Substance Use Disorders: Research and Real World Treatment

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Stats and Substance Use Disorders

- **Annual Costs** $700 billion

- **Lifetime prevalence (2014)**
  - Alcohol: 12-17=29.6, 18-25=83.4, 26+=88.3
  - Cigarettes: 12-17=14.2, 18-25=56.1, 26+=67.5
  - Illicit: 12-17=23.3, 18-25=57.9, 26+=50.8

Overdose Deaths

National Overdose Deaths—Number of Deaths from Prescription Drugs. The figure above is a bar chart showing the total number of U.S. overdose deaths involving prescription drugs from 2001 to 2014. The chart is overlayed by a line graph showing the number of deaths by females and males. From 2001 to 2014 there was a 2.8-fold increase in the total number of deaths.
National Overdose Deaths—Number of Deaths from Heroin. The figure above is a bar chart showing the total number of U.S. overdose deaths involving heroin from 2001 to 2014. The chart is overlayed by a line graph showing the number of deaths by females and males. From 2001 to 2014 there was a 6-fold increase in the total number of deaths.
National Overdose Deaths—Number of Deaths from Cocaine. The figure above is a bar chart showing the total number of U.S. overdose deaths involving cocaine from 2001 to 2014. The chart is overlayed by a line graph showing the number of deaths by females and males. From 2001 to 2014 there was a 42 percent increase in the total number of deaths.
<table>
<thead>
<tr>
<th>All underlying causes of death*</th>
<th>Percent Increase</th>
<th>Fold Increase</th>
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</thead>
<tbody>
<tr>
<td><strong>Prescription Drugs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>271%</td>
<td>3.0</td>
</tr>
<tr>
<td>Male</td>
<td>223%</td>
<td>2.7</td>
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<tr>
<td><strong>Opioid Analgesics</strong>**</td>
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<tr>
<td>Female</td>
<td>516%</td>
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<tr>
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<td>300%</td>
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<td><strong>Benzodiazepines</strong></td>
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<tr>
<td>Female</td>
<td>730%</td>
<td>5.7</td>
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<tr>
<td>Male</td>
<td>523%</td>
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<td><strong>Illicit Drugs</strong></td>
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<tr>
<td>Female</td>
<td>276%</td>
<td>3.5</td>
</tr>
<tr>
<td>Male</td>
<td>193%</td>
<td>3.0</td>
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<tr>
<td><strong>Cocaine</strong></td>
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</tr>
<tr>
<td>Female</td>
<td>81%</td>
<td>1.6</td>
</tr>
<tr>
<td>Male</td>
<td>31%</td>
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<tr>
<td><strong>Heroin</strong></td>
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<tr>
<td>Female</td>
<td>689%</td>
<td>7.7</td>
</tr>
<tr>
<td>Male</td>
<td>393%</td>
<td>5.6</td>
</tr>
</tbody>
</table>

*Percent Increase and Fold Increase are calculated for the period 2001-2014.
Rural Surpassed Urban
Drug Related ER Visits (2011)

• Total ER 2.5 mil drug use or misuse
  – Total Drug visit: 5.1 mil

• Alcohol involved in 724k cases (alone in only 117k cases, combo 607)

• Illicit substances 1.25 mil
  – Guess the Top 3!
• Top Three Illicit
  – Cocaine 505,224
  – Heroine 258,482
  – Marijuana 455,668

• Opiates
  – 556,551

• CDC data: 46,471 drug related deaths (2013) (non accidental)
According to the CDC, alcohol is a leading cause of premature death (4th in 2006).
- Multiple “leading causes” can be related to alcohol so difficult to determine
- Unintentional deaths is 4th leading cause, unclear how many related to alcohol for recent data

Average 87,798 alcohol attributable deaths each year or an average of 6 people every day (76% male)
- For comparison, Alzheimer's is 6th leading cause of death with 84,767 cases in 2013
Brief Definition of Addiction

• According to the American Society of Addiction Medicine (ASAM) Public Policy Statement: Definition of Addiction

• Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.

• Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one’s behaviors and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death.

Long Definition of Addiction

• Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry.

• Addiction affects neurotransmission and interactions within reward structures of the brain, including the nucleus accumbens, anterior cingulate cortex, basal forebrain and amygdala, such that motivational hierarchies are altered and addictive behaviors, which may or may not include alcohol and other drug use, supplant healthy, self-care related behaviors.

