



Addiction Recovery: From Culture to Science

**Society for the Study of Addiction (SSA)
Society Lecture**

November 2021

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**RECOVERY
RESEARCH
INSTITUTE**



**MASSACHUSETTS
GENERAL HOSPITAL**



**HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL**

Outline



Definition - From cultural generality to formal clinical/public health and research definitions



Rationale - How did we get here? A rationale for the new public health and scientific focus on addiction “recovery”



Recovery Support Services and Recovery Capital – facilitating supportive environments and recovery capital



Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?



Insights - Some novel findings from recovery research



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Endemic problems related to alcohol and other drugs

Mortality

Disease

Disability

Social

Legal

Economic

Recovery Definition

From cultural
generality to formal
clinical/public
health/research
definition

...

- General cultural use is as a positively valanced term - captures set of salubrious changes that often occur with remission from variety of health problems (e.g., “recovering from cancer/cold/broken leg”)
- Addiction “recovery” implies not just subtraction of symptoms, but addition of new elements reflecting improvements that exceed premorbid functioning (e.g., self-actualization; “better than well”; Hibbert and Best, 2011)
- More than “just abstinence” or “reductions in problem use”; rather, an enriched quality of life, and sense of well-being, a positive existential shift with renewed meaning/purpose
- Recovering persons describe new levels of functioning not just in spite of, but because of, having experienced the condition

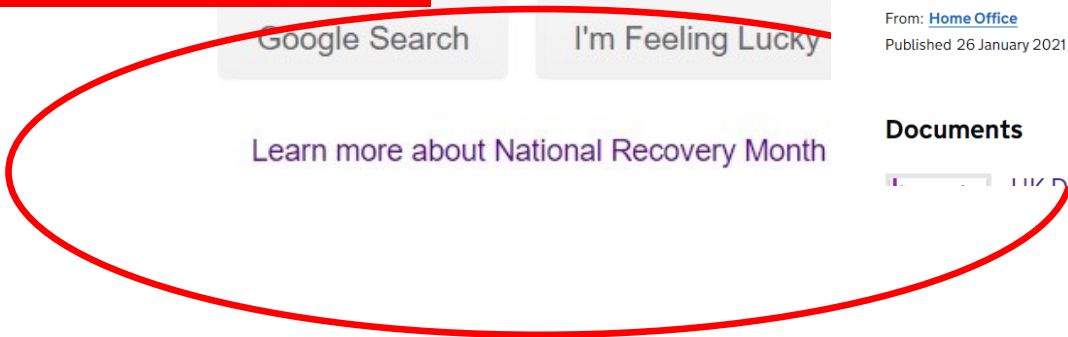
On Defining “Recovery” – Cultural Status



NATIONAL
RECOVERY
MONTH 2020



September 2020 and 2021
Google featured Recovery Month
on its main landing search page



GOV.UK Topics Departments Government activity

→ Coronavirus (COVID-19) | Guidance and support

Home > Health and social care > Public health > Health improvement > Drug misuse and dependency

Corporate report
UK government Drug Recovery Champion annual report

The first annual report from the UK Recovery Champion outlines the work he has undertaken since his appointment and sets out his future work programme.

From: [Home Office](#)
Published 26 January 2021

Documents

[UK Drug Recovery Champion first annual](#)

Brexit
[Check what you need to do](#)

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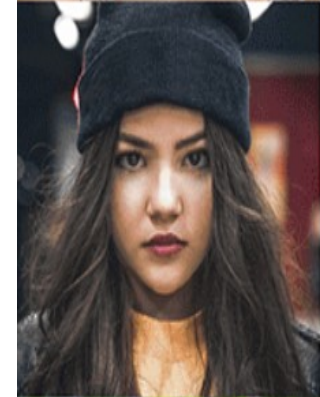
2021 Marked 32 years Recovery Month in the United States



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[home](#) [events](#) [community](#) [downloads](#) [faces & voices of recovery](#)



RECOVERY IS FOR EVERYONE:
Every **Person**, Every **Family**, Every **Community**

- U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) announces new Office of Recovery (Sept, 2021)

- New legislation mandates 10% of all state block grant funds must be used for recovery support services...




U.S. Department of Health & Human Services

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Substance Abuse and Mental Health
Services Administration

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- Statements
- Logo Use Guidelines

SAMHSA to Launch New "Office of Recovery" to Expand Its Commitment to Recovery for All Americans

Thursday, September 30, 2021

The Substance Abuse and Mental Health Services Administration (SAMHSA) is launching an Office of Recovery, within the Office of the Assistant Secretary for Mental Health and Substance Use, to advance the agency's commitment to, and support of, recovery for all Americans. September marks National Recovery Month, and in organizing this new office, SAMHSA will now have a dedicated team with a deep understanding of recovery to promote policies, programs and services to those in or seeking recovery.

"We have identified recovery as a crosscutting principle throughout SAMHSA's policies and programs," said Miriam E. Delphin-Rittmon, Ph.D., the U.S. Department of Health and Human Services Assistant Secretary for Mental Health and Substance Use and the leader of SAMHSA. "In standing up this new office, SAMHSA is committed to growing and expanding recovery support services nationwide."

Recovery is enhanced by peer-delivered services. These peer support services have proven to be effective as the support, outreach and engagement with new networks help sustain recovery over the long term. Peer services are critical, given the significant workforce shortages in behavioral health. SAMHSA's new Office of Recovery will promote the involvement of people with lived experience throughout agency and stakeholder activities, foster relationships with internal and external organizations in the mental health and addiction recovery fields and identify health disparities in high-risk and vulnerable populations to ensure equity for support services across the Nation.

"SAMHSA believes in recovery and recognizes the importance of including families, loved ones and allies," said

Source	Definition
SAMHSA	A process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential.
ASAM	Recovery from addiction is an active process of continual growth that addresses the biological, psychological, social and spiritual disturbances inherent in addiction...
Recovery Science Research Collaborative	Recovery is an individualized, intentional, dynamic, and relational process involving sustained efforts to improve wellness.
UK Drug Policy Commission	The process of recovery from problematic substance use is characterized by voluntarily-sustained control over substance use which maximizes health and wellbeing and participation in the rights, roles and responsibilities of society.
William L. White	Recovery is the experience (a process and a sustained status) through which individuals, families, and communities impacted by severe alcohol and other drug (AOD) problems utilize internal and external resources to voluntarily resolve these problems, heal the wounds inflicted by AOD-related problems, actively manage their continued vulnerability to such problems, and develop a healthy, productive, and meaningful life.
National Institute on Drug Abuse	Research on the science of addiction and the treatment of substance use disorders has led to the development of research-based methods that help people to stop using drugs and resume productive lives, also known as being in <i>recovery</i>.
Betty Ford Institute	Recovery is a “voluntarily maintained lifestyle characterized by sobriety, personal health, and citizenship.”
Alexandre B. Laudet	“...recovery goes well beyond abstinence ...experienced as a bountiful ‘new life’, an ongoing process of growth, self-change and of reclaiming the self.”

Most recognize
that recovery is
a process and
is both
dimensional
and a
category....

- “Recovery” describes a process of salubrious change that occurs as individuals attempt to resolve AOD problems
- “Recovery” also a category (“in recovery”); at some point people consider themselves “in recovery” but previously did not
- Like “remission”, also potentially different degrees of “recovery” that may be marked by time (alone) that suggest more stable “recovery” with greater time, but...
- Currently missing - markers of resilience beyond just “time”; which remission-based factors are indicative of continued remission vs elevated risk of relapse/reinstatement (e.g., resiliency/vulnerability)?

Utility and Challenges: On “defining” ...

- Jellinek (1960) on “definitions” ...

“...there are more definitions of the word ‘definition’ in the dictionary than alcoholism, and this should communicate that definition, of itself, is nothing sacred, and cannot be disputed for correctness, unless it goes against the rules of the defining process, but one can argue about its utility”

- Who gets to or should define it? Should it be left to individual sufferers themselves... more along the lines of “you’re in recovery when you say you are”?
- VS. researchers/clinicians designating a “recovery” category in which people will fit or not? (like diagnostic remission)

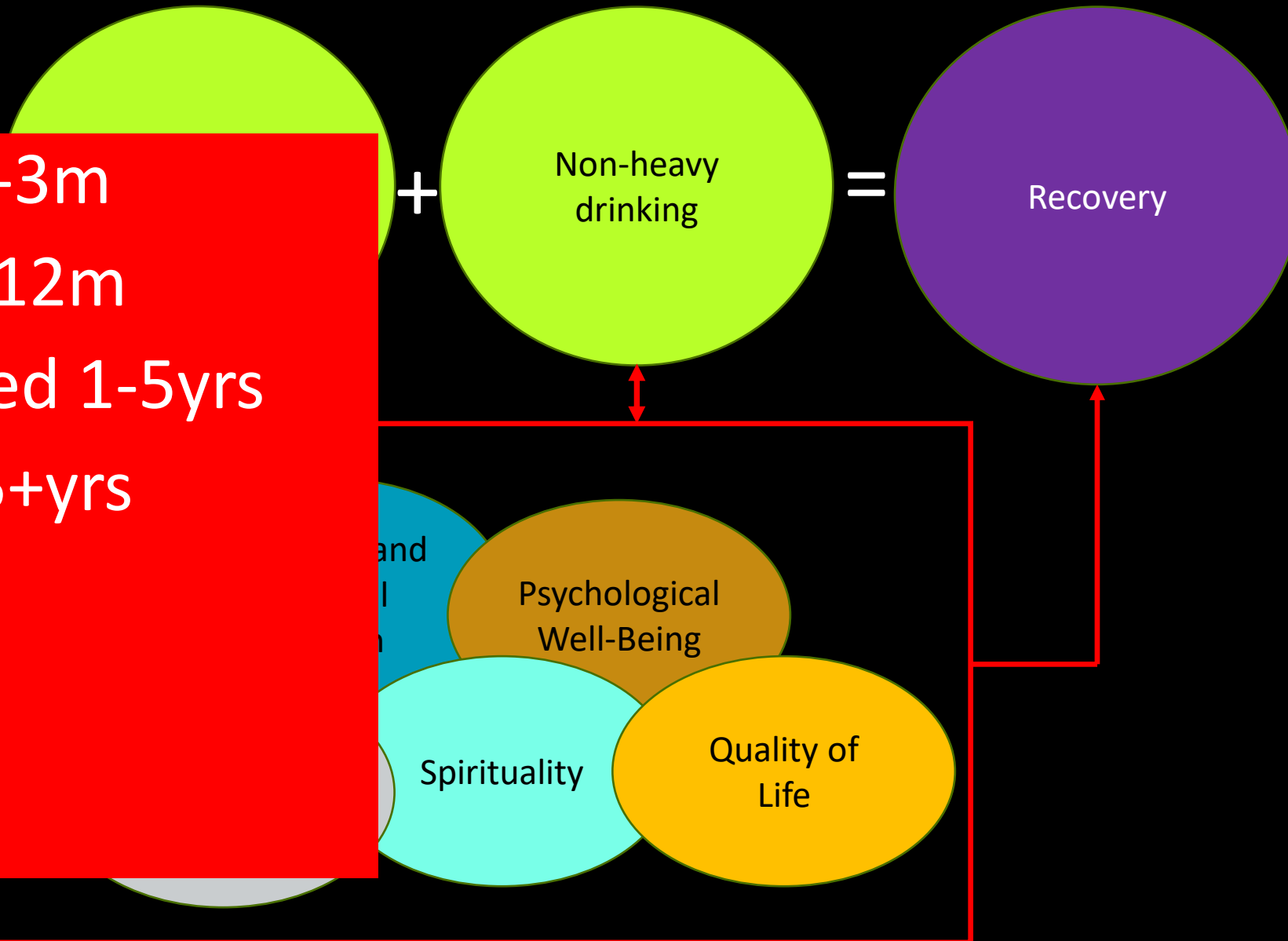
***NIAAA Definition:
Recovery from
AUD***

“Recovery is a process through which an individual pursues both remission from AUD and cessation from heavy drinking. An individual may be considered “recovered” if both remission from AUD and cessation from heavy drinking are achieved and maintained over time.”

“For those experiencing alcohol-related functional impairment and other adverse consequences, recovery is often marked by the fulfillment of basic needs, enhancements in social support and spirituality, and improvements in physical and mental health, quality of life, and other dimensions of well-being. Continued improvement in these domains may, in turn, promote sustained recovery.”

NIAAA Definition of "Recovery" and Additional Components

- Initial 0-3m
- Early 4-12m
- Sustained 1-5yrs
- Stable 5+yrs





NIAAA definition...Utility and Challenges

- Adds scientific legitimacy to cultural concept of “recovery”
- Opens door to recovery research paradigm that will investigate dynamic interplay of remission, heavy alcohol use, recovery capital, and functioning/QOL, beyond alcohol outcomes alone
- Moves away from complete “abstinence” alone as primary endpoint; acknowledges that remission is not enough – other factors important - have reciprocal relation with remission
- Including all its features - accurately conceptualizes many of the component parts of what many consider “recovery”, but only partly operationalizes these (e.g., with regard to remission/non-harmful use, which are specified as necessary and sufficient for “recovery” to be achieved).

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Insights - Some novel findings from research



50 years....
1971-2021





NIAAA
National Institute on Alcohol
Abuse and Alcoholism



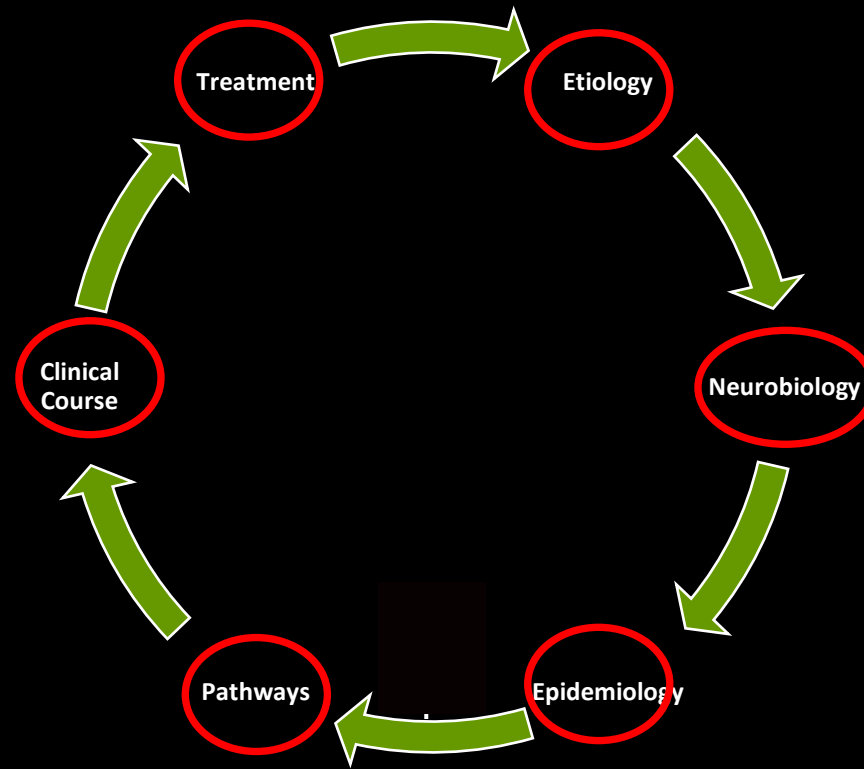
NIDA
NATIONAL INSTITUTE
ON DRUG ABUSE

CSAT
Center for Substance
Abuse Treatment
SAMHSA



The “war on drugs” was part of a U.S. national and global concerted effort to reduce “supply” but also “demand” that created a massive prison building program but also treatment and public health-oriented agencies that have produced important insights into addiction...

Past 50 yrs since
declaration of “War on
drugs” led to large-scale
federal appropriations and
a number of paradigm
shifts...



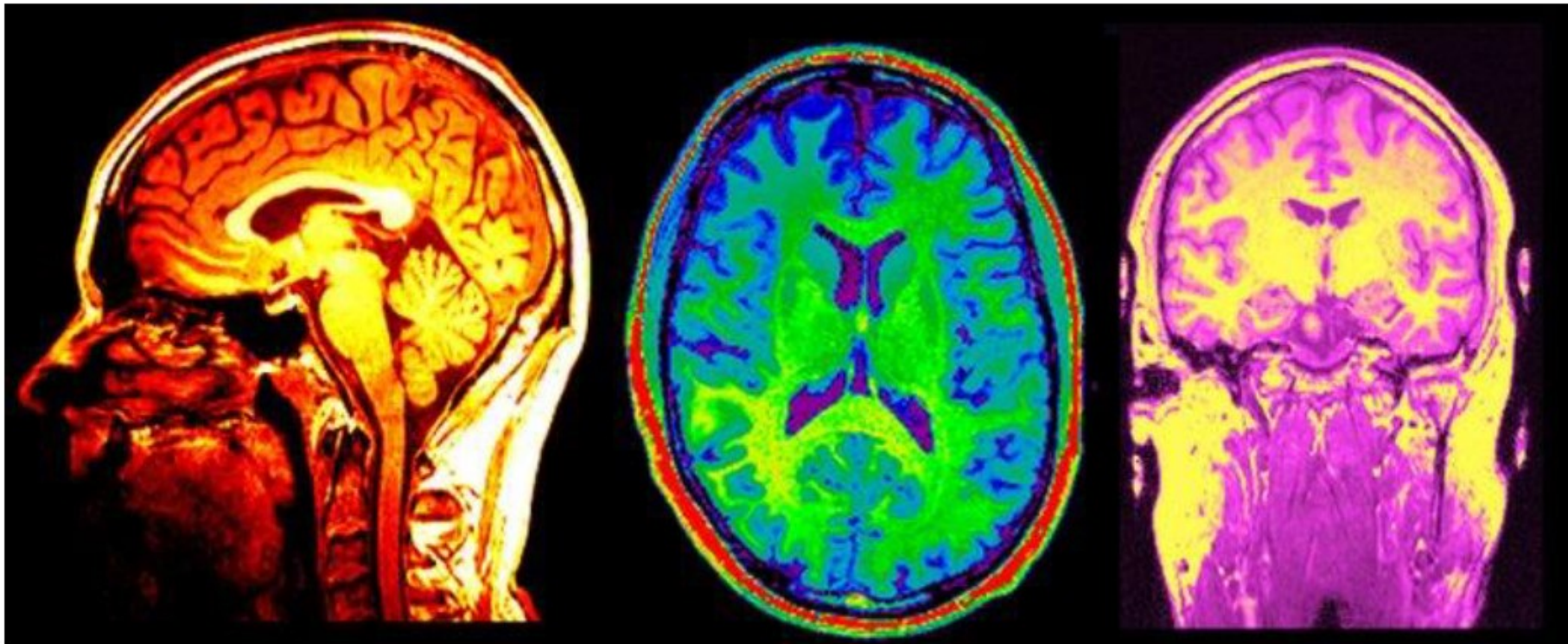


Paradigm Shifts

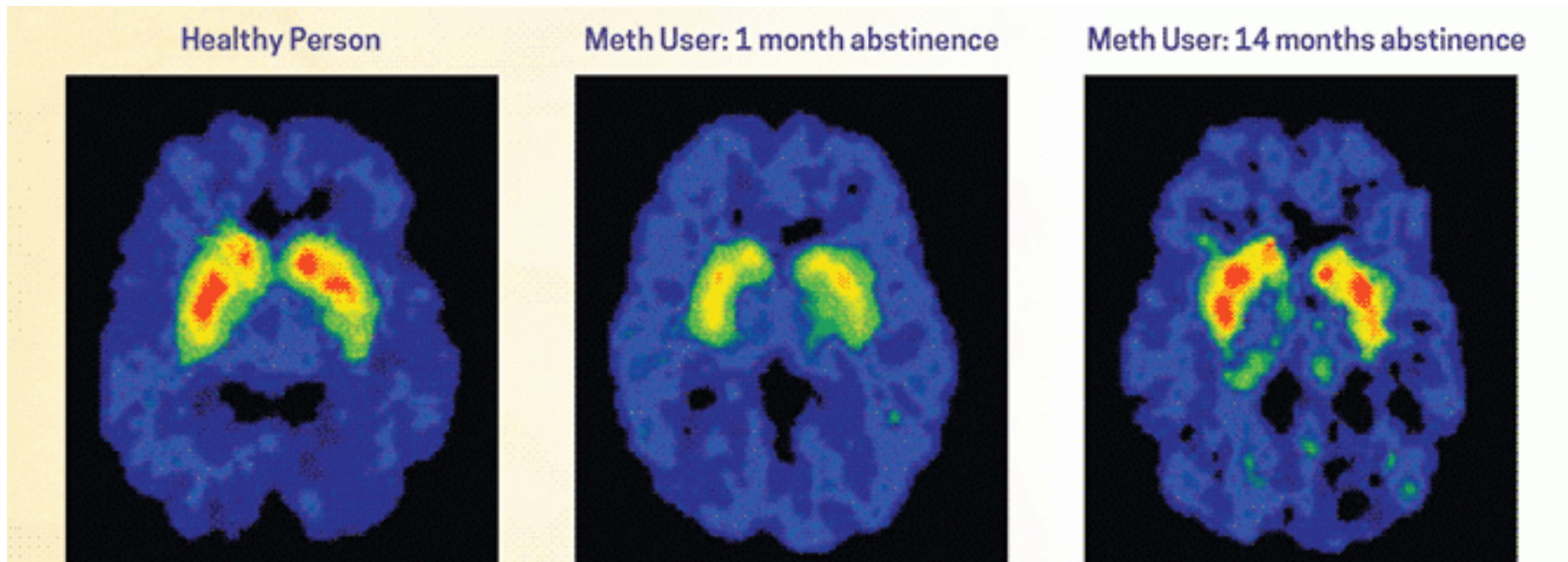
Genetics, Genomics, Pharmacogenetics



Neuroscience: Neural plasticity



Changes in the brain with abstinence

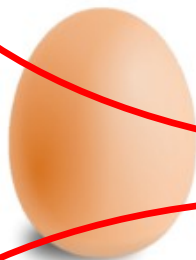


STAGES OF CHANGE

RELATED TREATMENT & RECOVERY SUPPORT SERVICES

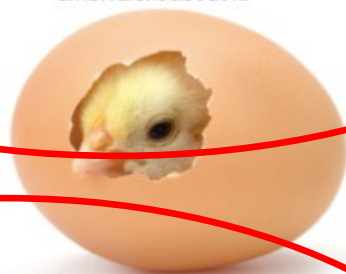
PRECONTEMPLATIVE

In this stage, individuals are not even thinking about changing their behavior. They do not see their addiction as a problem: they often think others who point out the problem are exaggerating.



CONTEMPLATIVE

In this stage people are more aware of the personal consequences of their addiction & spend time thinking about their problem. Although they are able to consider the possibility of changing, they tend to be ambivalent about it.



