- or cobicistat-containing products, ritonavir, CYP2C8 substrates with narrow therapeutic indices (eg, paclitaxel, repaglinide), efavirenz, etravirine, apixaban, rivaroxaban, dabigatran etexilate, avanafil, inhaled/nasal steroids, salmeterol, voriconazole: not recommended. May need to adjust dose of insulin, antidiabetics, dasatinib, nilotinib, sildenafil, tadalafil, vardenafil, perphenazine, risperidone, thioridazine, buprenorphine, naloxone, methadone, tramadol, bosentan, rifabutin, and sedatives/hypnotics. Concomitant maraviroc: give maraviroc 150mg twice daily. Monitor concomitant antiarrhythmics, digoxin, vincristine, vinblastine, warfarin, clonazepam, carbamazepine, lamotrigine, SSRIs, TCAs, trazodone, fentanyl, immunosuppressants, other statins, β-blockers, CCBs. Concomitant macrolide or ketolide antibiotics, CYP3A-inducing anticonvulsants, systemic corticosteroids: consider alternatives.
darunavir/ cobicistat	Prezcobix	<ul style="list-style-type: none"> Concomitant alfuzosin, ranolazine, dronedarone, colchicine (in renal/hepatic impaired), rifampin, lurasidone, pimozide, ergots, cisapride, St. John's wort, lovastatin, simvastatin, oral midazolam, triazolam, sildenafil (for PAH). Concomitant tenofovir DF with concomitant or recent nephrotoxic agents, darunavir- or cobicistat-containing products, ritonavir, or other antiretrovirals that require PK boosting (eg, another protease inhibitor, elvitegravir), efavirenz, etravirine, nevirapine, apixaban, dabigatran etexilate, rivaroxaban, voriconazole, rifapentine, boceprevir, telaprevir, simeprevir, everolimus, salmeterol, avanafil: not recommended. May need to adjust dose of dasatinib, nilotinib, colchicine, sildenafil, tadalafil, vardenafil, perphenazine, risperidone, thioridazine, buprenorphine, buprenorphine/naloxone, methadone, tramadol, bosentan, rifabutin, sedatives/hypnotics. Concomitant maraviroc: give maraviroc 150mg twice daily. Monitor with antiarrhythmics, digoxin, warfarin, clonazepam, carbamazepine, SSRIs, TCAs, trazodone, antimalarials (eg, artemether, lumefantrine), antifungals, fentanyl, oxycodone, immunosuppressants, other statins, β-blockers, calcium channel blockers. Concomitant antibacterials (eg, clarithromycin, erythromycin, telithromycin), CYP3A-inducing anticonvulsants, corticosteroids: consider alternatives. Concomitant vincristine, vinblastine: consider temporarily withholding cobicistat-containing regimen if significant hematologic or GI adverse events develop. Concomitant hormonal contraceptives: consider additional or alternative (non-hormonal) contraception. Separate dosing of didanosine at least 1hr before or 2hrs after.
efavirenz (EVF)/ emtricitabine (FTC)/ tenofovir disoproxil fumarate (TDF)	Atripla	<ul style="list-style-type: none"> Concomitant voriconazole. Avoid alcohol, atazanavir, posaconazole, boceprevir, adefovir dipivoxil or other NNRTIs, psychoactive, and/or hepatotoxic drugs. Potentiates didanosine toxicity (>60kg; reduce dose of didanosine); discontinue didanosine if toxicity develops. Potentiates, and is potentiated by ritonavir (monitor liver function and for adverse events). Tenofovir levels increased by lopinavir/ritonavir; discontinue if toxicity occurs. Efavirenz levels decreased by phenobarbital, carbamazepine, phenytoin, rifampin, rifabutin. May decrease levels of indinavir (may be ineffective, even with increased dose), amprenavir, atazanavir, bupropion, carbamazepine, phenytoin, phenobarbital, clarithromycin, calcium channel blockers (eg, diltiazem, felodipine, nicardipine, nifedipine, verapamil), itraconazole, ketoconazole, lopinavir (adjust dose), maraviroc, methadone, rifabutin (increase dose), raltegravir, sertraline, statins, progestins (eg, norelgestromin, levonorgestrel), immunosuppressants (eg, cyclosporine, sirolimus, tacrolimus). Efavirenz increases nelfinavir plasma levels. <i>(entry continues)</i>

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ANTIRETROVIRAL THERAPY CONSIDERATIONS AND DRUG INTERACTIONS* (Part 9 of 9)

