



Addiction Recovery: From Culture to Science

Albatross Conference, Paris, France, June 2024

John F. Kelly, PhD, ABPP

**RECOVERY
RESEARCH
INSTITUTE**

Massachusetts General Hospital
Founding Member, Mass General Brigham

**HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL**

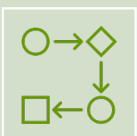
Outline



How did we get here? A rationale for the new public health and scientific focus on addiction recovery and support services



Ingredients of recovery– facilitating access to the scaffolding, building materials, permits, and supportive environments



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



On Defining “Recovery” – Cultural Status

National Recovery Month

Every Person. Every Family. Every Community.



SAMHSA
Substance Abuse and Mental Health
Services Administration



September 2020 to 2023
Google featured Recovery Month
on its main landing search page

Google Search

I'm Feeling Lucky

Learn more about National Recovery Month

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's first annual

Brexit

[Check what you need to do](#)

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2023 Marked 34 years Recovery Month in the United States



[log in](#) [create an account](#)



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- 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

SAMHSA
Substance Abuse and Mental Health Services Administration

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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

Recovery Definition

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

- General cultural use 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 - exceeds 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

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 recovery.
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 category (“in recovery”); at some point people consider themselves “in recovery” but previously didn’t
- Like “remission” – has 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 “time”; which remission-based factors are indicative of continued remission vs elevated risk of relapse/reinstatement (e.g., resiliency/vulnerability)?



WITH CONSTITUENT PARTS...

- HEALTH HOME COMMUNITY PURPOSE
- CHIME (COMMUNITY HOPE IDENTITY MEANING EMPOWERMENT)
- RECOVERY CAPITAL (HUMAN SOCIAL FINANCIAL COMMUNITY)
- SOCIAL SUPPORT MODELS (SOCIAL EMOTIONAL ESTEEM INFORMATION TANGIBLE)

Utility and Challenges: On “defining” ...

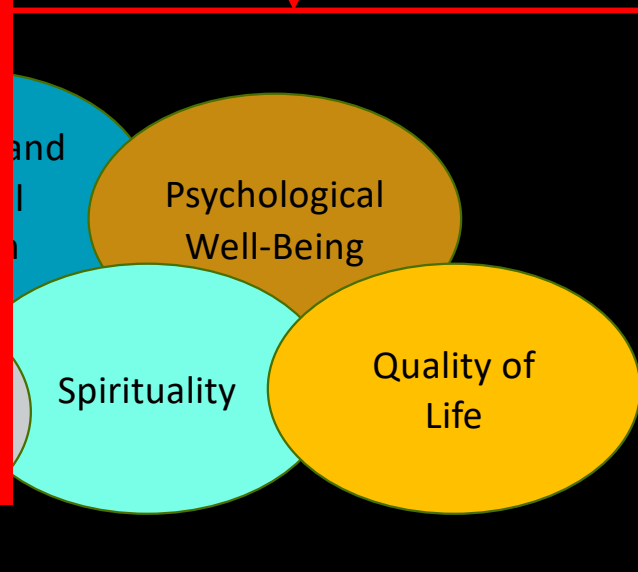
- Jellinek (1960) on “definitions” ...

“...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 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).

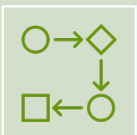
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Ingredients of recovery– facilitating access to the scaffolding, building materials, permits, and supportive environments



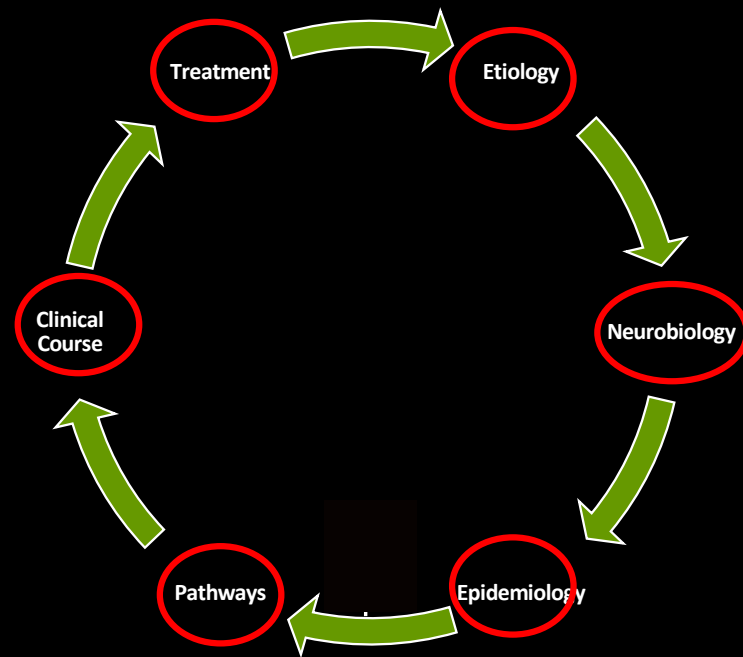
Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?



50 years
of criminal justice,
treatment, and
public health,
approaches



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



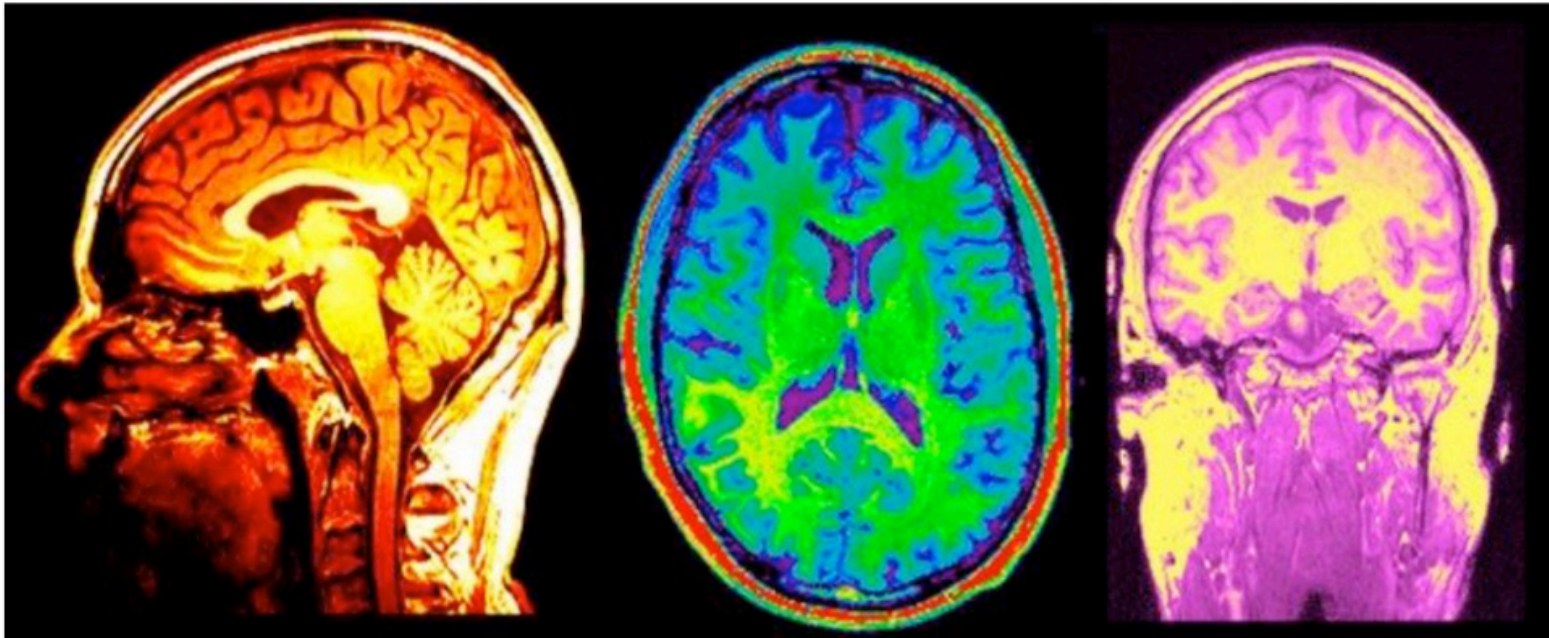


Paradigm Shifts

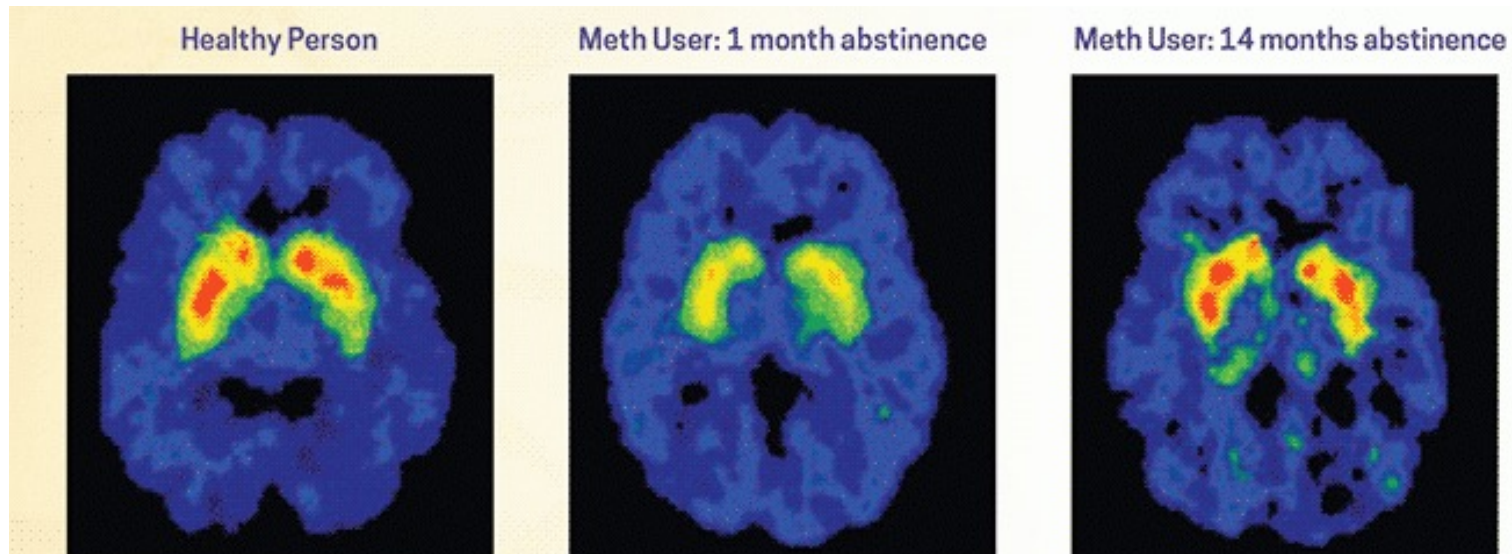
Genetics, Genomics, Pharmacogenetics



Neuroscience: Neural plasticity



Changes in the brain with abstinence

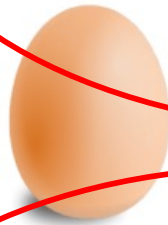


STAGES OF CHANGE

RELATED TREATMENT & RECOVERY SUPPORT SERVICES

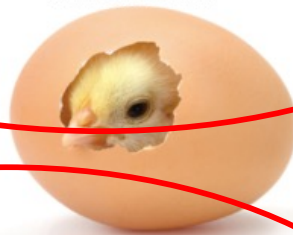
PRECONTEMPLATIVE

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

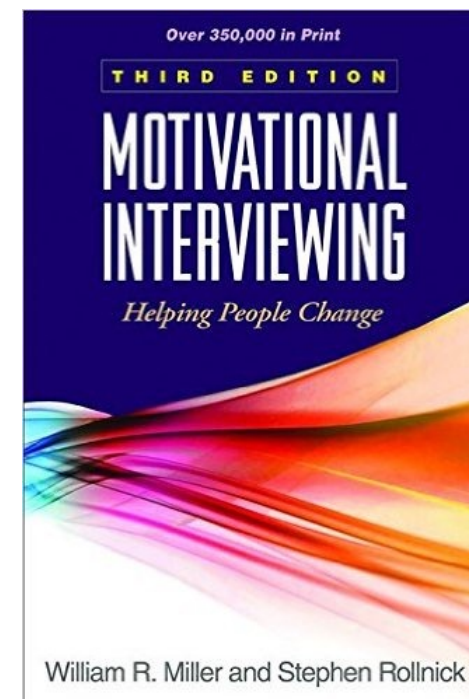
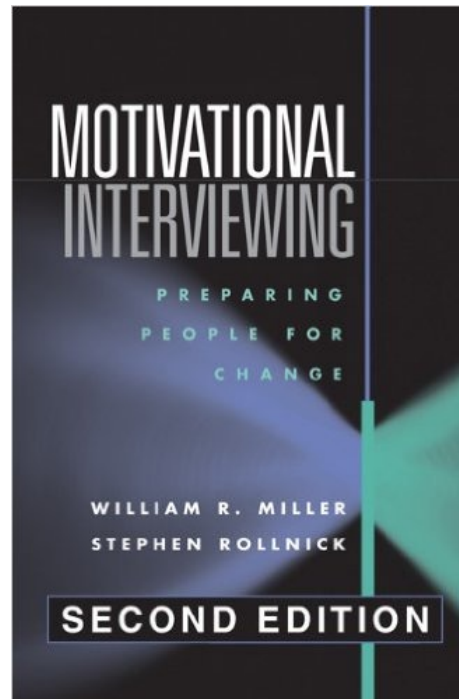
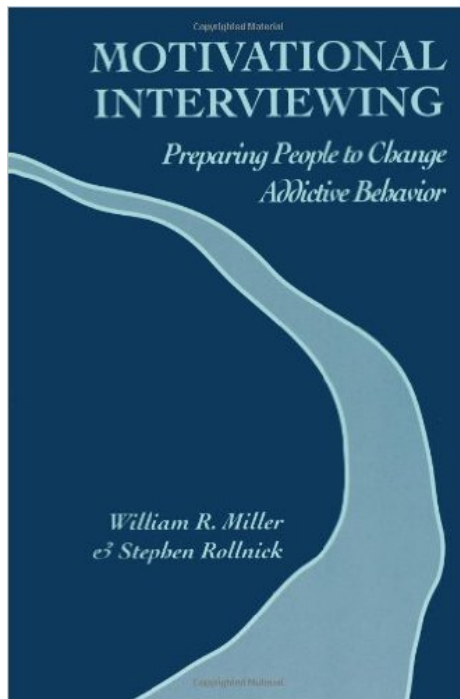
RECOVERY MONITORING (1-5+ yrs)

