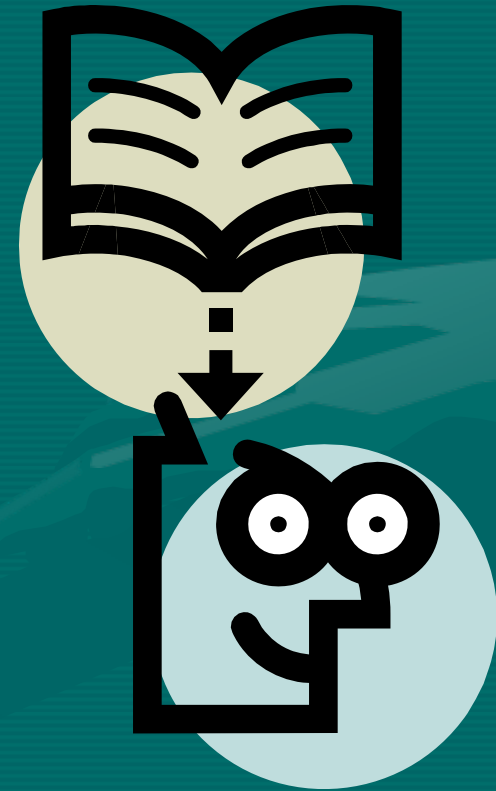


Scattered Brains: Substance Abuse and Behavior Involving the Mentally Ill

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If one has a
brain one
can
become
addicted!



London's Times Cartoons ©Rick London/S. Bennett, illustrator



Ocymoron... highly addictive drug to cure low IQ

Classification of Drugs

Drug abuse: the drug is used by choice, but in illegal, unsafe, or inappropriate times, places or situations and is harmful to the person.

Drug dependence: episodes of loss of control over use of the drug. There is the apparent inability to modify drug usage in spite of adverse consequences.

- Diabetes costs society \$131.7 billion annually
- Cancer costs society \$171.6 billion annually

Substance abuse costs our
nation more than \$484
billion annually

- In 2008 an estimate of 22.2 million people were classified with substance dependence (8.9%)
- Between 2002 and 2008 there was no change in the amount of people
- In 2008 an estimate of 2.9 million people aged 12 or older used an illicit drug for the first time
- This averages to almost 8,000 initiates per day

- Nearly 1/3 initiates were with psychotherapeutics: 22.5 % with pain relievers, 3.2 % with tranquilizers, 3 % with stimulants, and 0.8 % with sedatives
- 56.6 % report their first drug was marijuana
- Inhalants was 9.7 %
- Hallucinogens was 3.2 %

National Findings SAMHSA, OAS

Neurophysiology

The brain consist of two basic cells: the neuron and the glia. The neuron is the working cell in the brain, it sends information throughout the body via changes in an electrochemical process. Neurons are separated by synaptic spaces. Neurons transmit information through neurotransmitters-chemicals released from the neurons.



Neurotransmission, Drugs, and Behavior

Psychoactive drugs produce their effects by altering the functioning activity of the neurons and neurotransmitters by:

- increasing the release of a neurotransmitter
- directly activating the neurotransmitter receptors
- inhibiting the reuptake of the transmitter into the neuron



**School of Medicine,
Neurological Studies**

no brain, no gain

London's Times

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Stimulants

Individual drugs: cocaine,
methamphetamine



Common terms: coke, blow, candy, crack,
jack, jimmy, rock, nose candy, whitecoat,
crank, bennies, uppers, meth, crystal, ice

Legal Stimulants

- Amphetamines:
Adderall, Dexedrine,
Ephedrine, Ritalin,
Concerta
- These medications are
used for ADHD and
weight loss.
- When abused, effects on
behavior are the same as
illegal stimulants.



History of Cocaine

- Important to the natives of South America in their daily lives
- They chewed (and continue to do so) cocaine for alertness and to increase their endurance for the high altitude
- Spaniards attempted to stop the practice with the Inca's but found they worked harder with the cocaine
- In America, cocaine was in Coca-Cola, banned in the early 1900's
- Sigmund Freud helped popularize the use of cocaine in Europe.



How cocaine is used today?

