

Table 27-12: Summary of Significant Drug-Drug Interactions
in Palliative Care of HIV Disease

Disease States and Medications	Protease Inhibitors		
	Ritonavir (Norvir)	Indinavir (Crixivan)	Nelfinavir (Viracept)
CARDIOVASCULAR			
Beta Blockers	↑ plasma conc. of metoprolol & timolol		↓ plasma conc. of these drugs
Antiarrhythmics	↑ plasma conc. of amiodarone & quinidine Serious arrhythmias with propafenone ↑ plasma conc. of ecainide, mexilente, flecainide, & systemic lidocaine	↑ plasma conc. of amiodarone & quinidine	↑ plasma conc. of amiodarone & quinidine
Ca⁺⁺ Channel Blockers	↑ plasma conc. of nifedipine (Significant ↑ over all Ca ⁺⁺ Channel Blockers)		↑ plasma conc. of nifedipine ↓ plasma conc. of felodipine
Antihyperlipidemics	Significant ↑ in levels of simvastatin & lovastatin	Significant ↑ in levels of simvastatin & lovastatin	Significant ↑ in levels of simvastatin & lovastatin
GASTROINTESTINAL			
Cisapride	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias (No longer on market)	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias (No longer on market)	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias (No longer on market)
RESPIRATORY			
Astemizole and terfenadine	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias
Theophylline	↓ in plasma conc. of theophylline		

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Disease States and Medications	Protease Inhibitors		
	Ritonavir (Norvir)	Indinavir (Crixivan)	Nelfinavir (Viracept)
CENTRAL NERVOUS SYSTEM			
Antipsychotics	↑ plasma conc. of pimozone		
Antidepressants	↑ plasma conc. of bupropion, nefazodone, SSRIs, & tricyclics		
Benzodiazepines	<p>↑ plasma conc. of diazepam & flurazepam</p> <p>↑↓ metabolism of alprazolam</p> <p>Extreme sedation & respiratory depression with clorazepate, estazolam & zolpidem</p> <p>Prolong sedation of midazolam & triazolam due to narrow therapeutic index</p>	Prolong sedation of midazolam & triazolam due to narrow therapeutic index	
ANTIEPILEPTIC AND NEUROLEPTIC AGENTS			
Carbamazepine, phenytoin, & phenobarbital*	↓ plasma conc. of these drugs and monitor blood levels to assure therapeutic goals		↓ plasma conc. of phenytoin & phenobarbital ∴ results in an ineffectiveness of the drugs
Clozapine	↑ plasma conc. ∴ results in serious toxicities such as respiratory depression, or tachycardia		
Divalproex and lamotrigine	↓ plasma conc. of these drugs		

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	Ritonavir (Norvir)	Indinavir (Crixivan)	Nelfinavir (Viracept)
Clonazepam, perphenazine, risperidone, and thioridazine	↑ plasma conc. of these drugs		
*Inducers such as phenytoin, phenobarbital, and carbamazepines can cause a reduction in plasma conc. of PIs			
ANALGESICS			
NSAIDS	↑ plasma conc. of Piroxicam		
Opiates	↑ plasma conc. of meperidine, propoxyphene, fentanyl, & tramadol ∴ ↓ dose		
Ergotamines	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias
Methadone	↑ plasma conc. due to a ↓ in its metabolism ↓ plasma conc. due to displacement from PPB and ↑ in its metabolism	↑ plasma conc. due to a ↓ in its metabolism	↑ plasma conc. due to a ↓ in its metabolism
OTHER MEDICATIONS			
Rifampin and rifabutin	Rifampin ↓ plasma conc. of PIs	Significantly ↑ the plasma conc. of rifabutin	Significantly ↑ the plasma conc. of rifabutin
	Significantly ↑ the plasma conc. of rifabutin	↓ clearance of rifabutin	↓ clearance of rifabutin
	Rifampin ↓ plasma conc. of PIs	Rifampin ↓ plasma conc. of PIs	
Ketoconazole and itraconazole	↑ plasma conc. of PIs	↑ plasma conc. of PIs	↑ plasma conc. of PIs

