



HARVARD UNDERGRADUATE

CBE

Psychedelic Therapies for Mental Health

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CBE Team Introduction



Harvard Undergraduate CBE represents a diverse range of backgrounds and interests within its members. We are excited to present the findings of our Think Tank's research!



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Executive Summary



This presentation examines the landscape of psychedelic therapies used for mental health, providing a comprehensive overview of their medical uses and associated risks, the top competitors in an emerging market, and current barriers.

	Psychedelic	Actions Taken and Key Findings
	Ketamine	<ul style="list-style-type: none">• Ketamine, historically used as an anesthetic, is now used to treat Treatment Resistant Depression, which shows high effectiveness despite the lack of FDA approval for its psychotherapy usage.• The Schedule III drug requires compliance to strict regulations due to side effects of hallucination and long-term health risks. Insurance often doesn't cover treatment due to lack of FDA approval.
	LSD	<ul style="list-style-type: none">• LSD is a powerful synthetic hallucinogen that shows strong potential for reducing anxiety when paired with psychotherapy in clinical settings, though this is considered highly experimental.• Access as a Schedule I Drug is highly limited; future expansion depends on regulatory approval, safe clinical frameworks, and large-scale controlled studies confirming efficacy and safety.
	MDMA	<ul style="list-style-type: none">• MDMA is an entactogen that works by inhibiting reuptake of serotonin and releasing it along with other neurohormones such as dopamine and norepinephrine• The drug has shown promise as a treatment for PTSD, but it remains a Schedule I Drug and the FDA recently denied approval for MDMA-therapy due to blinding issues in the phase III trial.
	Psilocybin	<ul style="list-style-type: none">• Psilocybin, a prodrug of psilocin, is a non-selective agonist of serotonin receptors found in over 200 mushrooms and is primarily used to treat anxiety disorders - though new uses have emerged for addition, PTSD, anorexia, and more.• Psilocybin is still a schedule I drug but has been seeing increased research into its medical applications. Currently psilocybin treatment is legal in Oregon, Colorado, and New Mexico.



Section 1: Overview of Psychedelic Therapies

Section 2: Market and Competitor Analysis

Section 3: Access and Barriers

Overview of Psychedelic Therapies



This section provides an overview of the four main psychedelics considered for therapeutic use, outlining their biological mechanisms of action, drug history, associated indications, and potential safety concerns.

Section 1: Mechanisms of Action and Drug History

Section 2: Clinical Indications and Safety Concerns

Ketamine



Ketamine is a dissociative anesthetic and Schedule III controlled substance that is used for extreme mental health conditions. It has been used for over 60 years and directly impacts the glutamate and mTOR pathways.

About Ketamine

- Ketamine reduces symptoms of **depression, anxiety, Post-Traumatic Stress Disorder** and **pain conditions** such as Complex Regional Pain Syndrome.
- Ketamine increases **neural connectivity** and **neuroplasticity**.
- It has helped **70%** of people with **mood disorders**, even if they didn't react to other treatments.

Biological Function

- Ketamine affects the **glutamate pathway** by binding to the **NMDA receptor protein** on cell membranes and **blocking glutamate** from binding there.
- Ketamine also acts on the **mTOR pathway**, the **AMPA receptor**, and the **opioid receptors** in the brain.

Usage in the Past

- Ketamine was used as a **clinical** and **surgical anesthetic** in the 1960s.
- Ketamine was the most widely-used **dissociative** and **battlefield anesthetic** during the Vietnam War (1970).
 - Ketamine provided **immediate pain relief** without respiratory issues.
- Ketamine had **hallucinogenic risks** and was used in underground **psychedelic therapy** in the late 1970s.
- Its rise in **recreational use** in the 1990s led to stricter medical regulations.
- In 2000s, labs worked to use ketamine to **alter the brain's** levels of serotonin, norepinephrine, and dopamine.

Usage in the Present

- Ketamine is still **widely used** for **anesthesia** and **acute pain** in surgical, operative, and emergency trauma settings.
- Ketamine is now used against **mental illnesses** including treatment-resistant depression in the form of **esketamine**.
- Under medical supervision, ketamine helps people with PTSD **disconnect** from their **emotions** and **better process traumatic experiences**.
 - 80% of patients enjoy a better quality of life overall post-treatment.
- The number of patients with a ketamine prescription increased **5.47 times** from 2017 to 2022.

Key Takeaway

Despite ketamine's misuse and potential negative effects of hallucinations, it is a very powerful drug in mental health and anesthetics.



Psychedelic Therapies: Psilocybin and LSD

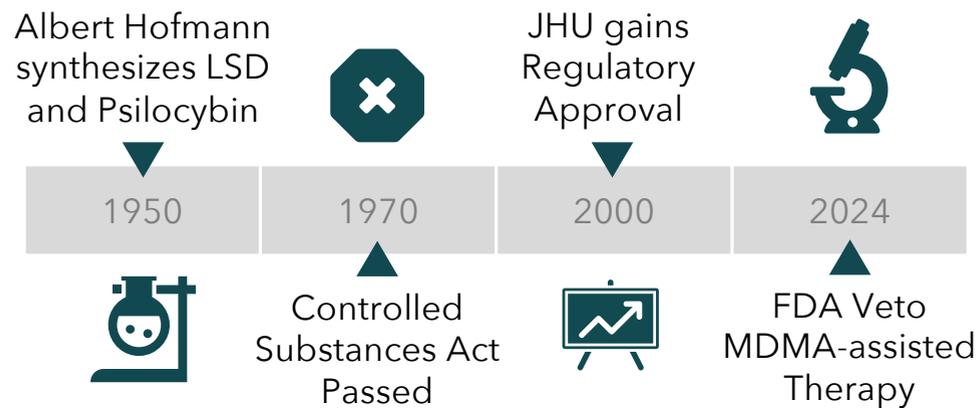
Psilocybin and LSD are psychoactive substances (also known as hallucinogens) that are designated as schedule I drugs and have become potential treatments for mental disorders, substance abuse, and post-traumatic stress after new research.

Psychedelics

Psychedelics are a class of psychoactive substances that alter cognitive processes including LSD, NBOme, DMT, Psilocybin, Ayahuasca, 2C-B, and Salvia. Widely classified as **Schedule I drugs**, psychedelics change a person's perceptions by binding to brain **cognition receptors** like serotonin, dopamine, and adrenergic.

Modern research began between 1950-1970 but **declined due its ties to counterculture**. New interest includes **\$500M** invested (2023) and research centers opening in London, Baltimore, Berkely, and Austin that study **depression, PTSD, and addiction** treatment.

Relevant Dates



LSD and Psilocybin Overview

- Psilocybin, a prodrug of psilocin, is a **non-selective agonist** of **serotonin receptors** found in over 200 mushrooms.
 - Lifetime use in adults rose from 10% to 12.1% from 2019 to 2023 and past-year use rose by 44% in young adults.
 - John Hopkins University (JHU) found Psilocybin to **relieve major depression** with structured psychotherapy.
- Lysergic acid diethylamide, derived from ergot, activates **serotonin, dopaminergic and adrenergic** receptors.
 - It induces visual and auditory hallucinations including ego dissolution, paranoia, delusions, anxiety and flashbacks.
 - LSD-derived drug MM120 **reduces anxiety**, and evidence most strongly supports LSD use for **alcohol addiction**.
- LSD is **~200 times as potent** as psilocybin - both suggest psychotherapy applications but require further research.

Therapy and Research

Mood and Mental Disorders

- Psilocybin “produces significant positive effects for depression in the **short and long term**”, compared to antidepressants that require long periods of time to take effect.
- A Sep 2025 study found receiving high does of LSD (100/200µg) improved treatment of generalized anxiety disorder compared to standard antidepressants.

Substance Use Disorders

- In 2021, JHU received the first federal grant to research the impacts of **psilocybin on tobacco addiction** after a 2016 study found **67% smokers stopped** after treatment.
- Early studies found LSD to have statistically significant benefits for decreasing alcohol misuse. Reviews affirm the potential benefit but controversial results require new tests.

Alternative Use Cases

- Psilocybin and LSD have shown **significant potential for treating PTSD**, but their unpredictable psychological effects pose as potential barriers for implementation.
- Nature Partner Journals’ Aging found consuming psilocybin extended the **cellular lifespan** of human skin and lung cells by **more than 50%**, protecting against aging.

[ADF](#), [BetterHealth](#), [Emory](#), [JHU](#), [LEK](#), [Nature](#), [NIH \(I\)](#), [NIH \(II\)](#), [NIH \(III\)](#), [Psychiatrist](#)

MDMA



MDMA is a hallucinogenic and entactogenic drug that increases the amount of several neurotransmitters in synapses. The drug was popularized in the 1970s before being banned in 1985 but has recently shown promise in PTSD treatment.

MDMA Background Information

- MDMA, also commonly known as **Ecstasy or Molly**, is a stimulant similar to methamphetamine.
- Users commonly take it during **parties or raves** due to its **euphoric, hallucinogenic,** and **entactogenic** effects.
- The drug has a **schedule I classification**.
- MDMA was invented in 1912, but it has been illegal since 1985.
- The drug has shown promise for **aiding PTSD**.

Biological Mechanism of MDMA

- MDMA **enhances the release of serotonin, norepinephrine, and dopamine** in the brain, but principally norepinephrine and serotonin.
- These neurotransmitters are responsible for the feelings of happiness, euphoria, and decreased aggression that MDMA users report.
- MDMA also works to **inhibit the Serotonin Transporter Protein (SERT)**, dopamine transporter (DAT), and norepinephrine transport protein (NET) which are involved in neurotransmitter reuptake.
- When MDMA diffuses into the cell, it **reverses SERT transport** to move serotonin outside of the cell.
- When abused or used long term, MDMA has been shown to **reduce overall serotonin content in the brain** and **decrease the number of serotonin-containing cells** within the brain.

Usage of MDMA in the Present/Past

Past Usage

- MDMA was created in 1912 as a precursor for blood coagulants.
- Psychiatrists in the 1970s began using the drug in **psychotherapy** since it made their patients **more communicative** and **less fearful** of confronting their trauma.

Present Usage

- MDMA is used recreationally as it was in the 1980s and 1990s.
- The **first clinical trial** using MDMA was in the **1990s**, but it was not published.
- **Two phase-3 trials** using MDMA to assist patients started in 2021 and 2022.

