Recreational Drugs and HIV Antiretrovirals –
A Guide to Interactions for Clinicians

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Disclaimer: Neither the AIDS Education and Training Centers nor HRSA condone or recommend the use of illicit drugs in any context. The data in this guide are 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 are a compilation of information obtained from published and anecdotal studies through November 2009.

* PLEASE REFER TO PAGE 10 OF THIS GUIDE FOR IMPORTANT HARM REDUCTION THAT SHOULD BE SHARED WITH PATIENTS.
**GENERAL**

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

**AMPHETAMINES (Crystal)**
Paranoia, anxiety, depression, hallucinations, tachycardia, hypertension, stroke, myocardial infarction, hyperthermia, rhabdomyolysis, diarrhea, erectile dysfunction, teeth grinding

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

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

### KNOWN DRUG INTERACTIONS

#### NNRTIs
- delavirdine (Rescriptor)
- efavirenz (Sustiva)
- nevirapine (Viramune)
- etravirine (Intelicence)

#### NRTIs
- abacavir (ABC,Ziagen)
- Atripla (EFV/TDF/FTC)
- Combivir (AZT/3TC)
- didanosine (ddl, Videx)
- emtricitabine (FTC, Emtriva)
- Epzicom (3TC/ABC)
- lamivudine (3TC, Epivir)
- stavudine (d4T, Zerit)
- tenofovir (TDF,Viread)

#### Protease Inhibitors
- amprenavir (Agenerase)
- fosamprenavir (Lexiva)
- atazanavir (Reyataz)
- darunavir (Prezista)
- indinavir (Crixivan)
- lopinavir/ritonavir (Kaletra)
- nelfinavir (Viracept)
- ritonavir (Norvir)
- saquinavir (Fortovase, Invirase)
- tipranavir (Aptivus)

#### CCR5 Inhibitor
- Maraviroc (Selzentry)

#### Integrase Inhibitor
- Raltegravir (Isentress)

#### KNOWN DRUG INTERACTIONS

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<thead>
<tr>
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**General Pharmacokinetics**
Metabolized by alcohol dehydrogenase and aldehyde dehydrogenase; alcohol may induce CYP2E1 and CYP3A.
**GENERAL**

**PHARMACOKINETICS**

**KNOWN DRUG INTERACTIONS**

**BENZODIAZEPINES**

CNS depression, drowsiness, memory loss, impaired coordination

Most agents extensively metabolized in the liver by the CYP3A4 system; lorazepam, oxazepam, and temazepam metabolized by conjugation via glucuronidation.

**AMYL NITRITE** (amyl nitrate, poppers)

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

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**KNOWN DRUG INTERACTIONS**

**NNRTI’s**
- likely inhibits benzodiazepine metabolism through CYP3A4 inhibition and increases risk of adverse effects; concomitant use should be avoided
- diazepam drug levels may be increased by etravirine; a decrease in diazepam dosage may be needed

**NRTI’s**
- no known interactions specific to this combination

**Protease Inhibitors**
- decreases therapeutic effect of lorazepam, oxazepam, and temazepam (monitor for withdrawal)

**CCR5 Inhibitor**
- no known interactions specific to this combination

**Integrase Inhibitor**
- no known interactions specific to this combination
**COCAINE** *(coke, blow)*

Increases rate of HIV viral replication in vitro, hypertension, cardiac dysrhythmias, myocardial infarction, seizures, depression, anxiety

**PHARMACOKINETICS**

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

**ECSTASY** *(X, MDMA)*

Tachycardia, hypertension, hyperthermia, dehydration, dry mouth, tense jaw, teeth grinding, depression

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

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**KNOWN DRUG INTERACTIONS**

* SEE INDIVIDUAL COMPONENTS
**Erectile Dysfunction Agents**
*(sildenafil (Viagra), tadalafil (Cialis), vardenafil (Levitra))

Hypotension, tachycardia, arrhythmias (cardiac arrest and death), headache,flushing, rhinitis, dyspepsia, nausea, and visual effects (e.g. light sensitivity, changes in color vision), priapism

**Metabolized in the liver via CYP3A4**

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**Potential to significantly increase sildenafil, tadalafil, and vardenafil concentrations. Use sildenafil at reduced doses of 25 mg every 48 hours, tadalafil at reduced doses of 10 mg every 72 hours, vardenafil at reduced doses of no more than 2.5 mg every 72 hours and monitor closely for adverse effects.**

