Neurobiology of Substance Use Disorder

INTEGRATED ADDICTION TREATMENT ADDRESSING THE COGNITIVE, SOMATIC, BEHAVIORAL, NEUROBIOLOGICAL AND SOCIOECONOMIC ROOT CAUSES OF ADDICTION
How Addiction Develops:

Trauma
- Less than adequate nurturing in-utero
- Less than adequate attachment 1st year
- On-going chronic trauma throughout childhood
- Acute traumatic experiences
- Environment modifies genetics
- Drugs change neuro-pathways

Neural Pathways Re-routed
- Orbito-frontal Loop Disconnect
- Deep Right Limbic System by-passed
- Amygdala over-sensitized
- Hippocampus compromised
- Implicit trauma memories created vs explicit memories

Neurotransmitter Imbalance
- Lower Serotonin Levels
- Lower Dopamine Levels
- Too little or too much Norepinephrine
- High Cortisol Levels
- High Adrenaline Levels
- Low GABA Levels

Unrelenting Pain
- Neurotransmitter imbalance can result in debilitating pain:
  - Physical
  - Psychological
  - Emotional
  - **Self-medicating and chemical coping begin**

Dopamine-driven Behaviors
- Need of system to create homeostasis and balance creates dopamine seeking behaviors.
- Under stress, these behaviors become obsessions and compulsions

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Early Childhood Trauma/SUD Progression

In-Utero:
- Somatosensory Distress
- Neural path disconnect

0-12 mos:
- “Sense of Self” can’t develop
- Trauma/Stress memories can’t release
- Fight/Flight/Freeze experience is the norm

1-3 yrs:
- Attachment patterns established:
  - Dominance, Dependence, Disordered
  - “Not Belonging” established
  - Superiority/Inferiority established
- No authentic sense of self
- Hard to make sense of experiences = trauma
- Non-verbal: Language learning and understanding

Early Childhood:
- Verbal: language integrated into thought process
- No authentic sense of self
- Mask/Persona created
- Core beliefs, behaviors & emotions created by external experiences
- “Trauma Cluster” begins to develop:
  - Depression
  - Anxiety
  - OCD
  - PTSD
  - Suicidality

Adolescence:
- Black & white thinking established
- Perfectionism
- Unrealistically high expectations
- Feelings of shame, guilt, humiliation and rejection
- Self-hatred, Self-loathing
- Sense of not belonging reinforced
- Trauma Cluster issues increase in intensity
- Beginning of chemical coping/self medicating
  - Occasional relief drinking/using
  - Increase in Tolerance
  - Increasing dependence
  - Guilt
  - Unable to discuss problems
  - Persistent remorse
  - Loss of other interests

Young Adult:
- No “Sense of Self”
- No release of trauma memories
- Self-hatred, self-loathing
- Feelings of shame, guilt, humiliation and rejection
- Chronic stress/fight, flight, freeze
- Hopelessness
- Escape from unceasing, painful self-awareness becomes compelling:
  - Sleep
  - Cutting/self mutilation
  - Alcohol
  - Drugs
  - Eating disorder
  - Death
- Family and friends avoided
- Unreasonable resentments
- Drinking/using with chronic users
- Impaired thinking

Adult:
- Obsessive drinking/using continues in vicious cycles
- Unable to initiate action
- Family, relationship, money and employment troubles
- Unbearable emotional, physical, psychological pain

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Early Childhood Trauma/SUD Recovery

Consequences of Early Childhood Trauma:
- Co-occurring Mental Illness
- Trauma memories not released
- Chronic stress/live, flight, freeze
- Black & white thinking
- Perfectionism
- Unrealistically high expectations
- Feelings of shame, guilt, humiliation and rejection
- Sense of not belonging reinforced
- Superiority/Inferiority established

- Diminished “Sense of Self” (don’t know who they really are)
- Self-hatred, Self-loathing
- Attachment patterns established: Dominance, Dependence, Disordered
- “Trauma Cluster issues manifest

- Mask/Persona created
- Core beliefs, behaviors & emotions created by external experiences, not internalized learning/development
- Hopelessness
- “Trauma Cluster issues increase in intensity

Beginning of Chemical Coping/Self Medicating:
- Occasional relief drinking/using
- Increase in Tolerance
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Process of Recovery:
Month 1
- Detox/MAT
- Assess co-occurring mental illness
- Assess medical issues
  - Assess chronic stress

Months 1 - 3
- Relaxed Muscle Body
- Create safe, compassionate relationships: increase sense of belonging
- Increase body awareness
- Activate right brain
- “Sense of Self” Development
- Create Hope