PREPARATION

In this stage, people have made a commitment to make a change. This stage involves information gathering about what they will need to change their behavior.



ACTION

In this stage, individuals believe they have the ability to change their behavior & actively take steps to change their behavior.

MAINTENANCE

In this stage, individuals maintain their sobriety, successfully avoiding temptations & relapse.



HARM REDUCTION

- * Emergency Services (i.e. Narcan)
- * Needle Exchanges
- * Supervised Injection Sites

SCREENING & FEEDBACK

- * Brief Advice
- * Motivational Interventions

SCREENING, BRIEF INTERVENTION, & REFERRAL TO TREATMENT (SBIRT)

CLINICAL INTERVENTION

- * Phases/Levels (e.g., inpatient, residential, outpatient)
- * Intervention Types
 - Psychosocial (e.g. Cognitive Behavioral Therapy)
 - Medications: Agonists (e.g. Buprenorphine, Methadone) & Antagonists (Naltrexone)

NON-CLINICAL INTERVENTION

- * Self-Management/Natural Recovery (e.g. self-help books, online resources)
- * Mutual Help Organizations (e.g. Alcoholics Anonymous, SMART Recovery, Lifering Secular Recovery)
- * Community Support Services (e.g. Recovery Community Centers, Recovery Ministries, Recovery Employment Assistance)

CONTINUING CARE (3m- 1 year)

Recovery Management Checkups, Telephone Counseling, Mobile Applications, Text Message Interventions

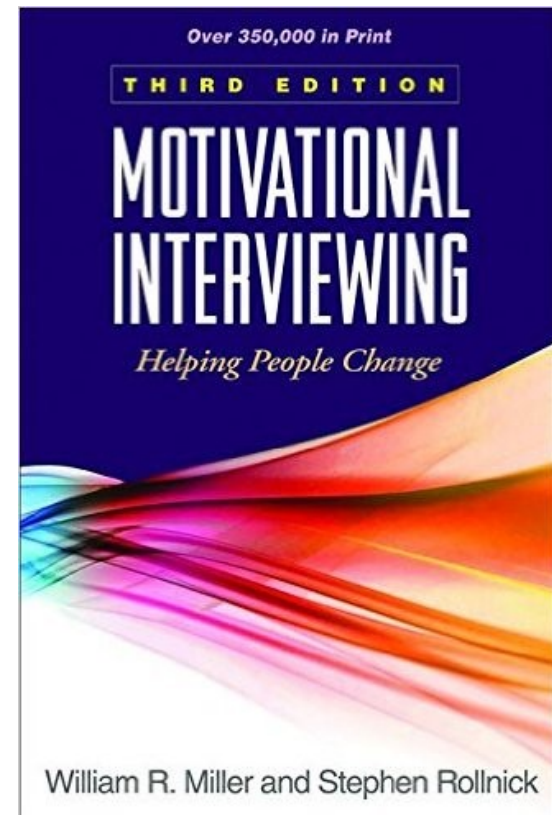
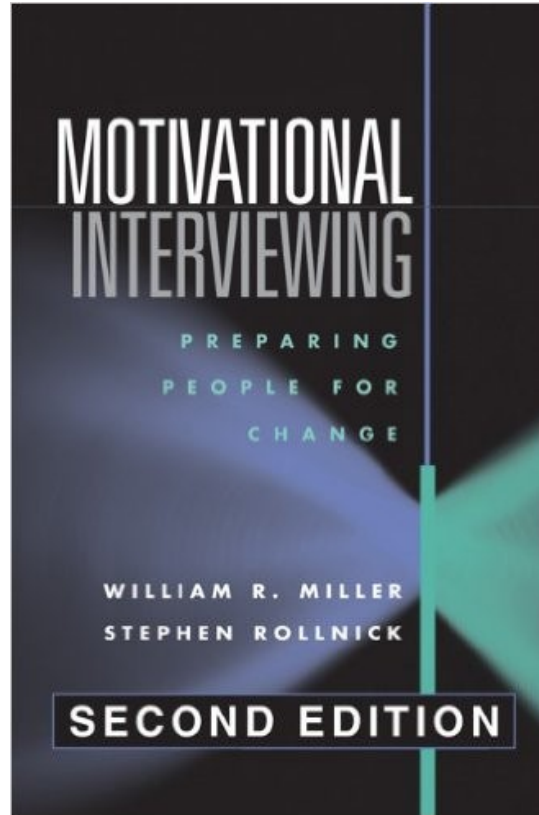
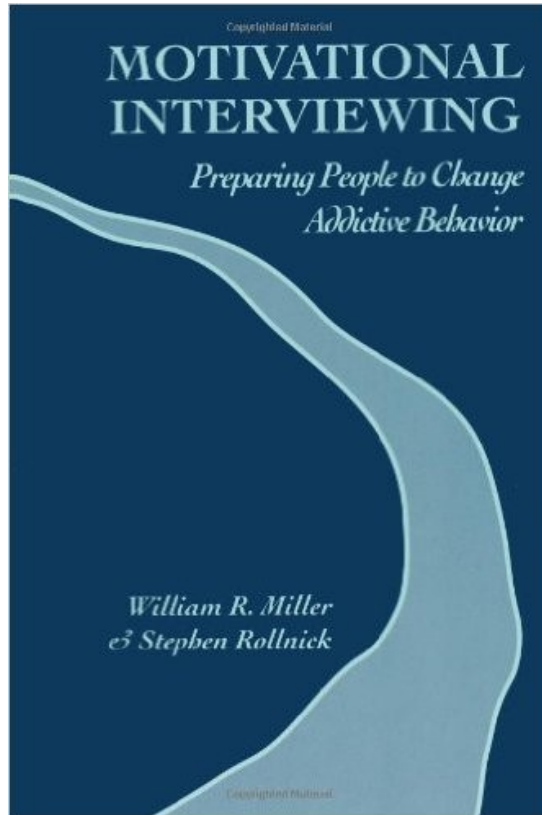
RECOVERY MONITORING (1-5+ yrs)

Continued Recovery Management Checkups, therapy visits, Primary Care Provider Visits

Harm Reduction Strategies



- Anti-craving/anti-relapse medications (“MAT”)
- Overdose reversal medications (Narcan)
- Needle exchange programs
- Heroin prescribing
- Overdose prevention facilities (safe Injection facilities)

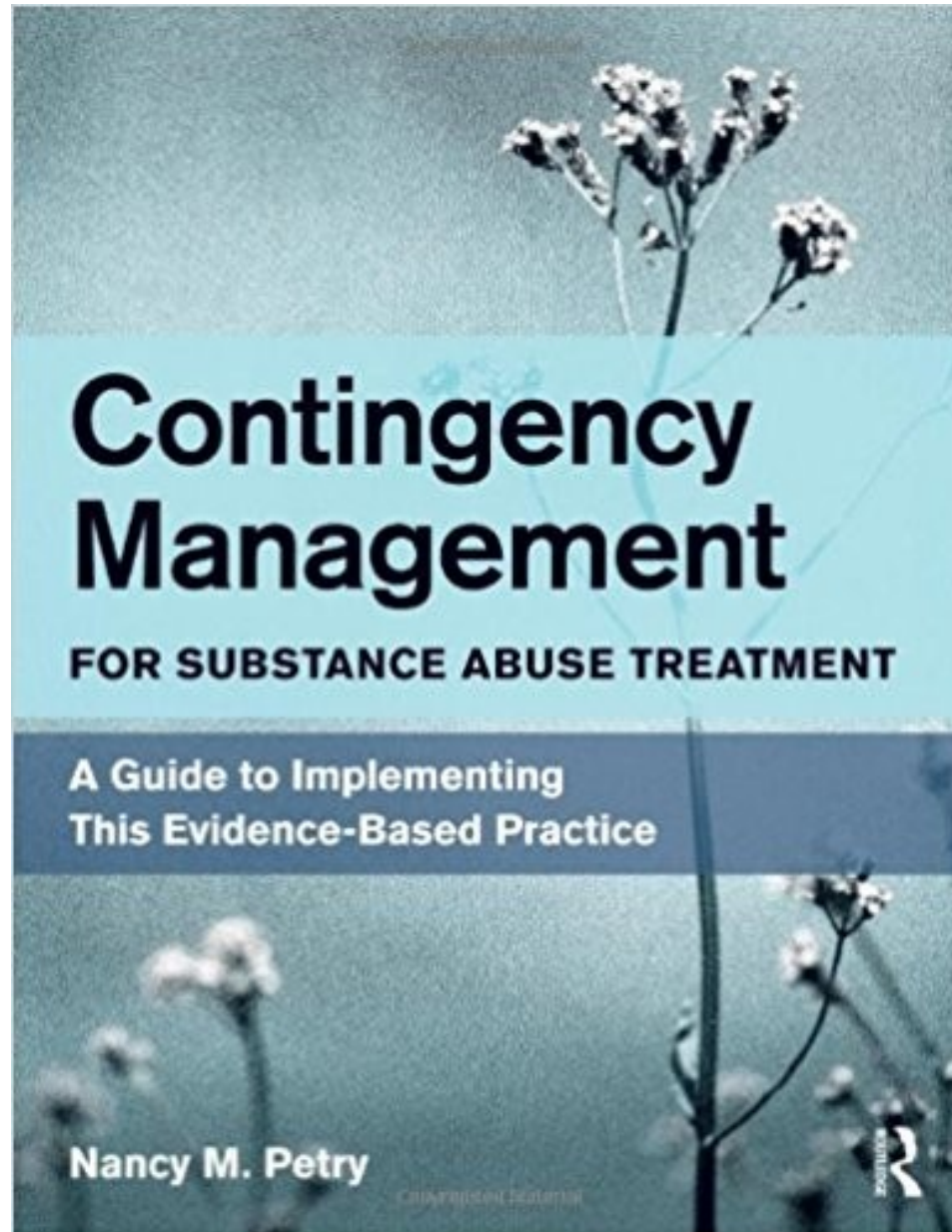


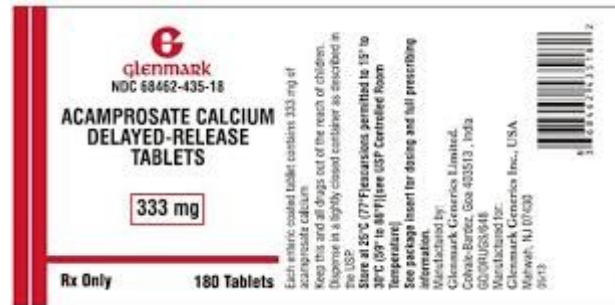
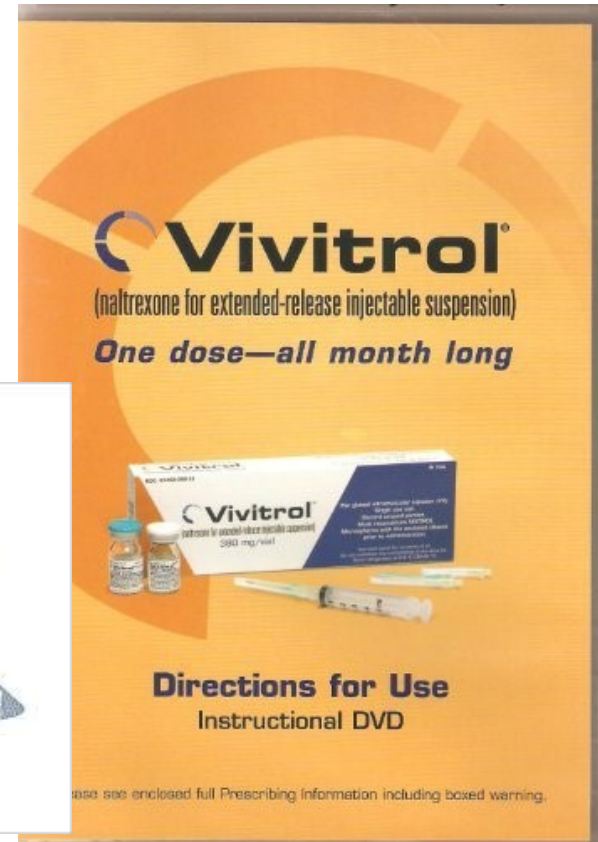
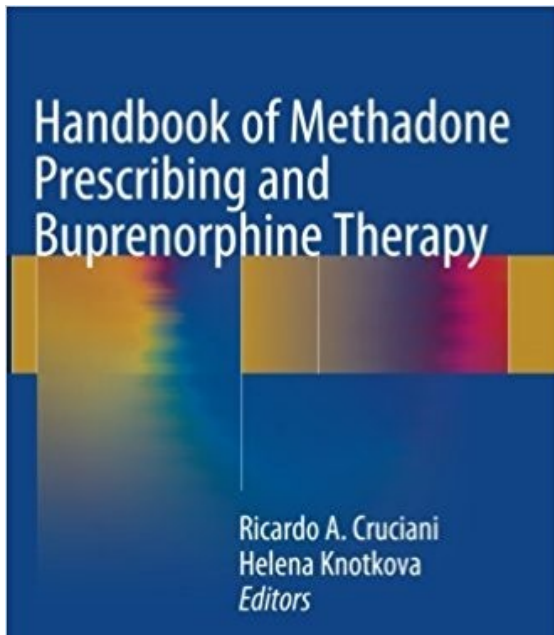
What people really need is a good listening to...

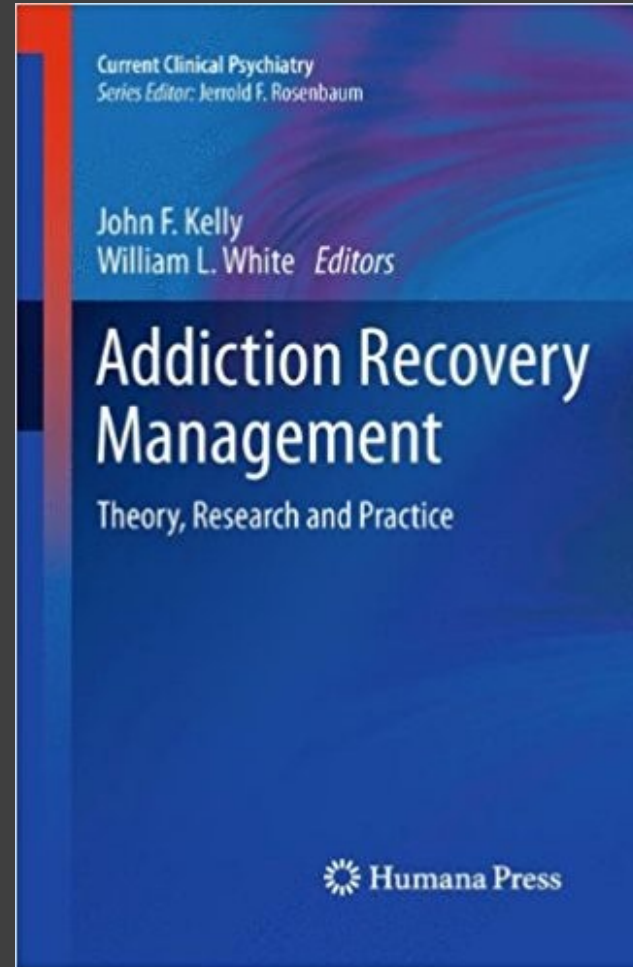
“Quitting
smoking is
easy, I’ve done
it dozens of
times” –Mark
Twain



Swift, certain,
modest,
consequences
shape
behavioral
choices...

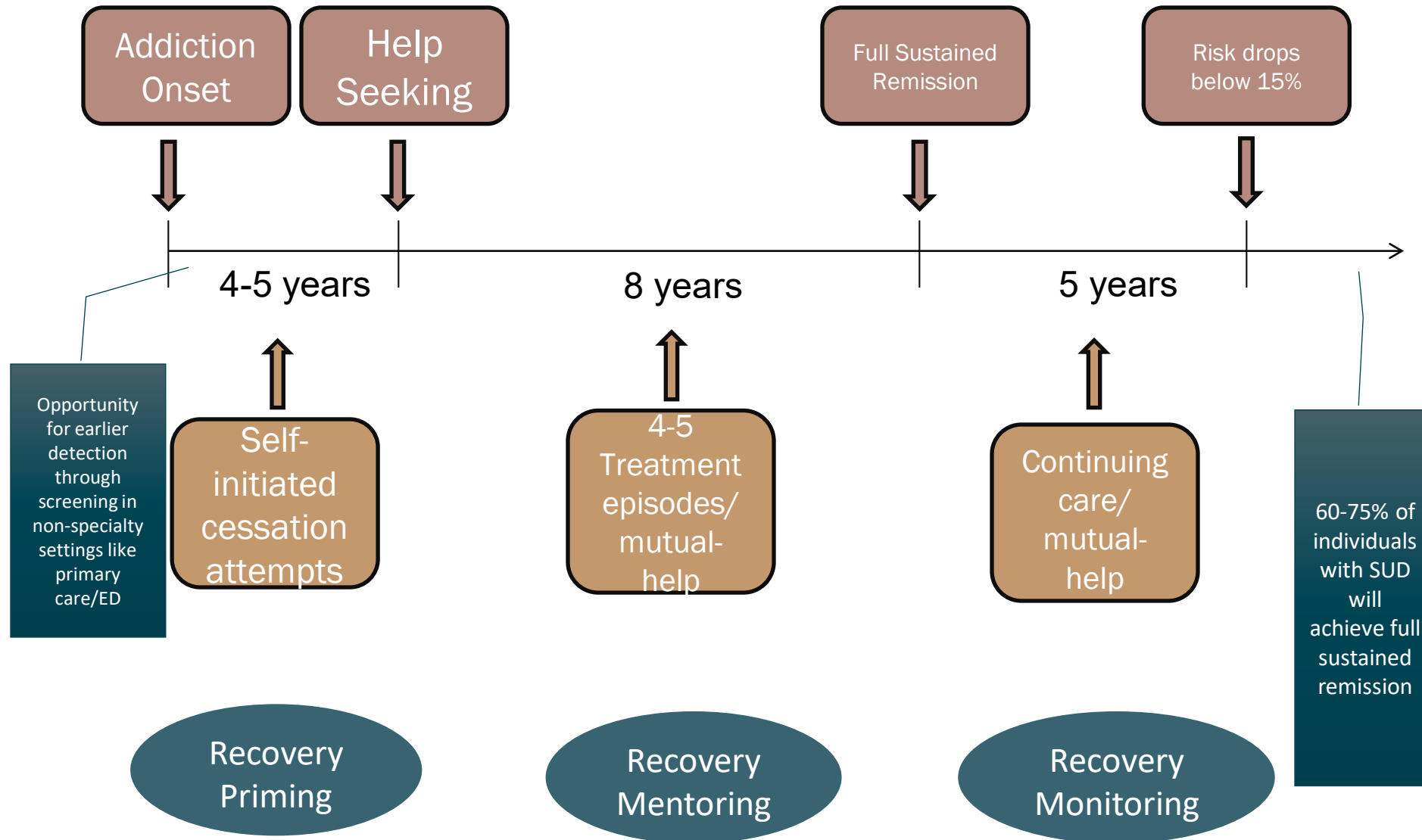






The clinical course of addiction and achievement of stable recovery can take a long time ...

Can we speed this up?



50 years of Progress:
Burning building
analogy...

- **Putting out the fire** –addressing acute clinical pathology - good job
- **Preventing it from re-igniting (RP)** - emphasized - pragmatic disconnect...
- **Building materials (recovery capital)** – mostly neglected
- **Scaffolding (building skills and support beyond acute stabilization)**
- **Granting “rebuilding permits”** - (removing barriers - neglected)



More rapid initial achievement
and maintenance of stable
remission may occur through
attending BOTH to clinical
pathology AND environmental
and resource
deficits.... (“recovery capital”)
AND legal/other barriers

Recovery Capital is multi-faceted

Individual

(coping, motivation, self-efficacy)

Social

(recovery-specific/family, friends)

Financial

(income, resources)

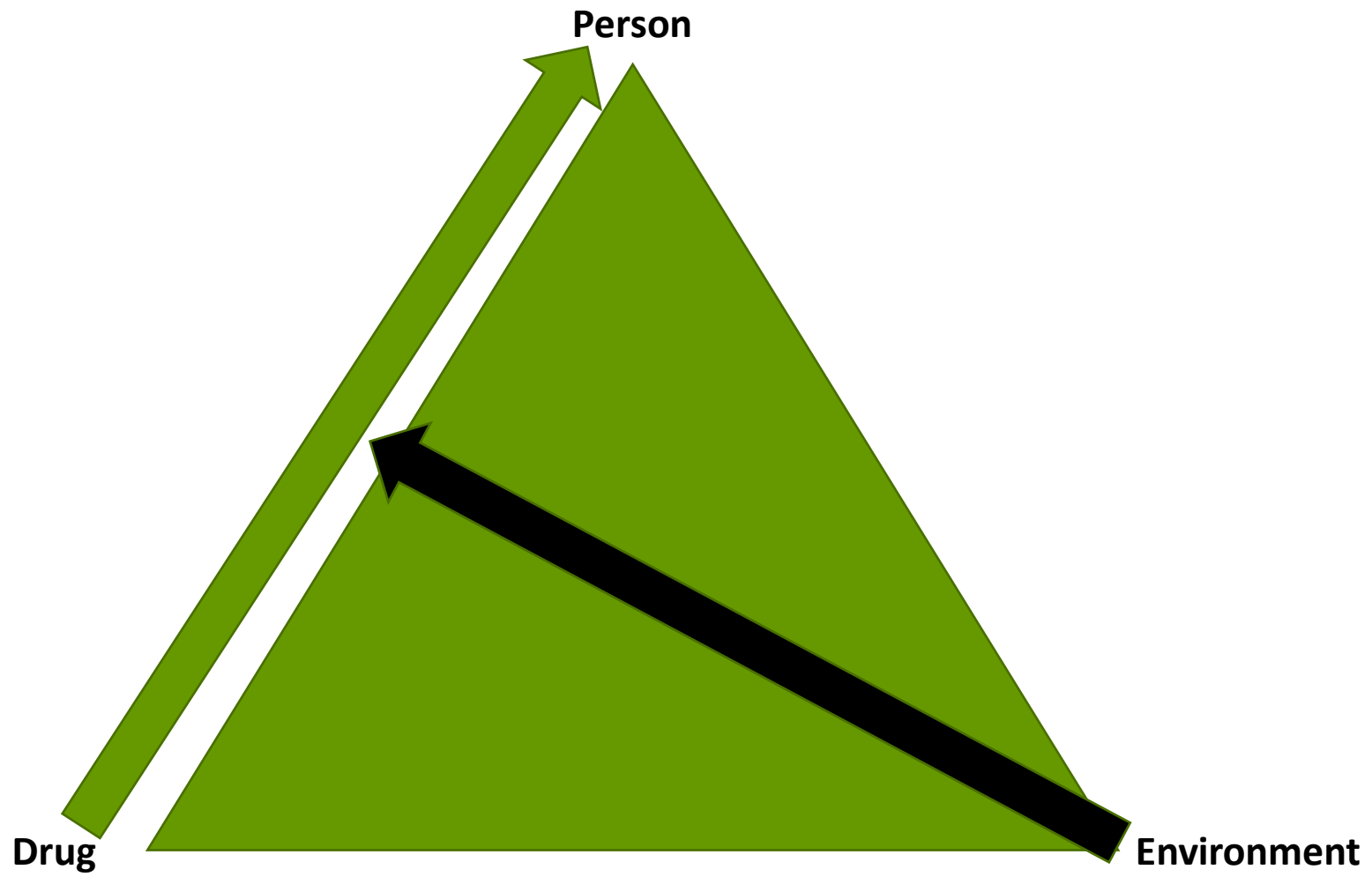
Cultural

(identity, values)



Only so much we can do
to address deficits within
the organism itself at any
one time...





