

WHAT IS TODAY'S OBJECTIVE?

Maybe It's Maybelline



Maybe It's Methamphetamine

**Understanding
the effect of
drugs on the
body**

DRUGS OF ABUSE

Workplace drug testing is concerned 1^o with drugs of abuse.

MEs try to establish the cause of death and thus, typically examine blood and other tissues for drugs of abuse and for other possibly lethal toxins

DRUGS w/ HIGH ABUSE POTENTIAL

Opiates

Amphetamines

Phencyclidine

Cocaine

Cannabinoids



Meth



N2O



Psilocin



Speed



Cocaine



Barb



Amphetamine



Ecstasy



GHB



MCat



Alcohol



Indica



Sativa



Caffeine



LSD



Ketamine



Heroin



Crack



Methadone



Mescaline

— DRUG OVERDOSES —
KILL MORE
THAN CARS, GUNS, AND FALLING.



Falling 26,852 deaths



Guns 31,672 deaths



Traffic accidents 33,687 deaths

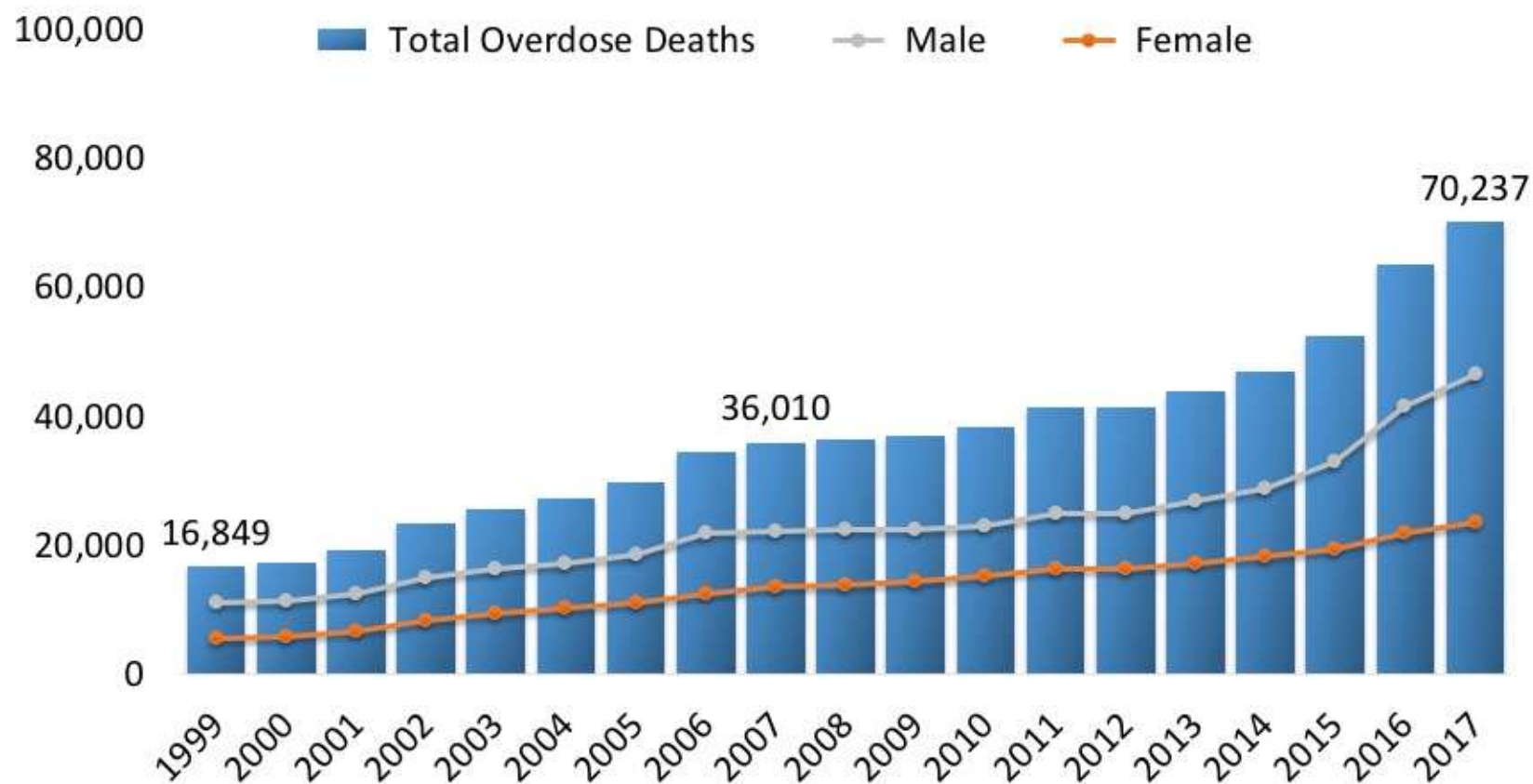


Drug overdoses 38,329 deaths*

*30,006 of which were unintentional.

Source: CDC Wide-ranging OnLine Data for Epidemiologic Research (WONDER) on Mortality: <http://wonder.cdc.gov/mortsql.html> (2010)

Figure 1. National Drug Overdose Deaths Number Among All Ages, by Gender, 1999-2017



Source: : Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2017 on CDC WONDER Online Database, released December, 2018

OPIATES

- Cause profound euphoria
- Pain relievers (ex. morphine & codeine)
- Classified as depressants
- Reduce muscle activity, depressed respiration and heartbeat, and an inclination to sleep
- To OD: paralysis of respiratory center



Files for just 2 years of opioid-related deaths
(Cleveland Corners)

WHAT OPIOID PAINKILLERS DO TO YOUR BODY AND BRAIN

Opioid painkillers can have effects similar to **heroin and morphine**, especially when taken in ways other than prescribed by a doctor.

Your pupils may **dilate**.

Your breathing will slow. Overdosing can **stop breathing and cause brain damage, coma, or even death**.

You may develop a **tolerance**, meaning that you gradually need more to produce the same effect.

Stopping the drug can cause **withdrawal symptoms like shakiness, vomiting, and diarrhea**.

You'll begin to feel their effects 10-90 minutes after use, depending on the method used.

They **capitalize on our body's natural pain-relief system** by binding to special pain receptors on cells in the brain and other parts of the body.