Months 3 - 12
- Attachment Patterns
- Core Beliefs
- Spiritual Self/Mindfulness/Detachment
- Emotions: Moment of Choice
- Building a Tribe (relationships)

Year 2
- Superiority/inferiority
- Mask/Persona or Authenticity
- Blk & Wht Thinking or Rainbow Thinking
- Self Acceptance
- Shame

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Steps to Prepare Clients Neurobiologically

Create a Safe Relationship

Calm the Body

Activate the Right Brain

Integrate the Whole Brain and Whole Body

Reframe & Release, Validate & Support
Techniques to Prepare Clients Neurobiologically

- Limbic Resonance
- Guided Relaxation
- Movement/Stretching
- Breathwork
- Tapping
- Acudetox
- Rhythmic Stimulation
- Storytelling
- Writing
- Role-playing
- Experiential Exercises
- Continuous Check-in with Somatosensory Experience

- Child
- Wild Woman
- Wise Woman

- Create a Safe Relationship
- Calm the Body
- Activate the Right Brain
- Integrate the Whole Brain and Whole Body
- Reframe & Release, Validate & Support

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The Effects of Neurotransmitter Imbalance are Chronic and Cumulative:

- **Trauma**:
  - **In-utero**:
    - F/F/F constant state: Depression, anxiety, OCD, PTSD - severe
  - **0-12 mos**:
    - Low concentration ability, low attention span
  - **12-36 mos**:
    - Sense of Self under-developed
  - **3-10 yrs**:
    - Low trauma release: low resiliency
  - **10-19 yrs**:
    - Low confidence/self esteem
  - **Adult**:
    - 

- **Genetics & Environment**:
  - **F/F/F sensitivity**: Depression, anxiety, OCD, PTSD - probable
  - **Sense of Self somewhat developed**
  - **Some trauma release**: some resiliency
  - **Low confidence/self esteem**

- **Opioid Use**:
  - **F/F/F reaction to danger**
  - **High ability to concentrate and focus**
  - **Healthy Sense of Self**
  - **High resiliency**
  - **Healthy trauma release**: healthy confidence/self esteem

*Not all addiction is the same; treatment needs are based on amount & length of trauma-based neurotransmitter imbalance.*
Current Substance Use Disorder/Addiction Treatment

Reduce Stigma

Addiction is a Disease
- Not a choice
- Punishment
- Brain Pathways Disconnected
- Neurotransmitter Dysfunction
- Integrated Behavioral Health Approach Required

Detox

Remove the Coping Chemicals
- Medical Detox Protocol
- Inpatient
- Outpatient
- Focus on Acute Withdrawal Symptoms and Behaviors
- Integrated Behavioral Health Approach Required

MAT

Post Acute Withdrawal

Withdrawal Syndrome
- Relieve PAW Symptoms with Medication
- Vivitrol
- Suboxone
- Campral
- Anabuse
- Methadone
- Naloxone
- Reduces Relapse
- Allows for Treatment to be More Effective
- Go back to Work

Current Treatment

Residential, PHP, Intensive Outpatient
- CBT
- DBT
- REBT
- Trauma-informed therapies
- EMDR
- Psycho-ed
- Healthy activities: hiking, exercise, swimming, yoga
- Art therapy
- Music therapy
- Psychodrama

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Reduce Stigma

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MAT Post Acute Withdrawal

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Chronic Disease Management

Treating the Neurotransmitter Dysregulation
- Identify the Root Cause of Self Medicating Behaviors
- Calm Central Nervous System
- Activate Trauma Release
- Deactivate Mesolimbic Dopamine System
- Balance Neurotransmitters
- Socio-economic Factors
- Genetics
- Environment

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Implementation of a Neurobiologically-based Program

INTEGRATED ADDICTION TREATMENT ADDRESSING THE COGNITIVE, SOMATIC, BEHAVIORAL, AND NEUROBIOLOGICAL ROOT CAUSES OF ADDICTION
Recovery With Respect

• Addiction is a Treatable Disease Requiring Medical Science and Psychological Science Integrated and Applied

• Our Neurobiological Treatment Approach Addresses the Root Causes of Addiction

• Respect and Compassion
Recovery Treatment Models

Current Process of Recovery Treatment:

Months 1 - 3
- Transforming event, legal consequences, family/friend, ultimatum, intervention, medical crisis, DCS involvement, employer intervention
- Reach out for help (only 13% reach out)
- Detox
- MAT
- Psychiatric assessment
- PHP assessment
- Treatment; residential, PHP, IOP, OP (50% graduate)

On-going
- 12 Step, Celebrate Recovery, White Bison, SMART
- Aftercare Program

Recovery Treatment Neuroscience
Primary Focus:

