Recreational Drugs and HIV Antivirals
A Guide to Interactions for Clinicians
Fall 2002
Recreational Drugs and HIV Antivirals – A Guide to Interactions for Clinicians

Prepared by: Bruce Olmscheid, MD and Christine Kubin, PharmD

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Disclaimer: Neither the AIDS Education and Training Centers nor the Health Resources and Services Administration (HRSA) condone or recommend the use of illicit drugs in any context. The data in this guide is intended for use by clinicians and other health care providers to provide advice that may reduce harm to patients who use these substances in conjunction with antiretroviral agents. The data in this guide is a compilation of information obtained from published and anecdotal studies as of September 2002.

For further information, please visit one of the following websites:

- www.hivatis.org/druginteractions.html
- www.thebody.com/whatis/druguse_rec.html
- www.hafci.org/drugs/
- www.hivguidelines.org

To obtain information about drug treatment and harm reduction contact:

- www.samhsa.gov/centers/csat2002/csat_frame.html (for treatment information)
- www.harmreduction.org (for harm reduction information)
- www.nynjaetc.org
- 212-305-8291
**COCAINE (coke, blow)**

**GENERAL**
 Increases rate of HIV viral replication in vitro. Respiratory depression, cardiac dysrhythmias, seizures, hypertension, depression, anxiety

**PHARMACOKINETICS**
Mainly metabolized by nonspecific tissue and plasma esterases; some cocaine metabolism (~10%) via CYP3A4

**KNOWLEDGE INTERACTIONS**

**NNRTIs**
delavirdine (Rescriptor)
efavirenz (Sustiva)
nevirapine (Viramune)

**NRTIs**
abacavir (ABC, Ziagen)
Combivir (AZT/3TC)

*SEE INDIVIDUAL COMPONENTS*
didanosine (ddI, Videx)
lamivudine (3TC, Epivir)
stavudine (d4T, Zerit)
tenoforvir (Viread)

*SEE INDIVIDUAL COMPONENTS*
Trizivir (ATZ/3TC/ABC)
zalcitabine (ddC, Hivid)
zidovudine (AZT, ZDV, Retrovir)

**Protease Inhibitors**
amrenavir (Agenerase)
indinavir (Crixivan)
lopinavir/ritonavir (Kaletra)
nefuvir (Viracept)
ritonavir (Norvir)
saquinavir (Fortovase) (Invirase)

**ECSTASY (X, MDMA)**

**GENERAL**
Tachycardia, hypertension, hyperthermia, dehydration, dry mouth, tense jaw, teethgrinding, depression

CYP2D6 demethylation important in metabolism; 2D6 inhibitors are likely to increase ecstasy levels

**KNOWLEDGE INTERACTIONS**

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# PATIENT INFORMATION TO REDUCE THE HARM

Don't Get So High You Forget To Stick To Your Antiretroviral Regimen. Avoid Cocaine If You Have Heart Or Liver Problems, Or High Blood Pressure.

Decrease To 1/4 Or 1/2 Tablet Of Ecstasy. Drink Plenty Of Water.
**GENERAL**

**PHARMACOKINETICS**
Utilizes CYP2D6 pathway for metabolism

**GHB** (gamma-hydroxy-butyrate, grievous bodily harm, liquid X)
Seizures, bradycardia, severe respiratory depression, hypotension, coma, death

**HEROIN** (smack, brown junk, China, White)
Dreamlike state of warmth and well-being with small doses. CNS depression, drowsiness, respiratory depression, constricted pupils, nausea/vomiting with excessive doses
Utilizes CYP3A4 pathway for metabolism

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**PATIENT INFORMATION TO REDUCE THE HARM**

*The Dose You Used Last Week Can Kill You This Week. If You Choose To Use This Dangerous Drug Start With A Half-Teaspoon And Wait A Half-Hour Before Taking More. Do Not Mix With Alcohol, Tranquilizers, Pain-Killers, Or Allergy Medications. Do Not Use If You Are Alone. This Drug Should Be Avoided.*

**NRTIs**
abacavir (ABC,Ziagen)  
Combivir (AZT/3TC)  
*SEE INDIVIDUAL COMPONENTS didanosine ( ddl, Videx)  
lamivudine (3TC, Epivir)  
stavudine (d4T, Zerit)  
tenofovir (Viread)  
Trizivir (AZT/3TC/ABC)  
*SEE INDIVIDUAL COMPONENTS zalcitabine (ddC,Hivid)  
zidovudine (AZT, ZDV, Retrovir)  

**Protease Inhibitors**
amprenavir (Agenerase)  
indinavir (Crixivan)  
lopinavir/ritonavir (Kaletra)  
nelfinavir (Viracept)  
ritonavir (Norvir)  
saquinarv (Fortovase) (Invirase)

*Protease Inhibitors potentially increase drug levels of GHB

**NNRTIs**
delavirdine (Rescriptor)  
efavirenz (Sustiva)  
nevirapine (Viramune)  

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lopinavir/ritonavir (Kaletra)  
nelfinavir (Viracept)  
ritonavir (Norvir)  
saquinarv (Fortovase) (Invirase)

*Possible decrease in heroin levels

**GENERAL**

**PHARMACOKINETICS**
Metabolized by alcohol dehydrogenase and aldehyde dehydrogenase; alcohol may induce CYP2E1 and CYP3A.

**ALCOHOL**
Confusion, disorientation, incoordination, loss of balance and judgement, respiratory depression, stupor, coma.

**AMPHETAMINES (Crystal)**
Paranoia, anxiety, depression, hallucinations, tachycardia, stroke, pruritis, liver damage, diarrhea, hypertension, erectile dysfunction.

