Treating Stimulant Use Disorders

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WILLAMETTE
PARK
DISTRICT

CNS Stimulants

- Cocaine
- Methamphetamine
- Prescription amphetamines
  - Adderall
  - Vyvanse

DISCUSSION QUESTIONS

Are you seeing more stimulant use disorders?

Cocaine/ Methamphetamine/ Rx amphetamines?

What are the characteristics of clients?

Stimulants and Depressants

- Increased CNS activity
- Stimulation
- Withdrawal symptoms minor
- OD: Heart attack, stroke, seizures
- Potential for psychiatric impairment high

- Decreased CNS activity
- Sedation
- Withdrawal symptoms a major issue
- OD: Respiratory depression
- Potential for psychiatric impairment low

Hospital Admissions Related to Methamphetamine Use: 2008 Vs. 2017

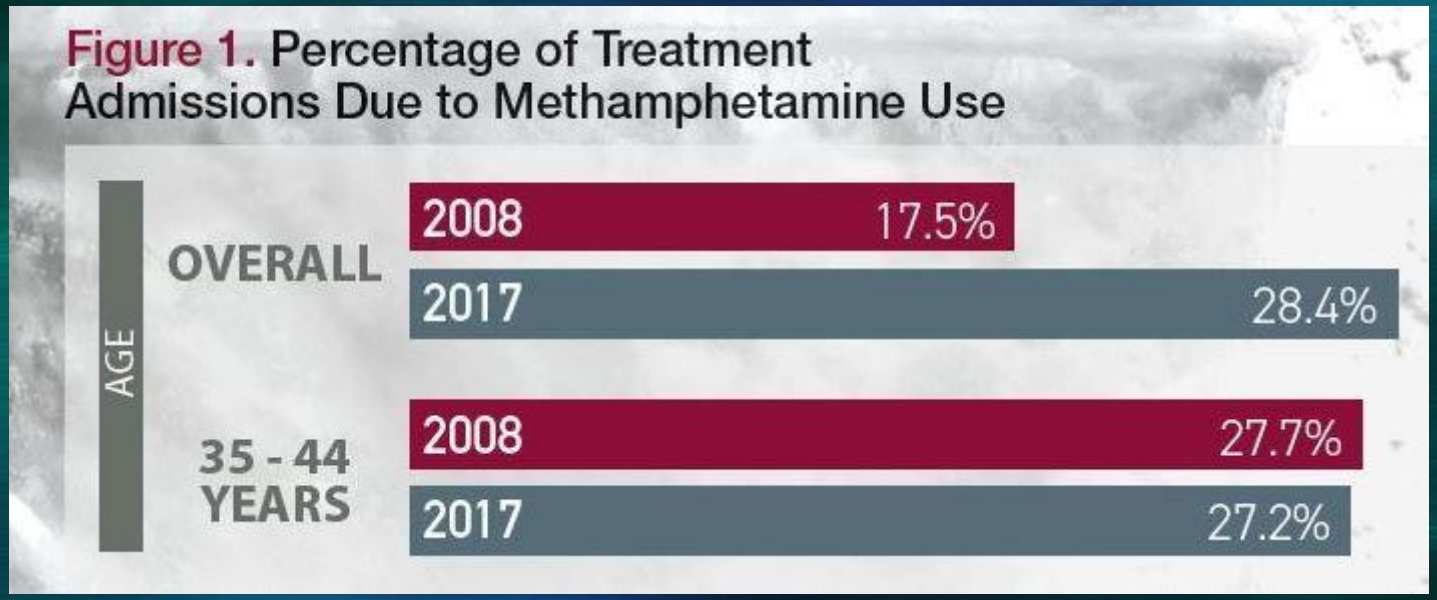
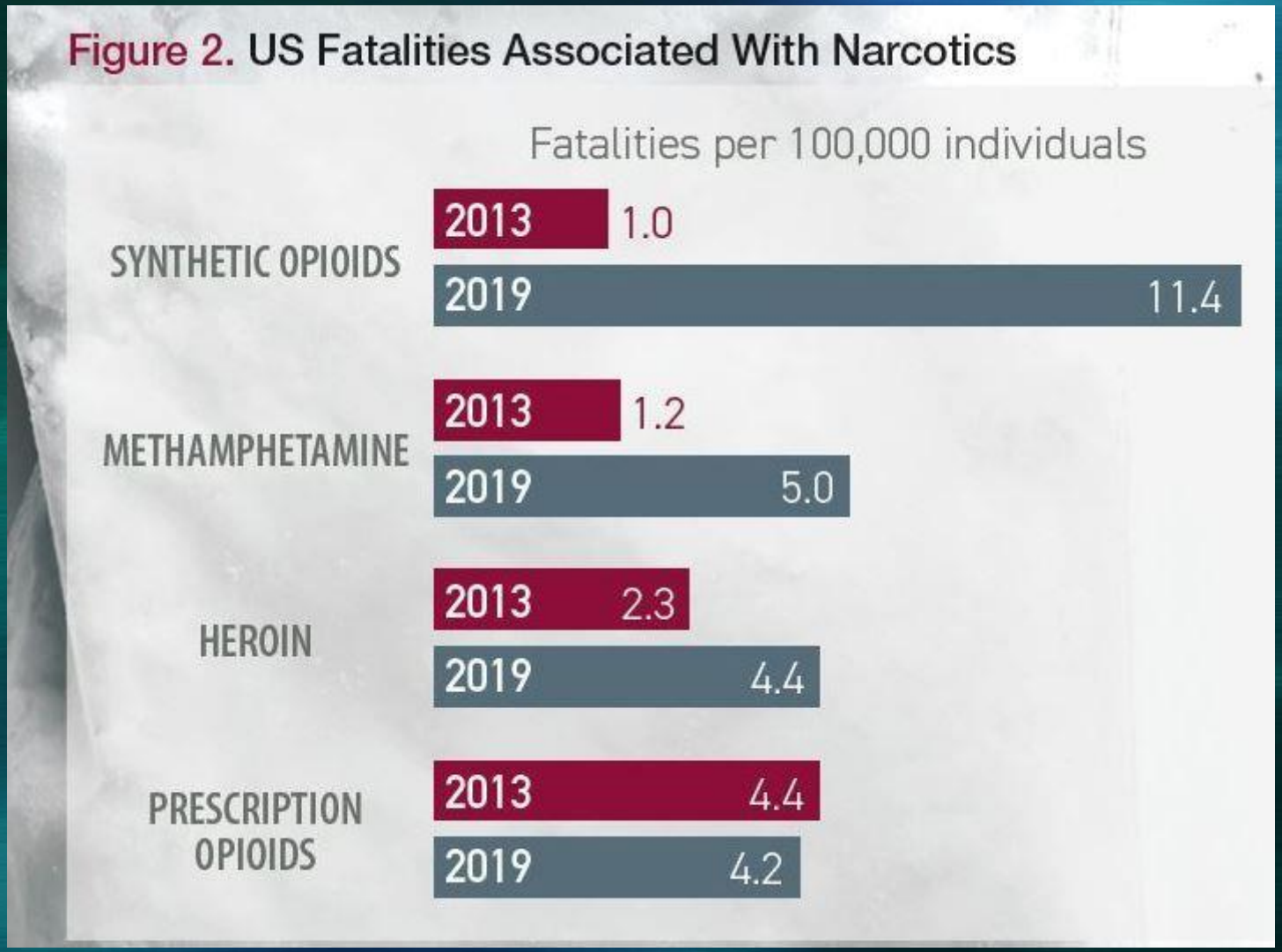


Figure 2. US Fatalities Associated With Narcotics



KEY DATES IN THE HISTORY OF STIMULANT USE

- 19TH century
  - Cocaine extracted from coca
  - Methamphetamine synthesized
- 1936: The first reported misuse of amphetamines occurs by student subjects in a research project at University of Minnesota testing effects of the drug.
- Once exposed to the drug, students were seeking and using the drug outside the research study.

KEY DATES IN THE HISTORY OF STIMULANT USE

- 1938: The first published report of the possible addiction to amphetamine appears.
- 1938: Amphetamine psychosis is first reported in the medical literature.
- 1960s: “Diet pills” become popular and are widely prescribed
- 1970s: Cocaine becomes popular among middle class
- 1990s: “Methamphetamine epidemic”

KEY DATES IN THE HISTORY OF STIMULANT USE

- 2000s: Most methamphetamine manufactured in Mexican “super labs”
- 2000s: Much fentanyl cut with cocaine or methamphetamine

AMPHETAMINES VS COCAINE

- ORIGIN
- METHOD OF USE
- ONSET OF ACTION
- DURATION OF ACTION
- NEUROTOXICITY
- LOCAL ANESTHESIA
- CHARACTERISTICS OF USERS

Amphetamines: Methods of Administration

- Oral (ingestion)
- Insufflation (“snorting”)
- Inhalation
- Injection

AMPHETAMINES: ONSET OF ACTION

- 30-60 minutes when ingested
- 5-10 minutes when snorted
- 10-15 seconds when injected
- 5-10 seconds when smoked

DURATION OF ACTION

- 4-12 hours, depending on dose, method of administration and form

COCAINE: ONSET OF ACTION

- 5-10 minutes when snorted
- 10-15 seconds when injected
- 5-10 seconds when smoked

DURATION OF ACTION

- 10-60 minutes depending on dose, method of administration and form

SIGNS OF STIMULANT USE

- Desired effects
  - Euphoria
  - Enhanced concentration
  - Reversal/prevention of fatigue
  - Reduction in appetite

SIGNS OF STIMULANT USE

- Side Effects:
  - Insomnia/lack of sleep
  - Increased breathing and pulse rate
  - Sweating
  - Rapid/pressured speech
  - Hyperactivity
  - Dry mouth

SIGNS OF STIMULANT USE

- Side Effects:
  - Tremor (shaking hands)
  - Dilated pupils
  - Bruxism (teeth-grinding)
  - Depression (“the crash”-occurs when drug wears off)

SIGNS OF STIMULANT USE

- Side Effects: Stimulant Psychosis
  - Irritability, suspiciousness, paranoia
  - Visual and auditory hallucinations
  - Formication (“coke bugs”)

STIMULANT PSYCHOSIS:

- Onset of stimulant psychosis can be from 2-48 hours after the initial dose.

STIMULANT PSYCHOSIS:

- Onset appears as a result of acute intoxication.
- While psychosis may appear during the withdrawal period, it is not a true withdrawal sign.
- Generally associated with chronic, high dosage use.
- More likely to occur in IV users and smokers.

STIMULANT PSYCHOSIS: SYMPTOMS

- Suspiciousness
- Irritability
- Delusions of persecution and/or grandeur
- Ideas of reference
- Visual, auditory and/or tactile hallucinations (latter = formication)
- Hyperactivity

STIMULANT PSYCHOSIS: SYMPTOMS

- Agitation
- Aggressiveness.
- Depression, sometimes severe, may also be present.
- Closely resembles paranoid schizophrenia.

STIMULANT PSYCHOSIS: SYMPTOMS

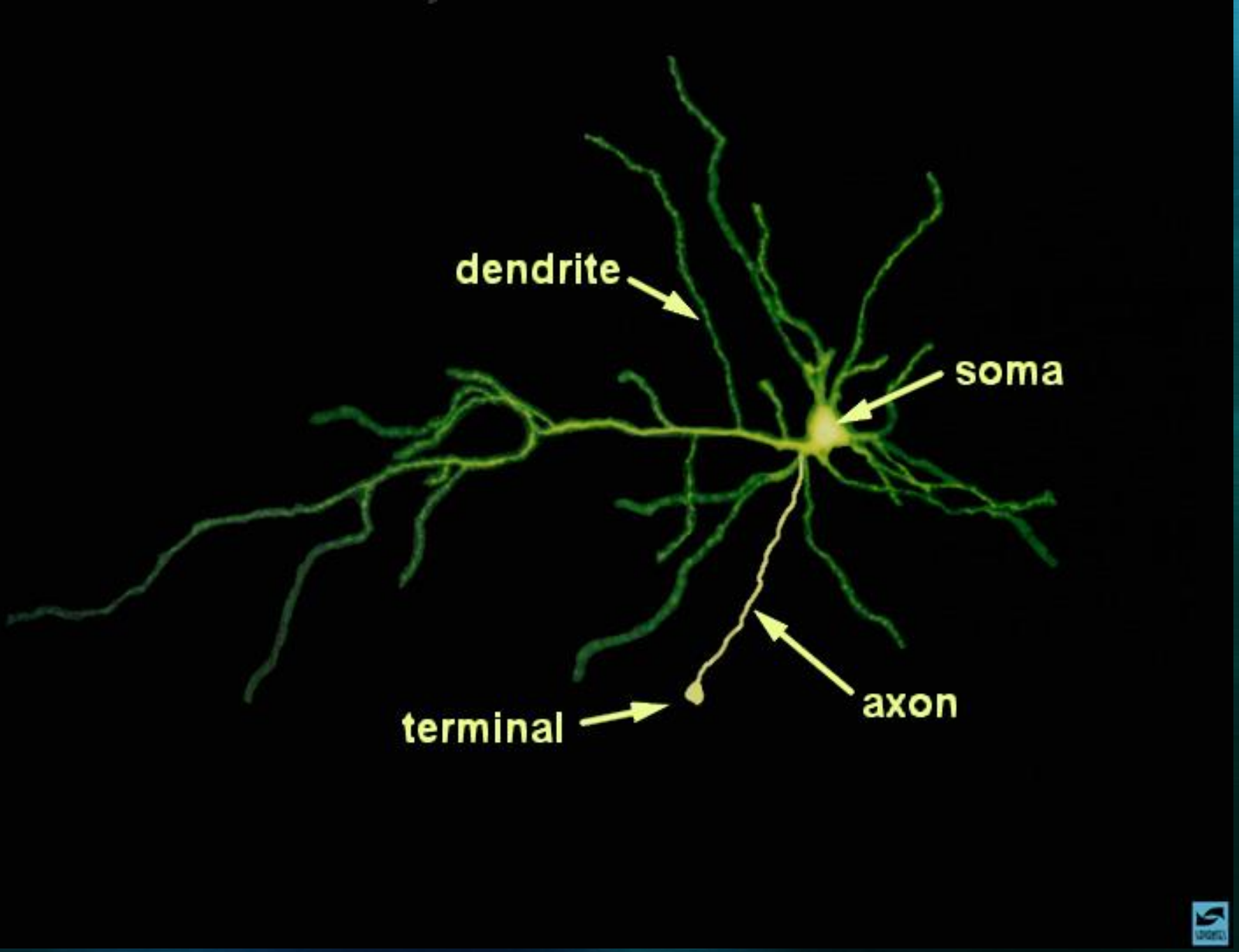
- Differential diagnosis may be based on presence or lack of physical signs such as pupillary dilation, increased blood pressure, pulse, and rapid breathing rate, as well as sudden onset and remission

