**All Interactions with Lopinavir/ritonavir (Kaletra)**

| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Amiodarone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78) | - | - | Not studied; may increase amiodarone levels | - | Increased amiodarone effects (eg, cardiac arrhythmias, hypotension) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Use with caution. Monitor ECG and adjust amiodarone as indicated |
| Amprenavir[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78),[79](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#79)  (APV)(Agenerase) | 450 mg BID x 5 days, 750 mg BID x 5 days | 400 mg/100 mg BID x 22 days | No significant change | Lopinavir AUC: decreased 15%; lopinavir Cmax: no significant change; Cmin: decreased 19% | - | - | No dose adjustment necessary |
| Amprenavir[65](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#65)  (APV)(Agenerase) | 600 mg BID | 400 mg/100 mg BID | Amprenavir Cmin: decreased 37% (when compared to standard curve obtained from amprenavir and ritonavir at same doses) | Not studied | Decreased amprenavir levels | Not established | Dose adjustment not established |
| Amprenavir[151](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#151)  (APV)(Agenerase) | 750 mg BID | 533mg/133 mg BID with and without efavirenz 600 mg QHS | Amprenavir AUC: no significant change; Cmax: decreased 34%; Cmin: increased 22%(when compared to amprenavir, lopinavir/ritonavir with efavirenz) | Lopinavir AUC: no significant change; Cmax: no significant change; Cmin: no significant change; half-life: decreased 32%(when compared to amprenavir, lopinavir/ritonavir with efavirenz) | - | - | No dose adjustment necessary |
| Amprenavir[64](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#64)  (APV)(Agenerase) | Group 2: 1200 mg amprenavir/200 mg ritonavir BID; Group 4: 1200 mg amprenavir/400 mg ritonavir BID x weeks 1-26 | 400 mg/100 mg BID x weeks 2-26 | Amprenavir Cmin: decreased 42% (in Group 2); Cmin decreased 69% (in Group 4) | Not studied | Decreased amprenavir levels | - | Dose adjustment not established |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Astemizole[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Hismanal) | - | - | Not studied; may increase astemizole levels | - | Increased astemizole effects (eg, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **Cetirizine Fexofenadine Loratadine** |
| Atazanavir[160](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#160)  (ATV)(Reyataz) | 300 mg QD on d 11-24 | 400 mg/100 mg BID on d 11-24 | Atazanavir AUC: no significant change; Cmin: increased 45%; Cmax: no significant change (compared to 300 mg atazanavir with 100 mg ritonavir QD) | No significant change | Increased atazanavir effects | Inhibition of CYP450 3A4 by ritonavir, lopinavir and atazanavir | No dose adjustment necessary |
| Atazanavir[160](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#160)  (ATV)(Reyataz) | 300 mg with 100 mg QD ritonavir on d 25-34 | 400 mg/100 mg BID on d 25-34 | Atazanavir AUC: no significant change; Cmin: increased 64% (compared to 300 mg atazanavir with 100 mg ritonavir QD) | - | - | Inhibition of CYP450 3A4 by ritonavir, lopinavir and atazanavir | No dose adjustment necessary |
| Atorvastatin[216](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#216),[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78) | 20 mg QD x 4 days | 400 mg/100 mg BID x 14 days | Atorvastatin AUC: increased 488%; Cmax: increased 367%; Cmin: increased 128% | No significant change | Increased atorvastatin effects (eg, myopathy, rhabdomyolysis) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Avoid combination if possible; may consider low dose atorvastatin or alternative agents; monitor for myopathy  *Alternative Agents*:  **Pravastatin** |
| Atovaquone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Mepron) | - | - | May decrease atovaquone levels | - | Decreased atovaquone effects | - | No dose adjustment necessary; consider other agents if using for malaria prophylaxis |
| Atovaquone[487](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#487)  (Mepron) | 250 mg with 100 mg proguanil x 1 | 400/100 mg BID | Atovaquone AUC: decreased 74%; Cmax: decreased 44% | - | Potentially compromised antimalarial activity | Increased atovaquone glucuronidation; induction of CYP450 3A4 by lopinavir/ritonavir | Dose adjustment not established |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Bepridil[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78) | - | - | Not studied; may increase bepridil levels | - | Increased bepridil effects (hypotension, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister |
| Boceprevir[735](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#735),[599](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#599)  (Victrelis) | 800 mg TID | 400/100 mg BID | Boceprevir AUC: decreased 45%; Cmin: decreased 57% | Lopinavir AUC: decreased 34%; Cmax: decreased 36%; Cmin: decreased 43% | Decreased HIV and HCV treatment efficacy | - | Do not coadminister |
| Bosentan[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727),[467](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#467) | 125 mg BID | 400/100 mg BID | Bosentan AUC: increased 422%; Cmax: increased : 512% | Lopinavir AUC: decreased 14%; Ritonavir AUC:decreased 17% | Increased bosentan effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Start low and titrate bosentan to effect. If patient has been on protease inhibitor (other than unboosted atazanavir) for more than 10 days, start bosentan at 62.5 mg daily or every other day. If patient is currently on bosentan and requires a PI (other than unboosted atazanavir), stop bosentan for at least 36 hours prior to initiating ART. Wait 10 days and then resume bosentan starting with 62.5 mg daily or every other day. |
| Buprenorphine[453](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#453)  (Suboxone)(Buprenex) | paitents on stable buprenorphine/naloxone | Lopinavir/ritonavir 800 mg/200 mg QD | Buprenorphine: no significant change; Norbuprenorphine Cmax: decreased 41% | Lopinavir Cmax: decreased 22-32% (when compared to historical controls) | No significant change | - | No dose adjustment necessary |
