Treating Addiction As A Chronic Disease

John F. Kelly, PhD, ABPP

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RECOVERY RESEARCH INSTITUTE

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From the “War on Drugs” to “The War on the War on Drugs”
Where are we now in addiction? From where have we come?
Shift toward Public Health approaches in addiction
Rationale for Addiction as Chronic Disease
Long-term Treatment and Recovery Support Services
1971

PUBLIC ENEMY NUMBER ONE
in the
United States
IS DRUG ABUSE

NIXON
Risks and Consequences with differing policies

Source: Canada Drug Policy Coalition, 2015
From “the War on drugs”

to… the “war on the ‘war on drugs’”….

BUT… not just about interdiction, supply reduction, incarceration….

It signaled a concerted Federal focus on the “drug problem” which also produced included demand reduction …
Quality control and supply reduction
Statement of Elinore F. McCance-Katz, MD, PhD, Assistant Secretary for Mental Health and Substance Use regarding the National Registry of Evidence-based Programs and Practices and SAMHSA's new approach to implementation of evidence-based practices (EBPs)

Thursday, January 11, 2018
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>Reorganizational Plan No. 2</td>
<td>Creation of the Drug Enforcement Agency (DEA), consolidating a number of different entities to form a single federal agency to enforce government drug control policy.</td>
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<tr>
<td>1996</td>
<td>Sober Truth on Preventing Underage Drinking Act (STOP Act)</td>
<td>Passed in 2006, the STOP act created a grant program to target underage drinking within communities &amp; established the federal Interagency Coordinating Committee on the Prevention of Underage Drinking (ICCPUD) with high-level leadership from across 15 federal agencies to coordinate government efforts to address underage drinking.</td>
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<tr>
<td>2006</td>
<td>Fair Sentencing Act</td>
<td>Passed in 2010, the act reduces the sentencing disparity between crack &amp; powder cocaine from 100:1 to an 18:1 ratio.</td>
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<td>2010</td>
<td>Comprehensive Addiction &amp; Recovery Act (CARA)</td>
<td>Passed in 2016, CARA increased access to overdose treatment, naloxone (overdose reversal medication), &amp; medication assisted treatments (MAT), reauthorized an opioid treatment program for pregnant &amp; postpartum women, &amp; allocated money for the creation of opioid epidemic response plans on the state level.</td>
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<tr>
<td>1970</td>
<td>Controlled Substances Act (CSA):</td>
<td>Part of the larger Comprehensive Drug Abuse Prevention &amp; Control Act of 1970, the CSA established U.S. drug control policy &amp; created 5 schedules (classifications) of drugs to determine the legality of a substance &amp; corresponding legal ramifications.</td>
</tr>
<tr>
<td>1986-1988</td>
<td>Anti-Drug Abuse Act</td>
<td>1st passed in 1986, &amp; then amended in 1988, the act created the policy goal of a drug-free America, created the Office of National Drug Control Policy (ONDCP), changed the federal probation &amp; release system from a rehabilitative to a punitive (punishment focused) model, enacted minimum mandatory sentencing for drug possession &amp; distribution (100:1 crack/powder cocaine sentencing disparity), &amp; prohibited controlled designer drugs.</td>
</tr>
<tr>
<td>2008</td>
<td>Mental Health Parity &amp; Addiction Equity Act (MHPAEA)</td>
<td>Enacted in 2008, the MHPAEA closed loopholes in the Mental Health Parity Act of 1996 by requiring insurance companies to offer coverage for mental &amp; substance use disorders that is equal to the coverage or benefits offered for other medical or surgical care (e.g. deductibles, co-pays, out-of-pocket maximums, treatment limitations).</td>
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<tr>
<td>2010</td>
<td>The Patient Protection &amp; Affordable Care Act (ACA)</td>
<td>Healthcare legislation enacted in 2010, declared substance use disorders 1 of the 10 elements of essential health benefits in the U.S., requiring that Medicaid &amp; all insurance plans sold on the Health Insurance Exchange provide services for addiction treatment equal to other medical procedures (closing insurance exemption gaps of the 2008 MHPAEA). Commonly referred to as the Affordable Care Act or “Obamacare”.</td>
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</tbody>
</table>
With 5% of the world’s pop, the US has 25% of its prisoners. Avg US cost per prison inmate = (2010) = $31K (range 14K–60K); about $16 Billion for the 500,000 drug-related prisoners (20% of all inmates).
Prisons overcrowding: 20% (500,000) of US prisoners are in prison due to drug offences; the majority of inmates meet criteria for substance use disorder/psych illness
ONDCP Director Kerlikowske declares move away from “war on drugs” toward broader public health approach.
Words matter

The words we use to describe drug and alcohol use disorders contribute to stigma around the conditions, psychologist John F. Kelly told attendees at a recent White House Conference on Drug Policy Reform.
Substance Use Disorder (SUD) may be most stigmatized condition around the world...

