SUD Relapse Prevention and the Workplace

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The Beige Book
Summary of Commentary on Current Economic Conditions By Federal Reserve District
In Congressional testimony in July, Federal Reserve chair Janet Yellen related opioid use to a decline in the labor participation rate.

The past three Fed surveys on the economy, known as the Beige Book, explicitly mentioned employers’ struggles in finding applicants to pass drug tests as a barrier to hiring.
Recovery and the Employer

Major Factors of Recovery

• **Health** — Overcoming or managing one’s disease(s) or symptoms. For example, abstain from using alcohol, illicit drugs, and non-prescribed medications if one has an addiction problem. This includes making informed, healthy choices that support physical and emotional well-being;

• **Home** — Having a stable and safe place to live;

• **Purpose** — Conducting meaningful daily activities, such as a job, school, volunteerism, family caregiving, and the independence, income, and resources to participate in society;

• **Community** — Having relationships and social networks that provide support, friendship, love, and hope.
Addiction, The Disease

What is drug addiction (Moderate to Severe Substance Use Disorder)?

• Chronic, relapsing brain disease
• Characterized by compulsive drug seeking and use, despite harmful consequences
• Can lead to long lasting changes in the brain and harmful behaviors
• Continued use induces
  - Tolerance
  - Physical dependence
  - Sensitization
  - Craving
  - Relapse

Addiction, The Disease

Substance Use Disorder is not a defect of willpower, but is an actual disease caused by:

- neurotransmitter defects
- abnormal brain chemistry
- genetic and environmental influences,
- much like Diabetes is a disease.
Addiction- Reward

• The VTA-nucleus accumbens pathway is activated by all drugs of dependence including alcohol

• This pathway is important not only in drug dependence, but also in essential physiological behaviors such as eating, drinking, sleeping, and sex
Addiction - Reward

Natural Rewards Elevate Dopamine Levels

**SEX**
- DA Concentration (% Baseline)
- Sample Number
- Copulation Frequency
- Mounts
- Intromissions
- Ejaculations

**FOOD**
- % of Basal DA Output
- Time (min)
- Empty Box
- Feeding

Sources:
Addiction - Reward

Effects of Drugs on Dopamine Levels

Cocaine

- DA
- DOPAC
- HVA

% of Basal Release

Time After Cocaine (hours)

Meth

- DA
- DOPAC
- HVA

% of Basal Release

Time After Meth (hours)

Addiction - The Reward System

The reward system is activated by cocaine, methamphetamines, heroin, and alcohol.

Neurotransmitters ‘transmit’ reward signals to other parts of the brain.

Reward system begins in specific areas of the brain.
Addiction - Reward

Cellular Auto regulation

- Normal
- Pre-synaptic Changes
- Post-synaptic Changes
Hijacking the Brain

New research suggests that the brain’s reward system has different mechanisms for craving and pleasure. Craving is driven by the neurotransmitter dopamine. Pleasure is stimulated by other neurotransmitters in “hedonic hot spots.” When the craving circuitry overwhelms the pleasure hot spots, addiction occurs, leading people to pursue a behavior or drug despite the consequences.

Pathways to Craving

Desire is triggered when dopamine, which originates near the top of the brain stem, travels through neural pathways to act on the brain. Drugs increase the flow of dopamine.

Ventral tegmental area (VTA)
Dopamine is produced here and flows outward along neurons distributed throughout the brain’s reward system.

Dorsal striatum
Neurons here help form habits by identifying enjoyable patterns, such as the anticipation of buying drugs.

Prefrontal cortex
The amino acid glutamate, produced here, interacts with dopamine to spark visualizations that cue cravings.

Amygdala
Neurons here are stimulated by learned emotional responses, such as memories of cravings and pleasure.

Orbitofrontal cortex
This hot spot gives a sense of gratification but is also the first to shut down if a person has indulged too much.

Nucleus accumbens
A hot spot within this key part of the craving circuitry amplifies the response to pleasure.