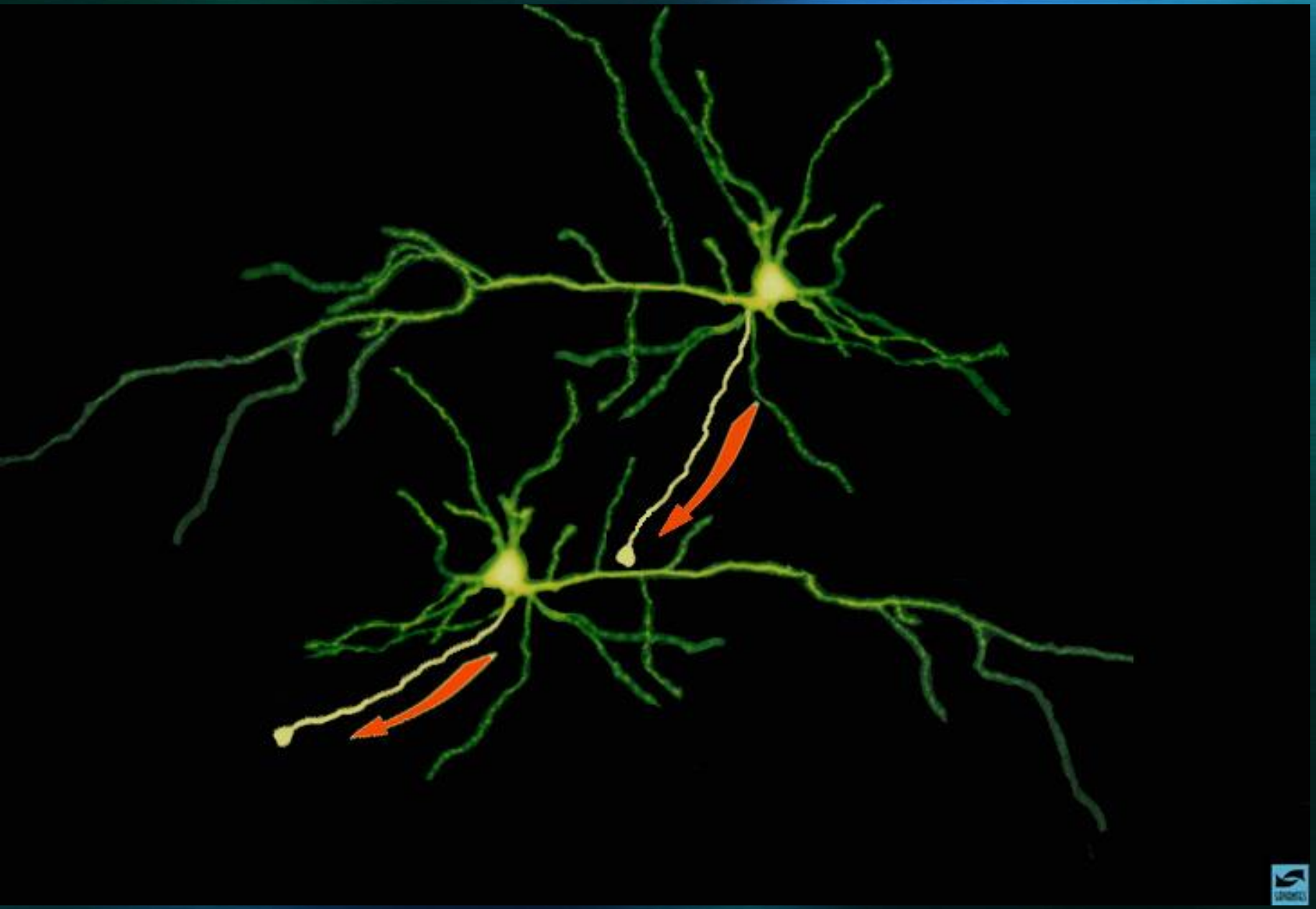
STIMULANT PSYCHOSIS

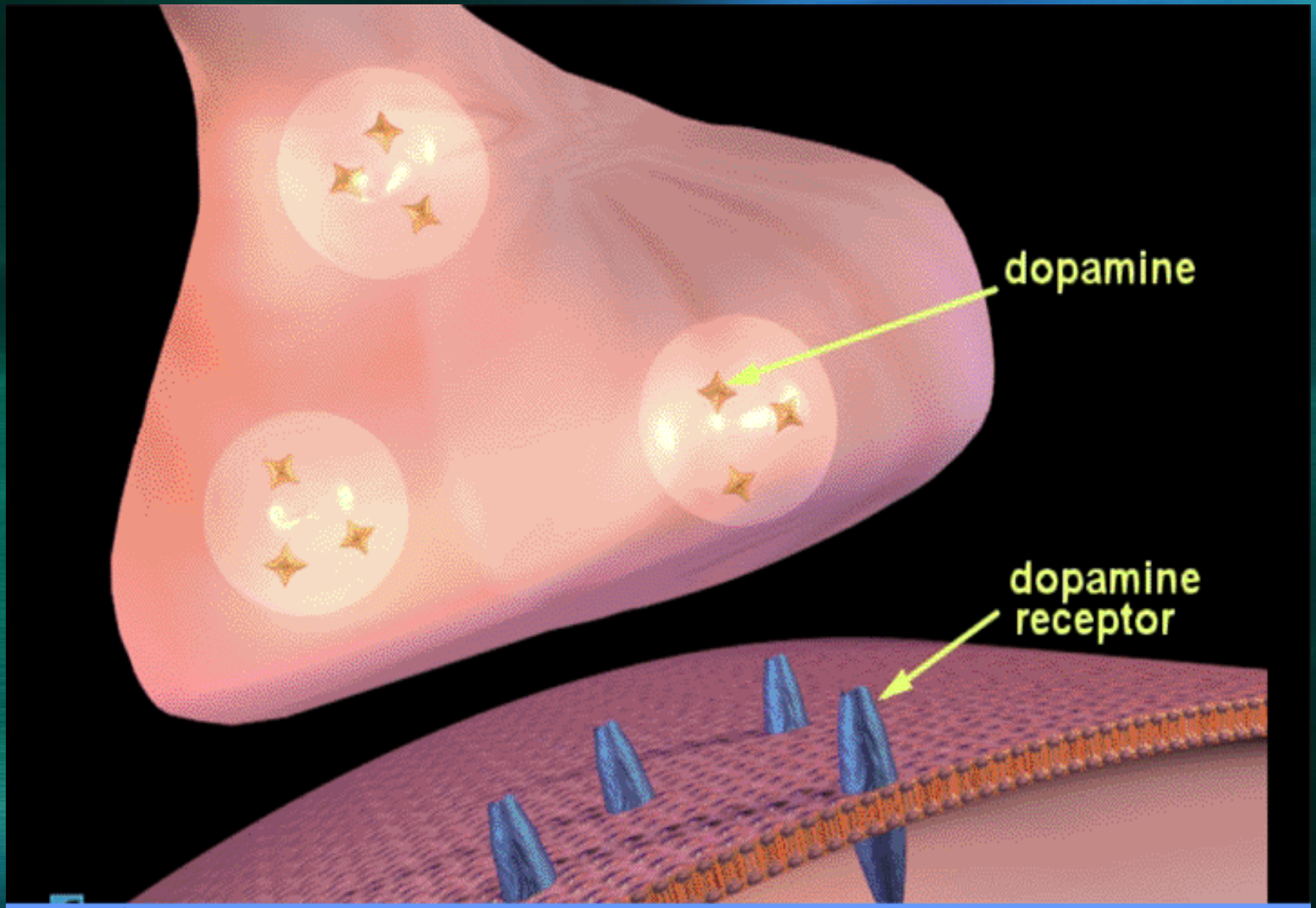
- Once an individual has suffered a CNS stimulant psychosis, s/he is more likely to experience the same outcome in the future.

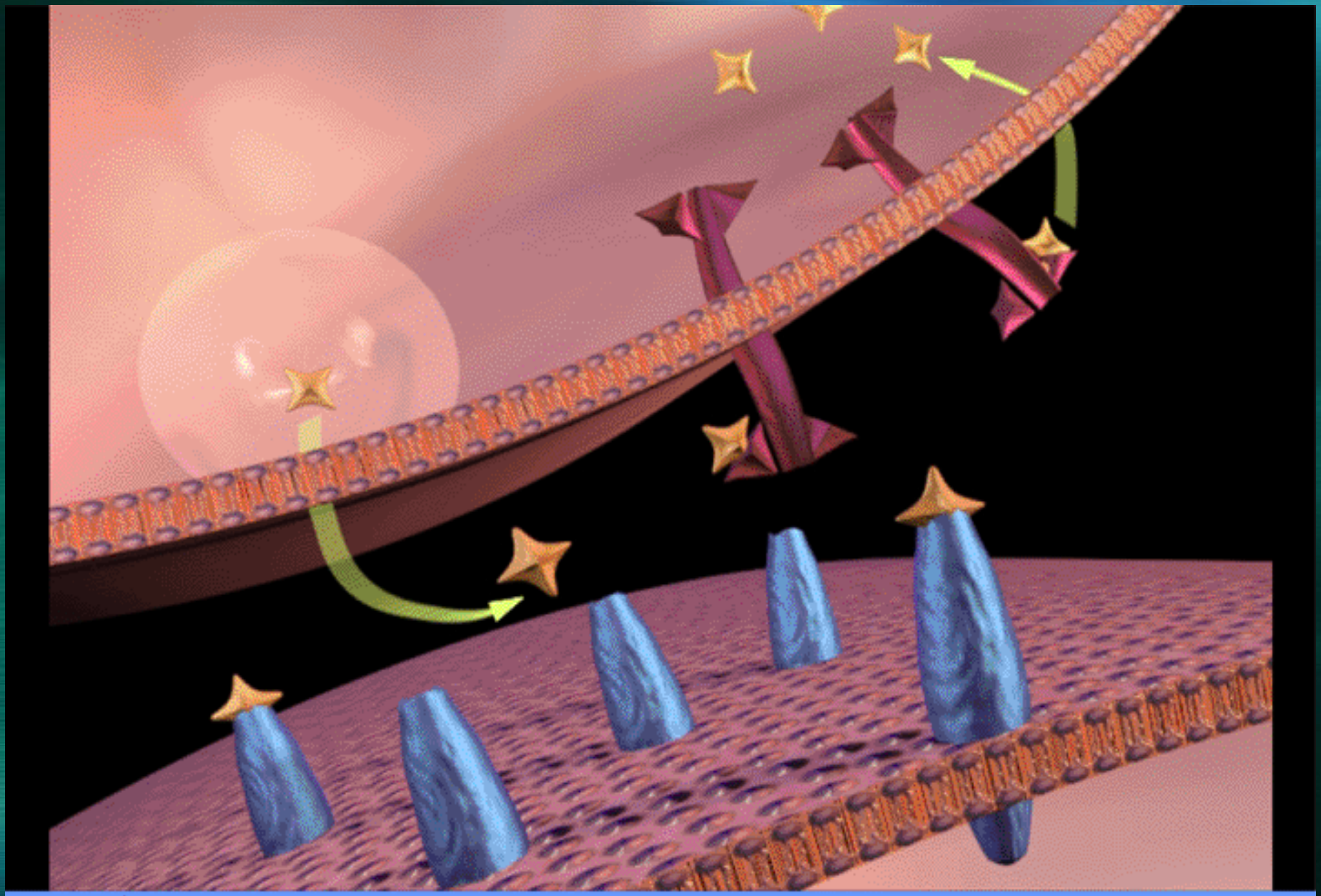
PERSISTENT STIMULANT PSYCHOSIS

- Psychotic symptoms generally disappear as abstinence continues, and rarely persist beyond 24 hours after the cessation of drug use.
- If psychotic signs persist beyond 24-48 hours, additional psychiatric consultation is advised.


dendrite
soma
axon
terminal




dopamine
dopamine receptor



NIDA NATIONAL INSTITUTE ON DRUG ABUSE

www.drugabuse.gov

Normal Functioning in the Reward Pathways

- Natural reinforcers related to survival (food, water, sex) cause a release of dopamine into the synapse

Dopamine Levels in the Shell of the Nucleus Accumbens (% of baseline)