| Bupropion[533](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#533)  (Zyban)(Wellbutrin) | 100 mg x 1 | 400/100 mg BID | Bupropion AUC: decreased 57%; Cmax: decreased 57% | Ritonavir AUC: decreased 15% | Decreased bupropion effects | Possible induction of CYP450 2B6 and UGT enzymes | Titrate dose of bupropion based on response |
| Carbamazepine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (others)(Tegretol) | - | - | - | Not studied; may decrease lopinavir levels | Decreased lopinavir/ritonavir effects | - | Avoid combination if possible; Do not coadminister with LPV/r or FPV/r once daily. Monitor carbamazepine levels and adjust as indicated or consider alternative agents;  *Alternative Agents*:  **Gabapentin Lamotrigine Tiagabine Topiramate** |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Cerivastatin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78) | - | - | Not studied; may increase cerivastatin levels | - | Increased cerivastatin effects (eg, myopathy, rhabdomyolysis) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **Atorvastatin Pravastatin** |
| Cisapride[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Propulsid) | - | - | Not studied; may increase cisapride levels | - | Increased cisapride effects (eg, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **Metoclopramide** |
| Clarithromycin[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727),[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Biaxin) | - | - | May increase clarithromycin levels | - | Increased clarithromycin effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | No dose adjustment necessary. Monitor for clarithromycin-related toxicities or consider alternative macrolide. Reduce clarithromycin dose by 50% in patients with CrCl 30– 60 mL/min. Reduce clarithromycin dose by 75% in patients with CrCl <30 mL/min.  *Alternative Agents*:  **Azithromycin** |
| Colchicine[555](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#555)  (Colcrys) | - | - | - | - | Increased colchicine effects | Inhibition of P450 3A4 by lopinavir/ritonavir | For treatment of gout, reduce colchicine dosage to 0.6 mg x 1 then 0.3 mg one hour later. Dose not to be repeated no earlier than 3 days. For prophylaxis of gout, reduce colchicine dosage to 0.3 mg QD if on 0.6 mg BID prior to PI therapy or reduce colchicine dose to 0.3 mg QOD if on 0.6 mg QD prior to PI therapy. For treatment of familial Mediterranean fever: Do not exceed colchicine 0.6 mg once daily or 0.3 mg BID. Do not coadminister in patients with hepatic or renal impairment. |
| Cyclosporine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Neoral, Sandimmune) | - | - | May increase cyclosporine levels | - | Increased cyclosporine effects (increased immunosuppression, renal toxicity) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust cyclosporine as indicated |
| Daclatasvir[747](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#747)  (Daklinza) | 30 mg daily | 400 mg with ritonavir 100 mg twice daily | Daclatasvir Cmax decreased 66%; AUC decreased 42% | Lopinavir Cmax increased 22% | - | - | No dose adjustment necessary |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Darunavir[164](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#164)  (DRV)(Prezista) | 1200 mg BID with ritonavir 100 mg BID | 400/100 mg BID | Darunavir AUC: decreased 38%; Cmax: decreased 21%; Cmin: decreased 51% (compared to DRV/r 600/100 mg BID) | Lopinavir Cmin: increased 23% | Decreased darunavir/ritonavir effects; increased lopinavir/ritonavir effects | Possible induction of CYP450 3A4 | Do not coadminister |
| Darunavir[161](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#161)  (DRV)(Prezista) | 300 mg BID with ritonavir 100 mg BID | 400/100 mg BID | Darunavir AUC: decreased 53%; Cmax: decreased 39%; Cmin: decreased 65% | Lopinavir AUC: increased 37%; Cmax: increased 22%; Cmin: increased 72% | Decreased darunavir/ritonavir effects; increased lopinavir/ritonavir effects | - | Do not coadminister |
| Dasabuvir, Ombitasvir/Paritaprevir/Ritonavir[745](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#745)  (Viekira) | - | 800 mg with ritonavir 200 mg once daily | Dasabuvir AUC decreased 46%; Cmin decreased 53%. Ombitasvir Cmin increased 11%. Paritaprevir AUC increased 87%; Cmin increased 823%. | Lopinavir AUC decreased 6%, Cmin increased 15% | Potential increase paritaprevir toxicity. | - | Do not coadminister |
| Dasabuvir, Ombitasvir/Paritaprevir/Ritonavir[745](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#745),[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727)  (Viekira) | paritaprevir 150 mg with ritonavir 100 mg with ombitasvir 25 mg daily + dasabuvir 250 mg twice daily | 400 mg with 100 mg ritonavir twice daily | Dasabuvir AUC ↓ 7%; Cmin ↓ 32%. Ombitasvir AUC increased 14%. Paritaprevir AUC ↑ 117%, Cmin increased 136% | Lopinavir AUC decreased 6%; Cmin increased 15% | Potential increased paritaprevir toxicity. | - | Do not coadminister |
| Delavirdine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (DLV)(Rescriptor) | - | - | - | Not studied; may increase lopinavir/ritonavir levels | Increased lopinavir/ritonavir effects | - | Dose adjustment not established |
| Dexamethasone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Decadron) | - | - | - | Not studied; may decrease lopinavir levels | Decreased lopinavir/ritonavir effects | - | No dose adjustment necessary; use with caution. Consider alternative corticosteroid for long-term use. |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Didanosine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (ddI)(Videx) | - | - | - | - | - | Decreased lopinavir/ritonavir absorption | Take didanosine 1 hour before or 2 hours after lopinavir/ritonavir |
| Disulfiram[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Antabuse) | - | Oral solution (contains alcohol) | - | - | Disulfiram reaction (eg, nausea, vomiting, hypotension, headache) | Inhibition of alcohol and aldehyde dehydrogenase by disulfiram | Do not coadminister; consider lopinavir/ritonavir capsules |