• Addiction also affects neurotransmission and interactions between cortical and hippocampal circuits and brain reward structures, such that the memory of previous exposures to rewards (such as food, sex, alcohol and other drugs) leads to a biological and behavioral response to external cues, in turn triggering craving and/or engagement in addictive behaviors.
Long Definition of Addiction
Brain Structure and chemistry

• The frontal cortex and connections with circuits of reward, motivation and memory are fundamental in the manifestations of altered impulse control, altered judgment, and the dysfunctional pursuit of rewards (which is often experienced by the affected person as a desire to “be normal”) seen in addiction—despite cumulative adverse consequences experienced from engagement in substance use and other addictive behaviors.

• The frontal lobes are important in inhibiting impulsivity and delaying gratification. When persons with addiction manifest problems in deferring gratification, there is a neurological locus of these problems in the frontal cortex.
Long Definition of Addiction
Adolescent Brain

• Frontal lobe morphology, connectivity and functioning are still in the process of maturation during adolescence and young adulthood, and early exposure to substance use is another significant factor in the development of addiction.
• Front lobe is important for executive functioning
• Limbic system is the “emotional center” (internal structure, developed earlier)
• These two systems start linking about age 12/14 through early 20’s
Genetic factors account for about **half** of the likelihood that an individual will develop addiction. Environmental factors interact with the person’s biology and affect the extent to which genetic factors exert their influence.

Resiliencies the individual acquires (through parenting or later life experiences) can affect the extent to which genetic predispositions lead to the behavioral and other manifestations of addiction.

Culture also plays a role in how addiction becomes actualized in persons with biological vulnerabilities to the development of addiction.
Long Definition of Addiction

Other Factors

• The **presence of an underlying biological deficit** in the function of reward circuits, such that drugs and behaviors which enhance reward function are preferred and sought as reinforcers;

• The **repeated engagement in drug use** or other addictive behaviors, causing neuroadaptation in motivational circuitry leading to impaired control over further drug use or engagement in addictive behaviors;

• **Cognitive and affective distortions**, which impair perceptions and compromise the ability to deal with feelings, resulting in significant self-deception;
Disruption of healthy social supports and problems in interpersonal relationships which impact the development or impact of resiliencies;

Exposure to trauma or stressors that overwhelm an individual’s coping abilities;

Distortion in meaning, purpose and values that guide attitudes, thinking and behavior;

Distortions in a person’s connection with self, with others and with the transcendent (Spirituality); and

The presence of co-occurring psychiatric disorders in persons who engage in substance use or other addictive behaviors.
Addiction symptoms (ASAM)

- Inability to consistently Abstain;
- Impairment in Behavioral control;
- Craving; or increased “hunger” for drugs or rewarding experiences;
- Diminished recognition of significant problems with one’s behaviors and interpersonal relationships; and
- A dysfunctional Emotional response.
A minimum of 2-3 criteria is required for a mild substance use disorder diagnosis, while 4-5 is moderate, and 6-7 is severe (APA, 2013). Substance of abuse is specified instead of Substance Use Disorder.

- Taking the substance in larger amounts and for longer than intended
- Wanting to cut down or quit but not being able to do it
- Spending a lot of time obtaining the substance
- Craving or a strong desire to use
• Repeatedly unable to carry out major obligations at work, school, or home due to substance use

• Continued use despite persistent or recurring social or interpersonal problems caused or made worse by substance use

• Stopping or reducing important social, occupational, or recreational activities due to substance use

• Recurrent use of substance in physically hazardous situations
• Consistent use of substance despite acknowledgment of persistent or recurrent physical or psychological difficulties from using opioids

• *Tolerance as defined by either a need for markedly increased amounts to achieve intoxication or desired effect or markedly diminished effect with continued use of the same amount. (Does not apply for diminished effect when medications are used appropriately under medical supervision, e.g. opiates)

• *Withdrawal manifesting as either characteristic syndrome or the substance is used to avoid withdrawal (Does not apply when medications are used appropriately under medical supervision)
• CASA study on science to practice gap
  – Only about 1/10 people get needed treatment or approximately 20.7 million Americans not receiving needed treatment (vs 7/10 for medical issues like diabetes)

• The Spending Gap

• Evidence to Practice Gap
  – only a small fraction of individuals receive interventions or treatment consistent with scientific knowledge about what works.
Opioid Treatment

• Excellent Resources on Evidence-Based Treatment for Opioid Use Disorders
• Medication Assistant Treatment (MAT) has rigorous evidence... for opioids.

CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016
ASAM Addiction Treatment Criteria

AT A GLANCE: THE SIX DIMENSIONS OF MULTIDIMENSIONAL ASSESSMENT

ASAM's criteria uses six dimensions to create a holistic, biopsychosocial assessment of an individual to be used for service planning and treatment across all services and levels of care. The six dimensions are:

1. **Dimension 1**: Acute Intoxication and/or Withdrawal Potential
   - Exploring an individual's past and current experiences of substance use and withdrawal

2. **Dimension 2**: Biomedical Conditions and Complications
   - Exploring an individual's health history and current physical condition

3. **Dimension 3**: Emotional, Behavioral, or Cognitive Conditions and Complications
   - Exploring an individual's thoughts, emotions, and mental health issues

4. **Dimension 4**: Readiness to Change
   - Exploring an individual's readiness and interest in changing

5. **Dimension 5**: Relapse, Continued Use, or Continued Problem Potential
   - Exploring an individual's unique relationship with relapse or continued use or problems

6. **Dimension 6**: Recovery/Living Environment
   - Exploring an individual's recovery or living situation, and the surrounding people, places, and things

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6. **DIMENSION 6**
   - **Recovery/Living Environment**
   - Exploring an individual’s recovery or living situation, and the surrounding people, places, and things
Through this strength-based multidimensional assessment the ASAM criteria addresses the patient's needs, obstacles and liabilities, as well as the patient's strengths, assets, resources and support structure.
Screening

• Screening and Assessment of Co-occurring Disorders in the Justice System

• [http://store.samhsa.gov/product/SMA15-4930](http://store.samhsa.gov/product/SMA15-4930)
NIDA on SUD Treatment

- Principles of Drug Addiction Treatment: A Research-Based Guide (3rd Ed)

Principles of Effective Treatment

- **Addiction is a complex but treatable disease that affects brain function and behavior.** Drugs of abuse alter the brain’s structure and function, resulting in changes that persist long after drug use has ceased. This may explain why drug abusers are at risk for relapse even after long periods of abstinence and despite the potentially devastating consequences.

- **No single treatment is appropriate for everyone.** Treatment varies depending on the type of drug and the characteristics of the patients. Matching treatment settings, interventions, and services to an individual’s particular problems and needs is critical to his or her ultimate success in returning to productive functioning in the family, workplace, and society.
NIDA Principles Cont...

• **Treatment needs to be readily available.** Because drug-addicted individuals may be uncertain about entering treatment, taking advantage of available services the moment people are ready for treatment is critical. Potential patients can be lost if treatment is not immediately available or readily accessible. As with other chronic diseases, the earlier treatment is offered in the disease process, the greater the likelihood of positive outcomes.