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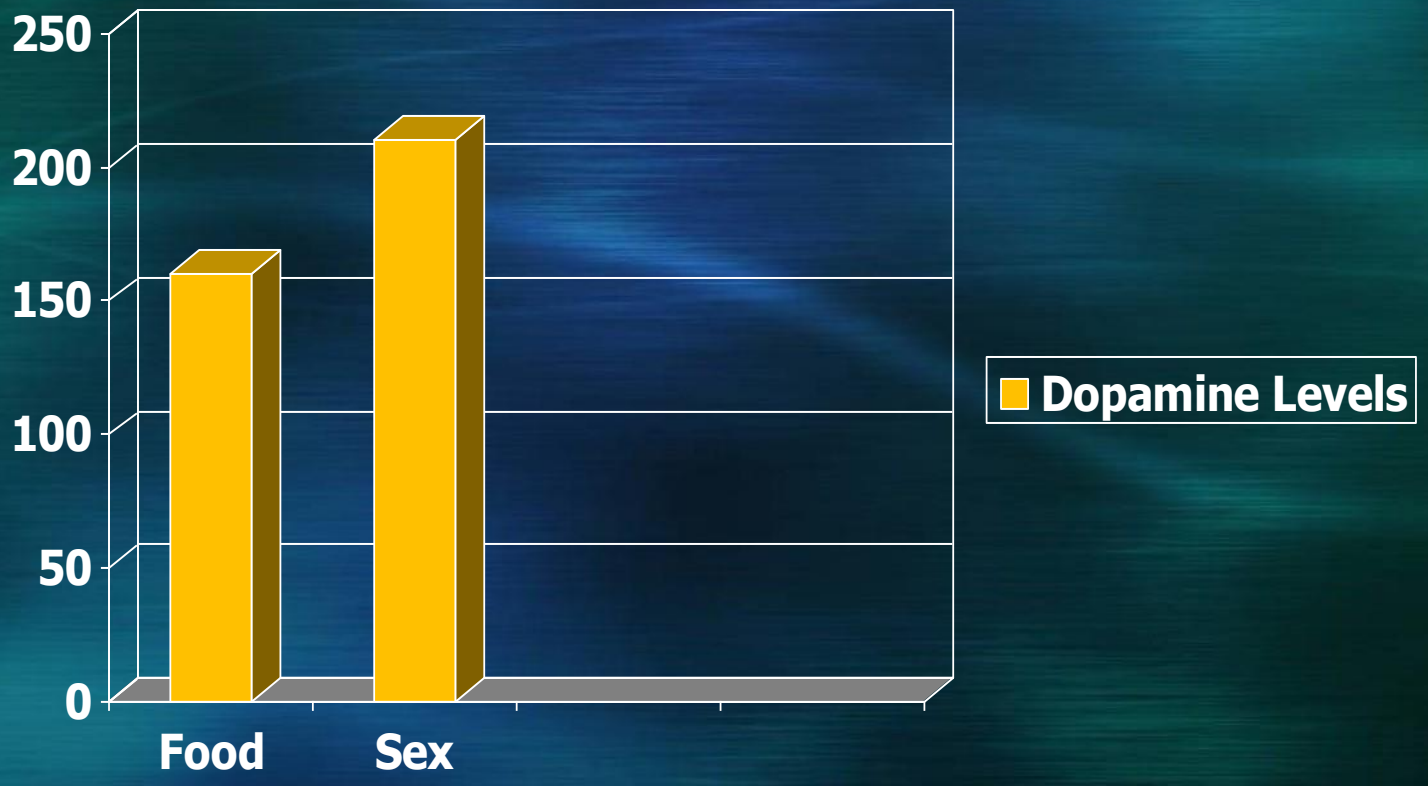
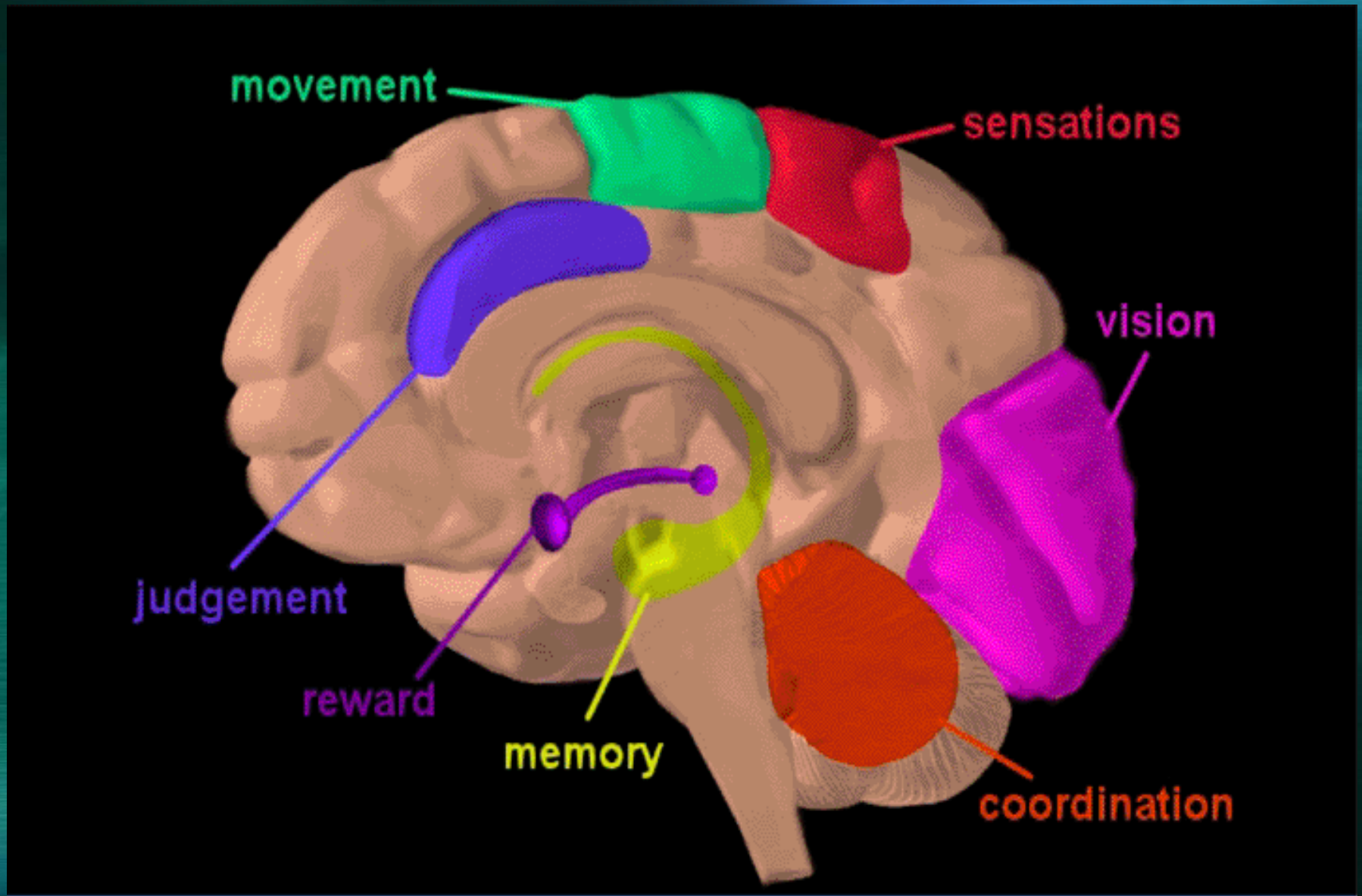
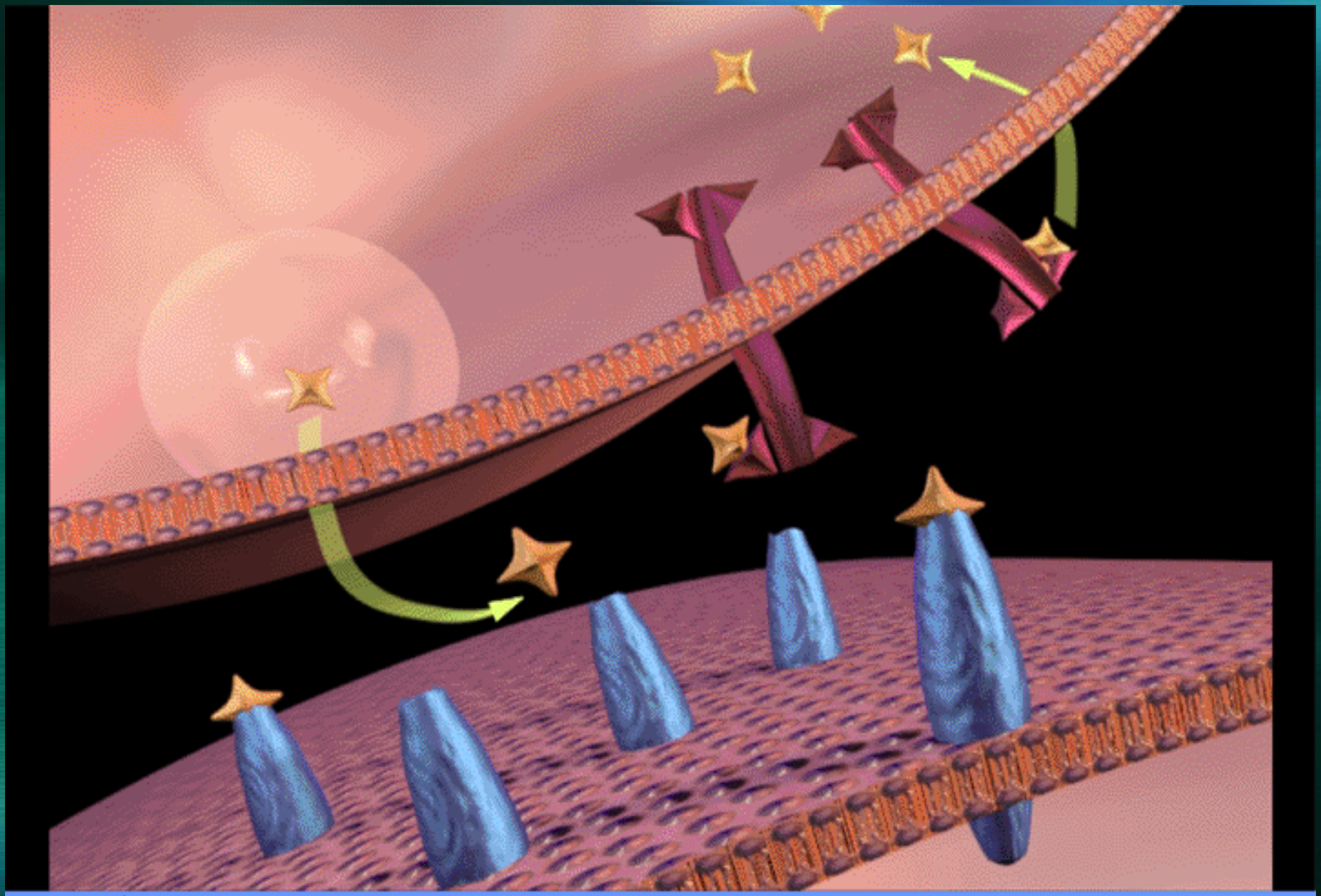



movement
sensations
vision
judgement
reward
memory
coordination

Normal Functioning in the Reward Pathways

- Dopamine “docks” with DA receptor
- A sense of pleasure is perceived
- Dopamine is taken back into the releasing cell by transporters and “recycled” (reuptake)



