

# Magic mushroom

Dr.MH.Novin

MD. MPH. PhD

## DEFINITION

- ▶ Hallucinogens, by definition, are intoxicants.
- ▶ Hallucinogens are natural and synthetic substances that are variously called **psychedelics or psychotomimetics** because, in addition to inducing hallucinations, they produce a loss of contact with reality and an experience of expanded and heightened consciousness.
- ▶ The classic, naturally occurring hallucinogens are psilocybin (from some mushrooms) and mescaline (from peyote cactus); others are harmine, harmaline, ibogaine, and dimethyltryptamine (DMT).

## DEFINITION

- ▶ The classic synthetic hallucinogen is **LSD**, synthesized in 1938 by Albert Hoffman.
- ▶ Some researchers classify the substituted or so-called designer amphetamines, such as 3,4-methylenedioxyamphetamine (**MDMA**), as hallucinogens.
- ▶ Phencyclidine (**PCP**), also known as angel dust, was first developed as a novel anesthetic in the late 1950s .
- ▶ This drug and the closely related compound **ketamine** were termed dissociative anesthetics, because they produced a condition in which subjects were awake but apparently insensitive to, or dissociated from, the environment.

# DEFINITION

- ▶ Hallucinations are usually **visual, often of geometric forms** and figures, but auditory and tactile hallucinations can occur. The sense of self is much changed, sometimes to the point of depersonalization, merging with the external world to the point of feeling separation of oneself from one's body.
- ▶ The hallucinogens are classified **as Schedule I** controlled substances; the US FDA has decreed that they have no medical use and high abuse potential.

## Psychological effects



**Table 4-38**

### **Psychological Effects of Hallucinogens**

Heightened perceptions (richer colors, sharpened contours, richer responses to music, smells or tastes)

Synesthesia

Changes in body image

Alterations in time and space

Intense, labile emotions

Suggestibility

Either sensitivity or detachment from others

Awareness of internal organs

The recovery of lost early memories

The release of unconscious material in symbolic form

Regression and the apparent reliving of past events, including birth

Introspective reflection and feelings of religious and philosophical insight

Depersonalization

Derealization

Anxiety, panic attacks

Flashbacks (hallucinogen-persisting perception disorder)

Mood disorders

Anxiety disorders

Psychosis

Delirium

## Magic mushroom

- ▶ An unusual collection of **tryptamines** has its origin in the world of fungi. The natural prototype is **psilocybin** itself.
- ▶ As many as 100 species of mushroom, mainly of the *Psilocybe* genus contain psilocybin or related homologs.
- ▶ People usually ingest psilocybin as mushrooms. In the United States, large *Psilocybe cubensis* (gold caps) grow in Florida and Texas.
- ▶ The tiny *Psilocybe semilanceata* (liberty cap) grows in lawns and pastures in the Pacific Northwest.

# Magic mushroom

- ▶ Psilocybin mushrooms are used in religious activities by Mexican Indians. They are valued in Western society by users who prefer to ingest a mushroom rather than a synthetic chemical. Of course, one danger of eating wild mushrooms is misidentification and ingestion of a poisonous variety.
- ▶ Psilocybin remains active when the mushrooms are dried or cooked into foods.
- ▶ Psilocybin is usually **ingested** as mushrooms. Many species of psilocybin-containing mushrooms are found worldwide



# Pharmacology

- ▶ Feelings of euphoria and subsequent sensory distortion develop within 30 minutes to 2 hours after ingesting these mushrooms and are commonly associated with mild tachycardia and dilated pupils. Frank hallucinations may also occur.
- ▶ The duration of symptoms is typically 4 to 12 hours after mushroom consumption.
- ▶ The typical recreational dose of psilocybin is 10 to 50 mg, which corresponds to 20 to 30 g of fresh mushrooms or 1 to 2 g of dried mushroom powder.

# Pharmacology

The neurobiology of hallucinogenic compounds is complex and involves the interaction of numerous neurotransmitters, including **serotonin (5-HT), dopamine, and glutamate.**

The exact mechanism underlying hallucinations is not known, but a property common to most of the drugs in this class is their ability to bind **5-HT<sub>2A</sub> receptors.**

This serotonergic activity may cause serotonin syndrome, which has been associated with LSD and a number of other hallucinogens.

**Tolerance** for LSD and other hallucinogens develops rapidly and is virtually complete after 3 or 4 days of continuous use.

