Traumatic Brain Injury & SUD: Brain Injury, Addictions and the Importance of Family Involvement

Presented by
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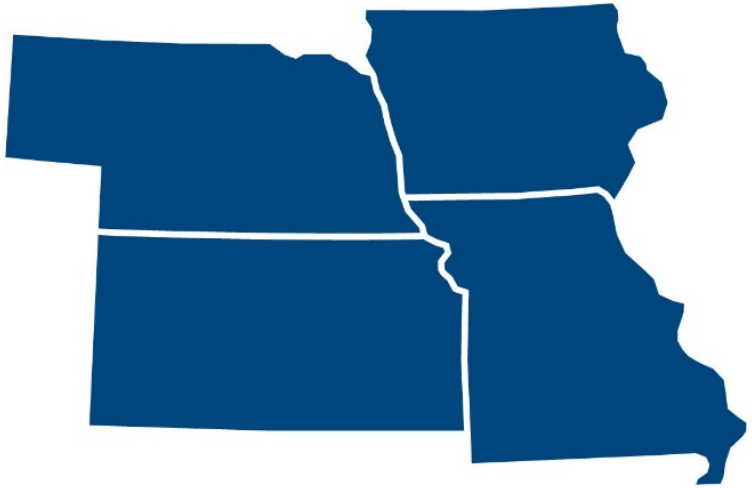
Mid-America ATTC & Mountain Plains ATTC



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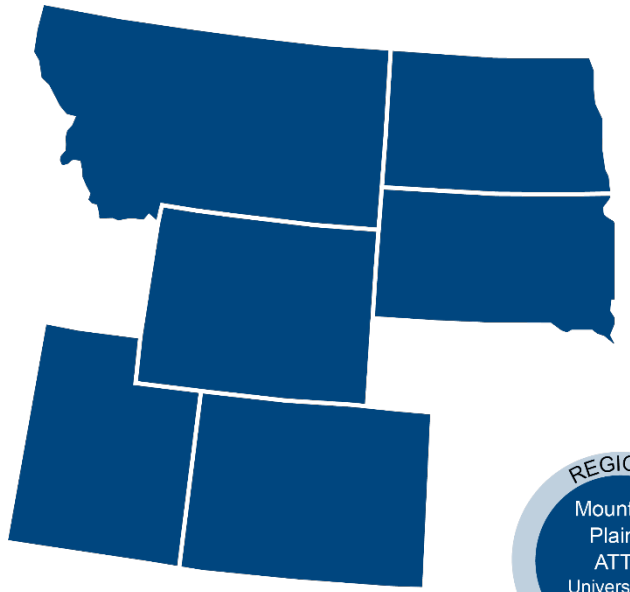

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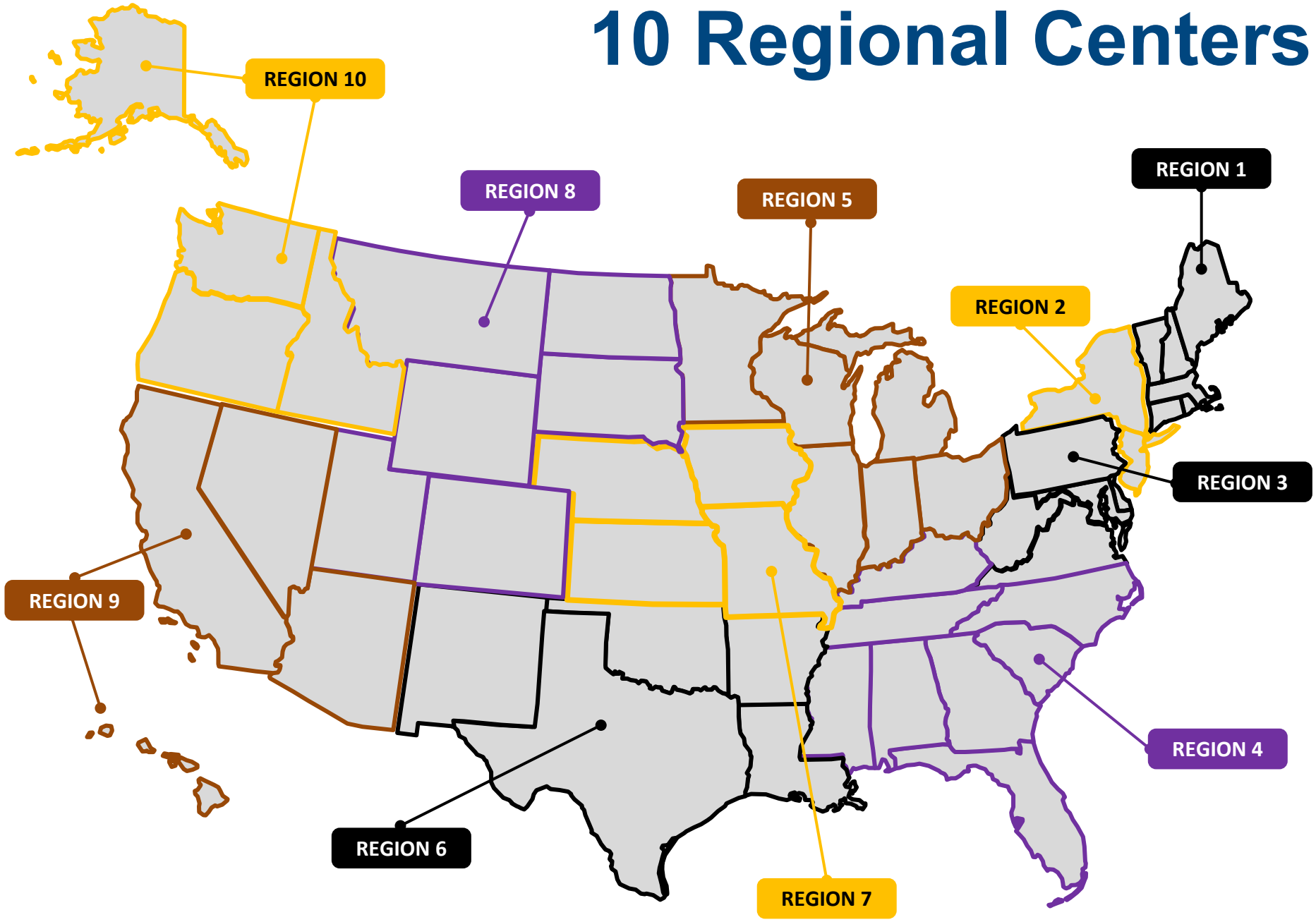
HHS Regions

10 Regional Centers



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Housekeeping Items

- All attendees are muted and attendees cannot share video during this session.
- Remember to ask questions using the Q&A feature
- How to access training materials

Dr. Frank R. Sparadeo

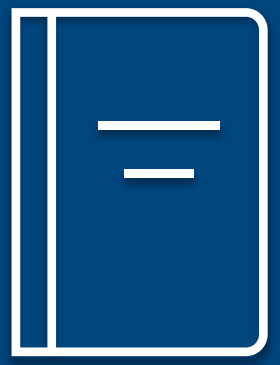
- Practiced as a neuropsychologist for over 34 years
- Experience evaluating and treating people with people experiencing brain disorders or chronic pain, and/or addiction.
- Most recently involved in the formation of a special program in the combined problem of chronic pain and addiction
- Experience in switching patients from pain meds to suboxone
- Closely involved in the treatment of chronic pain utilizing a new theoretical approach that relies on information theory to reduce pain responses. The neuromatrix theory of pain is the basis of this treatment.