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)

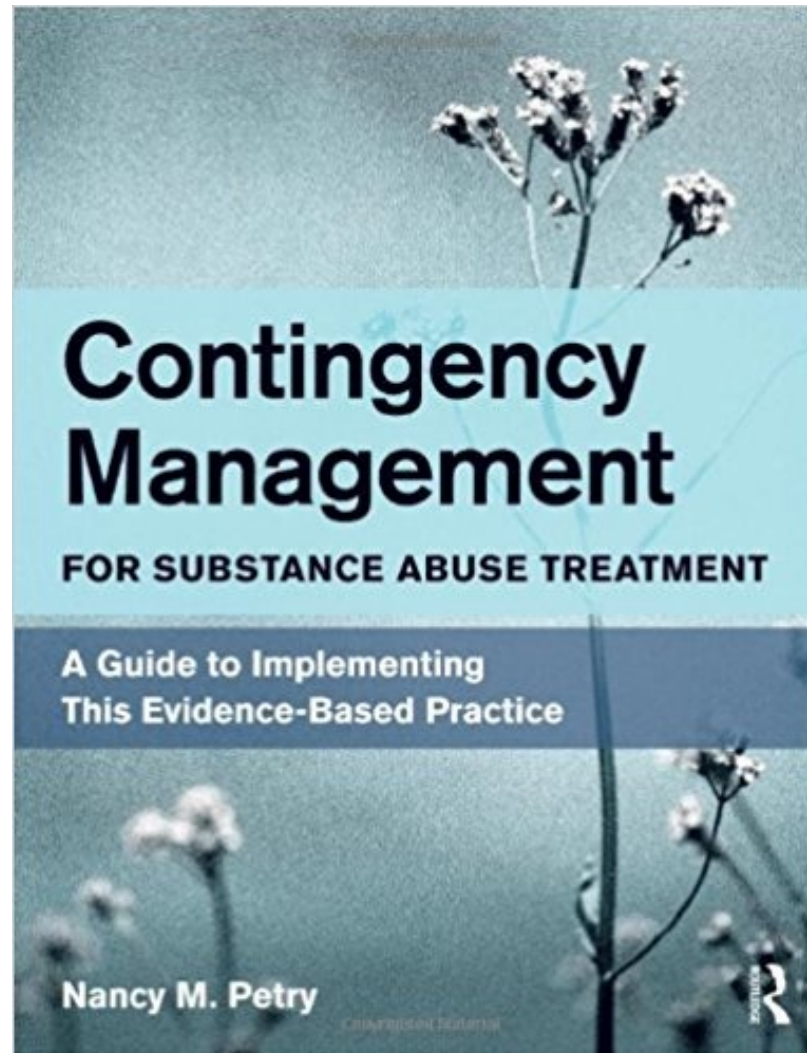


What people really need is a good listening to...

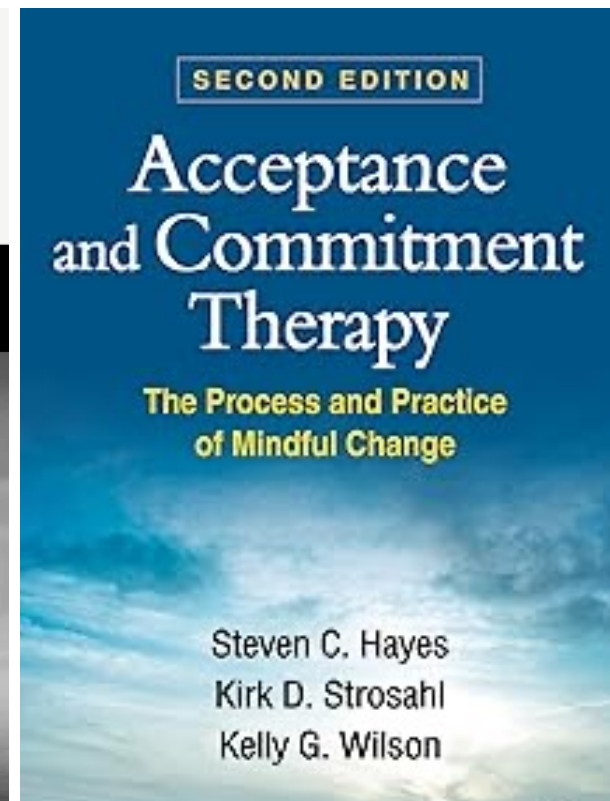
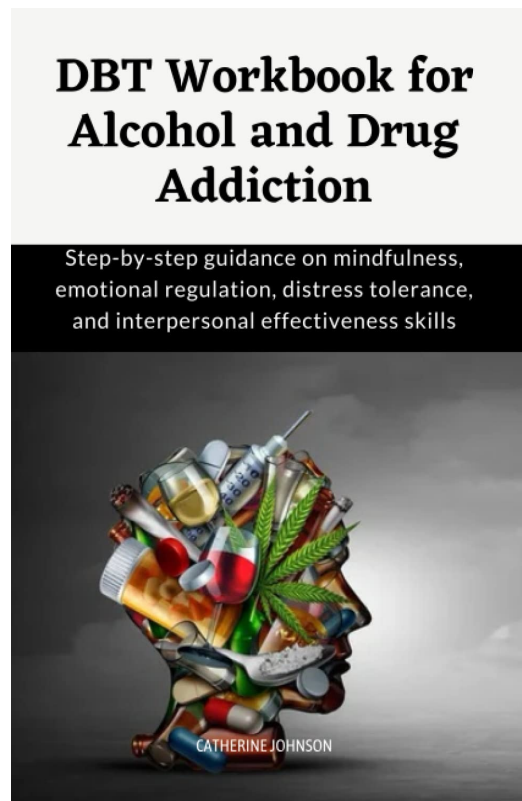
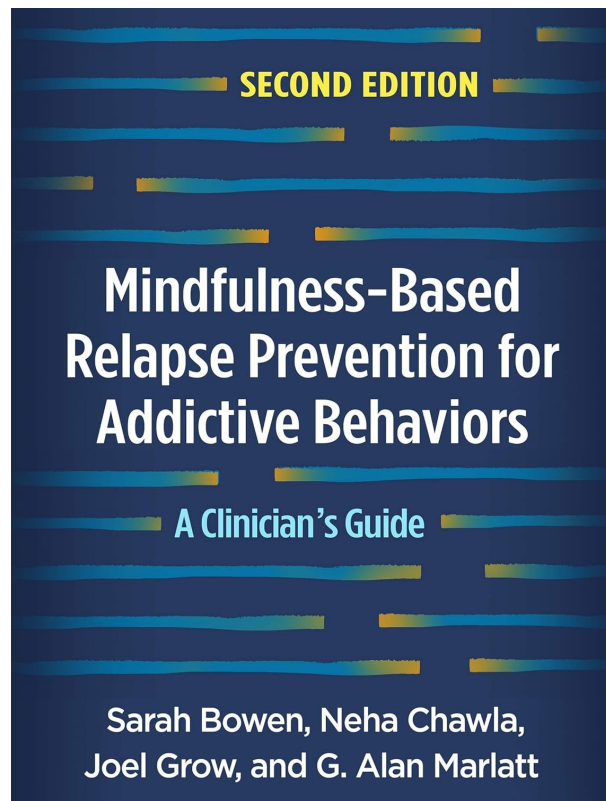
“Quitting is
easy, I’ve done
it dozens of
times” –Mark
Twain

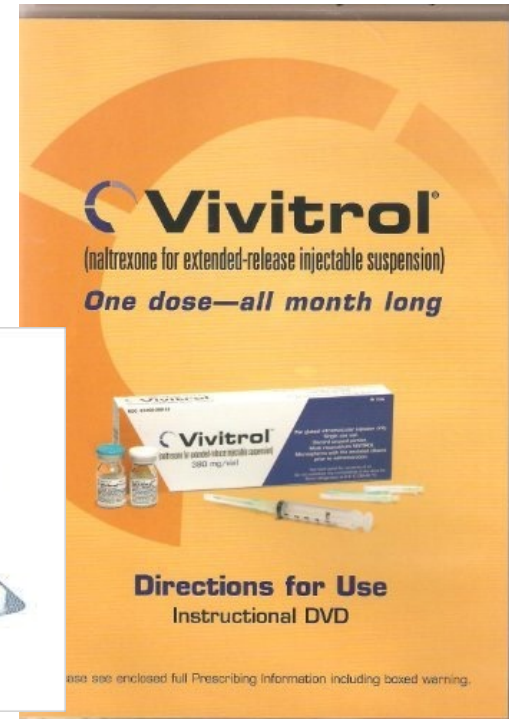
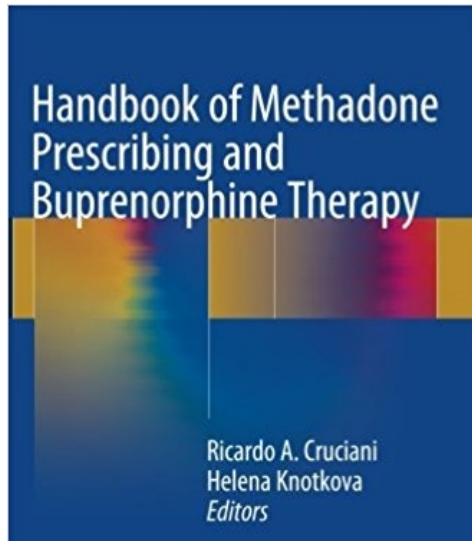


Swift, certain,
modest,
consequences
shape
behavioral
choices...



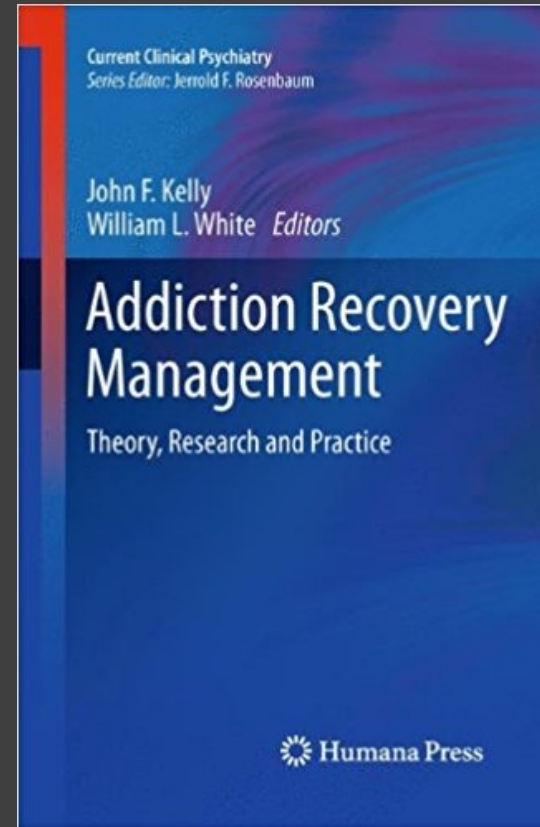
“Third wave” Psychotherapy approaches...





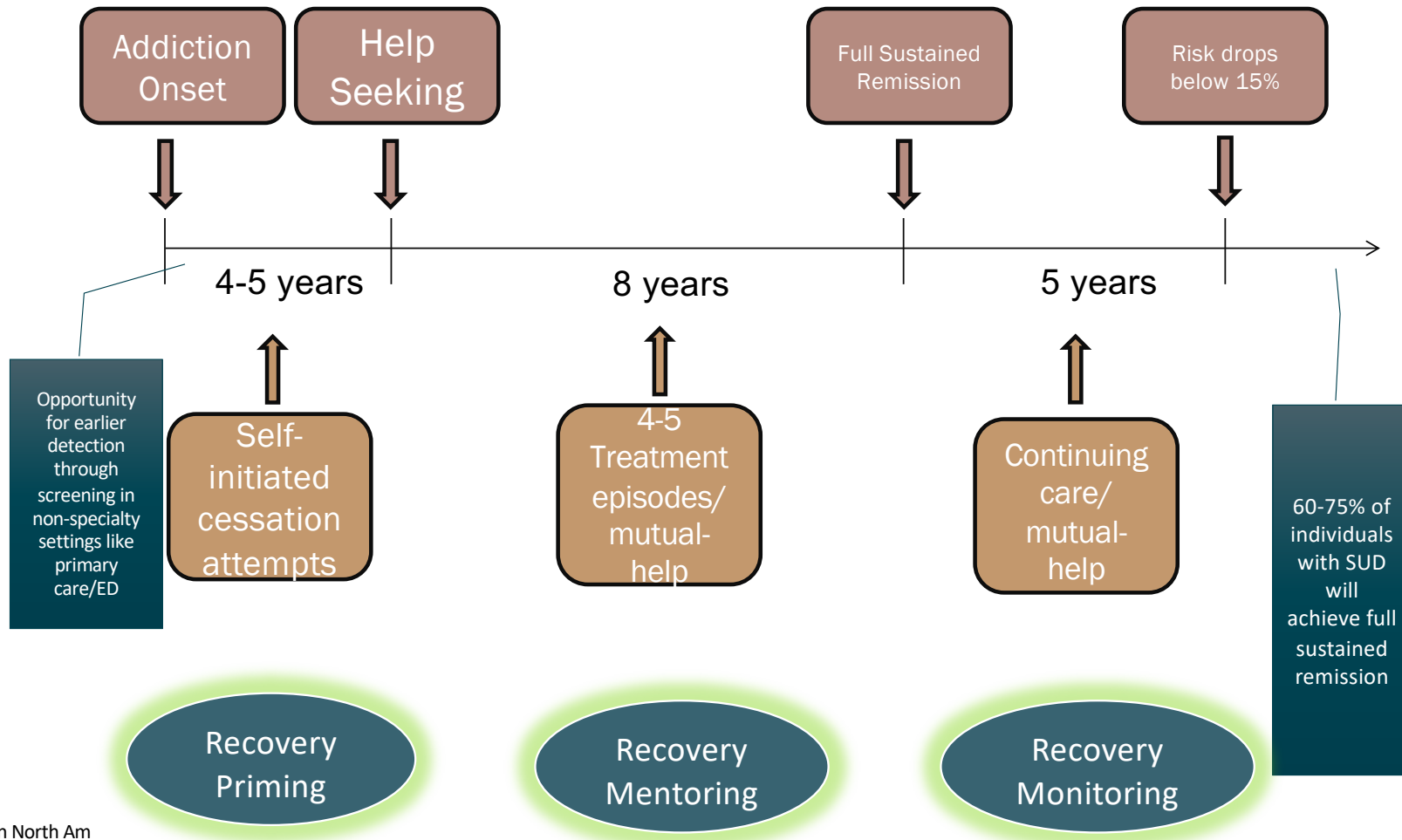


Digital
Health



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)