- Across 14 countries and 18 of the most stigmatized conditions... *(Centre for Social Research on Alcohol and Drugs)*
  - Illicit drug addiction ranked 1st
  - Alcohol addiction ranked 4th

- People hold more negative attitudes towards persons with SUD than mental illness. *(Barry et al., Psychiatric Services Journal)*

- People with SUD viewed as having themselves to blame for their disorder... *(Crisp et al., British Journal of Psychiatry)*
  - Only 7% rate people with schizophrenia in this way
Factors that influence stigma have language that is associated with them...

<table>
<thead>
<tr>
<th>Cause</th>
<th>Controllability</th>
<th>Stigma</th>
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<tbody>
<tr>
<td>“It’s not their fault”</td>
<td>“They can’t help it”</td>
<td>Decreases</td>
</tr>
<tr>
<td>“It is their fault”</td>
<td>“They really can help it”</td>
<td>Increases</td>
</tr>
</tbody>
</table>
CAUSE: If drugs are so pleasurable, why aren’t we all addicted? Genetically mediated reward sensitivity...

- Approx. 50% of the risk for addiction is genetic.
- Genetic differences affect the degree of reward people experience from different substances/activities.
- Genes also can be used to enhance the effectiveness in matching treatments.

[Graph showing the outcome of treatment for alcohol dependence, adapted from Oslin et al. Neuropsychopharmacology, 2003.]
CONTROLLABILITY: Addiction is a result of neurological changes ...

Key:
PFC - prefrontal cortex;
ACG - anterior cingulate gyrus;
OFC - orbitofrontal cortex;
SCC - subcallosal cortex;
NAc - nucleus accumbens;
VP - ventral pallidum;
Hipp - hippocampus;
Amyg - amygdala.

All of these brain regions must be considered in developing strategies to effectively treat addiction.
HUMAN BRAIN IMAGES

Moderate Drinker  Alcoholic

Axial magnetic resonance images from a healthy 57-year-old man (left) and a 57-year-old man with a history of alcoholism (right). D. Pfefferbaum
A disease of the brain, from which most people will recover....
The language we use reflects and influences our policies and approaches to addiction.
Different terms convey different meanings and can affect perceptions, cause, and controllability, punishment, or treatment.
Goes beyond mere “political correctness”
Can implicitly affect judgment that can perpetuate stigma/discrimination against addicted individuals.
People with eating–related conditions are always referred to as “having an eating disorder”, never as “food abusers”.

So why are people with substance–related conditions referred to as “substance abusers” and not as “having a substance use disorder”?
What can we do about stigma and discrimination in addiction?

- **Education** about essential nature of these conditions; but also stress that treatment and recovery supports help sustain remission, and a majority of people make full recoveries and have productive lives.

- **Personal witness** (putting a face and voice on recovery)

- **Change our language/terminology** to be consistent with the nature of the condition and the policies we wish to implement to address it.
Two commonly used terms...

- Major policy approaches ("war on drugs" vs. public health approaches) has corresponding rhetoric.

- Referring to someone as...
  - "a substance abuser" – implies willful misconduct (it is their fault and they can help it); because people are choosing to do it they should be punished
  - “having a substance use disorder” – implies a medical malfunction (it’s not their fault and they cannot help it) people are choosing NOT to do it but still do it (using AGAINST their will) they should be treated

- But, does it really matter how we refer to people with these (highly stigmatized) conditions?

- Can’t we just dismiss this as a well-meaning point, but merely “semantics” and “political correctness”?

How we talk and write about these conditions and individuals suffering them does matter

Does it matter how we refer to individuals with substance-related conditions? A randomized study of two commonly used terms

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ABSTRACT

Objective: Stigma is a frequently cited barrier to help-seeking for many with substance-related conditions. Common ways of describing individuals with such problems may perpetuate or diminish stigmatizing attitudes yet little research exists to inform this debate. We sought to determine whether referring to an individual as “a substance abuser” vs. “having a substance use disorder” evokes different judgments about behavioral self-regulation, social threat, and treatment vs. punishment.

Method: A randomized, between-subjects, cross-sectional design was utilized. Participants were asked to read a vignette containing one of the two terms and to rate their agreement with a number of related statements. Clinicians (N=516) attending two mental health conferences (63% female, 81% white, M age 51; 65% doctoral-level) completed the study (71% response rate). A Likert-scaled questionnaire with three subscales (“perpetrator-punishment” (α=.80); “social threat” (α=.86); “victim-treatment” (α=.64)) assessed the perceived causes of the problem, whether the character was a social threat, able to regulate substance use, and should receive therapeutic vs. punitive action.