Exploring the New Trial

- In 2024, the FDA **rejected Lykos Therapeutic's approval request** of its MDMA-assisted treatment for PTSD despite two phase-3 trials showing a **67% and 71% PTSD declassification rate** in the treatment group.
- The FDA cited **safety concerns** and wants additional data before approval.

7.1%

U.S Adults 18-25 who reported MDMA usage

6.8%

Lifetime frequency of PTSD in U.S. Adults

[Addictionhelp.com](https://www.addictionhelp.com), [Avens Publishing Group](https://www.avenspublishing.com), [NIH \(I\)](https://www.nih.gov), [NIH \(II\)](https://www.nih.gov), [NIH \(III\)](https://www.nih.gov), [Recovery.org](https://www.recovery.org)

Overview of Psychedelic Therapies



This section provides an overview of the four main psychedelics considered for therapeutic use, outlining their biological mechanisms of action, associated indications, and potential safety concerns.

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Esketamine for Treatment Resistant Depression (TRD)



Esketamine targets Treatment Resistant Depression by interacting with the glutamate system and works well when combined with other inhibitors. Its efficiency and growth promoting effect makes it unique from other prescriptions.

About the Disorder

- Treatment Resistant Disorder (TRD) exists when **at least two different first-line antidepressants** aren't enough to manage the condition during a depressive episode.
- TRD can develop in people who were **previously responsive** to antidepressant medications.
- **30% of patients** with **Major Depressive Disorders** have TRD.
- **Symptoms:** accelerated depressed mood, sleep disturbances, appetite changes, longer and more frequent depressive episodes, anhedonia, suicidal ideation and behavior.

Prognosis

- In nine outcome studies, TRD was **highly recurrent** with **80%** requiring multiple treatments relapsing **within a year** of achieving remission.
- The **probability of recovery** within 10 years was about **40%** for those with **more protracted illnesses**.
- TRD was associated with **poorer quality of life** and **increased mortality**.

Treatment with Esketamine

What is Esketamine?

- Esketamine is a **nasal spray** that is a **derivative** of ketamine.
- Esketamine can lead to **rapid remission** of depressive symptoms within **two hours** of taking it.
- A healthcare provider must **monitor** the patient for **at least two hours** after taking it due to risks of **sedation** and **disassociation**.

Impact of Esketamine

- Esketamine interacts with the **glutamate system** in the brain by antagonizing the **N-methyl-D-aspartate (NMDA) receptor**.
- Unlike other antidepressants, esketamine **increases levels of glutamate**.
- Esketamine has a **growth promoting effect** by **reversing chronic stress-related changes** diminishing connections between brain cells.

Combination with other Treatments

- Combination with **Selective Serotonin Reuptake Inhibitors (SSRI)**: correlated with **lower incidence of suicide attempts**.
- Combination with **Serotonin-Norepinephrine Reuptake Inhibitors**: **significantly lower rates** of all-cause mortality, hospitalization, and depression relapse compared to patients treated with esketamine + SSRI.

Ketamine Usage: Patient First-Hand Experiences



Treatment resistant depression patients often use ketamine as a last resort, which has positive effects on long-term mood and behavior despite its immediate costs of disassociation and adverse physiological reactions like headaches.

Sean



Usage and Treatment

- Sean is a PTSD patient and was persuaded by his mother to use ketamine as other drugs would not be fully effective.
- 13 Patients finding new depression treatment were recruited for qualitative study interviews. They described noticeable and concrete positive behavioral changes.

Key Takeaway

Despite all patients experiencing immediate dissociative side effects during the treatment, they think the rewards of escaping their psychological disorder is worth the risks of infusing the drug.

1 Background

Sean was a victim of a **gun-shot wound** at 9 and has dealt with **PTSD trauma, depression,** and **anxiety** since, impacting his daily life. He tried establishing **new neural pathways** through **cannabis** and **Xanax**, but these drugs were only successful to a **certain extent**.

2 Outcomes of Study

After a single session, he starts to **float** and his **brain disassociates** from his body. When he is meditating, he feels **in control** of ketamine. Right after the first infusion, he felt that he **escaped grief**.

3 Implications

If Sean gets an infusion **every month**, he would **not slip into physical depression** period. His severe depression became **mild depression** after a year of infusions. Ketamine gives us the ability to see the **good things** that are happening instead of focused completely on the negative.

13 Patients Qualitative Study

1 Background

Interviews were conducted with 6 male and 7 female **treatment resistant depression patients** who received ketamine infusions in 40-minute sessions. All participants received ketamine treatment within an **NHS trust**.

2 Outcomes of Study

Most patients reported an **initial high, enhanced perception,** and **disassociation** followed by **mood lifting** and reduction or removal of suicidal ideation and depression symptoms lasting around **3-6 days**.

3 Implications

Many experienced unusual bodily **sensations,** a sense of **peace,** disinhibition, and a sense of **altered perception** after using ketamine. However, they also reported **reduced suicidal ideation,** improved mood, clarity of thought, focus, concentration, ability to function, and reduced anxiety.

Safety Concerns of Ketamine



Ketamine leads to psychological and physical side-effects, making monitoring and screening crucial before usage. Immediate side-effects may go away within 4 hours, but long-term chronic conditions may be harder to cure.

General Impact

- Ketamine is **not FDA approved** for the **treating psychiatric disorders** because of potential **sedation, disassociation,** and **changes in vital signs. Derivatives** like esketamine and ketamine for anesthesia are **FDA approved.**
- Therapy risks can be **minimized** with **regular monitoring, personalized dosage,** integration **therapy,** and comprehensive **screening** to evaluate each patients' tolerance and necessity for the drug.

Short Term Effects

- **Immediate side effects** include drowsiness, disassociation, dizziness, disorientation, nausea, temporarily increased anxiety, numbness, blurred vision, difficulty speaking, increased heart rate and blood pressure, and headache.
- Ketamine side effects usually go away **within 4 hours,** leading to **addiction, exploitation,** and increased **tolerance** in misuse. Antidepressant effects may last **several weeks** with repeated doses.

Long Term Effects

- **Long term effects** include more chronic disorders like urinary and bladder issues, renal damage, cardiovascular concerns, potential organ failure and psychological dependence. Mood swings and memory loss are also common.
- **Ketamine abuse** can lead to **flashbacks** and trigger **psychosis** and **schizophrenia** in those predisposed to these mental health conditions. Long-term and frequent users may also experience **dissociation,** even when the effects of the drug have worn off.

Restricted Usage

- Patients **should not** use ketamine if they are pregnant, have uncontrolled high blood pressure, heart disease, history of schizophrenia or schizoaffective disorders, history of substance abuse or addiction, or have other medical conditions like liver or kidney disease.
- Ketamine **should not be used** with **other drugs** like alcohol, opioids, or cocaine as this leads to **amplified side effects.**

[GoodRx](#), [Heading Health](#), [Priory Group](#)

Therapeutic Usage of LSD – Treating Anxiety Disorders

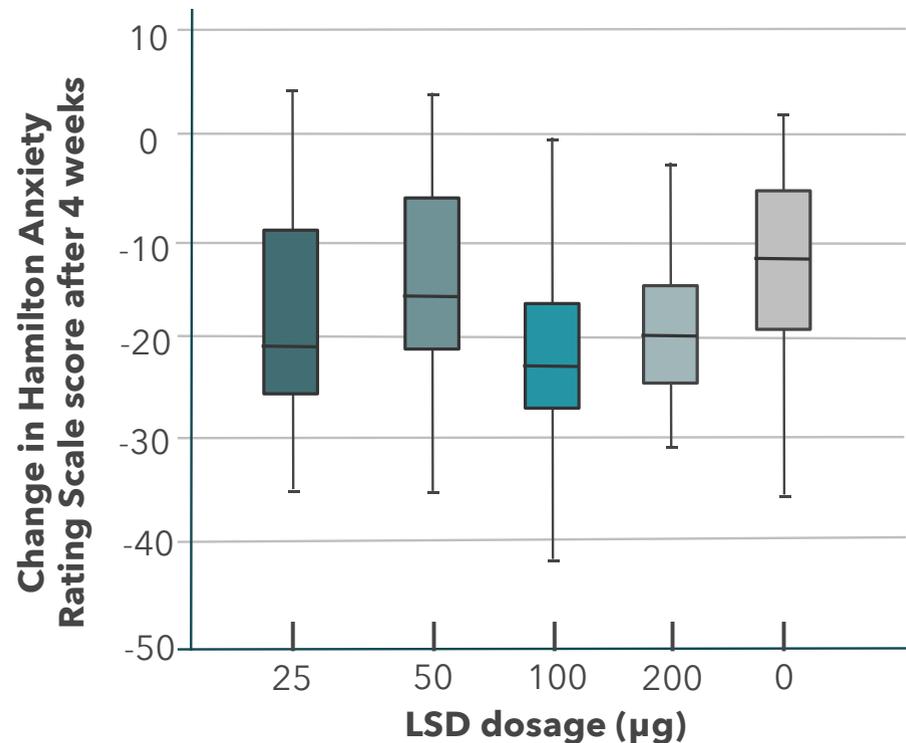


LSD-assisted therapy can reduce anxiety by altering serotonin-driven brain activity, but its intensity and risks highlight the need for standardized clinical frameworks and larger, controlled studies to confirm its safety and effectiveness.

OVERVIEW

Preliminary evidence has demonstrated the potential of LSD to reduce symptoms of anxiety disorders, as indicated in the below figure from a clinical trial published in September 2025.

Change in Anxiety Levels with LSD Dosage



Effect Mechanism

- LSD binds strongly to **serotonin receptors** in the brain, which regulate perception, mood, and emotion, to temporarily alter how **self-focused thoughts** are processed.
- This effect reduces **default mode network (DMN)** activity to decrease ruminations and increases **limbic system** communication for integrated emotional experiences.

Therapy Structure

- Participants may experience **intense perspectives** during the hours after dosage.
- Therapists **do not direct** the trip but help the stay calm amidst any difficult emotions.
- After the session, **follow-up therapy meetings** guide the participant to discuss the experience and integrate it with their goals, **turning insight into real-life change**.

Research Outcomes

- Mostly small studies suggest LSD-assisted therapy can **reduce anxiety** through **emotional breakthroughs**, helping participants feel more connected to their life.
- Participants report releasing of **suppressed emotions**, feelings of self-compassion, and **amplified introspection**, making it easier to explore **root causes** of anxiety.

Future Work

- Given LSD's intensity and potential risks, **consistent therapeutic frameworks** must be established for therapist training, informed consent, and participant protection.
- More **randomized, placebo-controlled studies** must be conducted with larger and more diverse participant groups to confirm the current findings on **safety** and **effect**.