Objectives

1. Review the relationship between TBI and SUD
2. Describe the symptoms of TBI following or during rehabilitation
3. Discuss risk factors for substance use in the TBI population
4. Understand differing family characteristics in relation to TBI vs SUD
5. Describe various family assessment and treatment approaches

TBI and Substance Use Disorder

TBI and Substance Use Disorder: Overview



- TBI is one of the most common contributors to ongoing disability
- SUD is the number one health problem in the US
- The occurrence of substance use at the time of TBI is common and in some areas of the country it can be as high as 72%.
- The most common substance detected on toxicology screens in TBI is alcohol.
- Most recently a new population of TBI cases has surfaced. These are people who survive Opiate/opioid overdose.
- Families must adjust to the knowledge that their loved one has had a brain injury that was related in some way with the use of a substance

SUD & TBI: Implications after Injury

TBI sustained in people with a history of alcohol intoxication at the time of the injury demonstrated worse cognitive outcomes than those with negative toxicology screens, with particular difficulty on tests of verbal intelligence, verbal memory, attention and concentration.

Harmful or hazardous alcohol use in the 12 months prior to TBI was associated with poorer verbal learning and memory and slowed processing speed.

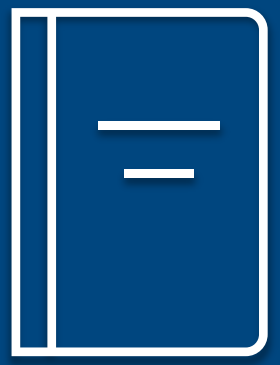
Previous alcohol abuse increases the risk for development of mood disorders following TBI

SUD and TBI: Complications

Substance use or SUD may complicate issues of TBI recovery by:

- Lowering seizure threshold
- Increasing risk for additional TBIs
- Contributing to brain damage
- After TBI, alcohol and other drugs may have a more powerful effect

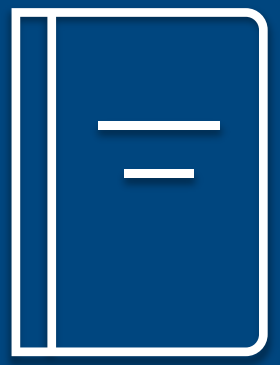
TBI Symptoms and SUD Treatment



The following TBI-related symptoms may hinder treatment for substance abuse:

- Cognitive limitations
- Increased irritability or emotional distress
- Problems with inhibition
- Treatment of pain with medications

SUD and TBI: Implications for TBI Recovery



Negative consequences of ongoing SUD following TBI include:

- Interference with the natural healing process of the brain
- Increased risk for seizures
- Exacerbations of TBI-related physical and psychological symptoms (e.g., balance difficulties, depression)
- Magnifications of TBI-related cognitive difficulties (e.g., judgment, decision-making)
- Heightened risk for suicide attempts, particularly when depression is also present
- Increased risk for legal difficulties/criminal misconduct
- Difficulties distinguishing whether cognitive difficulties (e.g., problems with memory) are due to TBI or substance abuse
- Increased risk for future TBIs

Substance Use Disorder and TBI Risk Factors

Risk factors for substance abuse following TBI include:

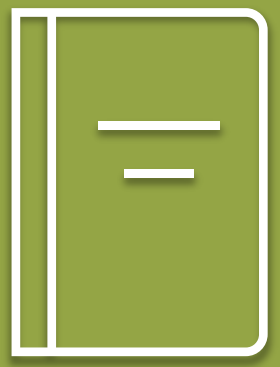
- Pre-TBI substance abuse
- Post-TBI depression
- Male gender
- Younger age
- Unmarried
- Having Medicaid or no health insurance

Goals of Family Treatment

4 Goals of Family Treatment

1. Acceptance by all family members, as well as by the client, that addiction/SUD and/or TBI are treatable illnesses, and the occurrence of addiction/SUD is not a sign of moral weakness.
2. Establishing and maintaining a family system without substances
3. Developing a system for family communication and interaction that reinforces the client's recovery process by integrating family therapy into addiction treatment as well as psychosocial rehab for TBI
4. Processing the family's readjustment after cessation of drug and alcohol use.

Complexity of Family Issues in the Individual with Both TBI and Substance Use Disorder



- In the early approaches to TBI rehabilitation the SUD problem is relatively easily handled by both family and professionals.
- The complexity begins as the TBI survivor reaches greater independence and less oversight by family or professionals.
- Family must be vigilant for signs of substance use which can stimulate resentment and avoidance by the survivor.
- Outpatient rehab professionals must also be vigilant and be able to share information with a survivor's family.
- Family members may have to examine their own use of substances and make changes so as to continue with the message that substance use following TBI is a major risk factor for another TBI as well as other psychosocial difficulties including vocational difficulties.

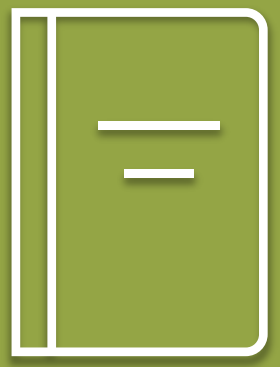
Complexity of Family Issues

- Difficulty in transitioning from rehab to home
- Difficulty in transitioning from home to independent living
- Family influence on re-establishing friendships
- Is tough love an option for families when there is a TBI and SUD?
- While there are differences in family approaches to TBI and SUD as separate disorders, there is opportunity to learn from each other

Family Education

- It can be helpful to educate families about how drugs of abuse work and why withdrawal occurs.
- Components of this educational process include
- Understanding the key brain structures and networks
- Understanding the chemical process of addiction
- Understanding the key neurotransmitter pathways
- Understanding the process of change and the maintenance of sobriety

Determining Readiness for Change & Stages of Change



1. **Precontemplation**
   - "What Problem?"
2. **Contemplation**
   - "I'd like to change but not quite ready"
3. **Preparation**
   - "I've made some changes by cutting back a little"
4. **Action**
   - "I'm no longer using"
5. **Maintenance**
   - "I'm sober/drug free and participating in a healthy lifestyle"
6. **Relapse**

