Intervening with Men Who Have Sex with Men Who Use Methamphetamine

Frederick L. Altice, M.D., M.A.
Professor of Medicine and Public Health
Yale University
Acknowledgements

• University Malaya
  – Howie Lim
  – Ezra Akbar
  – Adeeba Kamarulzaman

• Yale University
  – Jeffrey Wickersham

• UCLA
  – Steve Shoptaw

• University of Pennsylvania
  – George Woody
Global Trafficking Routes of Amphetamine-Type Substances

Global methamphetamine trafficking flows by size of flows estimated on the basis of reported seizures, 2012-2016:

- Principal flows
- Main markets
- Frequently mentioned countries of provenance as reported by countries where methamphetamine seizures took place
WHY THE BRAIN PREFERENCES “ICE” OVER NASI LEMAK

It feels REALLY good!
MULTIPLE PATHWAYS TO ADDICTION

Biology/Genes

Environment

Brain Mechanisms

Addiction

DRUG
Dopamine and Vesicular Monoamine Transporter 2 (VMAT2)
Reward (Pleasure) Pathway
Similarities in Addiction Between Various Substance Use Disorders

Dopamine D2 Receptors Are Lower in Addiction

Stimulants

Control
Addicted

Cocaine
Meth
Alcohol
Heroin
DSM-5 Definition: Substance Use Disorder

Maladaptive pattern of use, *clinically significant impairment or distress* and 2+ of the following within a 12-month period:

- Tolerance
- Withdrawal (Psychological or physical)
- Used for longer periods than intended
- Can’t cut down or quit
- Time spent getting, using or recovering
- Give up social, work or fun activities
- Craving or a strong desire or urge to use a substance
- Continued use despite knowledge of negative consequences
- Failure to fulfill major role obligations
- Use in physically hazardous situations
- Continued use despite social and interpersonal problems

Mild = 2-3 criteria; Moderate = 4-5 criteria; Severe = 6+ criteria
The Spectrum of Substance Use Disorders

No use or use that does not cause problems

Occasional use causes problems occasionally to frequently

Fun → Fun with Problems → Problems

Mild to Moderate SUD

Severe SUD (Addiction)
Consequences of Amphetamine Use

Psychological Effects
- Delusions
- Euphoria
- Aggression
- Self-Confidence

Physical Effects
- Heart Rhythm Changes
- Nausea
- Feeling Hot or Cold
- Full-Body Stimulation

Meth High

Extreme Use
- Heart Problems*
- Seizures
- Death
- Addiction

*May occur with minimal use in susceptible individuals
Dopamine Recovery After Methamphetamine Use Discontinuation

Volkow ND, J Neuroscience, 2001
Methamphetamine Use, HIV Incidence in MSM: Attributable Fraction

1. Koblin et al., 2006, AIDS, 20: 731-739
2. Ostrow et al., 2009, JAIDS, 51: 349-355
Micro-Ecological Study of ATS and Sex Concurrency
N=50 x 60 days (events for 2790 days)

ATS Use
699 (25%)

58% (N=403) of days where ATS occurred involved sex

80% (N=474) of days where sex occurred was without condoms

Sex
596 (21%)
Micro-Ecological Study of ATS and Sex Concurrency
N=50 x 60 days (events for 2790 days)

Multiple Seroconversions Over 60 days
HIV incidence: 24%
Sexual Ecology: *Triad of Risk*

**ATS increases:**
- Sexual disinhibition
- Number of sexual partners
- Entry of new individuals into sexual networks

**Infectivity by route of transmission**

**Prevalence in a key population**
Potential Model for ATS and Sexual Transmission
ATS and the Ecological Environment
Behavioral Strategies

*Contingency Management*
Contingency Management and Substance Use Disorders

• Operant conditioning (Skinner, 1938)
  – Grandma’s Rule (positive & negative consequences)
• Meta-analysis suggests a moderate effect in ATS use and in some cases sustained
• Three key elements:
  – Rate of reinforcement (amount of reinforcement per behavior)
  – Immediacy of the reinforcer (timeliness)
  – Magnitude of the reinforcement
• It has been adapted to simultaneously address co-occurring psychiatric disorders & polysubstance use
• Effective in diverse communities (rural, race, income level)

Petry, N. 2005; McPherson SM, Subst Ab Rehab, 2018
Contingency Management and Substance Use Disorders

• Relatively new experiences with CM and technology-based interventions
  – Challenges with transportation, delivery of rewards in real-time, etc
  – Challenges with technology (e.g., breathalyzer for alcohol, CO monitoring for nicotine, etc)

• Early data supporting personalized assessment and rewards
  – Monitoring medication adherence and delivering prizes

• There are virtually NO adverse consequences from CM except when the punishment level is problematic – increased substance use!