Results: No differences were detected between groups on the social threat or victim-treatment subscales. However, a difference was detected on the perpetrator-punishment scale. Compared to those in the “substance use disorder” condition, those in the “substance abuser” condition agreed more with the notion that the character was personally culpable and that punitive measures should be taken.

Conclusions: Even among highly trained mental health professionals, exposure to these two commonly used terms evokes systematically different judgments. The commonly used “substance abuser” term may perpetuate stigmatizing attitudes.

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Compared to those in the “substance use disorder condition”, those in the “substance abuser” condition agreed with the idea that the individual was personally culpable and more in need of punishment.
Does Our Choice of Substance-Related Terms Influence Perceptions of Treatment Need? An Empirical Investigation with Two Commonly Used Terms

John F. Kelly, Sarah J. Dow, Cara Westerhoff

Substance-related terminology is often a contentious topic because certain terms may convey meanings that have stigmatizing consequences and present a barrier to treatment. Chief among these are the labels, "abuse" and "abuser." While intense rhetoric has persisted on this topic, little empirical information exists to inform this debate. We tested whether referring to an individual as "a substance abuser (SA)" versus "having a substance use disorder" (SUD) evokes different judgments about treatment need, punishment, social threat, problem etiology, and self-regulation. Participants (N = 314, 76% female, 81% White, M age 38) from an urban setting completed an online 35-item assessment comparing two individuals labeled with these terms. Dependent t-tests were used to examine subscale differences. Compared to the SUD individual, the SA was perceived as engaging in willful misconduct, a greater social threat, and more deserving of punishment. The "abuser" label may perpetuate stigmatizing attitudes and serve as a barrier to help-seeking.
Figure 1. Subscales comparing the “substance abuser” and “substance use disorder” descriptive labels

Implications

- Even well-trained doctoral clinicians judged *same individual* differently and *more punitively depending on* to which term they were exposed.

- **Use of the “abuser” term may activate an implicit cognitive bias** that perpetuates stigmatizing attitudes – these could have broad stroke societal ramifications for treatment/funding.

- Let’s learn from our colleagues treating allied disorders: **Individuals with “eating-related conditions” are uniformly described as “having an eating disorder” NEVER as “food abusers”**.

- Referring to individuals as suffering from **“substance use disorders”** is likely to diminish stigma and may enhance treatment and recovery.


Avoid “dirty,” “clean,” “abuser”

“Negative urine” test for drugs

A patient with diabetes has “an elevated glucose” level. A patient with cardiovascular disease has “a positive exercise tolerance test” result. A clinician within the health care setting addresses the results. An “addict” is not “clean”—he has been “abusing” drugs and has a “dirty” urine sample. Someone outside the system that cares for all other health conditions addresses the results. In the worst case, the drug use is addressed by incarceration.

On December 9, 2013, the first ever national drug policy reform summit was held at the White House. A major thrust of this summit was to mark a philosophical shift away from the “war on drugs” and toward a broader public health approach. Much of the summit was devoted to addressing the stigma surrounding addiction and the under-recognized importance of language.

Stigma is defined as an attribute, behavior, or condition that is socially discrediting. It is important because of the 23 million Americans who meet criteria for a substance use disorder each year, only 10% access treatment, and stigma is a major barrier to seeking help. A World Health Organization study of the 18 most stigmatized social problems (including criminal behavior) in 14 countries found that drug addiction was ranked number 1, and alcohol addiction was ranked number 4. Despite harmful consequences. Yet, despite evidence of a strong causal role for genetics and impairment in inhibitory control, stigma is alive and well. Research is now revealing that one contributory factor to the perpetuation of stigma may be the type of language we use.

Use of the more medically and scientifically accurate “substance use disorder” terminology is linked to a public health approach that captures the medical malfunction inherent in addiction. Use of this term may decrease stigma and increase help-seeking. In contrast, tough, punitive, language, including the word “war,” in “war on drugs,” is intended to send an uncompromising message, “You use, you lose,” in the hopes of deterring drug involvement. Accompanying this aggressive rhetoric are terms such as drug “abuse” and drug “abusers,” implying willful misconduct (ie, “they can help it and it is their fault”). This language increases stigma and reduces help-seeking.

Since the 1970s, such language has become the norm. Even our federal health institutions that address addictions have the term “abuse” in their names (eg, National Institute on Drug Abuse), and their materials often refer to affected individuals as substance “abusers.” But, does it really matter what we call it? Rhetorical opposition has persisted regarding the use of stigmatizing language, but there was

International Society of Addiction Journal Editors

ADDITION TERMINOLOGY STATEMENT

The International Society of Addiction Journal Editors recommends against the use of terminology that can stigmatize people who use alcohol, drugs, other addictive substances or who have an addictive behavior.

