ADHD
BIPOLAR DISORDER
METHAMPHETAMINE USE DISORDER

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BIPOLAR DISORDER

BIPOLAR DISORDER

- Epidemiology Catchment Area (1990)
- Lifetime prevalence for mania 0.6%
- 60 % lifetime prevalence of SUD in BD 1

BIPOLAR DISORDER

- Often comorbid with SUD
- SUD patient have higher rate of mania and hypomania
- Manic phase has 14x likelihood of SUD and 6 x more likely for AUD
- Bipolar symptoms makes it likely for patients to use substances
- SUD worsens bipolar symptoms
- Associated with earlier age of onset of SUD
- Associated with more hospitalizations

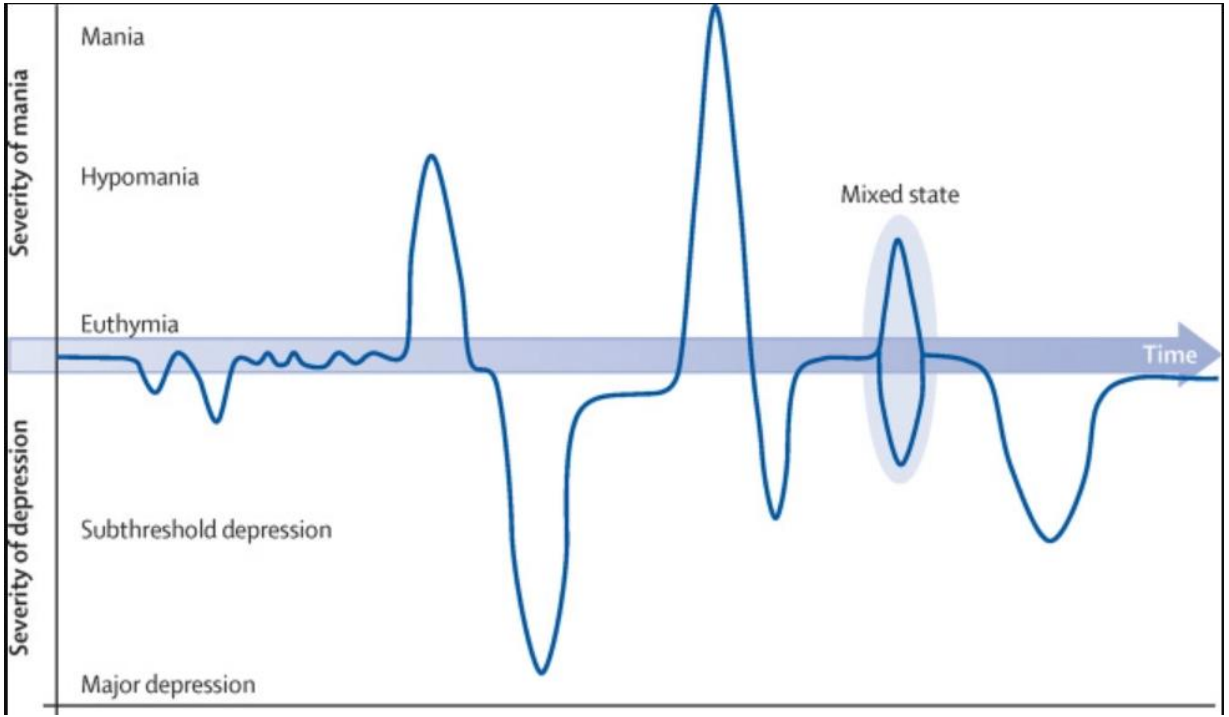
BIPOLAR DISORDER- DIAGNOSIS

Manic/hypomanic episode	Depressive episode	Episode with mixed features
• Elevated/expansive mood • Inflated self-esteem/ grandiosity • Overtalkativeness/ pressure of speech • Flight of ideas/racing thoughts • Increased energy/goal directed activities • Increased risky activities • Decreased need for sleep	• Prominent depressed mood • Anhedonia • Significant weight loss or gain • Insomnia or hypersomnia • Psychomotor agitation or retardation • Loss of energy • Feelings of worthlessness or guilt • Decreased concentration/ indecisiveness • Suicidal ideation/attempt	• Three or more manic/ hypomanic symptoms in an MDE - BD type I - BD type II - MDD • Three or more depressive symptoms in a manic or hypomanic episode - BD type I - BD type II