Recovery Capital

Individual

(coping, motivation, self-efficacy)

Social

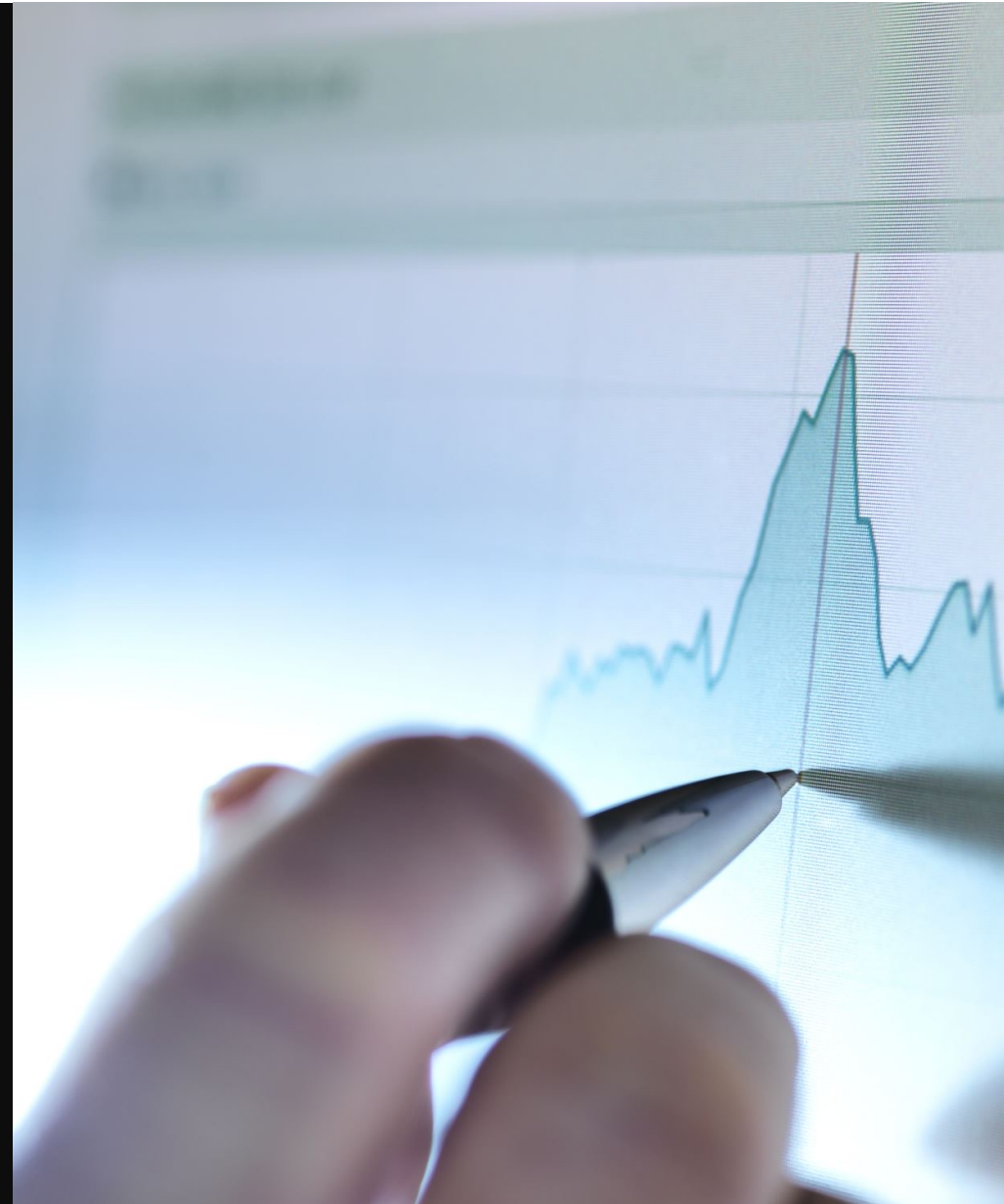
(recovery-specific/family, friends)

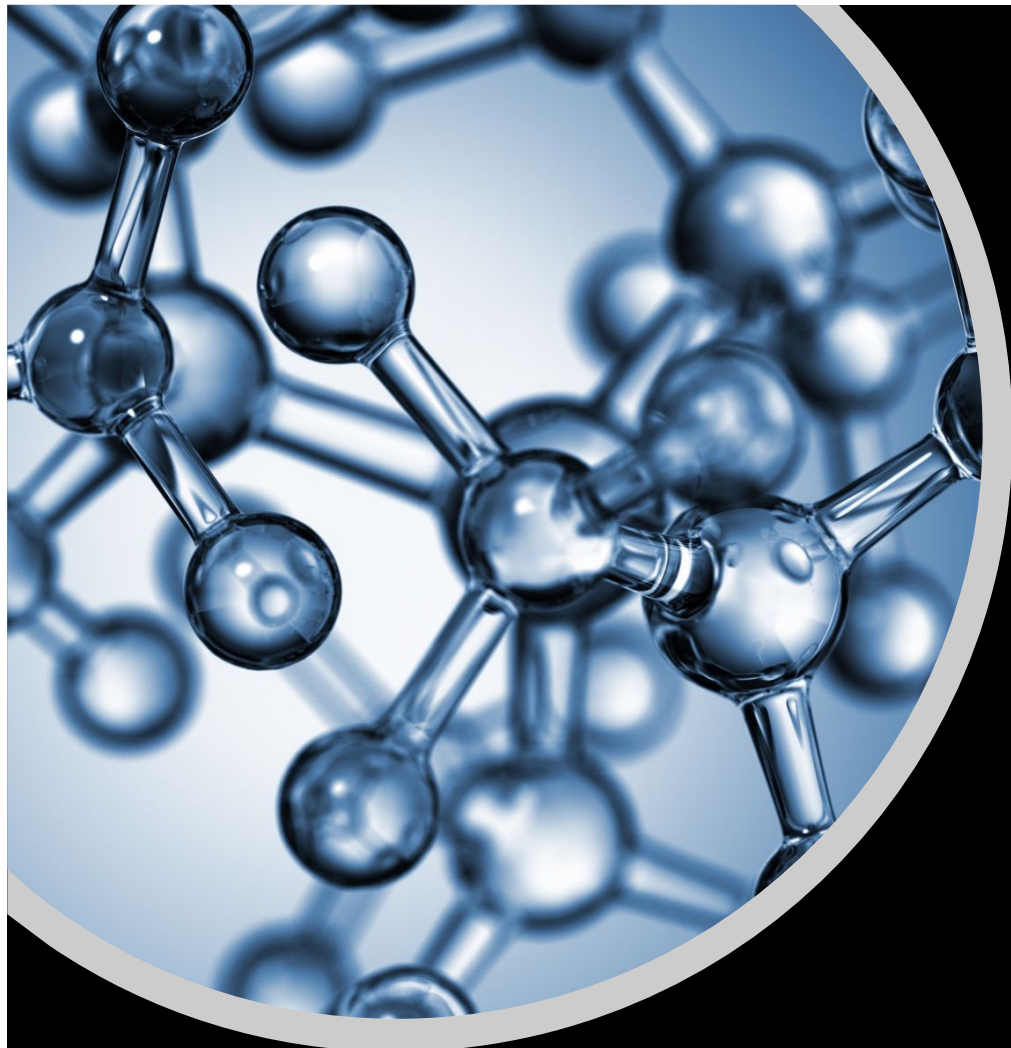
Financial

(income, resources)

Cultural

(identity, values)





Challenges undermining change attempts...



Increased
sensitivity
to stress



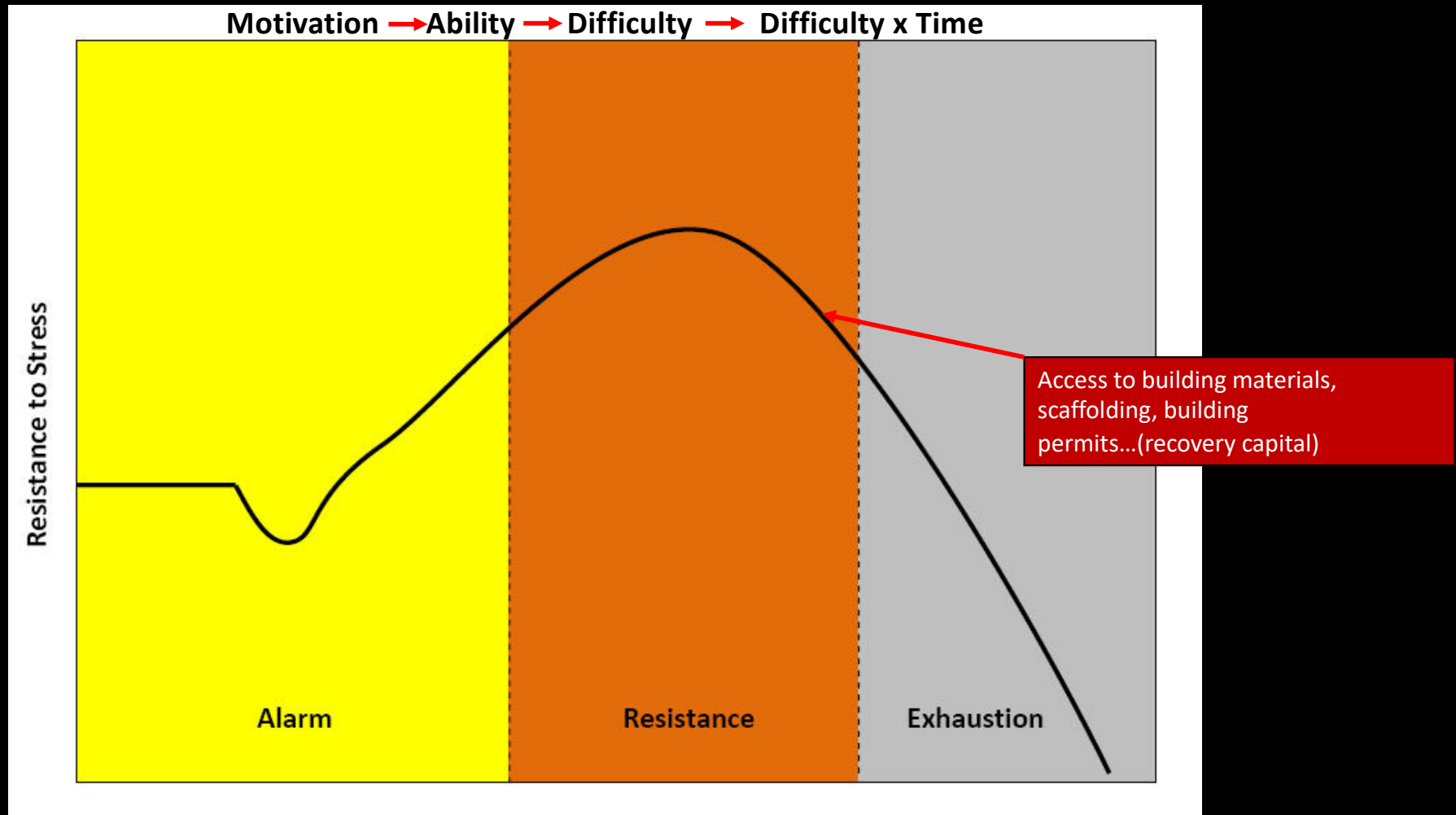
Decreased
capacity to
experience
normal levels of
reward