Rationale: Terms that stigmatize can affect the perception and behavior of patients/clients, their loved ones, the general public, scientists, and clinicians (Brayles et al., 2014; Kelly, Dow, & Westerhoff, 2010). Kelly, Wakeman, & Saltz (2015) found that the terms used to refer to individuals with substance-related conditions affected clinician perceptions. Clinicians who read a clinical vignette about “abuse” and an “abuser” agreed more with notions of personal culpability and an approach that involved punishment than did those who read an identical vignette that replaced “abuse” and “abuser” with “substance use disorder” and “person with a substance use disorder.”

ISAJE is aware that terminology in the addiction field varies across cultures and countries and over time. It is thus not possible to give globally relevant recommendations about the use or non-use of specific terms. “Abuse” and “abuser” or equivalent words in other languages should, however, in general be avoided, unless there is particular scientific justification (an example of scientific justification of the use of “abuse” is when referring to a person who meets criteria for a Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, alcohol abuse; that person would be said to have “alcohol abuse”). Another example of stigmatizing language is describing people as “dirty” (or “clean”) because of a urinalysis that finds the presence (or absence) of a drug (Kelly, Wakeman & Saltz, 2015). Instead, the test results and clinical condition should be described.

The above was approved by the International Society of Addiction Journal Editors at its 2015 annual meeting (Budapest, Hungary, August 31-September 2, 2015).

References


ADDICTIONARY

IF WE WANT ADDICTION DESTIGMATIZED,
WE NEED A LANGUAGE THAT'S
UNIFIED.

The words we use matter. Caution needs to be taken, especially when the disorders concerned are heavily stigmatized as in substance use disorders.
The clinical course of addiction and achievement of stable recovery can take a long time …

- Addiction Onset
- Help Seeking
- Full Sustained Remission (1 year abstinent)
- Relapse Risk drops below 15%

- 4-5 years
- 8 years
- 5 years

- Self-initiated cessation attempts
- 4-5 Treatment episodes/mutual-help
- Continuing care/mutual-help

Recovery Priming
Recovery Mentoring
Recovery Monitoring

50–60% of individuals with addiction will achieve full sustained remission
Why are treatments of addiction & hypertension evaluated differently?

The successful treatment of hypertension is seen as an ongoing process. The successful treatment of addiction is seen as something that begins after treatment stops.
Traditional addiction treatment approach: Burning building analogy

- **Putting out the fire** – good job (detox/stabilization/cessation)

- **Preventing it from re-igniting** (relapse prevention) – less good

- **Architectural planning** (recovery plan) – almost totally neglected

- **Re-building materials** (recovery capital) – largely absent

- **Granting “rebuilding permits”** – (removing legal/structural barriers to recovery capital e.g., criminal records) – rarely considered/poor job
More stress and lowered ability to experience normal pleasures

Increased sensitivity to stress via…

- Increased activity in hypothalamic–pituitary–adrenal axis (HPA-axis) and CRF/Cortisol release

Lowered ability to experience normal levels of reward via…

- Down-regulated dopamine D2 receptor volume increasing risk of protracted dysphoria/anhedonia and relapse risk
Physiological Theories

General Adaptation Syndrome
(Selye, 1956)

Alarm—— Resistance—— Exhaustion
To help offset long-term relapse risk, a number of indigenous community-based treatment and recovery support services have emerged and grown; these help build “recovery capital” to sustain remission.
Changing the “soil” of communities so that recovery can grow and flourish

- Recovery community centers
- Recovery supports in educational settings
- Clinical models of long-term recovery management
- Mutual help organizations
- Peer-based recovery support services
- Sober living environments
Clinically, we are trained to address the psychiatric and medical pathology; RSSs address recovery capital....

Example:

Clinical Pathology: Two 30 yr old men enter treatment with clinically identical levels of severity of opioid and alcohol addiction and psychiatric and medical problems and report the same level of distress and impairment

Treatment Plan: Patients are matched based on these clinical profiles to receive the same array of interventions to address clinical needs
Clinically, we are trained to address the psychiatric and medical pathology; RSSs address recovery capital.

But....

One man is single, he’s from a neighborhood that has a high crime rate/drug and alcohol-related arrests; he didn’t graduate High School, has a father with active AUD with whom he lives, and is unemployed with a criminal record.

The other is from a low crime neighborhood, is married with two children, a supportive family, has a master degree and is employed as an engineer with a good job and income. His father has 17yrs of sobriety in AA.

Which is more likely to achieve and sustain remission?

