"The question is never 'Why the addiction?' but 'Why the pain?'"
- Dr. Gabor Mate
Trauma, Neurobiology, & Addiction

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Keep Learning!
- Matt's Mumblings Blog
- Trauma-Informed Lens Podcast

www.connectingparadigm.org
Trauma Defined

Traumatic Event – Events involving intense stress that overwhelms the nervous systems capacity for regulation, resulting in an existence dominated by the trauma.

Sustained Trauma - Living in high stress environment and in the shadow of the threat of traumatic events occurring at any time.

Compound/Complex Trauma – Combination of traumas occurring over an extended period of time.
Trauma, Neurobiology, & Addiction

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Seek Pleasure

Avoid Pain

Energy Efficiency
Energy Efficiency
Two Paths to Elevating Traumatic Pain & Memories

Get High

Working through your Issues!!
The new 'W' - 'Work'
Trauma & Drug Use

Self-Medicating - Attempt to relieve emotional and physical pain and experience some pleasure

Manhattan residents surveyed 5-8 weeks after attacks:
- 30% overall increase of substance use
- 25% increase in alcohol intake
- 20% reported at least one additional drink per day
- 10% increase in tobacco use
- A dramatic increase in sales of alcohol, tobacco, and prescription drugs

Biology of Pain
- Pain is the brain's experience of sensations, coming from our biology
- Emotional pain is processed similarly to physical pain

Acquilano, et al., 2003
Trauma & Drug Use

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Reality of Addiction

3 factors of addiction
- Susceptible organism
- A drug/behavior with addictive potential
- Stress
  - 20% of vets returning from Vietnam met the criteria for addiction while in Vietnam
  - 1% remained addicted once returning home
  - 95% remission rate

Drugs increase the severity of trauma symptoms

Mate, 2010; Acquilano, et al., 200
Dopamine & Endorphins

Dopamine: Hormone and neurotransmitter that just makes us feel great!

Endorphins: Naturally produced proteins that act as chemical messengers
  - Reduce the experience of pain in the brain
  - General feeling of well-being
  - When depressed – endorphin receptors are less active

Both and critical role in motivation:
  - Things that bring us pleasure result in dopamine and endorphin release in the brain
  - Our brain loves and moves towards things that cause this release

Trauma shuts down dopamine and endorphin receptors

Mate, 2010
Biology of Addiction

- **Pre-use**: Brain establishes a baseline to a certain dopamine/endorphin level
- **Repeated use**: When flooded with dopamine/endorphin from drug use, brain re-establishes baseline by reducing number of receptors
- **Withdrawal**: Diminished number of receptors no longer generate baseline without drugs. Lack of dopamine/endorphin uptake results in irritability, depressed mood, alienation, and extreme fatigue.
- **Tolerance**: Decreased receptors requires more drugs to reach baseline
- **Addiction cycle**: More use leads to increased loss of receptors; the fewer receptors, the more drug needed to make up for the lack of receptors....and so on and so on
- **Relapse**: Environmental clues associated with drug use trigger dopamine/endorphin release that the brain associates with the pleasure of using

Mate, 2010
Biology of Addiction & Human Development

Addiction and biological development
- Brain's white matter (fatty white tissue making synaptic connections more efficient) increases with age and experience
- Addiction limits or stops the formation of age-related white matter, resulting in decreased ability to:
  - Make new choices (volition)
  - Adapt to change in circumstances
  - Consider short and long-term consequences
  - Inhibit of pleasure seeking/pain reducing behaviors
  - Recognize of social cues needed to function in relationships
  - Access executive functioning
- Grey matter (bodies of brain cells) in the cerebral cortex and prefrontal cortex decreases in correlation to years of use

Mate, 2010
Stages of Change Model

Adapted from Time Magazine Article by Joe Letola and Alice Park

Kern, 2005
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