BIPOLAR DISORDER- HISTORY

- Establish timeline of mood disorder and Substance use disorder
- Investigate periods of abstinence from substance use
- Past medication trials
- Possibly differentials- MDD, ADHD, Borderline Personality Disorder
- If diagnosis is bipolar disorder, what phase of disease is patient in?

BIPOLAR DISORDER- PHASES



BIPOLAR DISORDER- TREATMENT

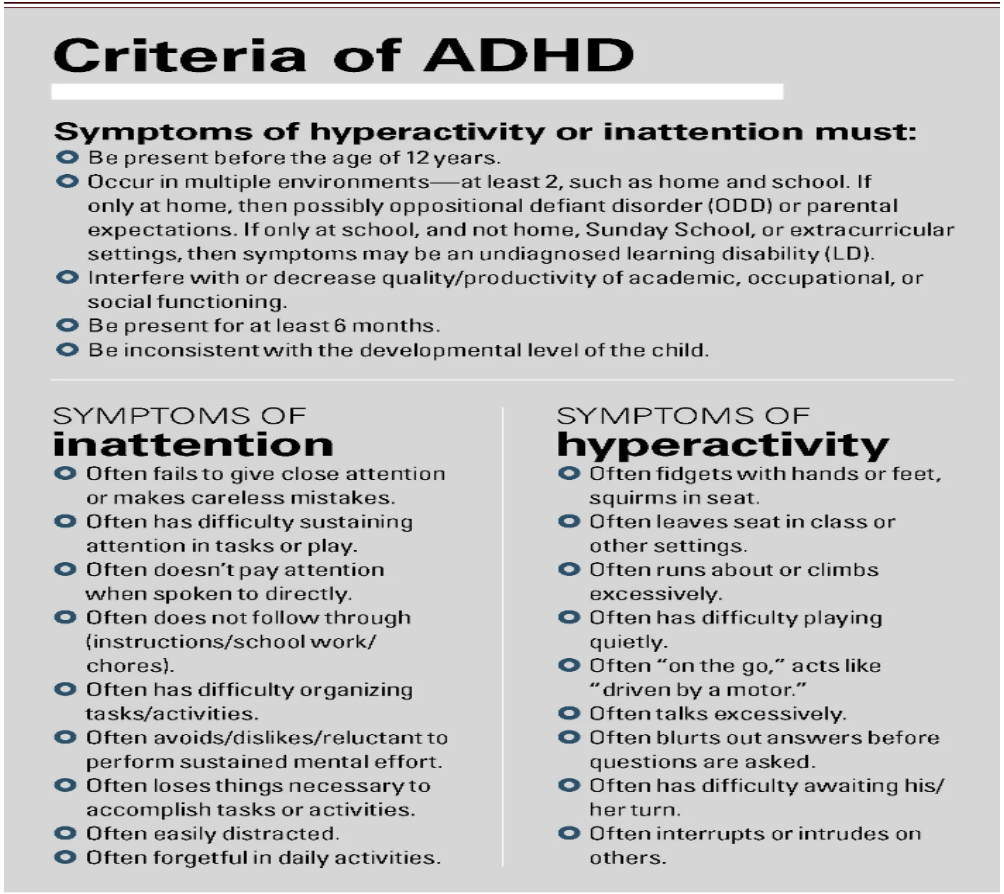
- Medications-
  - Lithium carbonate
  - Anticonvulsants- Depakote, Carbamazepine, Lamotrigine*, Oxcarbazepine
  - Antipsychotics- Clozapine, Risperidone, Olanzapine*, Quetiapine*, Ziprasidone, Aripiprazole, Lurasidone*, Cariprazine
  - Antidepressant (if MDE)- SSRIs, SNRIs, Wellbutrin, Remeron, TCA, MAO-I