Pleasure Hot Spots

A system of small hedonic hot spots, unrelated to dopamine, provides temporary sensations of pleasure and forms a feedback loop with the reward system that controls desire.
Addiction - A Brain Disease

Drug and stress innate immune gene induction creates the neurobiology of dependence

Disrupts frontal cortical behavioral control mechanisms

Frontal Cortex
Goal setting
Motivation
Planning
Impulse inhibition

Increases limbic negative affect, craving, and anxiety

Amygdala
Hippocampus
Anxiety, Urgency
Negative affect
Craving
Impulsiveness

mPFC
ACA
Thal
GP
CD
VS
AMG
ENT
STG
OFC
ITG
Addiction - A Brain Disease

Circuits Involved in Drug Abuse and Addiction

All of these circuits are also involved in pain perception and modulation!

Baler and Volkow, Trends in Molecular Medicine, 2006
Addiction - Drugs of Choice

User Dependent On Specific Substances in 2012 (thousands)

- Marijuana: 4,304
- Painkillers: 2,056
- Cocaine: 1,193
- Tranquilizers: 629
- Hallucinogens: 331
- Heroin: 467
- Stimulants: 535
- Sedatives: 135
- Inhalants: 164

# Top 10 Drugs Involved in Overdose Deaths in the United States, 2010-2014

<table>
<thead>
<tr>
<th>Rank</th>
<th>Referent Drug</th>
<th>Number of Deaths</th>
<th>Percent</th>
<th>Referent Drug</th>
<th>Number of Deaths</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oxycodone</td>
<td>5,256</td>
<td>13.7</td>
<td>Heroin</td>
<td>10,863</td>
<td>23.1</td>
</tr>
<tr>
<td>2</td>
<td>Methadone</td>
<td>4,408</td>
<td>11.5</td>
<td>Cocaine</td>
<td>5,856</td>
<td>12.4</td>
</tr>
<tr>
<td>3</td>
<td>Cocaine</td>
<td>4,312</td>
<td>11.2</td>
<td>Oxycodone</td>
<td>5,417</td>
<td>11.5</td>
</tr>
<tr>
<td>4</td>
<td>Alprazolam</td>
<td>3,677</td>
<td>9.6</td>
<td>Alprazolam</td>
<td>4,217</td>
<td>9.0</td>
</tr>
<tr>
<td>5</td>
<td>Heroin</td>
<td>3,020</td>
<td>7.9</td>
<td>Fentanyl</td>
<td>4,200</td>
<td>8.9</td>
</tr>
<tr>
<td>6</td>
<td>Morphine</td>
<td>2,941</td>
<td>7.7</td>
<td>Morphine</td>
<td>4,022</td>
<td>8.5</td>
</tr>
<tr>
<td>7</td>
<td>Hydrocodone</td>
<td>2,844</td>
<td>7.4</td>
<td>Methamphetamine</td>
<td>3,728</td>
<td>7.9</td>
</tr>
<tr>
<td>8</td>
<td>Fentanyl</td>
<td>1,645</td>
<td>4.3</td>
<td>Methadone</td>
<td>3,495</td>
<td>7.4</td>
</tr>
<tr>
<td>9</td>
<td>Diazepam</td>
<td>1,448</td>
<td>3.8</td>
<td>Hydrocodone</td>
<td>3,274</td>
<td>7.0</td>
</tr>
<tr>
<td>10</td>
<td>Methamphetamine</td>
<td>1,388</td>
<td>3.6</td>
<td>Diazepam</td>
<td>1,729</td>
<td>3.7</td>
</tr>
</tbody>
</table>

*Ranks were not tested for statistical significance.

**NOTES:** Drug overdose deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Deaths may involve other drugs in addition to the referent drug (i.e., the one listed). Deaths involving more than one drug (e.g., a death involving both heroin and cocaine) are counted in both totals. Caution should be used when comparing numbers across years. The reporting of at least one specific drug in the literal text improved, from 67% of drug overdose deaths in 2010 to 78% of drug overdose deaths in 2014.