#1 - Complications to Consider

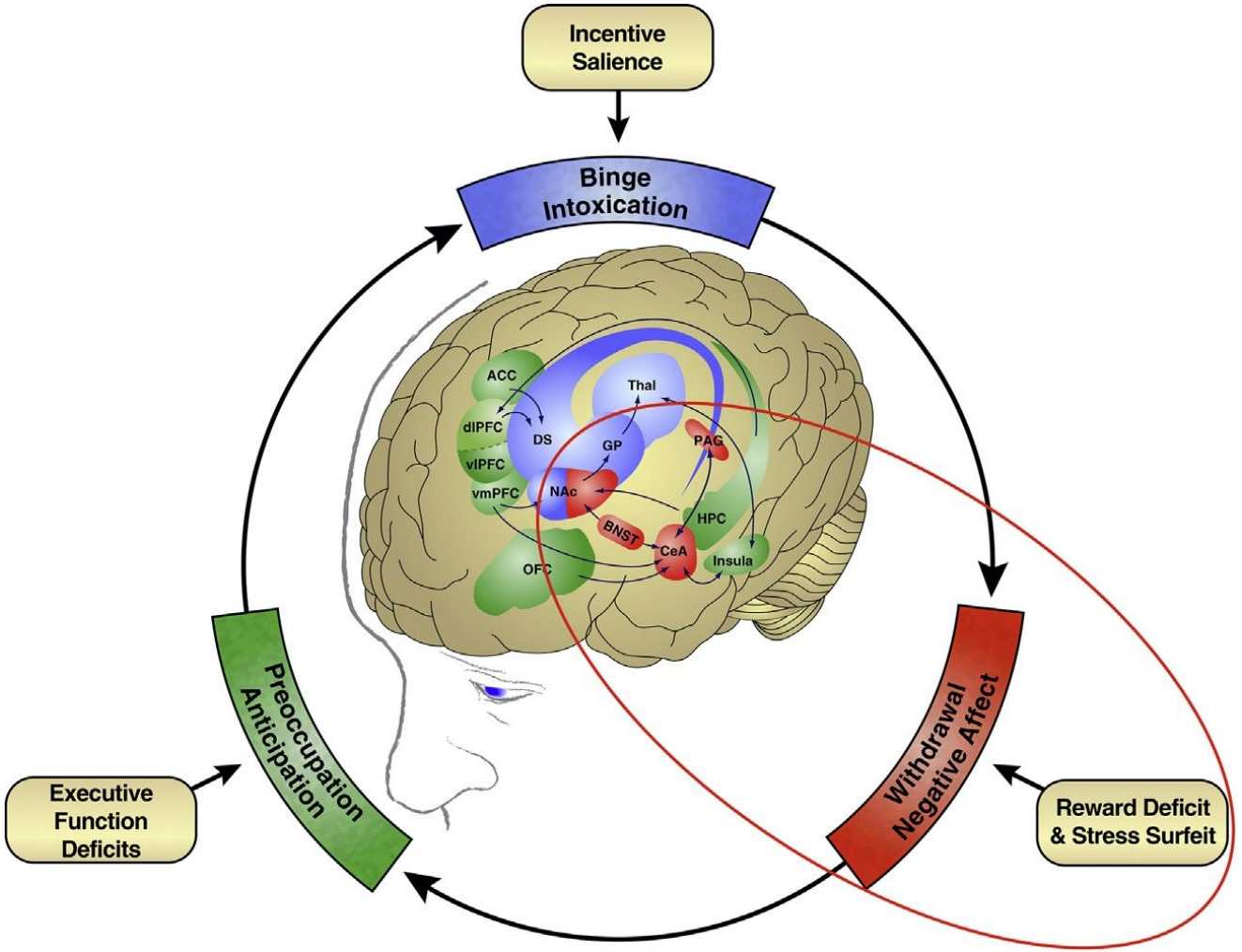
- Common complications during initial abstinence phase of treatment include debilitated thought processes and the persistence of withdrawal symptoms long after detox.
- 30% to 80% of people entering SUD treatment have mild to severe cognitive impairments
- Deficits of cognition often impair the person's ability to understand what is necessary to prevent or minimize their cravings and remain in recovery.

#2 - Complications to Consider

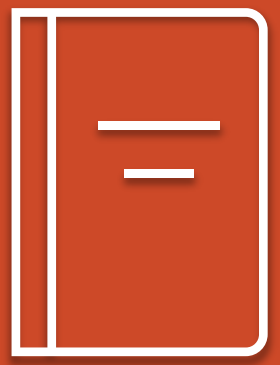
- Patients often appear normal during the early phase of recovery treatment but are actually experiencing an inability to fully understand and process the treatment curriculum.
- A patient may repeat what they hear but the information does not sink in (Disconnection Syndrome).
- It may take weeks, months or even years for cognitive functioning to recover and in some cases, there is a permanent impairment of cognitive functioning
- Educational strategies during treatment must be tailored to the person's ability to process the information being provided.