Key Takeaway

LSD-assisted therapy represents a bold frontier in mental health treatment by transforming anxiety through emotional insight, but its future depends on harnessing its power safely in structured therapeutic settings.

[CNS Drugs](#), [Journal of the American Medical Association](#), [National Public Radio](#), [Psychology Today](#)

Therapeutic Usage of LSD – First-Hand Patient Experiences



LSD-assisted therapy can lead to profound emotional insight, self-compassion, and connection under clinical supervision, but it also carries risks of fear, confusion, or distress if not carefully managed in a controlled environment.

Positive Outcomes

- 1 Emotional Insight**
Participants often report breakthroughs in understanding their fears or traumas, describing a sense of release and clarity.
"It was almost like finding the Holy Grail and the answer to all of life's questions."
- 2 Shifts in Perspective and Behavior**
LSD can help people view reframe problems from a new angle, removing the mental block around self-forgiveness and change.
"When these little anxieties walk in this big room, they seem so little... I feel safe."
- 3 Enhanced Connection**
Many describe a lasting sense of connection to others, nature, or life itself, which can reduce senses of loneliness and depression.
"It feels good to be in my body. I've found myself taking wonderful breaths."



Key Takeaway

LSD-assisted therapy highlights how mental health care is expanding from treating symptoms to transforming perception. However, because its power to dissolve emotional barriers is matched by risk of psychological overwhelm, the potential for neuroplasticity must be handled cautiously.



Negative Outcomes

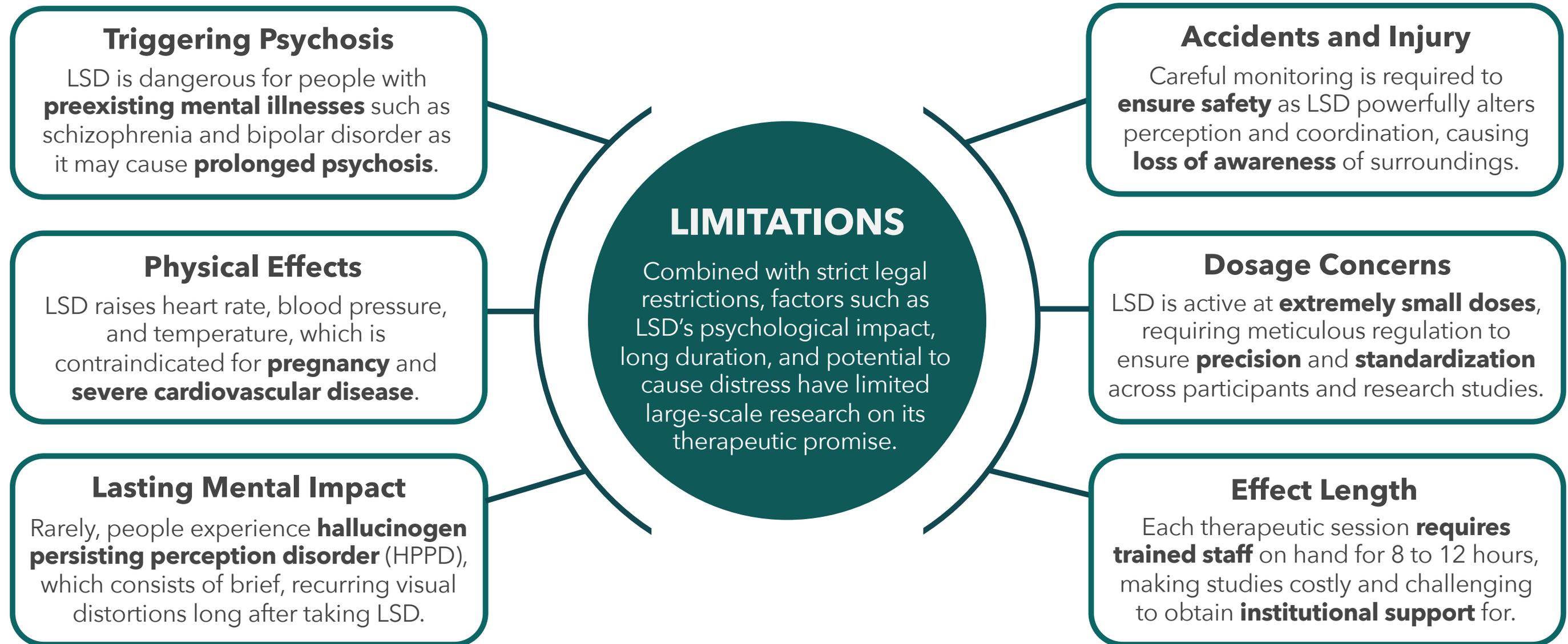
- 1 Unpredictable Effects**
Even for experienced users, LSD can trigger intense fear, confusion, or panic amidst a trip that requires therapist support to mitigate.
"I was convinced that I had become psychotic and would never get well again."
- 2 Emotional Distress**
Some may experience lingering anxiety, disorientation, or rare flashbacks (HPPD) after the hallucinogenic effects wear off.
"...you're stuck in your head, and it's even worse when you know that you're stuck."
- 3 Difficulty Comprehending**
After treatment, participants may find it confusing or frustrating to make sense of their experience without adequate support.
"I got really nervous that this was going bad... I thought that there was no way back."

[Cleveland Clinic Journal of Medicine](#), [Frontiers in Pharmacology](#), [International Journal of Drug Policy](#)

Safety Concerns of LSD



While LSD shows significant therapeutic promise, its relatively unpredictable physiological and psychological effects emphasize the need for strict medical supervision and controlled environments in safe, favorable research outcomes.



Drug Enforcement Administration, Mount Sinai, Neuropsychopharmacology, University of California San Francisco

MDMA as a Treatment for PTSD



PTSD is characterized by symptoms resulting from trauma that persist for longer than one month. The FDA's "breakthrough" designation of MDMA demonstrates that it has potential to rewrite the standard of care for the condition.



13,000,000

American adults suffer from PTSD during each year.



PTSD Symptoms

- People with PTSD will often **suffer from intrusive thoughts and vivid flashbacks** that make the patient feel as if they are reliving their past trauma.
- Patients will **avoid aspects of their life that spark memories** of whatever is causing their condition, reducing quality of life.
- **Mood changes are very common** with many people becoming more paranoid and more likely to blame themselves for their trauma.

PTSD Prognosis

- People are more likely to develop PTSD during their life if they have a prior **history of trauma**, are **female**, and/or are a **member of a marginalized group**.
- To qualify for an official PTSD diagnosis, symptoms associated with the trauma **must persist for a month**, but for many they persist for several months to years.
- Approximately **30% of patients will recover** completely, and about **40% will recover** with treatment but will still have some **milder symptoms**.
- Early treatment leads to the most effective treatment results.

MDMA as a Treatment

- Other treatments for PTSD include **group therapy, behavioral therapy, SSRIs, and exposure therapy**.
- The FDA designated **MDMA a "breakthrough" treatment for PTSD**.
- Despite the designation, the FDA denied approval of MDMA therapy based on **difficulties in blinding** during the clinical trial and a **lack of abuse safeguards**.
- In a yearly follow-up of PTSD patients treated with MDMA who had previously tried traditional treatments, **76% of patients no longer met PTSD criteria**.

[APA](#), [Air Force Med](#), [Cleveland Clinic](#), [Psychiatrist.com](#), [Riaz et al. \(2023\)](#)

MDMA First-Hand Patient Experiences



MDMA was able to give a beneficial treatment experience to both a psychiatrist with no trauma and a patient with severe PTSD with no major adverse effects afterwards, but there still must be rigorous safety precautions in place.

- 1 Background**
Ben Sessa is a British psychiatrist. He **did not have any trauma prior to treatment but was interested in the process** and wanted to understand it so he could implement it himself.
- 2 Benefits**
Sessa felt that the MDMA **"unlocked" issues he hadn't previously talked about** and that it was an extremely beneficial experience. He believes **MDMA can be an extremely powerful tool against trauma and would like to use it in his own practice**. He experienced **no comedown** after his session.
- 3 Takeaways**
MDMA's promise is impressive given Sessa's powerful experience **despite not having trauma**; however, as he states, there is **no "chemical utopia" and strong regulations are necessary** before broad usage.

Ben Sessa



Alice



Key Takeaway

Both users had a positive experience with their MDMA-assisted therapy sessions, and the experience was able to convince a psychiatrist to begin conducting his own trials.



- 1 Background**
Alice **suffered from severe PTSD caused by her father's abuse**. She tried somatic therapy, talking therapy, and EDMR but **none of the treatments worked**. She took MDMA from a therapist three times over 12 weeks.
- 2 Benefits**
Before the treatment, her PTSD Caps score was **106 (60 is severe)**. After the 12 weeks it **dropped to 2**. She stated that the drug **"pulled things" out of her and made her more open** to facing her trauma.

- 3 Takeaways**
MDMA's ability to drastically improve Alice's symptoms despite prior treatments having no effect shows its **immense potential**. It should be noted that Alice did not always feel content during treatment and felt that **some moments were "hellacious"**, but ultimately, she came back to **"feeling good" at the end**.

[The Guardian](#)

Potential Safety Concerns of MDMA Psycho-Therapy



Despite its therapeutic potential, MDMA is still considered a dangerous and unpredictable drug with complications surrounding physiological and psychological risks, and trials with the drug have not properly addressed them.

Psychological Risks

- MDMA can be **emotionally overwhelming for patients** as its ability to intensify emotions can trigger **panic attacks or anxiety during treatment** sessions which makes it unpredictable.
- Treatment can be **destabilizing for patients who have complex trauma**, making the treatment harmful.
- More research is needed on the whole of the psychological risks of MDMA and if it would result in **permanent mood regulation difficulties and cognitive function impairments**.
- MDMA use typically leads to a period where serotonin levels are depleted in the body, **leading to lethargy and depression**.

Physiological Risks

- As a stimulant, MDMA **increases heart rate and raises blood pressure** which is risky for people who **suffer from underlying heart conditions or hypertension**.
- High or repeated doses of MDMA have been known to cause **serotonin cell damage in recreational users**, meaning **clinical dosage measurements must be rigorously studied** for proper safety.
- MDMA **increases body metabolism** and leads to a **higher internal temperature as well as dehydration** which in combination with the hyperthermia can cause **severe dehydration** if not controlled properly.