**No known interactions specific to this combination.**

**Etravirine has been shown to decrease sildenafil concentrations, though may be used together without sildenafil dosage adjustment. Sildenafil dosage may need to be adjusted based upon clinical effect. Similar interactions are also predicted with tadalafil and vardenafil.**

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**SEE INDIVIDUAL COMPONENTS**
**GHB**
(gamma-hydroxy-butyrate, grievous bodily harm, liquid X)
Seizures, bradycardia, severe respiratory depression, hypotension, vomiting, 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

**Genera**
Utilizes CYP2D6 pathway for metabolism

**Pharmacokinetics**
Utilizes CYP3A4 pathway for metabolism

### KNOWN DRUG INTERACTIONS

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### KETAMINE (K, Special K)

**Paranoia, anxiety, mania, hallucinations, "K-hole" (semi-catatonic stupor). Elevated levels may cause tachycardia, hypertension, respiratory depression**

### LSD (acid)

Paranoia, visual and auditory hallucinations

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**PHARMACOKINETICS**

Undergoes N-demethylation and hydroxylation (possibly mediated by CYP3A4); possible weak inhibitor of CPY2D1 and CYP3A4

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**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

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**GENERAL**

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

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**PHARMACOKINETICS**

No known interactions specific to this combination

**SEE INDIVIDUAL COMPONENTS**

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- saquinavir (Fortovase, Inivirase)
- tipranavir (Aptivus)

### CCR5 Inhibitor
- Maraviroc (Selzentry)

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**Known Drug Interactions**

### Integrase Inhibitor
- Raltegravir (Isentress)
PATIENT INFORMATION TO REDUCE HARM

**ALCOHOL**
If you take ddI, do not drink alcohol. Try to avoid alcohol or use modestly.

**AMYL NITRITE (amyl nitrate, poppers)**
Do not use with sildenafil (Viagra), vardenafil (Levitra) or tadalafil (Cialis). Heart problems, glaucoma, or anemia make poppers more dangerous.

**COCAINEN (coke, blow)**
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

**Erectile Dysfunction Agents**
Do not mix with amyl or butyl nitrates (poppers). Combination can cause sudden drop in blood pressure leading to fainting or heart attack.

**GHBN**
Start with half-teaspoon, wait half-hour before taking more. Do not mix with alcohol, tranquilizers, pain-killers, or allergy medications. Do not use if you are alone. The dose you used last week can kill you this week.

**KETAMINE (K, Special K)**
Start with 1/3 or 1/2 of usual dose. Wait a half-hour before doing more. Always use with a friend, never alone.

**AMPHETAMINES (Crystal)**
Avoid use if you have heart or liver problems, or high blood pressure. Recent reports of transmitted HIV resistance in patients using methamphetamine and practicing unsafe sex.

**BENZODIAZEPINES**
Any changes to your methadone regimen or HIV medications should be reported to both providers to ensure potential interactions are identified.

**ECSTASY (X, MDMA)**
Start with 1/4 or 1/2 tablet. Drink plenty of water.

**HEROIN (smack, brown junk, China, White)**
Start with normal dose and increase only if you experience less of a hit and less buzz. Safe injecting. Do not mix with other recreational drugs.

**METHADONE**
Any changes to your methadone regimen or HIV medications should be reported to both providers to ensure potential interactions are identified.
RESOURCES

The National AETC Program also includes the following services:

National HIV/AIDS Clinicians Consultation Center: 1-800-933-3413
Offering treating clinicians current HIV clinical and drug information and individualized, expert case consultation.

Post-Exposure Prophylaxis 24 hour hotline: 1-888-HIV-4911
Providing consultation for occupational exposures.

Perinatal Hotline: 1-888-448-8765

Providing resources (including curricula and lecture slide sets) on HIV disease treatment, education and data.
FOR FURTHER INFORMATION, PLEASE VISIT ONE OF THE FOLLOWING WEBSITES:

NY/NJ AIDS Education and Training Center
www.nynjaetc.org

U.S. DHHS AIDS Info
aidsinfo.nih.gov

NYSDOH AIDS Institute Clinical Resources
www.hivguidelines.org

Substance Abuse and Mental Health Services Administration
www.samhsa.gov

Addiction Technology Transfer Center
www.nattc.org

Harm Reduction Coalition
www.harmreduction.org