COCAINE ADDICTION: INNOVATIONS IN TREATMENT

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Overview

- Mechanism of Action
- Psychosocial Treatments
- Pharmacological Treatments
- Medication or No Medication

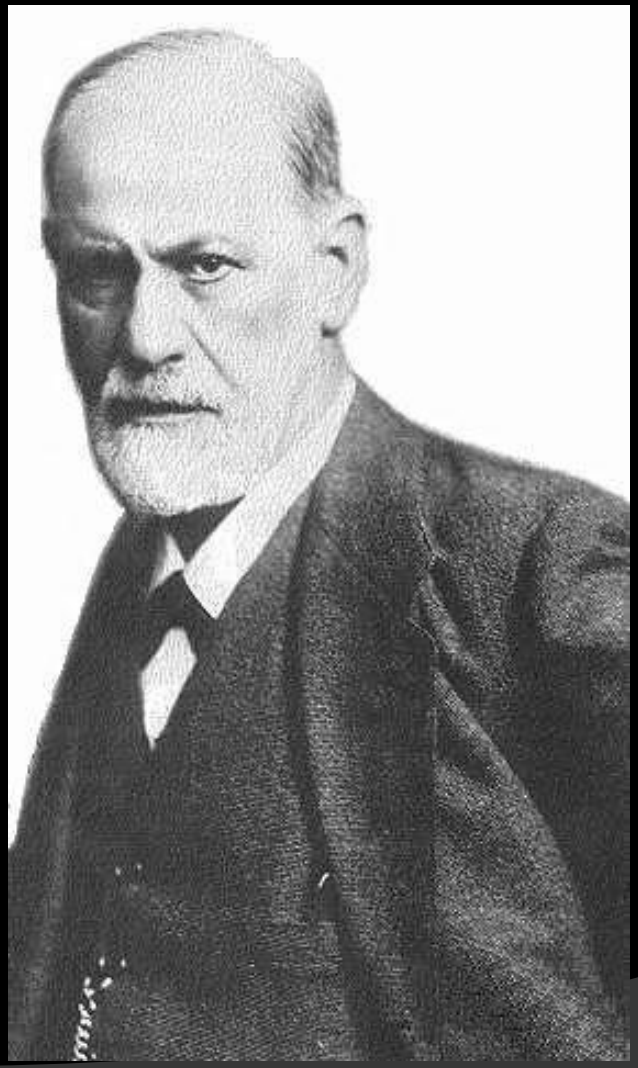
Cocaine

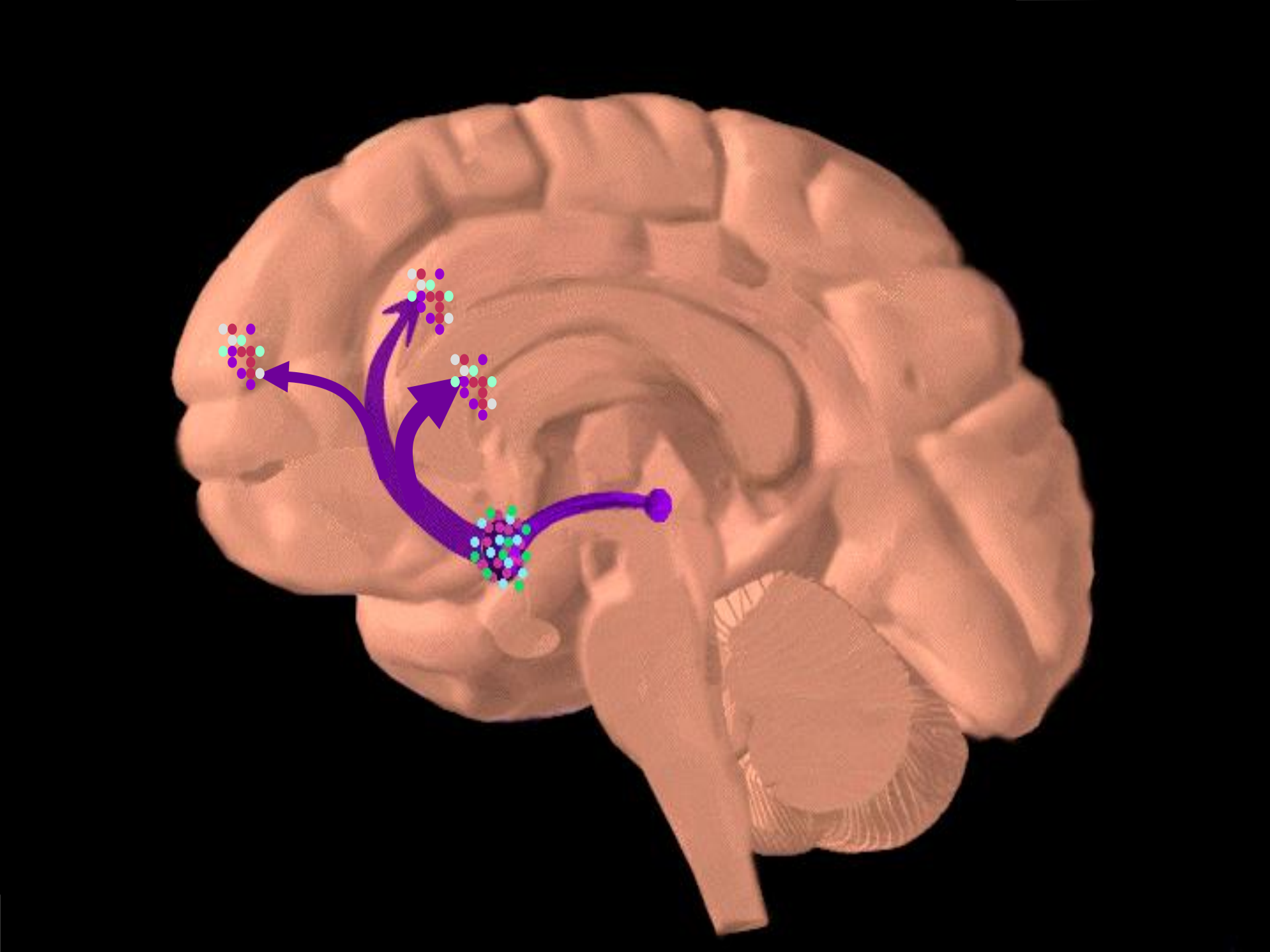
- White powdery substance derived from the coca plant
- Coca leaves used by Native South Americans for >1000 years
- Europeans isolated cocaine from coca leaves in the late 1800s
- Crack epidemic in the US in the 1980s