# N,N-dimethyltryptamine (DMT).

- ▶ Although not originating from mushrooms, another analog of psilocybin is N,N-dimethyltryptamine (DMT).
- ▶ Many plants contain this substance, which is also found normally in human biofluids at very low concentrations.
- ▶ When DMT is taken parenterally or by sniffing, a brief, intense hallucinogenic episode can result.
- ▶ As with mescaline, DMT is one of the oldest, best documented, but **least potent of the tryptamine hallucinogens.**

# 10 COMMON MAGIC MUSHROOMS

## ▶ 1. Psilocybin Semilanceata

These magic mushrooms are also popularly known as **liberty caps** due to their characteristic large caps. They are among **the most potent magic** mushrooms in the world. They mostly grow in North America and Europe. You can find them in meadows and pastures.



## ▶ 2. *Psilocybe Cubensis*

known as the golden teacher because of their characteristic deep (for young ones) to light brown color (for mature ones). They are **the most well-known** magic mushrooms.

they are mostly found in tropical areas in the world, such as **Southeast Asia**, Thailand, Vietnam, Cambodia, and India.



### ▶ 3. **Psilocybe Mexicana**

these magic mushrooms are mostly found in Mexico and South and Central America.

They look a lot like the *Psilocybe Semilanceata* with large bell-shaped caps.

However, their caps are light brown compared to the darker liberty caps.



#### ► 4. *Psilocybe Cyanescens*

These mushrooms are popularly known as **wavy caps** because they have large wavy caps.

When they are fresh, they have a caramel-like brown color, but they become pale, almost yellowish as they dry.

*Psilocybe Cyanescens* grow in western and central Europe, New Zealand, North America, and parts of **the Middle East**.



▶ **5. Psilocybe Azurescens**

They are known as the flying saucer mushroom because of their large, saucer-like caps.

These are **extremely potent magic** mushrooms.

They are naturally found in a small part of the West coast of the United States.



## ▶ 6. Psilocybe Tampanesis

Also known as the **magic truffles** or the **philosopher's stone**.

These are popular in the Netherlands.

They are called the philosopher's stones because they are believed to make one **profoundly thoughtful**.



## ▶ 7. Copelandia Cyanescens

These mushrooms are popularly known as **Blue Meanies**.

While they are not part of the Psilocybe species,

they are among **psychedelic mushrooms with the highest potency.**



## ▶ 8. *Psilocybe Caerulescenes*

The landslide mushrooms, also known as “derrumbes,” are small mushrooms with a silvery luster.

They **have low-moderate psilocybin** potency and are preferred by people who are looking for a gentle and short psychedelic trip.



## ► 9. *Psilocybe Caerulipes*

These mushrooms are also known as **blue foot mushrooms**, as they are bluish at the base of their stems.

They are a very rare type of magic mushroom found in the US and parts of Canada.

They grow near rivers on hardwood logs in the summer and fall.



## ▶ 10. *Psilocybe Baeocystis*

Also known as **knobby tops**, **bottle caps** or **olive caps**, these mushrooms have thin, cone-shaped medium-sized caps rippled on the edges. These mushrooms grow on lawns with high lignin content, mulch, and wood chips. They also like to grow under other trees.







## . Substance related disorders

### ❖ Substance induced disorder

I. Intoxication

II. Withdrawal

III. Substance/medication-induced mental disorder

### ❖ Substance use disorder

# ***SUBSTANCE USE DISORDER DSM-5***

- ▶ 1. Taking the substance in larger amounts or for/longer than you meant to.
- ▶ 2. Wanting to cut down or stop using the substance but not managing to.
- ▶ 3. Spending a lot of time getting, using, or recovering from use of the substance.
- ▶ 4. Cravings and urges to use the substance.
- ▶ 5. Not managing to do what you should at work, home, or school, because of substance use.
- ▶ 6. Continuing to use, even when it causes problems in relationships.
- ▶ 7. Giving up important social, occupational, or recreational activities because of substance use.
- ▶ 8. Using substances again and again, even when it puts you in danger.
- ▶ 9. Continuing to use, even when you know you have a physical or psychological problem that could have been caused or made worse by the substance.
- ▶ 10. Needing more of the substance to get the effect you want.
- ▶ 11. Development of withdrawal symptoms, which can be relieved by taking more of the substance.

# Hallucinogen use disorder

- ▶ Long-term hallucinogen use is uncommon. Some long-term users of PCP are said to be “crystallized,” a syndrome characterized by dulled thinking, decreased reflexes, loss of memory, loss of impulse control, depression, lethargy, and impaired concentration. **Although psychological dependence occurs, it is rare**, in part because each LSD experience is different and in part because there is no reliable euphoria.

# Hallucinogen intoxication

The hallmarks of hallucinogen intoxication are maladaptive behavioral and perceptual changes, along with particular physiologic signs.