Photosynthesis and thriving of plant organisms can occur under the right environmental conditions of light, temperature, moisture, nutrients...

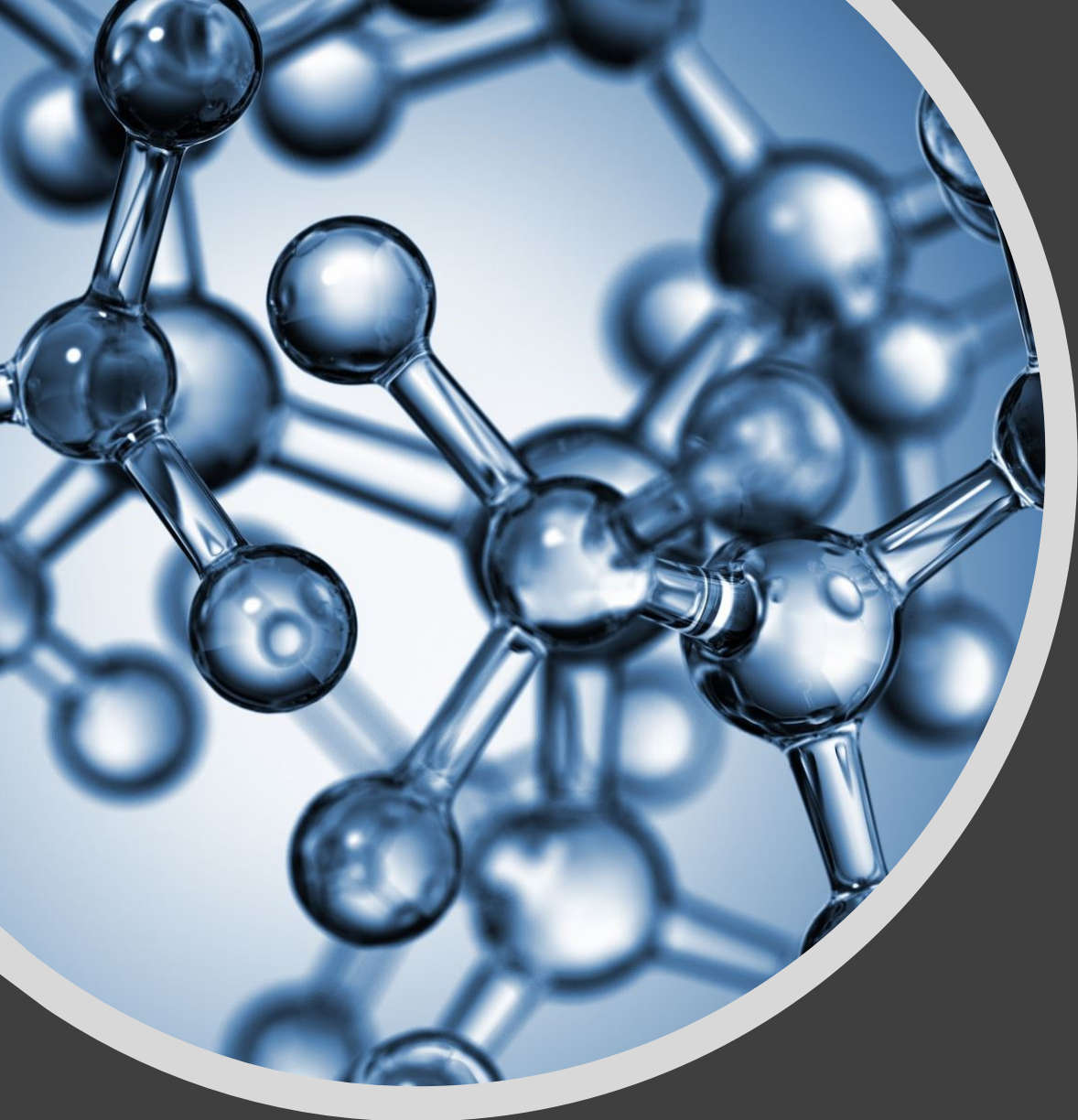


The exact same organism can thrive, merely survive, or die, depending on the environmental conditions...



Recovery - is a kind of “psychosynthesis” - and improved robustness and resilience can occur in humans when provided the right conditions and resources, conducive and supportive of recovery....





Challenges of Initial and Early Recovery

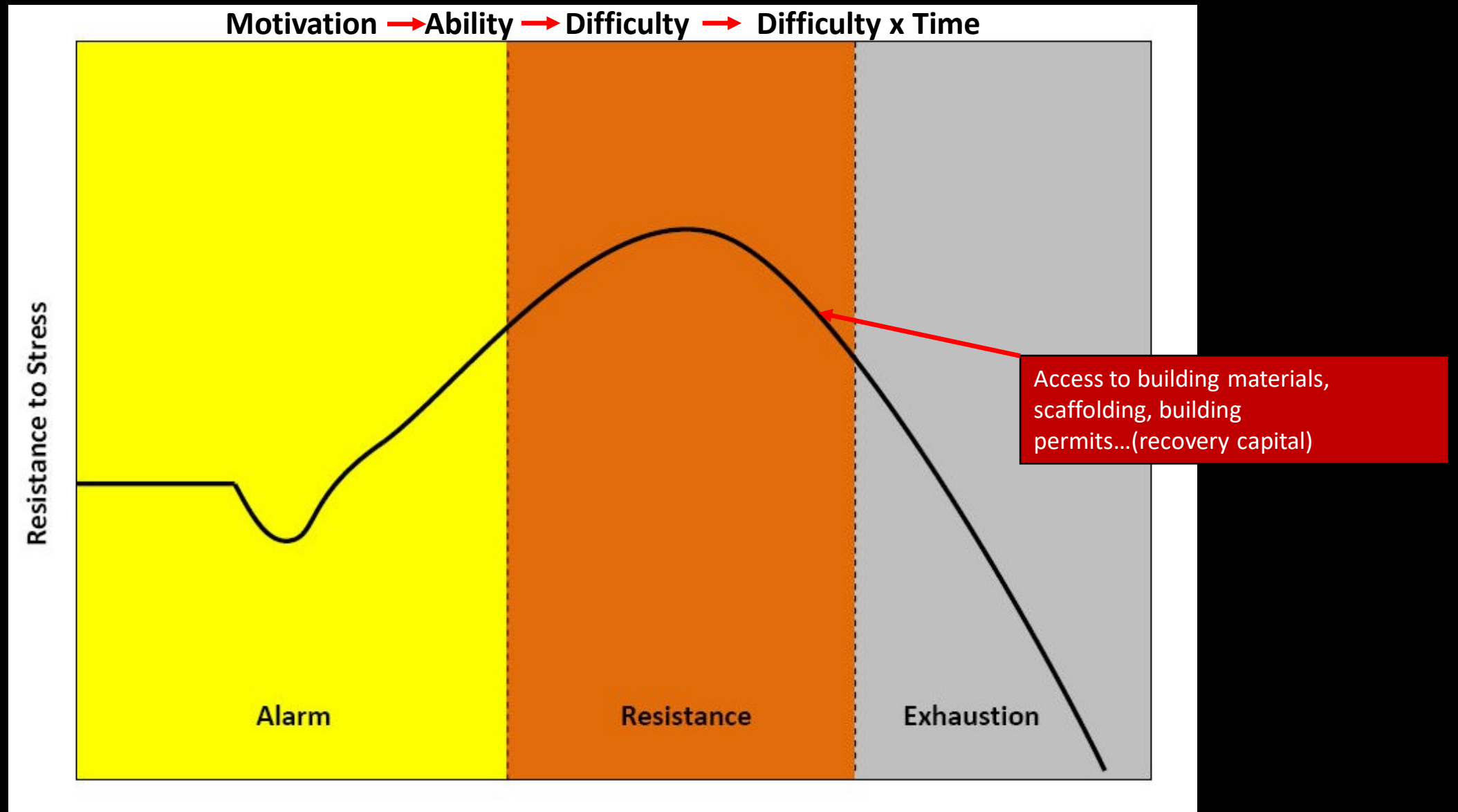


Increased
sensitivity
to stress



Decreased
capacity to
experience
normal levels of
reward

Allostasis (maintaining an organism's stability [homeostasis] through change) occurs both during the development of addiction and of recovery...



THINK PIECE

A biaxial formulation of the recovery construct

John Francis Kelly and Bettina Hoepfner

Department of Psychiatry, MGH Center for Addiction Medicine and Harvard Medical School, Boston, MA, USA

Abstract

The term "recovery" in the substance use disorder (SUD) field has been used generally and non-technically to describe global improvements in health and functioning typically following successful abstinence. More recently, however, in an attempt to reduce the stigma and negative public and clinical perceptions regarding remission potential for individuals suffering from SUD, "recovery" has been used more strategically to instill hope and to serve as an organizing paradigm that has inspired a growing recovery movement. In addition, with "recovery" gaining momentum internationally within governments' national health care agencies, there is increasing pressure to operationalise this construct as without it, it is difficult to develop, commission, and deliver the tailored packages of recovery support services needed to help individuals suffering from SUD. Initial attempts to define recovery and delineate its constituent parts have agreed on major elements, but differ on important subtleties; generally

Keywords

Addiction, policy, recovery, remission, terminology, substance use disorder

History

Received 2 January 2014
Revised 27 May 2014
Accepted 28 May 2014
Published online 23 June 2014

Like the original (bi-axial) formulation of the "dependence syndrome" itself, "recovery" also might be conceptualized as bi-axial...

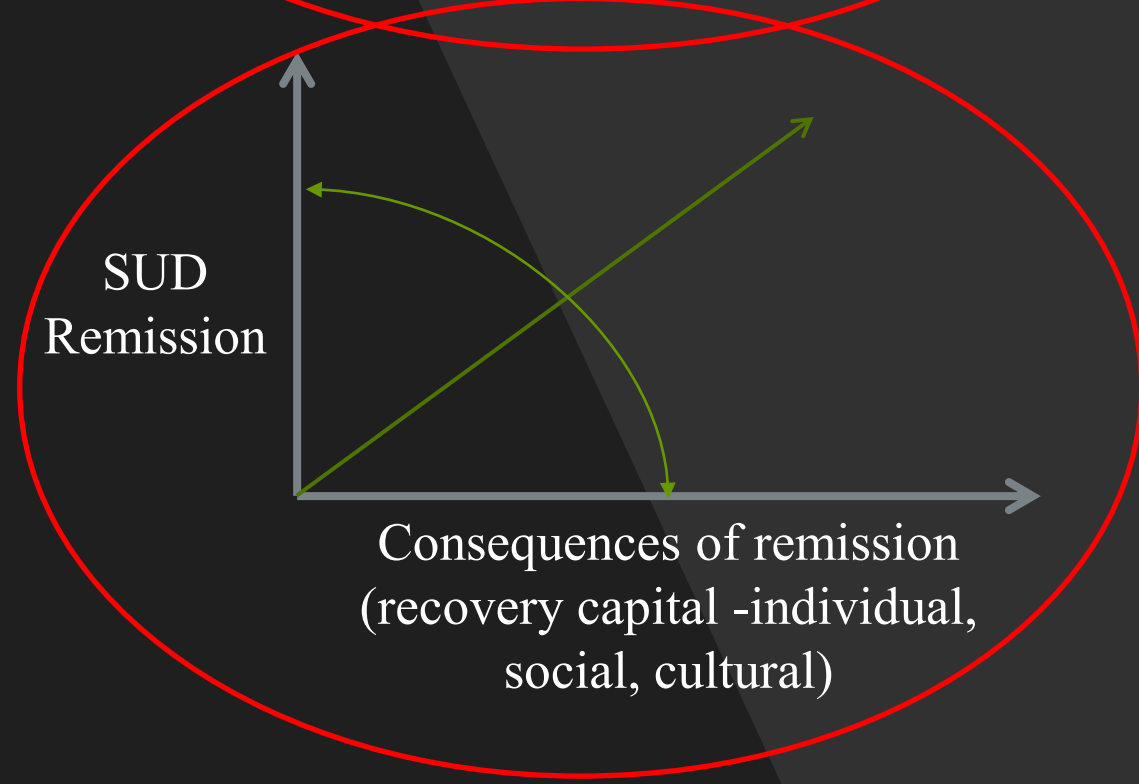
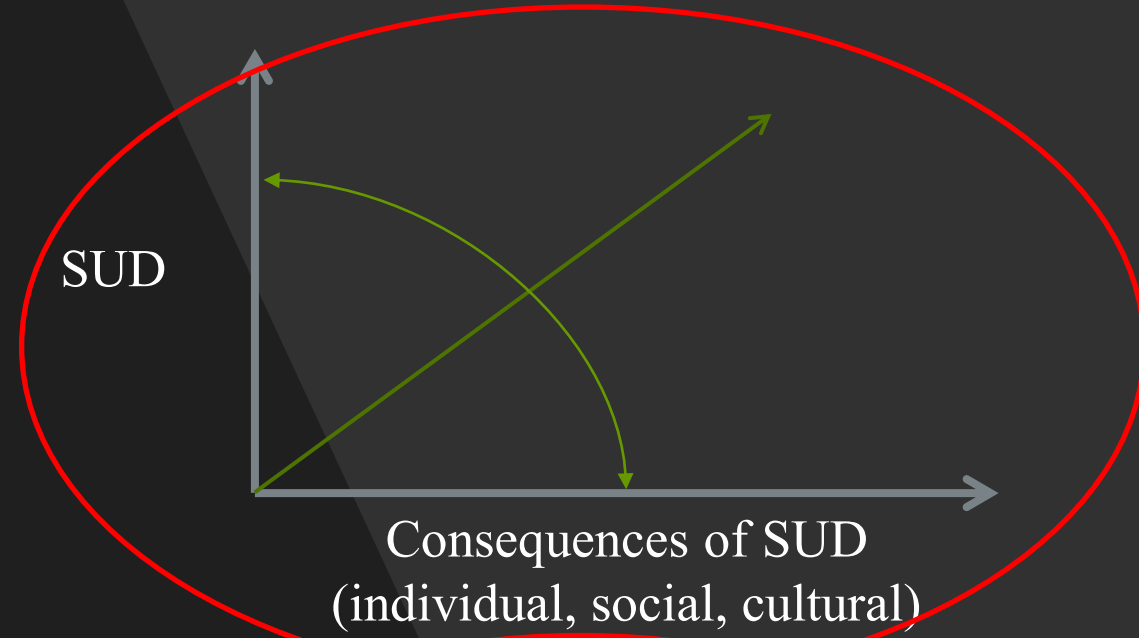
Health Services Administration, 2011; UK Drug Policy Commission, 2008; White, 2007)

With "recovery" gaining momentum as an organizing paradigm in many countries (El-Guebaly, 2012; Substance Abuse and Mental Health Services Administration, 2011; UK Drug Policy Commission, 2008; White, 2007) a need to define this term and construct has become increasingly necessary. Without greater clarity, it is challenging to develop,

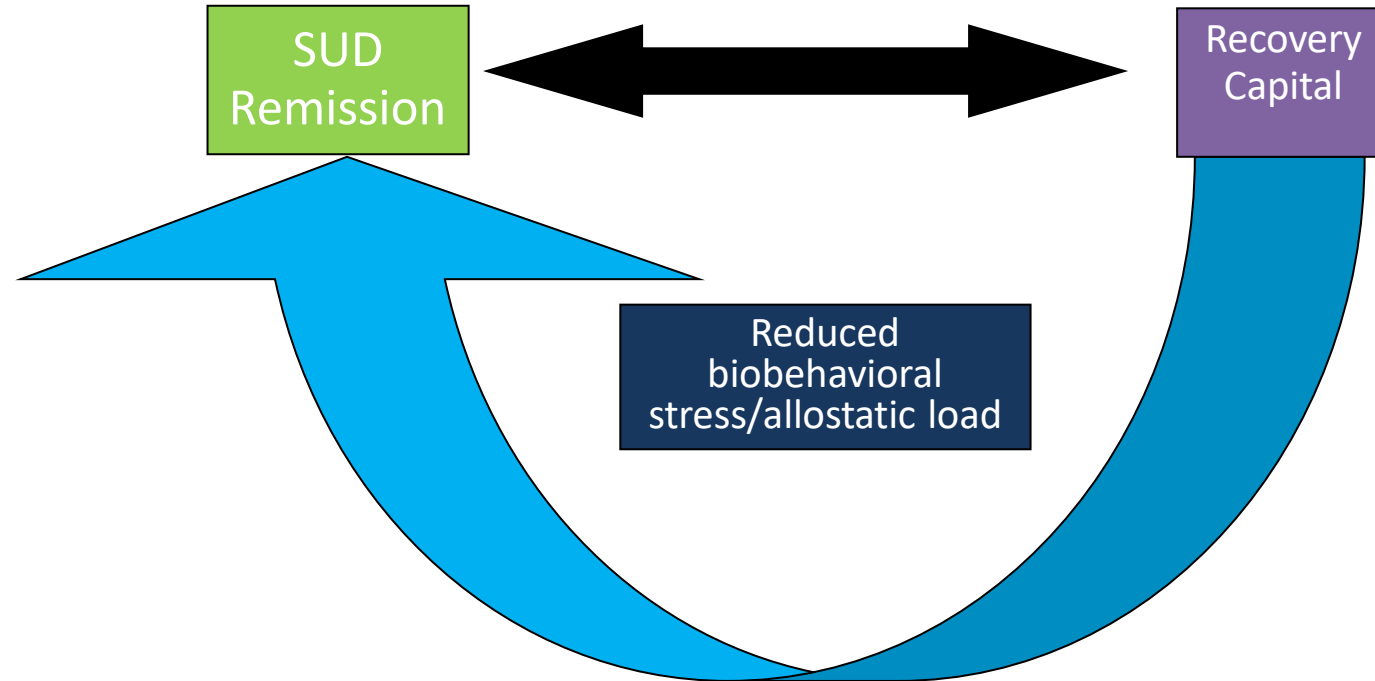
of addiction recovery by El-Guebaly (2012) concluded that "a consensual theoretical framework of addiction recovery remains to be elaborated...".

To this end, the goal of this article is to stimulate further thought and debate by offering a theoretical basis for, and description of, the recovery construct that we hope enhances clarity and measurability, and stimulates further discussion. To accomplish this goal, we review current definitions of the recovery construct and offer a simplified bi-axial formulation and definition grounded in stress and coping theory (Folkman, 1984), which mirrors, conceptually, original formulations of the addiction syndrome (Edwards, 1986; Edwards & Gross, 1976).

Correspondence: John Francis Kelly, Department of Psychiatry, MGH Center for Addiction Medicine, 60 Stanford Street, Boston, MA 02114, USA. E-mail: jkelly11@mg.harvard.edu



Recovery: Dynamic Reciprocal relationship between remission and recovery capital where increases in individual and social capital reduces bio-behavioral stress/allostatic load and enhances chances of ongoing remission

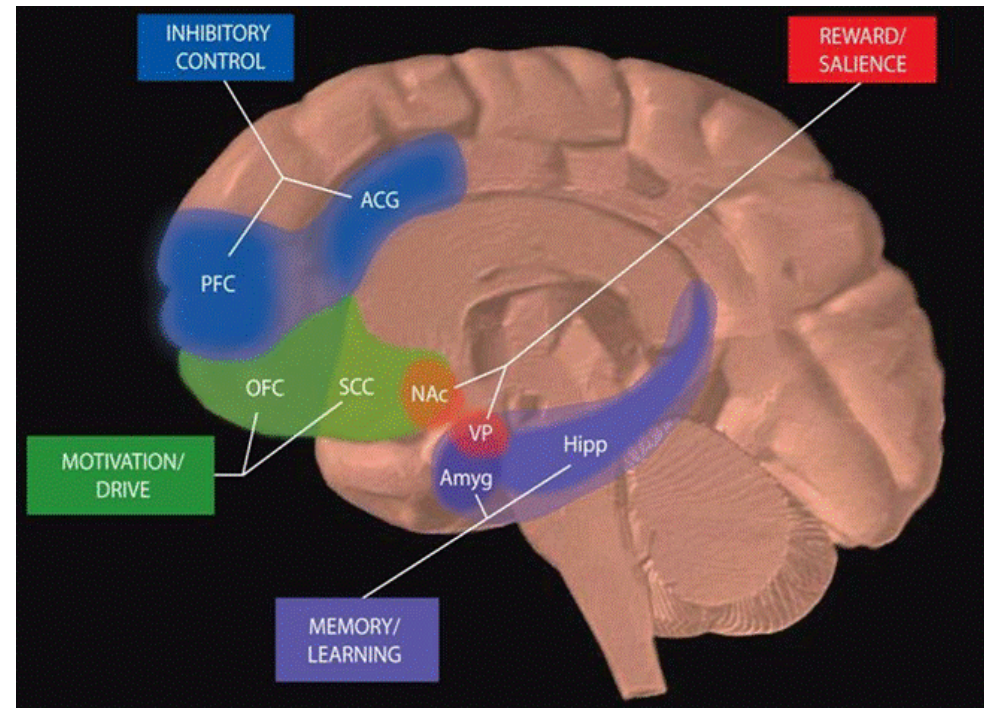


Longer remission results in greater accrual of recovery capital; in turn, greater recovery capital increases the chances of longer remission because it reduces biobehavioral stress – a major pathway to relapse. Thus, providing more recovery support will increase the chances of remission by reducing stress.

Adapted from Kelly and Hoepfner (2014)

Neuroscience of Recovery Capital

Can social factors, recovery housing, and employment, change the brain, mitigate stress, upregulate down-regulated receptor systems, and increase the chances of long-term remission?