Post-Acute Withdrawal Phenomena

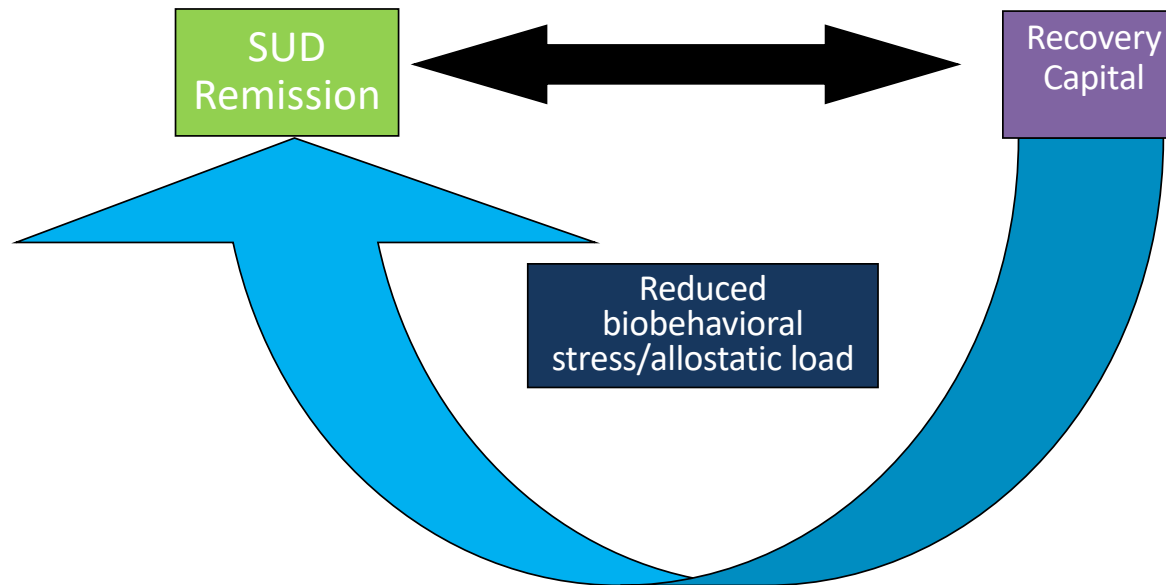
- Sensitivity to stress
- Memory problems
- Sleep difficulties
- Emotional overreactions/numbness
- Cognitive challenges
- Physical coordination challenges



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



Recovery: Dynamic Reciprocal relationship between remission and recovery capital



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)

How Did We get here? Summary

- Growing cultural significance of “recovery” paradigm
- Federal focus intended to empower lived experience, destigmatize (e.g., Recovery Month)
- Increasing clinical and research focus on defining recovery...
- NIAAA formal operational definition of AUD “recovery”
- Numerous short-term acute care focused interventions accumulated
- Greater recognition of underlying neuro-biological/ cognitive/psychological deficits – and “recovery capital” ...
- Increased recognition of need for long-term chronic “disease/recovery management”
- Led to rethinking addiction and how to move beyond purely short-term stabilization toward how to support long-term change... and “stable recovery”

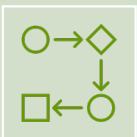
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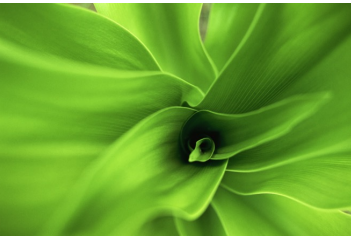
Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?



How Organisms Recover



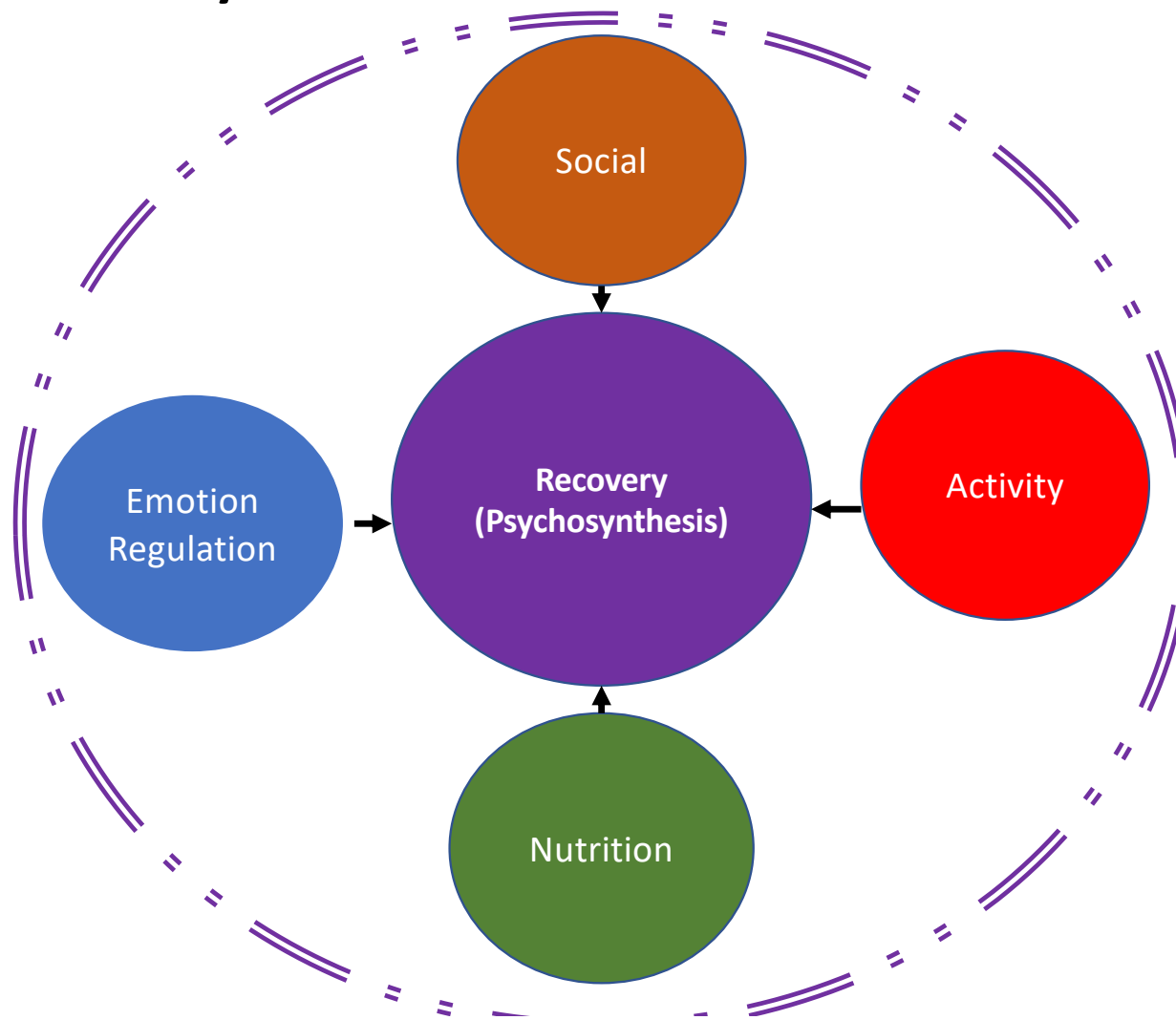
Photosynthesis



Psychosynthesis



A Social Activity Nutrition Emotion Regulation (SANER) Approach to Recovery



Social

Activity

Nutrition

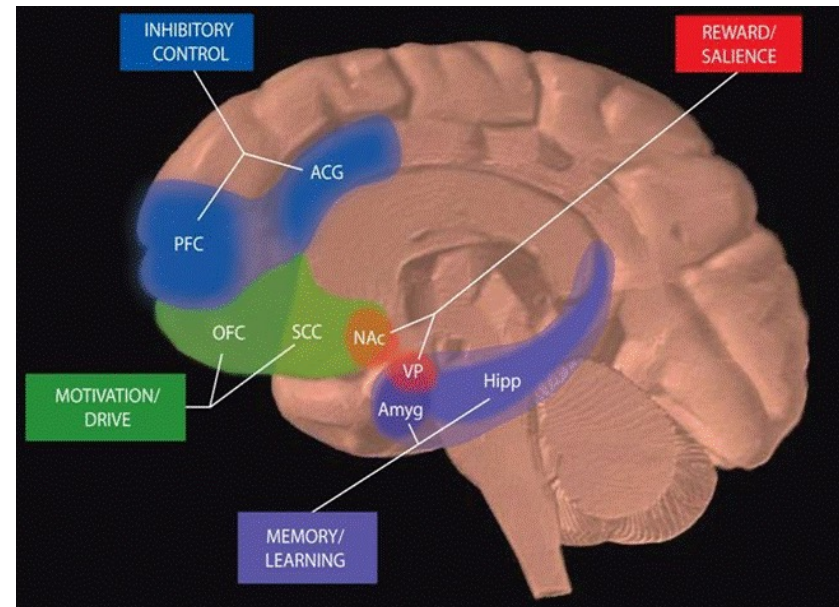
Emotion

Regulation

(**SANER**)

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?

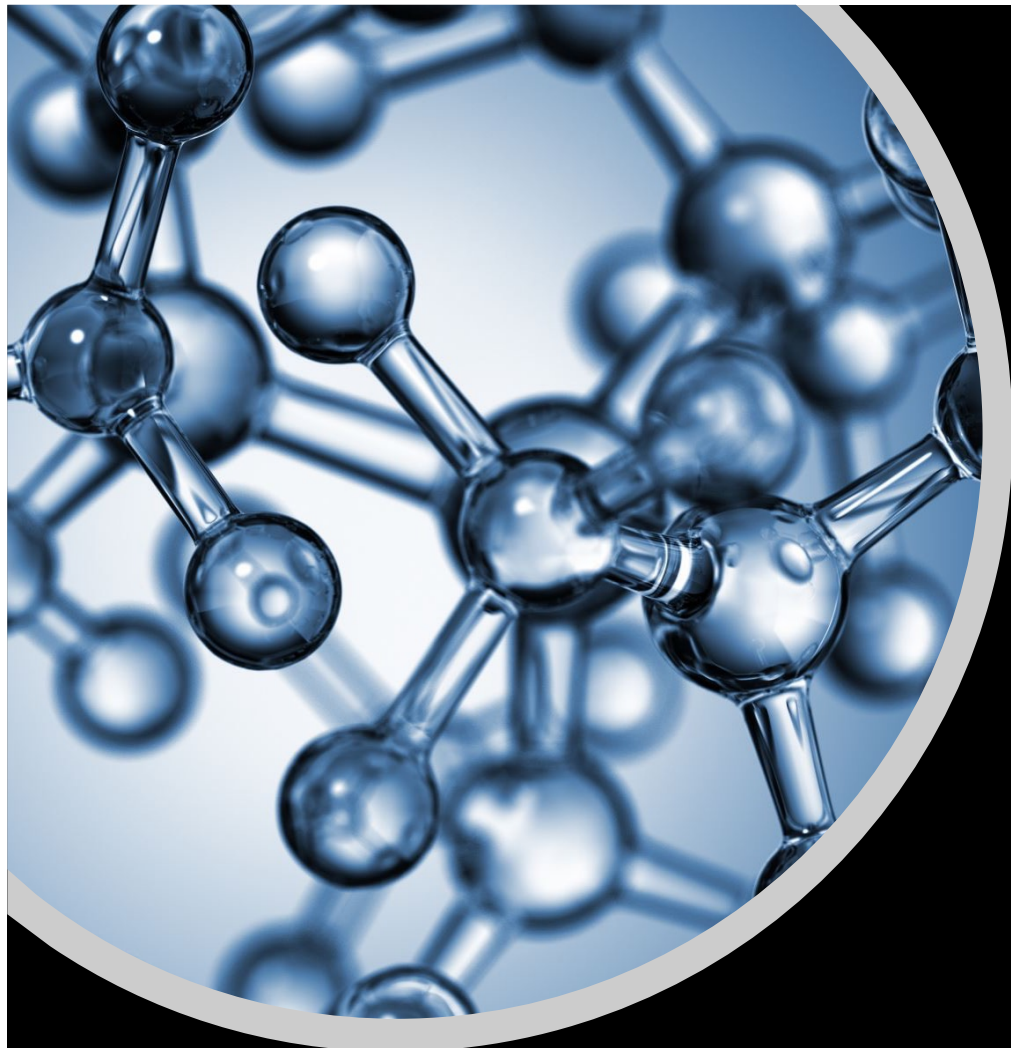


Social factors are key in the onset and offset of SUD

People want to use substances for 4 main reasons:
To feel <u>good</u>
To feel <u>better</u>
To <u>do</u> better
Because <u>others</u> are doing it

Social factors are key in the onset and offset of SUD

People want to use substances for 4 main reasons:	People want to <u>stop using</u> substances and <u>recover</u> for the same 4 main reasons:
To feel <u>good</u>	To feel <u>good</u>
To feel <u>better</u>	To feel <u>better</u>
To <u>do</u> better	To <u>do</u> better
Because others <u>are</u> doing it	Because others <u>are not</u> doing it



Challenges undermining change attempts...