**Table 20.5-2**  
**Physiological Changes from Hallucinogens**

---

1. Pupillary dilation
  2. Tachycardia
  3. Sweating
  4. Palpitations
  5. Blurring of vision
  6. Tremors
  7. Incoordination
-

# Hallucinogen intoxication

- ▶ Behavioral disturbances sometimes are severe; they can include inappropriate laughing, stripping off clothes, violence, urinary incontinence, crying, and public masturbation. Patients frequently have amnesia for the entire period of the psychosis.

# Hallucinogen intoxication treatment

- ▶ The preferred treatment for hallucinogen intoxication is talking down the patient; during this process, guides can **reassure patients** that the symptoms are drug induced, that they are not going crazy, and that the symptoms will resolve shortly.
- ▶ In the most severe cases, dopaminergic antagonists-for example, haloperidol or benzodiazepines-for example, diazepam can be used for a limited time.
- ▶ Patients may need **gentle restraint** if they present a danger to themselves or others, but clinicians should avoid restraints if possible.

# TREATMENT

- ▶ Hallucinogen Intoxication :
- ▶ A basic principle in treatment is providing reassurance and supportive care. Patients experiencing intense and unpleasant hallucinogen intoxication can be helped by a quiet environment, verbal reassurance, and the passage of time.
- ▶ More rapid relief of intense anxiety is likely after oral administration of **20 mg of diazepam (Valium)** or, if oral administration presents problems, an equivalent parenteral dose of a benzodiazepine.
- ▶ Neuroleptic medications, particularly if given at **excessive doses, may worsen symptoms** and are best avoided unless the diagnosis remains unclear and behavior cannot otherwise be managed.

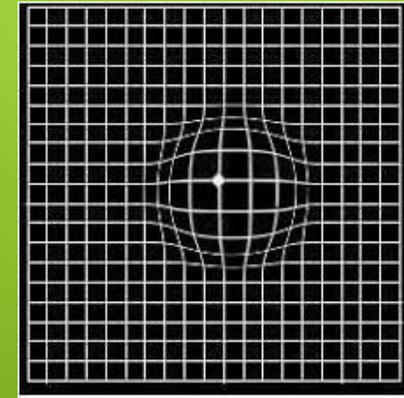
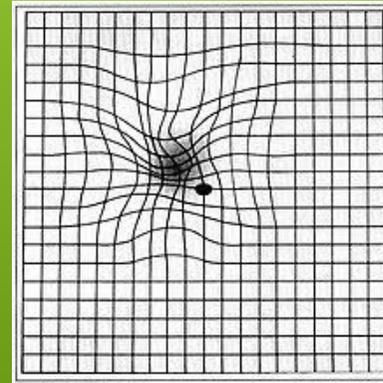
# Hallucinogen Persisting Perception Disorder

- ▶ Long after ingesting a hallucinogen, a person can experience a **flashback** of hallucinogenic symptoms. This syndrome is diagnosed as hallucinogen persisting perception disorder
- ▶ According to studies, from 15 to 80 percent of users of hallucinogens report having experienced flashbacks.
- ▶ triggers of flashback: **emotional stress; sensory deprivation**, such as monotonous driving; or **use of another psychoactive** substance, such as alcohol or marijuana.

# Hallucinogen Persisting Perception Disorder

- ▶ Most flashbacks are episodes of visual distortion, **geometric hallucinations**, hallucinations of sounds or voices, false perceptions of movement in peripheral fields, flashes of color, trails of images from moving objects, positive afterimages and halos, macropsia, micropsia, physical symptoms, or relived intense emotion.
- ▶ The episodes usually last a few seconds to a few minutes, but sometimes last longer. Most often, even in the presence of distinct perceptual disturbances, **the person has insight into the pathological nature of the disturbance.**

# macropsia, micropsia



- ▶ When diagnosing this disorder several other similar syndromes should be considered in the differential. **Migraines and seizures** can cause flashback like experiences. Posttraumatic stress disorder (**PTSD**) can also cause flashbacks. In addition, a variety of visual system abnormalities can cause perceptual problems that may resemble flashbacks.

# TREATMENT

- ▶ Hallucinogen Persisting Disorder :
- ▶ Treatment for hallucinogen persisting perception disorder is palliative.
- ▶ Pharmacological approaches include long-lasting benzodiazepines, such as clonazepam (Klonopin) and, to a lesser extent, anticonvulsants including valproic acid (Depakene) and carbamazepine (Tegretol).
- ▶ Antipsychotic agents should be used only in the treatment of hallucinogen-induced psychoses, because they may have a paradoxical effect and exacerbate symptoms.
- ▶ A second dimension of treatment is behavioral.

- ▶ The second dimension of treatment is behavioral. We should instruct the patient to avoid gratuitous stimulation in the form of **OTC drugs, caffeine, and alcohol, and avoidable physical and emotional stressors**. **Marijuana** smoke is a particularly strong intensifier of the disorder, even when **passively inhaled**.
- ▶ Finally, three comorbid conditions are associated with hallucinogen persisting perception disorder: panic disorder, major depression, and alcohol use disorder. All these conditions require primary prevention and early intervention.