“In my last serious depression I took cocaine again, and a small dose lifted me to the heights in a wonderful fashion. I am just now collecting the literature for a song of praise to this magical substance.”

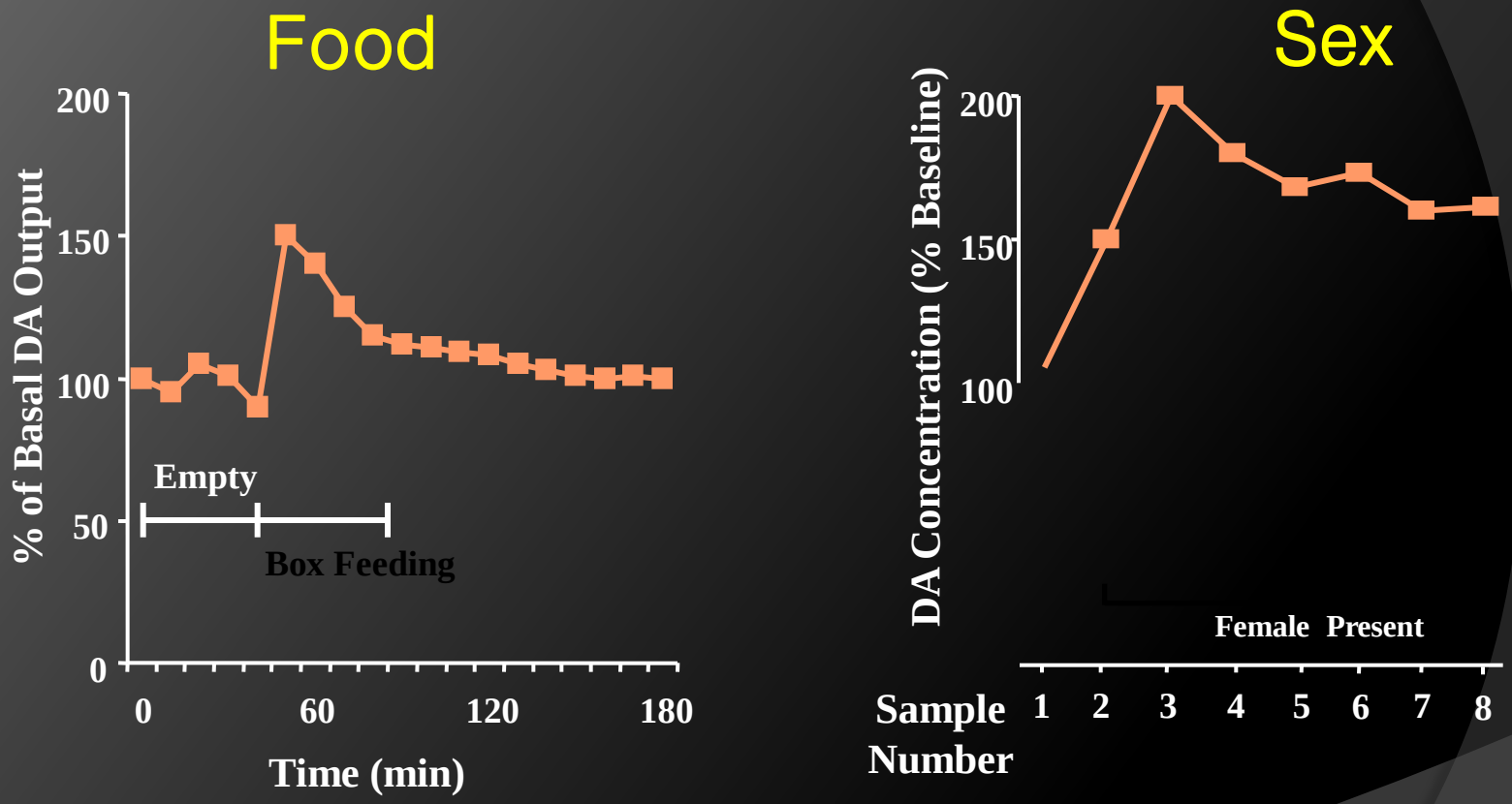
Dominic Streatfeild. Cocaine: An unauthorized biography. Dunne Books, June 2002