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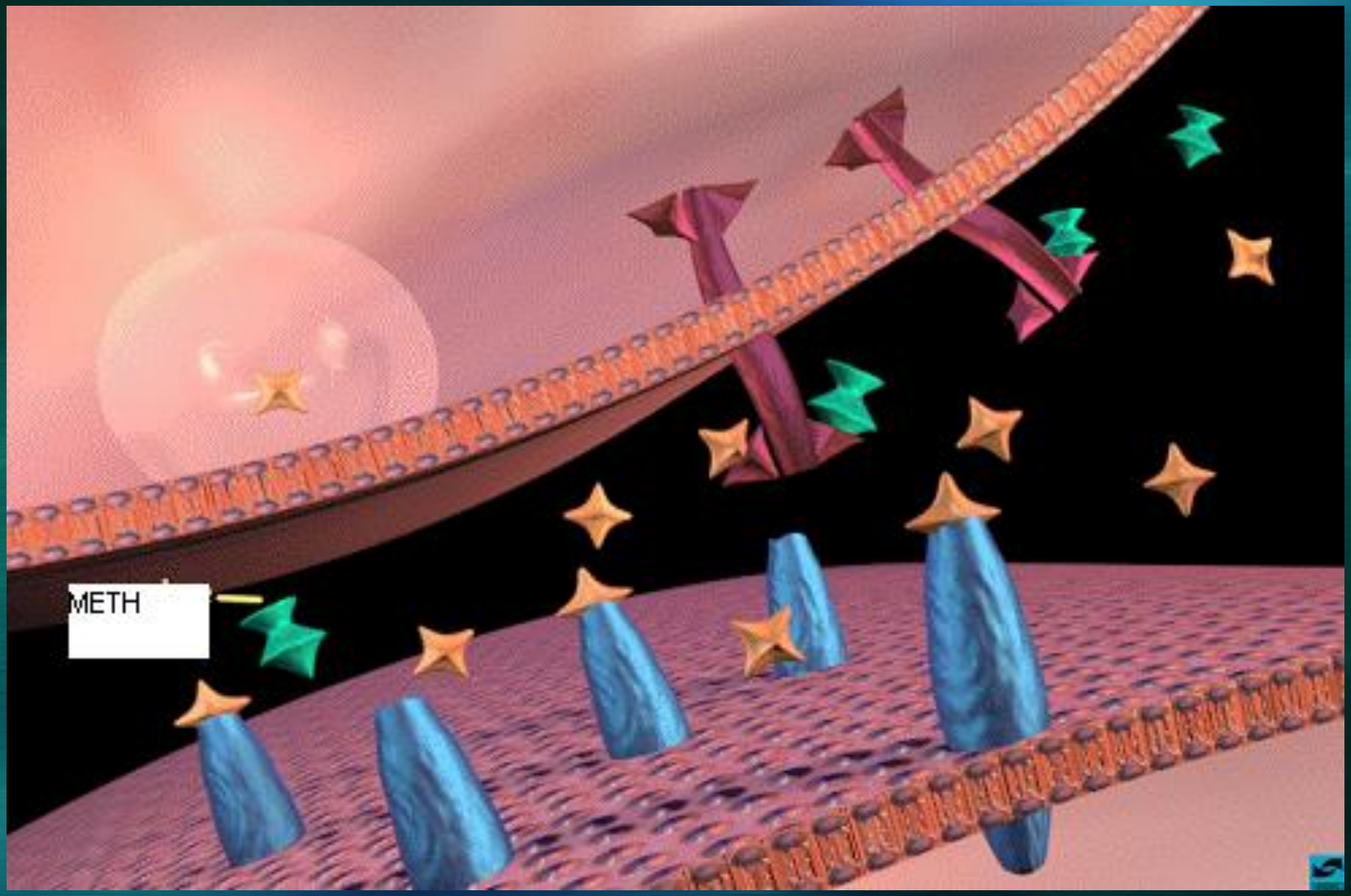
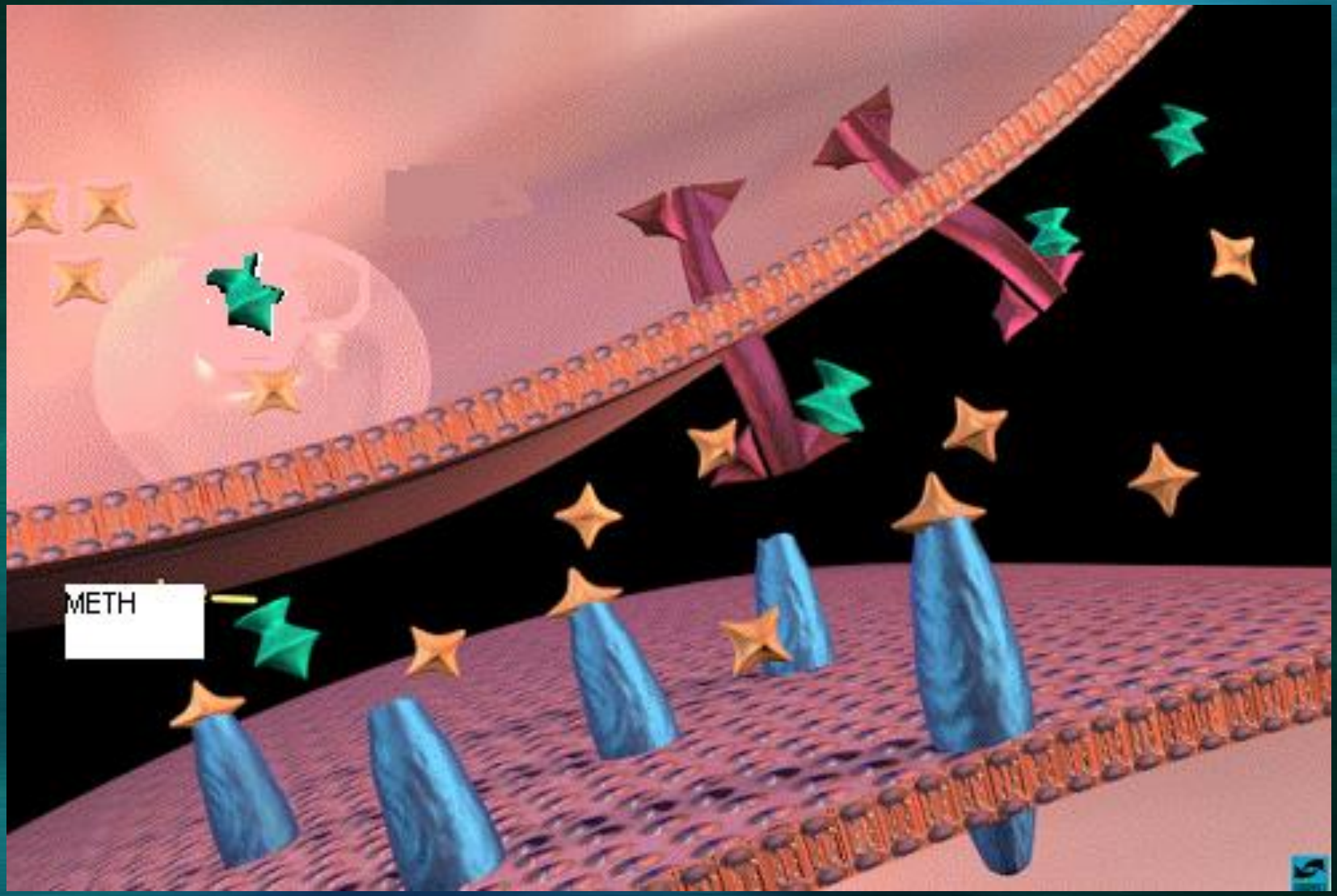
Stimulants: Neurochemical Mechanisms

- Stimulants enter the brain and is removed from the synapse by dopamine transporters


METH

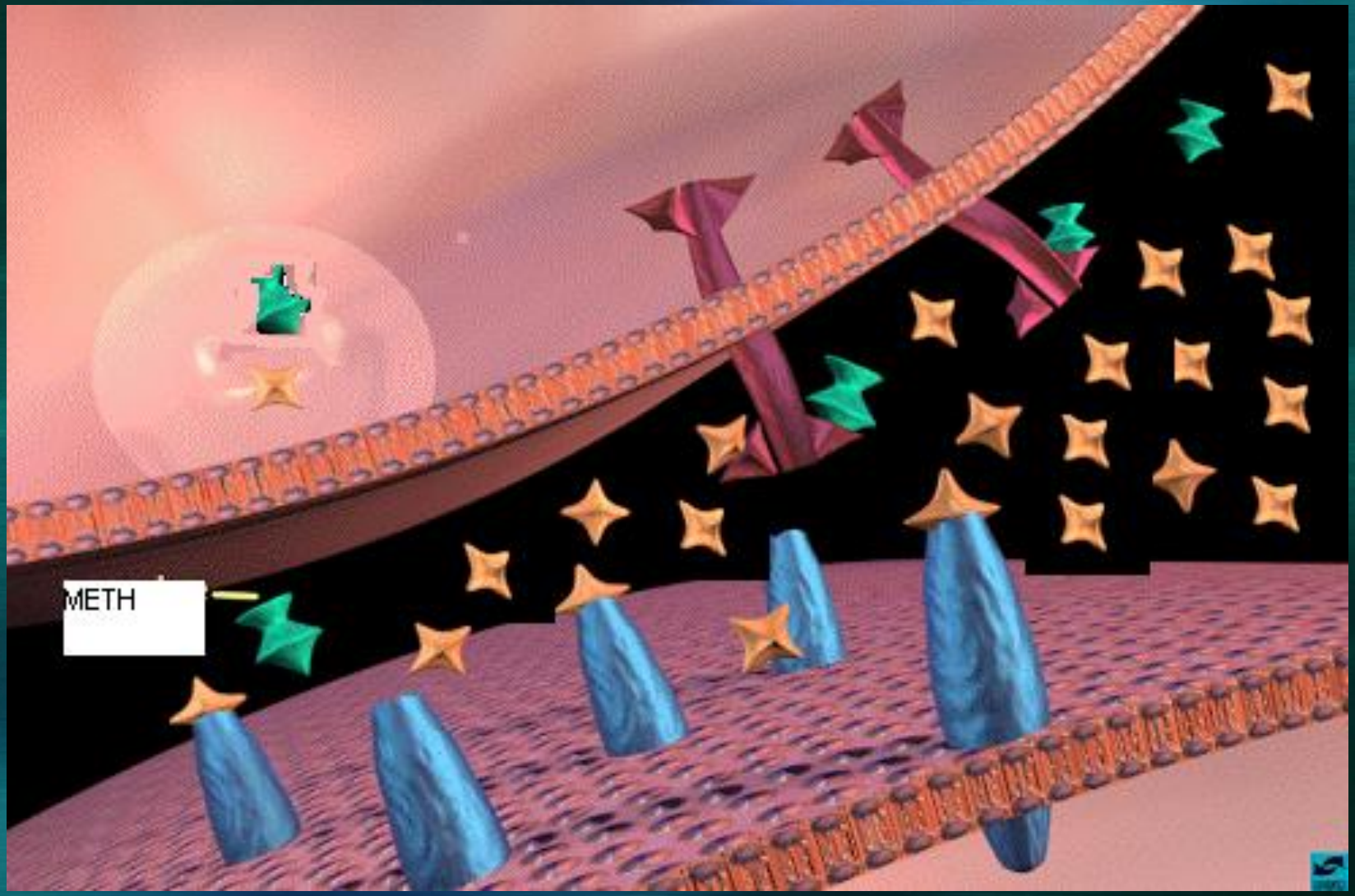
Methamphetamine: Neurochemical Mechanisms

- Enters dopamine vesicles
- Vesicles deplete themselves of dopamine


METH

Methamphetamine: Neurochemical Mechanisms

- Free-floating DA produces “free radicals” (neurotoxins), so it is forced out of the neuron.
- The synapse is flooded with dopamine, producing a profound sense of pleasure.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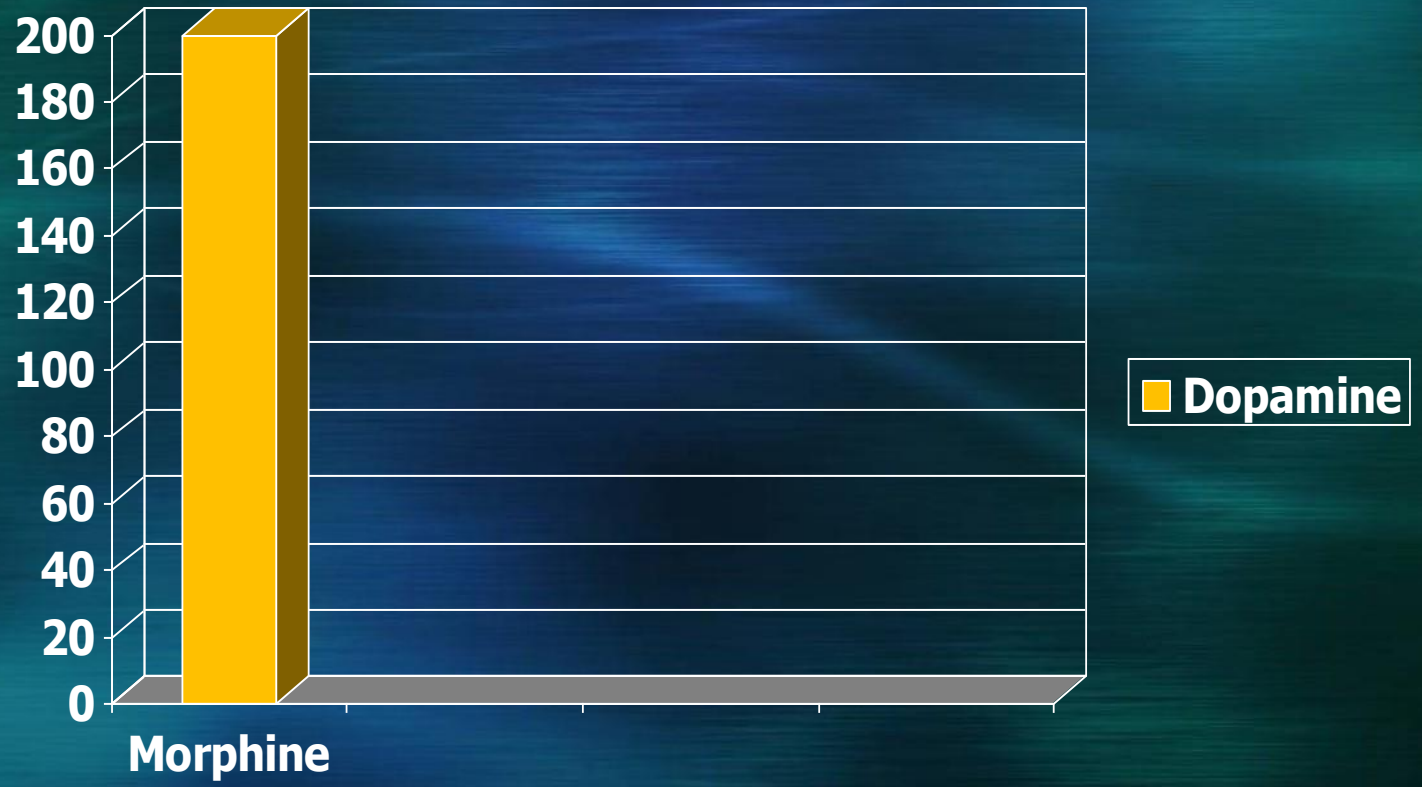