Neurological Dependence

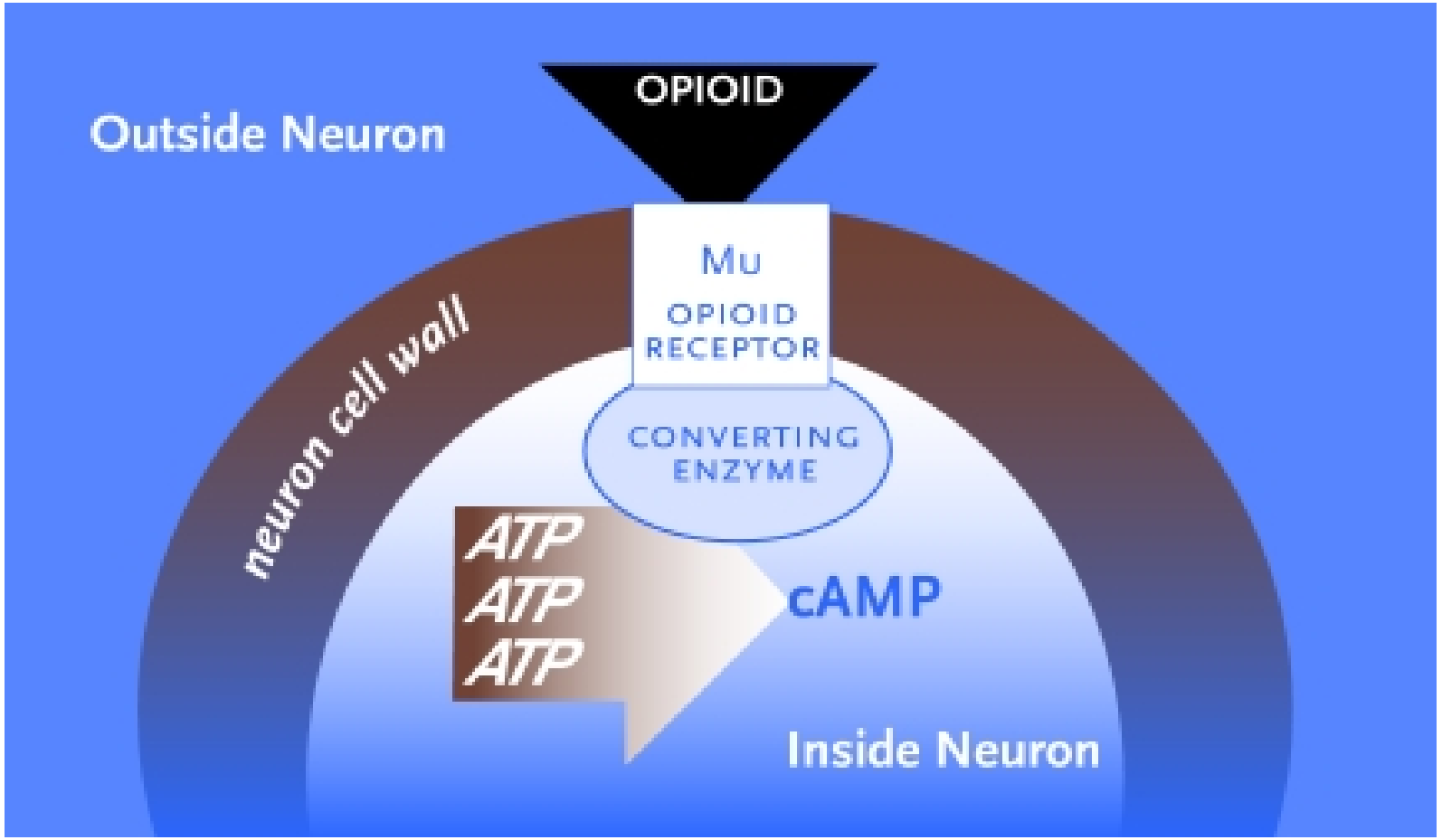
Brain and Addiction



Neurobiological Basis of Dependence and Withdrawal



Normally, natural opiate-like chemicals produced by the body link to mu opioid receptors on the surface of neurons. This linkage activates an enzyme that converts a chemical called adenosine triphosphate (ATP) into another chemical, called cyclic adenosine monophosphate (cAMP), which in turn triggers the release of NA. Prior to initiation of opioid drug abuse, the neuron produces enough NA to maintain normal levels of alertness, muscle tone, respiration, etc.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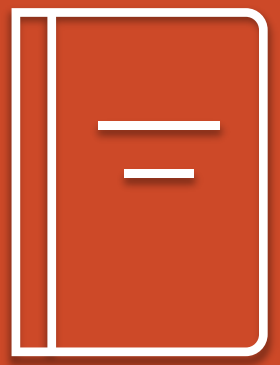
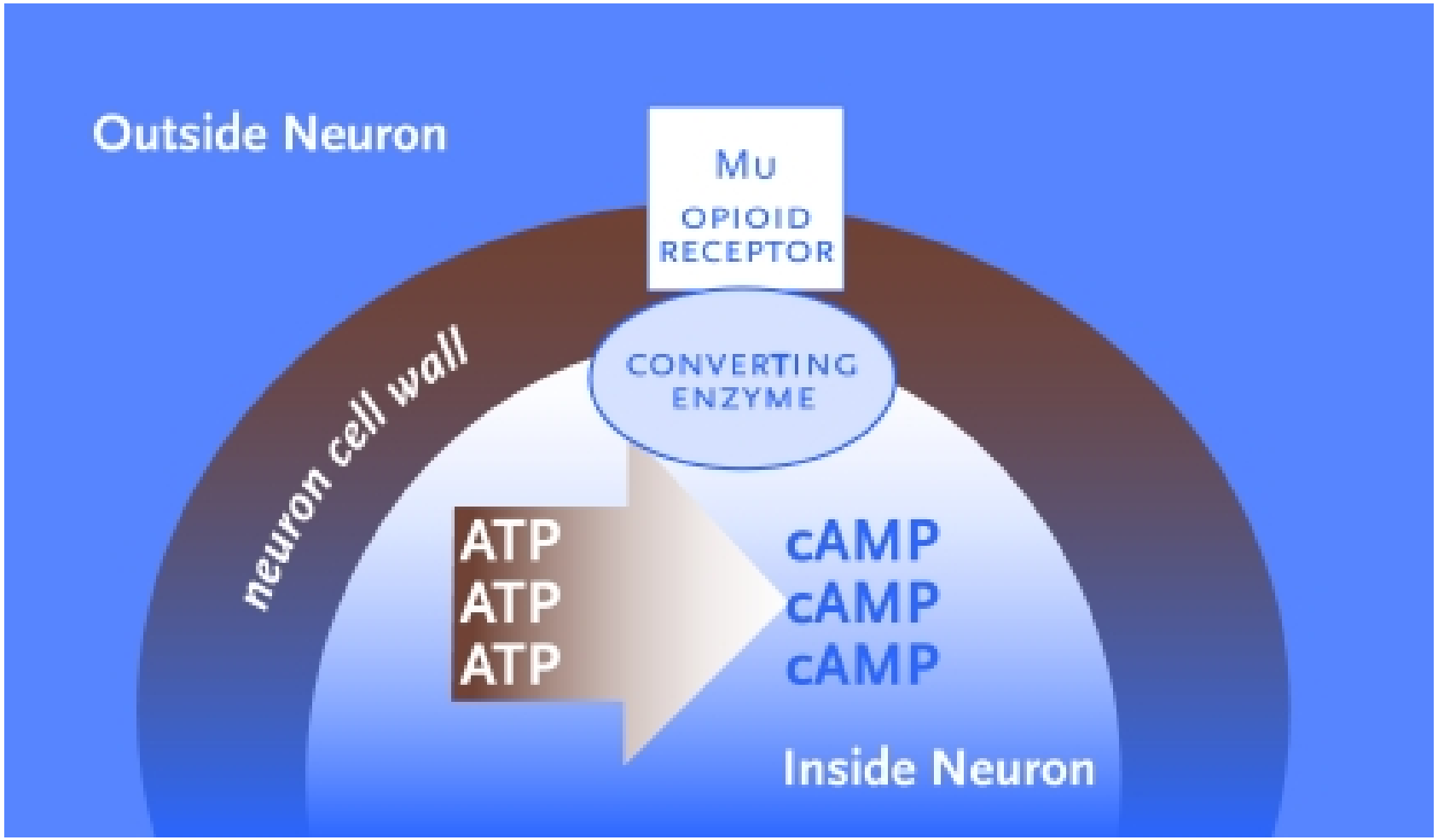
Neurobiological Basis of Dependence and Withdrawal #1