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	Ritonavir (Norvir)	Indinavir (Crixivan)	Nelfinavir (Viracept)
Antabuse	Causes an intense flushing & abdominal pain due to alcohol in ART Causes an antabuse-like effect with metronidazole when given with alcohol		
Oral Contraceptives	↓ plasma conc. of ethinyl estradiol	↓ plasma conc. of ethinyl estradiol	
Sildenafil (Viagra)	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects
HERBAL REMEDIES			
St. John's wort*		↓ plasma conc. of PIs by more than 50%	
Garlic	Causes severe gastrointestinal toxicity		
*This herbal product with PIs will increase the risk of viral resistance.			
ILLEGAL DRUGS			
Ecstasy	Slows down the liver enzymes that break down the drug ∴ becomes 5-10 times stronger Most dangerous interaction		
	Avoid in patients with family or personal history of depression or anxiety disorders because the drug damages the serotonin neurons.		
Marijuana	Protease inhibitors increase the levels of THC (active ingredient) ∴ smaller doses may have a greater effect		

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Disease States and Medications	Protease Inhibitors		
	Ritonavir (Norvir)	Indinavir (Crixivan)	Nelfinavir (Viracept)
Heroin	↓ plasma conc. of by 50% ∴ ↓ risk of overdose		
Ketamine (Special K)	Causes “chemical hepatitis”		
Amphetamines	↑ levels in the blood by 20%-30% Strengthens or weakens the effects of ritalin		
LSD	No known interactions	No known interactions	No known interactions
Cocaine	Doubles the speed at which the virus reproduces ∴ increases progression of the disease		
Disease States and Medications	Protease Inhibitors		
	Agenerase (Amprenavir)	Saquinavir (Fortovase)	
CARDIOVASCULAR			
Antiarrhythmias	↑ plasma conc. of amiodarone & quinidine ↑ plasma conc. of lidocaine		
Ca ⁺⁺ Channel Blockers	↑ plasma conc. of nifedipine (Significant ↑ over all Ca ⁺⁺ Channel Blockers)		
Anthyperlipidemics	Significant ↑ in levels of simvastatin & lovastatin		
GASTROINTESTINAL			
Cisapride	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias (No longer on market)	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias (No longer on market)	
RESPIRATORY			
Astemizole and terfenadine	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	

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Disease States and Medications	Protease Inhibitors	
	Agenerase (Amprenavir)	Saquinavir (Fortovase)
CENTRAL NERVOUS SYSTEM		
Antidepressants	↑ plasma conc. of tricyclics	
Benzodiazepines	↑ plasma conc. of alprazolam, diazepam, & flurazepam Prolong sedation of midazolam & triazolam due to narrow therapeutic index	Prolong sedation of midazolam & triazolam due to narrow therapeutic index
*Inducers such as phenytoin, phenobarbital, and carbamazepines can cause a reduction in plasma conc. of PIs		
ANALGESICS		
Ergotamines	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias
Methadone	↓ in its metabolism ∴ ↑ in plasma conc.	↓ in its metabolism ∴ ↑ in plasma conc.
OTHER MEDICATIONS		
Rifampin and rifabutin	Rifampin ↓ plasma conc. of PIs Significantly ↑ the plasma conc. of rifabutin ↓ clearance of rifabutin	Rifabutin significantly ↓ plasma conc. of PIs by 70%-80%
Ketoconazole and itraconazole	↑ plasma conc. of PIs	↑ plasma conc. of PIs.
Sildenafil (Viagra)	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects	Sildenafil AUC ↑ two- to eleven-fold. Use a 25mg starting dose of sildenafil. ¹
ILLEGAL DRUGS		
Ecstasy	Avoid in patients with family or personal history of depression or anxiety disorders because the drug damages the serotonin neurons.	

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Disease States and Medications	Protease Inhibitors	
	Agenerase (Amprenavir)	Saquinavir (Fortovase)
Marijuana	PIs increase the levels of THC (active ingredient) ∴ smaller doses may have a greater effect.	
LSD	No known interactions	No known interactions
Cocaine	Doubles the speed at which the virus reproduces ∴ increases the progression of the disease	

Disease States and Medications	Non-nucleoside Reverse Transcriptase Inhibitors		
	Delavirdine (Rescriptor)	Efavirenz (Sustiva)	Nevirapine (Viramune)

CARDIOVASCULAR

Antiarrhythmias	↑ plasma conc. of amiodarone & quinidine		
Ca ⁺⁺ Channel Blockers	↑ plasma conc. of nifedipine		
Anthyperlipidemics	Significant ↑ in levels of simvastatin & lovastatin		