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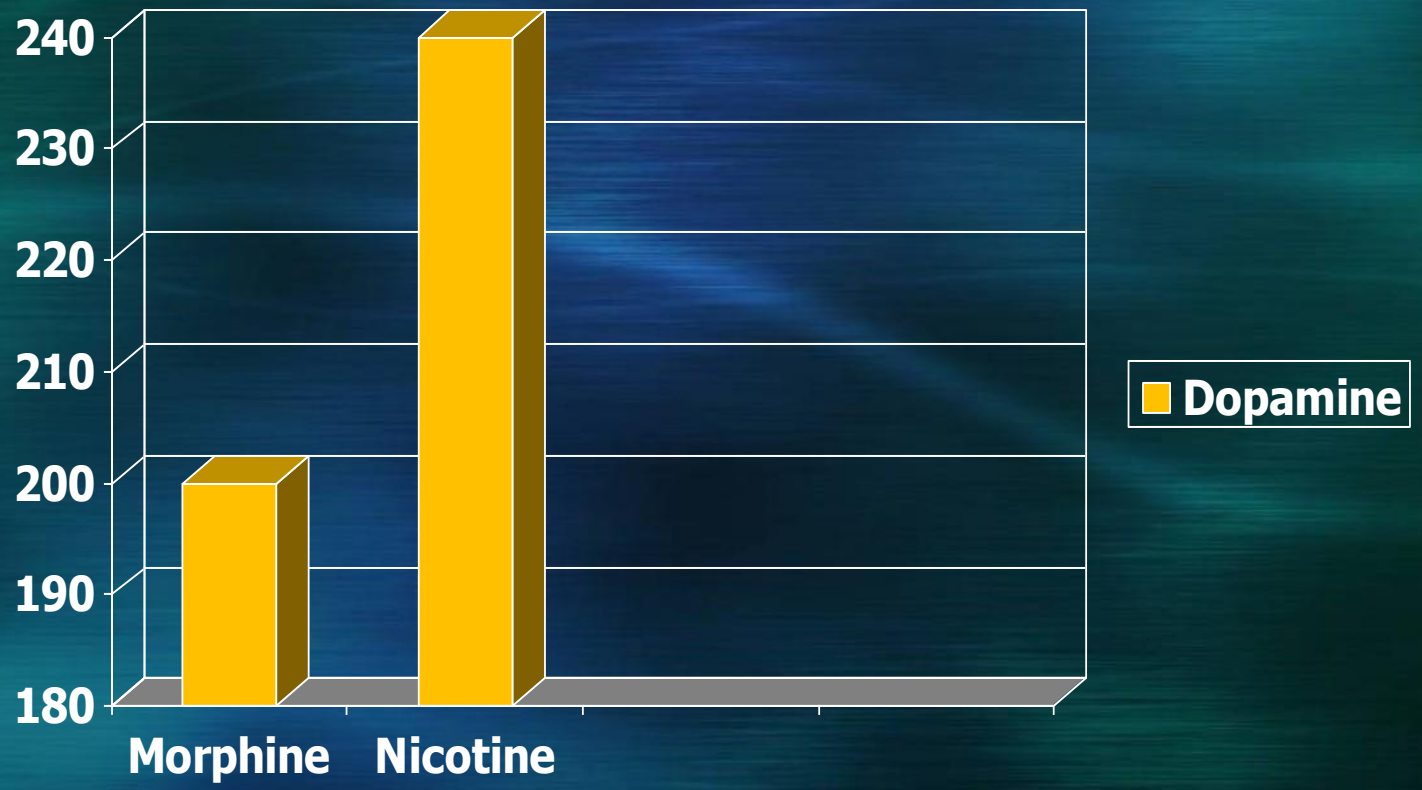

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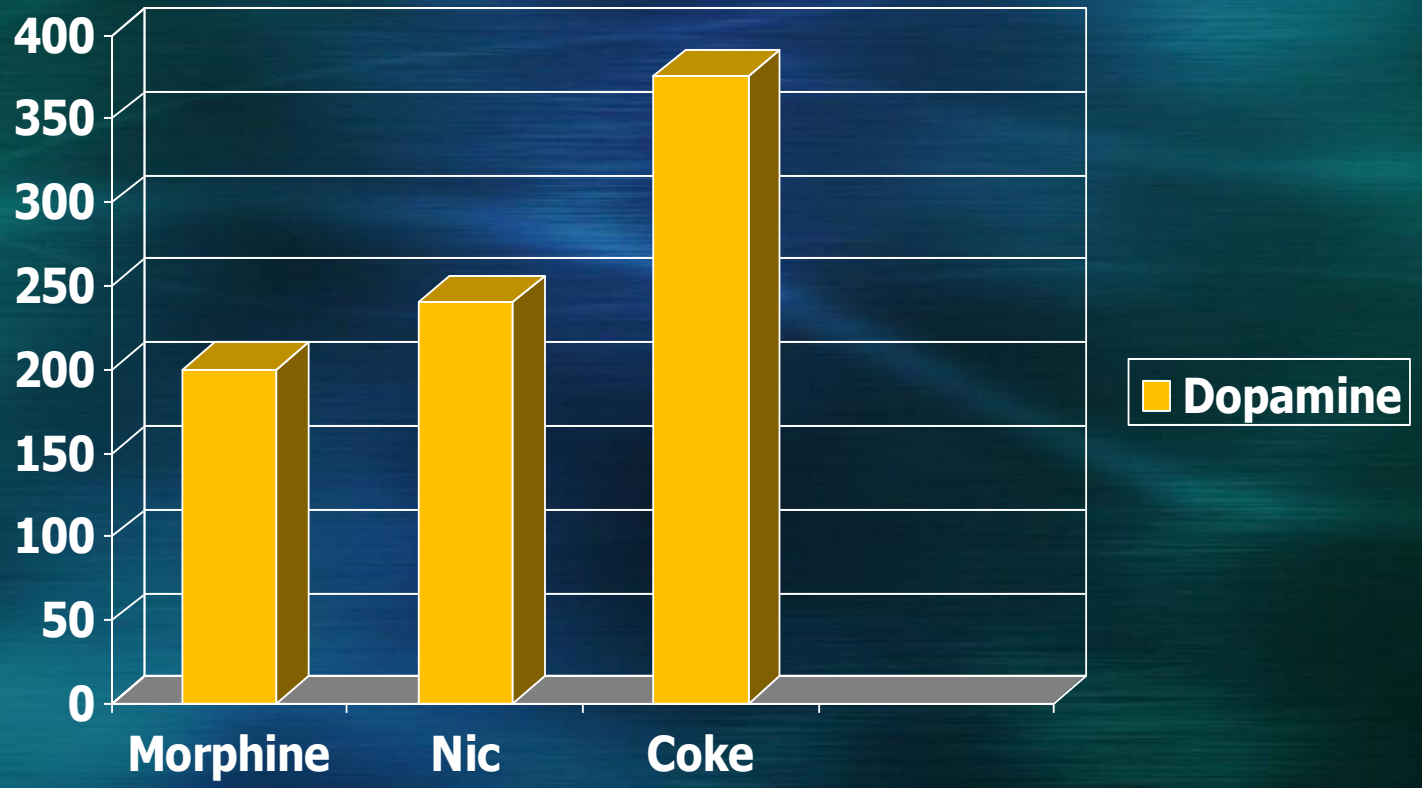

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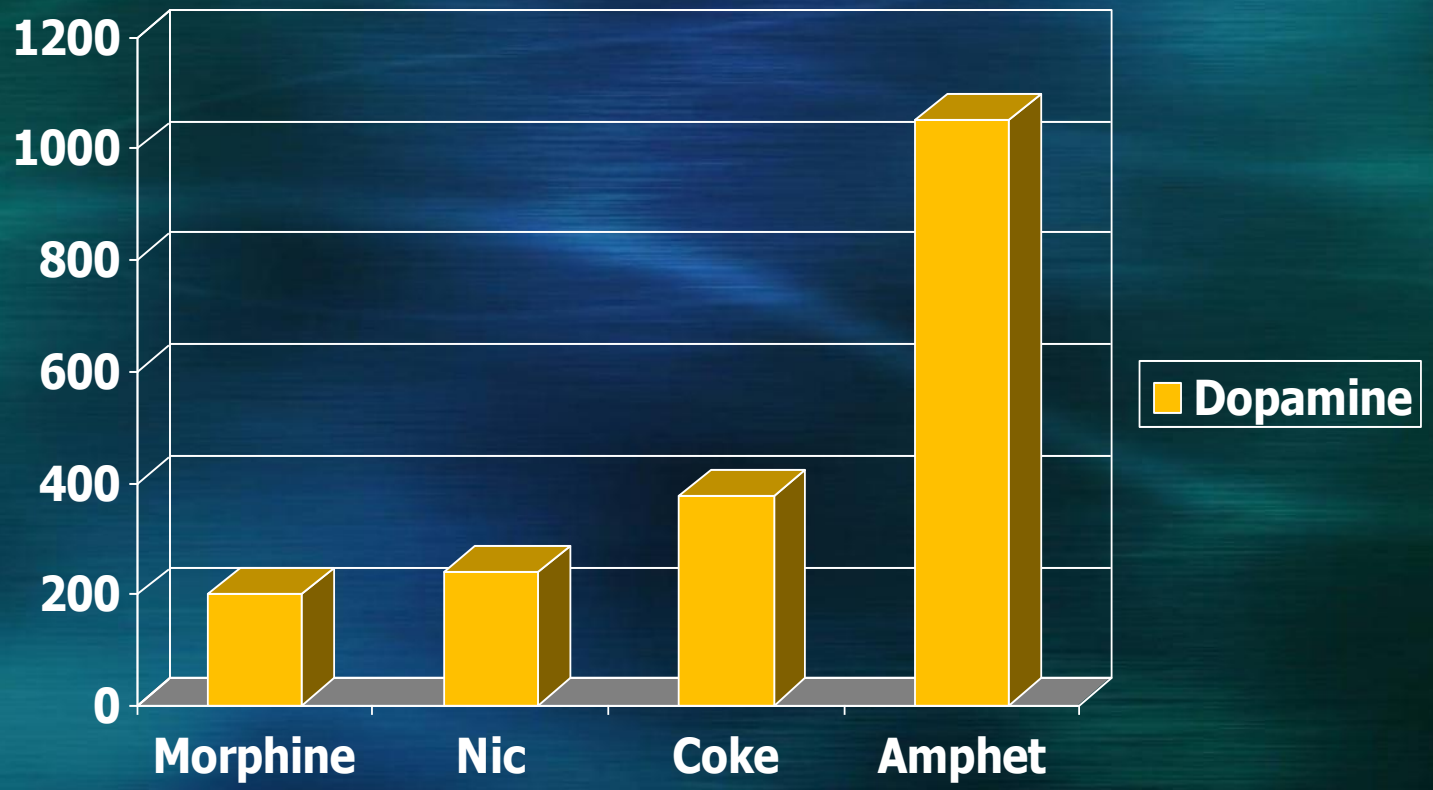

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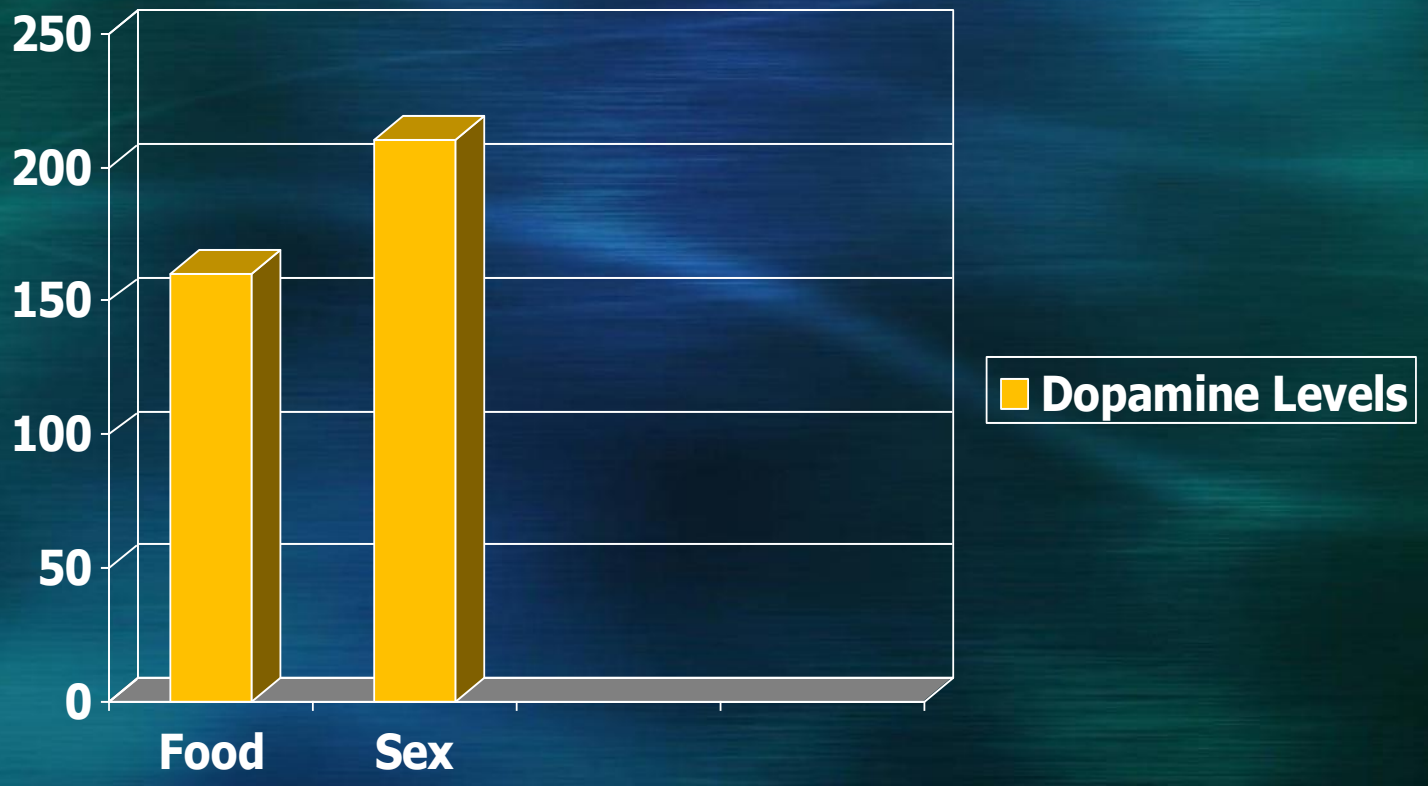