Clinical and Ethical Concerns

- Combining SSRIs and MDMA can lead to **unpredictable interactions that may have dangerous effects** and lead to **serotonin syndrome**, a condition that when severe can **lead to seizures, confusion, and tremors**.
- Patients using MDMA are in a **heightened state of suggestibility**, so there must be rigorous ethical standards during therapy.
- Therapists will need **proper qualification to work with MDMA** as it has not been in use in psychology for decades.
- In the MDMA-AT trial, the FDA cited **failure to show long-term safety data and inadequate reporting of side effects** that could make the treatment more damaging than helpful for PTSD patients.

Contraindications

- Because of the concerns discussed above, **individuals with cardiac diseases, bipolar disorder, psychosis, and/or uncontrolled hypertension should avoid using MDMA** to prevent major adverse events.
- Any patient already taking **another medication that involves serotonin** should also **avoid MDMA because of its unpredictable synergistic effects** in serotonin reuptake and retention.
- Patients with **prior instances of substance abuse** should avoid MDMA because of its **addictive nature** and use other treatments before considering MDMA-assisted therapy.

[Cleveland Clinic](#), [JAMA](#), [PubMed](#), [Psychiatry Online](#), [VA](#)

Psilocybin Treatment for Anxiety (Generalized, Acute, Disease)



Psilocybin shows strong potential as a treatment for multiple types of anxiety by rewiring brain networks, enhancing emotional processing, and creating lasting clinical improvements across generalized, acute, and disease-induced anxiety.

Applications for Various Anxiety Disorders

Generalized Anxiety (GAD)

- GAD has **chronic/pervasive symptoms** making typical anxiolytics ineffective, but psilocybin use is promising.
- Innex found Psilocybin showed **44.1% positive clinical responses** and 27% remissions, far exceeding placebo.
- Phase 2 trial (PSX-001 / Psi-GAD) found an **average 12.8-point reduction on the** Hamilton Anxiety Scale.

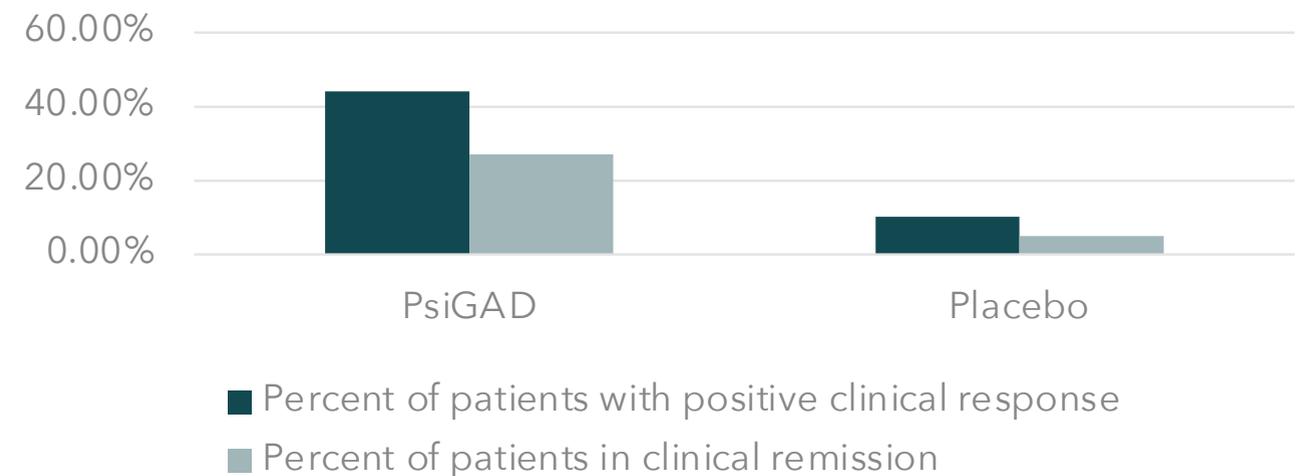
Acute Anxiety

- Acute anxiety has sudden, intense episodes of fear or panic that are often disproportionate to the actual threat.
- Psilocybin produces **transient spikes in anxiety** levels, followed by a **rebound reduction in anxiety behaviors**.
- Imperial College London found a **15% increase in brain connectivity** related to "resetting" overactive areas.

Disease-Induced Anxiety

- Disease-induced anxiety refers to the psychological distress and fear that emerge because of serious illness.
- Life-threatening disease trials had a **6.0-point and 5.9-point reduction** in STAI-State and STAI-Trait respectively.
- RCT found **60-80% of cancer patients** maintained strong **anxiety reductions** 6.5 months post-psilocybin.

Patient Responses Changes After Psilocybin (for GAD)



Mechanisms Behind Psilocybin Treatment for Anxiety

- Psilocybin reduces anxiety by altering serotonin signaling, easing hyperactive fear responses, and increasing cognitive flexibility to fight persistent anxious thought patterns.
- Brain effects: reduce amygdala reactivity and disrupts the Default Mode Network (DMN).
- Neuroplasticity: activates BDNF/mTOR pathways and synaptic remodeling for anxiety relief.
- Emotional processing: facilitates fear extinction, improves amygdala-prefrontal regulation, and promotes emotional openness alongside psychotherapy to regulate anxiety responses.

[Cell](#), [Innex](#), [MDPI](#), [Nature](#), [PNAS](#), [Ross](#), [Science Direct](#), [UW](#)

Psilocybin Usage: Patient First-Hand Experiences



Research into psilocybin's medical implications increasingly demonstrate positive potential especially for patients with severe disorders, however rigorous research on safety, dosing, and clinical application is still needed to ensure efficacy.

Victor

1 Background

Victor was a graduate student in his 20s and **non-Hodgkin's lymphoma survivor in remission**. He suffered chronic **anxiety** with nightly panic and fear of recurrence (diagnosed **Adjustment Disorder with Anxiety**).

2 Outcomes of Study

After a single session, he showed **reduced anxiety and increases in purpose in life, spirituality, and death** transcendence and on follow-up assessments described, less fear of his body **betraying** him and a **new acceptance** that **"this is my body"**.

3 Implications

Victor's session involved **tremendously painful emotions** (helplessness, funeral imagery, disembodiment) that were **safely navigated** with **preparation**, music-assisted **guidance**, and **integration** therapy pointing to what future treatment may look like.



Usage and Treatment

- Victor enrolled into NYU's cancer-related anxiety RCT and received one supervised psilocybin session with psychotherapy.
- Dr. A spent 6 weekends across a 6-month facilitator training using "back-to-back, high-dose psilocybin-containing mushrooms" with no supervision, support, or monitoring.

Key Takeaway

Psilocybin shows strong medical promise with patients like Victor, but its benefits depend on rigorous screening, supervision, and integration; without them, serious harm can occur. Standardized protocols and dosage require further research.

Dr. "A"

1 Background

Dr. A was a 71-year-old psychologist who enrolled in an **underground facilitator-training program** that asked trainees to undergo **repeated high-dose psilocybin treatment** on weekends to "experience what their clients would".

2 Outcomes of Study

Over 6 months she developed **severe insomnia, agitation/racing thoughts, anhedonia**, weight loss, and **suicidal ideation**, requiring **hospitalization** and ultimately ECT (Electroconvulsive Therapy).

3 Implications

Dr. A's experiences illustrate how **non-clinical, high-dose, high-frequency psilocybin use** can lead to **serious adverse outcomes** and that that psilocybin should **not** be pursued in repeated high doses or **outside regulated protocols**.

Safety Concerns of Psilocybin



As a hallucinogen, Psilocybin still presents potential risk short-term and long-term for patients, especially with improper use or outside monitored therapy, including acute side effects, dampening of other medications, and perception disorders.

Short-Term Concerns

Acute Psychological Risks

- Meta-analysis of psilocybin found **transient anxiety, fear, and dysphoria** are common during dosing, however paranoia and transient thought were not.
- Psilocybin can **cause depersonalization** and resurfacing of dissociated trauma.

Acute Medical Risks

- JAMA found **76%** of users had non-clinically significant elevations in **blood pressure and heart rate** while **34%** recorded **SBP >160 mmHg** (significant).
- 6 RCTs found increased BP risk, headaches, fear, nausea, and dizziness.

Drug-drug Interaction

- **Notable Hazards: 47%** of lithium and psilocybin co-uses result in **seizures**; co-use of other hallucinogens can cause dangerously high serotonin levels.
- SSRIs (antidepressants) have **47-55% odds of dampen psilocybin's effects**.

Long-Term Implications

Possible Persisting Adverse Effects

- Long-term use of psilocybin is associated with **potential alterations of brain chemistry** with **uncertain implications** for energy barriers between brain states.
- Hallucinogen-Persisting Perception Disorder **is rare** but can occur for some.

Non-eligible Individuals (Typical Exclusions/Strong Cautions)

- Patients with cardiovascular disease or recent stroke **should avoid psilocybin** because its use can result in **2.29x** higher risk of elevated blood pressure.
- **Rare maniac psychiatric events** can occur to patients with bipolar disorder.

Safety Issues Still Being Addressed

- **Cardiovascular risk stratification** requires more research specifically relating to use for patients with hypertension, arrhythmias, or **structural heart disease**.
- **Medication management** around dosing and **standardized taper protocols**.

Key Takeaway

Though psilocybin shows promise for medical application, preliminary research has found various acute effects including fear, increased BP, and nausea that must be evaluated. Current research points to minimal common long-term side effects of use but also cite the need for further research, especially in dosage and psilocybin's interactions with other brain altering substances.