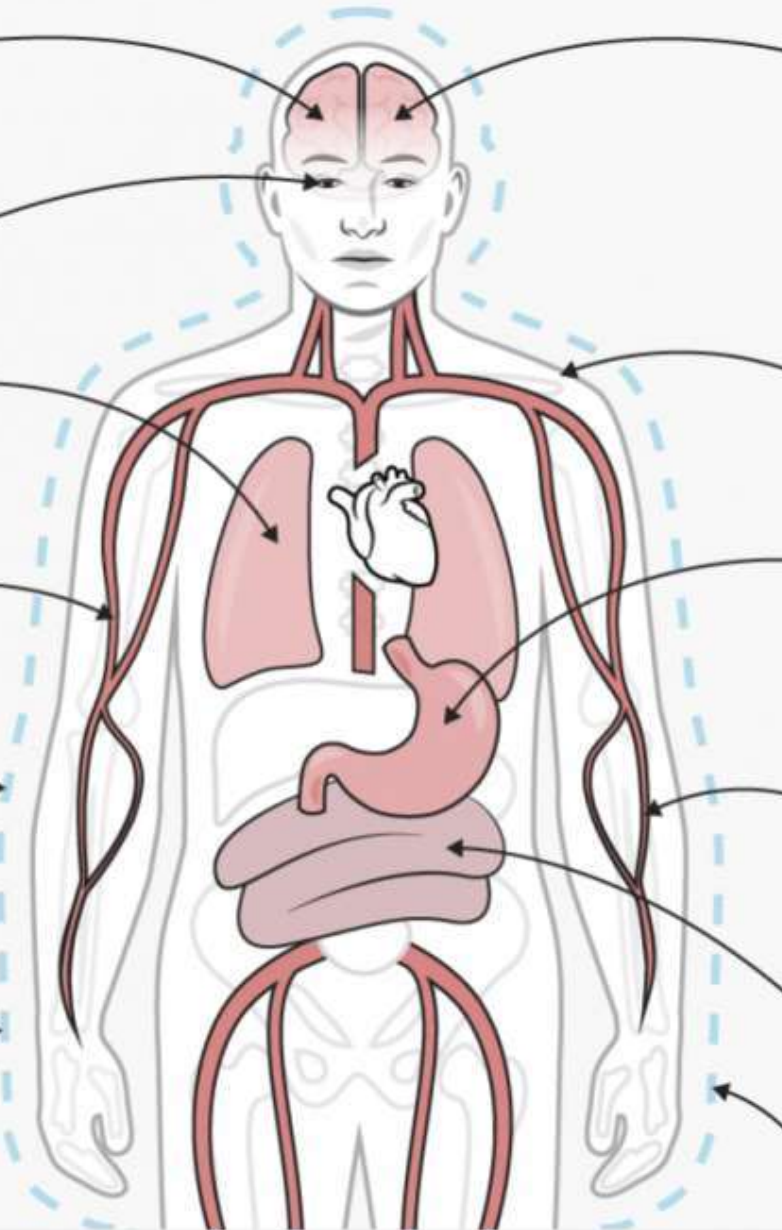
Your skin may feel **flushed and warm**.

Combining them with **alcohol or other drugs** – even when taken as directed – is especially risky.

A report found that people who'd abused them were **40x as likely to abuse heroin** compared with those who hadn't.

You become **constipated**.

Their effects can last anywhere from **4-12 hours**.



Where Opiates Come From



- The unripe (green) poppy pod (*Papaver somniferum*) oozes a sticky, milky juice when cut with a blade
- The liquid leaking out of the bulb is ***opium gum***
- This gum is boiled & strained, resulting in blocks of morphine

- **Semisynthetic opiates** are those made by simple modification of the morphine or codeine molecule (ex. Heroin)



- **Synthetic opiates** are not structurally similar to morphine
 - Get highly potent narcotic analgesic (ex. Methadone)