Social Buffering

- Stress-buffering effects of social relationships— one of the major findings of past century
- Mechanisms of this poorly understood

Psychobiological Mechanisms Underlying the Social Buffering of the Hypothalamic–Pituitary–Adrenocortical Axis: A Review of Animal Models and Human Studies Across Development

Camelia E. Hostinar
University of Minnesota

Regina M. Sullivan
New York University Langone Medical Center

Megan R. Gunnar
University of Minnesota

Discovering the stress-buffering effects of social relationships has been one of the major findings in psychobiology in the last century. However, an understanding of the underlying neurobiological and psychological mechanisms of this buffering is only beginning to emerge. An important avenue of this research concerns the neurocircuitry that can regulate the activity of the hypothalamic–pituitary–adrenocortical (HPA) axis. The present review is a translational effort aimed at integrating animal models and human studies of the social regulation of the HPA axis from infancy to adulthood, specifically focusing on the process that has been named *social buffering*. This process has been noted across species and consists of a dampened HPA axis stress response to threat or challenge that occurs with the presence or assistance of a conspecific. We describe aspects of the relevant underlying neurobiology when enough information exists and expose major gaps in our understanding across all domains of the literatures we aimed to integrate. We provide a working conceptual model focused on the role of oxytocinergic systems and prefrontal neural networks as 2 of the putative biological mediators of this process, and propose that the role of early experiences is critical in shaping later social buffering effects. This synthesis points to both general future directions and specific experiments that need to be conducted to build a more comprehensive model of the HPA social buffering effect across the life span that incorporates multiple levels of analysis: neuroendocrine, behavioral, and social.

Keywords: stress, social support, early caregiving, oxytocin, prefrontal cortex

It is an empirical reality that some individuals succumb, whereas others thrive, when confronted with similar stressors. Having access to social support may be an important modulator of these widespread individual differences in responses to potentially stressful events. Indeed, some exciting experiments in humans (e.g., Heinrichs, Baumgartner, Kirschbaum, & Ehlert, 2003; Kirschbaum, Klauer, Filipp, & Hellhammer, 1995; Taylor et al., 2008) and animals (e.g., Hennessy, 1984, 1986; Vogt, Coe, & Levine, 1981) have identified a dampening of the hypothalamic–pituitary–adrenocortical (HPA) axis response to stressors by social

factors as one of the possible mechanisms underlying the benefits of social support. Longitudinal studies also reveal relations between social support and basal levels of stress hormones such as salivary cortisol (Rosal, King, Ma, & Reed, 2004). Understanding the social buffering processes affecting this neuroendocrine axis would allow the possibility of interventions that might have cascading positive effects across multiple biological and psychological systems. Despite the important implications of this knowledge, our understanding of the underlying neurobiology and relevant components of social interaction that permit these HPA activity-regulating effects remains vastly incomplete.

General Framework

RESPONDING TO STRESS: SOCIAL BUFFERING

...and researchers have started to examine possible neurobiological connections between social support and individual stress responses

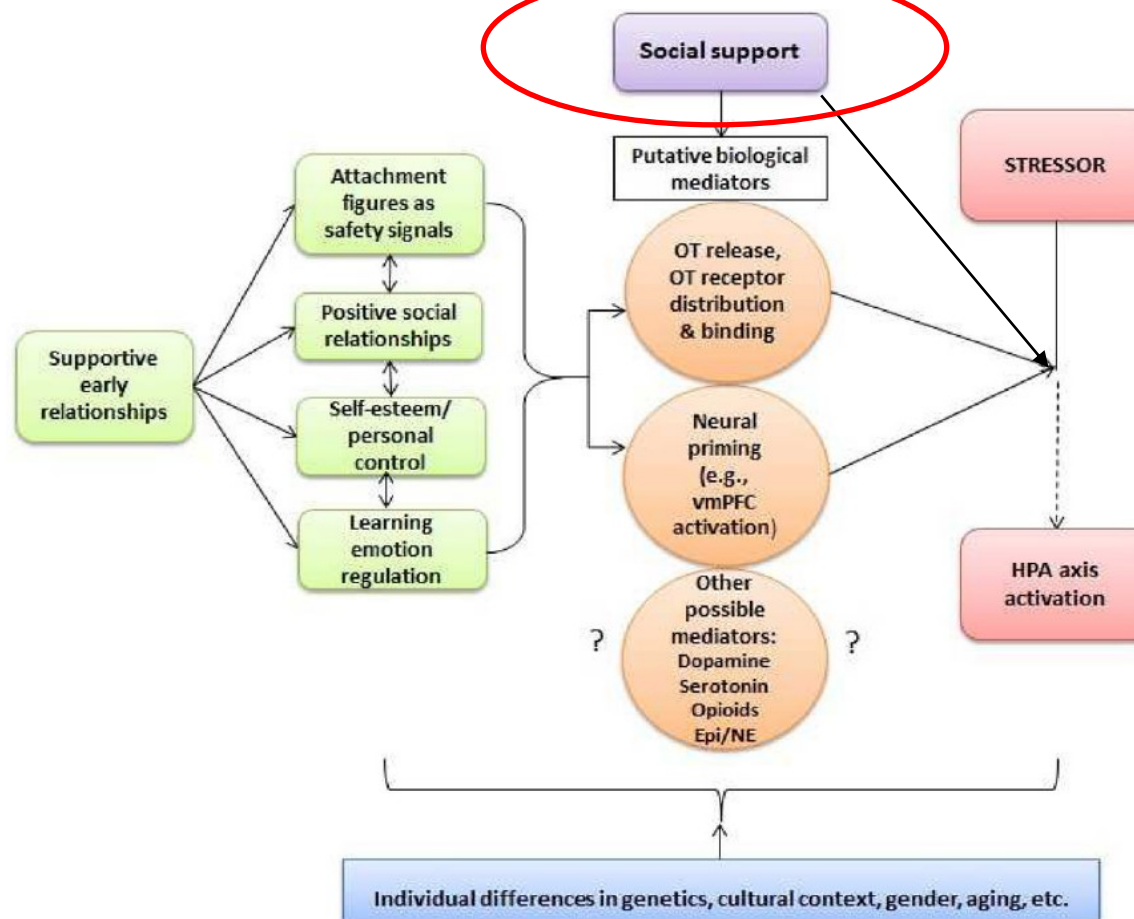


Figure 1. A Developmental Working Model of Social Buffering of the HPA Axis in Humans

OT = oxytocin, vmPFC = ventro-medial prefrontal cortex, Epi = epinephrine, NE = norepinephrine

D2/D3 RECEPTOR BINDING & SOCIAL STATUS AND SUPPORT

AIM

Assess whether $D_{2/3}$ receptor levels correlate with social status and social support (particularly, to determine if low social status and low social support correlate with low $D_{2/3}$ 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 $D_{2/3}$ 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
- [^{11}C]raclopride to measure $D_{2/3}$ receptor binding in the striatum

OUTCOMES

- Positive correlation between **$D_{2/3}$ receptor binding potential and social status**
- Positive correlation between **$D_{2/3}$ receptor binding potential and perceived social support**
- Results similar to prior studies of nonhuman primates, which show higher $D_{2/3}$ receptor levels in monkeys who are dominant in their social hierarchy, compared to those who are subordinate

BRIEF REPORTS

Dopamine Type 2/3 Receptor Availability in the Striatum and Social Status in Human Volunteers

Diana Martinez, Daria Orlowska, Rajesh Narendran, Mark Slifstein, Fei Liu, Dileep Kumar, Allegra Broft, Ronald Van Heertum, and Herbert D. Kleber

Background: Previous positron emission tomography (PET) imaging studies in nonhuman primates have shown that striatal dopamine type 2/3 ($D_{2/3}$) receptors correlate with social hierarchy in monkeys and that dominant animals exhibit higher levels of $D_{2/3}$ receptor binding. The goal of the present study was to examine this phenomena in human subjects using PET and the radiotracer [^{11}C]raclopride.

Methods: Fourteen healthy volunteers were scanned with [^{11}C]raclopride to measure $D_{2/3}$ receptor binding potential (BP). Social status was assessed using the Barratt Simplified Measure of Social Status. In addition, participants were asked to assess their level of social support using the Multidimensional Scale of Perceived Social Support (MSPSS).

Results: A correlation was seen between social status and dopamine $D_{2/3}$ receptors, where volunteers with the higher status had higher values for [^{11}C]raclopride BP. A similar correlation was seen with the perceived social support, where higher [^{11}C]raclopride BP correlated with higher scores on the MSPSS.

Conclusions: The results of this study support the hypothesis that social status and social support is correlated with $D_{2/3}$ receptor binding.

Key Words: [^{11}C]raclopride, dopamine 2/3 receptor, PET imaging, social status

Methods and Materials

Previous studies in animals have shown a correlation between dopamine transmission in the brain and social hierarchy (1). In monkeys, dominant and subordinate social rank are determined by physical and social triumph and defeat. Dominant animals win more physical confrontations and receive more social attention, such as grooming or huddling. Two positron emission tomography (PET) imaging studies have investigated the relationship between social status and $D_{2/3}$ receptors in the striatum in monkeys. Both showed that social dominance was associated with higher $D_{2/3}$ receptor binding compared with subordinate animals (2,3).

In humans, social hierarchy is a more subtle phenomenon that can be approximated by measuring social status and social support (4). Thus, the goal of the present study was to examine the correlation between these factors and dopamine $D_{2/3}$ receptor binding in human subjects. Given the known effect of disease states on striatal $D_{2/3}$ receptors, including substance dependence, schizophrenia, and anxiety disorders (5-7), only healthy control volunteers were included in this study. Social status was measured using the Barratt Simplified Measure of Social Status (BMSSS) (8) and social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) (9). Our hypothesis was that low social status and low levels of social support would correlate with low $D_{2/3}$ receptor binding in the striatum measured with [^{11}C]raclopride.

The study was approved by the Institutional Review Board of the New York State Psychiatric Institute and all subjects provided written informed consent. Study participants were nonsmoking healthy control subjects and were required to have no DSM-IV Axis I disorder (including substance abuse or dependence), no significant medical conditions, and no use of medications before the scan (6 months for medications that could affect dopamine, 2 weeks for all others). Subjects (nine men and five women) were recruited from the New York City metropolitan area. Participant screening included a psychiatric assessment with the *Structured Clinical Interview for DSM-IV Axis I Disorders* (10), physical examination, electrocardiogram, and laboratory tests. All subjects were asked for data to complete the Barratt Simplified Measure of Social Status and to complete the Multidimensional Scale of Perceived Social Support. The scans performed on female subjects were not controlled for menstrual cycle phase.

[^{11}C]raclopride was prepared as previously described (11), and PET studies were acquired using a bolus injection of the radiotracer. The PET scans were obtained on the ECAT EXACT HR+ (Siemens/CTI, Knoxville, Tennessee) in three-dimensional (3-D) mode. Emission data were obtained as 15 frames of increasing duration up to 60 minutes. The PET images were reconstructed by filtered backprojection (Shepp-5 filter) with attenuation correction using the data from a 10-minute transmission scan.

All image analysis was performed in MEDx (Sensor Systems, Inc., Sterling, Virginia). Each subject underwent a transaxial T1 magnetic resonance imaging (MRI) scan, acquired on the GE Signa EXCITE 3 T/94 cm scanner (GE Medical Systems, Milwaukee, Wisconsin), for delineation of the regions of interest (ROIs). The regions of interest outlined on the MRI included the subdivisions of the striatum, which have been previously described (12). Briefly, these included the ventral striatum (VST), the dorsal caudate rostral to the anterior commissure (AC) (precommissural dorsal caudate [preDCAD]), the dorsal putamen rostral to the AC (precommissural dorsal putamen [preDPU]), the caudate caudal to the AC (postcommissural caudate [postCAU]), and the putamen caudal to the AC (postcommissural putamen [postPUT]).

From the Departments of Psychiatry (DM, DO, MS, FL, DK, AB, HDK) and Radiology (RVH), Columbia University, College of Physicians and Surgeons, New York, New York, and Department of Radiology (RN), University of Pittsburgh, Pittsburgh, Pennsylvania. Address correspondence to Diana Martinez, M.D., New York State Psychiatric Institute, 1051 Riverside Drive, Box #31, New York, NY 10032; E-mail: dm437@columbia.edu.

Received Dec 18, 2008; revised Jul 23, 2009; accepted Jul 28, 2009.

Martinez, D., Orlowska, D., Narendran, R., Slifstein, M., Liu, F., Kumar, D., . . . Kleber, H. D. (2010). Dopamine type 2/3 receptor availability in the striatum and social status in human volunteers. *Biological Psychiatry*, 67(3), 275-278. doi:10.1016/j.biopsych.2009.07.037

D2/D3 RECEPTOR BINDING & SOCIAL STATUS AND SUPPORT

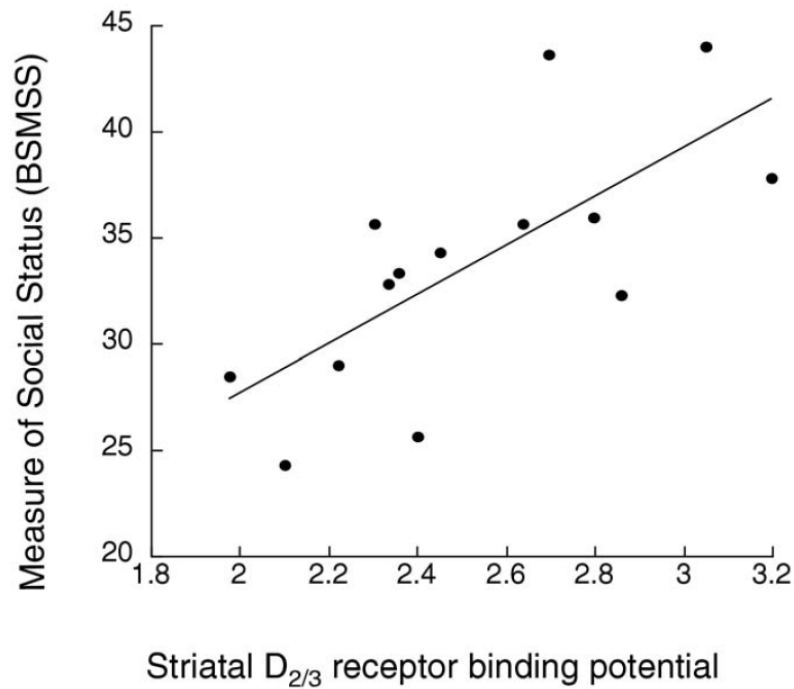


Figure 1. Correlation between [¹¹C]raclopride BP (x axis) and social status, measured with the Barratt Simplified Measure of Social Status (BSMSS). A positive correlation was seen, where higher BP correlated with higher BSMSS ($r = .71, p = .004, \text{age-corrected } p = .007$). BP, binding potential.

D_{2/3} receptor binding increases as **social status** increases.

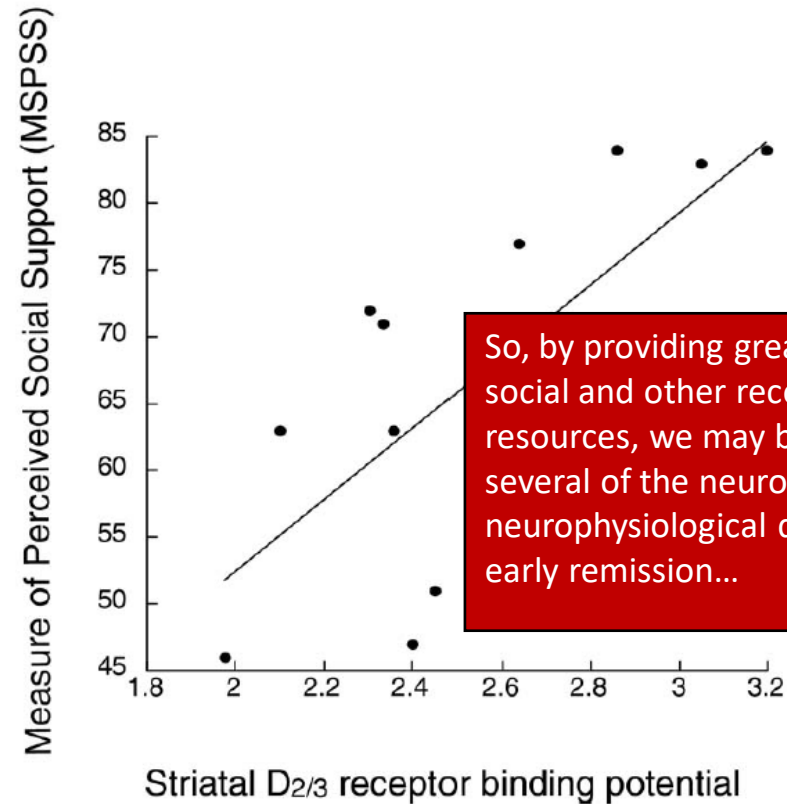


Figure 2. Correlation between [¹¹C]raclopride BP (x axis) and score on the Multidimensional Scale of Perceived Social Support (MSPSS). A positive correlation was seen, where higher BP correlated with higher score on the MSPSS ($r = .73, p = .005, \text{age-corrected } p = .02$). BP, binding potential.

D_{2/3} receptor binding increases as **social support** increases.

So, by providing greater access to social and other recovery specific resources, we may be able to mitigate several of the neuroendocrine/ neurophysiological deficits present in early remission...

Outline



Definition - From cultural generality to formal clinical/public health and research definitions



Rationale - How did we get here? A rationale for the new public health and scientific focus on addiction “recovery”



Recovery Support Services and Recovery Capital – facilitating supportive environments and recovery capital



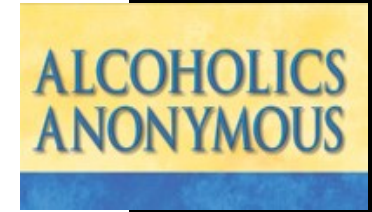
Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?



Insights - Some novel findings from research



Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital ...



Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital ...





Cochrane Database of Systematic Reviews

Alcoholics Anonymous and other 12-step programs for alcohol use disorder (Review)

Kelly JF, Humphreys K, Ferri M

Kelly JF, Humphreys K, Ferri M.
Alcoholics Anonymous and other 12-step programs for alcohol use disorder.
Cochrane Database of Systematic Reviews 2020, Issue 3. Art. No.: CD012880.
DOI: [10.1002/14651858.CD012880.pub2](https://doi.org/10.1002/14651858.CD012880.pub2).

www.cochranelibrary.com

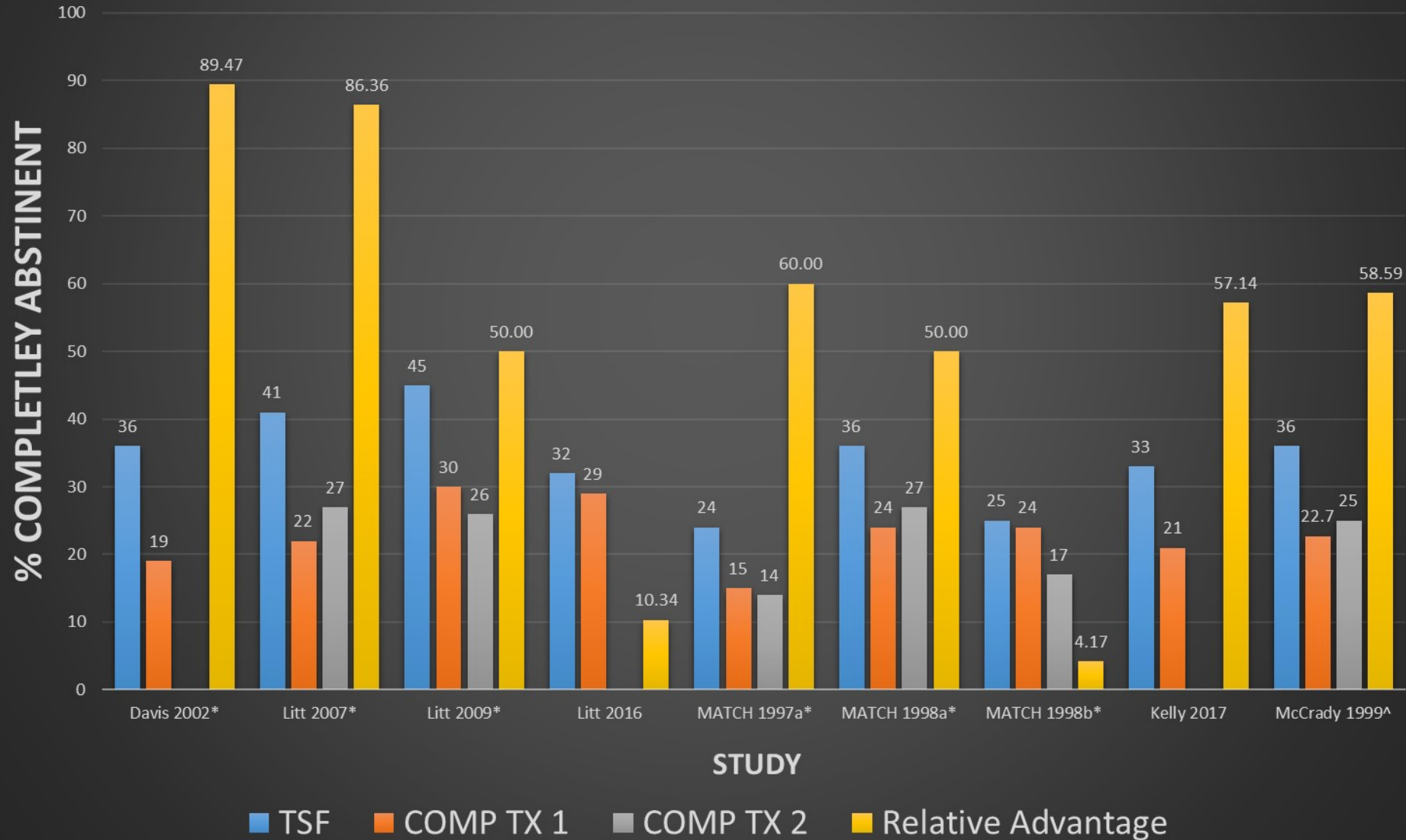
Alcoholics Anonymous and other 12-step programs for alcohol use disorder (Review)
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WILEY

Cochrane Systematic Review on AA/TSF (2020)

- Kelly, JF
- Humphreys, K
- Ferri, M

TSF Compared to Different Theoretical Orientation Treatments (RCTs all Manualized)