Week 1
- Detox/MAT
- Assess co-occurring mental illness
  - Trauma assessment
- Assess medical issues
  - Assess chronic stress

Months 1 - 3
- Create safe, compassionate relationships:
  increase sense of belonging (limbic resonance)
- Relaxed Muscle Body
  - Increase body awareness
- Activate right brain
- “Sense of Self” Development
- Create Hope

Months 3 - 24
- Attachment Patterns
- Core Beliefs
- Spiritual Self/Mindfulness/Detachment
- Emotions: Moment of Choice
- Building a Tribe (relationships)
- Superiority/inferiority
- Mask/Persona or Authenticity
- Blk & Wht Thinking or Rainbow Thinking
- Self Acceptance
- Shame

Jellinek Curve Progression of Recovery:
- Honest desire for help
- Told addiction can be arrested
- Learns alcoholism is a disease
- Stops taking alcohol
- Meets former addicts normal and happy
- Assisted in making personal stocktaking
- Right thinking begins
- Physical overhaul by doctor
- Spiritual needs examined
- Onset of new hope
- Start of group therapy
- Appreciation of possibilities of new way of life
- Diminishing fears of the unknown future
- Regular nourishment taken
- Return of self-esteem
- Realistic thinking
- Desire to escape goes
- Natural rest and sleep
- Adjustment to family needs
- Family and friends appreciate efforts
- New interests develop
- New circle of stable friends
- Rebirth of ideals
- Facts faced with courage
- Application of real values
- Increase of emotional control
- First steps toward economic stability
- Confidence of employers
- Care of personal appearance
- Contentment in sobriety
- Rationalizations recognized
- Increasing tolerance
- Group therapy and mutual help continue
- Enlightened and interesting way of life opens up with road ahead to higher levels than ever before

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10 Truths of Having a Strong Sense of Self

- You know how to self-soothe yourself
- You keep promises to yourself
- You make your own decisions and hold your own counsel
- You have your own hobbies and interests that you pursue outside of your friends/relationship
- You can set boundaries on other people’s demands on your time, energy and resources
- You can make your own life-choices without the need for constant reassurance and approval
- You act authentically, not how you “think” you should act
- You remain a leader of yourself no matter where your followers go
- You take full responsibility for your life
- You know yourself enough to be able to decide how true an insult is
### Sense of Self

<table>
<thead>
<tr>
<th>Unhealthy Sense of Self</th>
<th>Healthy Sense of Self</th>
</tr>
</thead>
<tbody>
<tr>
<td>feels not good enough</td>
<td>reflective, responsive, and resourceful</td>
</tr>
<tr>
<td>uses anger to control other people</td>
<td>thinks in terms of possibilities</td>
</tr>
<tr>
<td>uses substances to comfort, avoid, numb, escape or distract from uncomfortable feelings</td>
<td>turns to healthy coping mechanisms during times of stress</td>
</tr>
<tr>
<td>is reactive, dramatic, defensive or easily triggered</td>
<td>optimistic and grateful</td>
</tr>
<tr>
<td>repeats problematic behaviors that cause suffering</td>
<td>can understand, appreciate, and validate perspectives that are different</td>
</tr>
<tr>
<td>fights reality or wishes it away</td>
<td>strong sense of capability and security</td>
</tr>
<tr>
<td>refuses to face fear and challenges</td>
<td>constantly growing in strength, confidence, and ability to handle triggering situations</td>
</tr>
<tr>
<td>believes that happiness only occurs when there’s no emotional pain or fear</td>
<td>can tolerate discomfort and regulate emotions</td>
</tr>
<tr>
<td>often feels overwhelmed by emotions</td>
<td>curious</td>
</tr>
<tr>
<td>expects perfection</td>
<td>does not personalize what others say or do; maintains a healthy perspective</td>
</tr>
<tr>
<td>personalizes what others say and do</td>
<td>embraces the imperfections of self, others and life</td>
</tr>
<tr>
<td>uses blame, avoidance, criticism or denial to deal with difficult situations</td>
<td>takes ownership of problems; let’s other people be responsible for themselves</td>
</tr>
<tr>
<td>feels a sense of entitlement or grandiosity</td>
<td>understands the difference between wants and needs</td>
</tr>
<tr>
<td>requires a lot of emotional validation and feels angry, anxious or depressed if it’s not available</td>
<td>practices acceptance, compassion and cooperation</td>
</tr>
<tr>
<td>is unable to demonstrate compassion or understanding towards people who hold different opinions or beliefs</td>
<td>acts with integrity and authenticity</td>
</tr>
<tr>
<td>feels a sense of competition with others</td>
<td>can discern between what can be changed and what can’t be</td>
</tr>
<tr>
<td>feels jealous or judgmental of other people’s success</td>
<td>has a strong sense of personal power</td>
</tr>
<tr>
<td>avoids making apologies and taking responsibility</td>
<td>is adaptive and flexible</td>
</tr>
<tr>
<td>needs to be right and feel superior</td>
<td>feels worthy and deserving of good things</td>
</tr>
<tr>
<td>is chameleon-like; changing to fit in or fulfill a role</td>
<td>can give and receive love and appreciation</td>
</tr>
<tr>
<td></td>
<td>is aware of interests, desires, and talents</td>
</tr>
</tbody>
</table>
What is Compassion?