Move from a “Treatment Plan” to “Recovery Plan” based on pathology AND available recovery capital.
Treating Addiction as a Chronic Disease: Treatment and Recovery Support Services

- Mutual help organizations
- Peer-based recovery support services
- Sober living environments
- Clinical models of long-term recovery management
- Recovery community centers
- Recovery supports in educational settings
Mutual help Organizations

- Recovery supports in educational settings
- Recovery community centers
- Clinical models of long-term recovery management
- Peer-based recovery support services
- Sober living environments
In past 25 years, MHO research has gone from contemporaneous correlational research to rigorous RCTs.
Facilitating involvement in Alcoholics Anonymous during out-patient treatment: a randomized clinical trial

Kimberly S. Walitzer, Kurt H. Dermen & Christopher Barrick
Research Institute on Addictions/University at Buffalo, The State University of New York, Buffalo, NY, USA

Addiction (1998) 93(9), 1313–1333

RESEARCH REPORT

Network support for drinking Anonymous and long-term

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²George Washington University, Washington, DC, ³University of Wisconsin-Milwaukee, Center for Addiction & Behavioral Health Research, Milwaukee, WI, ⁴Brown University and Butler Hospital, Center for Alcohol & Addiction Studies, Providence, RI, USA

Abstract
Aims. (1) To examine the matching hypothesis that Twelve Step Facilitation Therapy (TSF) is more
Empirically-supported MOBCs through which AA confers benefit

- AA participation in turn is explained by these factors which are similar to the mechanisms operating in formal treatment...

- Social network
- Spirituality
- Recovery motivation
- Coping skills
- Negative Affect Abstinence self-efficacy
- Impulsivity
- Craving
Also, state of the art instrumental variables analyses, as well as propensity score matching (Ye and Kaskutas, 2013) that help to remove self-selection biases, indicate AA has a causal impact on enhancing abstinence and remission rates.
Linkage to MHO like AA can lead to much higher rates of full sustained remission
(Project MATCH, 1997)

Continuous Abstinence Rates during year following treatment (4-15 Months)

Continuous Abstinence Rates past 90 days- 3 Years

TSF treatment can lead to much higher rates of full sustained remission
Compared to CBT-treated patients, 12-step treated patients more likely to be abstinent, at a $8,000 lower cost per pt over 2 yrs ($10M total savings)

Also, higher remission rates, means decreased disease and deaths, increased quality of life for sufferers and their families
Peer–based Recovery Support Services

- Mutual help organizations
- Peer–based recovery support services
- Recovery community centers
- Recovery supports in educational settings
- Clinical models of long–term recovery management
- Sober living environments
Formal Peer Support: Recovery Coaching

- Interacting with peers who have lived experience of addiction and long-term recovery and who support recovery help reduce relapse risk. They can facilitate…
  - Acquisition of coping skills
  - Increases in abstinence self-efficacy
  - Maintenance of recovery motivation
  - Serve as a healthy recovery role model and social contact
  - Provide community service
  - Linkages and emotional support
Sober Living Environments
Peer Run/Self-Governing

- Recovery community centers
- Clinical models of long-term recovery management
- Sober living environments
- Peer-based recovery support services
- Mutual help organizations
- Recovery supports in educational settings
Societal Benefits of Oxford Houses

- **Sample**: 150 individual completing treatment in the Chicago metropolitan area
- **Design**: Randomized controlled trial
- **Intervention**: Oxford House vs. community-based aftercare services (usual care)
- **Follow-up**: 2 years
- **Outcome**: Substance use, monthly income, incarceration rates

Oxford Houses are democratic, mutual help-oriented recovery homes for individuals with substance abuse histories. There are more than 1200 of these houses in the United States, and each home is operated independently by its residents, without help from professional staff.

In a recent experiment, 150 individuals in Illinois were randomly assigned to either an Oxford House or usual-care condition (i.e., outpatient treatment or self-help groups) after substance abuse treatment discharge. At the 24-month follow-up, those in the Oxford House condition compared with the usual-care condition had significantly lower substance use, significantly higher monthly income, and significantly lower incarceration rates. (Am J Public Health. 2006;96:1727–1729. doi:10.2105/AJPH.2005.070839)
Sober Living Environments are effective...
Oxford House vs. Usual Care

Sober living had –

- half as many individuals using substances across 2 yr follow up as usual care
- 50% more likely to be employed
- 1/3 re-incarceration rate
...and, cost–effective
Mean per–person societal benefits and costs

Net benefit for Oxford House per participant: $29,022.00
Clinical Models of Long-term Recovery Management

- Mutual help organizations
- Peer-based recovery support services
- Recovery supports in educational settings
- Recovery community centers
- Sober living environments
- Clinical models of long-term recovery management
Recover Management Check–ups

4–year outcomes from the Early Re–Intervention experiment using Recovery Management Checkups