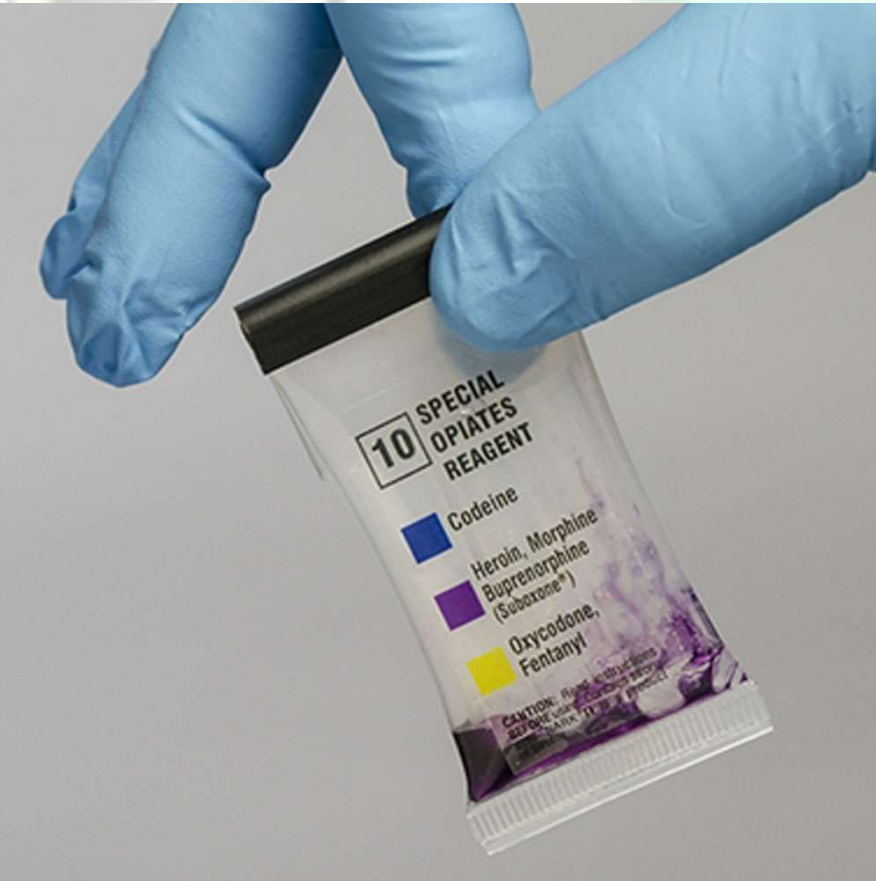


Heroin overdoses killed more people in the US than guns last year, according to the CDC