| Dolutegravir[641](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#641)  (Tivicay) | 30 mg QD | 400/100 mg BID | No significant change | - | - | - | No dose adjustment necessary |
| Echinacea[527](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#527)  (Purple coneflower) | 500 mg TID x 28 days | 400/100 mg BID x 29.5 days | - | No significant change | - | - | No dose adjustment necessary |
| Efavirenz[80](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#80)  (EFV)(Sustiva) | - | 400 mg/100 mg BID | No significant change | Lopinavir AUC: decreased 20-25%; Cmin: decreased 40-45% | - | - | Increase dose of lopinavir/ritonavir to 533 mg/133 mg (4 capsules) BID with food |
| Efavirenz[120](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#120)  (EFV)(Sustiva) | 600 mg QD on days 1-35 | 400/100 mg BID on days 1-14, then increased to 533/133 mg BID on 15-35 | Not studied | Lopinavir AUC: increased 46%; Cmax: increased 33%; Cmin: increased 141%; Ritonavir AUC: increased 48%; Cmax: increased 46%; Cmin: increased 63% (compared to lopinavir/ritonavir 400/100 mg BID) | Increased lopinavir/ritonavir effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Increase lopinavir/ritonavir to 533/133 mg BID when used with efavirenz |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Efavirenz[158](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#158)  (EFV)(Sustiva) | 600 mg QHS on days 11-25 | 400/100 mg BID (tablet formulation) on days 1-15, then 600/150 mg BID on days 15-25 | Not studied | Lopinavir AUC: increased 36%; Cmax: increased 36%; Cmin: increased 35% (compared to lopinavir 400/100 mg BID tablets without efavirenz)Ritonavir AUC: increased 78%; Cmax: increased 92%; Cmin: increased 60% (compared to ritonavir 150 mg BID without efavirenz) | - | Increased levels due to formulation | No dose adjustment necessary |
| Efavirenz[681](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#681),[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (EFV)(Sustiva) | 600 mg QHS x 9 days | 400 mg/100 mg BID x 9 days | Efavirenz AUC: decreased 16%; Cmax: no significant change; Cmin: decreased 16% | Lopinavir AUC: decreased 19%; Cmax: no significant change; Cmin: decreased 39%;Ritonavir AUC: no significant change; Cmax: no significant change | Decreased lopinavir effects | Induction of CYP450 3A4 by efavirenz | Increase dose of lopinavir/ritonavir to 533 mg/133 mg (4 capsules) BID with food |
| Elbasvir/grazoprevir[733](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#733),[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727)  (Zepatier) | Elbasvir 50 mg QD with grazoprevir 100 mg QD | 400 mg/100 mg BID | Elbasvir AUC ↑ 3.7 fold Grazoprevir AUC ↑ 12.9 fold | - | May increase the risk of ALT elevations due to a significant increase in grazoprevir plasma concentrations caused by OATP1B1/3 inhibition | OATP1B1/3 inhibition by lopinavir/ritonavir | Contraindicated: Do not coadminister |
| Elvitegravir/cobicistat[649](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#649),[639](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#639)  (Stribild) | Elvitegravir 125 mg QD | 400/100 mg BID | Elvitegravir AUC; increased 75%; Cmax: increased 52%; Cmin: increased 139% | No significant change | Potentially decreased or increased elvitegravir, cobicistat and/or lopinavir effects | - | Do not coadminister |
| Ergotamine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Cafergot, Ergot derivatives)(Cafergot, others) | - | - | Not studied; may increase ergotamine levels | - | Increased ergotamine effects (eg, ergotism) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **5-HT agonists ("triptans")** |
| Ethinyl estradiol/norethindrone acetate[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (others)(Ortho-Novum) | Ethinyl estradiol 35 mcg QD x 21 days | 400 mg/100 mg BID x 14 days | Ethinyl estradiol AUC: decreased 42%; Cmax: decreased 41%; Cmin: decreased 58% | - | Decreased ethinyl estradiol effects (eg, contraceptive failure) | Induction of CYP450 3A4 by ritonavir | Use alternative contraceptive method  *Alternative Agents*:  **Barrier devices Condoms** |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Ethinyl estradiol/norethindrone acetate[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (others)(Ortho-Novum) | Norethindrone 1 mg QD x 21 days | 400 mg/100 mg BID x 14 days | Norethindrone AUC: decreased 17%; Cmax: decreased 16%; Cmin: decreased 32% | - | Decreased norethindrone effects (eg, contraceptive failure) | Induction of CYP450 3A4 by ritonavir | Use alternative contraceptive method  *Alternative Agents*:  **Barrier devices Condoms** |
| Etravirine[405](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#405),[434](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#434)  (ETR)(Intelence) | 200 mg BID | 400/100 mg BID | Etravirine AUC: decreased 35%; Cmax: decreased 30%; Cmin: decreased 45% | Lopinavir Cmin: decreased 20%; Ritonavir Cmax: decreased19% | Potentially decreased etravirine effects | Potential induction of CYP450 3A4, 2C9 and 2C19 by lopinavir/ritonavir | No dose adjustment necessary |
| Felodipine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Plendil)(Plendil) | - | - | Not studied; may increase felodipine levels | - | Increased felodipine effects (hypotension, bradycardia) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust felodipine as indicated |
| Flecainide[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Tambocor)(Tambocor) | - | - | Not studied; may increase flecainide levels | - | Increased flecainide effects (eg, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister |
| Fluticasone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Flonase, Aerobid)(Advair, Flonase, Aerobid) | - | - | Increased fluticasone concentrations | - | Decreased plasma cortisol concentrations (eg, Cushing's syndrome, adrenal suppression) | - | Avoid if possible |