**SOURCE:** NCHS, National Vital Statistics System. Mortality files linked with death certificate literal text.

Addiction - The RELAPSING Disease

Comparison of Relapse Rates Between Drug Addiction and Other Chronic Illnesses

- Drug Addiction: 40 to 60%
- Type 1 Diabetes: 30 to 50%
- Hypertension: 50 to 70%
- Asthma: 50 to 70%
Addiction- The RELAPSING Disease

Factors Involved in Relapse

- Edy whole London's study of functional MRIs -
  - Positive Reinforcement
  - Cue cravings
  - Negative Reinforcement
  - Inhibitory Control Dysfunction
Addiction - The RELAPSING Disease

Dopamine and Reward

Dopamine and Craving
Addiction - The RELAPSING Disease

PFC – Limbic Interactions in Negative Affect and Inhibitory Control

Positive Reward Nucleus Accumbens
Negative Feeling / VTE
Cue Cravings
Loss of Inhibitory Control

Figure 1. Schematic and functional magnetic resonance imaging (fMRI) of cortical areas involved in pain processing.
Medication Assisted Treatment for Opioids

- **Methadone** is tied to thousands of deadly overdoses a year, although almost entirely when it’s used for pain, not addiction, treatment — since it’s much more regulated in addiction care.

- **Buprenorphine** is safer in that, unlike common painkillers, heroin, and methadone, its effect has a ceiling — meaning it has no significant effect after a certain dose level. But it’s still possible to misuse, particularly for people with lower tolerance levels.

- **Naltrexone** can heighten the risk of overdose and death in the case of a relapse between agonist and antagonist therapy since a full detox is required prior to administration.

  Overdose after antagonist induction would require someone to stop taking Naltrexone, since the antagonist blocks the effects of opioids up to certain doses.
OPIOID RECEPTOR PHARMACOLOGY

**Agonists, antagonists, and partial agonists**

**Agonists:** substances that bind to the receptor and produce a full biological response

**Antagonists:** substances that bind to the receptor and do not produce a biological response

**Partial agonists:** substances that bind to the receptor and produce a limited response – less than the full response produced an agonist

Relapse Prevention - Medication
## Relapse Prevention - Medication

### Methadone Maintenance Therapy
- Full Opioid Receptor Agonist – Synthetic Narcotic
- Used for more than 30 years for the treatment of Opioid Addiction
- Methadone occupies the opioid receptors in the brain and suppresses narcotic withdrawal for 24 – 36 hours
- Reduces opiate cravings
- Administered Daily in optimum therapeutic doses of 60-120 mg/day at Outpatient Treatment Programs and is efficacious with supportive services

### Potential Methadone Adverse Events
- QT Prolongation
- Respiratory Depression
- Testosterone Suppression - hypergonadalism
- Sleep Disturbances (including Sleep Apnea)
- Patients can switch to other opioids
- Increased Tolerance
Relapse Prevention - Medication

BUPRENORPHINE
Pharmacological Profile

- High affinity for mu-opioid receptor
  - Competes with other opioids and blocks their effects
  - Ceiling effect on mu-opioid receptor
- Slow rate of dissociation from mu-opioid receptor
- Antagonist at Kappa Receptor (no overdose unless used with respiratory depressants i.e. benzodiazepines)
- Absorption
  - 40% Sublingual
  - 10% Oral
  - 100% IV
- Half Life - 37 ½ hours
- Onset of Action – ½ hour
- Pregnancy – Category C
- Class III

A Controlled Trial of Buprenorphine Treatment for Opioid Dependence - Johnson, Jaffe, Fulada JAMA 1992

Design: A Randomized, double-blind, parallel group study comparing buprenorphine(8mg/d), methadone(60mg/d) and methadone(20mg/d) in a 17 week maintenance phase followed by an 8 week detoxification phase. One hundred sixty-two volunteers.