Increased
sensitivity
to stress



Decreased
capacity to
experience
normal levels of
reward

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 psychology 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

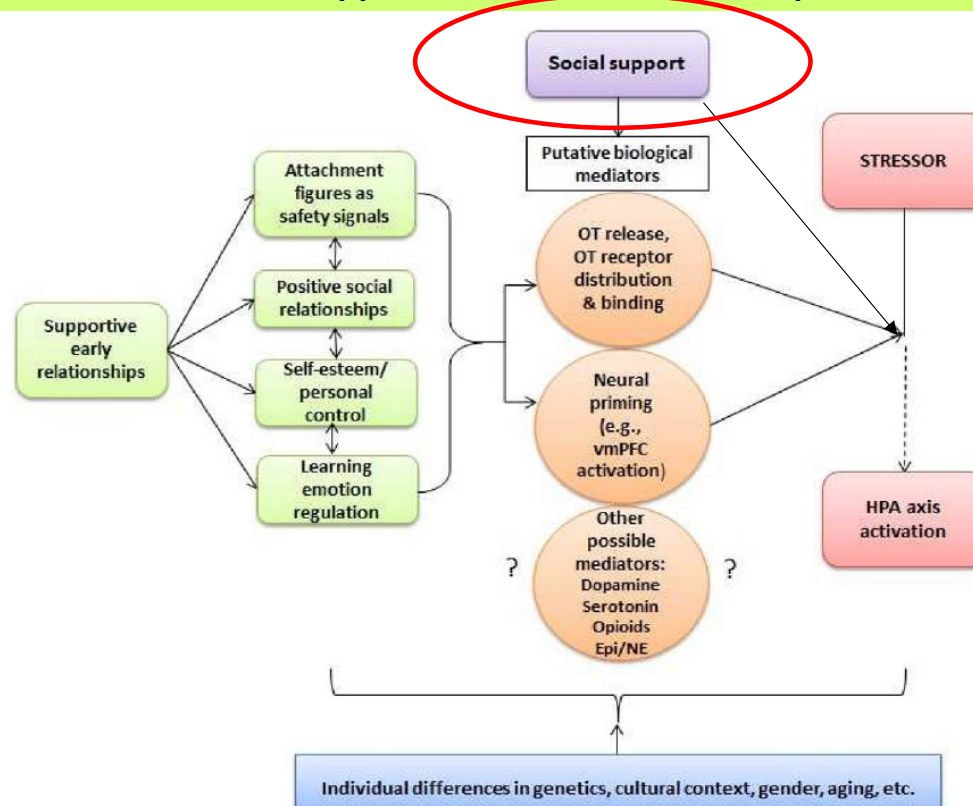
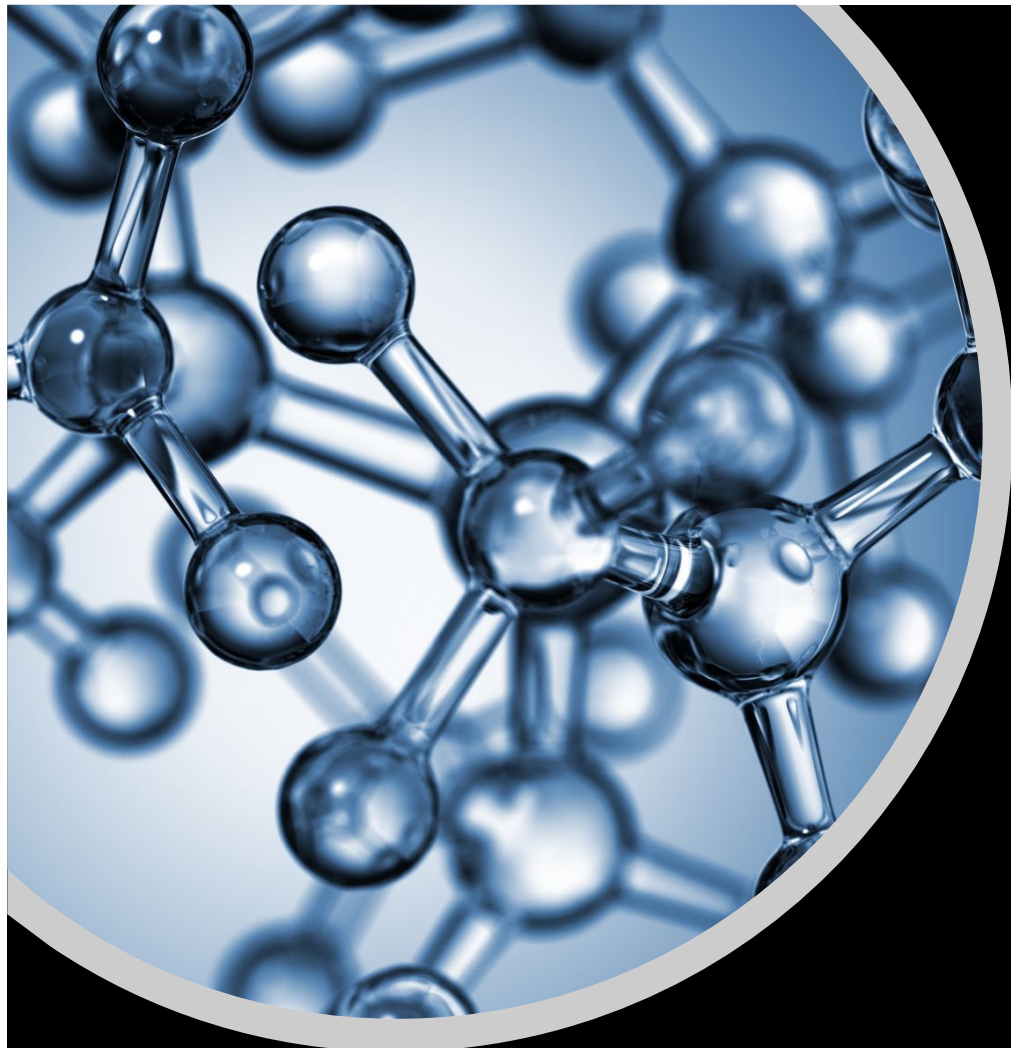


Figure 1. A Developmental Working Model of Social Buffering of the HPA Axis in Humans

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



Challenges undermining change attempts...



Increased sensitivity to stress



Decreased capacity to experience normal levels of reward

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
- [¹¹C]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, Ronald 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 [¹¹C]raclopride.

Methods: Fourteen healthy volunteers were scanned with [¹¹C]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 [¹¹C]raclopride BP. A similar correlation was seen with the perceived social support, where higher [¹¹C]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: [¹¹C]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 [¹¹C]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 non-smoking 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.

[¹¹C]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 EXCTE 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 [preCDCA]), the dorsal putamen rostral to the AC (precommissural dorsal putamen [preDPUT]), 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 (RWH), 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.

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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

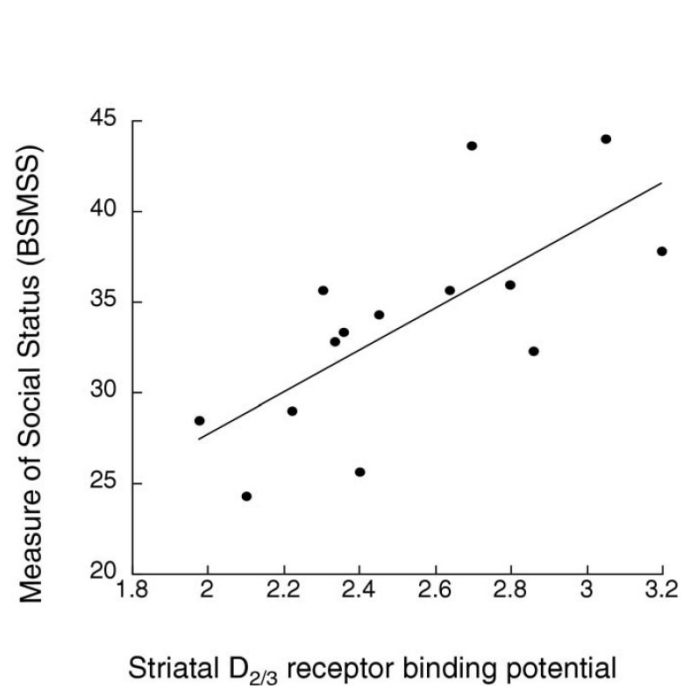


Figure 1. Correlation between [¹¹C]raclopride BP (x axis) and social status, measured with the Barratt Simplified Measure of Social Status (BSMSS). A positive correlation was seen, where higher BP correlated with higher BSMSS ($r = .71, p = .004$, age-corrected $p = .007$). BP, binding potential.

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

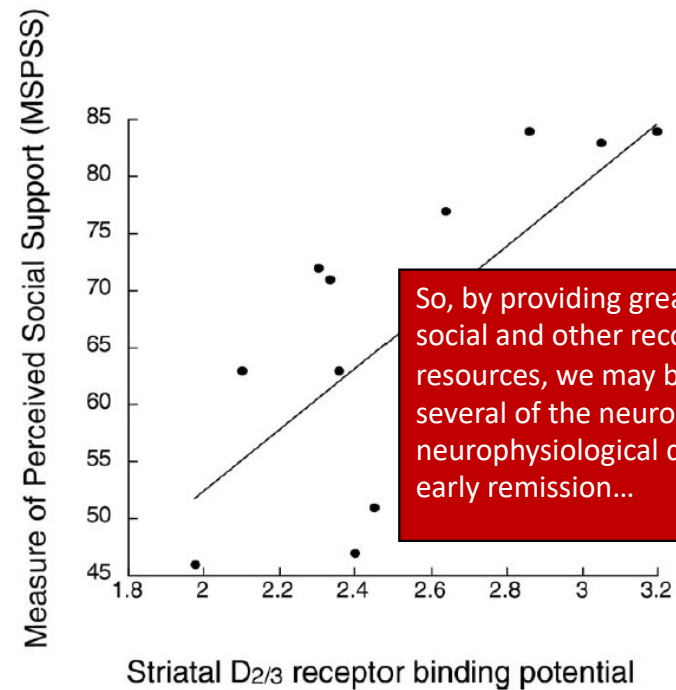


Figure 2. Correlation between [¹¹C]raclopride BP (x axis) and score on the Multidimensional Scale of Perceived Social Support (MSPSS). A positive correlation was seen, where higher BP correlated with higher score on the MSPSS ($r = .73, p = .005$, age-corrected $p = .02$). BP, binding potential.

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...

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

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



Advantages of
recovery support
services in
disease/recovery
management....

Available

Accessible

Flexible

Enduring

Low/no cost

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

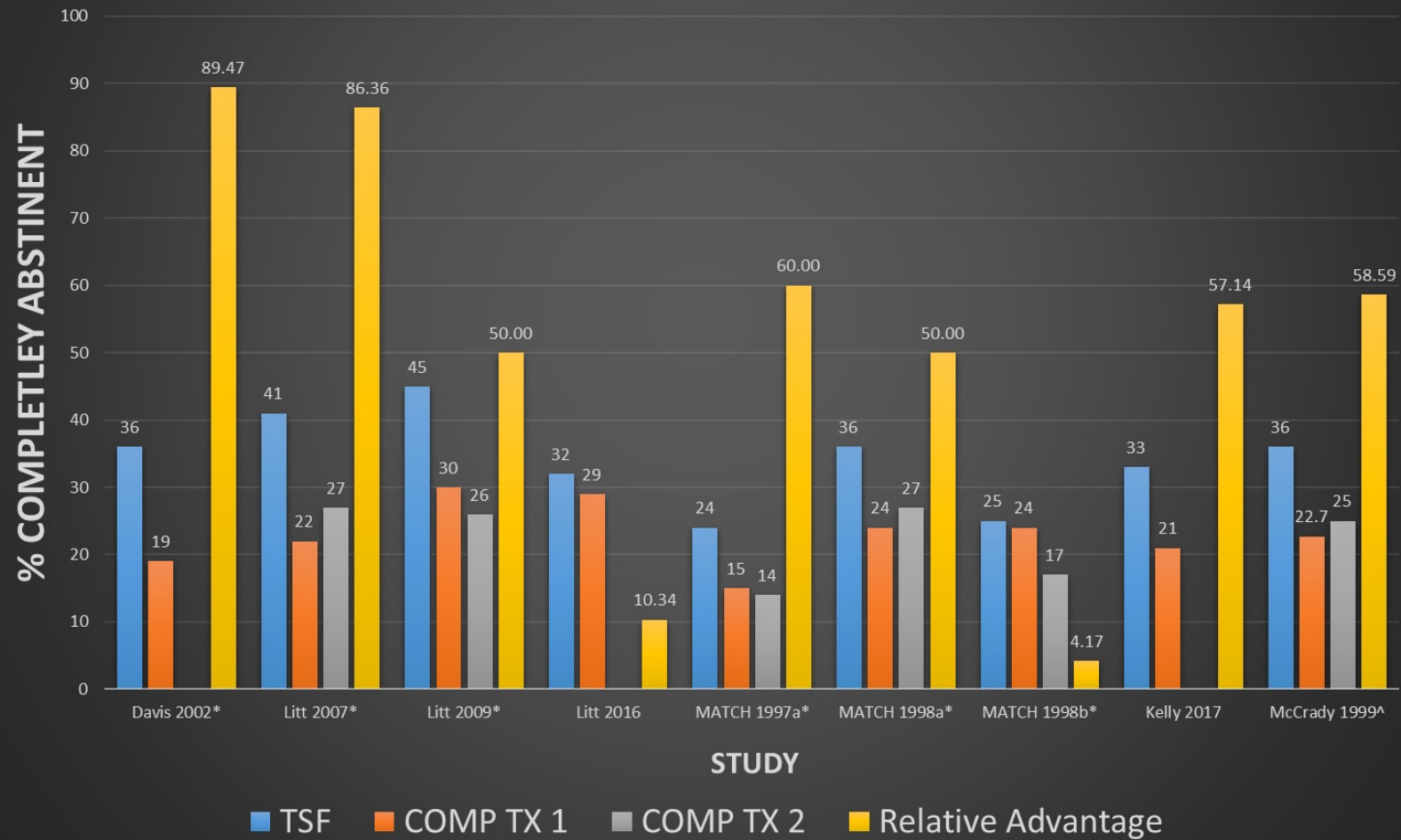
Alcoholics Anonymous and other 12-step programs for alcohol use disorder (Review)
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WILEY

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...

- AA is the closest thing public health to a free lunch, but...
- While AA is proven to help, not everyone wants to use AA
- Increasing the menu of recovery mutual-help support options is likely to engage more individuals in the recovery process

Do Fitness Centers Keep people fit?



- Of course!
- If you go and if you work out regularly
- Ongoing challenge is engaging and retaining people in some kind of ongoing exercise regimen...
- Fitness Centers therefore provide not just one, but an array, of different classes, spaces, equipment, pools, and courts, so that people can find something appealing...
- ...and move toward increasing physical fitness

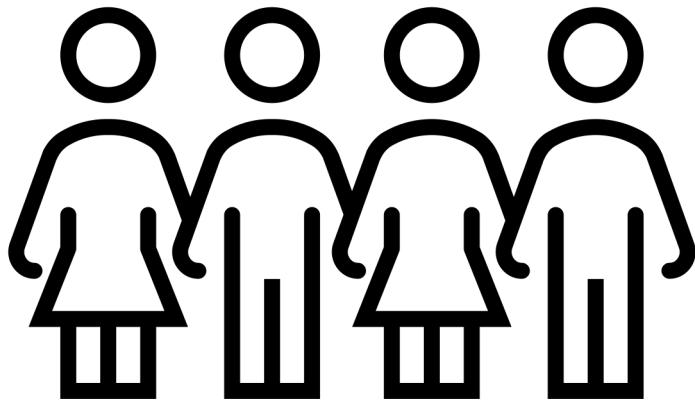
Do Mutual-Help Organizations Keep people fit for recovery?