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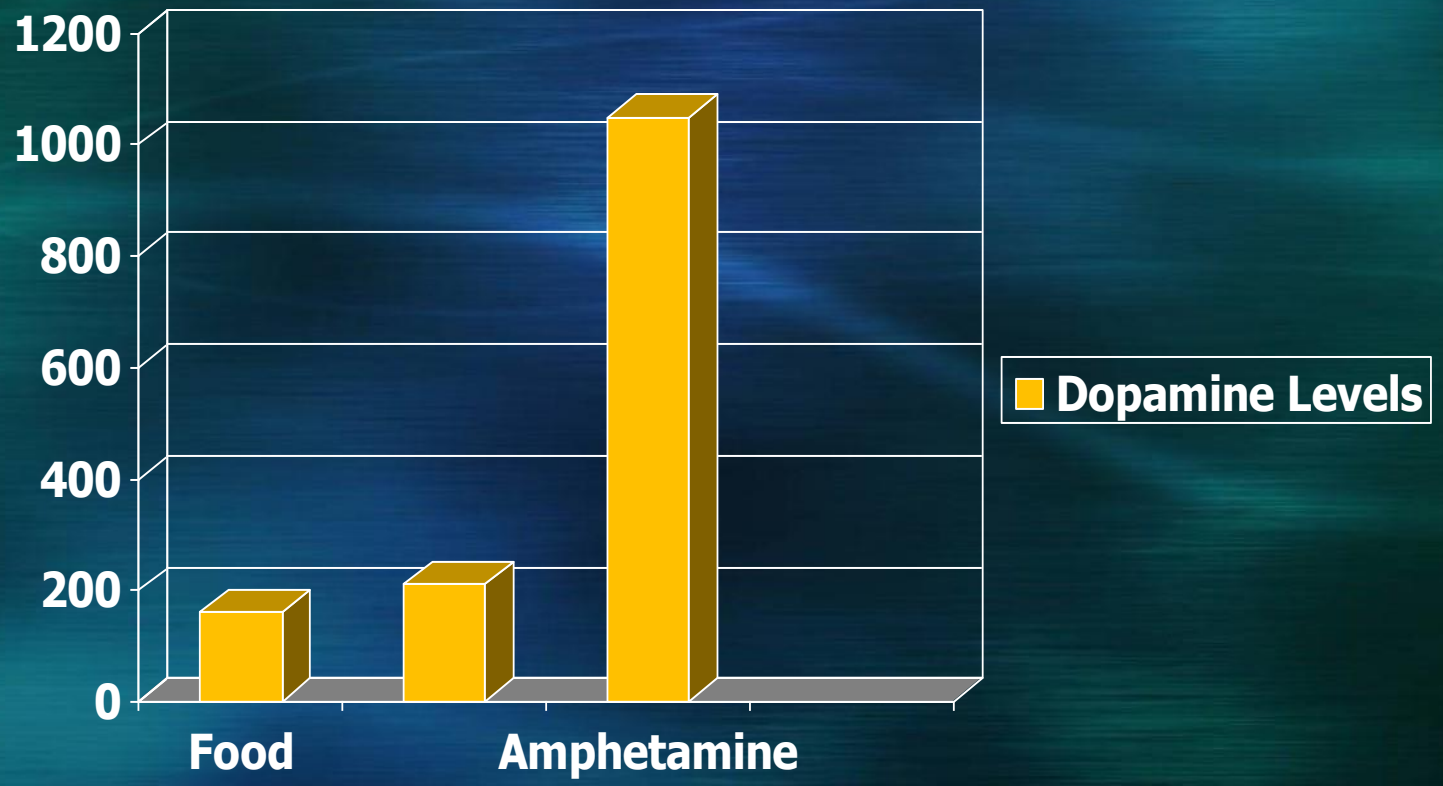


THE CRASH: NO PARACHUTE

- Severe depression
- Anhedonia
- Sadness
- Boredom
- Despair
- Anguish
- Anxiety
- Panic
- Suicidal ideation.

RESPONSES TO THE CRASH

- Pray for sleep
- Continued use of drug (the “run” continues)
- Self-medication with alcohol, marijuana, opiates or CNS depressants

Treatment of Stimulant Use Disorders

Stimulants: Key Clinical Issues

- Assessment
- Withdrawal
- Depression
- Craving
- Phases of recovery
- Sexuality
- Stimulant psychosis
- Cognitive impairment

Meth Addicted Women's Treatment Issues

- Reasons for initial use
  - Boyfriend introduction
  - Reduce fatigue and perform duties of employee, mother, homemaker, wife
  - Weight loss
  - Cope with abuse (current and historical)
  - Enhance sexual activities

Treatment Issues with Meth-dependent Women

- Concerns about inability to perform responsibilities
- Concerns about weight gain
- Emergence of abuse issues
- Anhedonia/depression

Treatment of Stimulant Use Disorders

- 80% of treatment is the same as other drugs
  - Initial engagement and retention of client long enough to ensure meaningful behavior change
  - identification of co-occurring medical and psychiatric issues
  - Identification of trauma
  - Successful placement in an appropriate level of care
- Refer to NIDA “Principles of Effective Treatment”

Client and Family Education

- Provide information about the drug in question
  - Effect of the drug on brain chemistry
  - Changes in behavior related to shifting of priorities
  - Neurological healing
  - Craving

Stimulant Withdrawal

- No severe signs as with alcohol, benzodiazepines or opioids
- Depression
- Anxiety
- Fatigue
- Cognitive impairment
- Lack of energy
- Anhedonia
- Psychosis, if present, will remit when drug leaves the body

Phases of Recovery

- Withdrawal (0-15 Days)
  - Sleep
  - Impulsivity
  - Shame
  - Strong craving
  - Difficulty concentrating/coping with stress.
  - Anxiety
  - Irritability

Phases of Recovery

- Honeymoon* (16-45 days)
  - Feels better physically
  - Increased energy
  - Optimism/confidence about life
  - Increased focus on exercise, diet, spirituality, etc.
  - Problems “under control” or “over.”
  - Premature treatment termination
  - Relapse

*”Flight into health”

Phases of Recovery

- The Wall (46-120+ days)
  - Major hurdle in recovery
  - More vulnerable to relapse
  - Reduced physical or sexual energy
  - Depression
  - Anxiety
  - Irritability
  - Boredom
  - Difficulty concentrating

Phases of Recovery

- The Wall (46-120+ days)
  - Return of strong cravings or thoughts about using

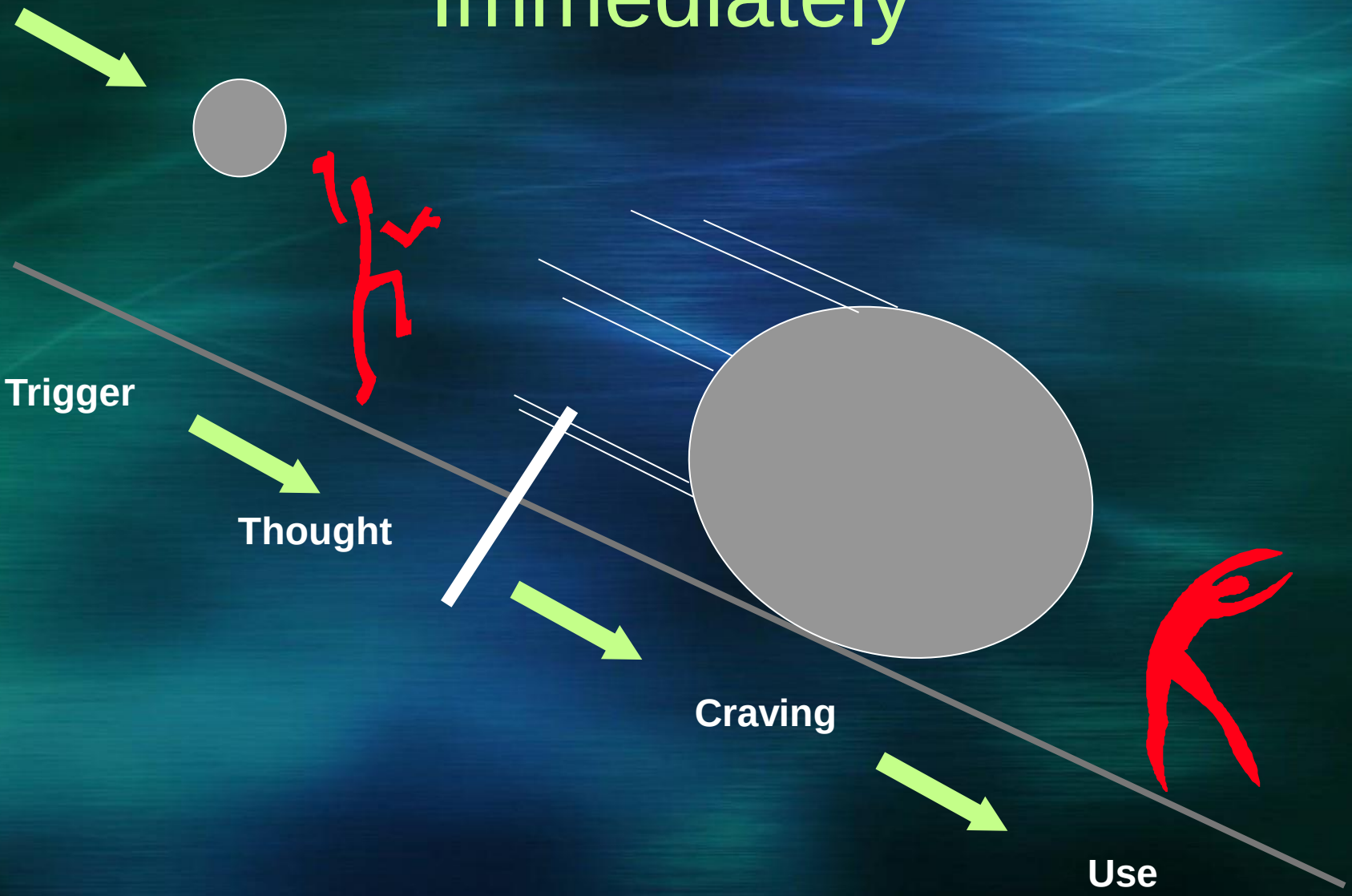
Phases of Recovery

- Stage 4: Adjustment (Up to 1 year)
  - Sense of accomplishment
  - Life begins to “get back to normal”
  - Lifestyle changes become more integrated
  - Improvement in mood, but some boredom and/or depression
  - Craving occurs less frequently and intensely
  - Possibility of putting self in high-risk situations that increase the risk of relapse to drug use.

Craving (Drug Hunger)

- Will emerge during withdrawal period
- Must be addressed immediately before it escalates to a dangerous level

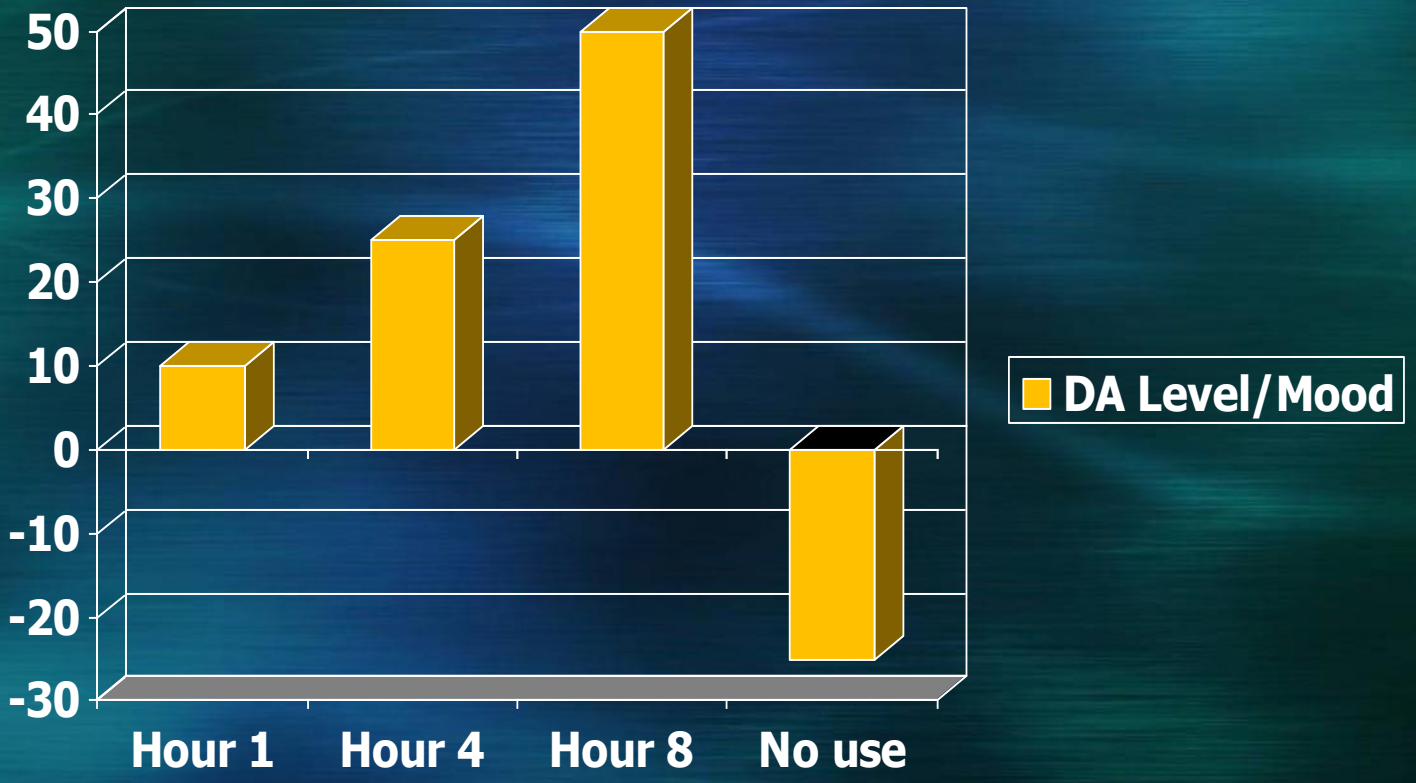
Craving Needs to be Addressed Immediately



Can Unaddressed Craving Produces a “High”?

- Dopamine levels in the reward circuit are increased by thoughts of using.
- If craving is not addressed soon enough, the client will “crash” if s/he does not use.