GASTROINTESTINAL

Cisapride	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias (No longer on market)		
Antacids, Proton Pump Inhibitors and H ₂ Antagonists	Cause an alteration in the pH of the stomach ∴ may delay or reduce the absorption of ART		

RESPIRATORY

Astemizole and terfenadine	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias		
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Table 27-12: Summary of Significant Drug-Drug Interactions
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Disease States and Medications	Non-nucleoside Reverse Transcriptase Inhibitors		
	Delavirdine (Rescriptor)	Efavirenz (Sustiva)	Nevirapine (Viramune)
CENTRAL NERVOUS SYSTEM			
Benzodiazepines	Prolong sedation of midazolam & triazolam due to narrow therapeutic index	Prolong sedation of midazolam & triazolam due to narrow therapeutic index	
Antiepileptic and Neuroleptic Agents	↓ plasma conc. of phenytoin & phenobarbital ∴ results in ineffectiveness of the drugs		
ANALGESICS			
Ergotamines	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias Can cause peripheral ischemia	↑ in plasma conc. ∴ results in serious or life-threatening arrhythmias	
Methadone		Causes a methadone withdrawal effect ∴ ↑ amt. of drug needed to get the desired effects	Causes a methadone withdrawal effect ∴ ↑ amt. of drug needed to get the desired effects
OTHER MEDICATIONS			
Clarithromycin		↓ plasma conc. of the drug	
Rifampin and rifabutin	Rifampin ↓ plasma conc. of ART Significantly ↑ the plasma conc. of Rifabutin		
Oral Contraceptives		↑ plasma conc. of ethinyl estradiol by 37%	Causes a modest ↑ in the clearance of ethinyl estradiol

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Disease States and Medications	Non-nucleoside Reverse Transcriptase Inhibitors		
	Delavirdine (Rescriptor)	Efavirenz (Sustiva)	Nevirapine (Viramune)
Sildenafil (Viagra)	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects	Significantly ↑ plasma conc. of drug due to a ↓ in its clearance ∴ results in ↑ effects
Chemotherapy Agents	↑ risk for toxicity with etoposide & paclitaxel		
ILLEGAL DRUGS			
Ecstasy	Most dangerous effects due to the break down of the drug	Less dangerous effects	Less dangerous effects
	Avoid in patients with family or personal history of depression or anxiety disorders because the drug damages the serotonin neurons.		
Cocaine	Doubles the speed at which the virus reproduces ∴ increases the progression of the disease		
LSD	No known interactions	No known interactions	No known interactions
Disease States and Medications	Nucleoside Reverse Transcriptase Inhibitors		
	Zidovudine (Retrovir)	Didanosine (Videx)	Abacavir (Ziagen)
GASTROINTESTINAL			
Antacids, Proton Pump Inhibitors and H ₂ Antagonists		↑ the absorption of ART	
CENTRAL NERVOUS SYSTEM			
Antipsychotics			↑ serum conc. of thiorazine & chloral hydrate

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Disease States and Medications	Nucleoside Reverse Transcriptase Inhibitors		
	Zidovudine (Retrovir)	Didanosine (Videx)	Abacavir (Ziagen)
ILLEGAL DRUGS			
Ecstasy	Avoid in patients with family or personal history of depression or anxiety disorders because the drug damages the serotonin neurons.		
Alcohol		↑ risk of pancreatitis	
Cocaine	Avoid in patients with family or personal history of depression or anxiety disorders because the drug damages the serotonin neurons.		
LSD	No known interactions	No known interactions	No known interactions

Alternative Agents		
	Interactions	Alternatives
Cardiovascular	Simvastatin, lovastatin, cerivastatin, atorvastatin	Pravastatin, fluvastatin
Gastrointestinal	Cimetidine	Famotidine, ranitidine
Respiratory	Astemizole, terfenadine, cetirizine, nasal steroids	Loratidine, fexofenadine
CNS	Alprazolam, diazepam, flurazepam, midazolam, triazolam	Temazepam, lorazepam
Analgesics	Meperidine, propoxyphene, fentanyl, tramadol	Hydromorphone, codeine
Antimycobacterial	Clarithromycin	Azithromycin, ethambutol
Oral Contraceptive	Ethinyl estradiol	Ethinyl estradiol + condom