| Fosamprenavir[140](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#140),[130](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#130)  (FPV)(Lexiva) | 1400 mg BID x 14 days | 533/133 mg BID x 14 days | Amprenavir AUC: decreased 26%; Cmax: no significant change; Cmin: decreased 42% | No significant change | Decreased amprenavir effects | Induction of CYP450 3A4 by lopinavir/ritonavir | Avoid coadministration |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Fosamprenavir[133](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#133)  (FPV)(Lexiva) | 700 mg BID with 100 mg ritonavir BID x 2-4 weeks | 400/100 mg BID | Amprenavir AUC: decreased 64%; Cmin: decreased 69% | Lopinavir AUC: decreased 48%; Cmin: decreased 61% | Decreased lopinavir and amprenavir effects | Induction of CYP450 3A4 by lopinavir and amprenavir | Do not coadminister |
| Fosamprenavir[140](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#140),[130](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#130)  (FPV)(Lexiva) | 700 mg BID with ritonavir 100 mg BID x 14 days | 400/100 mg BID x 14 days | Amprenavir AUC: decreased 63%; Cmax: decreased 58%; Cmin: decreased 65% | Lopinavir AUC: increased 37%; Cmax: increased 30%; Cmin: increased 52% | Decreased amprenavir effects; increased lopinavir effects | Induction of CYP450 3A4 by lopinavir/ritonavir and inhibition of CYP450 3A4 by amprenavir/ritonavir | Avoid coadministration |
| Fosamprenavir[139](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#139)  (FPV)(Lexiva) | 700 mg BID x 10 days taken simultaneously, 4 hours or 12 hours away from lopinavir/ritonavir dose | 400/100 mg BID x 10 days | Not studied | Lopinavir AUC (12 hours apart and compared to simultaneous dosing): increased 187%; Cmax: increased 53%; Cmin: increased 69%;Amprenavir AUC: increased 53%; Cmax: increased 56%; Cmin: decreased 71% | Decreased amprenavir and increased lopinavir effects | Induction of CYP450 3A4 by lopinavir and amprenavir | Avoid coadministration; Despite separating doses by 12 hours, significant induction still exists when amprenavir and lopinavir levels are compared to historical controls |
| Gemfibrozil[521](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#521) | 600 mg x 1 | 400/100 mg BID | Gemfibrozil AUC: decreased 41%; Cmax: decreased 33% | - | Decreased gemfibrozil effects | Reduced gemfibrozil absorption due to lopinavir/ritonavir | Potential option includes utilizing alternative antiretrovirals; unknown if fenofibrate has same interaction as gemfibrozil |
| Ginkgo biloba[621](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#621) | 120 mg BID | 400/100 mg BID | - | No significant change | - | - | No dose adjustment necessary |
| Indinavir[13](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#13)  (IDV)(Crixivan) | 400 mg BID x 14 days | 400/100 mg BID | Indinavir Cmax: no significant change; Cmin: increased 46%; AUC: increased 20% | No significant change | - | Inhibition of P450 3A4 by lopinavir/ritonavir | No dose adjustment necessary |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Indinavir[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (IDV)(Crixivan) | 600 mg x 1 dose | 400 mg/100 mg BID x 10 days | Indinavir AUC: no significant change; Cmax: decreased; Cmin: increased | Not studied | No significant change | - | Dose adjustment not established |
| Indinavir[108](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#108)  (IDV)(Crixivan) | 800 mg TID on days 1-5, 600 mg BID on days 6-15 | 400/100 mg BID on days 6-15 | Indinavir AUC: no significant change; Cmax: decreased 29%; Cmin: increased 247% | No significant change | - | Inhibition of CYP450 3A4 by lopinavir/ritonavir | No dose adjustment necessary |
| Itraconazole[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78),[279](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#279)  (Sporanox)(Sporanox) | - | - | Not studied; may increase itraconazole levels | Not studied; may increase ritonavir levels | Increased lopinavir/ritonavir effects; increased itraconazole effects | Inhibition of CYP450 3A4 by both drugs | Manufacturer recommends against using high doses of itraconazole (e.g. 200 mg daily)  *Alternative Agents*:  **Fluconazole** |
| Ketoconazole[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Nizoral) | 200 mg x 1 dose | 400 mg/100 mg BID x 16 days | Ketoconazole AUC: increased 204%; Cmax: no significant change | Lopinavir AUC: no significant change; Cmax: no significant change; Cmin: decreased 25% | Increased ketoconazole effects; decreased lopinavir/ritonavir effects | - | Manufacturer recommends against using high doses of ketoconazole(&gt;200 mg daily)  *Alternative Agents*:  **Fluconazole** |
| Lamotrigine[395](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#395)  (Lamictal)(Lamictal) | 50 mg QD on days 1 and 2, then 100 mg BID on days 3-20 | 400/100 mg BID on days 11-20 | Lamotrigine AUC: decreased 50%; Cmax: decreased 46%; Cmin: decreased 56%; half-life: decreased 46% | No significant change | Decreased lamotrigine effects | Possible induction of glucuronidation by lopinavir/ritonavir | Titrate to effect but may need to increase dose to 200 mg BID while patient is receiving lopinavir/ritonavir |
| Lidocaine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Xylocaine) | Systemic lidocaine | - | Not studied; may increase lidocaine levels | - | Increased lidocaine effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Use with caution. Monitor and adjust lidocaine as indicated |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Lovastatin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Mevacor)(Mevacor) | - | - | Not studied; may increase lovastatin levels | - | Increased lovastatin effects (eg, myopathy, rhabdomyolysis) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **Atorvastatin (low dose); Pravastatin** |
| Maraviroc[2](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#2)  (MVC)(Selzentry) | 300 mg BID | 400 mg/100 mg BID | Maraviroc AUC: increased 295%; Cmax: increased 97%; Cmin: increased 824% | - | Increased maraviroc effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Reduce maraviroc dose to 150 mg BID |