BIPOLAR DISORDER + SUD

- Accurate diagnosis can be challenging
- Limited guiding data
- Pharmacotherapy approach should be independent
- Preference for non-controlled substance for adjunctive therapy

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

ADHD-diagnosis



Criteria of ADHD

Symptoms of hyperactivity or inattention must:

- Be present before the age of 12 years.
- Occur in multiple environments—at least 2, such as home and school. If only at home, then possibly oppositional defiant disorder (ODD) or parental expectations. If only at school, and not home, Sunday School, or extracurricular settings, then symptoms may be an undiagnosed learning disability (LD).
- Interfere with or decrease quality/productivity of academic, occupational, or social functioning.
- Be present for at least 6 months.
- Be inconsistent with the developmental level of the child.

SYMPTOMS OF
inattention

- Often fails to give close attention or makes careless mistakes.
- Often has difficulty sustaining attention in tasks or play.
- Often doesn't pay attention when spoken to directly.
- Often does not follow through (instructions/school work/ chores).
- Often has difficulty organizing tasks/activities.
- Often avoids/dislikes/reluctant to perform sustained mental effort.
- Often loses things necessary to accomplish tasks or activities.
- Often easily distracted.
- Often forgetful in daily activities.

SYMPTOMS OF
hyperactivity

- Often fidgets with hands or feet, squirms in seat.
- Often leaves seat in class or other settings.
- Often runs about or climbs excessively.
- Often has difficulty playing quietly.
- Often "on the go," acts like "driven by a motor."
- Often talks excessively.
- Often blurts out answers before questions are asked.
- Often has difficulty awaiting his/ her turn.
- Often interrupts or intrudes on others.

- Ask questions about functional impairments- Car accidents, employment, legal history, divorce
- Obtain collateral information- school records, information from parents, teachers, care givers
- Rating scales and psychological testing
  - Weiss Functional Impairment Rating Scale
  - Brown Attention-Deficit Disorder Symptom Assessment Scale (BADDS) for Adults

ADHD and SUD

- 10.8% of SUD patients have ADHD (compared to 3.8% without SUD)
- 15.2% of ADHD patients had SUD (compared to 5.6% without ADHD)
- Earlier onset of SUD
- Worse outcomes
- Reduced likelihood for remission or recovery

Medication options

- Atomoxetine- High drop-out rate
- Bupropion (“Off-Label” – not FDA approved for ADHD)
- Guanfacine, clonidine, modafinil, tricyclic antidepressants (Off-label)
- Amphetamine or Methylphenidate formulations (ritalinic acid)

Concerns for diversion??