- Of course!
- If you go regularly and if you work the recovery program and build it in to your lifestyle (like exercise)
- Perennial challenge is engaging and retaining people in some kind of ongoing recovery support service ...
- Recovery mutual-help organizations, however, have been largely limited to one variety (12-step) therefore severely limiting options to engage and retain people in an ongoing recovery support service that can help mitigate relapse risk and sustain remission and recovery.
- This is tantamount to a fitness center having ONLY a weight room, or ONLY a pool etc...

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

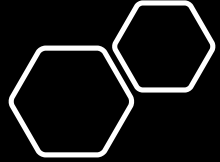
Alcohol Research Group, Emeryville, CA

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 ...

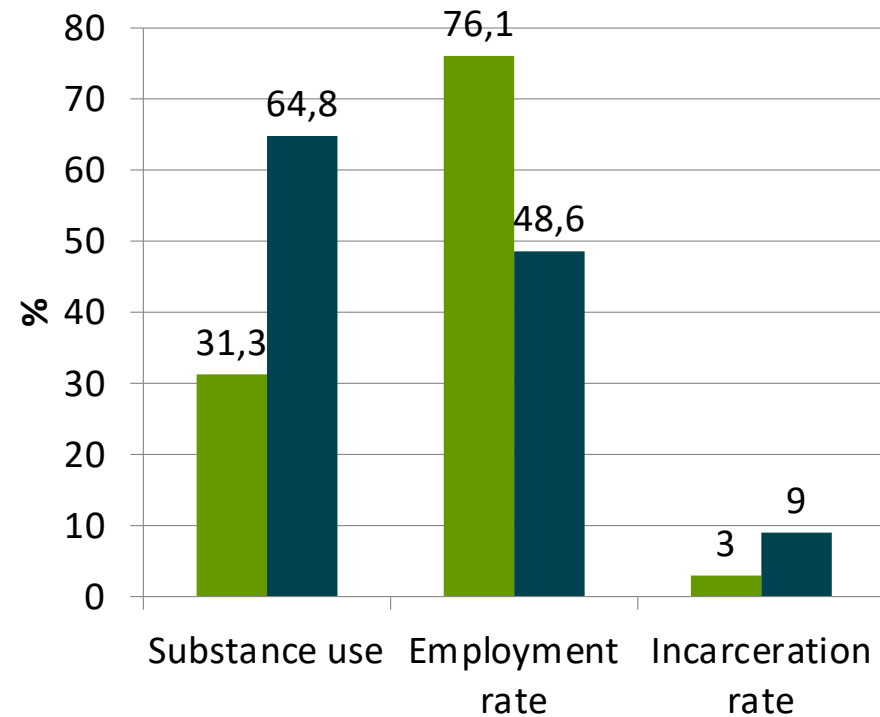




Oxford House vs. Usual Care

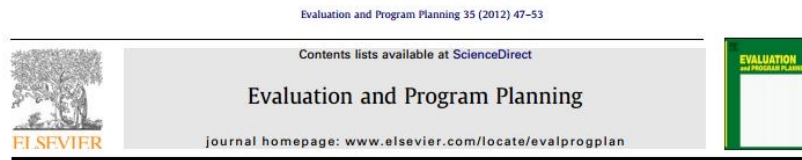
Recovery Residences had –

- 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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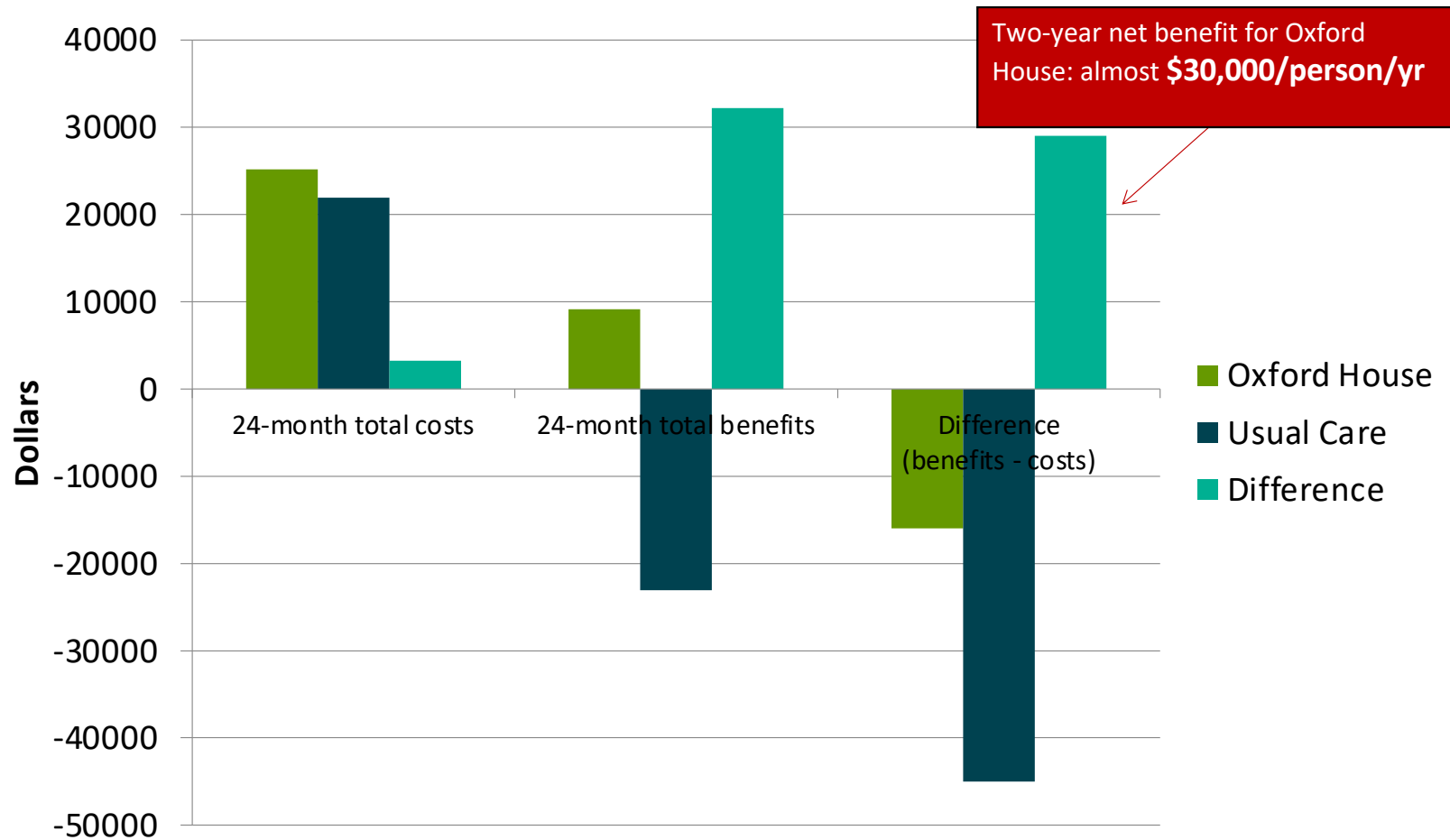
ABSTRACT

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

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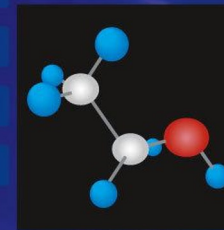
Reprint requests: John F. Kelly, PhD, Recovery Research Institute, Massachusetts General Hospital and Harvard Medical School, 151 Merrimac Street, 6th Floor, Boston, MA 02114; Tel.: 617-643-1980; Fax: 617-643-7667; E-mail: jkelly11@mgh.harvard.edu
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ALCOHOLISM

CLINICAL & EXPERIMENTAL RESEARCH

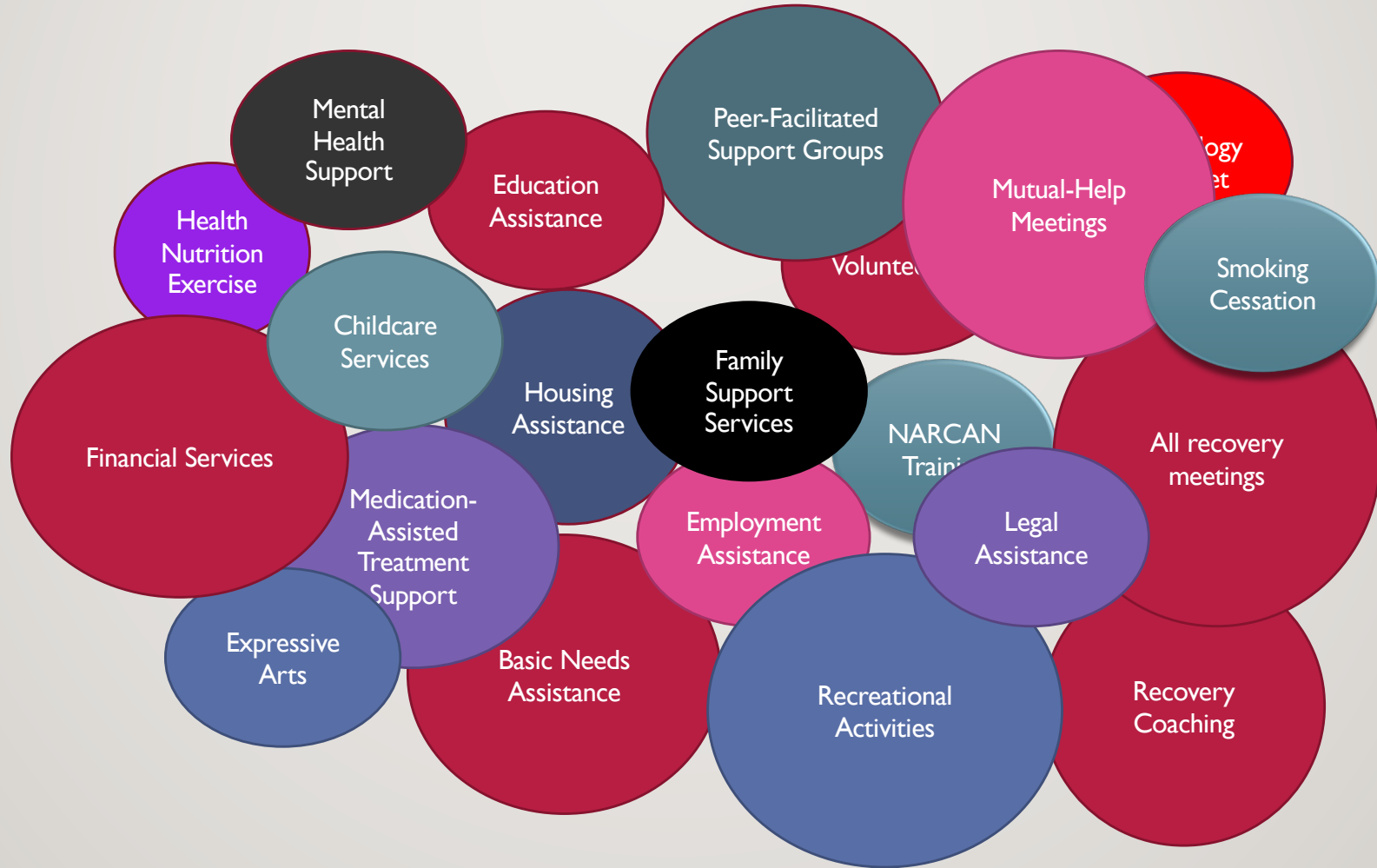


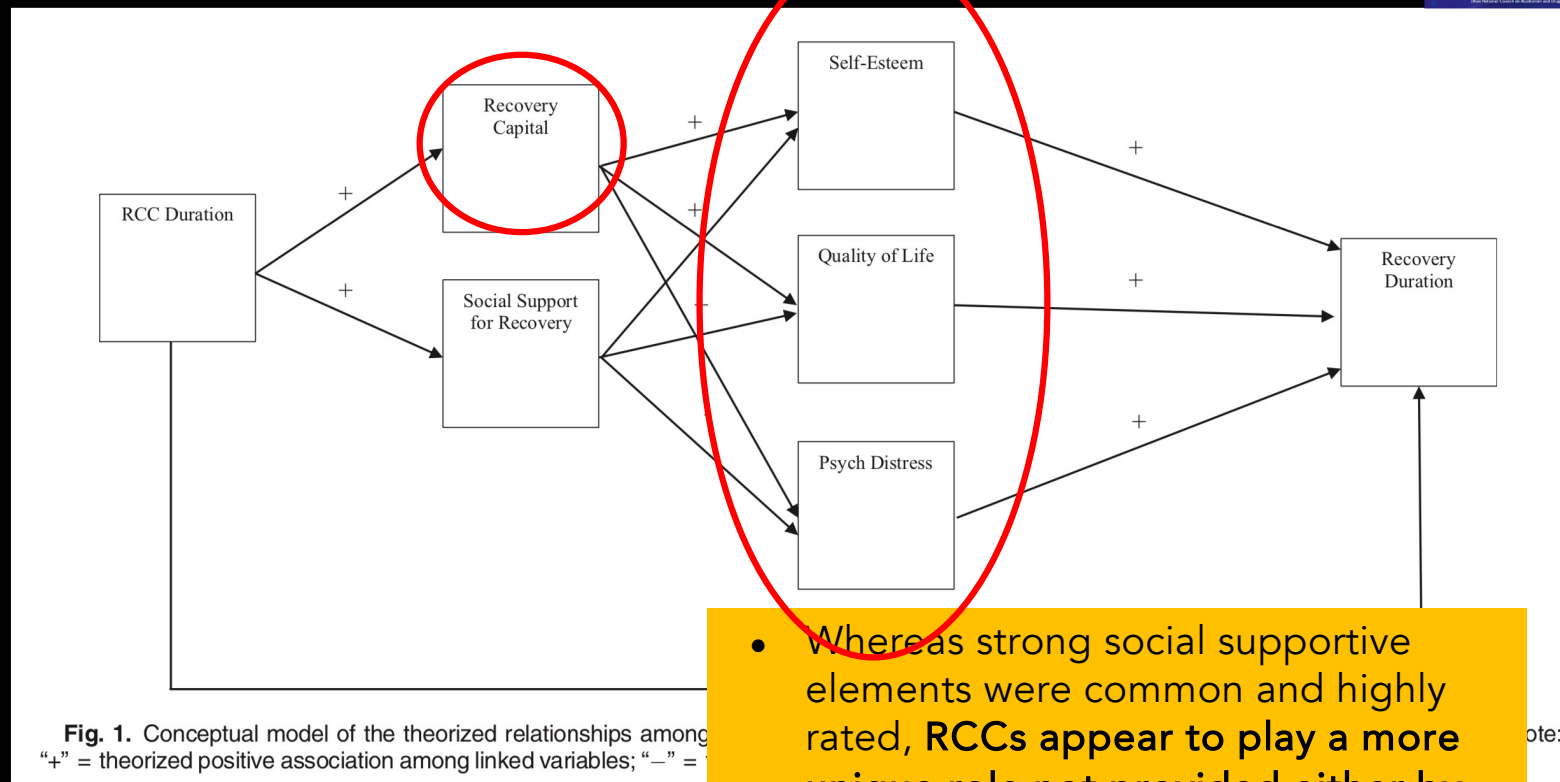
ACER
The Official Journal of the
Research Society on Alcoholism and the
International Society for Biomedical
Research on Alcoholism



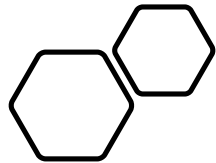
Founded in 1977 by the National Council on Alcoholism
(Now National Council on Alcoholism and Drug Dependence, Inc.)