If you want others to be happy, practice compassion. If you want to be happy, practice compassion.

Dalai Lama

Compassion is the basis of morality.

Arthur Schopenhauer

Wisdom, compassion, and courage are the three universally recognized moral qualities of men.

Dalai Lama

Love and compassion are necessities, not luxuries. Without them humanity cannot survive.

Dalai Lama

Recovery with Respect

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What is Compassion?

Empathy and Compassion combat shame

“In cultivating compassion we draw from the wholeness of our experience—our suffering, our empathy, as well as our cruelty and terror. It has to be this way. Compassion is not a relationship between the healer and the wounded. It’s a relationship between equals. Only when we know our own darkness well can we be present with the darkness of others. Compassion becomes real when we recognize our shared humanity.”
“Only wounded healers can heal, and only they can heal to the extent that they have healed themselves.”

Carl Jung
Trauma Informed

Trauma changes the brain. These changes can make everyday life unbearable. The pain of merely existing affects people:

- Physically
- Emotionally
- Psychologically
- Spiritually

Over time, the person can’t even tell where the pain is coming from, it’s all one exhausting experience every day and night.
Recent Brain Science Enhances Psychotherapy

<table>
<thead>
<tr>
<th>Old Paradigm</th>
<th>New Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  An expert authority</td>
<td>1.  A wounded healer</td>
</tr>
<tr>
<td>2.  Clients are patients with psychological disorders</td>
<td>2.  Clients are worthy human beings</td>
</tr>
<tr>
<td>3.  A component approach</td>
<td>3.  A holistic approach</td>
</tr>
<tr>
<td>4.  Focus on symptom reduction</td>
<td>4.  Focuses on both healing &amp; flourishing</td>
</tr>
<tr>
<td>5.  Remove negativity</td>
<td>5.  Embraces negativity</td>
</tr>
<tr>
<td>6.  Medical way to treat mental health</td>
<td>6.  Nature’s way to mental health</td>
</tr>
</tbody>
</table>
Neurotransmitter Imbalance Can Cause Unbearable Physical, Psychological and Emotional Pain.

This suffering is unrelenting, never lets up, it accumulates and gets worse over time.
Neurotransmitter Imbalance Results in Psychological & Physical Pain:

**LOW SEROTONIN**
- Fight/Flight/Freeze as natural state
- Anxiety/OCD/PTSD/Depression
- Lowered ability to concentrate/focus, Poorly organized
- Unable to release trauma
- Difficulty managing emotions
- Sense of not belonging anywhere
- No sense of Self: Lower self-esteem, Lower self confidence

**LOW DOPAMINE**
- Low pain threshold/chronic pain
- Depression
- Low ability to concentrate/focus
- Low energy/fatigue
- Low enjoyment/low interest levels
- Social withdrawal
- Emotional sadness
- No purpose or meaning in life

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Substance Use Disorder is NOT About “Chasing the High”

The person suffering is not enjoying themselves, they are self-medicating their pain.

They are not “chasing a high” they are trying to feel normal.

The cycle of pain/suffering/relief begins and continues despite negative consequences.

The person who is self-medicating does not “choose” to continue, they themselves cannot explain their own behavior.
The Most Common Reasons Given for Relapsing

**PHYSICAL PAIN/SUFFERING**

“I’m in pain all the time, my whole body hurts, its taken over my life, nothing helps”

“I can’t leave my house without something to control the panic”

“I am exhausted every day, I need to sleep, I lay awake all night worrying”

“I feel so agitated and angry, I am going to lose my job if I can’t control this”

“I have a headache constantly, nothing can relieve the pain except the drugs”

When I stop using, I get so sick I can’t function and I just want to die”

**TRAIT/STATE HOPELESSNESS**

“I hate myself”

“No one wants me around anymore”

“I can’t do anything right”

“I don’t remember what I did yesterday, or the day before, my mind is gone”

“I don’t care anymore, it’s not worth it”

“F#%* it”

“I will never be good enough”

“There’s no hope for me, everyone is better off if I’m dead”