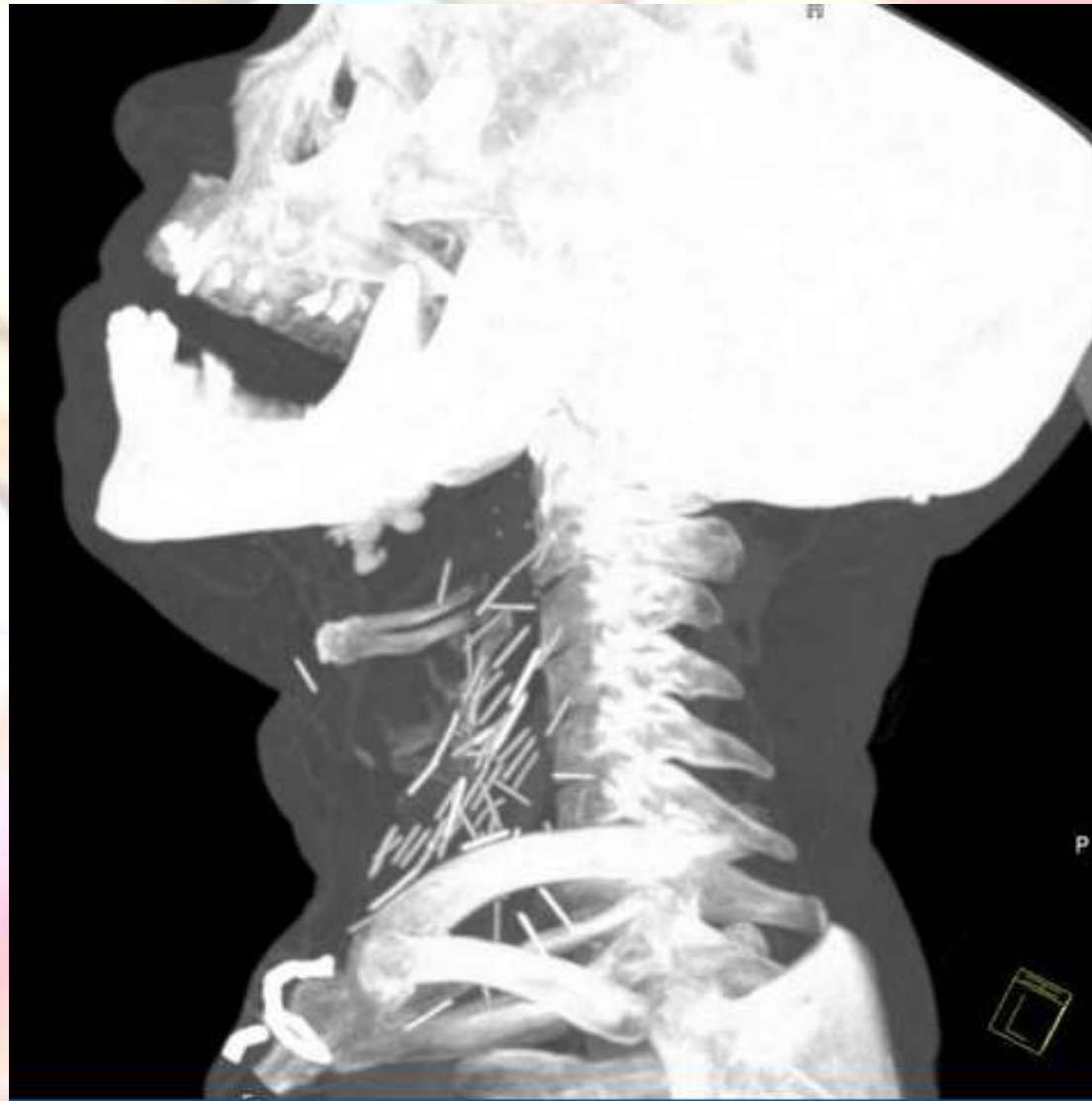
by Mike Denison

December 13, 2016

America's opioid epidemic has turned a frightening corner. According to the Centers for Disease Control and Prevention, heroin and other opiates killed 33,092 people in the United States in 2015. That's the most in recent history.



- Urine test for past 3-4 days use
- Hair test for past 90 days use
- Blood test for past 0.5 day use



Broken Heroin Needles Stuck In Patient's Neck



Initial X-rays show the faint needle lines.



Further imagery and reconstructions clearly show the needles

**Vials Of Heroin, Fentanyl, And
Carfentanil Side By Side, Each
Containing A Lethal Dose Of The Drug**