| Maraviroc[2](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#2)  (MVC)(Selzentry) | 300 mg BID | 400 mg/100 mg BID with 600 mg efavirenz QD | Maraviroc AUC: increased 153%; Cmax: increased 25%; Cmin: increased 529% | - | Increased maraviroc effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Decrease maraviroc dose to 150 mg BID |
| Medroxyprogesterone acetate[683](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#683)  (Depo-Provera) | 150 mg | 400/100 mg BID | Medroxyprogesterone acetate AUC: increased 46%; Cmax: increased 65% | Lopinavir: no significant change; Ritonavir: no significant change | - | - | No dose adjustment necessary |
| Methadone[192](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#192)  (Dolophine)(Dolophine) | - | 400/100 mg BID x 14 days | Methadone AUC: decreased 36%; Cmax: decreased 44% | Not studied | Decreased methadone effects (eg, withdrawal) | - | Monitor and adjust methadone as indicated |
| Methadone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Dolophine)(Dolophine) | 5 mg x 1 dose | 400 mg/100 mg BID x 10 days | Methadone AUC: decreased 53%; Cmax: decreased 45% | - | Decreased methadone effects (eg, withdrawal) | Possible induction of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust methadone as indicated |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Methadone[187](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#187)  (Dolophine)(Dolophine) | Stable methadone dose | 400/100 mg BID x 7 days | Methadone AUC: decreased 26%; Cmax: decreased 28%; Cmin: decreased 28% | - | Decreased methadone effects (eg, withdrawal) | Possible induction of methadone metabolism by lopinavir/ritonavir | Monitor for signs and symptoms of methadone withdrawal; some patients may need an increase in the methadone dose |
| Metronidazole[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Flagyl)(Flagyl) | - | Oral solution (contains alcohol) | - | - | Disulfiram reaction (hypotension, headache, nausea, vomiting) | Inhibition of alcohol and aldehyde dehydrogenase by metronidazole | Do not coadminister; may consider lopinavir/ritonavir capsules |
| Midazolam[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Versed) | - | - | Not studied; may increase midazolam levels | - | Increased midazolam effects (eg, increased sedation, confusion, respiratory depression) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Parenteral midazolam can be used with caution when given as a single dose in a monitored situation for procedural sedation; chronic midazolam administration (oral or intravenous) should be avoided  *Alternative Agents*:  **Lorazepam** |
| Naloxone[451](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#451)  (Narcan) | patients stable on buprenorphine/naloxone | - | No significant change | - | No significant change | - | No dose adjustment necessary |
| Nelfinavir[11](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#11)  (NFV)(Viracept) | 1250 mg BID | 400/100 mg BID | Nelfinavir Cmax: no significant change; AUC: no significant change; Cmin: increased 113% | Lopinavir Cmax: decreased 21%; AUC: decreased 27%; Cmin: decreased 33%. Ritonavir Cmax: decreased 26%; AUC: decreased 24%; Cmin: decreased 29% | Decreased lopinavir/ritonavir effects | Induction of P450 3A4 by lopinavir/ritonavir and nelfinavir | Dose adjustment not established |
| Nevirapine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (NVP)(Viramune) | 200 mg QD x 14 days, 200 mg BID x 6 days | 400 mg/100 mg BID x 20 days | Nevirapine AUC: no significant change; Cmax: no significant change; Cmin: increased 15% | Lopinavir: no significant change | Though study does not suggest need to increase lopinavir/ritonavir dose, other evidence indicated decreased lopinavir/ritonavir effects | Induction of CYP450 3A4 by nevirapine | Increase dose of lopinavir/ritonavir to 533 mg/133 mg (4 capsules) BID with food |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Nevirapine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (NVP)(Viramune) | 7 mg/kg or 4 mg/kg QD x 2 weeks; BID x 1 week | 300 mg/75 mg/square meter BID x 3 weeks | - | Lopinavir AUC: decreased 22%; Cmax: no significant change; Cmin: decreased 55% | Decreased lopinavir/ritonavir effects | Induction of CYP450 3A4 by nevirapine | Increase dose of lopinavir/ritonavir to 6.5 mL BID with food |
| Nicardipine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Cardene)(Cardene) | - | - | Not studied; may increase nicardipine levels | - | Increased nicardipine effects (eg, hypotension, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust nicardipine as indicated |
| Nifedipine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Procardia, Adalat)(Adalat, Procardia) | - | - | Not studied; may increase nifedipine levels | - | Increased nifedipine effects (eg, hypotension, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust nifedipine as indicated |
| Omeprazole[243](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#243)  (Prilosec)(Prilosec) | 40 mg QD on days 11-15 | 800 mg/200 mg tabs QD on days 1-15 | Not studied | Lopinavir: no significant change; Ritonavir: no significant change | - | - | No dose adjustment necessary |
| Omeprazole[243](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#243)  (Prilosec)(Prilosec) | 40 mg QD on days 11-15 | 400 mg/100 mg tabs BID on days 1-15 | Not studied | Lopinavir: no significant change; Ritonavir: no significant change | - | - | No dose adjustment necessary |