- Used in pure form for local anesthetic effect
- Illegally: powdered form that is usually diluted with other white powder i.e. cornstarch, talcum powder, or mannitol
- It is either snorted or dissolved for injection
- Crack is formed by boiling cocaine powder with sodium bicarbonate (baking soda) and becomes hard.

Distribution of Cocaine in the Body

- Absorbed quickly due to the vascular constriction
- Often snorted, generally reaching a peak after 30 minutes
- If inhaled (crack), maximum levels occur in 1-2 minutes
- The rapid rise leads to rapid fall in approximately 40 minutes
- This begins a vicious cycle where the person craves more of the drug

Stimulants and Behavior

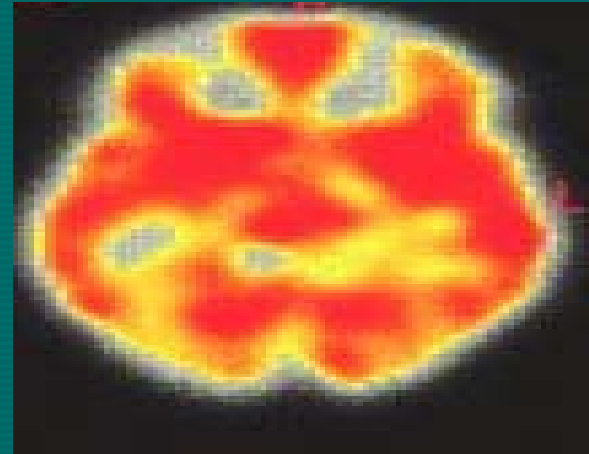
- Cause a sense of energy
- Alertness
- Talkative
- Pleasurable well-being
- Sympathetic nervous system stimulation
- Increased heart rate and blood pressure
- Psychomotor agitation
- Feelings of euphoria followed by feelings of paranoia

How stimulants work!

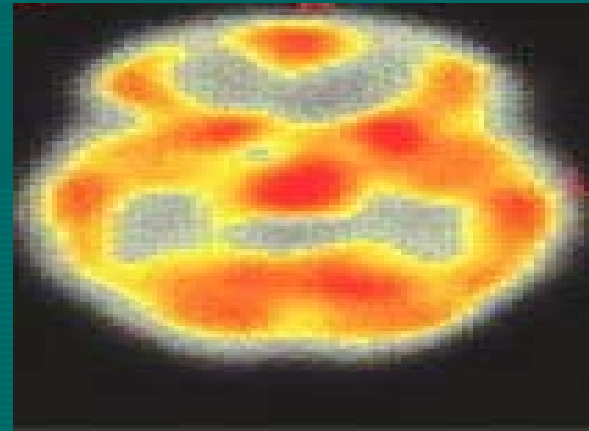
- It increases the monoamine neurotransmitters in the synapse
- They fire all at once
- Increases the sympathetic nervous system-increasing the fight or flight response
- Prepares the body for physical activity-norepinephrine response
- Hits dopamine which activates the pleasure center
- Serotonin which is involved in the regulation of sleep and mood