[Frontiers \(I\)](#), [Frontiers \(II\)](#), [JAMA Network](#), [Nature \(I\)](#), [Nature \(II\)](#), [NIH](#)



Section 1: Overview of Psychedelic Therapies

Section 2: Market and Competitor Analysis

Section 3: Access and Barriers

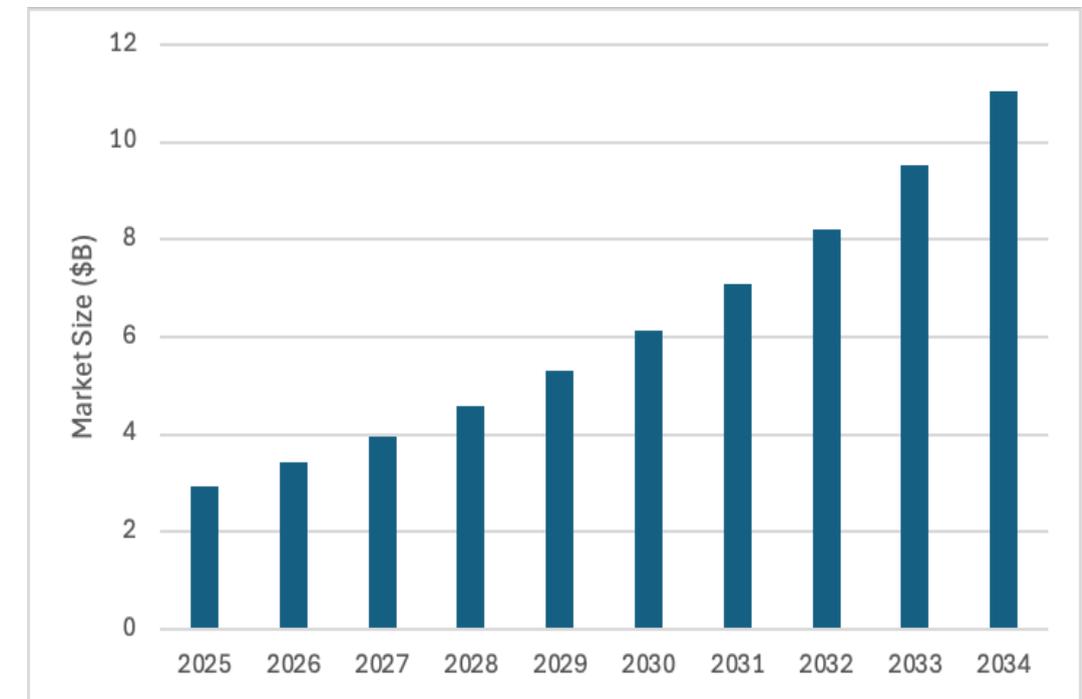
Psychedelics Industry Overview



The psychedelics market is expected to experience rapid growth in the following decade due to promising trial results across multiple therapies, but there still remains uncertainty around the regulation and safety of the substances.

<p>A Growing Market</p> <p>Although the psychedelics market is only valued at \$2.94 B, it is expected to increase to \$11.03 B by 2034 with a CAGR of 15.82% as a mainstream emphasis on mental health continues to develop.</p>	<p>MindMed Q2 Results</p> <p>Mind Medicine Inc. reported progress on Phase 3 trials for its use of lysergide D-tartrate as a means of treating GAD and MDD. They reported having sufficient funding until 2027 with total assets at \$237.9 M.</p>	<p>Implementation of AI</p> <p>AI has been used to develop new psychedelics. One instance is Mindstate Design Labs which with funding from Silicon Valley used AI to synthesize a mildly psychoactive compound for potential clinical use.</p>
<p>Major M&As</p> <p>AbbVie, a company known for its autoimmune drug Humira, recently acquired a depression-targeting psychedelic from Gilgamesh Therapeutics for \$1.92 B, signaling interest from big biotech in the sector.</p>	<p>North America in the Lead</p> <p>North America makes up the largest part of the psychedelics market with 52% because of strong infrastructure and a regulatory system that allows for psychedelic studies in controlled settings.</p>	<p>Current Drug Landscape</p> <p>Driving the psychedelics landscape are MDMA, Psilocybin, LSD, and Ketamine. Only esketamine (Spravato) has been approved, and the rest remain Schedule I substances during their trials.</p>
<p>Drivers of Industry</p> <p>Studies have shown that drugs like psilocybin and LSD can treat mental illnesses that have previously been unresponsive to modern medicine. This potential is leading companies to test the drugs in Phase 3 trials.</p>	<p>Concerns</p> <p>Despite the promise of psychedelic therapies, concerns arise from the FDA's reports of poor blinding, adverse psychological effects, and sexual abuse during trials build to the uneasiness.</p>	<p>Overview</p> <p>Until more big-pharma deals are made and Phase 3 readouts begin to come back from the FDA it is unclear how the market will turn out, but the potential is large for a lucrative next-gen in mental health treatment.</p>

Psychedelic Therapy Forecasted Market Size



Key Takeaway

It is unclear how the psychedelics market will play out as the therapeutics are controversial and could be rejected by the FDA. There is nevertheless large speculation about the value of the industry as mental health becomes more mainstream in modern medicine and psychedelics continue to perform well in clinical trials across multiple indications.

Company Profile: atai Life Sciences



atai Life Sciences is a clinical-stage biopharmaceutical company developing new mental health treatments to transform patient outcomes through psychedelics and other novel compounds that deliver rapid, durable benefit for unmet needs.



- atai Life Sciences (NASDAQ: ATAI) was **founded in 2018** with headquarters in Berlin and New York.
- They develop therapeutics for **mental health disorders** such as depression and social anxiety.
- atai's pipeline includes more than **11 distinct assets** (including classic and novel psychedelics) across multiple clinical and pre-clinical stages.
- atai reported **\$95.9 M in cash** as of Q2 2025 and has a market capitalization around **\$1.1 B**.

Program	Primary Indication	Preclin	P1	P2	P3
BPL-003 Mebufotenin benzoate	Treatment Resistant Depression				
VLS-01 DMT	Treatment Resistant Depression				
EMP-01 R-MDMA	Social Anxiety Disorder				
5-HT2A Receptor Agonists	Opioid Use, Treatment Resistant Depression				

Scientific Innovation

- Their **lead asset BPL-003** (intranasal 5-MeO-DMT benzoate) achieved a Montgomery-Asberg Depression Rating Scale (MADRS) reduction of **12.1 points** in a Phase 2b clinical trial, indicating significant potential to **combat treatment-resistant depression**.
- As of June 30, 2025, R&D expenses were approximately **\$11.1 M** for the quarter.

Industry Consolidation

- atai's announced **strategic combination with Beckley Psytech** to integrate BPL-003 moves them towards becoming a **global leader** in psychedelic mental-health therapies.
- In July 2025, atai made a **\$50 M Private Investment in Public Equity (PIPE) financing deal** to support its expansion, making psychedelic medicine more structured.

Market Ecosystem Leadership

- Their clinical trial work **legitimizes the field**, demonstrating how psychedelics fit into **mainstream frameworks** rather than only being underground or highly experimental.
- By emphasizing **"short time in clinic"** delivery models and integration into existing healthcare systems, they address the major barriers of **scalability** and **acceptability**.

Commercial-Scale Strategy

- atai is building a **multi-asset pipeline** rather than relying on single molecule, which helps to spread risk and accelerates their potential for **multiple market entry points**.
- A public offering in October 2025 raised approximately **\$149.5 M** (27,283,750 shares at \$5.48) to fund **pipeline programs**, scaling the potential commercial sector.

Key Takeaway

atai Life Sciences is transforming the psychedelic industry by advancing short-acting, clinically scalable therapies and leading its evolution from experimental research into mainstream mental-health treatment.

[atai \(I\)](#), [atai \(II\)](#), [atai \(III\)](#), [atai \(IV\)](#)

Company Profile: MindMed



As the first psychedelic pharmaceutical company to go public, MindMed currently focuses on research and development and capital raises for potential acquisitions. Their trials for drugs brain health disorders are presenting positive.



- **History:** MindMed was founded in 2019 as the **first psychedelic pharmaceutical company** to go **public**.
- **Focuses:** MindMed focuses on patients with **brain health disorders** such as Generalized Anxiety Disorder (GAD), Major Depressive Disorder (MDD), Autism Spectrum Disorder (ASD).
- **Treatments** are based on lysergic acid diethylamide, a powerful, semisynthetic hallucinogenic drug.
- **Market Cap:** USD \$1.08 B (2025).

Research and Development

- Research and development expenses more than **doubled to \$29.8 M** in Q2 2025, due to **increased spending** on the **MM120 ODT program** as it progresses through **late-stage clinical trials**. MM120 is used to treat GAD and MDD.
- MM120 showed **reduced anxiety and depression symptoms** after **one dose**.

Positive Trials

- MindMed included **sub-therapeutic doses** in psychedelic clinical trials as recommended by the FDA to **avoid investigational therapy versus placebo**. This led to **easier interpreted data** for the FDA and positive signals for **3,4-Methylenedioxymethamphetamine (MDMA)** drug trials.

Investor Confidence

- Company's cash and investments totaled **\$237.9 M** in June 2025, creating a **solid cash position** expected to **fund operations until 2027**.
- Despite **quarterly loss** in earnings report, MindMed's stock rose **2.99%** in aftermarket trading due to investor confidence in **company's long-term strategy**.

Recent News

- MindMed recently completed a **follow-on equity offering**, raising **\$225 M** for research and development and general corporate purposes.
- MindMed may pursue **acquisitions** that align with its core development strategies.
- Their current **immediate risk** is successful **milestones** and **potential deals**.

Program	Primary Indication	Preclin	P1	P2	P3
MM120 ODT (Lysergide D-tartrate)	Generalized Anxiety Disorder	█	█	█	█
	Major Depressive Disorder	█	█	█	█
	Additional Indications	█	█	█	█
MM402	Autism Spectrum Disorder	█	█	█	█

Key Takeaway

MindMed's new trial design drives their potential in creating effective MDMA drugs which increases the overall market value of the company.

[Google Finance](#), [Macrotrends](#), [MindMed \(I\)](#), [MindMed \(II\)](#), [Pharma Voice](#), [Yahoo Finance](#)

Company Profile: Lykos Therapeutics



Lykos Therapeutics, recently rebranded as Resilient Therapeutics, is in the strongest lead to deliver the first FDA approval for MDMA psychedelic treatment despite rejection in 2024, because of its recent acquisition and competitor weakness.



- Lykos is a private **public benefit corporation** based in **San Jose California**.
- As a PBC, Lykos operates for profit but also to **create societal good** and **considers the interests of the community and employees** as well as stakeholders.
- Lykos was once valued at **~\$8 per stock** in 2023 but currently has a **valuation at ~\$2.50 per stock**.

Other Competitors



Lead Programs

- The main therapeutic target for Lykos is **Midomafetamine**, an oral MDMA formulation, which **progressed to two Phase 3 trials**.
- The FDA declined approval because of concerns **over data reliability** and the true **blindness** of the study, **requesting another Phase 3 trial**.

Investors

- Billionaire **Antonio Gracias** recently led a **\$50 million funding round to acquire Lykos** along with other investors, especially billionaire **Christopher Hohn**.
- The initial proposal was \$100 million, and the investors are **attempting to raise the additional capital in the future**.