Sigmund Freud



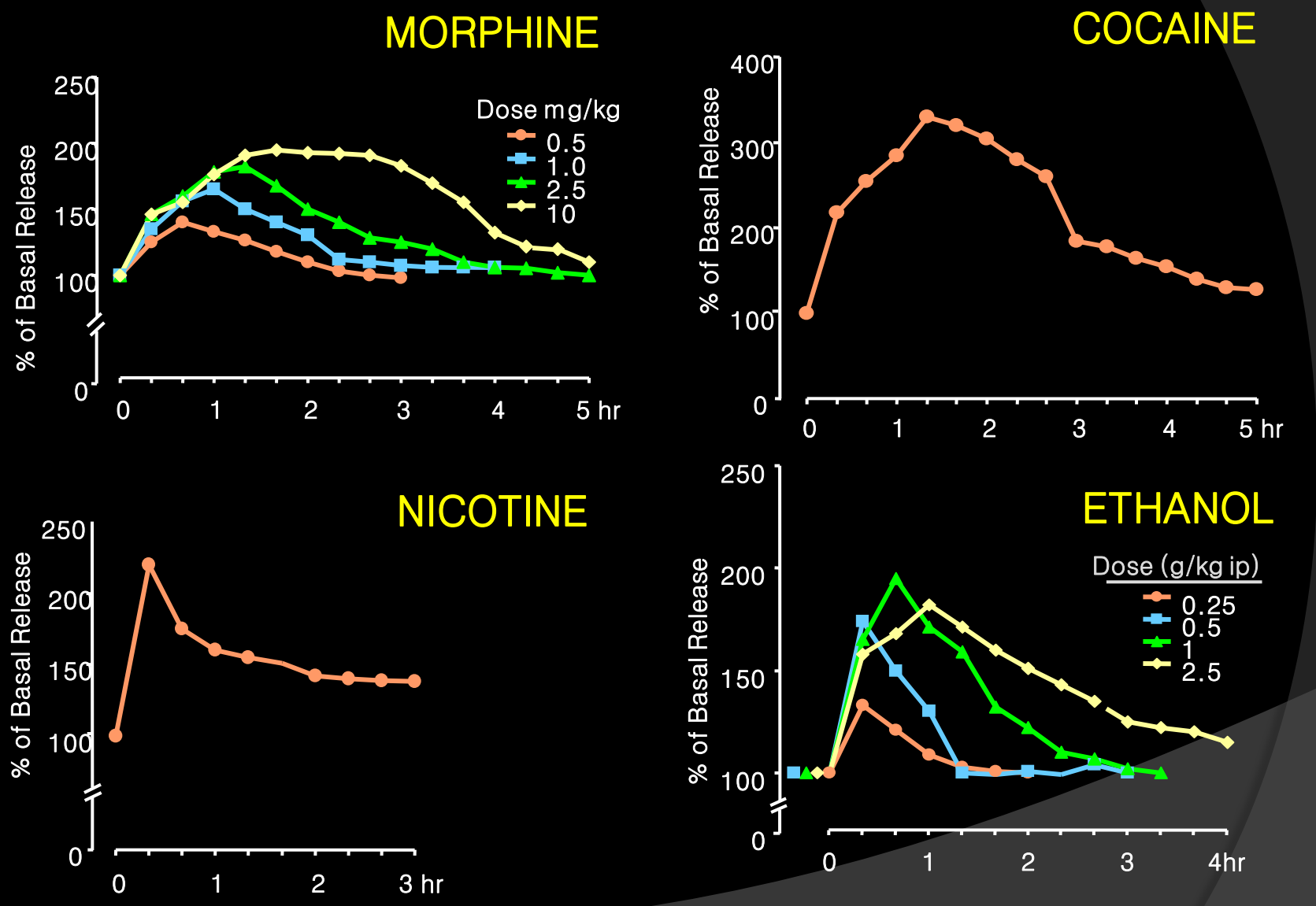


Natural Rewards and Dopamine Levels

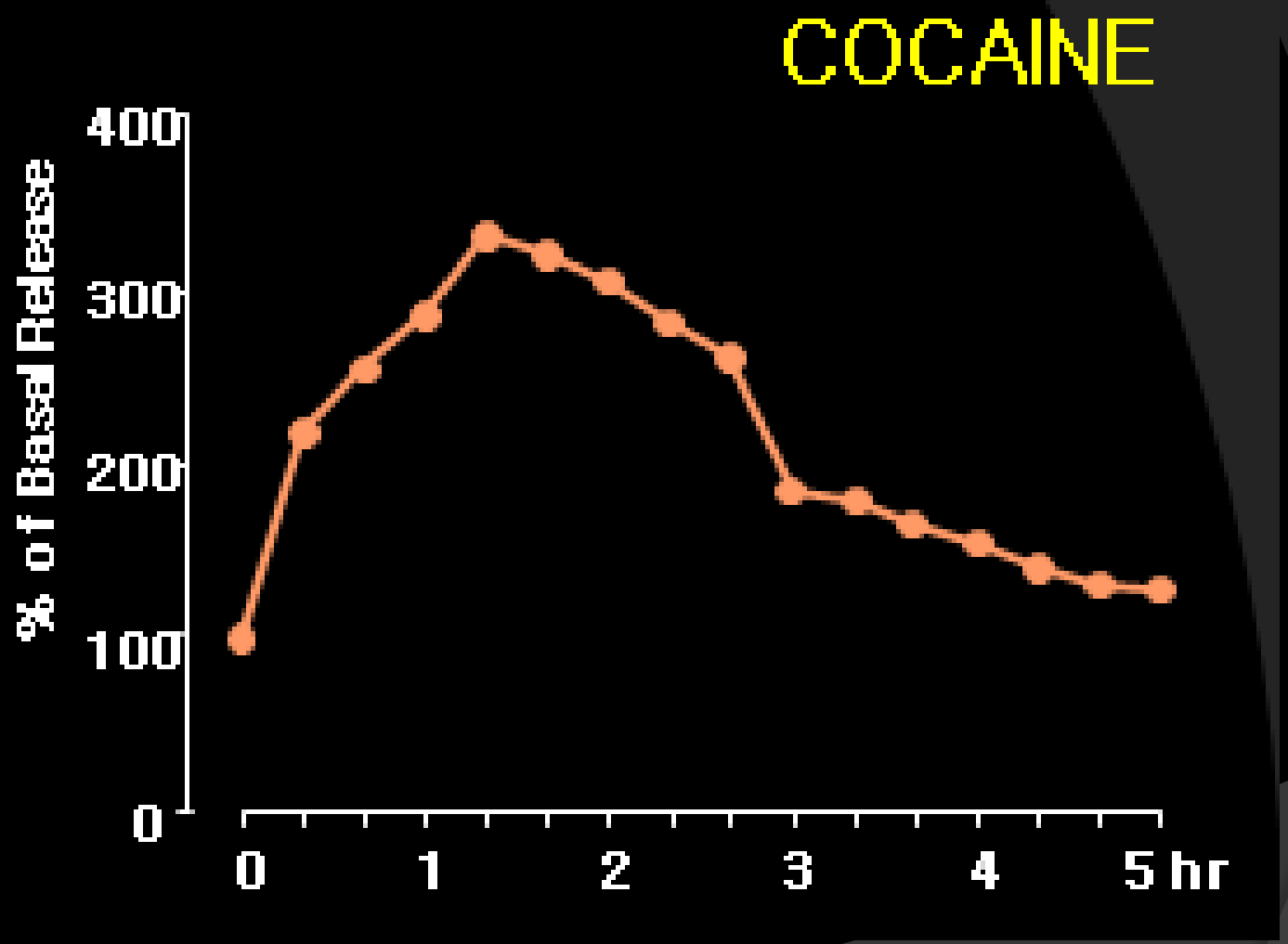


Adapted from: Di Chiara et al., *Neuroscience*, 1999.
Adapted from: Fiorino and Phillips, *J Neuroscience*, 1997.

Effects of Drugs on Dopamine Levels 1



Adapted from: Di Chiara and Imperato, *Proceedings of the National Academy of Sciences USA*, 1988; courtesy of Nora D Volkow, MD.


COCAINE
% of Basal Release
400
300
200
100
0
0
1
2
3
4
5 hr

PSYCHOSOCIAL TREATMENTS

First Wave: Psychoanalysis

1. Psychoanalysis works for all treatable mental illness.
2. Psychoanalysis does not work for addiction.
3. Therefore, addiction cannot be treated.

Second Wave: Synanon

The Prototype, Synanon, was founded in California in 1958 by Charles Dederich to address heroin addiction.

The goal was to:

- Break down defenses,
- Bust through denial, and
- Rebuild the addict's personality.

Second Wave: Therapeutic Communities (TCs)

1. Shaving heads, wearing diapers, wearing humiliating signs
2. "Encounter groups" – loud, free–flowing verbal attacks from staff and fellow residents
3. Very high success rate for those who completed the program
4. Very few people completed the program

Third Wave: Minnesota Model

- Heavily based on 12-step philosophy
- Relies on group support, with 80-90% of work in groups
- Supportive rather than confrontational and shaming. Patients are treated as responsible adults.
- More effective than TCs with higher retention
- Considered the GOLD STANDARD of rehabilitation treatment in the US

Fourth Wave: Relapse Prevention Therapy

1. Based on Cognitive Behavioral Therapy
2. Functional Analysis of Relapses
3. Skills Training to:
   - identify,
   - avoid, and
   - cope with thoughts about drugs & cravings

Kadden et al, *Cognitive-Behavioral Coping Skills Therapy Manual: A Clinical Research Guide for Therapists Treating Individuals with Alcohol Abuse and Dependence*, 1992.

Fourth Wave: New Interventions

1. Family Therapy
2. Mental Health Services
3. Aftercare
   - Intensive outpatient treatment
   - Transitional sober living