Stimulants and Blood

Healthy Control



Cocaine Dependent



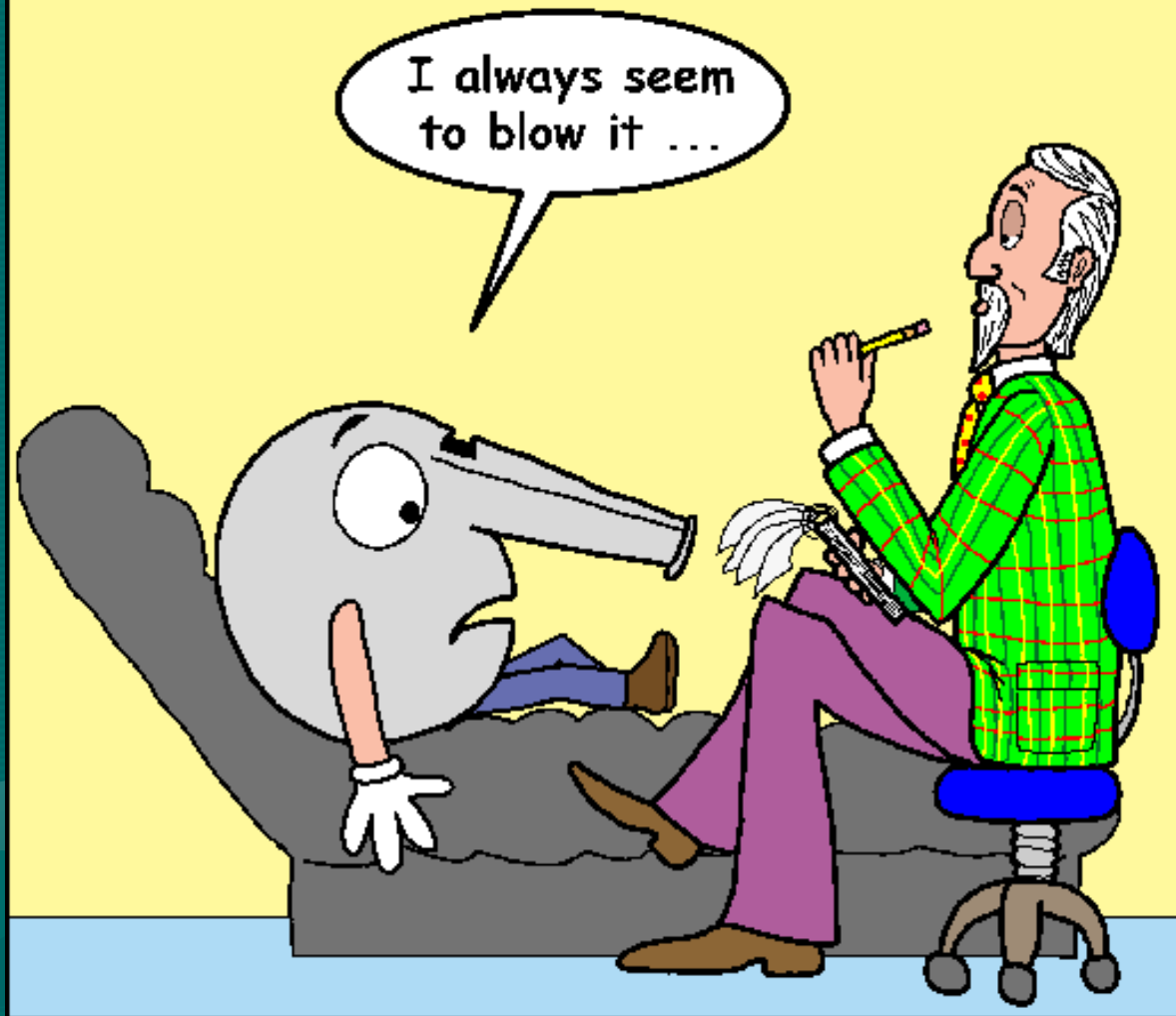
Gottschalk, 2001, American Journal of Psychiatry

Chronic Abuse of Stimulants

- Toxic psychosis-looks like Schizophrenia
- Confusion
- Disorganized behavior
- Paranoia
- Hallucinations
- Delusions
- Weight loss
- Skin ulcers

Withdrawal of stimulants

- Not life-threatening
- People crash after a long run
- Excessive sleep
- Inability to feel pleasure
- Anhedonia
- Longtime users can crave the drug for months to years after last usage



Sedatives

Drug class: sedative,
hypnotic, and
anxiolytic

Alcohol, marijuana



Alcohol: It is socially acceptable!

- Alcohol is probably the world's oldest drug
- Historically it has been known as a food, nutrient, palliative, and today as a drug.
- It is toxic to almost the entire body, effecting the brain, liver, heart, gut, pancreas, and fetus.
- Yet, people still drink gallons of it.

Why do people drink?

- Currently, more than 80% of high-school age Americans have tried alcohol
- 5-10 percent of this group drink to intoxication on a regular basis
- Moderate drinking has been defined by the Department of Agriculture as one drink for women per day and two drinks for men per day.
- There are more male than female alcoholics, 3:1
- Recently, women are abusing alcohol more.