Economic Studies

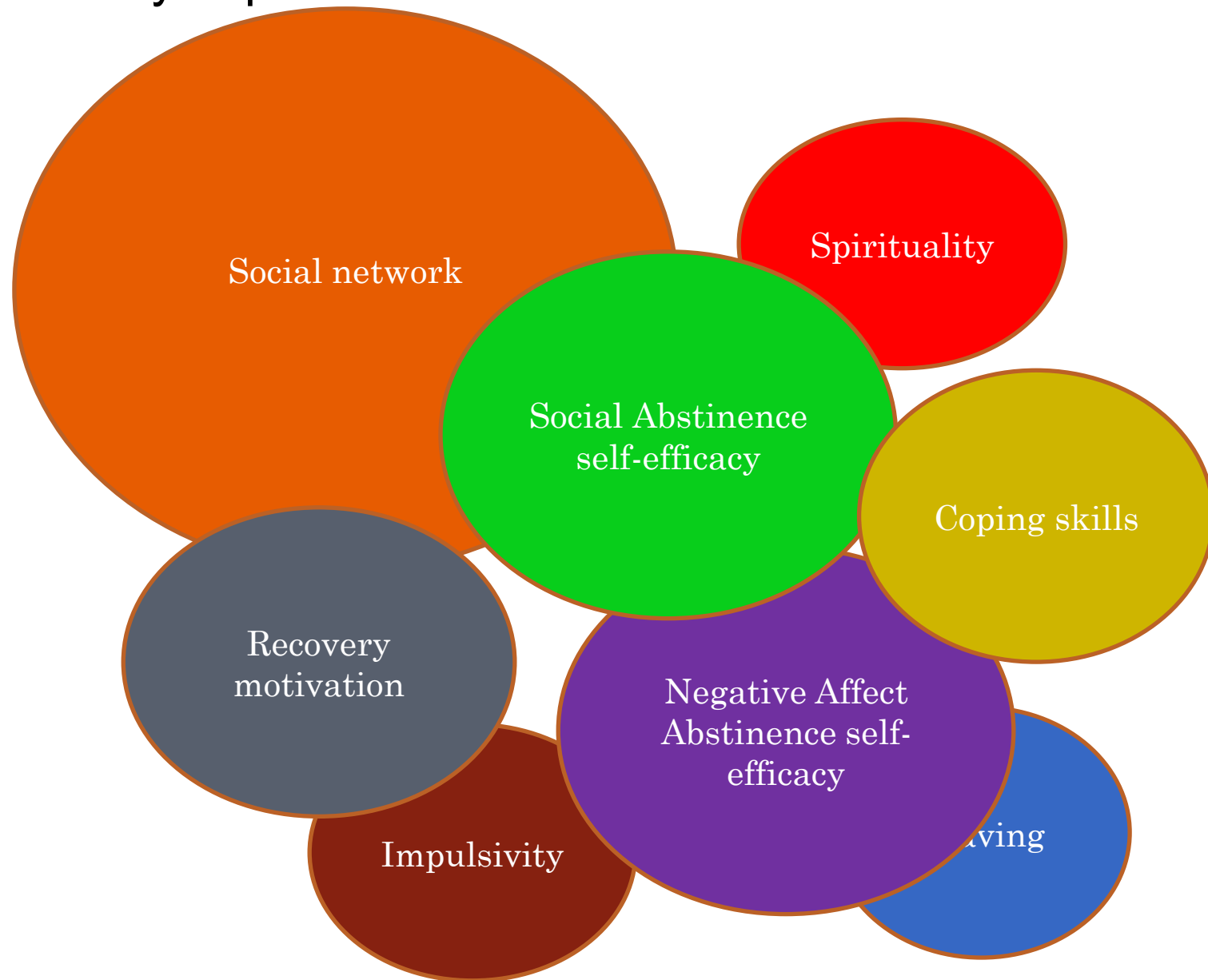
Healthcare Cost Savings

- 3/4 included studies in this category (n reports = 4/5; found sig. health care cost saving in favor of the AA/TSF condition.
- Economic analyses found benefits in favor of AA/TSF relative to outpatient treatment, and CBT interventions.
- Magnitude - large. In addition to sig. increased abstinence/remission, compared to CBT interventions



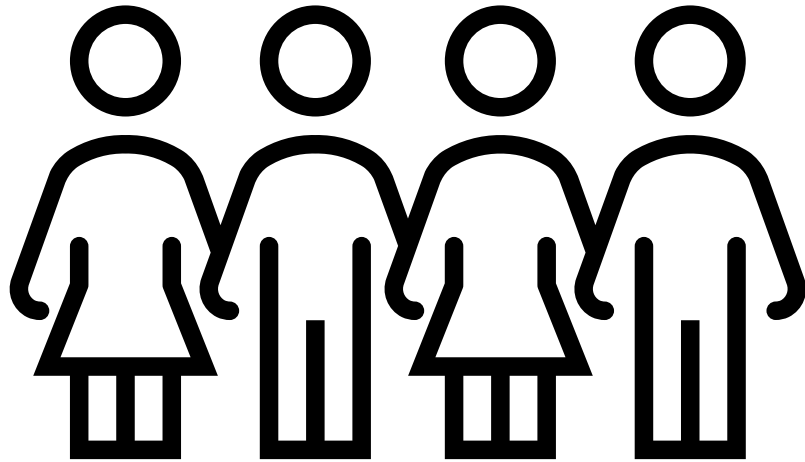
**\$10-15 Billion/yr savings
in health care alone**

Empirically-supported MOBCs through which AA confers benefit: AA mobilizes social and personal recovery capital...



Emerging Evidence for Additional Mutual-Help Organizations....

J Subst Abuse Treat. 2017 February ; 73: 16–26. doi:10.1016/j.jsat.2016.10.004.



Comparison of 12-step Groups to Mutual Help Alternatives for AUD in a Large, National Study: Differences in Membership Characteristics and Group Participation, Cohesion, and Satisfaction

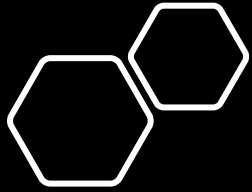
Sarah E. Zemore, Ph.D., Lee Ann Kaskutas, Dr.P.H., Amy Mericle, Ph.D., and Jordana Hemberg, MPH
Alcohol Research Group, Emeryville, CA

Abstract

Background—Many studies suggest that participation in 12-step groups contributes to better recovery outcomes, but people often object to such groups and most do not sustain regular involvement. Yet, research on alternatives to 12-step groups is very sparse. The present study aimed to extend the knowledge base on mutual help group alternatives for those with an alcohol use disorder (AUD), sampling from large, active, abstinence-focused groups including Women for Sobriety (WFS), LifeRing, and SMART Recovery (SMART). This paper presents a cross-sectional

Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital ...

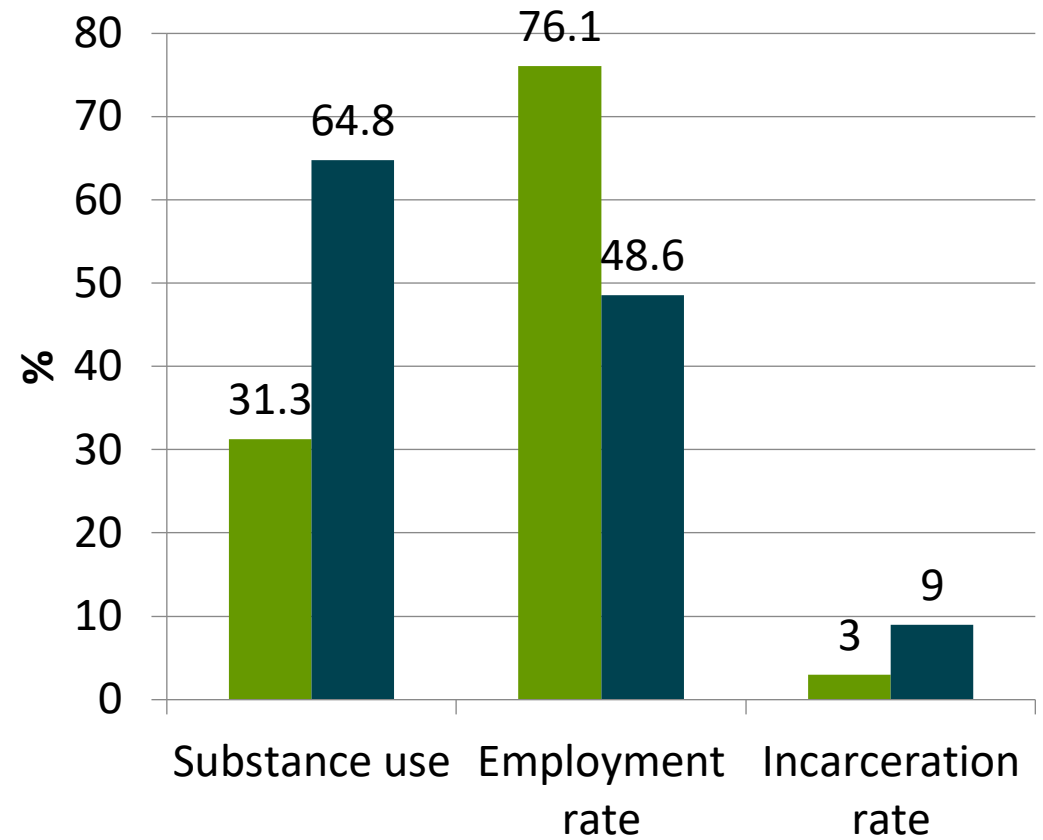




Oxford House vs. Usual Care

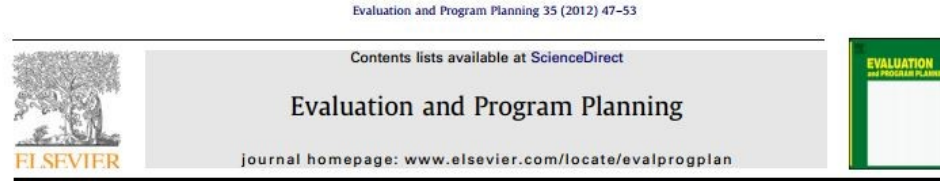
Recovery Residences had –

- half as many using substances across 2 yrs
- 50% more employed
- 1/3 re-incarceration rate



■ Oxford House
■ Usual Care

Cost-benefit analysis of the Oxford House Model



Benefits and costs associated with mutual-help community-based recovery homes: The Oxford House model

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ARTICLE INFO

Article history:

Received 20 May 2010

Received in revised form 10 June 2011

Accepted 29 June 2011

Available online 22 July 2011

Keywords:

Cost-benefit analysis
Substance abuse treatment
Residential treatment

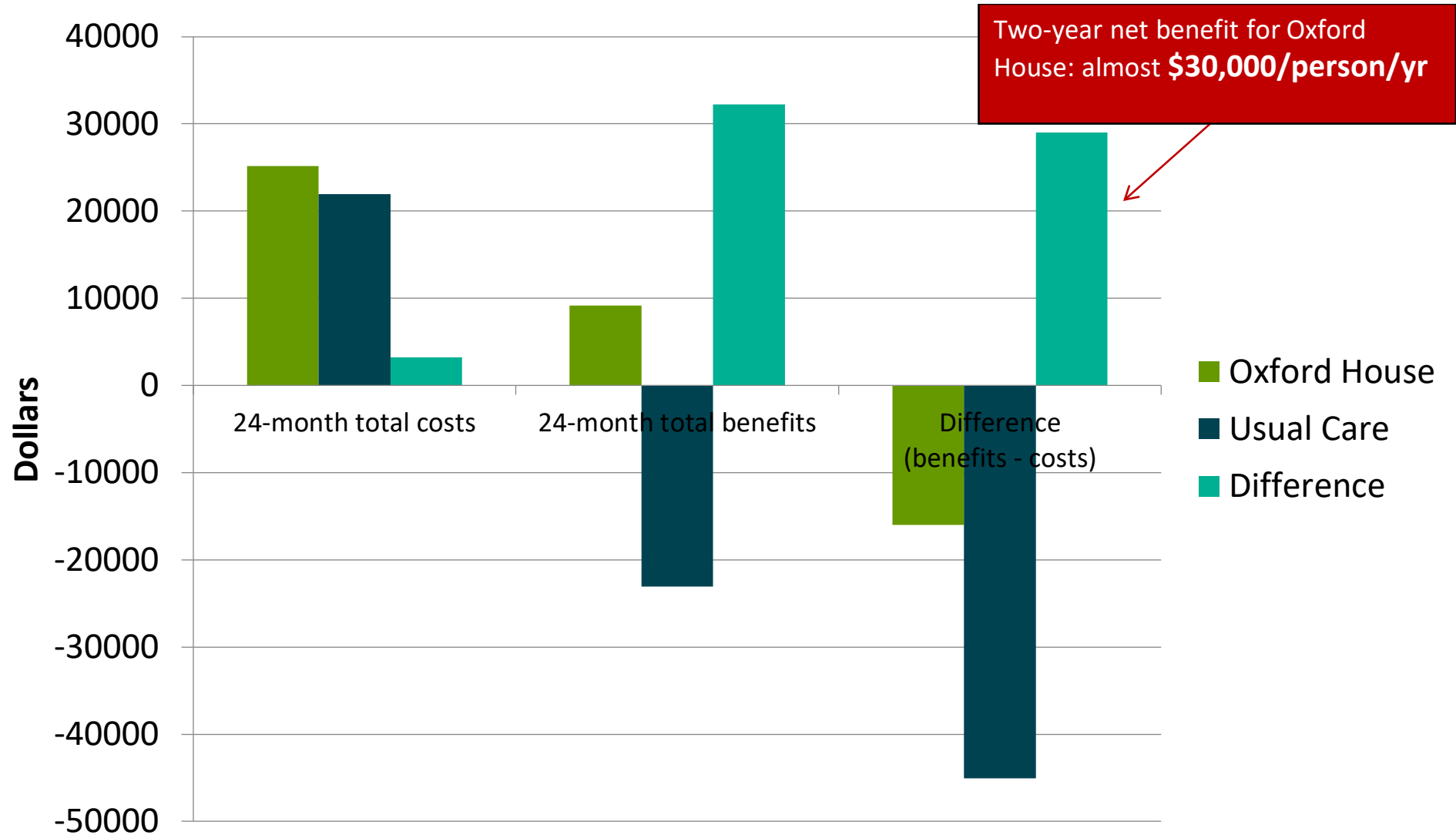
ABSTRACT

We used data from a randomized controlled study of *Oxford House* (OH), a self-run, self-supporting recovery home, to conduct a cost-benefit analysis of the program. Following substance abuse treatment, individuals that were assigned to an OH condition ($n = 68$) were compared to individuals assigned to a usual care condition ($n = 61$). Economic cost measures were derived from length of stay at an Oxford House residence, and derived from self-reported measures of inpatient and outpatient treatment utilization. Economic benefit measures were derived from self-reported information on monthly income, days participating in illegal activities, binary responses of alcohol and drug use, and incarceration. Results suggest that OH compared quite favorably to usual care: the net benefit of an OH stay was estimated to be roughly \$29,000 per person on average. Bootstrapped standard errors suggested that the net benefit was statistically significant. Costs were incrementally higher under OH, but the benefits in terms of reduced illegal activity, incarceration and substance use substantially outweighed the costs. The positive net benefit for Oxford House is primarily driven by a large difference in illegal activity between OH and usual care participants. Using sensitivity analyses, under more conservative assumptions we still arrived at a net benefit favorable to OH of \$17,830 per person.

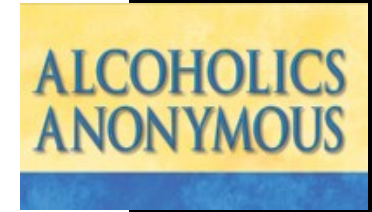
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- **Sample:** 129 adults leaving substance use treatment between 2002 and 2005
- **Design:** Cost-benefit analysis using RCT data
- **Intervention:** Oxford House vs. usual continuing care
- **Follow-up:** 2 years
- **Outcome:** Substance use, monthly income, incarceration rates

Mean per-person societal benefits and costs




Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital ...





One-Stop Shopping for Recovery: An Investigation of Participant Characteristics and Benefits Derived From U.S. Recovery Community Centers

John F. Kelly , Robert L. Stout, Leonard A. Jason, Nilofar Fallah-Sohy, Lauren A. Hoffman, and Bettina B. Hoepfner

Background: Recovery community centers (RCCs) are the “new kid on the block” in providing addiction recovery services, adding a third tier to the 2 existing tiers of formal treatment and mutual-help organizations (MHOs). RCCs are intended to be recovery hubs facilitating “one-stop shopping” in the accrual of recovery capital (e.g., recovery coaching, employment/educational linkages). Despite their growth, little is known about who uses RCCs, what they use, and how use relates to improvements in functioning and quality of life. Greater knowledge would inform the field about RCC’s potential clinical and public health utility.

Methods: Online survey conducted with participants ($N = 336$) attending RCCs ($k = 31$) in the northeastern United States. Substance use history, services used, and derived benefits (e.g., quality of life) were assessed. Systematic regression modeling tested a priori theorized relationships among variables.

Results: RCC members ($n = 336$) were on average 41.1 ± 12.4 years of age, 50% female, predominantly White (78.6%), with high school or lower education (48.8%), and limited income (45.2% < \$10,000 past-year household income). Most had either a primary opioid (32.7%) or alcohol (26.8%) problem. Just under half (48.5%) reported a lifetime psychiatric diagnosis. Participants had been attending RCCs for 2.6 ± 3.4 years, with many attending <1 year (35.4%). Most commonly used aspects were the socially oriented mutual-help/peer groups and volunteering, but technological assistance and employment assistance were also common. Conceptual model testing found RCCs associated with increased recovery capital, but not social support; both of these theorized proximal outcomes, however, were related to improvements in psychological distress, self-esteem, and quality of life.

Conclusions: RCCs are utilized by an array of individuals with few resources and primary opioid or alcohol histories. Whereas strong social supportive elements were common and highly rated, RCCs appear to play a more unique role not provided either by formal treatment or by MHOs in facilitating the acquisition of recovery capital and thereby enhancing functioning and quality of life.

Key Words: Recovery Community Centers, Recovery, Addiction, Support Services, Recovery Coaching, Addiction, Substance Use Disorder.

PROFESSIONAL TREATMENT SERVICES often play a vital role in addressing substance use disorders in the United States and around the world. Such clinical services can provide life-saving medically managed detoxification and stabilization as well as deliver medications and psychosocial interventions that can alleviate cravings and help prevent relapse. Extending the framework and benefits of these professional treatment efforts, peer-led mutual-help

organizations (MHOs), such as Alcoholics Anonymous (AA), Narcotics Anonymous (NA), SMART Recovery, and many others are commonly used to provide additional long-term free recovery support over time in the communities in which people live (Bog et al., 2017; Kelly, 2017; Kelly et al., 2017a). Adding to these resources in recent years has been a new dimension of recovery support services that are neither professional treatment nor MHOs. These new services (e.g., recovery community centers [RCCs], recovery residences, recovery coaching, recovery high schools, and collegiate recovery programs; Kelly et al., in press; White et al., 2012, 2012) combine voluntary, peer-led initiatives, with professional activities, and are intended to provide flexible community-based options to address the psychosocial barriers to sustained remission (White et al., 2012, 2012).

RCCs are one of the most common of these new additions to recovery support infrastructure and are growing rapidly (Cousins et al., 2012; Kelly et al., in press; Kelly et al., 2017b). RCCs are literally and metaphorically, “new kids on the block,” as these novel entities are most often located on

From the Recovery Research Institute (JFK, NF-S, LAH, BBH), Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts; DePaul University (RLS), Chicago, Illinois; and Decision Sciences Institute (LAJ), Providence, Rhode Island.

Received for publication October 11, 2019; accepted December 27, 2019.

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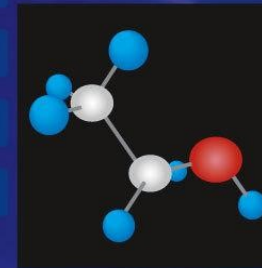
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DOI: 10.1111/acer.14281

Alcohol Clin Exp Res, Vol **, No *, 2020; pp 1–11

ALCOHOLISM

CLINICAL & EXPERIMENTAL RESEARCH

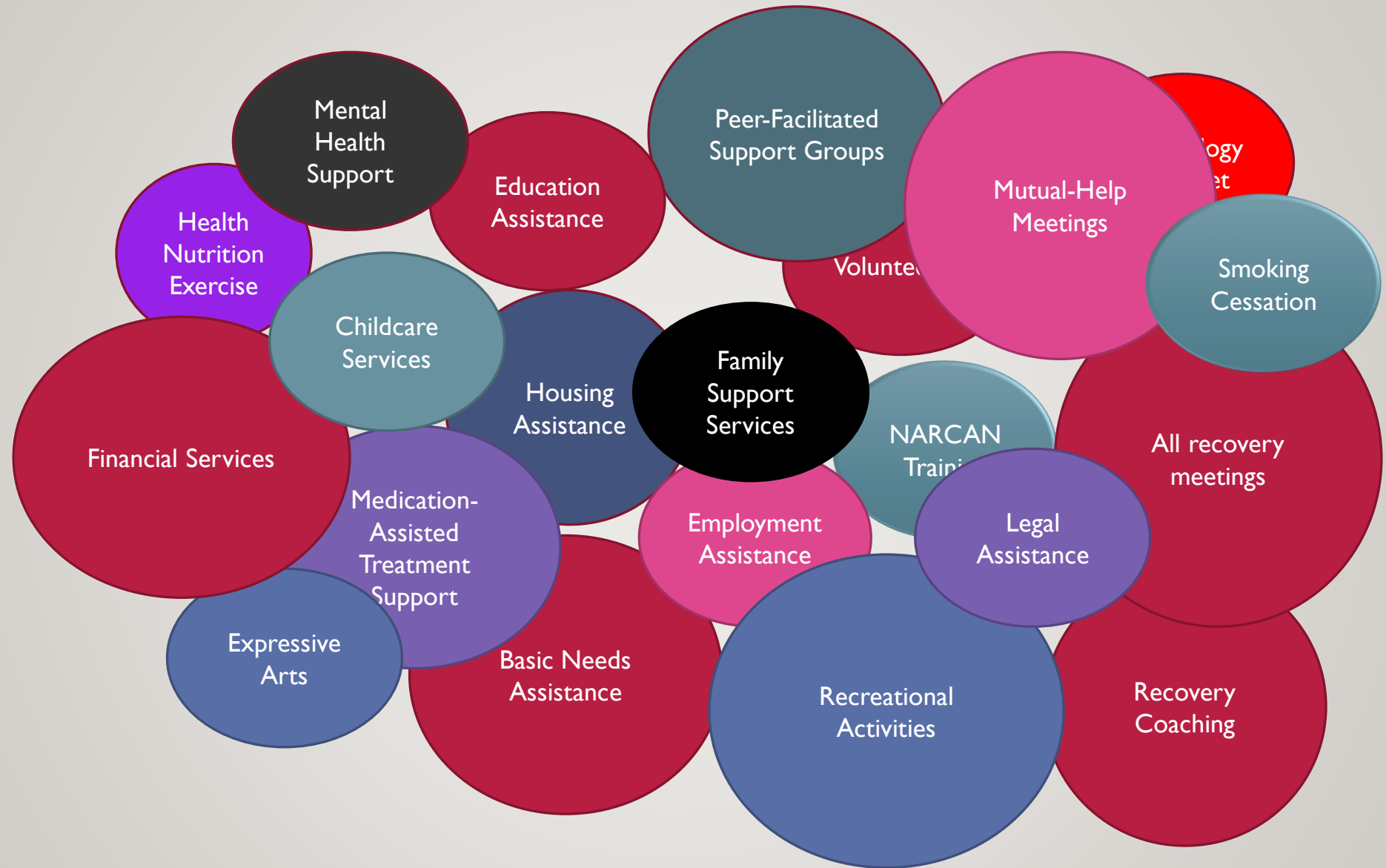


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Research on Alcoholism



Founded in 1977 by the National Council on Alcoholism
(Now National Council on Alcoholism and Drug Dependence, Inc.)