| Phenobarbital[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (others)(Luminal) | - | - | - | Not studied; may decrease lopinavir levels | Decreased lopinavir/ritonavir effects | Induction of CYP450 3A4 by phenobarbital | Avoid combination if possible; Do not use with once daily lopinavir/ritonavir. Consider alternative agents. If using, monitor phenobarbital levels and adjust as indicated  *Alternative Agents*:  **Gabapentin Lamotrigine Tiagabine Topiramate** |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Phenytoin[224](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#224)  (Dilantin) | 300 mg QHS for 10 days | 400/100 mg BID on days 1-22 | Phenytoin AUC: decreased 31%; Cmax: decreased 28%; Cmin: decreased 34%; half-life: decreased 38% | Lopinavir AUC: decreased 33%; Cmax: decreased 24%; Cmin: decreased 46%; half-life: decreased 51%.Ritonavir AUC: decreased 28%; Cmax: decreased 20%; Cmin: decreased 47%; half-life: decreased 38% | Decreased lopinavir/ritonavir and phenytoin effects | Induction of CYP450 3A4 by phenytoin; possible induction of CYP450 2C9 by lopinavir | Avoid combination if possible; do not use with once daily lopinavir/ritonavir. Consider alternative agents. If combination cannot be avoided, possible options include increasing LPV/r to 4 caps BID or adding ritonavir 100 mg BID to regimen and monitoring levels. Neither option currently has any data. Monitor phenytoin levels and adjust as indicated and monitor for virologic response.  *Alternative Agents*:  **Gabapentin Lamotrigine Tiagabine Topiramate** |
| Pimozide[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Orap)(Orap) | - | - | Not studied; may increase pimozide levels | - | Increased pimozide effects (eg, hypotension, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister |
| Pitavastatin[573](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#573)  (Livalo) | 4 mg QD | 400/100 mg BID | Pitavastatin AUC: decreased 20% | No significant change | - | - | No dose adjustment necessary |
| Pravastatin[216](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#216),[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Pravachol)(Pravachol) | 20 mg QD x 4 days | 400 mg/100 mg BID x 14 days | Pravastatin AUC: increased 33%; Cmax: increased 26% | No significant change | - | Unknown | No dose adjustment necessary |
| Prednisolone[425](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#425),[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727)  (others) | 20 mg x 1 | not stated | Prednisolone AUC: increased 31% | - | Possibly increased prednisolone effects (adrenal insufficiency, Cushing’s syndrome). | - | No dose adjustment necessary. Do not coadminister unless potential benefits of prednisone outweigh the risks of systemic corticosteroid adverse effects. |
| Proguanil[487](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#487)  (Malarone)(Malarone) | 100 mg with 250 mg atovaquone x 1 | 400/100 mg BID | Proguanil AUC: decreased 38%; Cmax: no significant change | - | Potentially compromised antimalarial activity | Increased atovaquone glucuronidation; induction of CYP450 3A4 by lopinavir/ritonavir | Dose adjustment not established |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Propafenone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Rythmol) | - | - | Not studied; may increase propafenone levels | - | Increased propafenone effects (eg, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister |
| Quinidine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Quindex, others)(Quindex) | - | - | Not studied; may increase quinidine levels | - | Increased quinidine effects (eg, cardiac arrhythmias) | - | Monitor and adjust quinidine as indicated |
| Raltegravir[413](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#413)  (RAL)(Isentress) | 400 mg BID | 400 mg/100 mg BID | Raltegravir Cmin: decreased 30% | No significant change | - | - | No dose adjustment necessary |
| Ranitidine[243](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#243)  (Zantac)(Zantac) | 150 mg QD on day 11 | 800 mg/200 mg tabs QD on days 1-15 | Not studied | Lopinavir Cmin: decreased 35%; Ritonavir AUC: decreased 16%; Cmax: decreased 21%; Cmin: decreased 16% | - | - | No dose adjustment necessary |
| Ranitidine[243](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#243)  (Zantac)(Zantac) | 150 mg QD on day 11 | 400 mg/100 mg BID on days 1-15 | Not studied | No significant change | - | - | No dose adjustment necessary |
| Ranolazine[709](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#709)  (Ranexa) | - | - | Not studied; may increase ranolazine levels | Not studied; may increase lopinavir levels | Potential increased ranolazine adverse effects (e.g. prolonged QT, cardiac arrythmias). | - | Do not coadminister |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Rapamycin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Sirolimus) | - | - | Not studied; may increase rapamycin levels | - | Increased rapamycin effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust rapamycin as indicated |
| Rifabutin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Mycobutin) | 150 mg QD x 10 days | 400 mg/100 mg BID x 20 days | - | Lopinavir AUC: increased 17%; Cmax: no significant change; Cmin: increased 20% | Increased lopinavir/ritonavir effects | - | Use rifabutin dose of 150 mg daily or 300 mg 3x/week. Monitor for antimicrobial activity and/or consider therapeutic drug monitoring. |
| Rifabutin[737](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#737)  (Mycobutin) | 300 mg daily x 2-4 weeks, then 150 mg every other day x 2 weeks, then 300 mg every other day | 400 mg with 100 mg ritonavir x 14 days | AUC for Rifabutin 150 mg every other day increased 10% when compared with rifabutin 300 mg daily . AUC for rifabutin 300 mg every other day increased 60% compared to 300 mg daily rifabutin. | Not studied | Potential toxicity from elevated rifabutin levels. | - | Reduce rifabutin dose to 150 mg daily or 300 mg 3x/week. Monitor for antimicrobial activity and/or consider therapeutic drug monitoring. |
| Rifabutin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Mycobutin) | 300 mg QD x 10 days, 150 mg QD x 10 days | 400 mg/100 mg BID x 10 days | Rifabutin AUC: increased 203%; Cmax: increased 112%; Cmin: increased 390%; 25-O-desacetyl rifabutin AUC: increased 4650%; Cmax: increased 2260%; Cmin: increased 9390% | - | Increased rifabutin effects (eg, uveitis) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Use rifabutin dose of 150 mg daily or 300 mg 3x/week. Monitor for antimicrobial activity and/or consider therapeutic drug monitoring. |