Results:
- Retention after 17 weeks –
  - buprenorphine (42%), methadone-60mg (32%) methadone-20mg (20%)
- Retention after 25 weeks -
  - buprenorphine (30%), methadone-60mg (20%) methadone-20mg (6%)
- Patients who received counseling -
  - buprenorphine (89%), methadone-60mg (89%) methadone-20mg (91%)
Relapse Prevention - Medication

NALTREXONE (Vivatrol)
Pharmacological Profile

- Opioid Receptor Antagonist with the highest affinity for the Mu Opioid Receptor
- Absorption - IM
- Half Life - 4-5 days
- Onset of Action – 2 hours
- Pregnancy – Category C

Vivitrol Opioid Dependence Phase 3 Clinical Trial

- A 24-Week, Multicenter, Double-Blind, Placebo-Controlled Trial
- Prior to the study, participants reported using heroin (88%), methadone (12%) and other opioid/analgesics (13%)
- Vivitrol with psychosocial support n= 126
- Placebo with psychosocial support n=124
- 36% of Vivitrol patients had complete abstinence through 24 week trial (100% Opioid-Free Weeks) vs 23% of placebo patients
- The average (median) Vivitrol patient was abstinent for 90% of 24 week trial vs 35% for placebo group
Relapse Prevention - Medication

The Future of Addiction Treatment

**Prediction of Medication Response:**
- Functional Brain MRI
- Reference EEG
- Genetic Testing

**Pharmacotherapy:**
- Long Acting Buprenorphine Implants
- Long Acting Naltrexone Implants

**Non Pharmacological Therapies**
- Bridge Device
- Transcranial Magnetic Stimulation

**Summary**
- Numerous new medications are successfully helping patients with cravings
- New approaches are still needed that can improve treatment outcomes and reduce the risk of relapse
Addiction - A BioPsychoSocial Disease

Biology/Genes
- Genetics
- Gender
- Mental Disorders
- Route of administration
- Effect of drug itself

Drug
- Early Use
- Availability
- Cost

Brain Mechanisms

Environment
- Chaotic home and abuse
- Parent's use and attitudes
- Peer influence
- Community attitudes
- Poor school environment

Dependence
Relapse Prevention or Recovery Support

The drink and/or drug was the \textit{solution} for an innate, poor response to endogenous dopamine.

The alcoholic addict needed pleasure and relief…

Things got out of control.

The real question is, \textit{“Why do people remain sober?”}, not, \textit{“Why to people relapse?”}. 
Support recovery to prevent relapse
Relapse Prevention; Marlatt/ Gorski

• Identify signs of and conditions which stimulate craving and relapse; avoid triggers until alternate response is trained
• Build supportive social networks; build self-efficacy
• Practice recovery skills and alternative behaviors which:
  • cope with feelings and situations
  • relieve discomfort and pain
  • achieve satisfaction and pleasure
• Seek lifestyle balance and positive addictions
• Limit duration of “lapse” to avoid “relapse (abstinence violation effect).
Relapse Prevention
PsychoSocial Models

Cognitive Behavioral Therapy

- Teach recognition of cognitive distortions, beliefs and behaviors which lead to or maintain substance use and/or relapse
- Replace irrational, faulty and/or self-defeating beliefs, ideas and behaviors with rational, recovery-supportive ideas and behaviors
- Practice making healthy, recovery supportive choices.

Dialectical Behavioral Therapy

- Integrate aversive feelings, beliefs and responses with constructive beliefs and responses
- Connect fragmented/ opposing ideas and processes into a cohesive whole
- “Stitches bring two sides of a wound together so that they can heal.”
Relapse Prevention
PsychoSocial Models

Long-term Chronic Care, Disease Management Model

• Clinical case management/ monitoring to assess and reduce risk over extended period (minimum five years)
• Urinalysis testing and activity tracking over long-term (minimum five years)
• Professional follow-up, reassessment, medication management, psychotherapy, and check-up- periodic over lifetime.
Mindfulness Meditation

- Increase awareness of thoughts and feelings effecting states of relapse vs recovery
- Practice observing and releasing thought and sensation streams and choosing positive, healthful, constructive focus
- “On what you focus, grows”
- Practice detaching “self” from thought and sensation
- Increase voluntary choice and eliminate automatic reaction
- Increase “intention” and intentional action
- “What you do directly impacts you” (Karma).
Relapse Prevention
PsychoSocial Models