- N=446 adults with SUD, mean age = 38, 54% male, 85% African–American
  - randomly assigned to two conditions:
    - quarterly assessment only
    - quarterly assessment plus RMC

- Recovery Management Checkups

  - Linkage manager who used MI to review participant’s substance use, discuss treatment barrier/solutions, schedule an appointment for treatment re–entry, and accompany participant through the intake

  - If participants reported no substance use in previous quarter, linkage manager reviewed how abstinence has changed their lives and what methods have worked to maintain abstinence

Source: Dennis & Scott (2012). Drug and Alcohol Dependence, 121, 10–17
Results 1
Return to treatment

• Participants in RMC condition sig. more likely to return to treatment sooner

Of 18 vars tested, the only variables that predicted return to treatment was the intervention.

Source: Dennis & Scott (2012). Drug and Alcohol Dependence, 121, 10–17
Cost-effectiveness analysis of Recovery Management Checkups (RMC) for adults with chronic substance use disorders: evidence from a 4-year randomized trial

Kathryn E. McCollister¹, Michael T. French², Derek M. Freitas³, Michael L. Dennis⁴, Christy K. Scott⁵ & Rodney R. Funk⁴

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ABSTRACT

Aims This study performs the first cost-effectiveness analysis (CEA) of Recovery Management Checkups (RMC) for adults with chronic substance use disorders. Design Cost-effectiveness analysis of a randomized clinical trial of RMC. Participants were assigned randomly to a control condition of outcome monitoring (OM-only) or the experimental condition OM-plus-RMC, with quarterly follow-up for 4 years. Setting Participants were recruited from the largest central intake unit for substance abuse treatment in Chicago, Illinois, USA. Participants A total of 446 participants who were 38 years old on average, 54% male, and predominantly African American (85%). Measurements Data on the quarterly cost per participant come from a previous study of OM and RMC intervention costs. Effectiveness is measured as the number of days of abstinence and number of substance use-related problems. Findings Over the 4-year trial, OM-plus-RMC cost on average $2184 more than OM-only (P < 0.01). Participants in OM-plus-RMC averaged 1026 days abstinent and had 89 substance use-related problems. OM-only averaged 932 days abstinent and reported 126 substance use-related problems. Mean differences for both effectiveness measures were statistically significant (P < 0.01). The incremental cost-effectiveness ratio for OM-plus-RMC was $23.38 per day abstinent and $59.51 per reduced substance-related problem. When additional costs to society were factored into the analysis, OM-plus-RMC was less costly and more effective than OM-only. Conclusions Recovery Management Checkups are a cost-effective and potentially cost-saving strategy for promoting abstinence and reducing substance use-related problems among chronic substance users.

Keywords Chronic substance use disorder, cost-effectiveness analysis, economic evaluation, Recovery Management Checkups.

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Submitted 10 January 2013; initial review completed 26 March 2013; final version accepted 8 August 2013
FDA approved medications for opioids and alcohol...
SAMPLE
375 individuals who participated in the Prescription Opioid Addiction Treatment Study (POATS; n = 653), a multi-site RCT, and also enrolled in the follow-up study

• Met DSM-IV criteria for OUD due to prescription opioid use, were not on opioid agonist therapy and had not used heroin over 4 times in the 30 days prior to enrolling in POATS

DESIGN
Study staff conducted telephone interviews with participants 18, 30, and 42 months after participants entered the first phase of the study

OUTCOMES
Substance use, current opioid dependence, overall health and pain

RESULTS
• 8% of participants reported using heroin for the first time during the follow-up period
• Participants who reported a lifetime history of heroin use at baseline were more likely to meet DSM-IV criteria for opioid dependence at 42 months
  • However 66.7% of participants who reported lifetime heroin use at baseline did not report heroin use in the follow-up period
• At 42 months, 31.7% of participants were abstinent from opioids and not on agonist therapy

Recovery Community Centers

- Mutual help organizations
- Peer-based recovery support services
- Sober living environments
- Clinical models of long-term recovery management
- Recovery community centers
- Recovery supports in educational settings

Recovery

Connecticut Community
Anchor
Recovery Community Center
Peer-to-peer support services

HOPE for New Hampshire Recovery

Philadelphia Recovery Community Center
Recovery Community Centers are...

- locatable sources of community-based recovery support beyond the clinical setting, helping members achieve sustained recovery by building and successfully mobilizing personal, social, environmental, and cultural resources.
There are currently more than 80 centers operating nationally
There are 35 centers currently operating throughout New England and New York.