- When an addictive drug is discontinued after chronic abuse, the drug's inhibitory impact is lost.
- Operating at normal efficiency but with enhanced supplies of converting enzyme and ATP, the neuron produces abnormally high levels of cAMP, leading to excessive release of NA.
- The patient experiences the clinical symptoms of withdrawal—jitters, anxiety, muscle cramps, etc. If no further drugs are taken, the neuron will largely revert to its pre-drug condition (panel A) within days or weeks.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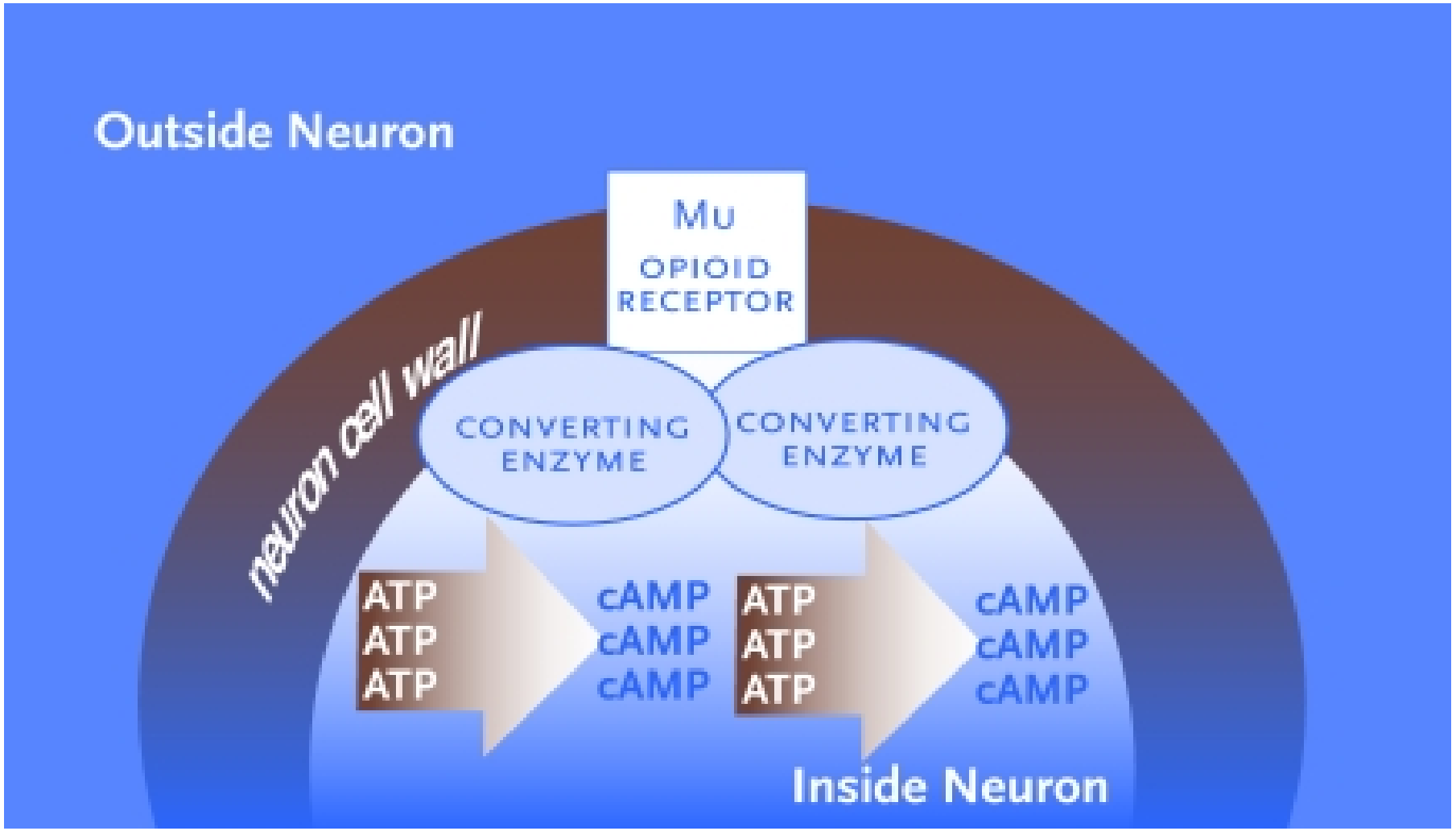
Neurobiological Basis of Dependence and Withdrawal #2

With repeated heroin exposure, the neuron increases its supply of enzyme and ATP molecules.

Using these extra raw materials, the neuron can produce enough cAMP to offset the inhibitory effect of the drug and release roughly normal amounts of NA despite the presence of the drug.

At this stage, the individual no longer experiences the same intensity of acute opioid effects as in earlier stages of abuse.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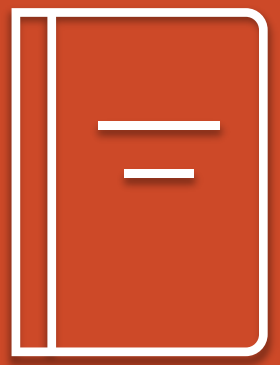
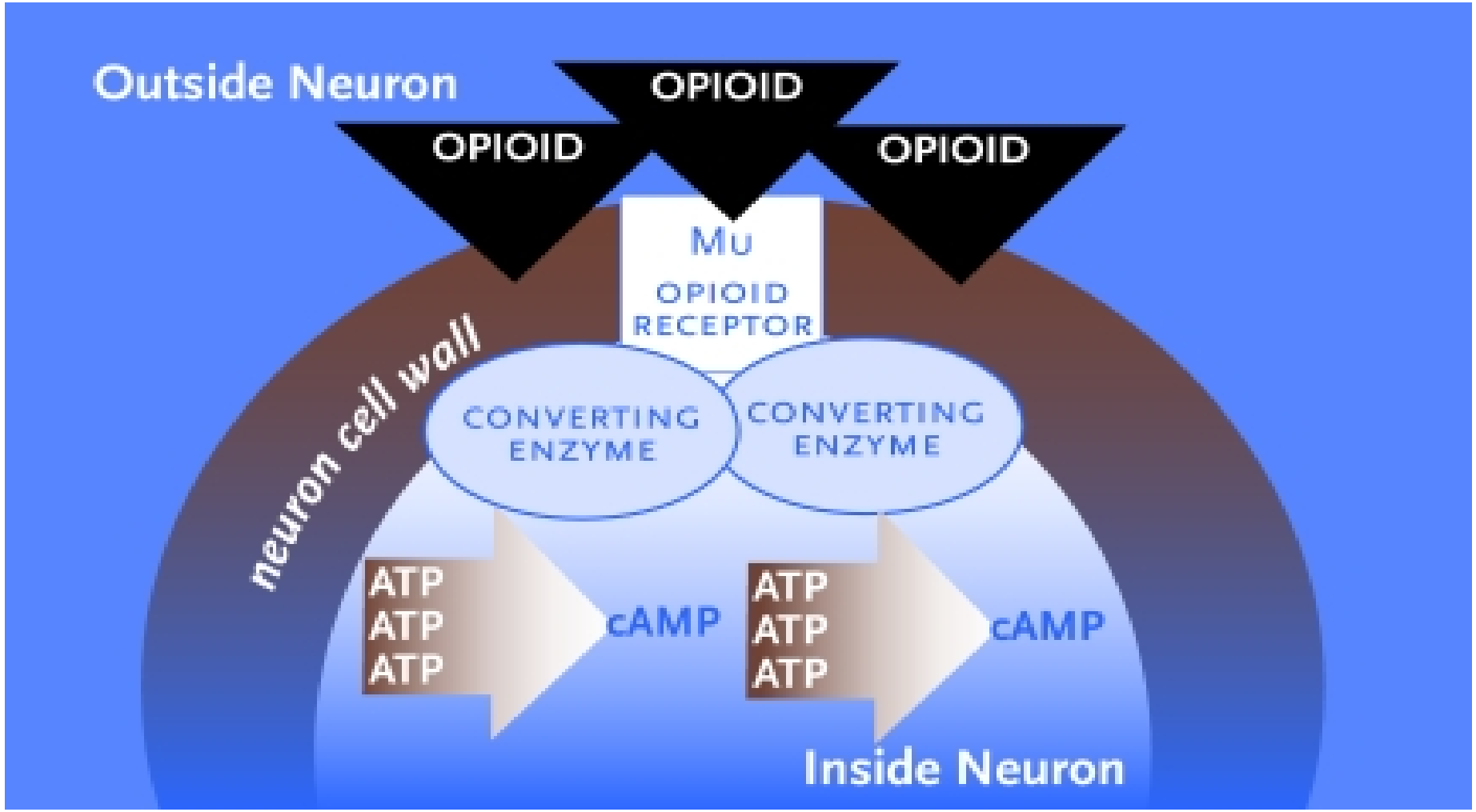
Neurobiological Basis of Dependence and Withdrawal #3



When heroin or another opioid drug links to the mu opioid receptors, it inhibits the enzyme that converts ATP to cAMP.