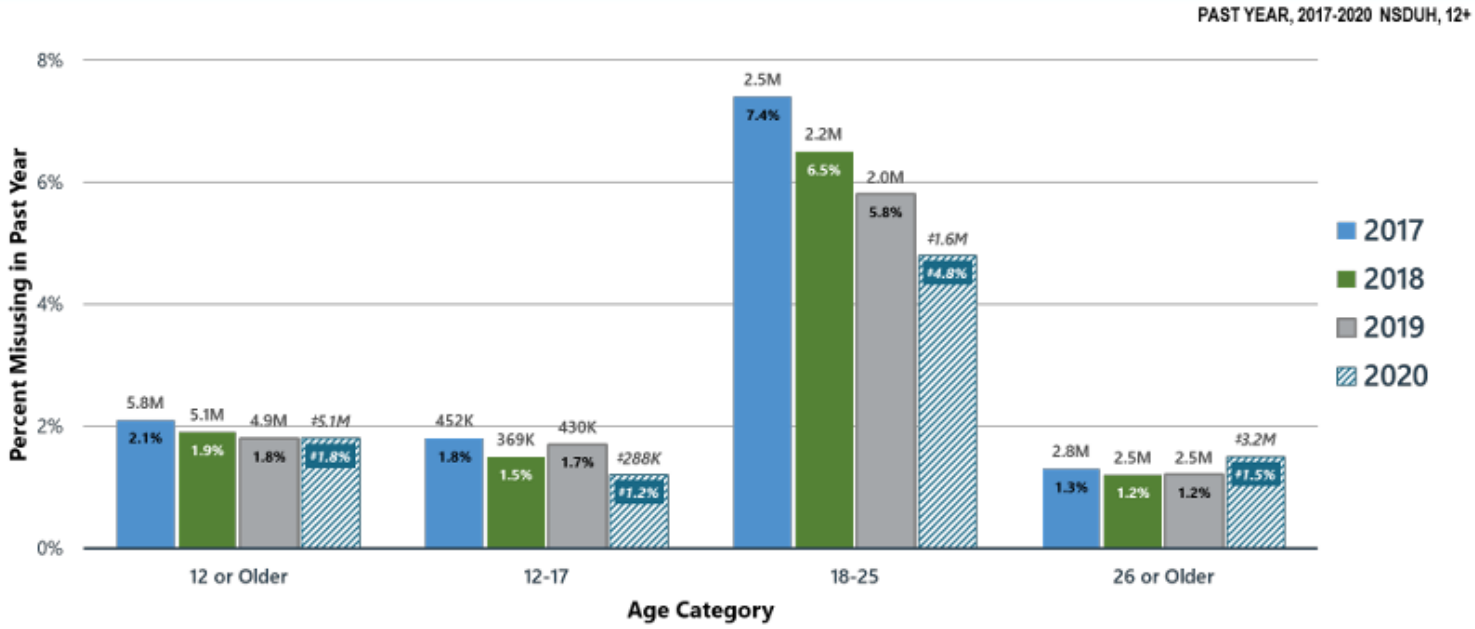
- Symptoms of intoxication or side effects associated with heavy use
- Demands for fast acting/immediate release
- Losing medications or early refills

Concerns for diversion??

N=22 Studies (N>113,000 participants); mostly survey studies in college students (80%)

- 10-20% prevalence of non-medical use of stimulants
- 65-85% of stimulants diverted from “friends”
- Majority *not* “scamming” local docs
- Not seen as potentially dangerous
- Motivation typically for concentration and alertness but for some it is to get “high”
- Young adults with SUD more likely to misuse stimulants
- Misuse more during periods of academic decline
- Increased risk of SUD in stimulant misusers (not causal

Misuse of Prescription Stimulants in Past Year: Among People Aged 12+



‡ Estimates on the 2020 bars are italicized to indicate caution should be used when comparing estimates between 2020 and prior years because of methodological changes for 2020. Due to these changes, significance testing between 2020 and prior years was not performed. See the *2020 National Survey on Drug Use and Health: Methodological Summary and Definitions* for details.

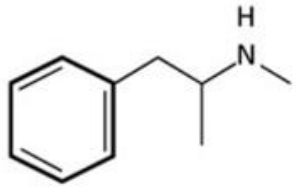
SAMHSA
Substance Abuse and Mental Health Services Administration

IU HEALTH

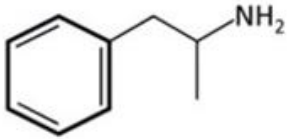
ADHD and SUD

- Limit pills
- Check PDMP
- Objective monitoring with UDS
- Safe storage of medications
- Preference for longer acting agents
- Regular use of medications (not PRN)
- Regular assessment of severity of ADHD symptoms and effects of treatment
  - Functional improvements not just self reports
  - Social, occupational, academic
  - If not improvement and still actively using substances consider STOP prescription