Fourth Wave

- Most new interventions were seamlessly integrated into the Minnesota Model

Fifth Wave: The Stages of Change

1. Precontemplation
2. Contemplation
3. Preparation
4. Action
5. Maintenance
6. Relapse

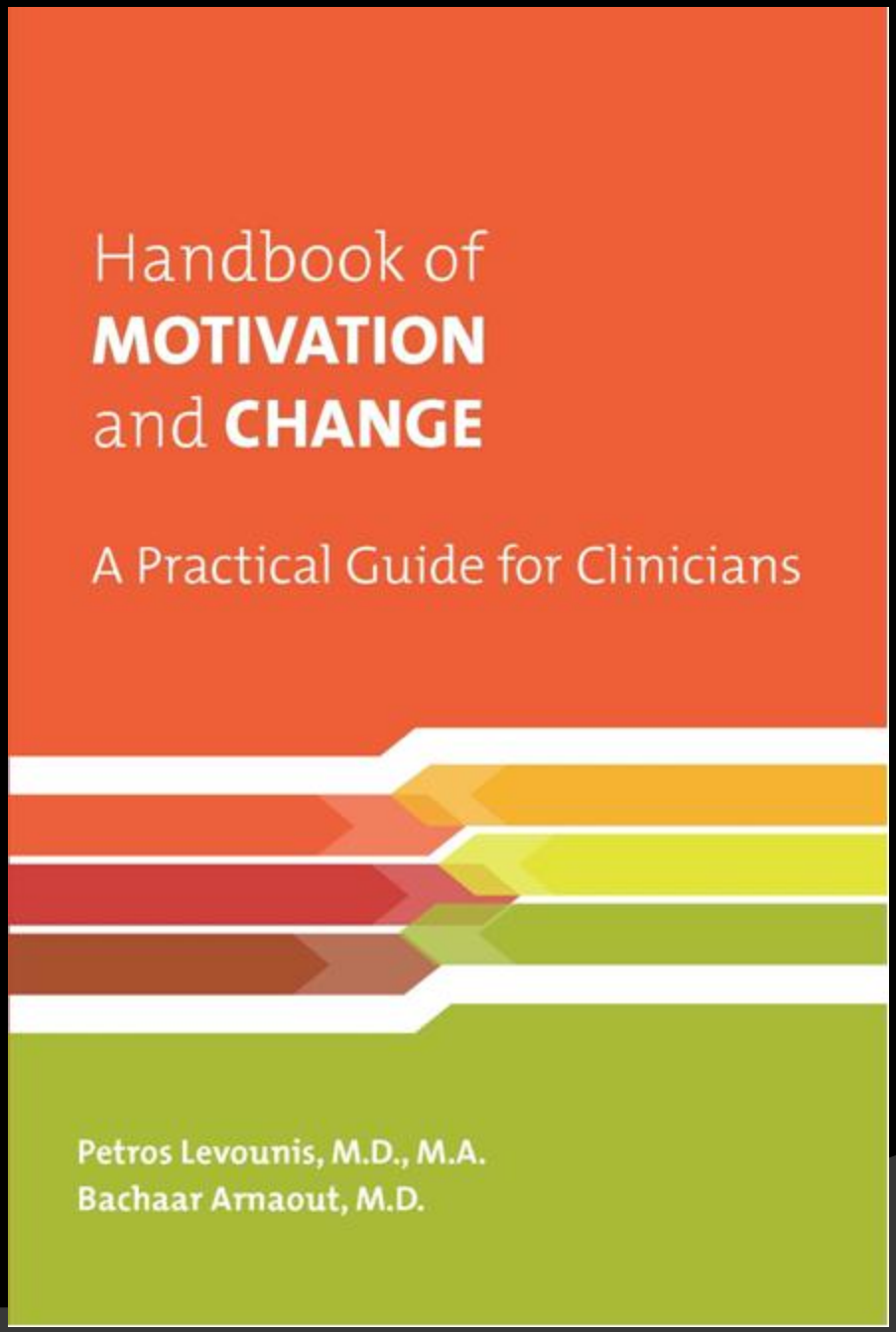
Prochaska and DiClemente, *The Transtheoretical Approach: Crossing Traditional Boundaries of Therapy*, 1984.

Fifth Wave: Motivational Interviewing

- Non-confrontational
- Identify patient's personal goals
- Do NOT use therapist's goals
- Develop discrepancies
- Support self-efficacy
- Develop internal motivation to stop using drugs

- REVOLUTIONARY

Miller and Rollnick, *Motivational Interviewing: Preparing People for Change (second edition)*, 2002.


Handbook of
MOTIVATION
and CHANGE
A Practical Guide for Clinicians
Petros Levounis, M.D., M.A.
Bachaar Arnaout, M.D.

Fifth Wave: Matrix Model

- Developed at UCLA to treat stimulant addiction
- Intensive Outpatient Model
- Combining data-supported interventions

Fifth Wave: Matrix Model

- Intensive Outpatient Treatment (IOP)
  - 16 weeks structured programming
  - 36 weeks of continuing care

Fifth Wave: Matrix Model

- Individual sessions
- Motivational Interviewing
- Relapse analysis
- Early recovery skills groups
- Relapse prevention groups
- 12-step meetings
- Social support groups
- Conjoint sessions (patient & spouse)
- Family educational groups
- Urine drug testing and reward system

Fifth Wave: Matrix Model

- Sessions are highly structured and manualized
- High level of consistency and reproducible results
- Amenable to research
- Statistically significant reductions in drug use, length of time to relapse, and sexual behaviors associated with HIV transmission

PHARMACOLOGICAL TREATMENTS

No medications for cocaine addiction approved by the U.S. Food and Drug Administration (FDA).

Anti-craving Medications

- Bupropion (Wellbutrin)
  - Antidepressant, anti-smoking drug
  - Increases levels of dopamine and norepinephrine in prefrontal cortex without significant effect on BRP

Anti-craving Medications

- Glutamate
  - Modafinil (Provigil)
    - Enhances glutamate
    - Improves energy and cognition
    - Slightly increases dopamine
  - N-Acetyl Cysteine
    - Reverses changes in glutamate levels from cocaine use
    - Powerful antioxidant with many clinical benefits

Anti-craving Medications

- GABA – inhibits DA release in the BRP
  - Topiramate
  - Valproic acid
  - Tiagabine
  - Baclofen
  - Vigabatrin