Generic	Brand	Contraindications and Drug Interactions*
MULTICLASS FIXED-DOSE COMBINATION (continued)		
efavirenz (EVF)/ emtricitabine (FTC)/ tenofovir disoproxil fumarate (TDF) <i>(continued)</i>	Atripla <i>(continued)</i>	<ul style="list-style-type: none"> • Antagonizes, and is antagonized by, saquinavir (do not use as sole protease inhibitor), telaprevir. • Caution with drugs metabolized by, or that affect activity of, CYP2C9, CYP2C19, CYP3A4. • Closely monitor warfarin, anticonvulsants (esp. phenytoin, phenobarbital, carbamazepine), rifabutin, immunosuppressants, methadone, others. • Monitor drugs that decrease renal function or compete for renal tubular secretion (eg, acyclovir, adefovir dipivoxil, cidofovir, ganciclovir, valacyclovir, valganciclovir, aminoglycosides, high-dose or multiple NSAIDs). • Efavirenz may cause false (+) cannabis screening test (CEDIA DAU multi-level THC assay)
emtricitabine (FTC)/ rilpivirine/ tenofovir disoproxil fumarate (TDF)	Complera	<ul style="list-style-type: none"> • Concomitant carbamazepine, oxcarbazepine, phenobarbital, phenytoin, rifabutin, rifampin, rifapentine, esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole, systemic dexamethasone (more than single dose), St. John's wort. • Avoid concomitant drugs that contain emtricitabine, tenofovir, rilpivirine, lamivudine, or adefovir dipivoxil. • Emtricitabine/tenofovir: Monitor drugs that reduce renal function or compete for renal tubular secretion (eg, adefovir dipivoxil, cidofovir, acyclovir, valacyclovir, ganciclovir, valganciclovir, aminoglycosides, high-dose or multiple NSAIDs). • Avoid concomitant or recent use of nephrotoxic agents. • Rilpivirine: Potentiated by CYP3A inhibitors. • Antagonized by CYP3A inducers. • May antagonize azole antifungals (monitor for breakthrough fungal infections), methadone (monitor). • Separate antacids (by at least 2hrs before or at least 4hrs after) and H₂-receptor antagonists (by at least 12hrs before or 4hrs after) rilpivirine; drugs that increase gastric pH may result in decreased plasma concentrations. • Caution with drugs with a known risk for torsades de pointes. • May be potentiated by clarithromycin, erythromycin, telithromycin.
elvitegravir/ cobicistat/ emtricitabine (FTC)/ tenofovir disoproxil fumarate (TDF)	Stribild	<ul style="list-style-type: none"> • Concomitant alfuzosin, carbamazepine, phenobarbital, phenytoin, rifampin, ergots, cisapride, St. John's wort, lovastatin, simvastatin, pimozone, sildenafil (when dosed for PAH), triazolam, oral midazolam. • Avoid with concurrent or recent use of nephrotoxic agents. • Do not administer with other antiretroviral agents. • May be potentiated by CYP3A inhibitors, antagonized by CYP3A inducers. • May potentiate antiarrhythmics, digoxin, clarithromycin (reduce dose by 50% if CrCl 50–60mL/min), telithromycin, carbamazepine, clonazepam, ethosuximide, SSRIs, TCAs, trazodone, ketoconazole (max 200mg/day), itraconazole (max 200mg/day), voriconazole, beta-blockers, calcium channel blockers, fluticasone (use alternative corticosteroid), atorvastatin, immunosuppressants, (monitor), neuroleptics, sedatives/hypnotics, PDE5 inhibitors (see literature for dose adjustments). • May antagonize CYP2C9 substrates. • Antagonized by carbamazepine, oxcarbazepine, phenobarbital, phenytoin, rifabutin, rifapentine, systemic dexamethasone. • Concomitant colchicine (see literature); do not coadminister to patients with renal or hepatic impairment. • Concomitant salmeterol: not recommended; increased risk of cardiovascular events. • Separate antacids by at least 2hrs. • Discontinue use of bosentan at least 36hrs prior to initiation of Stribild; after at least 10 days following initiation, resume bosentan. • Use alternative non-hormonal methods of contraception.

NOTES

Key: *Those listed in **bold type** are contraindications.

Not an inclusive list of medications and/or contraindications and drug interactions. Please see drug monograph at www.eMPR.com and/or contact company for full drug labeling. (Rev. 8/2015)