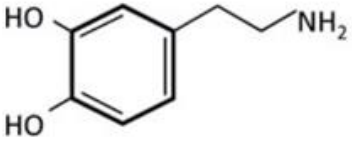
METHAMPHETAMINE USE DISORDER



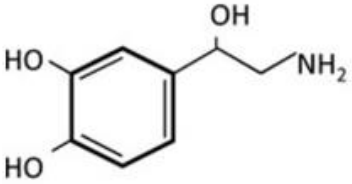
Methamphetamine



Amphetamine



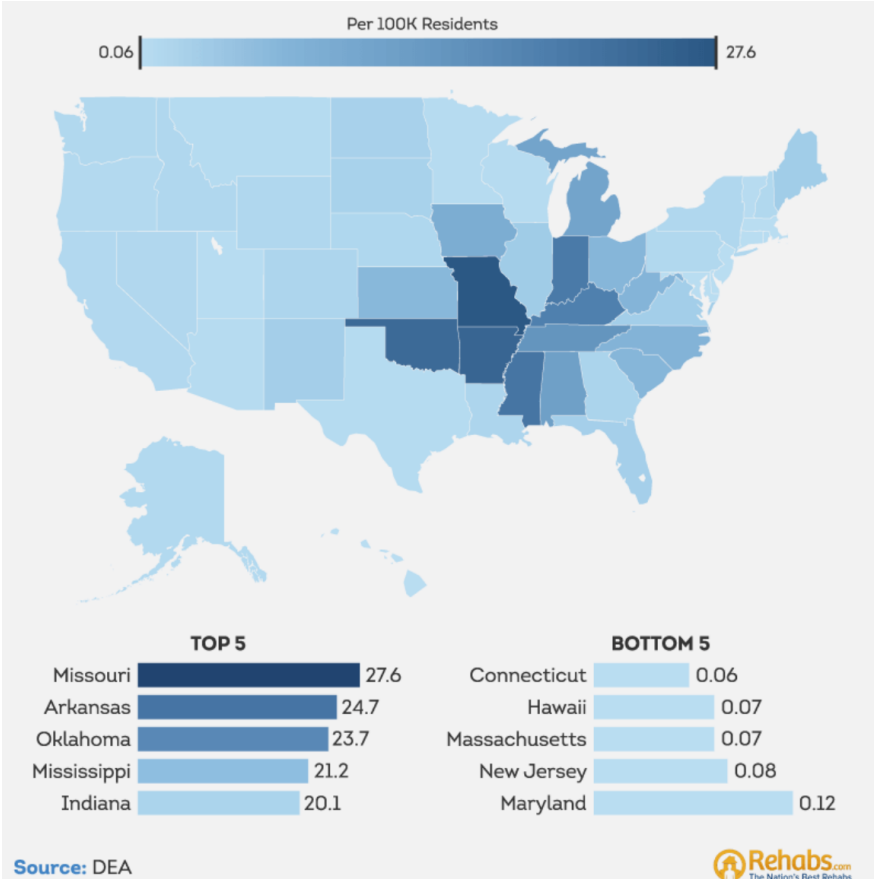
Dopamine



Norepinephrine

Kevil, Art Thromb Vasc Bio, 2019

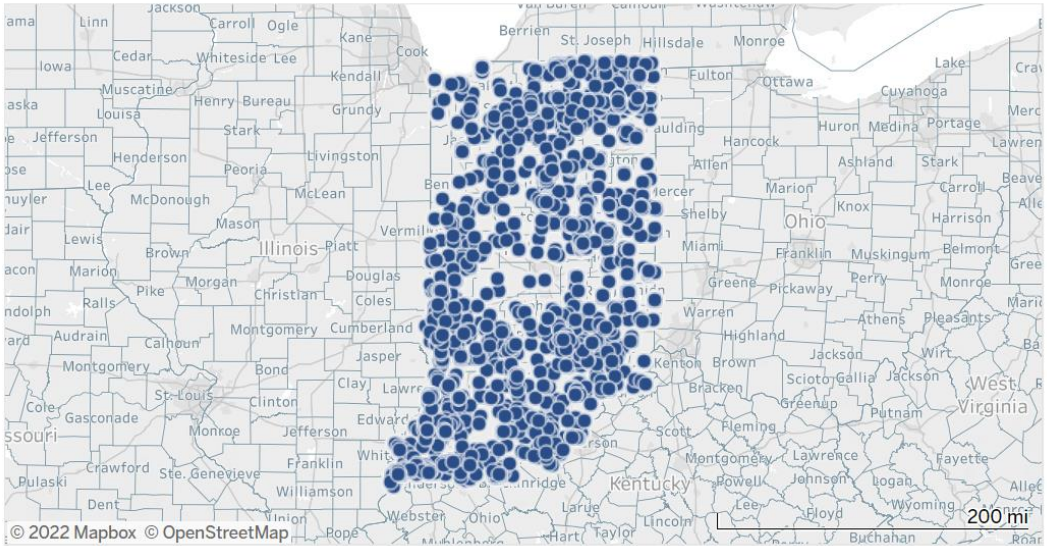
- Methamphetamine use - $2.17 billion in annual hospital costs by 2015 and higher in-hospital mortality rates.
- The U.S. economy took an estimated $23.4 billion hit from meth use in 2005, according to a RAND Corp. study.