Alcohol and Behavior

Hourly Rate of Intake

Function Impairment

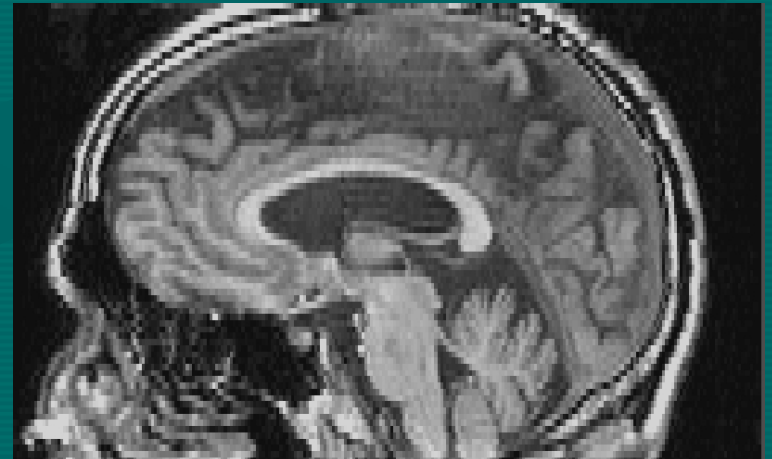
1-4 oz	judgment, fine motor coordination, reaction time
4-12oz	motor coordination, reflexes
12-16oz	voluntary responses to stimulation
16-24oz	sensation, movement and self protective reflexes
24-30oz	breathing and heart function

Shrinkage: Ventricles and Cerebellum

Healthy Control



Alcoholic



Withdrawal from Alcohol

Early stage (1-4 days)

- flu like symptoms
- tremors-"heebie jeebies"
- profound anxiety
- insomnia
- irritability
- tachycardia
- transient visual and/or tactile hallucinations
- seizures

Late stage (1-7 days)

- persistent hallucinations
- cognitive impairment
- agitation
- delirium tremens
- hypotension
- diaphoresis
- fever

Marijuana: The Illegal Recreation

- Marijuana is addicting: yet there is no known lethal dose in humans
- Far less toxic to humans than alcohol or nicotine
- In some states used legally for treatment of AIDS and cancer patients.



History

- In 2737 BC described in China as a “superior herb” and prescribed to treat rheumatism, malaria, bowel disorders, “female weakness,” and absent mindedness.
- Also used in other countries to treat dysentery, sunstroke, indigestion, reduced appetite, speech impediments, and for “alertness and gaiety of the mind.”
- George Washington grew *Cannabis sativa* on his Virginia farm (probably to make hemp rope).

What is marijuana?

- A plant that grows best in warm climates.
- Most common route of ingestion is through the pulmonary system.
- Usually called “joints, bones, roaches”
- Can be taken orally through food “brownies” or Marinol.



How does marijuana get to the brain?

- Cannabis is usually smoked in a joint
- Can be eaten-to get the psychoactive response you need to have 2-3 times amount of the drug
- Lungs are more efficient in getting the response and transporting the drug thus a more rapid onset
- Generally, the greatest onset of effect is 20-30 minutes after smoking

Marijuana and Behavior

- Mood lift
- Relaxation
- Creative thinking
- Heightened sensations
- Pleasant body feelings
- Pain relief
- Reduced nausea
- Increased appetite
- Mental slowness
- Physical tiredness
- Losing train of thoughts
- Respiratory problems
- Agitation
- Headaches
- Paranoia
- Apathy
- Loss of motivation
- Decreased productivity

Tolerance and Withdrawal

- Little research to indicate negative withdrawal effects-thus low abuse or addiction potential
- Abrupt stoppage can cause insomnia, irritable mood, nausea and drug cravings
- Withdrawal can interfere with serotonin system which can interfere with mood changes
- Cannabinoids can enhance dopamine levels thus increasing the addiction potential

Anxiolytics

- Drugs used to treat anxiety symptoms: fearfulness, palpitations, dizziness, excessive worry, sweating, fear of dying, paresthesia, feelings of impending doom
- Benzodiazepines: Xanax, Valium, Klonopin, Ativan, Librium, Tranxene
- Buspar, SSRI's

How do Benzo's Work

- Benzodiazepines interact with receptors on neurons that use the neurotransmitter gamma-aminobutyric acid (GABA)
- Effectiveness can occur as quickly as thirty minutes
- They have a half-life from about 2-10 hours, depending upon the particular drug and other factors.
- Caffeine can block the receptor sites keeping the benzo effect from working