“Crashing from Craving”



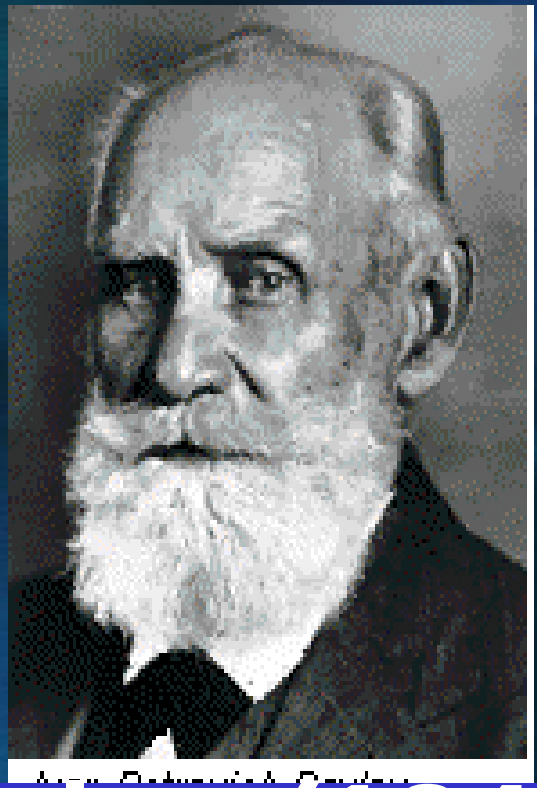
DRUG HUNGER

- Acute-Immediately after “high” wears off
- Baseline-Will begin after client has rested
- Evoked-Produced by triggers/cues

Early Recovery Issues
Engaging and Retaining

TRIGGERS

Triggers and Cravings

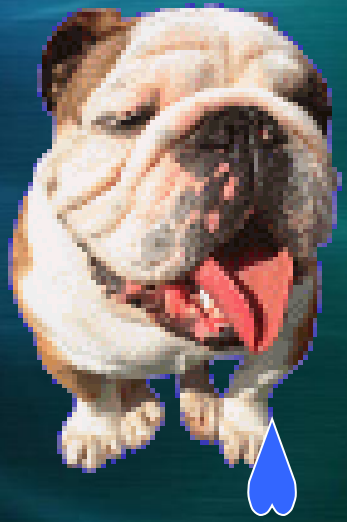


I.P. Pavlov (1849-1936)

Triggers and Cravings

Pavlov's Dog: Exposure to Food produces salivation

Triggers and Cravings



Pavlov's Dog: Producing a conditioned response

Triggers and Cravings

Pavlov's Dog: Producing a conditioned response

Addressing Craving

- Craving emerges in response to:
  - Presence of drug
  - Presence of injection equipment or paraphernalia
  - Environmental cues
  - Internal cues

Dealing with Environmental Cues

- Identification of environmental cues
- Development of avoidance strategies-specific plan to avoid each cue
- Rehearsal of avoidance strategies
- Implementation of avoidance strategies
  - changing phone numbers
  - seeking safe housing
  - avoiding old using haunts
  - separating from old using partners/situations
  - plans for handling money

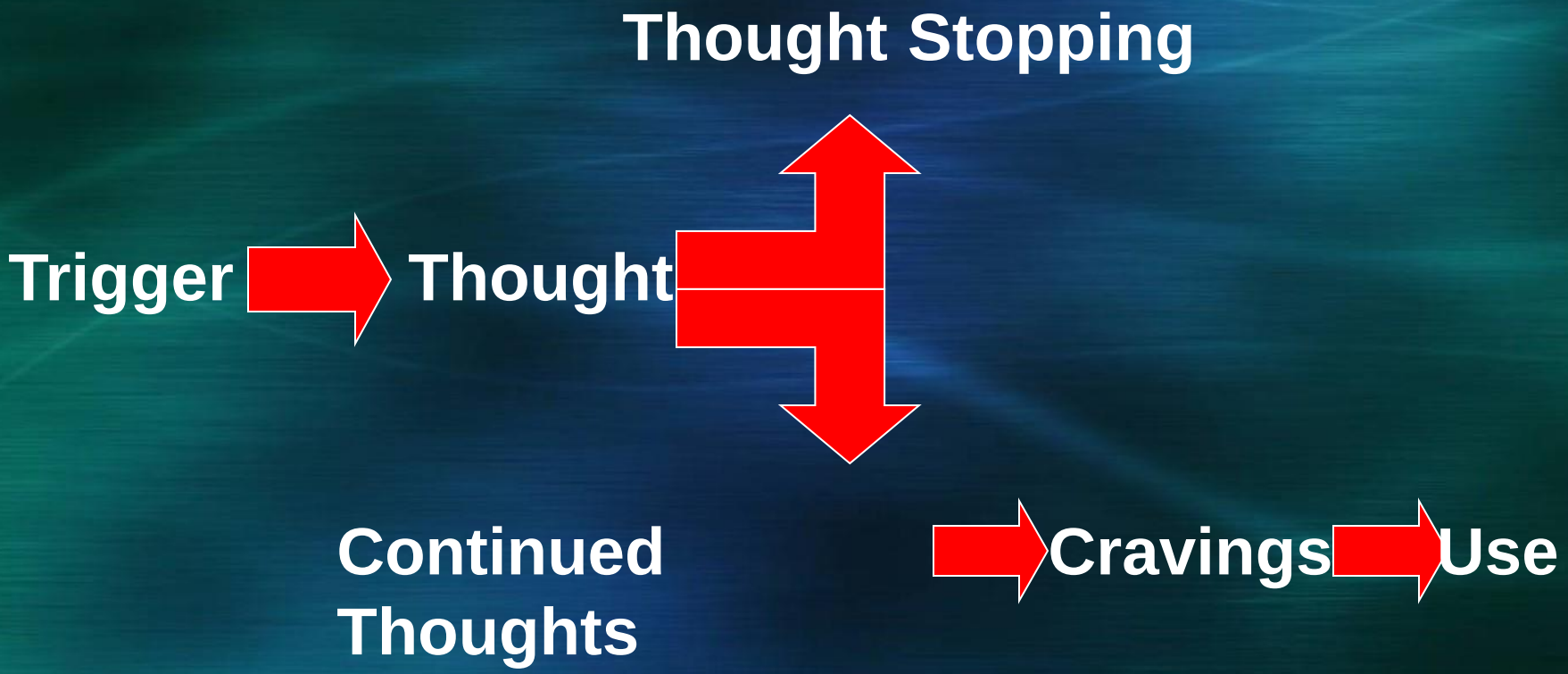
Strategies that Dissipate Craving

- Exercise: Two 20-minute periods daily
- Spiritual Practices: Meditation, Prayer
- Relaxation Exercises: Audio tapes or learned behavioral techniques
- Disclosing and discussing cravings
- Attendance at self-help meetings

Strategies that Dissipate Craving

- Written reminders
- Visualization
- “Snapping”
- Tokens
- Acupuncture

THOUGHT STOPPING



- Prevents the thought from developing into an overpowering craving
- Requires practice

Depression

- A normal sign during stimulant withdrawal
- Psychiatric evaluation
- If depression persists beyond two months, consider adjunctive psychotherapy and/or medication

Stimulant Psychosis

- Should not persist after the drug have been metabolized
- Those with psychosis of more than one day should be referred for psychiatric evaluation

Sexuality

- Always ask whether the client has mixed stimulant drugs with sex
- Some clients become hypersexual while using stimulants, others become hyposexual
- May have been a problem in intimate relations
- Some clients combine stimulants and sex
  - Fusing of the two behaviors
- Some clients
  - Combine stimulants and pornography
  - May find it difficult to engage in sex without the drug

Reciprocal Relapse

- Using stimulants may lead to a resumption of compulsive sexual behavior
- Engaging in sex can trigger a return to stimulants

Sexuality

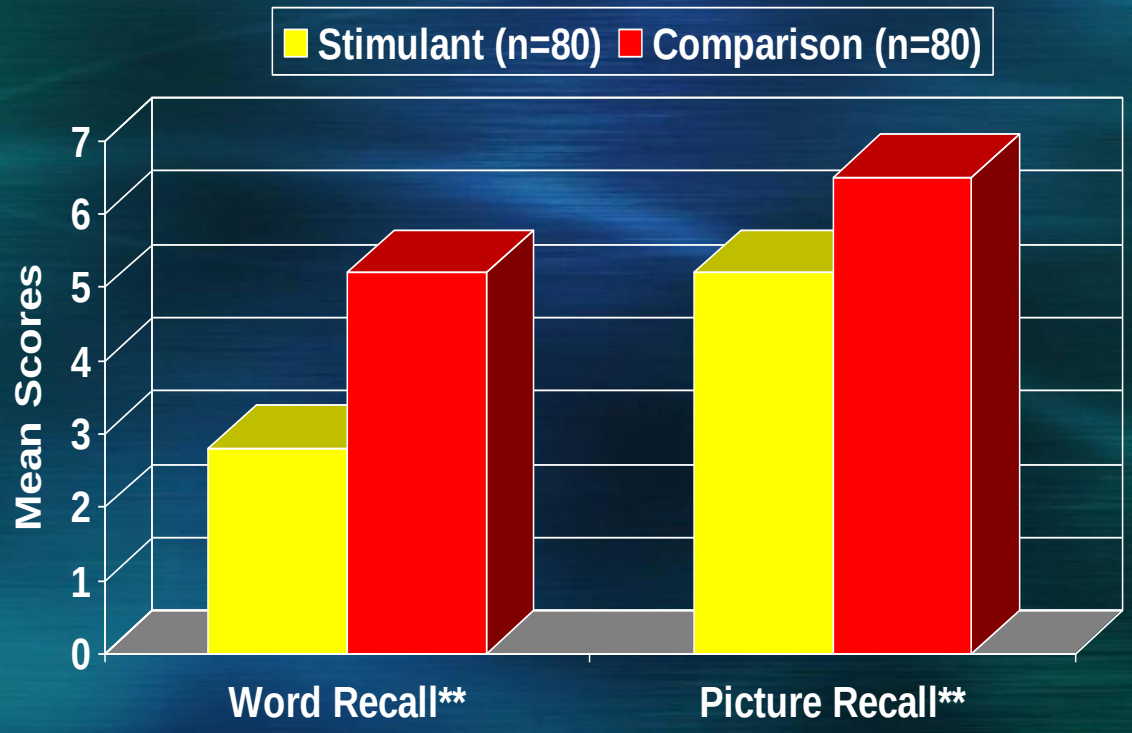
- Shame/guilt
- Embarrassment
- Provide education
- Gender-specific groups
- Family counseling
- Viewing pornography may cause craving
- Some clients may have to be referred for specialized treatment

Sexuality

- Refrain from all sexual activity for at least an initial “cooling off” period (e.g., 30 days) to let the intensity and frequency of sexual thoughts, feelings, and fantasies diminish.
- Counselor should explore and dispute thoughts that sex is impossible with the drug
- Assure client sex drive will return, but it will take time
- Encourage non-sexual physical contact

Cognitive Impairment

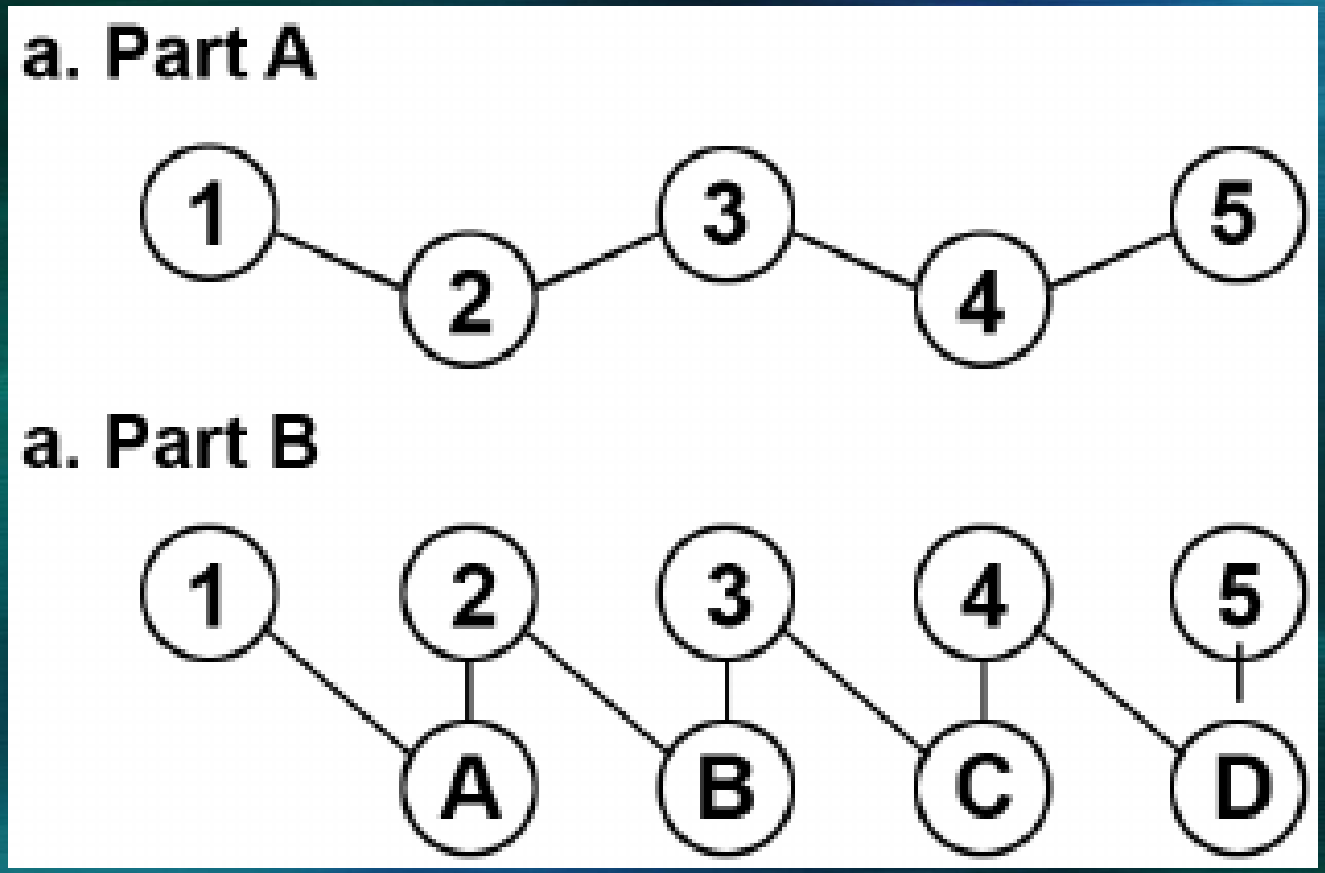
Memory Difference between Stimulant and Comparison Groups