SERVICES PROVIDED



Cross-Sectional Survey (N=366) - RCC Experiences

	Total	
	Mean/%	(SD/n)
RCC experience		
Referral source		
Family and friends	44.0	(148)
SUD treatment (detox, inpatient, outpatient)	14.6	(49)
Housing and social services (e.g., sober living, shelter, including DSS)	13.7	(46)
RCC outreach (e.g., street outreach, Internet, pamphlets, community event, and ads)	11.6	(39)
Health care (PCP, ED)	5.4	(18)
Other (e.g., employer, 12-step, church, and academic)	8.9	(30)
Length of RCC attendance (in years)	2.6	(3.4)
Less than a year	35.4	(119)
1 to 5 years	49.1	(165)
5+ years	14.0	(47)
Percent days attended RCC in past 90 days (in mean, SD)	45.5	(32.1)
Length of typical RCC visit (in hours)	3.1	(2.7)
RCC appraisal		
RCC's helpfulness to recovery	6.2	(1.2)
RCC's helpfulness to QOL	6.1	(1.2)
RCC's sense of community (in mean, SD)		
Self (identity and importance to self)	5.3	(1.0)
Membership (social relationships)	5.2	(1.0)
Entity (a group's organization and purpose)	5.3	(1.0)
Recovery assets		
Recovery capital (BARC; 10 items, 1- to 6-point scale)	5.0	(0.9)
Social support for recovery (CEST-SS; 9 items, 1- to 6-point scale)	4.8	(1.0)
Quality of life (QOL) (in mean, SD)		
Quality of Life (EUROHIS-QOL; 8 items, 1- to 5-point scale)	3.8	(0.7)
Self-esteem (1 item, 1- to 10-point scale)	6.5	(2.3)
Psychological distress (Kessler-6, 6 items, 0- to 4-point scale)	2.0	(0.8)

Accelerates improvements in QOL - half a SD higher than in Other general (NRS) samples despite shorter time in recovery

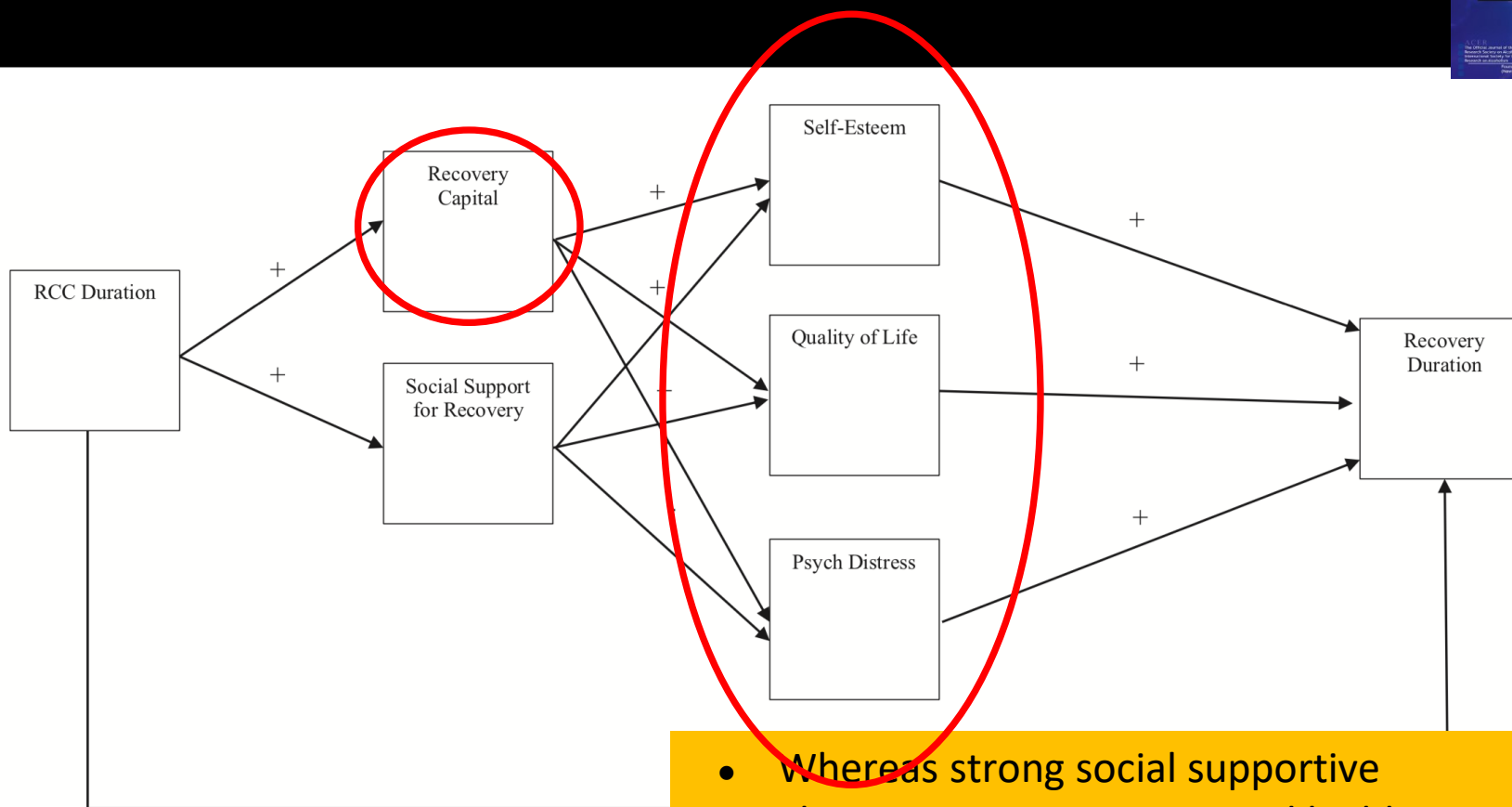
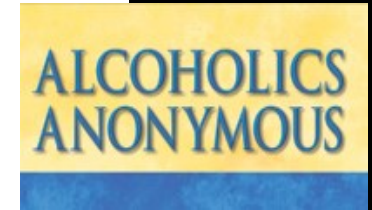
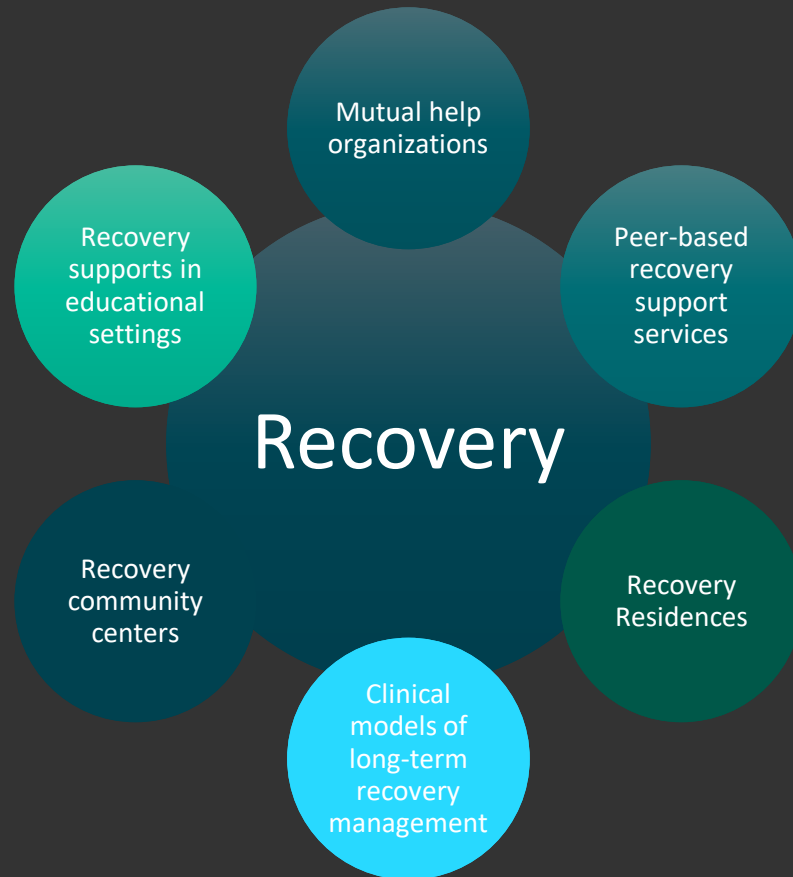


Fig. 1. Conceptual model of the theorized relationships among variables. “+” = theorized positive association among linked variables; “-” = theorized negative association among linked variables.

- Whereas strong social supportive elements were common and highly rated, **RCCs appear to play a more unique role not provided either by formal treatment or by MHOs** in facilitating the acquisition of recovery capital and thereby enhancing functioning and quality of life.

note:

Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital ...



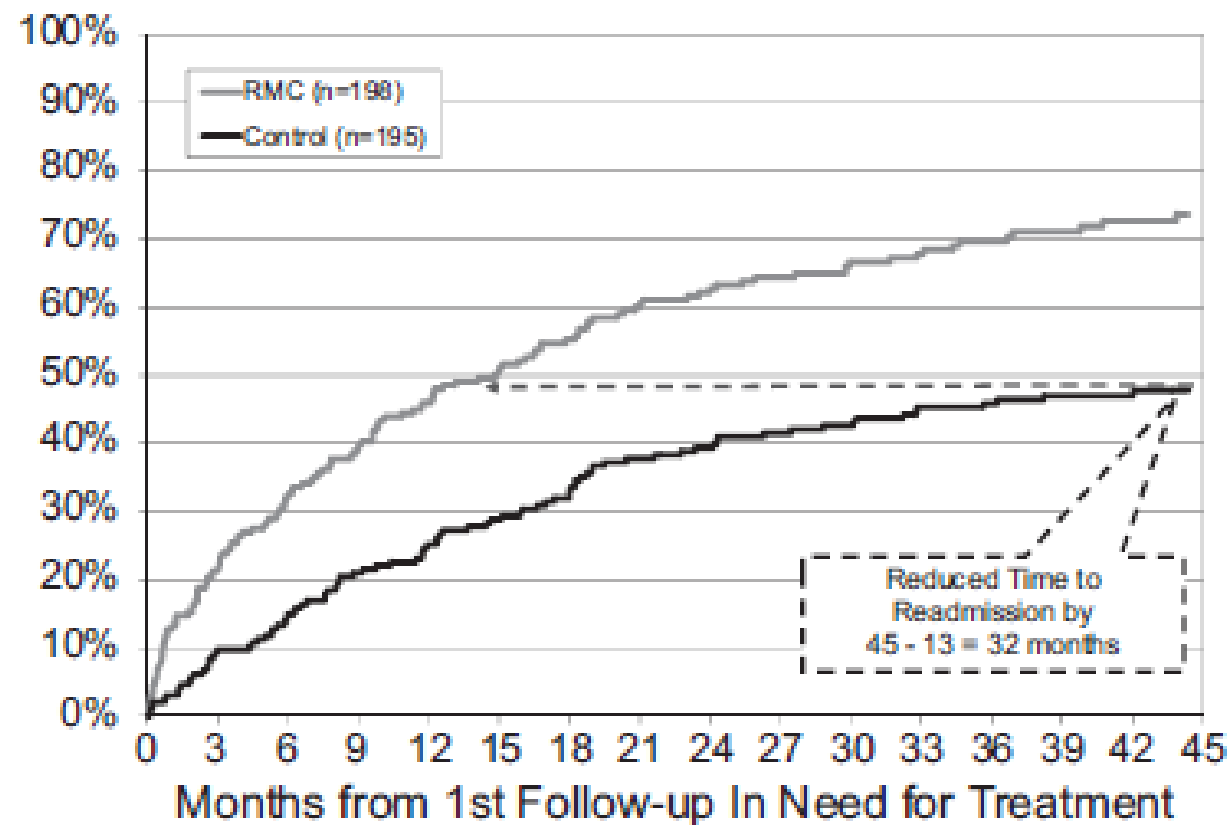
Recover Management Check-ups (RMC)

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
 - quarterly outcome monitoring (OM) only
 - quarterly OM plus RMC
- Recovery Management Checkups
 - Linkage manager who used motivational interviewing to review the 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 the previous quarter, the linkage manager reviewed how abstinence has changed their lives and what methods have worked to maintain abstinence

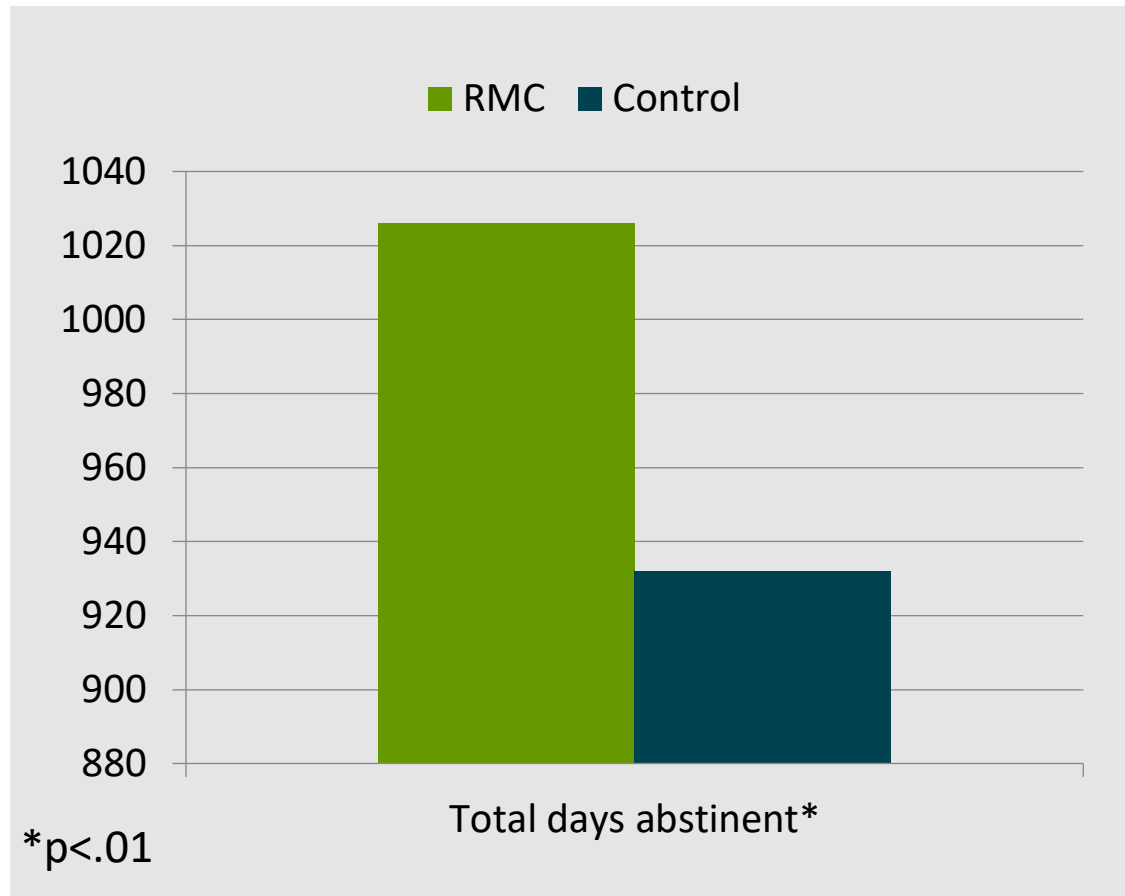
Results Return to treatment

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



Results 4

Days abstinent



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

Cost-effectiveness analysis of Recovery Management Checkups (RMC)

- **Sample:** 446 patients with substance use disorders residing in Illinois
- **Design:** Cost-effectiveness analysis using RCT data
- **Intervention:** Outcome monitoring (OM) plus RMC vs. OM-only
- **Follow-up:** 4 years
- **Outcome:** Cost per participant, number of days of abstinence, number of substance use-related problems

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

Department of Public Health Sciences, Miller School of Medicine, University of Miami, Miami, FL, USA,¹ Department of Sociology, University of Miami, Coral Gables, FL, USA,² New York University, School of Medicine, New York, NY, USA,³ Chestnut Health Systems, Normal, IL, USA⁴ and Chestnut Health Systems, Chicago, IL, USA⁵

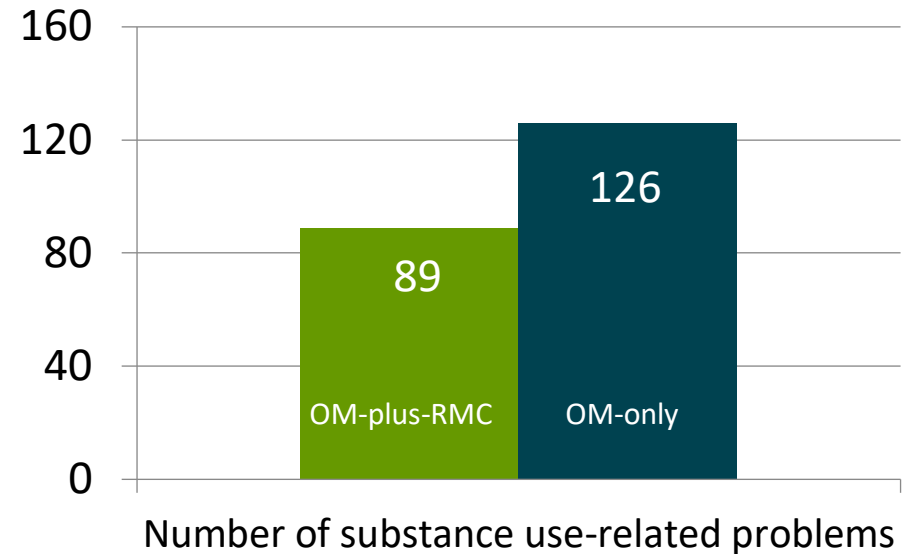
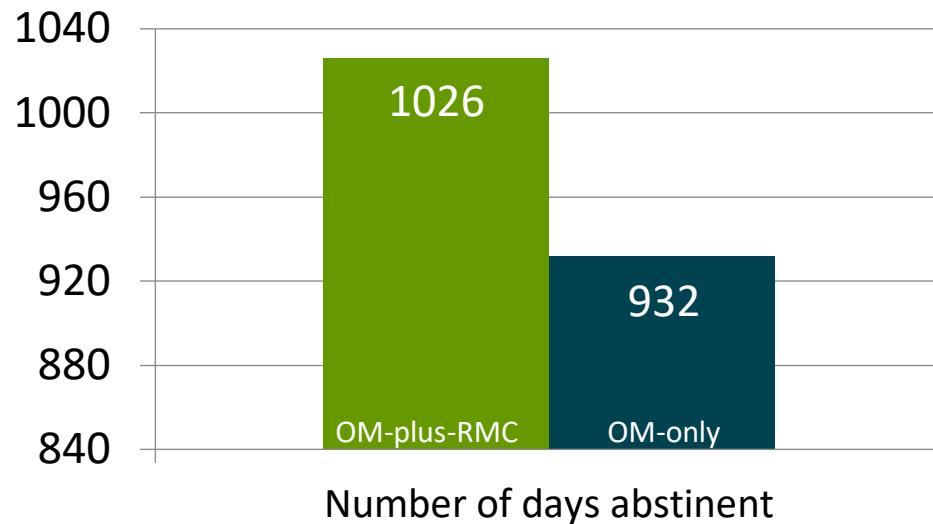
ABSTRACT

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** 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 large 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 was 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.

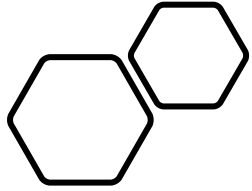
Keywords Chronic substance use disorder, cost-effectiveness analysis, economic evaluation, Recovery Management Checkups.