Internal Organization

- After the FDA rejection, **Lykos laid off 75% of its workforce**.
- Javier Muniz, Mike Burke, and Amy Emerson have joined Lykos **as CMO, CEO, and board member, hoping to reshape the company**.
- **Five board members left** and were replaced after FDA rejection.

Market Competitors

- Lykos' main competitor, MindMed, is working to create an **MDMA -based medication for autism** that is currently in Phase 1 trials.
- Atai is working on a **Phase 2 MDMA treatment for social anxiety**.
- **Tactogen has a Phase 2 program** with MDMA, and **Clearmind is still preclinical**.

Key Takeaway

Although Lykos suffered an FDA rejection for Midomafetamine, the new acquisition and internal reorganization shows that there is still market excitement about the company as it seeks to reapply for approval. The company remains ahead of other competitors in clinical trials.

Company Profile: COMPASS



As a leader in psychedelic medicine, COMPASS Pathways is developing new synthetic psilocybin variants to treat disorders with proprietary research, and an expanding infrastructure of trained clinicians enable real-world rollout.



COMPASS Pathways is a UK company founded in 2016 that is advancing **COMP360 (Compass's proprietary synthetic psilocybin)** paired with a standardized therapy protocol for **treatment-resistant depression (TRD)**.

Compass is also pursuing filings post-COMP005/COMP006 while expanding into **PTSD anorexia** and scaling delivery via therapist training.

Company Statistics

- **Scale: 166 employees** in 2024 but company announced a **30% headcount reduction** in 2025.
- **Capital Capacity: \$221.9M cash** as of **June 2025** with **runway into 2027**; raised **\$150M Jan 2025**.
- **Regulation Statistics:** Designated as FDA **Breakthrough Therapy** and UK Innovation Licensing and Access Pathway (**ILAP**) designations for TRD.

[Compass \(I\)](#), [Compass\(II\)](#), [Frog](#), [Nasdaq](#)

Net Loss (\$ M)



COMPASS's Psilocybin Niche

- Compass targets TRD, running the **largest RCT psilocybin** program to date.
- Pairs COMP360 with a **standardized protocol** of preparation and monitoring.
- A recent phase 2b study showed **rapid effects reduction/remission of TRD**.

Current Research and Future

- Currently research into COMP360 applications for **other disorders** including **anorexia nervosa, suicidal ideation, PTSD**, and chronic cluster headaches.
- Looking to innovate with new COMP005 and COMP006 variations for use.

Regulatory and Commercialization Landscape

- Looking to pursue accelerated filing paths post-COMP005 with UK and FDA.
- Building **certified delivery of psilocybin** with Therapist Training Program and Centers of Excellence to enable scale at launch of products and research.



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Ketamine Access and Affordability



Since Ketamine is not approved by the FDA, high costs of dosages/maintenance are often not covered by insurance. The drug is often only used to treat TRD and must also be carefully administered to avoid concerns of recreational usage.

	<h2>Treatment Costs</h2>	<ul style="list-style-type: none">• IV Ketamine treatments cost \$400-\$800 per infusion. With maintenance, total cost of \$2,400-\$4,800.• Intramuscular Ketamine treatments cost slightly less, around \$300-\$600 per treatment.• Intranasal treatments cost around \$800 per treatment. Its monitoring costs \$200-\$400 per visit.• Sublingual ketamine average around \$200 per dose.• Spravato (esketamine) costs about \$1050 per treatment without insurance, \$120-\$286 with commercial insurance, \$50-\$135 with commercial insurance and manufacturer subsidy.• Insurance coverage for ketamine treatments is often limited, as many insurance companies classify ketamine therapy as an "off-label" use.
	<h2>Concerns/Stigma</h2>	<ul style="list-style-type: none">• Ketamine's recreational use, "Special K" raises skepticism about its medical use, however up to 70% of patients experiencing symptom relief within hours or days of usage.• Ketamine is viewed as unsafe, but low doses are safe under close medical supervision.• Ketamine is not FDA approved for treating any psychiatric disorder. Compounded forms are currently used because FDA has not evaluated their safety, effectiveness, or quality prior to marketing.
	<h2>Eligibility/Guidelines</h2>	<ul style="list-style-type: none">• Certified Registered Nurse Anesthetists play a key role in administering ketamine.• Most Ketamine doses are only allowed for Treatment-Resistant Depression only and contraindications must be fully screened before dosages to ensure safety.• Ketamine should not be administered in doses that produce excessive sedation, unconsciousness or unresponsiveness, except when it is being used as a procedural anesthetic administered by a licensed health care professional in an appropriately equipped setting.

[Clear](#), [FDA](#), [Ketamine Therapy for Depression](#), [Noma Therapy](#), [Pain Medicine Consultants](#)

Regulations and Compliances for Ketamine



Although Ketamine isn't regulated heavily by the FDA, clinics must be DEA approved and acquire necessary licenses to administer and prescribe Ketamine. Each state's CPOM Doctrine must be carefully followed when regulating clinics.

Regulations

Schedule III

Ketamine is a **schedule III drug**. Pharmacists can dispense directly ketamine only pursuant to a **paper prescription** signed by a practitioner/agent. **Individual practitioners** may administer substances **without prescriptions**.

DEA Regulation

Clinics must **register therapy with the DEA**, storing the drug in a **locked, permanent fixture** to prevent unauthorized access. Only **DEA-registered prescribers** or authorized staff may handle or administer ketamine.

FDA Regulations

FDA **doesn't have many regulations** for off-label ketamine infusion therapy in clinics, which is a legitimate off-label use. Healthcare providers may prescribe **off-label ketamine when deemed medically appropriate**.

State Laws

Clinics should have **state medical board licenses**, meet Occupational Safety and Health **Administration regulations**, obtain **insurance coverage**, and store substances with **required licenses**.

Compliances

Spravato Access

SPRAVATO is only available through the **SPRAVATO Risk Evaluation and Mitigation Strategy (REMS) Program**. Patients must be administered at **certified healthcare settings** enrolled in the program.

CPOM Doctrine

States with strict **Corporate Practice of Medicine Doctrines** prohibit corporations from practicing medicine or employing physicians to provide professional medical services, **limiting direct ownership** of ketamine clinics.

Data Security

Clinics should comply with the **Health Insurance Portability and Accountability Act (HIPAA)** and other relevant privacy laws to protect patient information. Clinics must also keep **reports of all administrations and prescriptions** of the drug.

Financial Impact

Since Ketamine is mostly cash pay due to lack of reimbursement, providers take on a lot of **risk** and **potential stigma** from the medical community and must carefully follow **community protocols and screening to prevent misuse**.

[DEA](#), [Harris Sliwoski](#), [JNJ](#), [SafeHG](#)

Roadmap to Access and Affordability of LSD



Although research into LSD-assisted therapy is progressing through late-stage clinical trials and renewed scientific interest, real-world access remains extremely limited without the necessary regulatory approval or clinical infrastructure.

Overview

LSD-assisted therapy is subject to strict legal controls, hindering adoption by preventing approved access, reasonable pricing models, insurance coverage, necessary clinical training, and destigmatization.

Eligibility

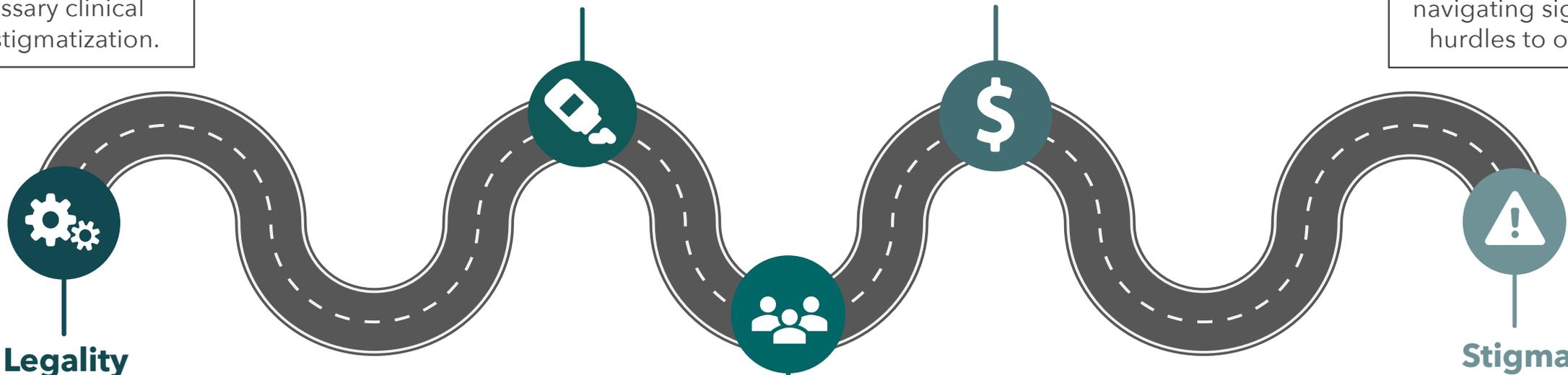
- Legal access is only provided by trials, such as MindMed’s Phase 3 program in **generalized anxiety disorder (GAD)**.
- This means access is severely limited for adults that do not **live near a study site** or meet the **necessary trial criteria**.

Pricing

- There is **no market price** for LSD therapy because it is not yet approved clinically.
- Despite ongoing **insurance deliberations**, any future approvals will likely require out-of-pocket payment as psychedelics are considered to be **highly experimental**.

Key Takeaway

Without FDA approval, any therapeutic applications of LSD are restricted to investigational use, so prospective patients must rely on clinical studies while navigating significant regulatory hurdles to obtain safe access.



Legality

- In the United States, LSD is a **Schedule I** substance.
- Across the world, LSD has no accepted medical use and cannot be offered clinically outside research.
- The only exception is Switzerland’s Federal Office of Public Health (FOPH), which has allowed **case-by-case “compassionate use” permits** for LSD psychotherapy under strict conditions since **2014**.

Sourcing

- Highly potent **synthetic psychedelics** of the **NBOMe** class are often mislabeled as LSD.
- Outside regulated trials, safety is compromised by **adulteration** as these drugs are more toxic.

Stigma

- After the FDA declined an MDMA approval bid in 2024, analysts noted gaps in protocols and ethical oversights, signaling **broader readiness issues** for any future approvals of LSD and other psychedelics.
- An **investigation-only** stance remains the norm for professional bodies regarding psychedelics, which increases barriers against routine **clinical adoption**.