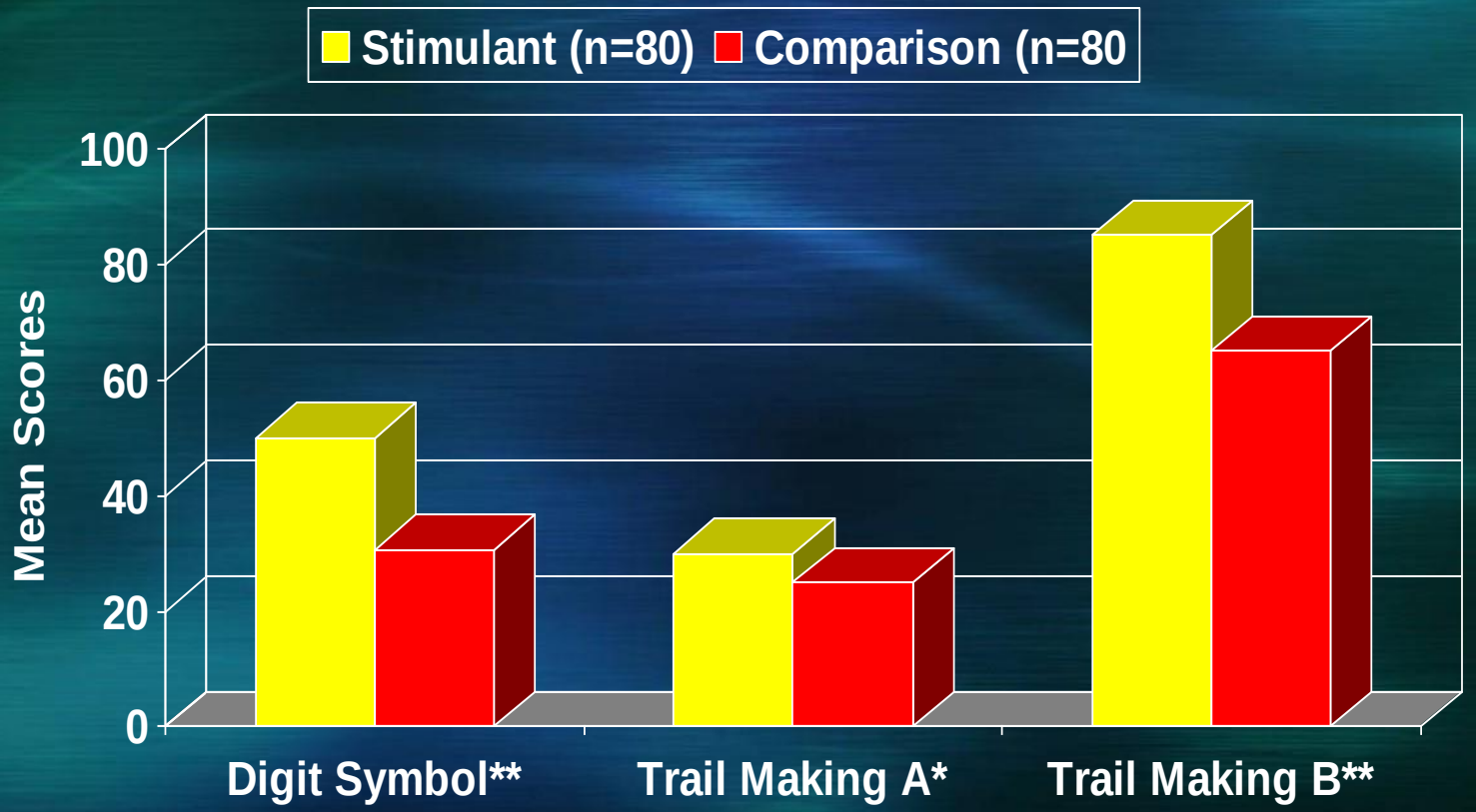
Digit Symbol Test

- Involves matching a number to a corresponding symbol
- The digit symbol test measures processing speed, working memory, visuospatial processing and attention

Trail Making Test



Differences between Stimulant and Comparison Groups on tests requiring perceptual speed



COGNITIVE IMPAIRMENT: SUMMARY

- Actively using MA addicts demonstrate impairments in
  - The ability to manipulate information
  - The ability to makes inferences
  - The ability to ignore irrelevant information
  - The ability to recall information

Addressing Cognitive Impairment

- Don’t mistake cognitive impairment for resistance
- Cognitive rehabilitation therapy
- Keep it simple
- Audiovisual aids may be more effective than lecture
- Clients may have difficulty remembering things
  - Scheduling
  - Written reminders
- Use picture drawing to reinforce relapse prevention

MODEL PROGRAMS

Evidence-Based Treatment Models

- Community Reinforcement Approach
- Contingency Management
- Cognitive-Behavioral Therapy
- Matrix Model

COMMUNITY REINFORCEMENT

An Underlying Principle of Community-Reinforcement-Plus-Vouchers

- Marital Therapy
- Vocational Assistance
- New Social and Recreational Activities
- Skills Training

Community Reinforcement Approach (CRA)

GOALS

- To reduce AOD consumption
- To achieve abstinence long enough to learn new abstinence-sustaining life skills.

Behavioral Treatment: Contingency Management

- CM: application of reinforcement contingencies to urine results or behaviors

Contingency Management

(An Underlying Principle of Community-Reinforcement-Plus-Vouchers)

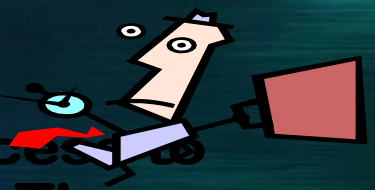
Vouchers

Inexpensive Gifts

Take-home Methadone Doses

Access to Housing

Gold Stars

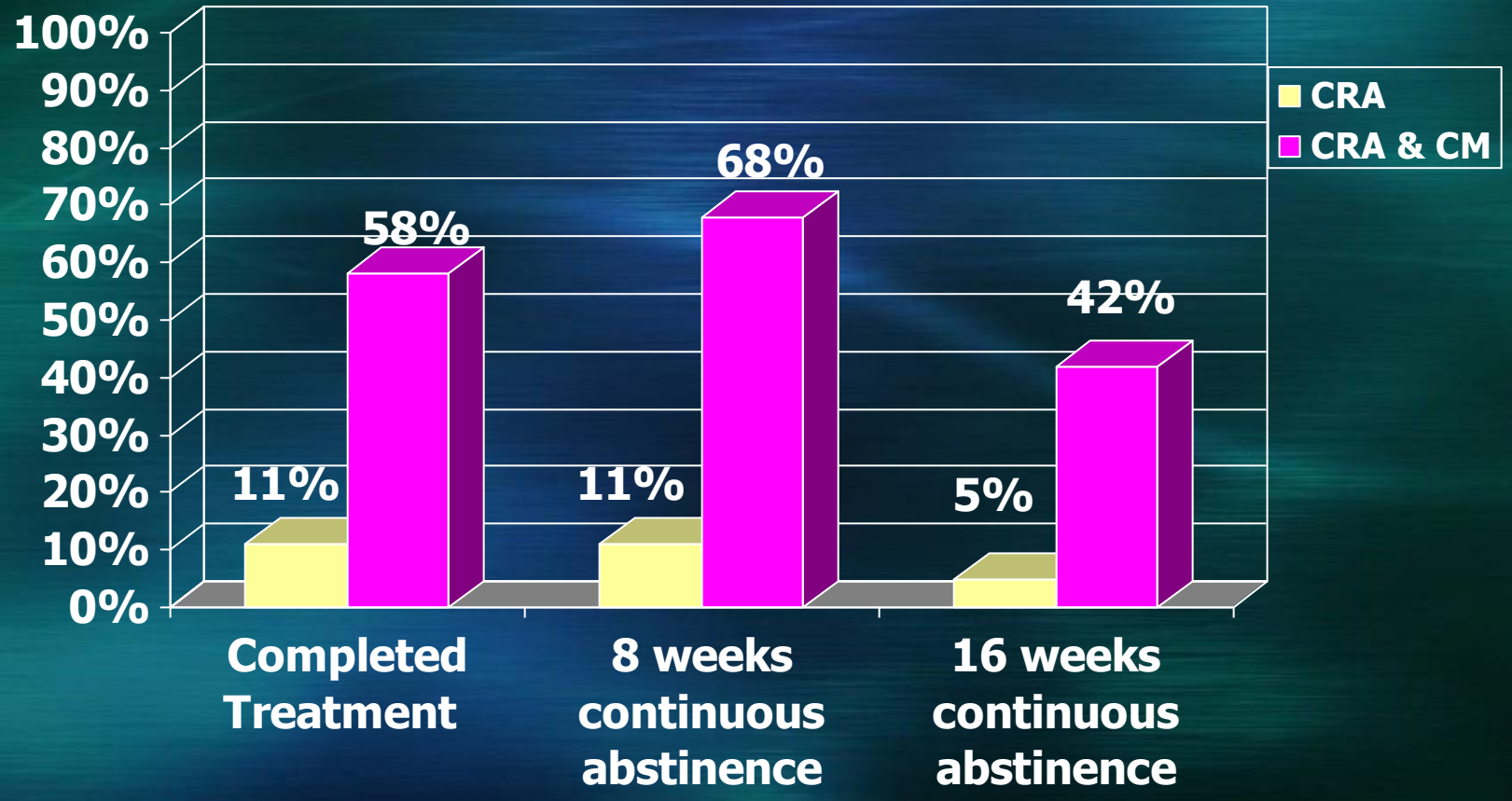


Access to Work Therapy

Contingency Management: Research Findings: Higgins

- 24-week treatment
- UA 3x/week
- 6-month follow-up
- Conditions
  - CRA
  - CRA plus vouchers

Contingency Management: Research Findings: Higgins



Incentives in Treatment of Cocaine Dependence
Review of the Literature

11 Studies

Positive Treatment Effects

2 Studies
No Significant Difference

13 Studies

Contingency Management

Other Incentives

Contingency Management
Other Incentives

- Doughnuts: ↑ attendance at MMT groups
- Chocolates: ↓ lateness in adolescent groups

Components Of The Matrix Model

- **Motivational Interviewing/MET**
- **CBT**
- **Neurobehavioral Education**
- Family Education Lectures
- Conjoint Sessions
- Urine Testing
- Relapse Analysis
- Self help Initiation

Matrix Model

- A cognitive behavioral model, based on specific knowledge of stimulant dependence issues.
- Derived from cocaine dependence treatment models
- Delivered on an intensive outpatient basis over 16 weeks
- Aftercare/Continuing care on an outpatient basis for next 36 weeks
- 3 group sesions/week for 16 weeks
- 1 group session/week for through week 52

Matrix Model

- 1 individual session/week for first 8 weeks
- 1 individual session/month for next 46 weeks
- Manualized, but adaptable to individual clients.
- 12-step involvement

Elements of the Matrix Model

- Engagement/Retention
- Structure
- Information
- Relapse Prevention
- Family Involvement
- Self Help Involvement
- Urinalysis/Breath Testing

Treatment Components of the Matrix Model

- Individual Sessions
- Early Recovery Groups
- Relapse Prevention Groups
- Family Education Group
- 12-Step Meetings
- Social Support Groups
- Relapse Analysis
- Urine Testing

Medications to treat SUD

- No currently approved medications exist either for withdrawal or relapse prevention

Medications for Stimulant Dependence

- **Bupropion (Wellbutrin)**
  - An atypical antidepressant
  - Approved to treat MDD, SAD and smoking
  - Some research has shown positive results in reducing stimulant relapse, but some have not

Medications for Stimulant Dependence

- **Topiramate**
  - **An anticonvulsant**
  - **Has shown mixed results in the treatment of SUD**
  - **Appears to work best when combined with group therapy**

Medications for Stimulant Dependence

- **Topiramate**
  - **An anticonvulsant**
  - **Increases brain levels of GABA**
  - **Has shown mixed results in the treatment of SUD**
  - **Appears to work best when combined with group therapy**

Medications for Stimulant Dependence

- **Modafnil**
  - Weak inhibitor of norepinephrine and dopamine re-uptake.
  - Used to treat narcolepsy, obstructive sleep apnea and shift work disorder.
  - Has been explored as a treatment for cocaine use disorder with mixed results.

Medications for Stimulant Dependence

- **Disulfiram (Antabuse)**
  - Used to treat alcohol use disorder
  - Causes unpleasant effects when combined with alcohol
  - Used to treat cocaine dependence, has decreased both alcohol and cocaine use

Medications for Stimulant Dependence

- **Naltrexone**
  - An opioid antagonist
  - Has shown promise in the treatment of cocaine use disorder, especially when used with buprenorphine
  - Results mixed when used in an injectable extended release form to treat methamphetamine use disorder

Medications for Stimulant Dependence

- **Mirtazapine**
  - An antidepressant that works through the serotonin system
  - Some studies have shown usefulness in reducing methamphetamine use and high-risk sexual behavior

Medications for Stimulant Dependence

- **Amphetamine/Ritalin**
  - Can reduce craving for methamphetamine and cocaine, but does not decrease use
  - High misuse potential