Abuse and Dependence

- In general population, use of benzodiazepines, does not cause a significant problem.
- At therapeutic doses, there can be withdrawal
- Withdrawal symptoms can begin 4-8 days after last dose of drug and can continue for several days
- Withdrawal symptoms include anxiety, sleep problems, weight loss, unsteady gait, seizures, sensitivity to bright lights and noise.
- Long-term usage-unsure of cognitive effects

Benzodiazepines and Behavior

- Reduce anxiety
- Impair aspects of mood and decrease cognition
- Suppress the learning process
- Lightheadedness
- Vertigo
- Poor muscle coordination
- Nightmares
- Use/abuse can cause amnesia-Rohypnol

Substance Abuse and the Mentally Ill

Mental illnesses include such disorders as schizophrenia, major depressive disorder, obsessive-compulsive disorder, panic and severe anxiety disorders, attention deficit/hyperactivity disorder, borderline personality disorder, and other severe and persistent mental illnesses that affect the brain.

Facts about Mental Illness

Mental Illnesses

- are biologically based brain disorders
- fall along a continuum of severity
- are the leading cause of disability
- strike individuals in the prime of their lives
- without treatment, the consequences for the society and the individual is staggering
- has a stigma that erodes confidence that mental disorders are real, treatable health conditions

Statistics

- Estimated 26.2 % of Americans age 18 and older-1 out of 4-have a diagnosable mental illness
- 2004 census translates that to 57.7 million people
- Mental disorders are the leading cause of disability in the U.S. and Canada for ages 15-44
- Nearly half suffer from 2 or more disorders

- Data developed by the massive Global Burden of Disease study reveal that mental illness including suicide, accounts for over 15% of the burden of disease

What that means!!!

- Mental illness is more a burden of disease than all cancers.

Treatment and Recovery

- The best treatments for serious mental illnesses today are highly effective
- Between 70-90% of individuals have significant reduction of symptoms and improved quality of life with a combination of pharmacological and psychosocial treatments
- Early identification of illnesses is imperative
- Early treatment accelerates recovery and the brain is protected from further harm

Mental Illness and Substance Abuse

- 50% of individuals with severe mental illness are affected by substance abuse
- 37% of alcohol abusers and 53% of drug abusers also have at least one serious mental illness
- Of people diagnosed with mental illness, 29% abuse either alcohol and/or drugs
- 47% of individuals with schizophrenia also had a substance abuse disorder (more than 4 times the general population)
- 61% of individuals with bipolar disorder also had substance abuse disorder (more than 5 times the general population)