Metabolized by hydroxylation and deamination via CYP2D6 pathway; CYP2D6 inhibitors may increase amphetamine levels (try to avoid).

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**KNOWN DRUG INTERACTIONS**

**NNRTIs**
- delavirdine (Rescriptor)
- efavirenz (Sustiva)
- nevirapine (Viramune)

**NRTIs**
- abacavir (ABC,Ziagen)
- Combivir (AZT/3TC)
- didanosine (ddl, Videx)
- lamivudine (3TC, Epivir)
- stavudine (d4T, Zerit)
- tenofovir (Viread)
- Trizivir (AZT/3TC/ABC)

**Protease Inhibitors**
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- ritonavir (Norvir)
- saquinavir (Fortovase) (Invirase)

**KNOWN DRUG INTERACTIONS**

No known interactions specific to this combination. Refer to comments for this drug class in general.

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**PATIENT INFORMATION TO REDUCE THE HARM**

If You Take ddl, Do Not Drink Alcohol. With Any Other Antiretrovirals, Try To Avoid Alcohol Or Use Modestly.

Avoid Use If You Have Heart Or Liver Problems, Or High Blood Pressure. Do Not Mix With Alcohol.
**PHARMACOKINETICS** Metabolized rapidly, probably hydrolytic denitration

**BENZODIAZEPINES**

CNS depression

Most agents extensively metabolized in the liver by the CYP3A4 system; lorazepam, oxazepam, and temazepam metabolized by conjugation with glucuronic acid

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### Protease Inhibitors

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<td>delavirdine (Rescriptor)</td>
<td>Likely inhibits benzodiazepine metabolism through CYP3A4 inhibition and increases risk of adverse effects; concomitant use should be avoided</td>
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<tr>
<td>efavirenz (Sustiva)</td>
<td>Likely known interactions specific to this combination. Refer to comments for this drug class in general</td>
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<td>nevirapine (Viramune)</td>
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<td>lamivudine (3TC, Epivir)</td>
<td>Likely known interactions specific to this combination. Refer to comments for this drug class in general</td>
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<td>stavudine (d4T, Zerit)</td>
<td>Likely known interactions specific to this combination. Refer to comments for this drug class in general</td>
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<td>tenofovir (Viread)</td>
<td>Likely known interactions specific to this combination. Refer to comments for this drug class in general</td>
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<td>Likely to interfere with metabolism and increase AUC (area under the curve) of benzodiazepines; use of PI with benzodiazepines should be avoided due to increase risk of sedation and respiratory depression</td>
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**AMYL NITRITE** (amyl nitrate, poppers)

Reduces glutathione levels; inhaling the fumes acts as a vasodilator (hypotension, tachycardia, headaches)

**GENERAL**

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<td>Metabolized rapidly, probably hydrolytic denitration</td>
<td>Do Not Use With Sildenafil (Viagra) Due To Risk Of Serious Hypotension. Heart Problems, Glaucoma, or Anemia Make Poppers More Dangerous.</td>
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**PATIENT INFORMATION TO REDUCE THE HARM**

Avoid Benzodiazepines In Combination With Protease Inhibitors. Lower Doses May Be Necessary With Other Antiretrovirals.
**KETAMINE (K, Special K)**
Paranoia, anxiety, mania, hallucinations, “K-hole” (semicatatonic stupor)

**PHARMACOKINETICS**
Undergoes N-demethylation and hydroxylation (possibly mediated by CYP3A4); possible weak inhibitor of CYP2D1 and CYP3A4

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**LSD (Acid)**
Paranoia, visual and auditory hallucinations
Extensively metabolized in the liver by hydroxylation

**GENERAL**

**BLACK BOX WARNING**

**PATIENT INFORMATION TO REDUCE THE HARM**

Do Not Mix With Other Recreational Drugs.
### MARIJUANA (Tetrahydrocannabinol; THC)

Tachycardia, loss of inhibitions, dry mouth, visual hallucinations

### METHADONE

Generalized CNS depression

Primarily utilizes CYP3A4 pathway for metabolism; inhibitor of CYP2D6 and CYP3A4

### GENERAL

**PHARMACOKINETICS**

Metabolized in the liver to active metabolite (11-hydroxy THC) via CYP3A4, 2C9, and 2C6; inhibitors/inducers of CYP3A4 may interfere with THC metabolism

### NNRTIs

delavirdine (Rescriptor)
efavirenz (Sustiva)
nevirapine (Viramune)

**KNOWN DRUG INTERACTIONS**

- No known interactions specific to this combination. Refer to comments for this drug class in general

### NRTIs

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Combivir (AZT/3TC)
Stavudine (d4T, Zerit)
tenofovir (Viread)
Trizivir (AZT/3TC/ABC)

**KNOWN DRUG INTERACTIONS**

- Methodone levels decreased significantly (~50%); titrate methodone dose to effect
- Increases didanosine levels ~41-60% (consider didanosine tablet form dose increase) (clinical significance unknown)
- Decreases stavudine levels ~13-27% (clinical significance unknown)

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**KNOWN DRUG INTERACTIONS**

- Potential to increase THC levels

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**KNOWN DRUG INTERACTIONS**

- Potential to increase THC levels

### PATIENT INFORMATION TO REDUCE THE HARM

**Be Aware That Smaller Amounts Of Marijuana May Lead To Increased Effects Due To Interaction With Antiretrovirals.**

**Be Sure Your Health Care Provider Knows That You Take Methadone. Remind Your Provider That You Take Methadone, Particularly If You Are Changing Antiretroviral Drugs.**