• **Effective treatment attends to multiple needs of the individual, not just his or her drug abuse.** To be effective, treatment must address the individual’s drug abuse and any associated medical, psychological, social, vocational, and legal problems. It is also important that treatment be appropriate to the individual’s age, gender, ethnicity, and culture.
• Remaining in treatment for an adequate period of time is critical. The appropriate duration for an individual depends on the type and degree of the patient’s problems and needs. Research indicates that most addicted individuals need at least 3 months in treatment to significantly reduce or stop their drug use and that the best outcomes occur with longer durations of treatment. Recovery from drug addiction is a long-term process and frequently requires multiple episodes of treatment. As with other chronic illnesses, relapses to drug abuse can occur and should signal a need for treatment to be reinstated or adjusted. Because individuals often leave treatment prematurely, programs should include strategies to engage and keep patients in treatment.
Behavioral therapies—including individual, family, or group counseling—are the most commonly used forms of drug abuse treatment. Behavioral therapies vary in their focus and may involve addressing a patient’s motivation to change, providing incentives for abstinence, building skills to resist drug use, replacing drug-using activities with constructive and rewarding activities, improving problem-solving skills, and facilitating better interpersonal relationships. Also, participation in group therapy and other peer support programs during and following treatment can help maintain abstinence.
Medications are an important element of treatment for many patients, especially when combined with counseling and other behavioral therapies. For example, methadone, buprenorphine, and naltrexone (including a new long-acting formulation) are effective in helping individuals addicted to heroin or other opioids stabilize their lives and reduce their illicit drug use. Acamprosate, disulfiram, and naltrexone are medications approved for treating alcohol dependence. For persons addicted to nicotine, a nicotine replacement product (available as patches, gum, lozenges, or nasal spray) or an oral medication (such as bupropion or varenicline) can be an effective component of treatment when part of a comprehensive behavioral treatment program.
• An individual's treatment and services plan must be assessed continually and modified as necessary to ensure that it meets his or her changing needs. A patient may require varying combinations of services and treatment components during the course of treatment and recovery. In addition to counseling or psychotherapy, a patient may require medication, medical services, family therapy, parenting instruction, vocational rehabilitation, and/or social and legal services. For many patients, a continuing care approach provides the best results, with the treatment intensity varying according to a person’s changing needs.
Many drug-addicted individuals also have other mental disorders. Because drug abuse and addiction—both of which are mental disorders—often co-occur with other mental illnesses, patients presenting with one condition should be assessed for the other(s). And when these problems co-occur, treatment should address both (or all), including the use of medications as appropriate.

Medically assisted detoxification is only the first stage of addiction treatment and by itself does little to change long-term drug abuse. Although medically assisted detoxification can safely manage the acute physical symptoms of withdrawal and can, for some, pave the way for effective long-term addiction treatment, detoxification alone is rarely sufficient to help addicted individuals achieve long-term abstinence. Thus, patients should be encouraged to continue drug treatment following detoxification. Motivational enhancement and incentive strategies, begun at initial patient intake, can improve treatment engagement.
• **Treatment does not need to be voluntary to be effective.** Sanctions or enticements from family, employment settings, and/or the criminal justice system can significantly increase treatment entry, retention rates, and the ultimate success of drug treatment interventions.

• **Drug use during treatment must be monitored continuously, as lapses during treatment do occur.** Knowing their drug use is being monitored can be a powerful incentive for patients and can help them withstand urges to use drugs. Monitoring also provides an early indication of a return to drug use, signaling a possible need to adjust an individual’s treatment plan to better meet his or her needs.
• Treatment programs should test patients for the presence of HIV/AIDS, hepatitis B and C, tuberculosis, and other infectious diseases as well as provide targeted risk-reduction counseling, linking patients to treatment if necessary. Typically, drug abuse treatment addresses some of the drug-related behaviors that put people at risk of infectious diseases. Targeted counseling focused on reducing infectious disease risk can help patients further reduce or avoid substance-related and other high-risk behaviors. Counseling can also help those who are already infected to manage their illness. Moreover, engaging in substance
NREPP Recommendations

• 385 programs for SUD and BH, for example
• Adolescent Community Reinforcement Approach:
  – behavioral intervention that seeks to replace environmental contingencies that have supported alcohol or drug use with prosocial activities and behaviors that support recovery. Youth 12-22 years old with DSM-IV cannabis, alcohol, and/or other substance use disorders. A-CRA includes guidelines for three types of sessions: adolescents alone, parents/caregivers alone, and adolescents and parents/caregivers together.  http://legacy.nreppadmin.net/ViewIntervention.aspx?id=41
Evidence Informed Treatment

- Cannabis Youth Treatment Series
- Multiple volumes to address
• MATRIX model handbooks for stimulant disorders:
  http://store.samhsa.gov/list/series?name=Matrix-Manuals

• Evidence informed, the largest RCT did not find a significant difference

• Did provide some positive outcomes.
Evidence Based Practice

• RCT trial study for adult cannabis treatment:

• http://store.samhsa.gov/shin/content/SMA12-4211/SMA12-4211.pdf
As the first well-controlled multisite trial of manual-guided treatments for marijuana dependence, this study produced several noteworthy findings:

• The results of the randomized trial suggest that both a two-session motivational enhancement therapy (MET) treatment and a nine-session treatment incorporating MET, coping skills training, and case management were significantly more effective in reducing marijuana use than a control condition.