Recovery Capitol

• More to lose, the less likely the relapse
• Recovery capitol and symptom severity/complexity directs the recovery plan
• Build essential ingredients of long-term recovery:
  • Life purpose/meaning
  • 12-step or mutual support group participation
  • Family and Social Support
• Establish optimistic life orientation, resilience to stress, lower anxiety, and positively effective coping skills
• Assertively link to community resources and aftercare
• Avoid drug/alcohol cultures.
Workplace Relapse Prevention

Ensure that supervisors have been trained to observe for signs of impending relapse:

- Identify behaviors that an employee makes which demonstrate movement toward or away from workplace goals which may reflect state of recovery
- Watch for social isolation, changes in mood, reduction of productivity, tardiness and other relapse warning signs
- Make a point to meet struggling and newly recovering employees on days they are returning to work after a break.

Train supervisors to:

- Identify performance problems
- Provide employee performance feedback and contracting
- EAP referral.
Observe for Impending Relapse

- Disengagement from productive relationships
- Inability to exchange help and support with others
- Denying or minimizing problems
- Inability to manage impulses and regulate emotional responses
- Distorting the truth about substance use; concealing substance use; minimizing the effects of substance use; denying the effects and consequences of substance use
- Romanticizing drug use or renewed interest in substance use
- Returning to the company of drinking/using friends.
Workplace Relapse Prevention

Support recovery and develop and health-promoting workplace culture:

• Promote healthy activities, mindfulness practices, recreation and sober celebrations in the workplace

• Allow flexibility in schedule and encourage participation in meditation, mutual support group attendance, and healthy activity/exercise

• Establish workplace culture which recognizes employee achievement of health goals (completion of treatment, periods of continuous sobriety, weight loss, lower blood pressure)

• Encourage recovery related events such as health promotional fairs, fundraisers, workshops/brown bag lectures.
Workplace Relapse Prevention

Develop positive peer support between employees:

• Promote peer support (member assistance programs) suitable for each workplace culture

• Encourage employees who have achieved health goals to mentor others who want to pursue similar goals

• Discourage peer pressure for drug/ alcohol use and replace with healthful celebrations and traditions.
Workplace Relapse Prevention

Implement Workplace Recovery Motivational Constructs

• Negotiate long-term return to work contracts which include physical and EAP monitoring and aftercare participation

• Establish periodic employee self-appraisal for health, mental health and substance use

• Encourage employee follow-through on personal goal-setting and seeking help

• Provide supervisors tools to evaluate performance using behavioral criteria which indicate management of behavioral health (accept feedback, negotiate solutions, cooperate with others, express ideas rationally, accept and contribute to change and organizational improvement, etc.).
Encourage employees to practice their recovery skills

- People usually drink, use and relapse **not** because they don’t know about the problem and its consequences.
- They usually drink, use and relapse because **they** haven’t developed skills necessary to more effectively access pleasure and cope with distress.
Addiction is an avoidance of pain and a means to achieve pleasure.

- Observe the use of healthy skills which alleviate (or cope with) pain and achieve pleasure.

- Encourage life-balance and healthy practices.

- Encourage the use of peer support, recovery coaching and/or professional help.
Drug-Free Workplace Advisor Main Menu

The Drug-Free Workplace Advisor has two main sections. Please choose the section you want to use based on the descriptions below.

The [Drug-Free Workplace Policy Builder section](http://webapps.dol.gov/elaws/asp/drugfree/policybuilder.htm) assists users to create customized drug-free workplace policies. It also provides guidance on how to develop a comprehensive drug-free workplace program, of which a policy is only one component.

[Go to Drug-Free Workplace Policy Builder Section](http://webapps.dol.gov/elaws/asp/drugfree/policybuilder.htm)

The [Drug-Free Workplace Act of 1988 section](http://webapps.dol.gov/elaws/asp/drugfree/act1988.htm) informs employers and workers about the Drug-Free Workplace Act of 1988, a law that requires some Federal contractors and all Federal grantees to provide drug-free workplaces as a precondition of receiving a contract or grant from a Federal agency.


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