As a result, less cAMP is produced, less NA is released.

Alertness, muscle tone, and respiration drop, and the acute opioid effects of sedation, shallow breathing, etc., appear.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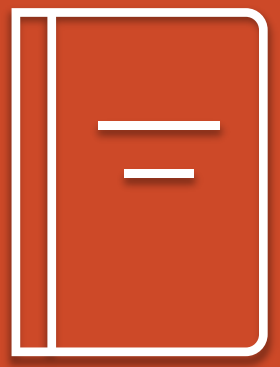
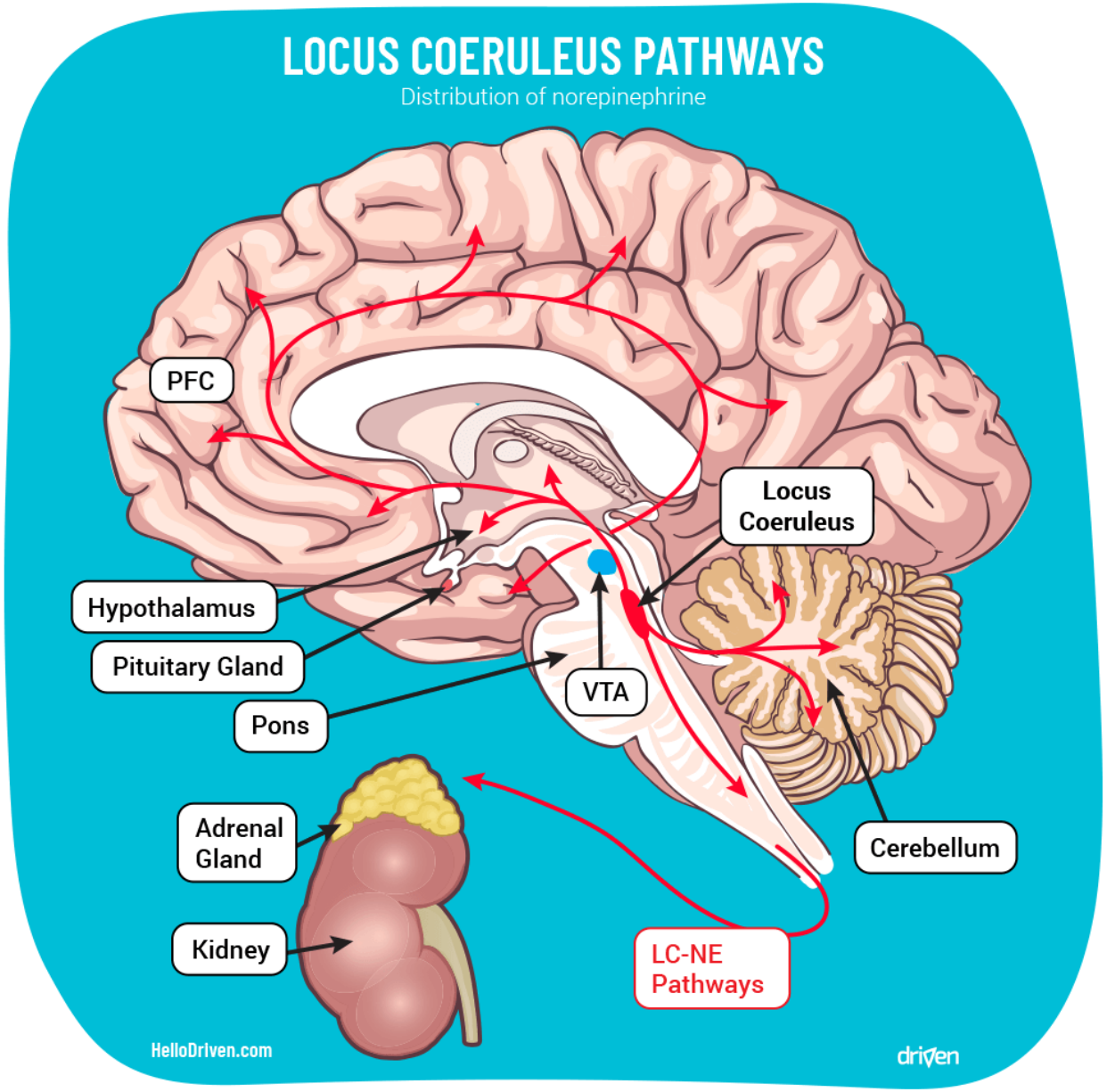
Neurobiological Basis of Dependence and Withdrawal #4



The locus coeruleus (LC) is an area of the brain that is critically involved in the production of opioid dependence and withdrawal.

The following diagrams show how opioid drugs affect processes in the LC that control the release of noradrenaline (NA), a brain chemical that stimulates wakefulness, muscle tone, and respiration, among other functions.

Locus Coeruleus Pathways



Family Response to TBI

Caregiver's Psychosocial Burden

- According to popular opinion, sympathies usually lie with the patients' of TBI. Their needs and efforts for rehabilitation are given utmost priority, however the needs of the caregiver who has an essential role in the care of the patient with TBI are often overshadowed and ignored resulting in elevated levels of caregiver's psychosocial burden.

- Psychological problems predominantly found in caregivers include; pressure, burden anxiety and clinical depression.

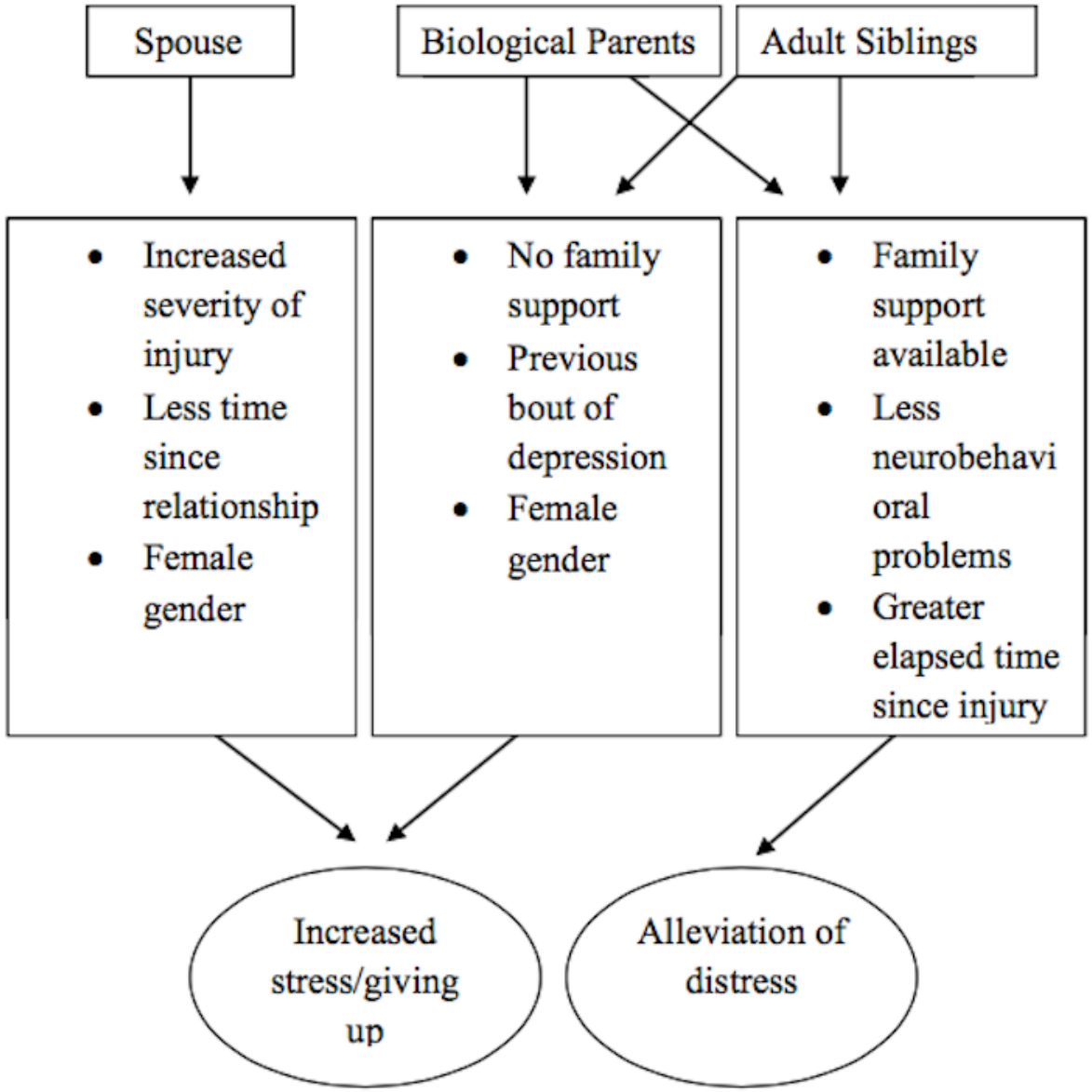
- Spouses have been found to be more prone to be overburdened by these psychological crises as compared to biological parents.