Anti-craving Medications

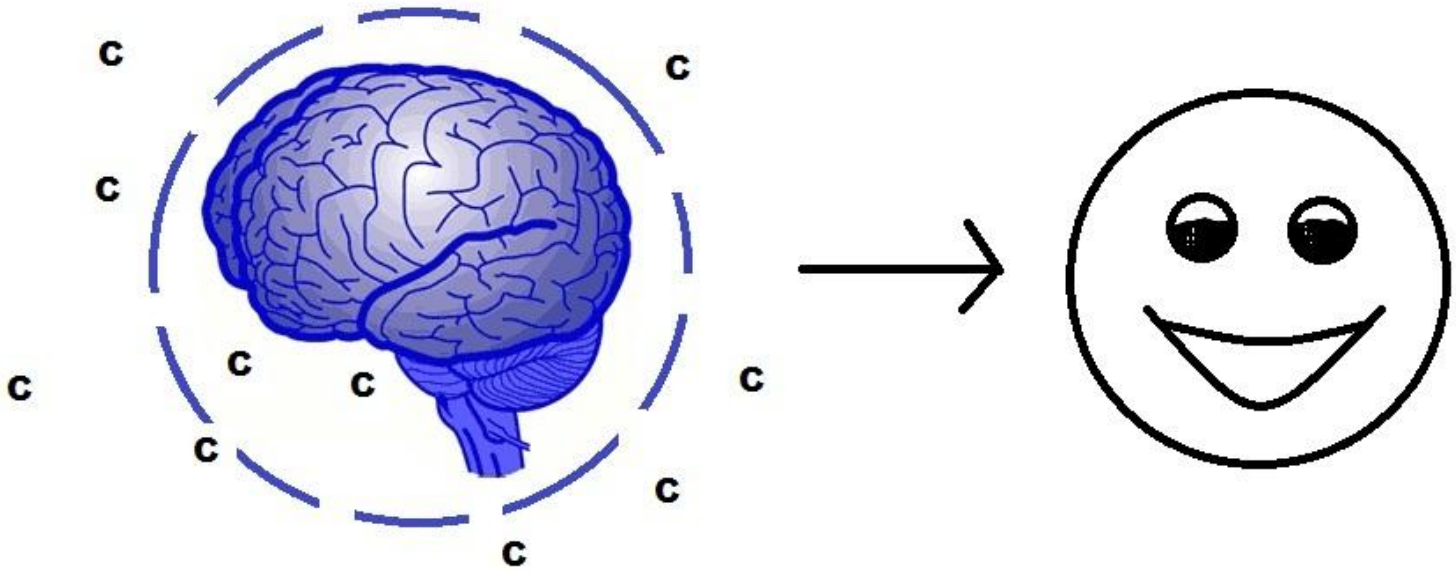
- Serotonin – cocaine stimulates the serotonin 3 (5HT3) receptor
  - SSRIs (fluoxetine, sertraline, paroxetine) not effective
  - Ondansetron
  - Mirtazepine?

Anti-craving Medications

- Dopamine agonists (replacement therapy)
  - Amantadine (weak agonist – mixed results)
  - Aripiprazole (partial agonist)
  - Disulfiram (inhibits DA beta hydroxylase)
  - Amphetamines