Per 100K Residents
0.06
27.6
TOP 5
Missouri 27.6
Arkansas 24.7
Oklahoma 23.7
Mississippi 21.2
Indiana 20.1
BOTTOM 5
Connecticut 0.06
Hawaii 0.07
Massachusetts 0.07
New Jersey 0.08
Maryland 0.12
Source: DEA
Rehabs.com

Total Statewide Distinct Lab Count: **2,520**

Last Updated: **November 1, 2022**

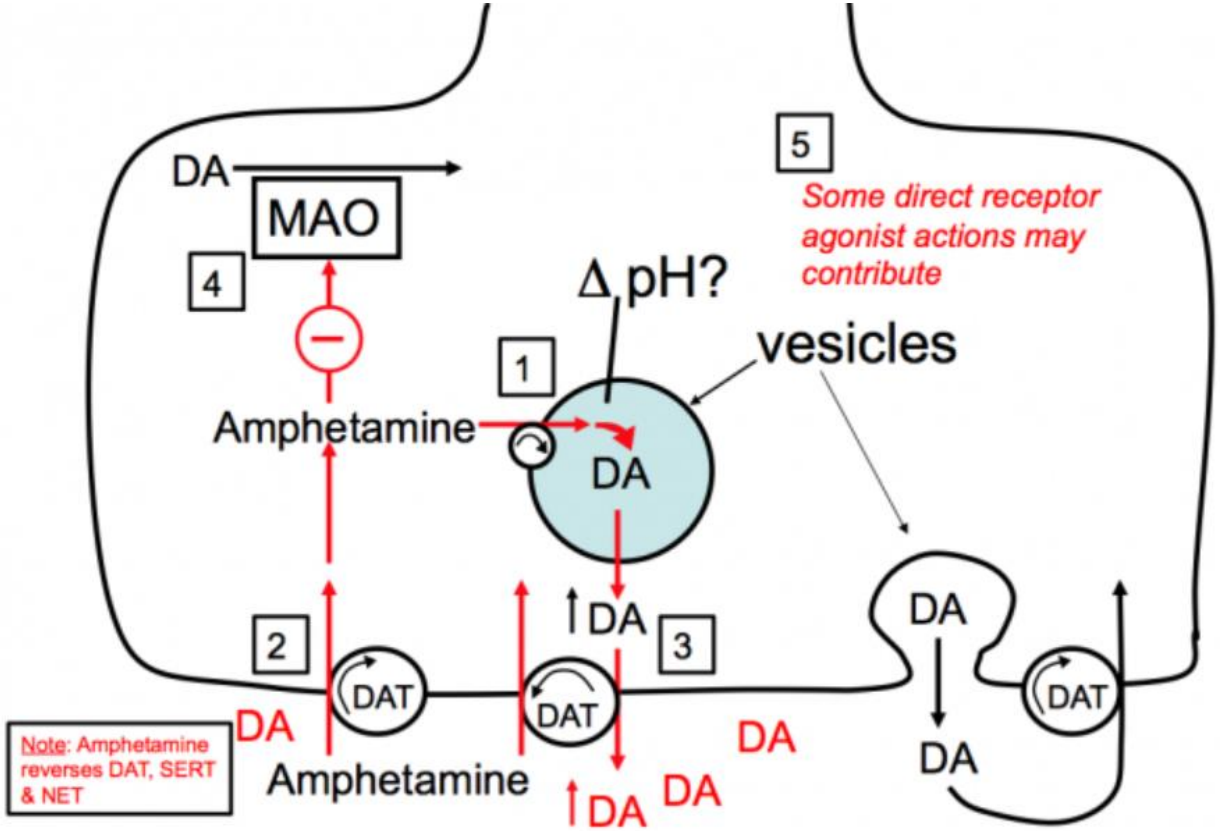
Selected Count(ies):	Map Type	Lab Address(es)
(All)	County Map	Highlight Lab Address(es)