• Politically, it has been mostly unpalatable for funders though some governments (VA in US and MoH in UK) have begun to support some projects

McPherson SM, Subst Ab Rehab, 2018
The “Place” for Contingency Management

FIGURE 1
Targets and possible use of contingency management along the treatment journey

European Monitoring Center for Drugs and Drug Addiction, 2016
Behavioral Strategies

*Cognitive Behavioral Therapy (CBT)*
Cognitive Behavioral Therapy - Matrix Model

- 16-week comprehensive and integrative behavioral treatment strategy – may be extended
- Effective for a number of stimulant disorders and polysubstance use
- Multi-dimensional by combining:
  - Behavioral therapy
  - Family education
  - Individual counseling
  - 12-step support
  - Drug testing
  - Encouragement for non-drug-related activities
- Has not been adapted for the virtual community

MATRIX Model Adapted for MSM

www.friendscommunitycenter.org/resources
Methamphetamine treatment in MSM

Full trial: 162 methamphetamine dependent MSM in West Hollywood, CA

| Cognitive Behavioral Therapy (n=40) | Gay/Bisexual Cognitive Behavioral Therapy (n=40) | Contingency Management (n=42) | Cognitive Behavioral Therapy Plus Contingency Management (n=40) |

Duration: 16 weeks; 1 year follow-up evaluations
Early Trial: CBT, CM, CM+CBT, GCBT in MA-Dependent MSM at risk for HIV

- Average # Negative UA out of 48 visits
- Percent negative at 12 months

Contingency Management (CM) Boosts nPEP Outcomes in at-risk Stimulant Using MSM

Design:
- Escalating 8-week CM schedule with thrice-weekly visits based on drug-free urine samples
- $430 maximum
- n=140

Methamphetamine Outcomes:
- CM = 8.9 (SD=9)
- Control = 6.1 (SD=6) *

## Theory-based Text Messages for Stimulant Use

<table>
<thead>
<tr>
<th>Social Support</th>
<th>Informational Support</th>
<th>“Did he give you a bug? Here’s where to go.”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>“Take care of your body, get vaccinated for hep A and B.”</td>
</tr>
<tr>
<td>Emotiona Support</td>
<td>“Screw your partner, not your life.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“You’re worth a new needle.”</td>
<td></td>
</tr>
<tr>
<td>Instrumental Support</td>
<td>“Meth brings you down, meds bring you up.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Pack your socks with condoms and lube.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health Belief</th>
<th>Health Threat</th>
<th>“Is that precum or do you have a STD drip?”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Meth can take your teeth.”</td>
<td></td>
</tr>
<tr>
<td>Health Behaviors to Reduce Risk</td>
<td>“Dip it, don’t stick it.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Inject clean, an abscess is a hot mess.”</td>
<td></td>
</tr>
<tr>
<td>Awareness of Health Risks</td>
<td>“50% of men with Chlamydia have no symptoms.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Using meth in public can be risky.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Cognition</th>
<th>Self-regulation Skills</th>
<th>“Weekends getting longer and longer?”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Don’t have an open sores relationship.”</td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>“Say 1st thing your poz, like you did last time. You can do it.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“You can take your meds, even when you party.”</td>
<td></td>
</tr>
</tbody>
</table>

Text Message Outcomes: Meth and Sex

Meth Use Past 30 Days

Sex on Meth, Past 30 Days

Reback CJ et al., *AIDS Behav.* 2019, 23:37-47
Pharmacological Studies

*Mirtazapine*
Mirtazapine: Placebo-Controlled Controlled Trial

Urine Drug Testing Results

Colfax G, Arch Gen Psych, 2011
Mirtazapine: Placebo-Controlled Controlled Trial

12-Week HIV Risk-Taking Results

Colfax G, Arch Gen Psych, 2011
Pharmacological Studies

Naltrexone
Placebo-Controlled Trial of Oral Naltrexone to Treat ATS Use Disorder (N=80) – Swedish Experience

Placebo-Controlled Trial of XR-Naltrexone to Treat ATS Use Disorder (N=100) – Iceland Experience

*UDT available for only 53% of samples (1247/2400)
Why the difference in the two RCTs?

- Iceland study had patients with
  - More polysubstance use disorders
    - Alcohol (75%)
    - Cannabis (69%)
    - Cocaine (26%)
    - Sedatives (30%)
  - Higher rates of addiction severity
  - Higher rates of drop-out and missing data in the NTX arms
Summary

• Contingency Management is THE most effective tool on the shelf for reducing meth use among MSM

• Reducing meth use:
  – Reduces HIV transmission behaviors
  – Improves HIV-prevention medication adherence

• For HIV+ MSM, affect regulation may boost CM outcomes by shifting mood and motivation

• Brief motivational interviewing sessions reduce HIV sexual risk behaviors in MSM using methamphetamine
  – Reinforce Screen, Briefly Intervene and Refer to Treatment (SBIRT)

• Personalized texting may have an impact on HIV risk
What can we do?

- **We MUST engage with the ChemSex Community**
  - No “don’t ask, don’t tell”!
  - No “we let them take care of it”

- **Integrative services are key**
  - Engagement
  - Set up collaborative models of care
  - Initiate evidence-based strategies (SBIRT)
    - Screen
    - Briefly Intervene
    - Refer (or PROVIDE) treatment

- **We need to reach the target population WHERE they are**
  - mostly in the virtual space!