Treatments on the Horizon

- Rimonabant (marijuana–receptor blocker)
  - Animal studies show positive effect
  - Human trials stopped because of toxicity
  - Requires further study
- Cocaine vaccine
  - Prevents cocaine from reaching the brain
  - Most people do not develop antibodies
  - Those who do have only a temporary, mild effect
  - Risk of overdosing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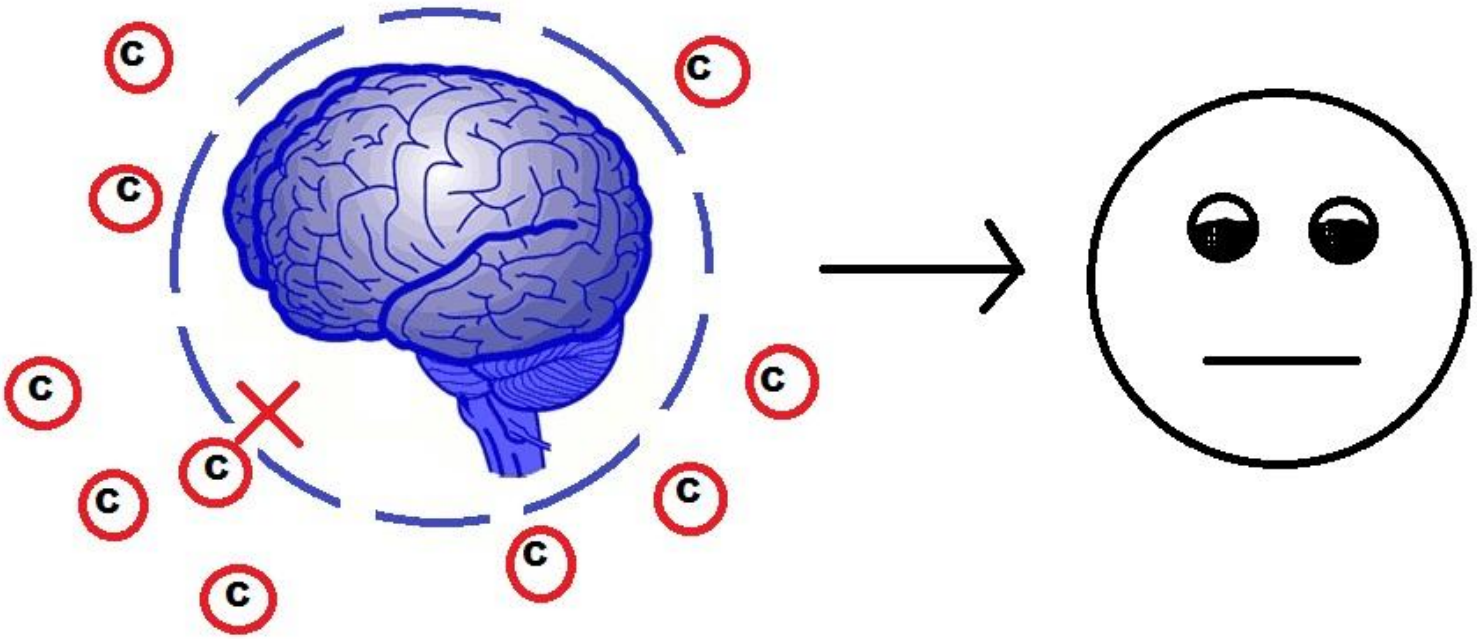
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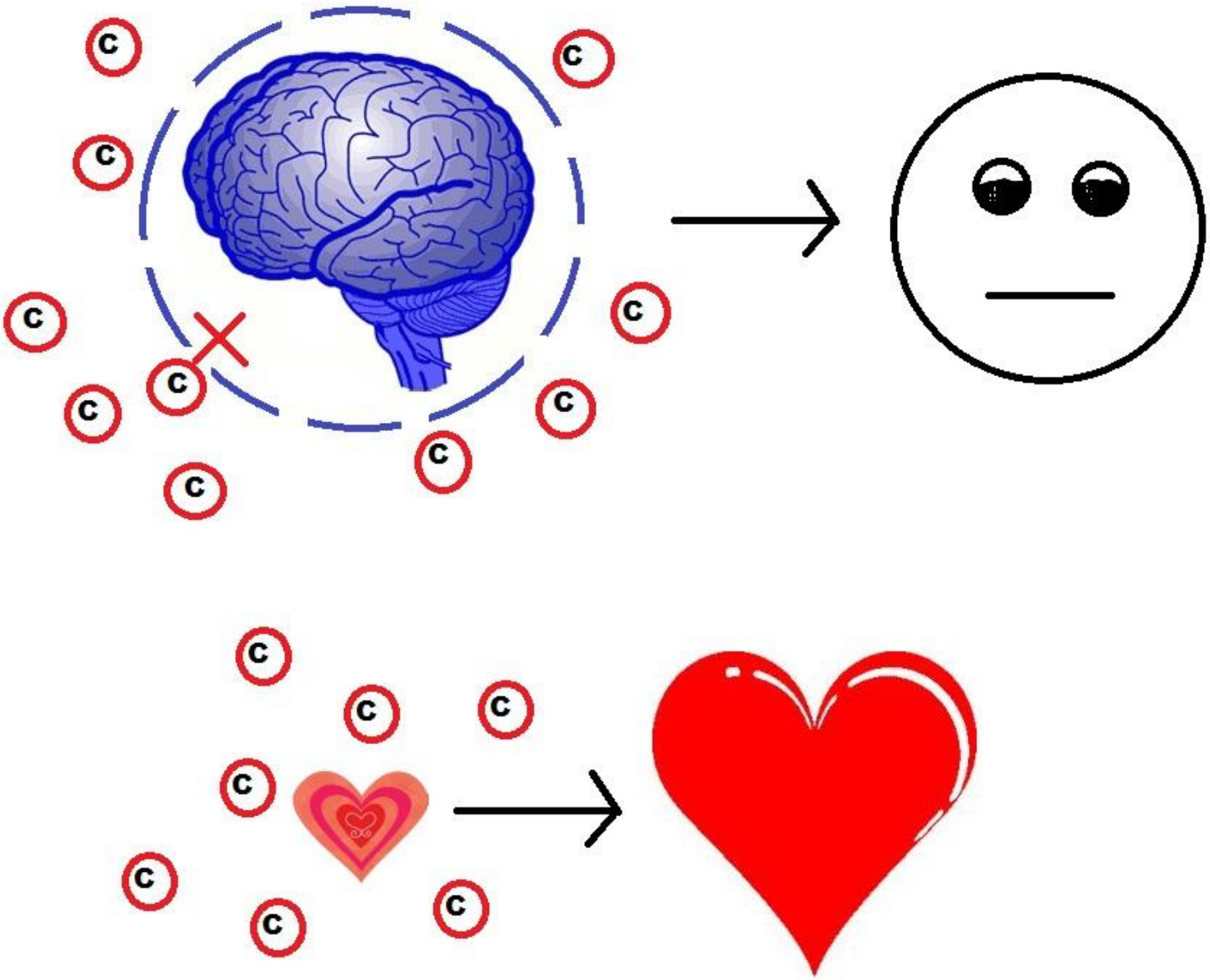
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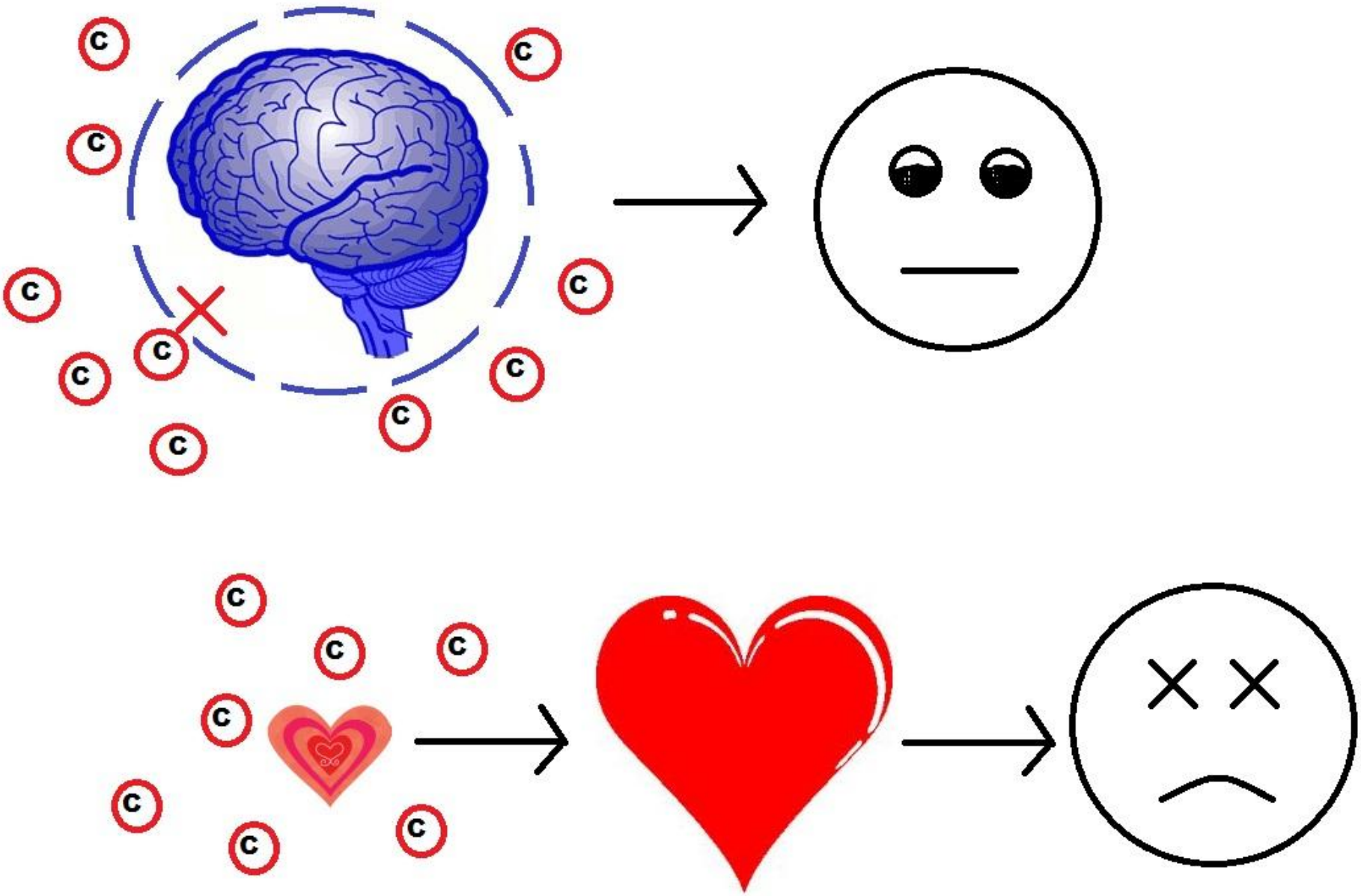
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Treatment of Co-morbid Illnesses