Costs and Effectiveness Estimates

- Cost on average (per participant) to deliver:
 - OM-plus-RMC: \$4,889
 - OM-only: \$2,705



- Incremental effectiveness of OM-plus-RMC:
 - 94 additional days abstinent
 - 37 fewer substance use-related problems

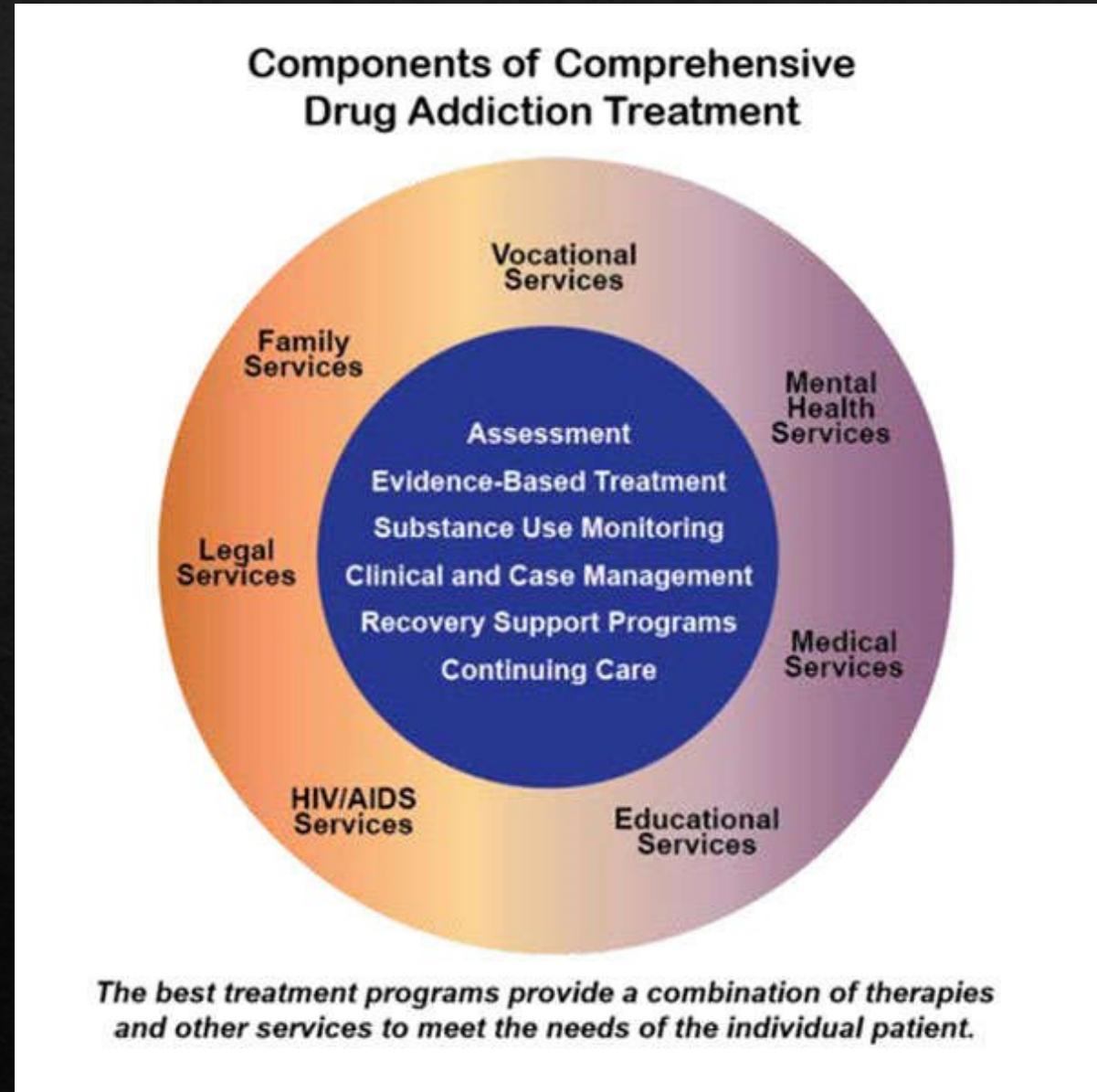


Connecting the Dots

Toward a Recovery-Oriented System of Care (ROSC)

A ROSC is a coordinated network of treatment and community-based services and supports that is person-centered and builds on the strengths and resiliencies of individuals, families, and communities to help achieve remission and improved health, wellness, and quality of life for those with or at risk of alcohol and drug problems

This broader ROSC-type orientation is what NIDA now models as “comprehensive drug addiction treatment” ...



Outline



Definition - From cultural generality to formal clinical/public health and research definitions



Rationale - How did we get here? A rationale for the new public health and scientific focus on addiction “recovery”



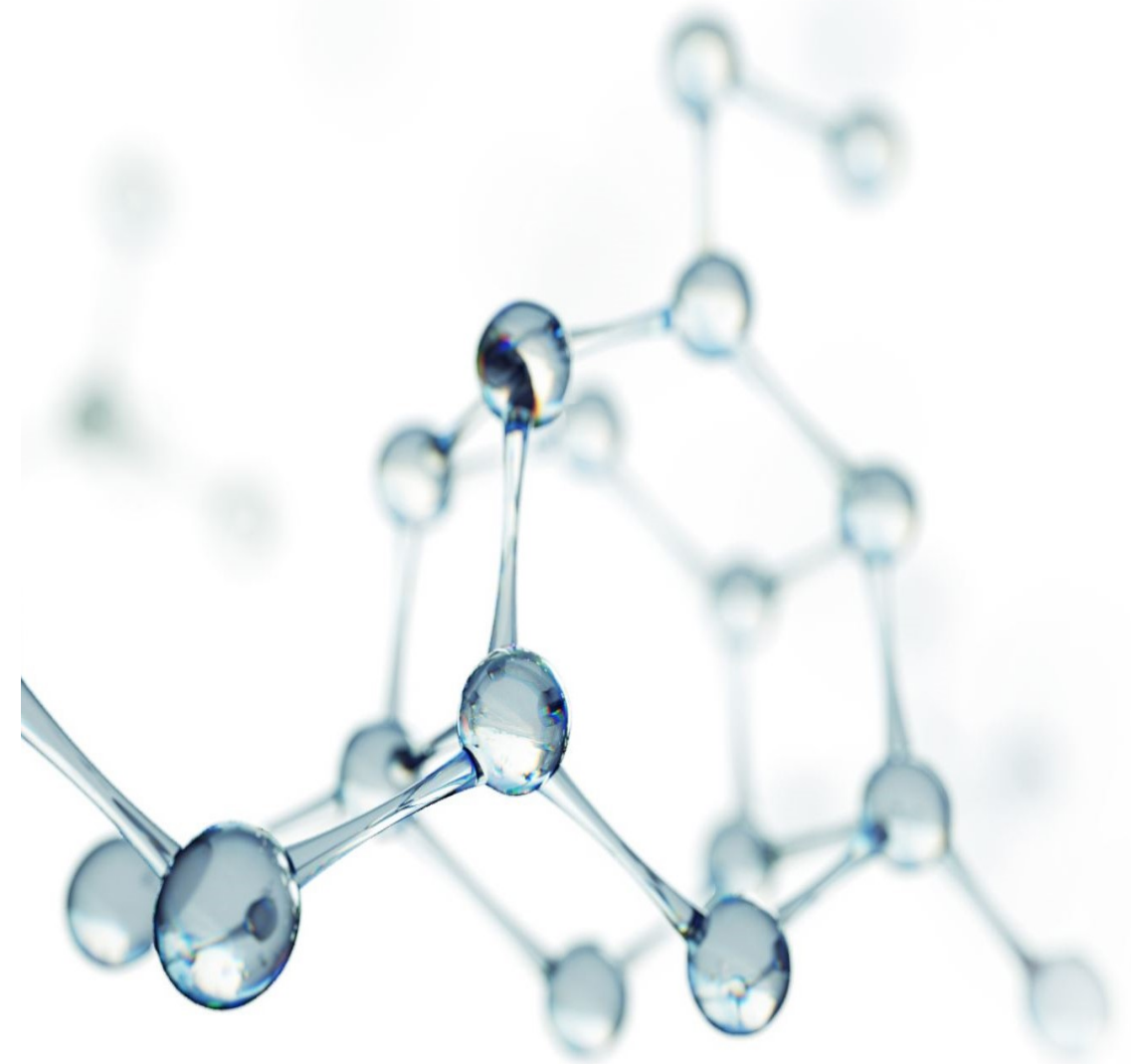
Recovery Support Services and Recovery Capital – facilitating supportive environments and recovery capital



Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?



Insights - Some novel findings from research



Recovery Milestones

- ◇ Initial 0-3m
- ◇ Early 4-12m
- ◇ Sustained 1-5yrs
- ◇ Stable 5+yrs



What do we know about recovery milestones and trajectories?

Relevant to
inform answers
to Questions
regarding
Treatment and
Recovery
Support
Services...

Who needs what type of service?

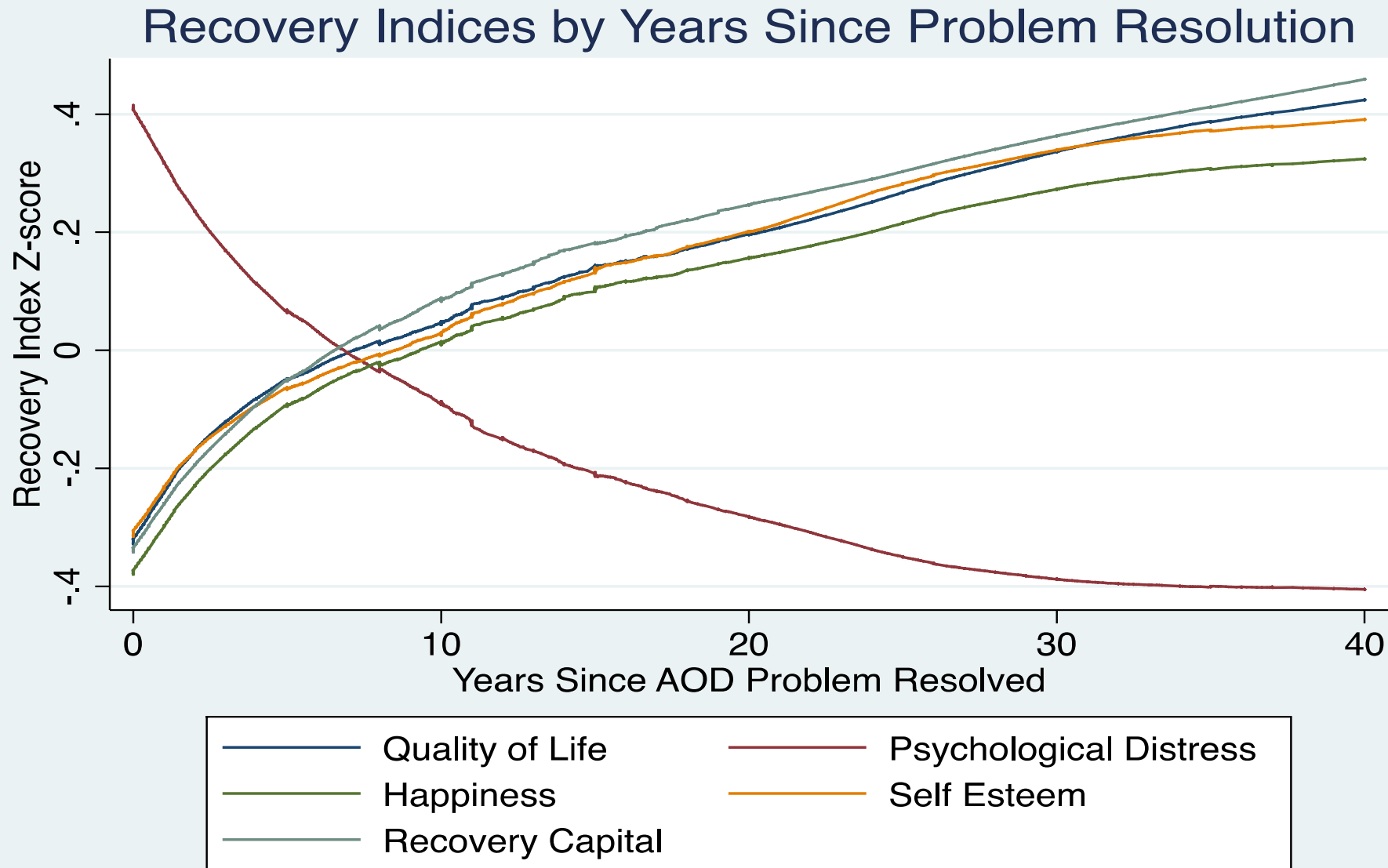
When in their recovery?

For what duration?

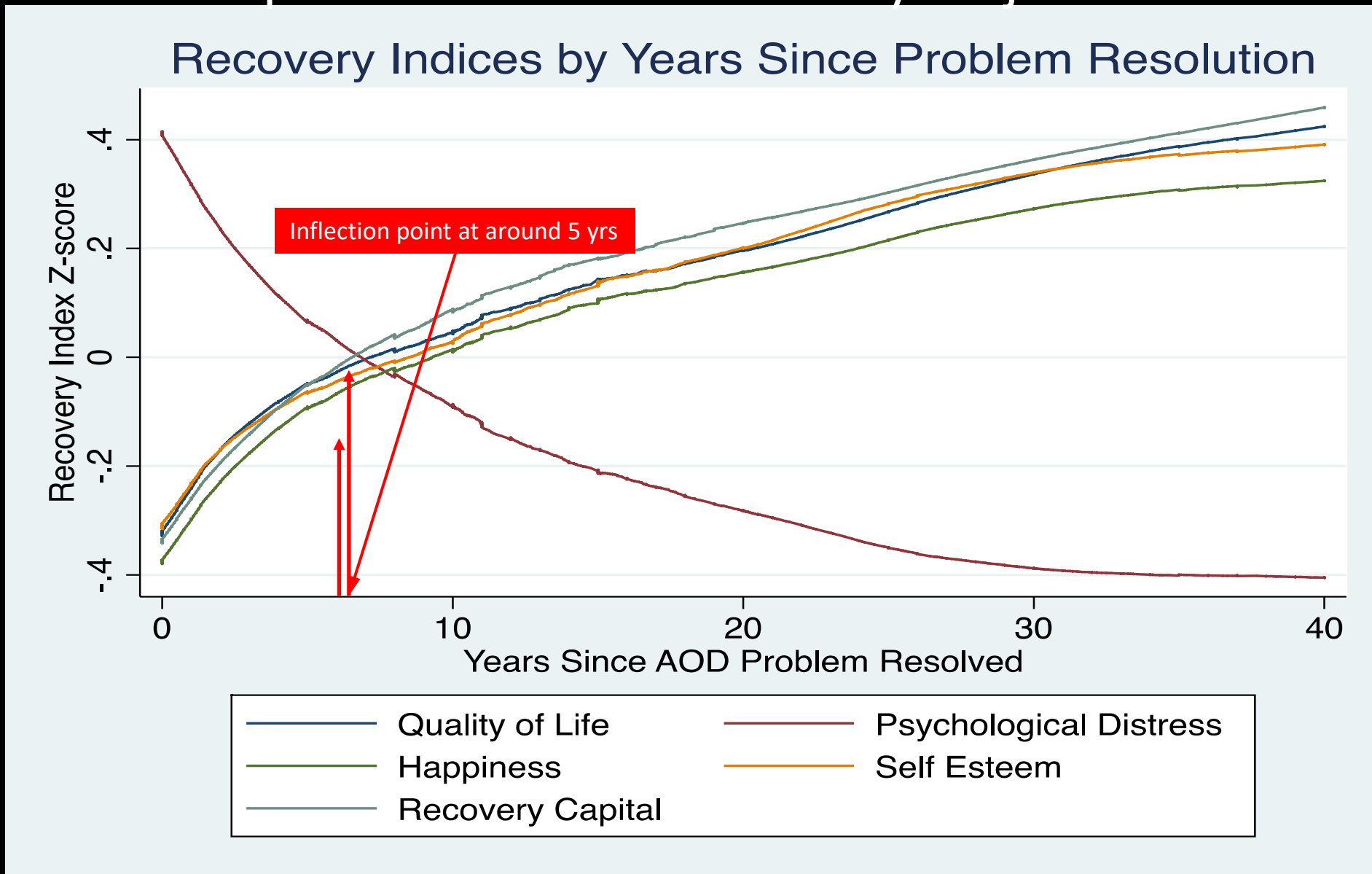
At what intensity?

40-Year Temporal Horizon of Recovery Trajectories

National
Recovery Study
(NRS)
N=2,002

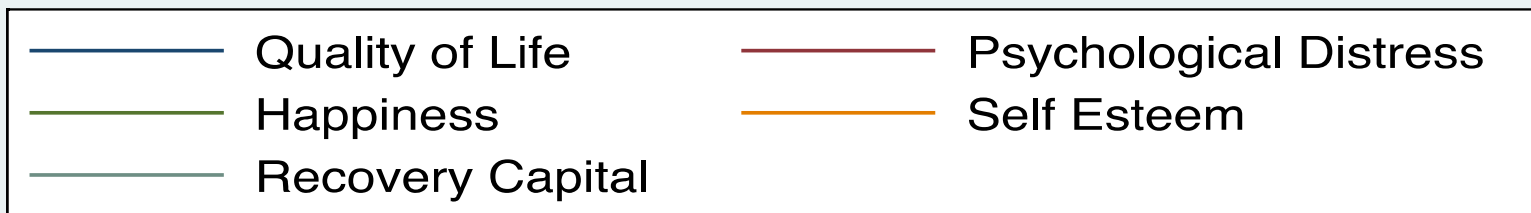
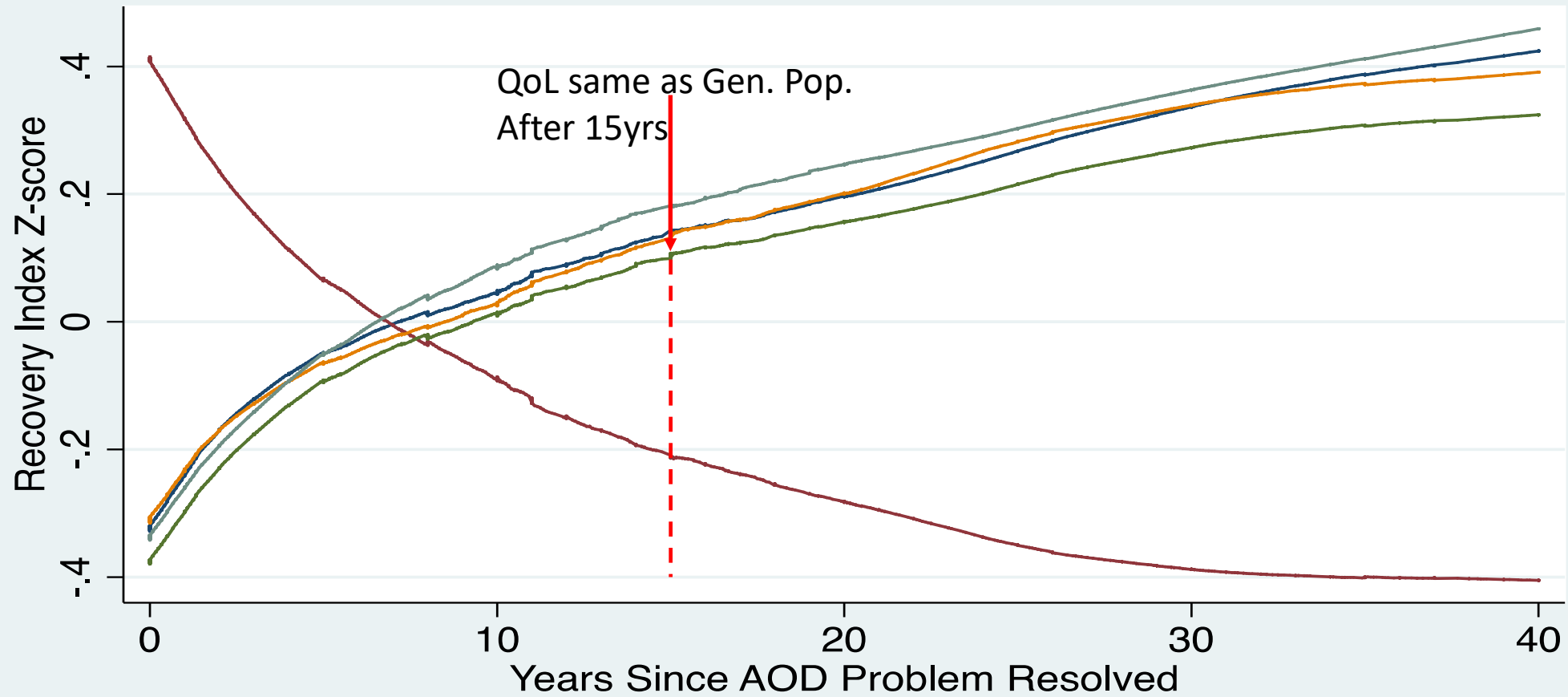


40-Year Temporal Horizon of Recovery Trajectories



40-Year Temporal Horizon of Recovery Trajectories

Recovery Indices by Years Since Problem Resolution



Changes in Recovery Capital and Quality of life Among Different Primary Substance Groups in first 5 yrs of Recovery