RCCs in New York and New England
Principles of RCCs

Source of recovery capital at the community level

- Provide different services than formal treatment
- Offer more formal and tangible linkages to social services, employment, training and educational agencies than do mutual-help organizations

There are many pathways to recovery

- RCCs are not allied with any specific recovery philosophy or model
Services offered

- All Recovery Meetings
- Telephone Recovery Support
- Recovery Coaching
- Family Support Groups
- Recovery Trainings
- Access to resources
Center Referral Sources

RCC members are referred to the centers from a variety of sources. Other referral sources include word of mouth (e.g., friends and family).
Members’ Primary Substance Problems

Director estimates cite heroin and other opioids (45%) and alcohol (32%) as the most prevalent primary substances used by center members.
Recovery Supports In Educational Settings

- Recovery supports in educational settings
- Mutual help organizations
- Peer-based recovery support services
- Sober living environments
- Clinical models of long-term recovery management
- Recovery community centers
Recovery High Schools....

- are secondary schools designed specifically for students in recovery from SUD.
- Each school operates differently depending on available community resources and state standards, but each recovery high school shares the following goals:
  - To educate all students in recovery from SUD and/or co-occurring disorders
  - To meet state requirements for awarding a secondary school diploma
  - To support students in working a strong program of recovery
Methods: Quasi-experiment comparing outcomes for treated adolescents who attended RHSs for at least 28 days

N=194 (134 in RHSs, 60 in non-RHSs) enrolled in Minnesota, Wisconsin, or Texas schools (M age = 16; 86% White; 49% female).

Results: Adolescents attending RHSs 4x more likely than non-RHS students to report complete abstinence from alcohol, marijuana, and other drugs at the 6-month follow-up (OR = 4.36, p = .026), significantly lower levels of marijuana use (d = −0.51, p = .034) and less absenteeism from school (d = −0.56, p = .028).
There are almost 50 CRPs recognized by Association of Recovery in Higher Education (ARHE)

Data in two model programs suggests relapse rates are very low at approximately 4% to 13% in any given semester

Laudet et al., 2014
RELAPSE

Cue Induced

Stress Induced

Substance Induced

Social

Psych

BioNeuro

Treatment and Recovery Support Services

Kelly, JF Yeterian, JD In: McCrady and Epstein Addictions: A comprehensive Guidebook, Oxford University Press (2013)
Three types of social support

- **Emotional** – warmth/nurturance provided by sources of support; offering of empathy, concern, affection, trust etc.

- **Instrumental** – provision of material goods, or services, money

- **Informational** – advice, guidance, suggestions
Post–acute withdrawal effects:

- More stress and lowered ability to experience normal pleasures

Increased sensitivity to stress via...

- Increased activity in hypothalamic–pituitary–adrenal axis (HPA–axis) and CRF/Cortisol release

Lowered ability to experience normal levels of reward via...

- Down-regulated dopamine D2/D3 receptor availability -- increasing risk of protracted dysphoria/anhedonia and relapse risk
Stress-buffering effects of social relationships – one of the major findings of past century

Mechanisms of this poorly understood
How do social relationships influence health?

The Stress Buffering Model

- Social support buffers (i.e., moderates) the negative effects of stressors on health by providing resources (i.e., emotional, tangible, informational) that promote adaptive behavioral or neuroendocrine responses to acute or chronic stressors.
• Widespread differences in the ways in which people respond to similar stressors

• **Social support** may help explain some of the difference in individual stress responses, for example, it’s believed that:
  
  • There is a relationship between social support and **basal levels of stress hormones** (e.g., salivary cortisol)
  
  • Social support may help dampen the **hypothalamic-pituitary-adrenocortical (HPA)** axis response to stressors

Social relationships have “stress-buffering” effects…

**SOCIAL SUPPORT:**
“…information leading the subject to believe that he [she] is cared for and loved, esteemed, and a member of a network of mutual obligations” (Cobb, 1976, p. 300)
...and researchers have started to examine possible neurobiological connections between social support and individual stress responses.

Figure 1. A Developmental Working Model of Social Buffering of the HPA Axis in Humans

OT = oxytocin, vmPFC = ventro-medial prefrontal cortex, Epi = epinephrine, NE = norepinephrine
Prairie voles are very social, monogamous, creatures; and like alcohol

Isolated prairie voles given 10% alcohol for 4 wks, followed by deprivation; then either kept isolated or housed with familiar same-sex social partner

Isolated voles increased alcohol use but socially housed voles did not show increase.

Voles display an alcohol deprivation/"relapse" effect that may be moderated by social re-integration, and mediated neurobiologically by decreased CRF
Following re-introduction of alcohol, isolated voles increased use but socially housed voles did not.
Post-acute withdrawal effects:

- More stress and lowered ability to experience normal pleasures

  Increased sensitivity to stress via...
  - Increased activity in hypothalamic–pituitary–adrenal axis (HPA-axis) and CRF/Cortisol release

  Lowered ability to experience normal levels of reward via...
  - Down-regulated dopamine D2/D3 receptor availability -- increasing risk of protracted dysphoria/anhedonia and relapse risk
Several empirical studies support the notion that social reward is processed in the same subcortical network as non-social reward and drug addiction.