| Rifampin[459](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#459)  (Rifampicin)(Rifadin) | 600 mg QD | 400/100 mg Q12h x 7 days, 600/150 mg Q12H x 7 days then 800/200 Q12H x 7 days | - | Lopinavir AUC: decreased 71% (on 400/100 mg Q12H); AUC: decreased 40% (on 600/150 mg Q12H); AUC: no significant change (on 800/200 mg Q12H) | Decreased lopinavir effects at lower dosages | Induction of CYP450 3A4 by rifampin | Avoid coadministration. If combination can not be avoided lopinavir/ritonavir dosage of 800/200 mg Q12H appears to compensate for rifampin induced 3A4 induction |
| Rifampin[351](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#351),[350](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#350),[352](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#352)  (Rifampicin)(Rifadin) | 600 mg QD on days 11-24 | 400/100 mg BID on days 1-15, then 800/200 mg BID or 400/400 mg BID on days 16-24 | Not studied | Lopinavir AUC: decreased 16% (in 800/200 mg BID group when compared to 400/100 mg BID); Cmin: decreased 57%; Cmax: no significant change. Ritonavir AUC: increased 42%; Cmax: increased 75%; Cmin: no significant change.Lopinavir pharmacokinetics: No significant change (in 400/400 mg BID group)Ritonavir AUC: increased 612%; Cmax: increased 738%; Cmin: increased 389% (in 400 mg/400 mg BID group) | Decreased lopinavir effects | Inhibition of CYP450 3A4 by ritonavir; Induction of CYP450 3A4 by rifampin | Avoid coadministration. If combination can not be avoided consider using lopinavir/ritonavir 400 mg BID with ritonavir 400 mg BID when coadministering with rifampin |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Rifampin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Rifampicin)(Rifadin) | 600 mg QD x 10 days | 400 mg/100 mg BID x 20 days | - | Lopinavir AUC: decreased 75%; Cmax: decreased 55%; Cmin: decreased 99% | Decreased lopinavir/ritonavir effects | Induction of CYP450 3A4 by rifampin | Avoid coadministration. If combination can not be avoided consider alternate dosing for lopinavir/ritonavir (800/200 mg Q12H) or additional ritonavir.  *Alternative Agents*:  **Rifabutin** |
| Rilpivirine[567](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#567)  (RPV)(Edurant) | 150 mg QD | 400/100 mg BID | Rilpivirine AUC: increased 52%; Cmin: increased 74%; Cmax: increased 29% | No significant change | Increased rilpivirine effects | - | No dose adjustment necessary |
| Ritonavir[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (RTV)(Norvir) | 100 mg BID x 3-4 weeks | 400 mg/100 mg BID x 3-4 weeks | - | Lopinavir AUC: increased 46%; Cmax: increased 28%; Cmin: increased 116% | Increased lopinavir/ritonavir effects | Inhibition of CYP450 3A4 by ritonavir | Dose adjustment not established |
| Rosuvastatin[170](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#170)  (Crestor) | 20 mg QD on days 1-7, 18-24 | 400/100 mg BID on days 8-24 | Rosuvastatin AUC: increased 108%; Cmax: increased 366%; Cmin: no significant change | Not studied | Increased rosuvastatin effects | - | Initiate lowest dose and titrate carefully. Do not exceed 10mg rosuvastatin daily.  *Alternative Agents*:  **Pravastatin; atorvastatin** |
| Saquinavir[150](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#150)  (SQV)(Fortovase, Invirase) | 1000 mg (soft gel caps) BID | 400/100 mg BID | Saquinavir AUC: no significant change; Cmax: no significant change; Cmin: increased 27% (compared to saquinavir/ritonavir control)Ritonavir AUC: decreased 54%; Cmax: decreased 37%; Cmin: decreased 60%; Clearance total: increased 107%(compared to saquinavir/ritonavir control) | Lopinavir AUC: no significant change; Cmax: no significant change; Cmin: no significant change; (compared to historical control) | - | Possibly increased clearance resulting in decreased ritonavir levels | No dose adjustment necessary |
| Saquinavir[108](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#108)  (SQV)(Fortovase, Invirase) | 1200 mg TID on days 1-5, 800 mg BID on days 6-15 | 400/100 mg BID on days 6-20 | Saquinavir AUC: increased 836%; Cmax: increased 517%; Cmin: increased 1700% | No significant change | Increased saquinavir effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Dose adjustment not established |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Saquinavir[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (SQV)(Fortovase, Invirase) | 800 mg BID | 400 mg/100 mg BID x 10 days | Saquinavir AUC: no significant change; Cmin: increased | - | Increased saquinavir effects | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Dose adjustment not established |
| Sildenafil[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Viagra) | - | - | Not studied; may increase sildenafil levels | - | Increased sildenafil effects (eg, hypotension, priapism) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Initiate sildenafil at 25 mg QOD-QD; adjust dose as indicated; not recommended to exceed 25 mg in a 48 hour period |
| Simeprevir[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727)  (Olysio) | - | - | - | - | - | Inhibition of CYP3A4 potentiating simeprevir effects | Do not coadminister |
| Simvastatin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Zocor)(Zocor) | - | - | May increase simvastatin levels | - | Increased simvastatin effects (eg, myopathy, rhabdomyolysis) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **Atorvastatin Pravastatin** |
| Sofosbuvir/velpatasvir[751](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#751)  (Epclusa) | 400 mg/100 mg | 800 mg /200 mg once daily | Sofosbuvir Cmin decreased 41%; AUC decreased 29%. Velpatasvir Cmin decreased 30$; Cmax increased 63% | - | - | - | No dose adjustment necessary |
| St. John's Wort[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Hypericum perforatum, hypericin, hyperforin) | - | - | - | Not studied; may decrease lopinavir/ritonavir levels | Decreased lopinavir/ritonavir effects | Induction of CYP450 3A4 by St. John's Wort | Do not coadminister |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Tacrolimus[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Prograf)(Prograf) | - | - | Not studied; may increase tacrolimus levels | - | Increased tacrolimus effects (increased immunosuppression) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Monitor and adjust tacrolimus as indicated |