Consequences of Dual Diagnosis

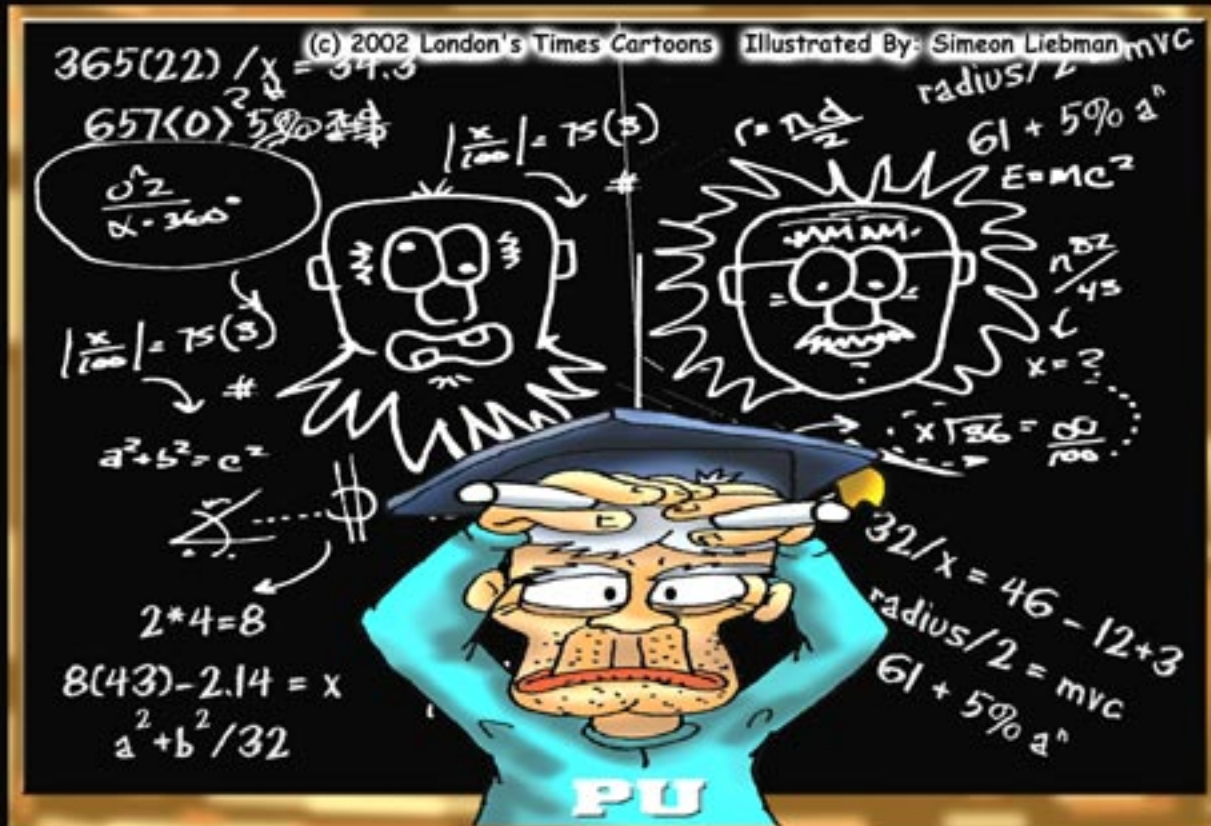
- greater propensity for violence
- medication noncompliance
- increased failure to respond to treatment
- overall poorer functioning
- greater chance of relapse
- tend to have tardive dyskinesia
- experience more episodes of psychosis

People with serious mental disorders
and substance abuse face
enormous problems for treatment.



Problems

- Mental health facilities tend to not be well prepared to deal with patients who have both afflictions
- Often only one of the two problems is identified
- Often the individual is bounced back and forth between services for mental illness and substance abuse
- Sometimes they are refused treatment by each of them
- Fragmented and uncoordinated services create a huge service gap for persons with dual diagnosis



Dr. Berkowitz discovers the fine line between madness and genius.

What is integrated treatment?

- Treatment consists of the same health professionals working in one setting
- Caregivers ensure that interventions are bundled together
- Consumers receive consistent treatment with no division between mental health and substance abuse assistance

Recovery Stoppers

- Provider must realize that denial is an inherent problem
- Individuals lack insight as to the seriousness and scope of the problem
- Insisting abstinence as precursor to treatment
- Using a moralistic approach versus an illness approach-careful of pure AA and/or NA approaches with persons with mental illness

Key Factors for Effective Integrated Treatment

- Stages of treatment
- Establish trust
- Assist consumers with goal attainment
- Educate about illness and substance abuse
- Intensive case management
- Going to the consumer's home
- Assist consumer to develop positive coping skills
- Teach how to develop healthy relationships

Key Factors for Effective Integrated Treatment

- Social support is critical
- Recovery is a long-term community based process-encourage successes
- Teach consumers stress management
- How to use social networks and obtain jobs
- Support pharmacological treatment for mental illness (remember hardcore AA treatment often involves no meds)

Pharmacological Treatment

- Antidepressants
- Mood stabilizers
- Anti-psychotics
- Anxiolytics



c1999 Michal Tkaczyk/Rick London

London's Times



IT WAS BOUND TO HAPPEN

Wizard of Oz

Remember the infamous saying
from the scarecrow:

“If I only had a brain....”



Resources

- Recreation Drug Information Site:
www.a1b2c3.com/drugs/
- The Drugs Forum: www.drugs-forum.com/
- The Daily Dose of Drug and Alcohol News:
www.dailydose.net
- National Alliance for Mentally Ill:
www.nami.org
- The US National Institute for Alcoholism:
www.niaaa.nih.gov/
- The International Association for Cannabis as Medicine: www.acmed.org

Resources

- National Institute on Drug Abuse,
<http://archives.drugabuse.gov>
- SAMHSA, OAS: Results from the 2008,
NSDUH: National Findings;
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