• The more intensive the treatment, the better the outcomes.

• Outcomes of these brief treatments were durable; data from a 1-year follow up of the treated groups demonstrated treatment’s sustained effect even after treatment termination.

• Reductions in drug use were linked to other positive outcomes (e.g., sustained reductions in marijuana-related problems).

• Treatment effects were robust across a number of participant characteristics, including gender and ethnicity.
SAMHSA TIP’s

• Best-practices guidelines for the treatment of substance use disorders, with manuals for clinicians, administrators and other service providers

• Tip Series Quick Guides
Treatment Meta Analysis

• Motivational Interventions (MET, brief motivational counseling (MI))

• CBT Interventions
  – (especially social skills: how to initiate social interactions, how to express thoughts/feelings, how to handle criticism, drug refusal skills)

• Community Reinforcement

• CM

• Marital or Family Behavioral Interventions
  • ** From A Guide to Treatments That Work. See Resource Section for Reference
Common Practice

- NREPP, SAMHSA, ASAM, Lit Review
- What are some similarities here that we can use for our treatment?
- Must be Motivational (not confrontational)
- CBT, CM, Community Reinforcement
- Include family/support component
- Address multiple needs
Sample EBP SUD list

- Motivational Interviewing – Miller and Rollnick
- Relapse Prevention – Marlatt
- CBT for SUD – Beck
- Self Help – Moos & Timko
- Harm Reduction – Denning and Little
- SBIRT - SAMHSA
- Contingency Management – Prendergast et al
- Seeking Safety – Najavits
Cultural Competence

- Overrepresentation in Justice System
- Underrepresentation in Mental Health
- SAMHSA Cultural Competence
  - [http://store.samhsa.gov/product/SMA16-4932](http://store.samhsa.gov/product/SMA16-4932)
Sample Initial Sessions

• Must use motivational techniques
• MI, MET, FFT
• Nonjudgmental stance
• Acceptance
• Seeking to understand
• Hearing client’s concerns and hopes
Sample Treatment Sessions

• Functional Analysis of Substance Use
  – Basically A-B-C of use:
    • Antecedents or Triggers
    • Behavior including amount
    • Consequences positive and negative

• Interventions based on A
  – Urge Surfing
  – Refusal skills
  – CBT for Anxiety or Depression
  – Relationship building with parents/significant others
  – Job Skills, Prosocial Activities…
  – Coping skills
Interventions Cont...

• Interventions Based on B
  – Assessment for detox needs, med referral, etc
  – Incompatible behaviors (school, friends, etc)
  – Sobriety Challenge

• Interventions Based on C
  – MUST replace positive consequences!!!!
  – Some programs do a full “Amends” list that looks at consequences in all major life areas: Family, Friends, Work, School, Financial, Health, Legal
Contingency Management

- Rewards for positive behaviors, such as abstinence
- Vouchers - worth monetary value and can be redeemed for goods or services consistent with a drug free lifestyle (movies, food).
- Prize incentives - chance to win money with each clean test.
- While CM is rewards based, can be graduated to increase with longer abstinence or attendance, fall back to baseline with positive test or missed group.

**Abstract**

**AIMS:** To examine the effectiveness of contingency management (CM) techniques in treating substance use disorders (i.e. illicit drugs, alcohol, tobacco).

**DESIGN:** Meta-analysis was used to determine the average effect size and potential moderators in 47 comparisons of the effectiveness of CM from studies based on a treatment-control group design and published between 1970 and 2002.

**FINDINGS:** The mean effect size (ES) of CM was positive, with a magnitude of $d = 0.42$ using a fixed effects model. The magnitude of the ES declined over time, following treatment. CM was more effective in treating opiate use ($d = 0.65$) and cocaine use ($d = 0.66$), compared with tobacco ($d = 0.31$) or multiple drugs ($d = 0.42$). Larger effect sizes were associated with higher researcher involvement, earlier studies and shorter treatment duration.

**CONCLUSIONS:** Study findings suggest that CM is among the more effective approaches to promoting abstinence during the treatment of substance use disorders. CM improves the ability of clients to remain abstinent, thereby allowing them to take fuller advantage of other clinical treatment components.
Resources