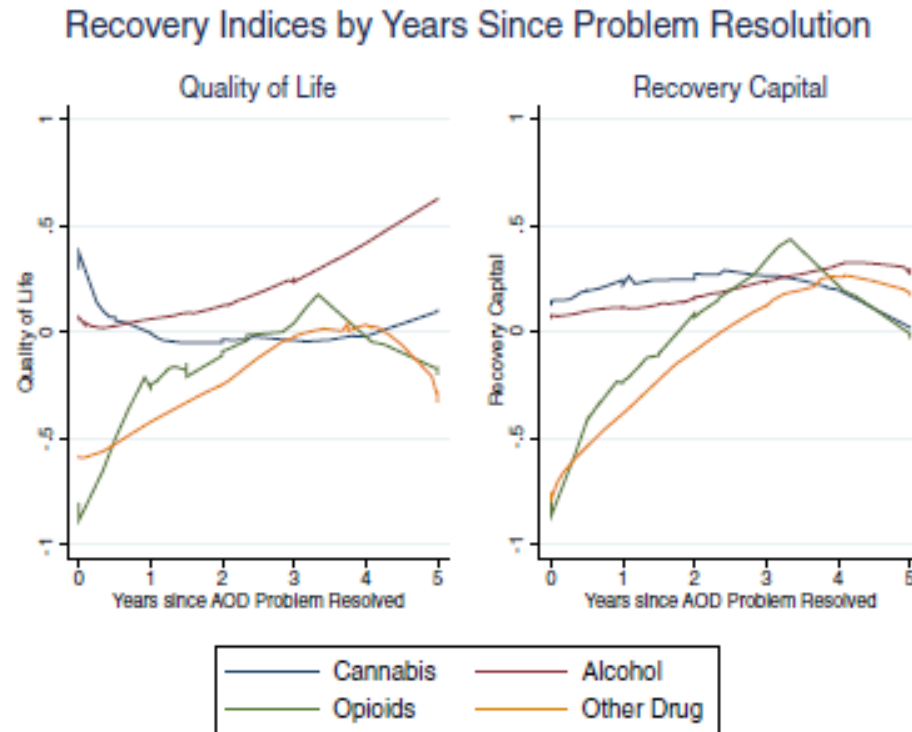
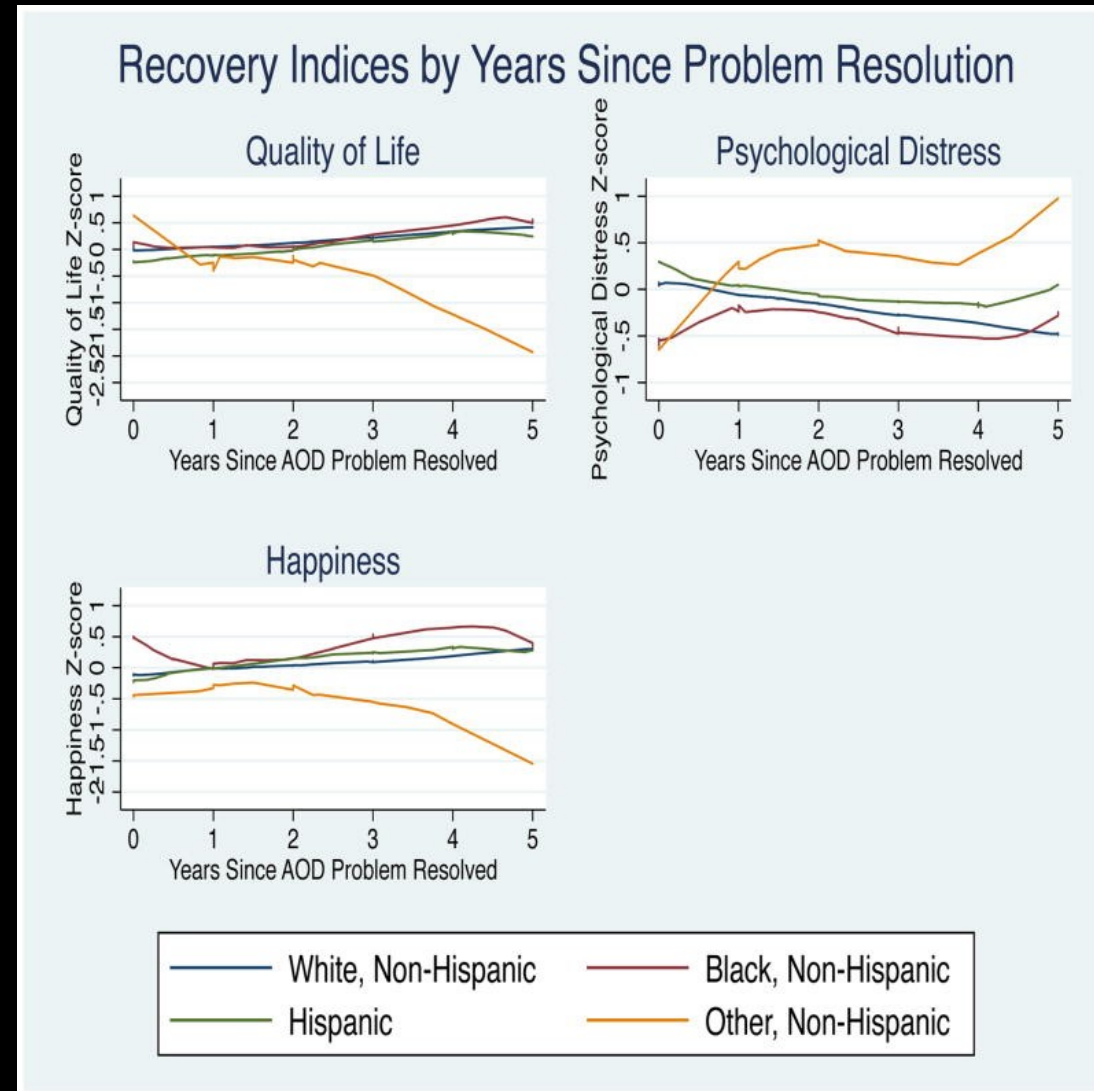
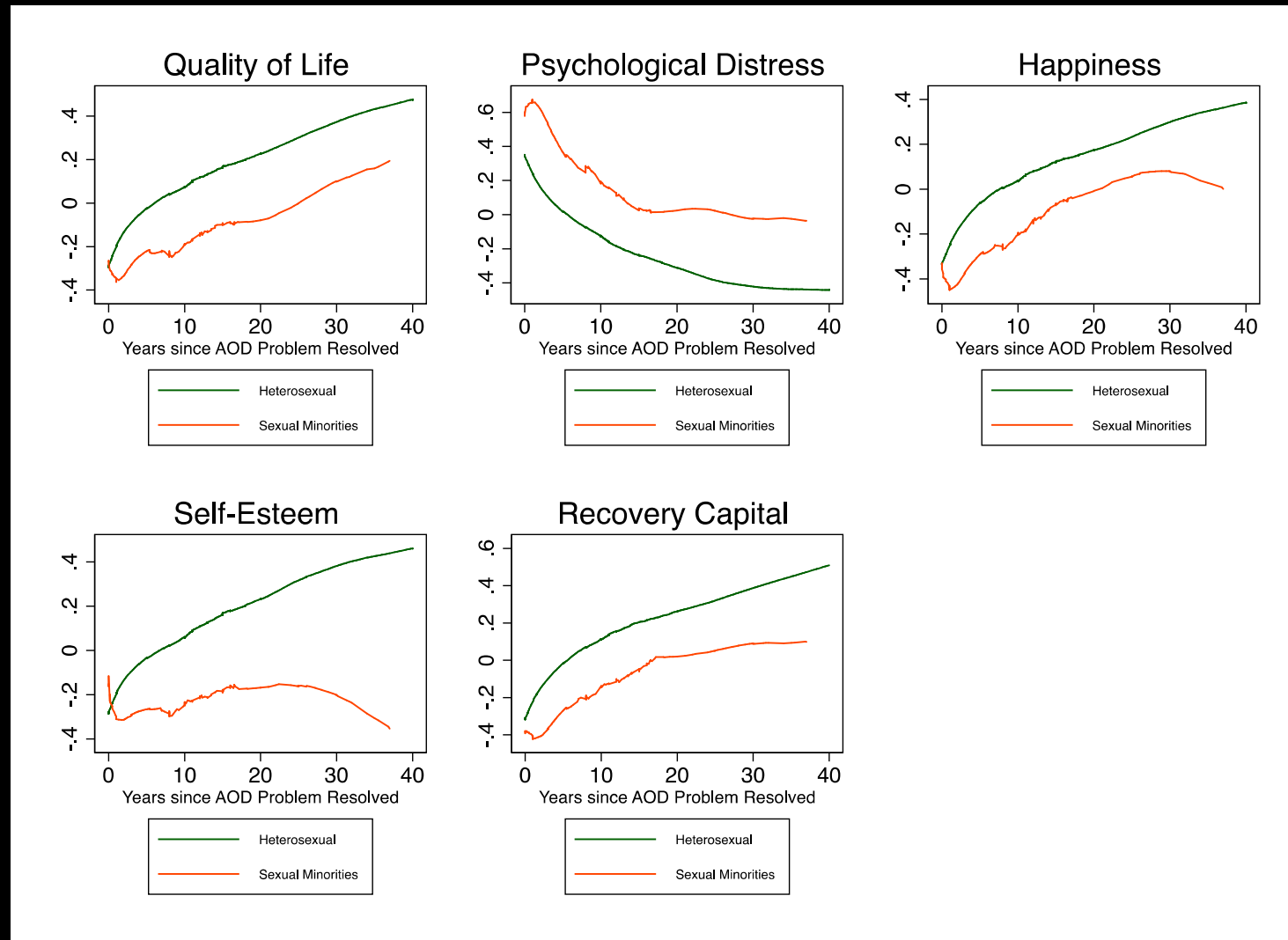


Fig. 5. Locally Weighted Scatterplot Smoothing (LOWESS) analysis of recovery indices by years since problem resolution stratified by primary substance.

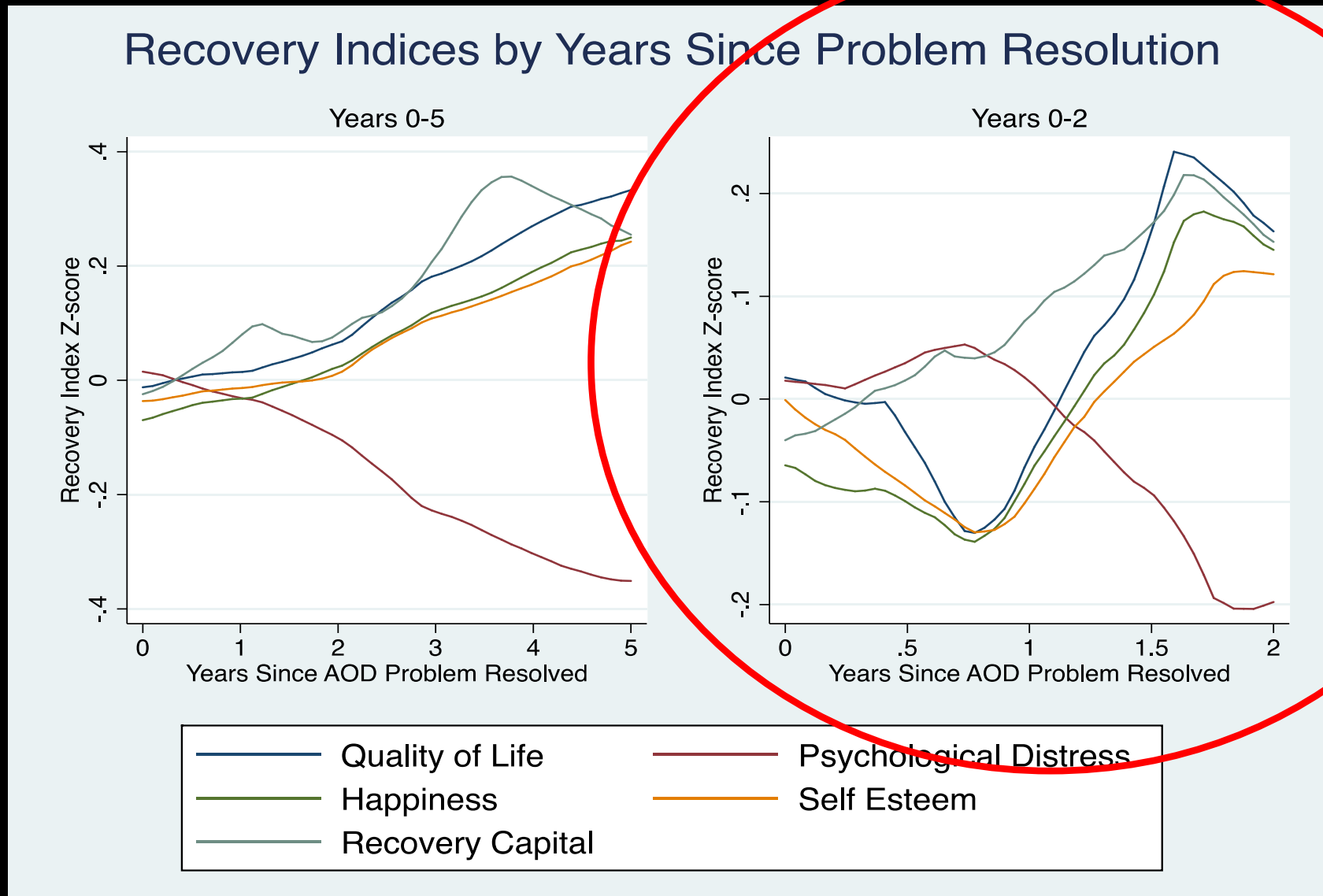
Changes in Quality of life, Distress, Happiness Among Different Racial/Ethnic Groups in first 5 yrs of Recovery



Sexual Minority vs Heterosexual Status and Changes in Functional and Well-Being Indices - 40 yr. temporal horizon



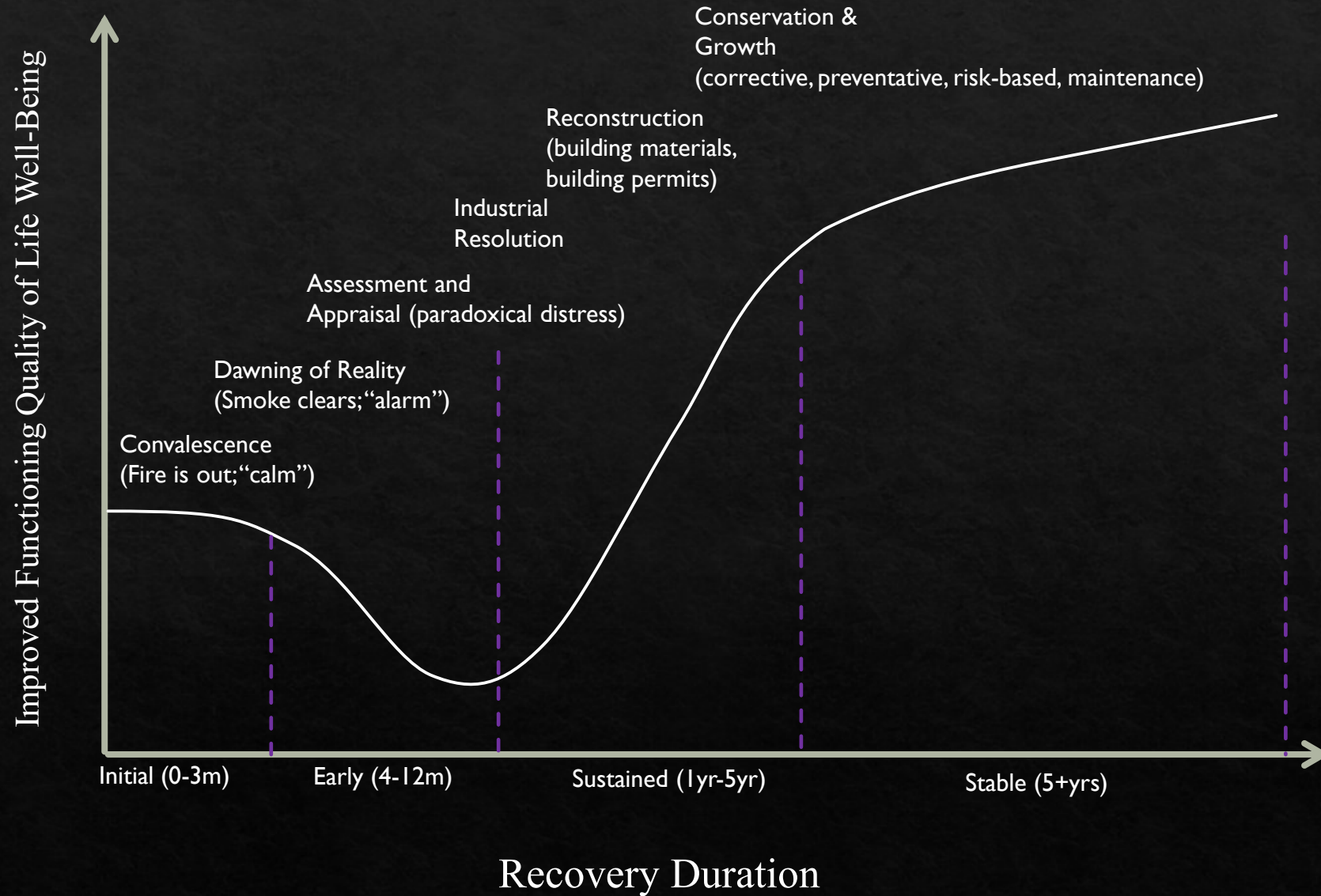
2-yr Year Temporal Horizon of Recovery Trajectories



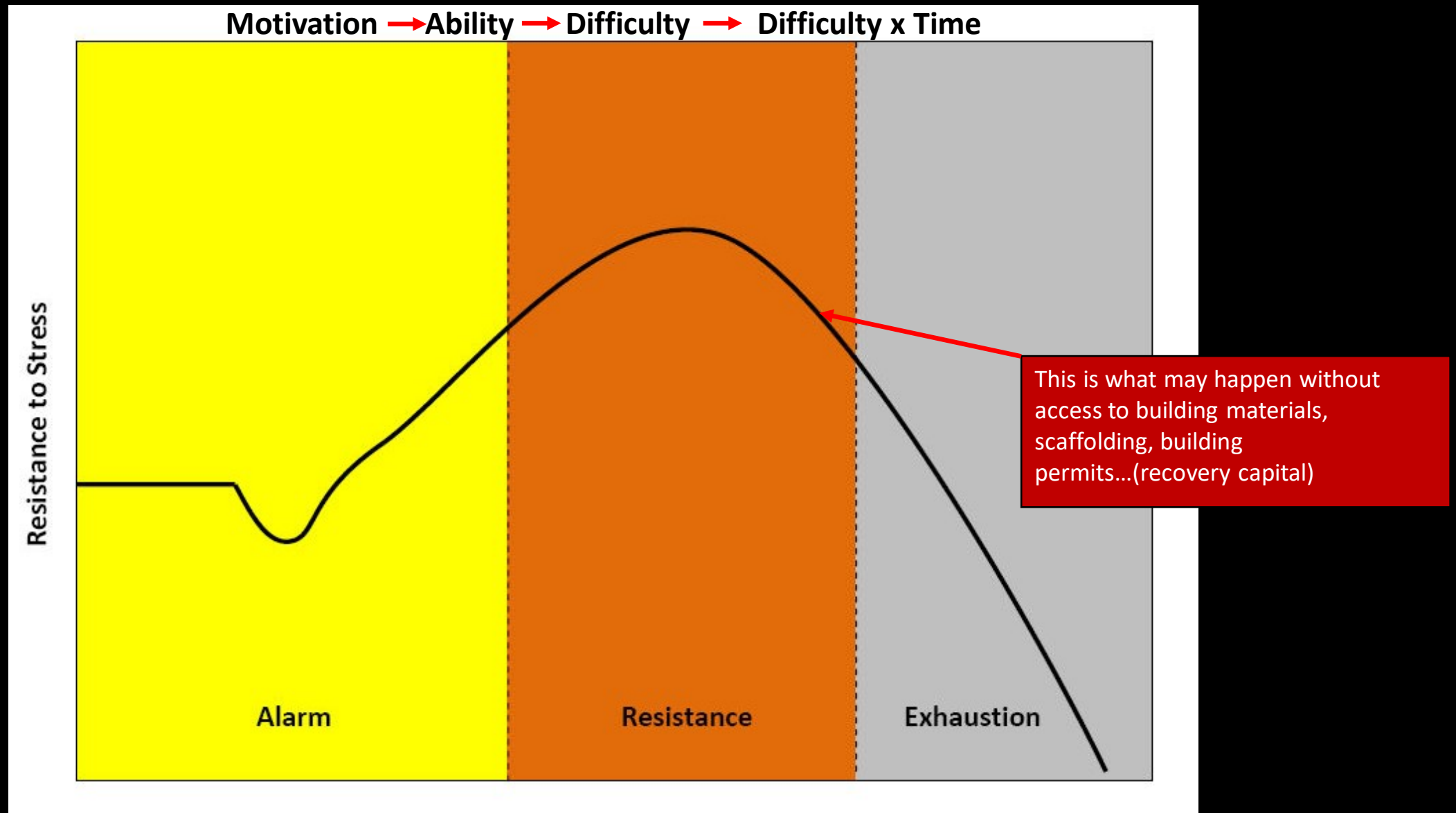


Recovery Curve

Preliminary Data-Based Recovery Milestones and Tasks...



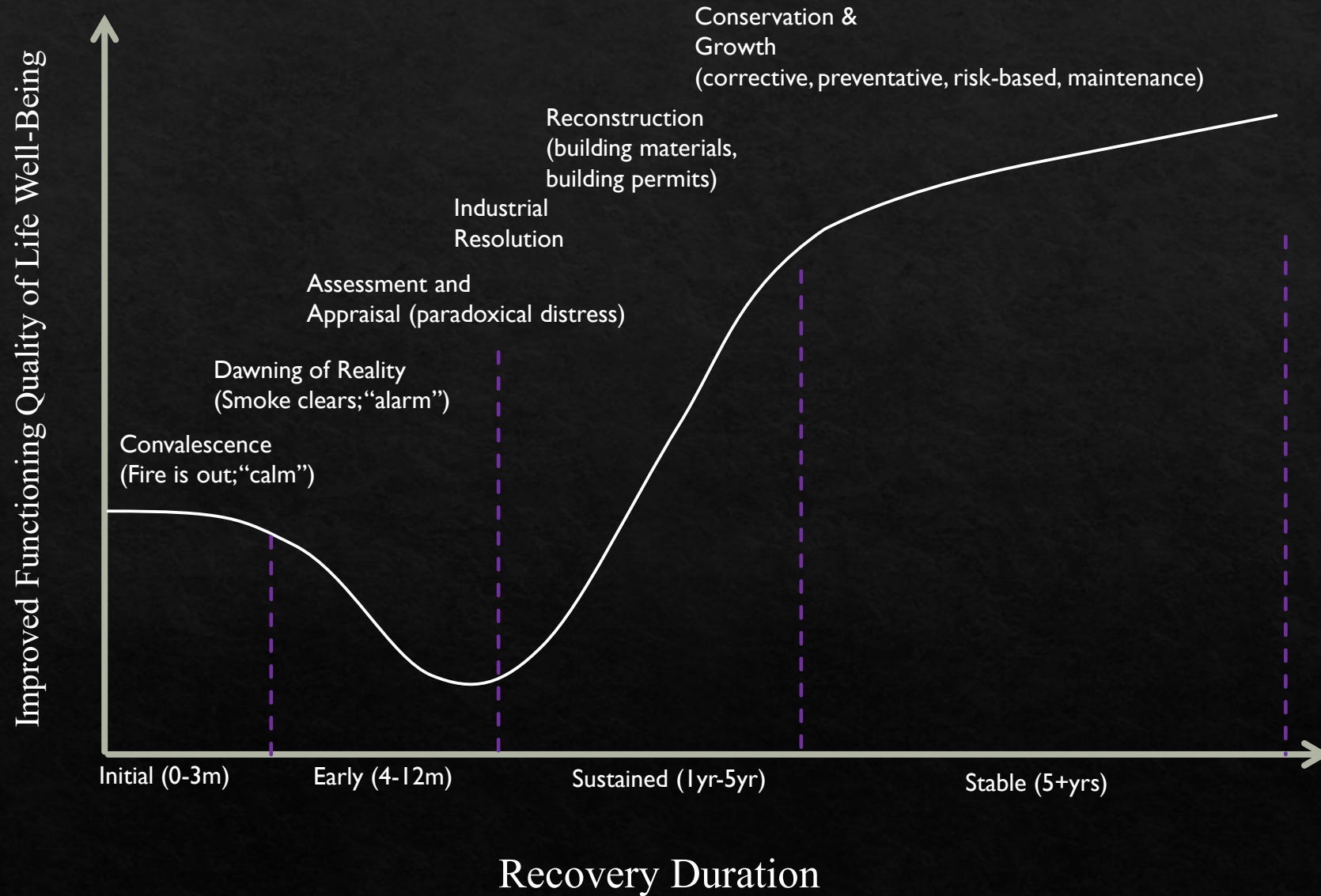
Noteworthy that the dynamics of the recovery curve are very similar as the adaptation to stress curve ...





Recovery Curve

Preliminary Data-Based Recovery Milestones and Tasks...



Outline



Definition - From cultural generality to formal clinical/public health and research definitions



Rationale - How did we get here? A rationale for the new public health and scientific focus on addiction “recovery”



Recovery Support Services and Recovery Capital – facilitating supportive environments and recovery capital



Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?



Insights - Some novel findings from research

Summary



Shift in “recovery” status from general cultural meaning, to explications from clinical, public health entities and now formal operational definitions (e.g., NIAAA)



Past 50 yrs have brought new insights and paradigm shifts including recognition of a long clinical course to remission



Enhanced awareness of need to address environmental stressors build availability and access to recovery capital to mitigate stress, instill hope, and strengthen resilience may shorten course to stable remission/recovery



Array of recovery support services emerged and grown with increasing empirical scrutiny and growing support



Recovery research is revealing dynamic nature of recovery process -can help inform who needs what types of services, when, for how long, and at what intensity



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