Family Concerns

- Predominant concerns of the caregivers are complaints of less personal time.

- Gender of the caregiver has been found to have an association with the emotions felt to vent out stress; females documented psychological depression and anxiety, while on the contrary males experienced exhaustion and agitation.

TBI and Family Response



Family Complexity

- Family's responses to the trauma of TBI is complex and heterogeneous.
- Pre-injury family dynamics are initially altered but eventually return sometimes to the detriment of the TBI survivor.
- It is often the case that the Mother plays a much more significant role in the direct care of the TBI survivor depending on the pre-injury status of the survivor
- Siblings eventually re-design their role in the family
- Fathers often develop second jobs or become active advocates and often display significant anger and/or agitation

Social Support

Social support is the strongest variable responsible for predicting family operation and demonstrated a direct linear relationship.

Caregivers who receive no social support have been shown to have higher levels of psychological discontent while, on the other hand, those receiving adequate support had reduced levels of stress.

Increased burden was experienced by caregivers in which the love-one began using alcohol or other drugs

Proposed Intervention Strategies

Conceptualizing the Family

A simple and quick system for understanding the family's response to TBI can be helpful in the way in which the clinical team responds to the stress of TBI.

This system can sometimes be used to conceptualize the role of the family in SUD recovery

Way to Understand Family Involvement and Support

	Uninvolved	Involved
Supportive	Often results in resentment	Common in SUD early rehab and TBI rehab
Unsupportive	Common in SUD-usually at relapse.	Often results in ongoing conflict

Factors Contributing to Brain Changes in SUD

- Length of time using
- Doses used
- Other drugs used
- Overdoses and hypoxia
- Pre use factors such as ADHD, LD, TBI
- Chronic pain and medication use/abuse

Understanding the Cognitive System

- Attention/Concentration
- Learning/Memory
- Language
- Visuoperceptual Processing
- Reasoning/Judgment/Executive Functioning

Losing Control: Using Drugs/Alcohol

- As information reaches the cortex it is the hope of the clinician and the family that a top-down process occurs and dampens the emotional survival signals that are driving the cravings.
- Unfortunately, the signal for “survival” is stronger than the prefrontal cortex’s ability to dampen that signal and often the individual loses control and uses.
- There is a constant struggle between the “old brain” go system and the “new brain” stop system.
- The clinician’s role is to strengthen top – down influence thereby staying in control and not giving into the craving.

Regaining and Sustaining Control

- Through a therapeutic process that addresses addiction by understanding the whole person as well as the dynamics of the addiction a person with an addiction to drugs can regain control and live a productive drug-free life.
- Sustaining control requires the clinicians, family and the person themself to understand all of the major contributing factors to regaining and sustaining control over addiction.
- Neuropsychological factors (cognitive) must be understood.
- Physiological and medical factors must be understood
- Mental status must be assessed, and findings integrated into the interventions and recovery process.

Cognitive Deficits and Treatment

Taking cognitive deficits into account during the SUD treatment process

Modifications that must be made to treatment models to compensate for cognitive impairment

Cognitive deficits and their impact on the emotional state of the patient.

Family approaches with a full understanding of the clinical limitations as well as the rehabilitation goals and how the family can participate in the cognitive rehab process.

Factors Contributing to a Good Treatment Outcome

- Accepting and understanding that substance use is a problem
- Self-efficacy of the patient
- Does the patient believe they can change
- Does the patient believe treatment helps
- Level of support for a drug free life—family and friends
- Family and friends must understand the risk factors of substance use in the TBI survivor
- Relationship with the clinicians working with the patient
- Therapeutic relationship must be genuine

Goals of Family Treatment

- Acceptance by all family members, as well as by the client, that addiction is a treatable illness and not a sign of moral weakness
- Establishing and maintaining a drug-free family system.
- Developing a system for family communication and interaction that reinforces the client's recovery process by integrating family therapy into addiction treatment.
- Processing the family's readjustment after cessation of drug and alcohol abuse.

Varying Approaches to Family Intervention

Family Systems Approach: This model explores and recognizes how a family regulates its internal and external environments, making note of how these interactional patterns change over time. Major focus areas are: daily routines, family rituals (e.g. holidays), and short-term problem—solving strategies.

Family Behavioral Approach: This model is based on the theory that interactional behaviors are learned and perpetuated by reinforcing the behavior.

Different Family Approaches

Family Functioning Approach: This approach classifies the family system into one of four types and uses the therapeutic intervention that is best suited to the functioning of that family system.

Functional family systems: The family and the client have maintained healthy interactions

Neurotic or enmeshed family systems: This approach usually requires intensive family treatment aimed at restructuring family interactions

Disintegrated family systems: This approach calls for separate yet integrated treatment of the client and the family.

Absent family systems: Unavailable family members. Clients estranged from members of their family often develop a family of choice with people with whom they spend the most time. Identifying and clarifying the roles of these extended family members is important, and clinicians encourage their participation.

Social Network Approach

- This approach focuses primarily on the treatment of the client and also establishes a concurrent and integrated support network for family members to assist with problems caused by the addiction.
- Support groups for TBI survivors and their families are popular and often offered by local TBI advocacy organizations
- The Recovery Movement is an alternative to formal treatment systems

Family-Centered Rehab

Challenges in Family-Centered Rehab

The challenge in initiating family-centered rehabilitation is promoting a philosophy that sees families and professionals as equal experts in the process of supporting the self-sufficiency of individuals with SUD and TBI.