[American Psychiatric Association](#), [Drug Enforcement Administration](#), [Journal of the American Medical Association](#), [Therapeutic Goods Administration](#)

Regulation and Barriers to Implementation of LSD



LSD-assisted therapy remains confined to research settings worldwide due to its Schedule I classification, strict dual FDA-DEA controls, and the absence of state or international frameworks permitting use beyond tightly regulated exceptions.

	Key Consideration	Technical Details
	Legal Classification	<ul style="list-style-type: none">Under the U.S. Controlled Substances Act (CSA), substances are placed in Schedules I-V based on potential for abuse, currently accepted use in treatment, and safety under medical supervision.Because LSD is Schedule I, it cannot be prescribed, dispensed or marketed for therapeutic use outside vetted research protocols detailing safe manufacturing and dosage under supervision.
	Regulatory Pathways	<ul style="list-style-type: none">A 2023 draft published by the FDA highlights compliance for clinical psychedelic investigations.This includes submitting an IND (Investigational New Drug) to the FDA, registering with the DEA for Schedule I research, and meeting Current Good Manufacturing Practices (cGMP) as defined by the Chemistry, Manufacturing, and Controls (CMC) regulations standards for manufacturing.
	Policy Movement	<ul style="list-style-type: none">While some U.S. states are implementing accessibility reforms for psychedelics, they typically do not apply to LSD, such as Colorado's Natural Medicine program excluding synthetic compounds.These state-level programs do not override federal status of LSD as a Schedule 1 drug and therefore cannot provide broad state-level therapy access outside of research under federal law.
	Administrative Barriers	<ul style="list-style-type: none">Unique challenges hindering psychedelic research include workforce training to safely handle acute effects and designing controls to distinguish between psychedelics and psychotherapy.Sponsors must establish secure storage protocols as well as provide detailed data on substance identity, purity, and stability, which complicates manufacturing compared to that of other drugs.

[Colorado General Assembly](#), [Drug Enforcement Administration](#), [Food and Drug Administration \(I\)](#), [Food and Drug Administration \(II\)](#), [National Law Review](#)

MDMA Access and Affordability



Access to MDMA in the United States is completely prohibited save for some clinical trials, but the minor leniencies in Australia and Canada can provide a model for how regulation of MDMA might function should it receive FDA approval.

Access and Affordability



Example Opportunities



1 - U.S. Status

MDMA remains classified as a **schedule I substance**, meaning that treatment with MDMA-assisted therapy can only be conducted in **monitored FDA-approved trials** or with **exemptions from the DEA**.



2 - Approval Pathway

The FDA created a complete response letter that detailed the **rejection of MDMA-assisted psychedelic therapy** in its current form until the **issues with controls and safety are addressed** by Lykos.



3 - Supply Controls

Without necessary FDA approval, the DEA will not change the scheduling of MDMA from schedule I. This creates **tight controls on manufacture**, with a punishment of up to **20 years prison** for first offense small-scale manufacturing.



4 - Other Jurisdictions

Two notable exceptions to MDMA prohibition are **Australia and Canada**. Australia **lowered MDMA's scheduling** and allows monitored prescription, and Canada permits physicians to **apply for special access to MDMA**.



5 - Regulatory Obligations

Australia provides a **model for MDMA legalization** and the regulatory requirements to follow. The system includes **authorized providers, specialized training, facility standards, and monitoring of patients**.

Availability of MDMA



There are some positive indications that MDMA could become widely available, including its ability to decrease costs for PTSD treatment and a commercial manufacturing technique, but it still does not have FDA approval.

Status



MDMA is currently not approved for any patients in the U.S. The FDA rejected its approval, and the **drug remains a schedule 1 controlled substance**. Australia is **the first country to allow prescription**; the physician must be a registered psychiatrist, and the patient must have PTSD.

Eligibility



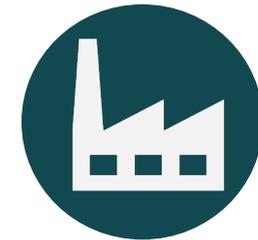
The Lykos Therapeutics Phase III study included **only patients with severe PTSD**. Patients with psychotic disorder, bipolar disorder, and other mental conditions **were excluded from the study**. There is also a Phase II trial for MDMA use in **social anxiety disorder and autism disorder** patients.

Costs



MDMA therapy is expected to cost **\$12,000** per patient. Under most assumptions about PTSD, MDMA therapy **saves costs by reducing severity of PTSD** and its accompanied costs. Currently, there is **no coverage for MDMA**, but if it is approved insurers may begin to cover its for **approved indications**.

Supply



Lykos published a **manufacturing technique to make kilograms of MDMA**. The method was designed to **assist clinical trials** and, in the future, **provide doses for patients**. Physicians must be trained extensively on MDMA therapy, **bottlenecking treatment** even if there is enough supply.

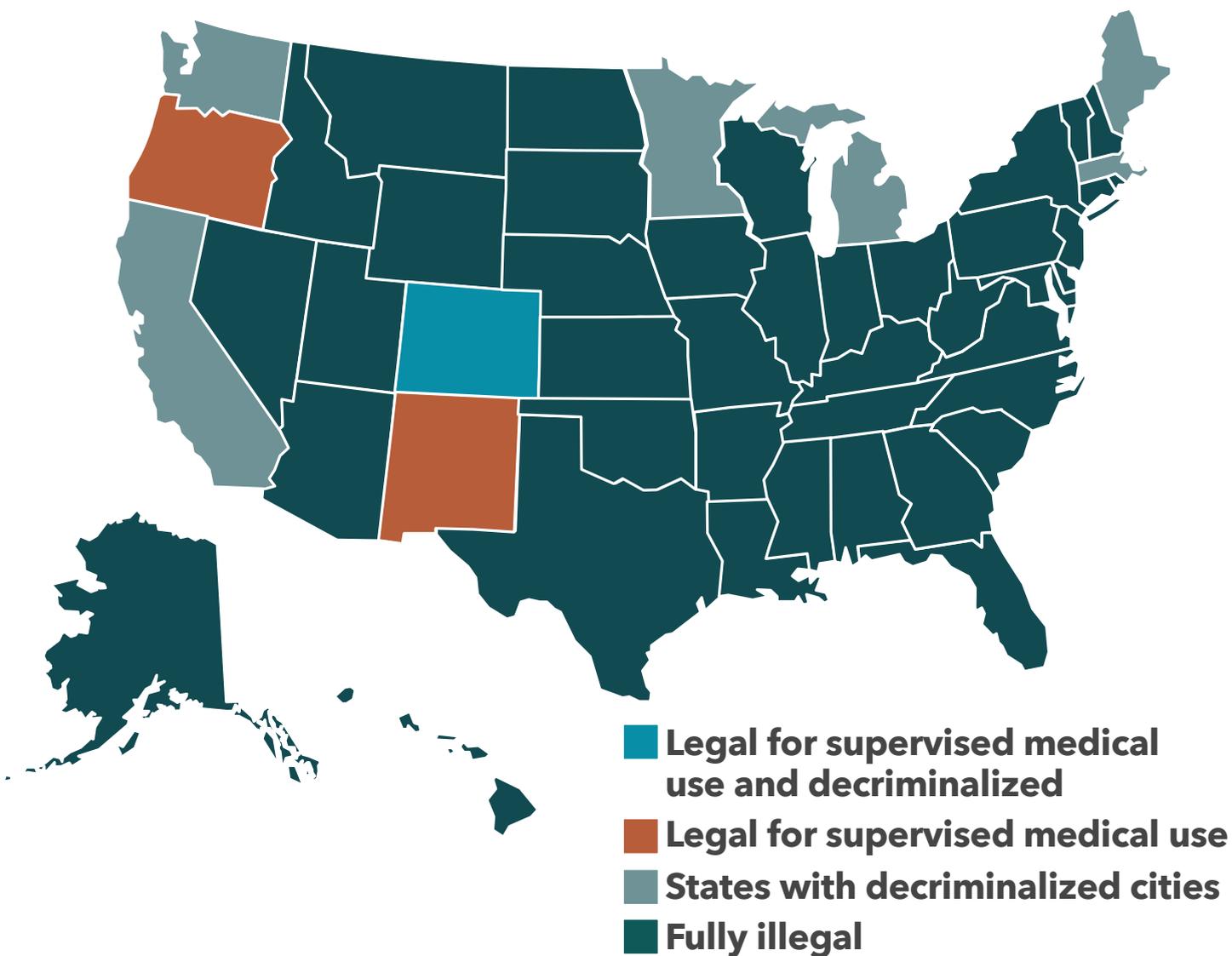
Key Takeaway

There is potential for mass production of MDMA for patient use and the treatment is expected to reduce the overall costs of PTSD treatment compared to the costs of traditional treatment. However, there is no current FDA approved use and there would need to be extensive physician training to begin administering MDMA even after approval.

Psilocybin Regulations and Implementation Barriers



Psilocybin is illegal throughout most of the United States, with only 3 states legalizing medical use but several with cities that have decriminalized use; These disparities create differentiated regulations leading to barriers to cost and access.



Psilocybin Regulations in the US

Federal Baseline Regulations

- Entities that handle psilocybin **must obtain DEA Schedule I registration and comply with strict security**, recordkeeping, and quota controls.
- In *AIMS v DEA* (Feb 13, 2025), federal courts affirmed that the **DEA is not required to allow access to psilocybin even under right-to-try laws**.

Differentiated State Regulation

- Psilocybin is illegal in most states (**only Oregon, Colorado, and New Mexico allow regulated access**) but some cities have decriminalized use.
- Legalized states all have **different governing bodies** supporting non-medical services, licensed centers, or clinician-led medical programs.

Typical Compliance Regulations

- Centers require **local zoning restrictions** (e.g. Denver proposes a 1,000ft buffer from schools and distinct facilitator/business licensing agencies).
- In Oregon, service centers **must end sessions by 11:59 pm**, maintain client records and comply with strict testing and unique product tracking.

Implementation Barriers

- Federal regulations **prevent ordinary business deductions** and **lower access to banking, insurance**, and **federally funded business services**.
- **Interstate commerce is banned** so programs and centers must source and serve in-state markets only, thus limiting scale and raising costs.

[Drug & Device Law](#), [Independent](#), [Oregon.gov](#), [Psychedelics Alpha](#), [Recovered.org](#)

Psilocybin Access and Affordability



Psilocybin access and affordability within the United States is still limited with only Oregon and Colorado legalizing use. Both have instituted use and administration licensing under strict criteria through service centers, facilitators, and taxes.