SERVICES PROVIDED





- 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 quality of life.



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

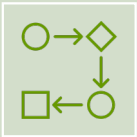
Outline



How did we get here? A rationale for the new public health and scientific focus on addiction recovery and support services



Ingredients of recovery– facilitating access to the scaffolding, building materials, permits, and supportive environments



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



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?

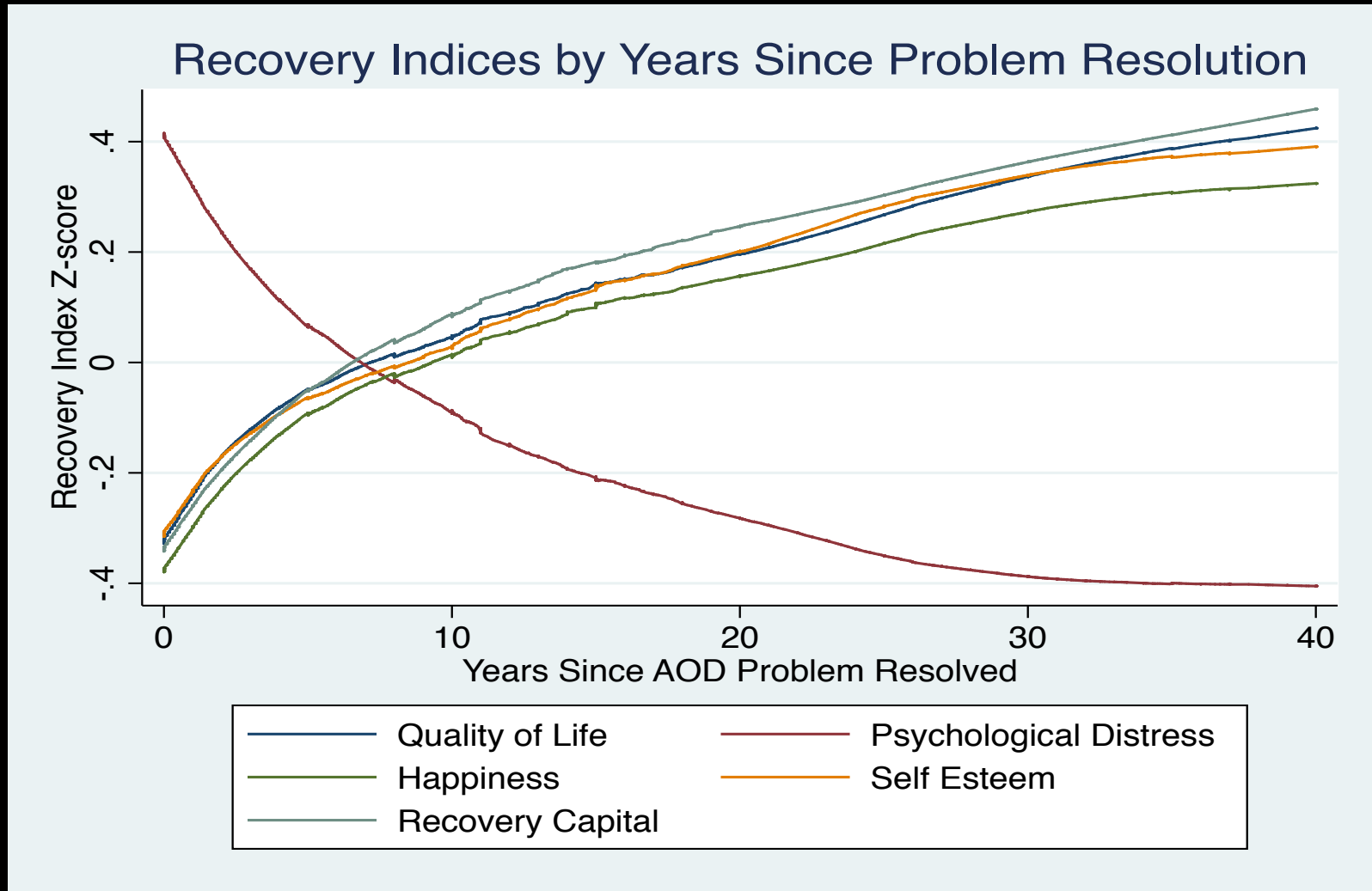
For what duration?

At what intensity?



Who?

40-Year Temporal Horizon of Recovery Trajectories



National
Recovery Study
(NRS)
N=2,002

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

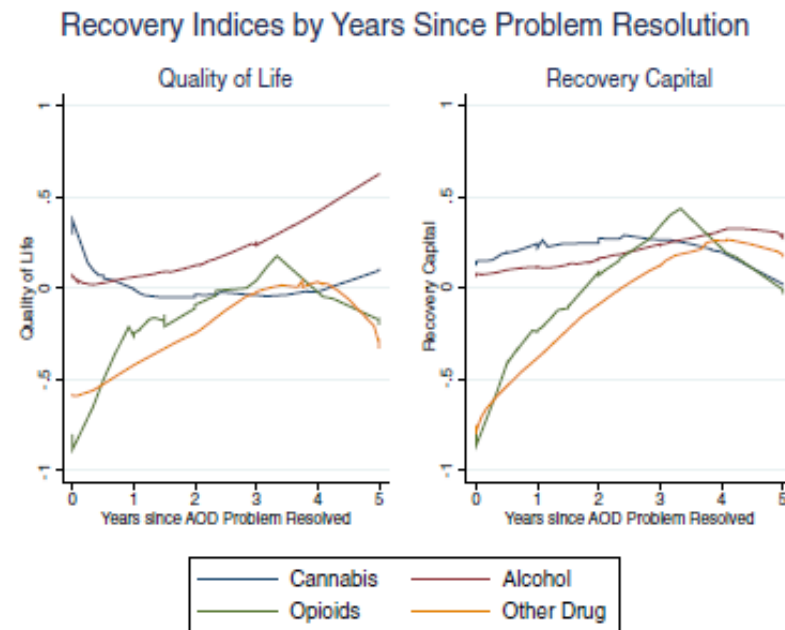
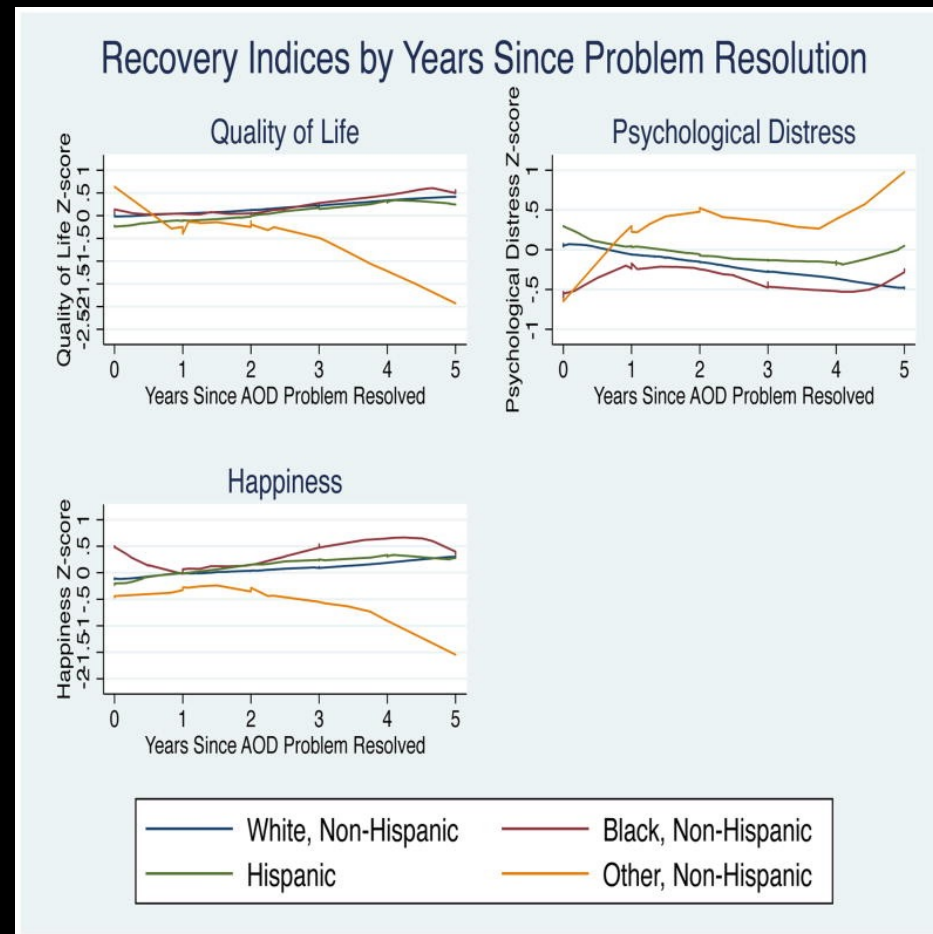
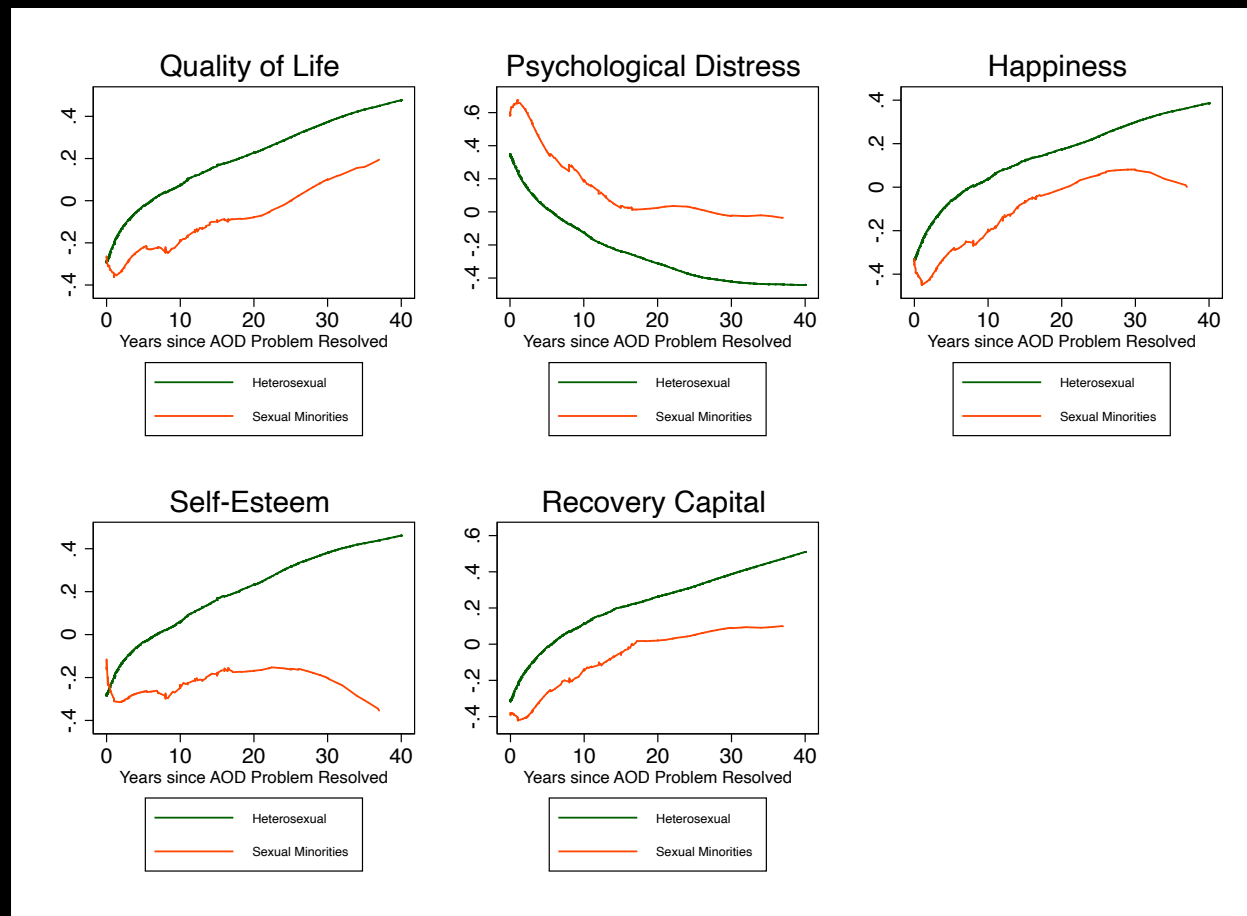


Fig. 5. Locally Weighted Scatterplot Smoothing (LOWESS) analysis of recovery indices by years since problem resolution stratified by primary substance.