# Hallucinogen Intoxication Delirium

- ▶ Hallucinogen intoxication delirium is a relatively rare disorder beginning during intoxication in those who have ingested pure hallucinogens.
- ▶ Hallucinogens are often mixed with other substances, however, and those other substances or the subsequent drug–drug interactions can also cause delirium.

# Hallucinogen- Induced Psychotic Disorders

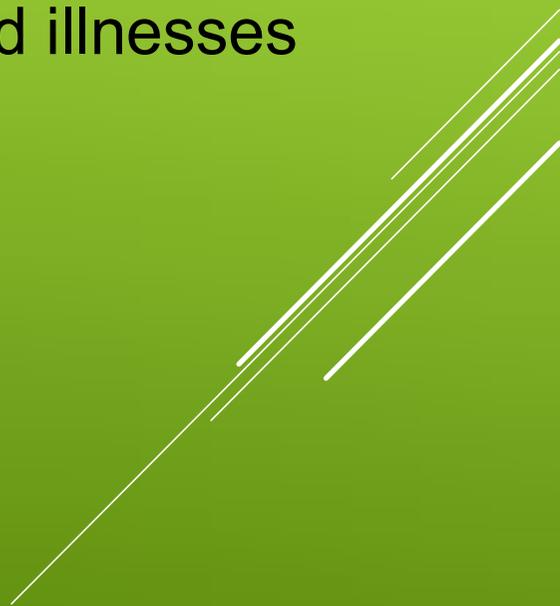
- ▶ If psychotic symptoms are present in the absence of retained reality testing, a diagnosis of hallucinogen-induced psychotic disorder may be warranted.
- ▶ The most common adverse effect of LSD and related substances is a "bad trip," an experience resembling the acute panic reaction to cannabis but sometimes more severe; a bad trip can occasionally produce true psychotic symptoms.
- ▶ Occasionally, the psychotic disorder is prolonged, a reaction thought to be most common in persons with preexisting schizoid personality disorder and prepsychotic personalities or much anxiety.

# Hallucinogen- Induced Psychotic Disorders

- ▶ Occasionally, a protracted psychotic episode is difficult to distinguish from a classic psychosis, such as from schizophrenia. Whether a chronic psychosis after drug ingestion is the result of drug ingestion, or is a combination of both the drug ingestion and predisposing factors is currently unanswerable.

# TREATMENT

- ▶ Hallucinogen-Induced Psychosis :
- ▶ **In addition to antipsychotic medications**, a number of agents are reportedly effective, including lithium carbonate, carbamazepine, and electroconvulsive therapy.
- ▶ as opposed to schizophrenia , patients with hallucinogen induced psychosis exhibit the positive symptoms of hallucinations and delusions.

- ▶ Also important are supportive, educational, and family therapies. The goals of treatment are the control of symptoms, minimal use of hospitals, daily work, the development and preservation of social relationships, and the management of comorbid illnesses such as alcohol use disorder.
- 

# Hallucinogen- Induced Mood Disorder

- ▶ Abusers may experience manic-like symptoms with grandiose delusions or depression-like feelings and ideas or mixed symptoms.
- ▶ the symptoms of hallucinogen induced mood disorder usually resolve once the drug has been eliminated from the person's body.

# Hallucinogen- Induced Anxiety Disorder

- ▶ patients with hallucinogen-related disorders frequently report panic disorder with agoraphobia. Anxiety is probably the most common symptom causing a PCP-intoxicated person to seek help in an emergency room.

# Psilocybin and depression

- **Highly resistant and refractory depression**
  - **Investigational therapies**
  - **Randomized clinical trials**
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, set against a green background.

**Trial of Psilocybin versus Escitalopram for Depression.**

AU

Carhart-Harris R, Giribaldi B, Watts R, Baker-Jones M, Murphy-Beiner A, Murphy R, Martell J, Blemings A, Erritzoe D, Nutt DJ

SO

N Engl J Med. 2021;384(15):1402.

**Effects of Psilocybin-Assisted Therapy on Major Depressive Disorder: A Randomized Clinical Trial.**

AU

Davis AK, Barrett FS, May DG, Cosimano MP, Sepeda ND, Johnson MW, Finan PH, Griffiths RR

SO

JAMA Psychiatry. 2021;78(5):481.

**Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial.**

AU

Griffiths RR, Johnson MW, Carducci MA, Umbricht A, Richards WA, Richards BD, Cosimano MP, Klinedinst MA

SO

J Psychopharmacol. 2016;30(12):1181.

Thanks for your attention