Pharmacology

Amphetamines

- Release of monoamines
- Reuptake inhibition of DA, NE & 5-HT
- Lesser MAOI effects
- Sensitization can also occur (e.g. to psychosis)
- Deplete catecholamines and 5-HT


DA
MAO
4
5
Some direct receptor agonist actions may contribute
Δ pH?
vesicles
1
Amphetamine
DA
2
DAT
DA
3
DA
DAT
DA
DA
DAT
DA
DA
Amphetamine
DA
DA
Note: Amphetamine reverses DAT, SERT & NET

- Route of administration matters- Bioavailability is 67% orally, 79% intranasal, 67 to 90% via inhalation, and 100% IV.
- Meth is designed to be lipophilic and cross the BBB fast.
- Intoxication- Amphetamine - 5-8 hours; Meth- 10-24 hours.
- Half life Methamphetamine 10–12 hours- metabolized to amphetamine.

Patterns of Use

- Binge pattern - binges 12-24 hrs to 2-3 days;
- Rapid tolerance
- Amount varies enormously from 10 mg to 1 gram or more/day
- Binges followed by “crash”

Clinical Effects

- Intoxication- Euphoria, hyperactivity (motoric & verbal), hypersexuality, Insomnia, increased alertness, decreased appetite, skin picking, teeth grinding, increased risk taking.

- Withdrawals- Dysphoria, anhedonia, fatigue, increased appetite, slowed psychomotor activity.

Medications for Stimulant Use

No FDA approved medications.

- **Naltrexone**
- Topiramate
- **Bupropion (low intensity users)**
- **Mirtazapine**
- Riluzole
- Methylphenidate
- Topiramate (abstinent at start of treatment)
- Modafinil
- Studies on Combination of Bupropion and naltrexone
- Disulfiram for cocaine

Therapies

- Contingency management
- Cognitive behavioral therapy
- MATRIX model- 16 weeks of IOP with CM, 12-STEPS and CBT
- Community Reinforcement Approach (CRA)
- 12-step facilitation
- Motivational interviewing

Bipolar disorder Vs Stimulant Use Vs ADHD

- Hierarchy of Diagnosis
  - Methamphetamine use disorder
  - Bipolar disorder
  - ADHD

ADHD VS Bipolar disorder

- ADHD- hyperactivity, inattention, talkativeness, impulsivity
  - Constant core symptoms
  - Improvement of symptoms with structure
  - Easily distracted by external stimuli
  - Family History of ADHD

- Bipolar Disorder- hyperactivity, inattention, talkativeness, impulsivity
  - Symptoms are cyclical
  - Attention drawn to unimportant or irrelevant external stimuli
  - Family history of bipolar disorder
  - More likely to have irritability, depression and substance abuse.
  - Psychosis, suicidality, grandiosity, decreased need for sleep

Bipolar disorder Vs Stimulant Use

- Bipolar disorder- hyperactivity, inattention, talkativeness, impulsivity, psychosis, decreased need for sleep
  - Symptoms are cyclical
  - More likely to have irritability, depression
  - Easily distracted by external stimuli
  - Family History of Bipolar disorder
- Methamphetamine intoxication- hyperactivity, inattention, talkativeness, impulsivity, psychosis, decreased need for sleep
  - Symptoms occur during intoxication
  - Family history of bipolar disorder
  - Irritability, depression during withdrawals
  - Family history of SUD

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