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



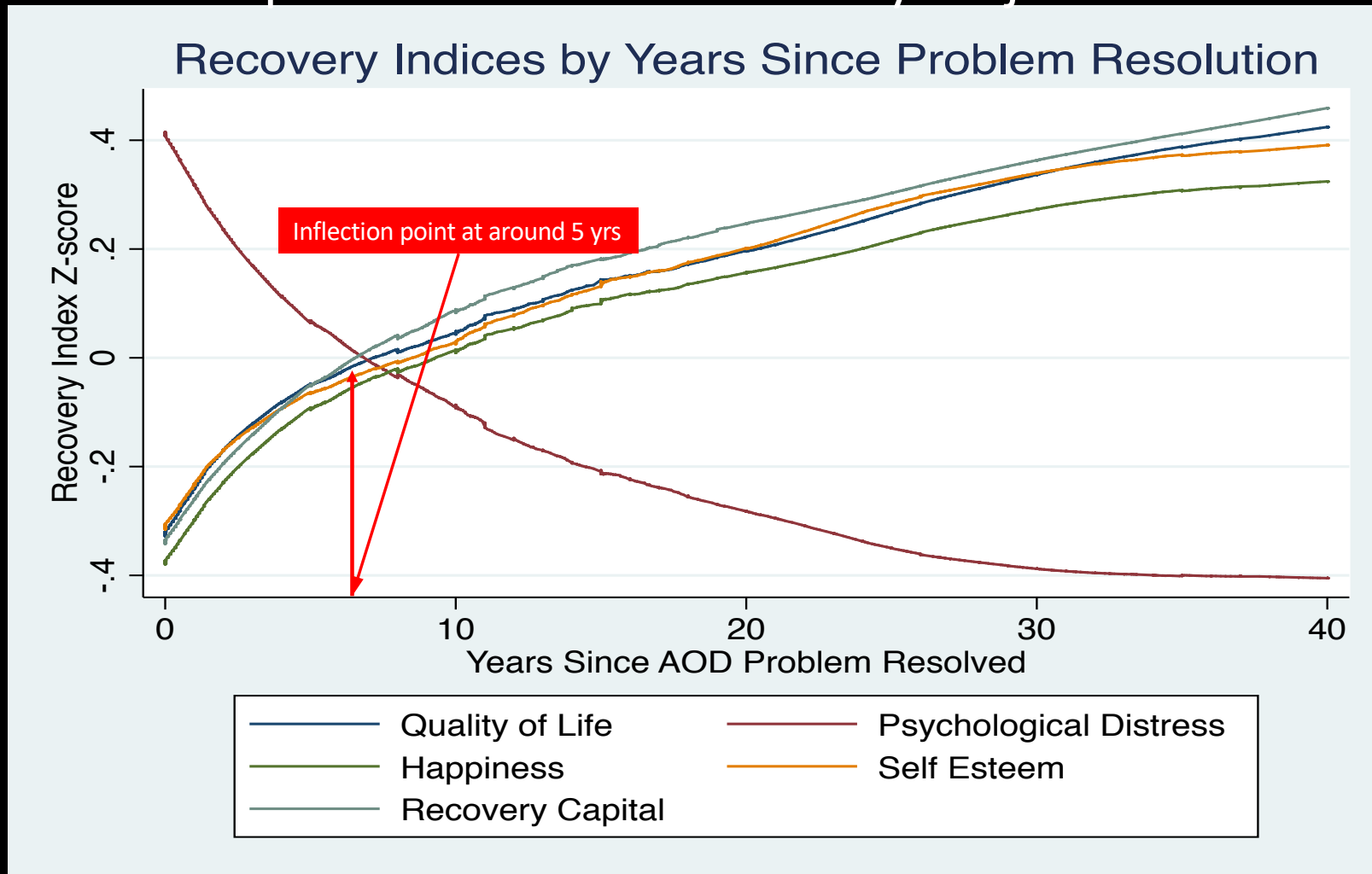
Sexual Minority vs Heterosexual Status and Changes in Functional and Well-Being Indices - 40 yr. temporal horizon



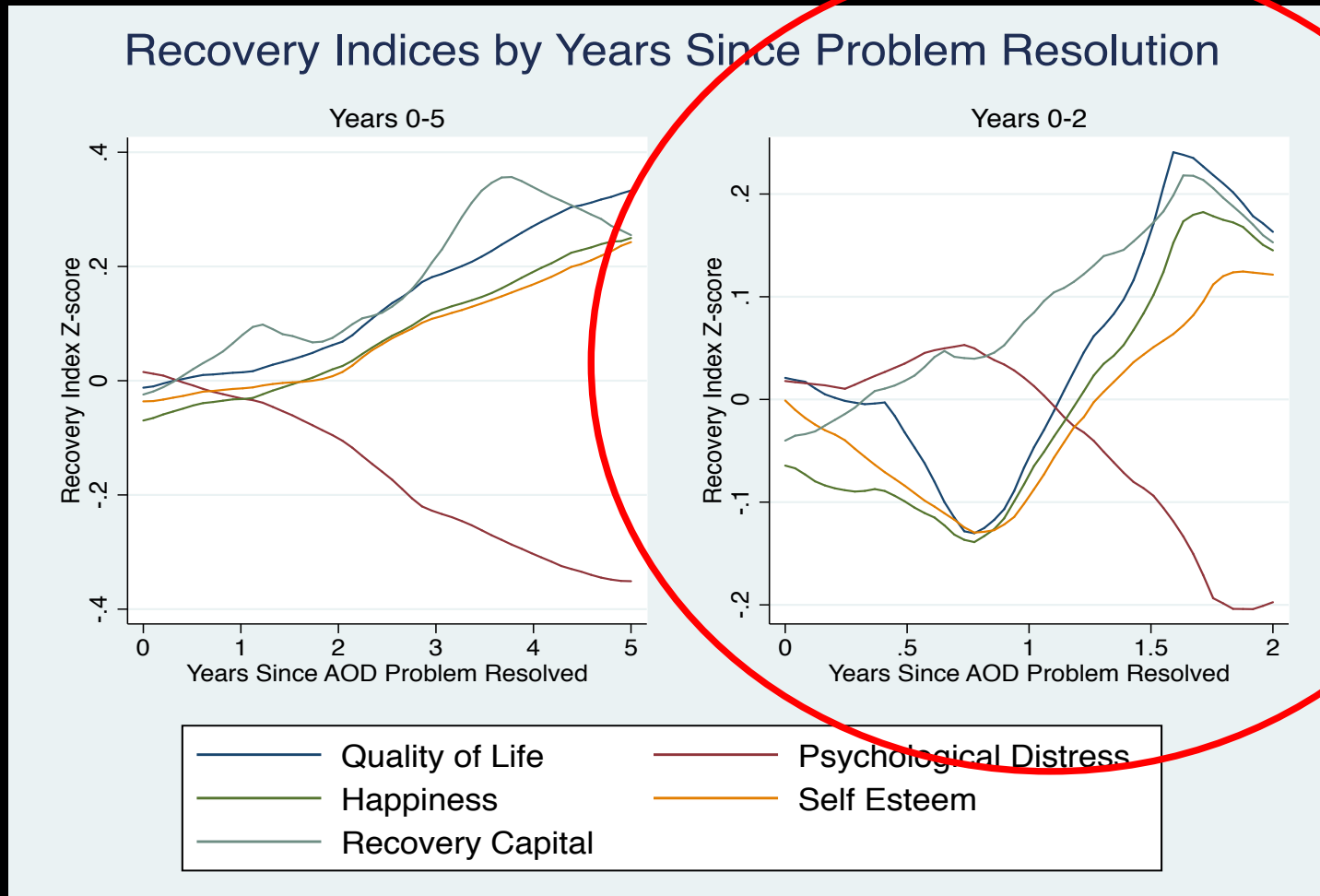


When?

40-Year Temporal Horizon of Recovery Trajectories



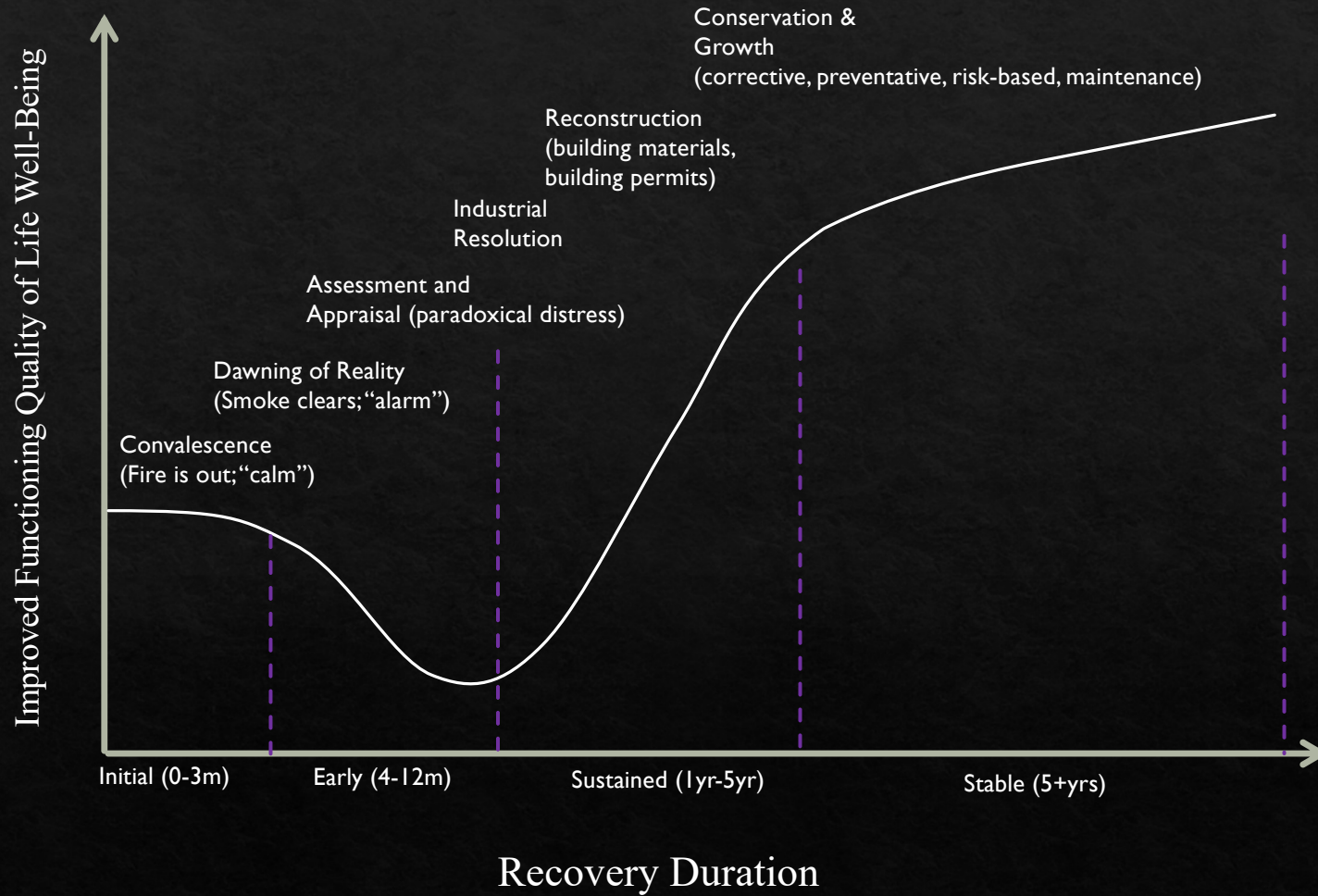
2-yr Year Temporal Horizon of Recovery Trajectories





Recovery Curve

Preliminary Data-Based Recovery Milestones and Tasks...



Some lingering challenges and final thoughts...



Some lingering challenges and final thoughts...

- Reaching people who can benefit from services...
- About 90% of individuals with SUD do not seek specialty care
 - How can we reach these individuals/reach them sooner?
- The majority of people who do, take many years to achieve stable remission and resilient recovery
- Technological innovation may, in part, facilitate greater access, utilization, and benefit, at least for some...





But, in a high-tech world, at its core, recovery remains low-tech



Fast Car –
Tracy
Chapman

“... and your arm felt nice
wrapped around my shoulder,
and I felt like I belonged, and I
felt like I could be someone...”

Summary

- ◆ Past 50 years since birth of NIDA and NIAAA learned a great deal about etiology, epidemiology, typologies, phenomenology, clinical course, interventions for stabilization and acute care tx
- ◆ Long and undulating clinical course is modifiable - shortened by attending to both clinical pathology and more enduring and sustaining environmental factors that can either support or undermine treatment gains or self-initiated change attempts through positive psychobiological effects and reduced allostatic load
- ◆ Recovery science beginning to uncover who needs what services, when, for what duration, at what intensity, highlighting – like “personalized medicine” - a “personalized recovery” that promises to lead to greater remission and more robust and resilient recovery sooner
- ◆ Effective and cost-effective community-based recovery support service options are becoming more ubiquitous, expanding in scope to serve broad array of needs that different people have across time; technological innovation may increase reach, but at its core, recovery remains a low-tech endeavor, characterized by compassion, caring, patience....



Thank you!

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