Use Eligibility Requirements in Psilocybin-Legal States

- **Must be 21+ with valid photo ID**
- **24h-90d prep session before dosing**
- **Review informed consent**
- **Client Bill of Rights (Oregon specific)**



Availability



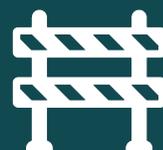
- **Oregon** is the first state with **regulated, non-medical psilocybin services specifically for adults 21+ without prescriptions**. They must complete supervised administration and only at licensed service center with facilitators.
- **Colorado and New Mexico also have legalized psilocybin programs**. The initial state-regulated sessions began in 2025 with **limited/locality-dependent rollouts**.
- **Elsewhere, no licensed services are available**, and psilocybin remains Schedule I federally, so access is limited to research and approved clinical trials.

Affordability



- Typical Oregon pricing is about **\$1,500-\$3,200 per individual session** but varies by center depending on prep/admin/integration time. **Oregon does not regulate prices**, and each service center sets its own rates for consumers.
- Pricing of psilocybin use at some centers price the drug around \$9 per mg plus a **15% tax psilocybin specific tax in Oregon** plus additional facilitator fees.
- Traditional health plans generally don't cover psilocybin service and there is **limited employer coverage emerging via Enthea (TPA) at select centers**.

Barriers to Access



- Only licensed manufacturers can cultivate, and process (no wild-harvest or synthetic products) psilocybin and **all products must be lab-tested & labeled** before reaching service centers set by Oregon Psilocybin Services (OPS).
- Psilocybin access can depend on local policy. In Oregon, localities have opt-outs bans and **access concentrates in specific counties or cities** (Colorado does not).
- Facilitators must complete an **OPS-approved program (120 hrs and 40-hr practicum)** and ongoing clinical background checks, supervision, and more.

[AP News](#), [Colorado Public Radio](#), [KTVM](#), [Oregon.gov](#), [Oregon Capital Chronical](#)

Psychedelic Influence on Artistic Culture



Usage of psychedelics have inspired different styles of music and art. Despite negative connotations, psychedelic music has evolved into hard/progressive rock while psychedelic art has shown positive impacts on mental/physical impacts.

Psychedelic Rock

History

Psychedelic Rock is a style of **rock music** existing from **1965 to 1971**. It was influenced by taking **hallucinogenic drugs** such as LSD and was formed out of Hippie Culture in San Francisco. After the United States and the United Kingdom outlawed LSD, psychedelic rock **evolved** into **hard/progressive rock**.

Characteristics

Psychedelic rock often included **electric guitar** with feedback, the **wah-wah pedal**, **trippy effects** (reverb, phasing, distortion, reversed sound), lengthy **improvised guitar solos**, and **surreal and abstract lyrics** that may allude to hallucinogenic drug use.

[Masterclass](#), [Tate](#), [Veronica's Art](#)

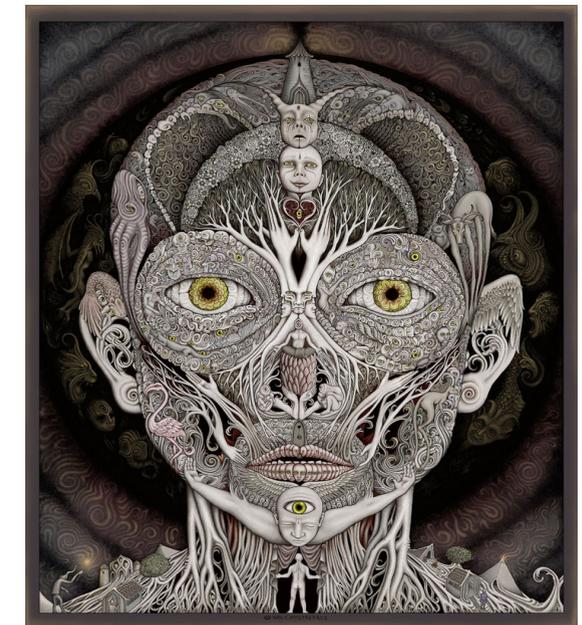
Psychedelic Art

What is Psychedelic Art?

- Psychedelic Art was a **graphic art form** that created **visual displays** inspired by the **experience and hallucinations of psychedelic drugs** such as LSD and psilocybin. Its evolution is considered a direct predecessor to the **development** and subsequent **popularity** of all **imaginative art today**.
- Key features of psychedelic art include **repetitive patterns or designs** (found in art of many prominent ancient cultures), **swirling patterns**, **erotic imagery** and **hidden messages**.

History and Impact

- Psychedelics have been used in **ceremonies** by many **ancient countries**. Some cave paintings from **30,000 years ago** depict altered states of consciousness.
- Psychedelic art first officially appeared **in 1960s** alongside psychedelic music as a form of **promotion for concerts and events**.
- Studies show that psychedelic art had **positive and diverse mental and physical impacts** through the sense of relaxation and peace, anxiety and stress alleviation, joy, thrill and sense of euphoria, sensations of awe and wonder, hypnotizing effect, holistic meditative effect, provocation of creative thoughts, induced hyperawareness of bodily states, and feelings of calmness.



Modern Psychedelic Art

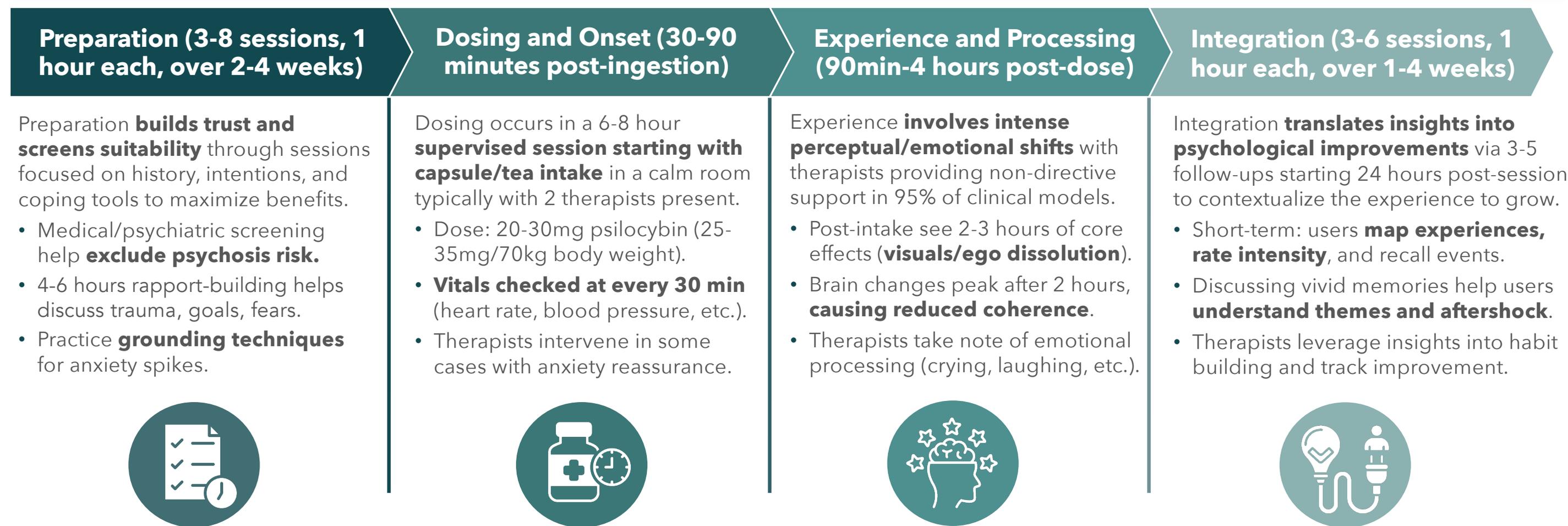


Ancient Psychedelic Mexican Art

Breaking Down Four Stages of Psilocybin Therapy



A well-run psilocybin therapy session follows four structured stages that build trust, ensure a safe monitored session, support deep reflection, and integrate insights into lasting psychological change with follow ups that track progress.



Key Takeaway

Psilocybin therapy that takes place in carefully executed stages maximize psychological benefits by keeping people safe, emotionally supported, and guided through the process. Doing so helps translate psychedelic insights into behavioral/psychological change.

[Intero Psychedelic Therapy](#), [Psychedelic Passage](#), [Renew Health](#), [Sanctuary Wellness Institute](#), [University of Cambridge](#)

Cultural Competence in Psychedelic Therapy



Working on all stages of psychedelic treatment and integration should entail ethical collaboration, acceptance of diverse spiritual and community perspectives, awareness of historical and social contexts, and respect for unique worldviews.

Indigenous Roots

- Psychedelic use across South America, Mesoamerica, Asia, and Africa came **millennia before** Western psychiatry.
- These practices were deeply **embedded in community**, not isolated clinical events.
 - Psychedelics supported unique moral and relational meanings within **communal rites of passage** such as ancestral connections.

Colonial Suppression

- European colonization **criminalized Indigenous practices**, labeling them as "sorcery" or "devil worship."
- Suppressing these traditional uses was accompanied by **Western scientists** appropriating **Indigenous knowledge**.
 - Compounds like **mescaline** and **ibogaine** were later **extracted for study** without acknowledgment.

Western Revival

- In the **1950s-70s**, notable psychiatrists studied LSD, mescaline, and psilocybin.
- Although this "**psychedelic renaissance**" of research brought reported **therapeutic breakthroughs**, experimental design was mostly **Eurocentric**.
 - The 1971 **UN Convention on Psychotropic Substances** curtailed this work globally by restricting usage.

Modern Research

- **Current research** is primarily driven by **Western institutions**.
- The most recent wave of interest (1990s-present) focuses on **therapy for mental health disorders** assisted by MDMA, psilocybin, and ketamine.
- Rapid investment in psychedelics has raised **ethical issues** around patenting.
 - Critics warn against **retracing patterns** of exploitation with commercialization.

Key Takeaway

As psychedelic therapy moves into mainstream psychiatry, its future depends on the combination of scientific rigor with cultural humility and historical awareness so that facilitators can accommodate for relevant sociocultural factors. Addressing the past injustices and exclusions that have shaped modern psychedelic practice is vital to uphold ethical responsibility moving forward.

[BMC Medical Education](#), [Journal of Psychedelic Studies](#), [Progress in Neuro-Psychopharmacology and Biological Psychiatry](#), [Transcultural Psychiatry](#)