Understanding the cognitive strengths and weaknesses of the client and how that impacts independence, self-sufficiency and rational decision-making. Families must have an accurate understanding of the cognitive system of the client and how that may impact independent decision making.

How drugs/alcohol impacts an impaired cognitive system.

4 Value Assumptions

01

First, a person who has experienced an SUD and/or TBI is part of a family.

02

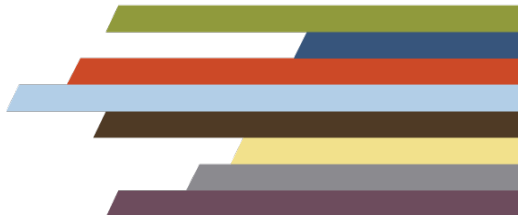
Second, families are already competent or have the capacity to become competent if the proper supports are in place.

03

Third, every person is assumed to have the right to live in a home in the community with whatever supports are necessary.

04

Fourth, the professional is a facilitator who generates the resources and solutions needed by families to live in their own homes in the community.



Separating the Person from Family

- In the past (and sometimes now) the system will separate the person with SUD or SUD/TBI from his/her family for extended periods of time.
- Services were provided within an established framework, and people with SUD and their families are forced to accommodate to that framework.
- These services are known as a continuum, and families in the past found themselves beginning at one point and arriving at another based in the availability of services that are provided, not necessarily the needs of the person.

Family Involvement Within Continuum

- Professionals are experts who work with an individual to achieve his/her goals.

- Friends, social activities, and community life are often put-on hold until a person gets “better.” Once a person has completed specific goals, or when funding runs out, he/she is returned to the family or community.

- Families in the past have been forced to work within the continuum, which rules their day-to-day life. Visits must be arranged, schedules changed, and accommodations made for the family to have some type of involvement in facility programming.

Family Interaction with Professionals

The peripheral involvement by families has often led to their inability to control what happens in their own lives.

Families are sometimes forced to interact with a large number of professionals who surround the separated family member. The interaction is often identified as a source of stress for both families and professionals.

Currently, in most cases, services are no longer at the center of daily life for families involved in rehabilitation; rather, families are at the center, and services are only one aspect of a family's life.

Language of Rehab

- The language of rehabilitation changed, so now we talk about families involving professionals and an array of services supporting a family's life.

- A person's social network of relationships, church, and community stays with the person, and needed services are tailored to support, not supplant, the family.

- Family-centered rehabilitation keeps the focus of rehabilitation on functional skills that a person can use to keep or acquire his/her own definition of a meaningful life.

Understanding Relapse

- Families must understand the problem of relapse
- Relapse is a complex process that is caused by an interruption of top-down problem solving leading to a lapse in coping and the impulsive re-use of drugs/alcohol.
- There are sometimes signs of impending relapse that should be considered and a plan should be developed when such signs are witnessed.
- Unfortunately, relapse tends to be a “normal” part of the recovery process. The client, family and professional team should have a system for avoiding relapse or minimizing the length and breadth of the relapse experience.

SUD and Memory

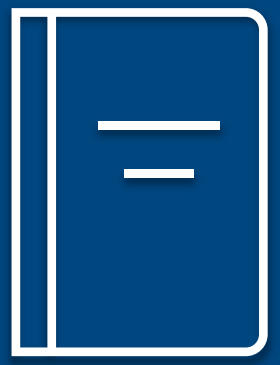
- There is extensive memory tracts created with the use of opiates/opioids and other drugs.
- The dendrites of the neurons in the pleasure circuit maintain information that reminds the individual of the pleasurable impact of the drug as well as the unpleasant impact of various states of withdrawal. These memories become incentives to use once again.
- Relapse is a function of urges or cravings that can be endogenous or exogenous.
- Urges or cravings are processes that provide emotional information from the brain stem and midbrain up to the prefrontal area.

Neuropsychological Factors and Relapse

- Deficits in prospective memory functioning may contribute to problems encountered in everyday living both during and after addiction treatment

- Thus, neuropsychological impairment may contribute to the failure to regulate drinking and drug-taking behaviors in the moment, thereby escalating the risk for relapse, and over the long term may contribute to the maintenance of substance-use behaviors, even in the face of severe, negative consequences of such use.

Cravings: Endogenous and Environmental Triggers



- Abuse of addictive drugs disrupts the brain's normal functioning and chemical balance, or homeostasis, resulting in a depletion of certain neurotransmitters. This altered brain chemical state, known as allostasis (imbalance), must then be maintained for the individual to remain functioning. If use of the addictive drug is not maintained, the individual's brain will experience severe withdrawal symptoms and cravings that serve to reinforce the need to resume drug use.
- This is an endogenous (internal or intrapersonal) trigger
- Endogenous triggers having the greatest impact of drug craving and relapse are negative emotional physical states or internally motivated attempts to regain control in order to use.

Endogenous Cravings

- The emotional states include; exhaustion, dishonesty, impatience, argumentativeness, depression, frustration, self-pity, cockiness, complacency, expecting too much from others, letting up on discipline, use of any mood-altering drugs and overconfidence.

- Traditional treatments for endogenous cravings consist of counseling, education, discussions with recovery sponsors, stress reduction therapies, biofeedback and participation in 12-step meetings.

- More recent treatments include medications and nutrients like amino acid precursors that are targeted to restore neurotransmitter homeostasis. These substances can lessen initial negative feelings of early sobriety, continue to suppress and/or reverse pleasurable effects of drugs and decrease craving.

Environmental Triggers

- Environmental triggers often precipitate drug cravings (Also known as external influences or interpersonal factors)
- This type of craving is caused by relationship conflicts, social pressures, lack of support systems, negative life events, sensory stimuli, and “slippery” people, places and things (e.g. money, neighborhoods, past using partners, a beer display in a grocery store).
- Drug craving caused by an environmental cue results in true psychological responses that are manifested by actual physiological changes of increased heart rate, pulse rate and BP; sweating; dilation of the pupils; specific electrical changes in the skin and EEG scans, increased peristalsis activity; and an immediate drop of 2 degrees or more in body temperature.

Controversial Issues

Harm Reduction: Is this approach reasonable for a person with both TBI cognitive and physical disorders and substance use?

Medication Assisted Treatment for Addiction: Considerations for people with both TBI and SUD and their family.

Is **"tough love"** a viable approach to a person with a TBI and SUD?

Case example:

- 24 yo male heroin addict. History includes 3 OD's with Narcan administration
- Living in the family home (recently allowed to return home following an OD)
- Living space is trashed, bathroom is trashed, no regard for parents or sibling
- Using again after a few weeks of abstinence. NOW WHAT?

Conclusions

TBI and SUD is a complex and variable situation in which psychosocial, biochemical, neurological, neuropsychological and family issues must be considered.

Families are in the forefront and at the center of the rehabilitation process and ultimately must become the central force in assisting their loved one in the rehabilitation and recovery process.

Families are not always equipped to play their optimal role

Families can learn and improve and therefore enhance the rehab and recovery process. Families must recognize there is much to learn about the complexities of TBI and SUD.

In some cases, it is necessary for the TBI/SUD patient to create a new family through the recovery process. Nevertheless, everyone deserves a family, and that family must play a significant role in the recovery process and long-term health of the individual who is part of that family.

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