AMPHETAMINES

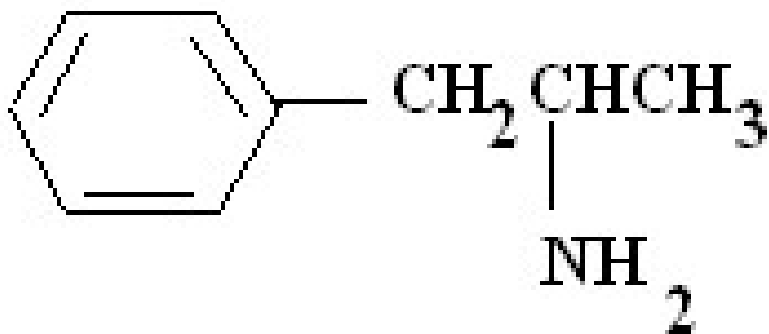
- Stimulants that create an excitatory condition characterized by elevations of heart rate, blood pressure, and respiratory rate
- Provoke intense euphoria
- Can be easily created by clandestine labs

THREE TYPES

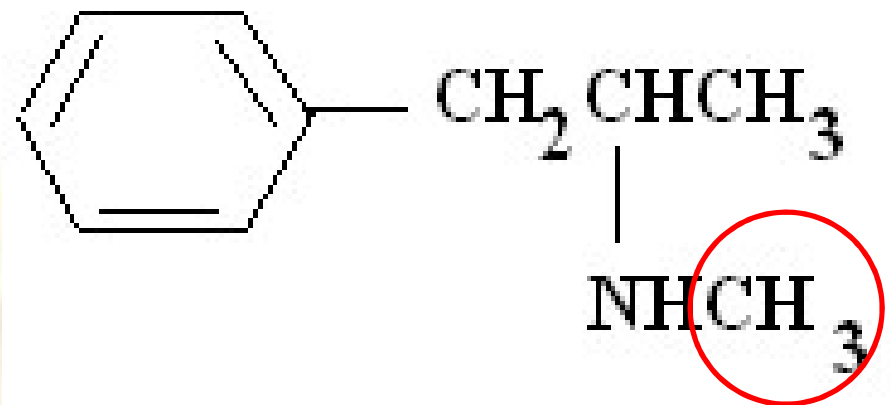
- Amphetamine
 - Speed
- Dextroamphetamine
 - Dexies
- Methamphetamine
 - Crystal, meth



Because there are molecular similarities between amphetamine and methamphetamine, drug testing methods must be rigorous



amphetamine



methamphetamine



_oman

y Loman

isty Loman

**ütest⁺
meth.**

METH 1000 ng/mL

+ Standard screening level
+ Detects methamphetamine in human urine.