| Tadalafil[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727),[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78) | - | - | Not studied; may increase tadalafil levels | - | Increased tadalafil effects (eg, hypotension, priapism) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Initiate tadalafil at 5 mg QD; adjust dose as indicated; not recommended to exceed 10 mg in 72 hour period  *Alternative Agents*:  **Sildenafil, vardenafil** |
| Telaprevir[571](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#571)  (Incivek) | 750 mg Q8H x 10 days | 400 mg lopinavir BID with 100 mg ritonavir BID x 20 days | Telaprevir AUC: decreased 54%; Cmin: decreased 52%; Cmax: decreased 53% | No significant change | Decreased telaprevir effects | - | Do not coadminister  *Alternative Agents*:  **Atazanavir/ritonavir** |
| Tenofovir disoproxil fumarate[96](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#96),[98](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#98)  (TDF)(Viread) | 300 mg QD | 400 mg/100 mg BID x 14 days | Tenofovir AUC: increased 34%; Cmax: increased 31%; Cmin: increased 29% | Lopinavir AUC: decreased 15%; Cmax: decreased 15%; Cmin: no significant change; Ritonavir AUC: decreased 24%; Cmax: decreased 28%; Cmin: no significant change | Increased tenofovir effects | - | No dose adjustment necessary |
| Tenofovir disoproxil fumarate[104](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#104)  (TDF)(Viread) | 300 mg QD | 400/100 mg BID | Not studied | Lopinavir: no significant change. Ritonavir: no significant change | - | - | No dose adjustment necessary |
| Tenofovir disoproxil fumarate[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78),[96](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#96)  (TDF)(Viread) | 300 mg QD | 400/100 mg BID | Tenofovir AUC: increased 32%; Cmin: increased 51%; half-life: no significant change | No significant change | Possibly increased tenofovir effects | - | No dose adjustment necessary |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Terfenadine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Seldane)(Seldane) | - | - | Not studied; may increase terfenadine levels | - | Increased terfenadine effects (eg, cardiac arrhythmias) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister  *Alternative Agents*:  **Cetirizine Fexofenadine Loratadine** |
| Tinidazole[329](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#329)  (Tindamax) | - | Oral solution (contains alcohol) | - | - | Disulfiram like reaction (eg, nausea, vomiting, headache, hypotension) | Inhibition of alcohol and aldehyde dehydrogenase by tinidazole | Do not coadminister; may consider lopinavir/ritonavir capsules |
| Tipranavir[154](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#154)  (TPV)(Aptivus) | 500 mg BID with 200 mg ritonavir BID | 400 mg/100 mg BID | - | Lopinavir AUC: decreased 55%; Cmax: decreased 47%; Cmin: decreased 70% | Decreased lopinavir effects | Induction of CYP450 3A4 by tipranavir/ritonavir | Do not coadminister |
| Trazodone[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Desyrel)(Desyrel) | - | - | Increased trazodone concentrations | - | Increased trazodone effects (eg, nausea, dizziness, hypotension, syncope) | Possible inhibition of trazodone metabolism | Use with caution; if benefit outweighs risk, initiate trazodone at lower dose |
| Triazolam[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Halcion) | - | - | Not studied; may increase triazolam levels | - | Increased triazolam effects (eg, increased sedation, confusion, respiratory depression) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Do not coadminister; consider alternative agents  *Alternative Agents*:  **Lorazepam Oxazepam Temazepam Trazodone** |
| Valproic acid[220](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#220)  (Depakene, Depakote) | 250 mg BID x 7 days | 400/100 mg BID | No significant change | Lopinavir Cmax: increased 33%; Cmin: increased 57%; AUC: increased 75%; half-life: no significant change | Increased lopinavir effects | Possible inhibition of UGT-mediated metabolism of lopinavir | Dose adjustment not established. Monitor VPA levels and virologic response. Monitor for LPV- related toxicities. |
| **Coadministered Drug** | **Dose of Drug** | **Dose of Lopinavir/ritonavir** | **Effect on Drug Levels** | **Effect on Lopinavir/ritonavir Levels** | **Potential Clinical Effects** | **Mechanism of Interaction** | **Management** |
| Vardenafil[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78) | - | - | Not studied; may increase vardenafil levels | - | Increased vardenafil effects (eg, hypotension, priapism) | Inhibition of CYP450 3A4 by lopinavir/ritonavir | Initiate vardenafil at 5 mg QD; adjust dose as indicated; not recommended to exceed 20 mg in a 48 hour period |
| Voriconazole[727](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#727),[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (VFend) | - | - | Decreased voriconazole levels | - | Decreased voriconazole effects | Possible induction of CYP450 by ritonavir | Do not coadminister with boosted protease inhibitors unless benefit outweighs risks. If coadministering, consider therapeutic drug monitoring. |
| Warfarin[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (Coumadin) | - | - | Not studied; may increase or decrease warfarin levels | - | Increased or decreased warfarin effects (eg, altered INR, increased risk of bleeding or clotting) | Possible inhibition of CYP450 by lopinavir/ritonavir | Monitor INR and adjust warfarin as indicated |
| Zidovudine[78](http://arv.ucsf.edu/insite?page=ar-00-02&param=3&post=4#78)  (AZT, ZDV)(Retrovir) | - | - | Not studied; may decrease zidovudine levels | Not studied | Decreased zidovudine effects | Induction of glucuronidation by lopinavir/ritonavir | No dose adjustment necessary |
| "-" indicates that there are no data available | | | | | | | |

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