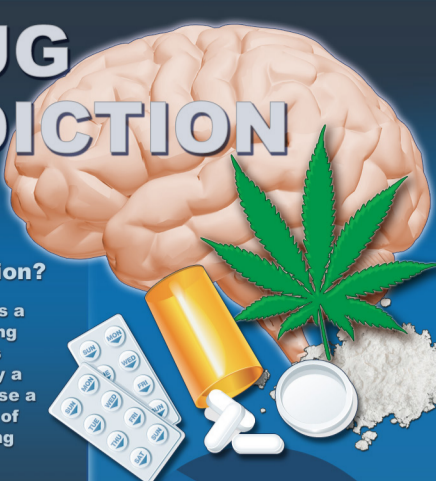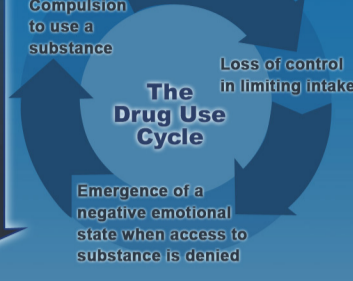# DRUG ADDICTION

What is Drug Addiction?

Drug addiction is a chronic, relapsing condition that is characterized by a compulsion to use a substance, loss of control in limiting intake, and the emergence of a negative emotional state when access to the substance is denied.
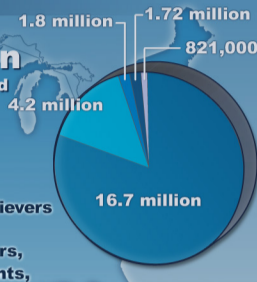
The core feature of drug addiction is a loss of control over drug use. Such pathologic drug use is characterized by repeated cycles of abstinence and relapse.

The Drug Use Cycle

Compulsion to use a substance

Loss of control in limiting intake

Emergence of a negative emotional state when access to substance is denied

Did You Know?

An estimated **20.6 million** (8% of the population) persons aged 12 or older are classified with substance abuse or addiction

- 16.7 million people for alcohol
- 4.2 million for marijuana
- 1.8 million for prescription pain relievers
- 821,000 for cocaine
- 1.72 million for heroin, tranquilizers, hallucinogens, stimulants, inhalants, and sedatives combined.

1.8 million — 1.72 million — 821,000
4.2 million
16.7 million

Did You Know?

After alcohol, marijuana has the highest rate of abuse or addiction among all drugs.

The number of current (past-month) marijuana users meeting clinical criteria for abuse or addiction of marijuana is more than double the number for abuse/addiction of prescription pain relievers and four times the number for abuse/addiction of cocaine.

Did You Know?

Over ~200,000 deaths each year and the loss of 7 million disability adjusted life years were attributable to illicit drug use.

The major causes of drug-related death include overdose, drug-related disease, suicide and trauma.
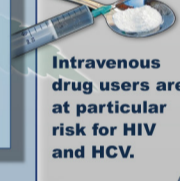
Did You Know?

Opioid overdoses lead to respiratory depression, while cocaine and amphetamine toxicity is typically due to myocardial infarction or stroke. The major cause of MDMA deaths is hyperthermia.

Opioids are associated with the highest risk of death as they are responsible for over 90% of all overdose-related deaths.

Did You Know?

Drug abuse is highly comorbid with other psychiatric illnesses including depression, bipolar disorder and schizophrenia. The rate of attempted and completed suicide among drug users is significantly higher compared to the general population.

Intravenous drug users are at particular risk for HIV and HCV.
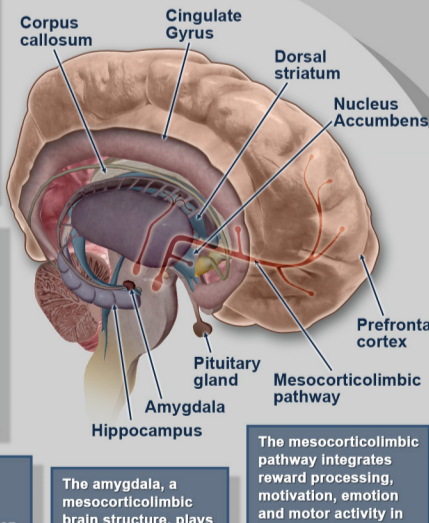
Risk Factors

- Individual genetics has been estimated to contribute to 25-80% of abuse risk depending on the drug. Addiction is a polygenic disorder with multiple genes contributing to vulnerability.

- Environmental factors including early life stress, trauma, developmental drug exposure and urban living are associated with addiction risk.

- Psychiatric comorbidity and personality trait (e.g.,impulsivity, novelty seeking anxiety/neuroticism) are common factors associated with vulnerability.

Neurobiology

Drugs of abuse activate the brain reward circuitry, leading to a sense of euphoria.

Dopaminergic neurons projecting from the midbrain (ventral tegmental area) to the ventral striatum (nucleus accumbens) and the prefrontal cortex are crucial components of the brain reward circuitry. (mesocorticolimbic pathway).

It has been hypothesized that the initial, impulsive phase of addiction is mediated by ventral striatal impairments, while the later, compulsive stages involve the dorsal striatum that mediates habit formation.
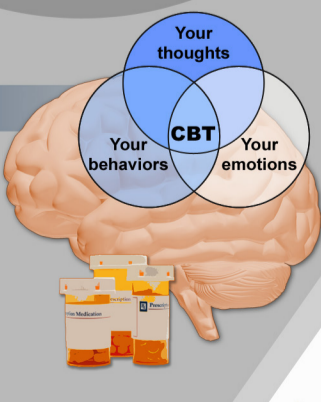
The glutamatergic system in mesocorticolimbic brain circuits has been shown to play a strong role in regulating synaptic plasticity and this dysregulation is highly implicated in drug-seeking behavior and relapse.

Anatomy of the Brain

Corpus callosum
Cingulate Gyrus
Dorsal striatum
Nucleus Accumbens
Prefrontal cortex
Mesocorticolimbic pathway
Pituitary gland
Amygdala
Hippocampus

The amygdala, a mesocorticolimbic brain structure, plays a key role in negative emotional states that is prominent during abstinence and contributes to relapse.

The mesocorticolimbic pathway integrates reward processing, motivation, emotion and motor activity in order to regulate goal-directed behavior.

Treatment

There are no cures for drug abuse disorders.

Treatment of drug abuse involves a multidisciplinary approach including pharmacotherapy, psychotherapy, self-help facilitation, and ongoing relapse prevention strategies.

Your thoughts
Your behaviors
CBT
Your emotions