- Addiction often co-morbid with other psychiatric illnesses
  - Depression
  - Anxiety
  - Attention-deficit disorder
  - Bipolar disorder
  - Schizophrenia
- Untreated psychiatric illness results in high risk of relapse

Challenges of Using Medications in Addiction Treatment

Case 1

- CM is a 31-year old female crack cocaine addict. She was mandated for treatment by the drug court and entered inpatient rehabilitation. During her initial detox, CM slept 10 to 14 hours per day and she was tired and irritable during the time that she was awake.

Case 1

- During her second week in rehab, CM reported feelings of sadness and apathy. She said that she often used crack cocaine to help herself cope with depressed mood. She was not suicidal, but she had been suicidal in the past. She asked to see a psychiatrist to consider starting an antidepressant.

Case 1

- CM did not have a history of taking antidepressants in the past, she denied feeling suicidal, and she denied any history of suicide attempts.
- The psychiatrist decided not to start an antidepressant but recommended that CM increase the frequency of visits with her drug counselor, who also provided supportive psychotherapy.

Case 1

- CM's depressive symptoms gradually decreased over the following 2 weeks, and she continued supportive psychotherapy during her aftercare following rehab. Depressive symptoms continued to improve until they completely resolved at 3 months.

Case 1

- What was the likely cause of CM's depressive symptoms during rehab?
- Was CM self-medicating with crack to treat her depression?
- What would have made you decide to start antidepressant medications?
- Why would you choose NOT to start antidepressant medications?

Case 2

- JR is a 26-year old male who smokes marijuana daily. He does not have any formally diagnosed psychiatric history, though he reports having some depression and anxiety during his teens. JR began smoking marijuana around the time that depression and anxiety began.

Case 2

- JR entered an inpatient rehabilitation program and stopped smoking marijuana completely. After discharge, the aftercare program found him increasingly loud and angry in groups, and he was asked to leave several times for arguing with others. In his second month after rehab, JR became fully manic and required initiation of a mood stabilizer.

Case 2

- What insight does this case give you about JR's marijuana usage?
- Would you have changed your course of treatment and timing of starting medication?

Case 3

- MT is a 34-year old former computer programmer who is addicted to crack cocaine. Because of his addiction, he lost his job 3 years ago, and he has been in inpatient rehab 3 times. Every time MT goes to rehab, he is highly motivated, and he talks about wanting to work again.

Case 3

- Every time MT leaves rehab, he does well for 1–3 months, but then he relapses on cocaine. He leaves rehab with strong motivation to stay sober, but cravings eventually become so strong that he relapses.

Case 3

- After this last relapse, he entered rehab for the fourth time, but his motivation was lower. He was less excited about trying to return to work, and he was losing hope that he would ever be able to remain sober.

Case 3

- Would you consider medication for this patient?
- How would you justify your decision?

Challenges

- When should you try adding a medication?
- Is my patient depressed or anxious, or is he/she in withdrawal?
- Is adding medication like giving an addict another quick fix (like drugs)?