There is evidence from several studies that dopaminergic reward circuits in the basal ganglia form the primary neural system for processing reward of various social stimuli which could motivate social behavior.
If addiction is a disease of the brain, could jobs, recovery housing, and social networks/friends, change the brain, upregulate down-regulated receptor systems, and increase the chances of long-term remission?
**D2/D3 RECEPTOR BINDING & SOCIAL STATUS AND SUPPORT**

**AIM**
Assess whether D2/3 receptor levels correlate with social status and social support (particularly, to determine if low social status and low social support correlate with low D2/3 receptor binding)

**SAMPLE**
N = 14 healthy participants (i.e., non-smoking with no Axis I disorders, significant medical conditions, or use of medications before the scan) who were scanned using positron emission tomography (PET) imaging to measure D2/3 receptor binding potential (BP)

**MEASURES**
- Barratt Simplified Measure of Social Status (BMSSS) to measure social status
- Scale of Perceived Social Support (MSPSS) to measure social support
- [11C]raclopride to measure D2/3 receptor binding in the striatum

**OUTCOMES**
- Positive correlation between D2/3 receptor binding potential and social status
- Positive correlation between D2/3 receptor binding potential and perceived social support
- Results similar to prior studies of nonhuman primates, which show higher D2/3 receptor levels in monkeys who are dominant in their social hierarchy, compared to those who are subordinate

**REFERENCES**
D2/D3 receptor binding increases as social status increases.

D2/D3 receptor binding increases as social support increases.

Monkeys, like humans, love to be with each Other, and also like cocaine…

Disruption of the dopaminergic system has been implicated in the etiology of many pathological conditions, including drug addiction. Here we used positron emission tomography (PET) imaging to study brain dopaminergic function in individually housed and in socially housed cynomolgus macaques (n = 20). Whereas the monkeys did not differ during individual housing, social housing increased the amount or availability of dopamine D2 receptors in dominant monkeys and produced no change in subordinate monkeys. These neurobiological changes had an important behavioral influence as demonstrated by the finding that cocaine functioned as a reinforcer in subordinate but not dominant monkeys. These data demonstrate that alterations in an organism’s environment can produce profound biological changes that have important behavioral associations, including vulnerability to cocaine addiction.
When all monkeys were individually housed no difference in DA D2 receptor volume.

After 3 months of social housing, dominant monkeys showed 22% increase in DA D2 volume; subordinate monkeys – no change.

Increase in DA D2 associated with lower likelihood of cocaine use.

“Dominance” defined as: easy access to food and water, social mobility, and greater environmental control.

Human Implications: facilitating greater access to and availability of recovery capital may instill hope, empower people, help them have more control over their environment, increase social contact and social mobility through the environment, and thereby induce neurochemical changes that reduces relapse risk.

**Table 1. Dopaminergic characteristics of monkeys.**

<table>
<thead>
<tr>
<th>Social rank</th>
<th>[18F]FCP distribution volume ratios</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individually housed</td>
<td>Socially housed</td>
</tr>
<tr>
<td>1</td>
<td>2.49 ± 0.08</td>
<td>3.04 ± 0.23</td>
</tr>
<tr>
<td>2</td>
<td>2.58 ± 0.13</td>
<td>2.99 ± 0.13</td>
</tr>
<tr>
<td>3</td>
<td>2.58 ± 0.13</td>
<td>2.88 ± 0.30</td>
</tr>
<tr>
<td>4</td>
<td>2.40 ± 0.06</td>
<td>2.49 ± 0.10</td>
</tr>
</tbody>
</table>

Mean ± s.e.m. [18F]FCP DVR as determined with PET imaging in male cynomolgus monkeys as a function of social rank while individually and socially housed. a For individually housed scans, these numbers represent eventual social rank. b Significantly higher than individually housed ‘dominants.’ c Significantly higher than socially housed subordinates.
Summary
Treating Addiction as a Chronic Disease

- RSSs open up new pathways to recovery and can enhance and extend the effects of professionally-delivered care by:
  - Helping change social networks towards those that model and support recovery in the communities in which people live
  - Helping build resilience, buffer stress, and increase recovery coping, confidence and motivation over the long-term
  - Help individuals build further “recovery capital” by providing supports in high risk educational environments like colleges/high schools, providing linkages to employment opportunities, and health/social services
  - Providing ongoing recovery-specific support at little cost reducing burden on professional health services while enhancing remission rates, thereby reducing health care costs.