Simple + reliable
at-home drug test



- Urine test for past 3-6 days use
- Hair test for past 90 days use
- Blood test for past 3 days use

PHENCYCLIDINE

phenylcyclohexyl-piperidine, aka PCP

Developed in the 1950s as an intravenous anesthetic.



Use in Hu stopped in 1965, because patients often became agitated, delusional, and irrational while recovering from its anesthetic effects

-Tested using blood or urine (up to 1 week)

what are other
words for
phencyclidine?



angel dust,
phencyclidine hydrochloride,
pcp, angel-dust, hallucinogen,
hallucinogenic drug



At low to moderate doses, physiological effects of PCP include a increased breathing rate and a rise in blood pressure and pulse rate.

Breathing becomes shallow, and flushing and profuse sweating occur.

Numbness of the extremities and loss of muscular coordination also may occur.



At high doses blood pressure, pulse rate, and respiration drop.

May be accompanied by nausea, vomiting, blurred vision, flicking up and down of the eyes, drooling, loss of balance, and dizziness.

Can also cause seizures, coma, and death (though death more often results from accidental injury or suicide during PCP intoxication).

Can cause symptoms that mimic schizophrenia, such as delusions, hallucinations, paranoia, disordered thinking, a sensation of distance from one's environment, and catatonia. Speech is often sparse and garbled.



- Natural product found in coca leaf
Erythroxylon coca
- Is alkaline so is extracted using HCl
- HCl bonds to cocaine, so treated w/base and extracted into organic solvent
(= freebase or crack cocaine)
- **Have much lower bps than cocaine- HCl,
∴ can smoke this version**

Cocaine Drug Testing



Cocaine in the blood is metabolically converted into **methylecgonine and benzoylecgonine.**

- **Labs test for benzoylecgonine**
- Urine test for past 3-4 days use
- Hair test for past 90 day use
- Blood test for 1-2 days use

WHAT COCAINE DOES TO YOUR BODY AND BRAIN

Cocaine can be snorted, smoked, or injected, and **starts affecting the brain in seconds.**

Your **pupils will dilate** as a side effect of increased serotonin levels in the brain.

Snorting can **create holes in parts of the nose** like the septum between your right and left airways.

Your **heart rate and blood pressure will rise.**

Smoking it can **irritate the lungs** and, in some cases, cause permanent lung damage.

You'll start to **feel warm** as the drug causes your blood vessels to tighten or constrict.

Chronic use may also **reduce your body's ability to store fat.**

It blocks the brain's absorption of pleasure and desire hormones serotonin and dopamine, resulting in **intense euphoria.**

In some users, **cravings can be triggered** by seeing people or places that remind them of getting high.

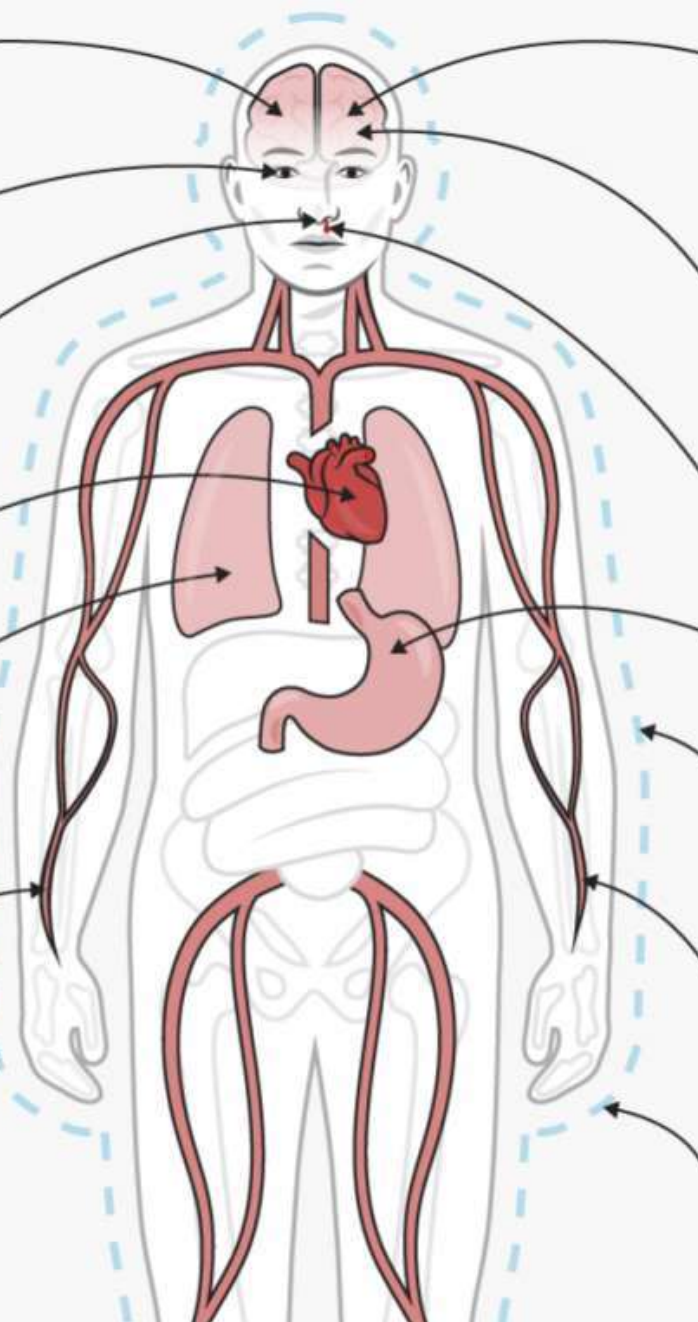
Your **nasal passages can dry out**, causing nosebleeds and nasal collapse.

Your appetite might **disappear.**

You may feel more **energized or alert.** You may also feel **irritable, anxious, or paranoid.**

Your **arteries will constrict**, which can block blood flow to the heart and even cause a heart attack.

Depending on the method used, the **high can last anywhere from 5 to 30 minutes.**



MAGIC MUSHROOM

- *Psilocybe mexicana* – the mushroom from which **psilocybin** was 1st extracted
- Considered a **psychedelic**
- >100 species of mushrooms contain **psilocybin** and **psilocin**
 - ~ cause hallucinations, euphoria, and other “trippy” symptoms



WHAT MAGIC MUSHROOMS DO TO YOUR BODY AND BRAIN

You may feel **more open or imaginative.**

You may **see sounds or hear colors**, since shrooms affect how different parts of the brain communicate.

Time may seem to **slow.**

In a study of cancer patients with anxiety, some users also experienced a **decrease in their anxious symptoms.**

You may have an **out-of-body experience** and feel as though you're observing yourself from afar.

In a small study of depressed people, some users experienced a temporary **decrease in symptoms.**

Shrooms' psychoactive ingredient is **psilocybin**. It acts on neural networks in the brain that use the chemical messenger **serotonin**.

Your pupils may **dilate.**

You might feel **relaxed.**

On the other hand, you may feel **extremely anxious or agitated.**

Most of shrooms' effects begin after **20-90 minutes** but can last up to **12 hours.**

Shrooms may be linked with a rare disorder called HPPD, where **hallucinations linger** long after use.

