Types of Drugs/Substances

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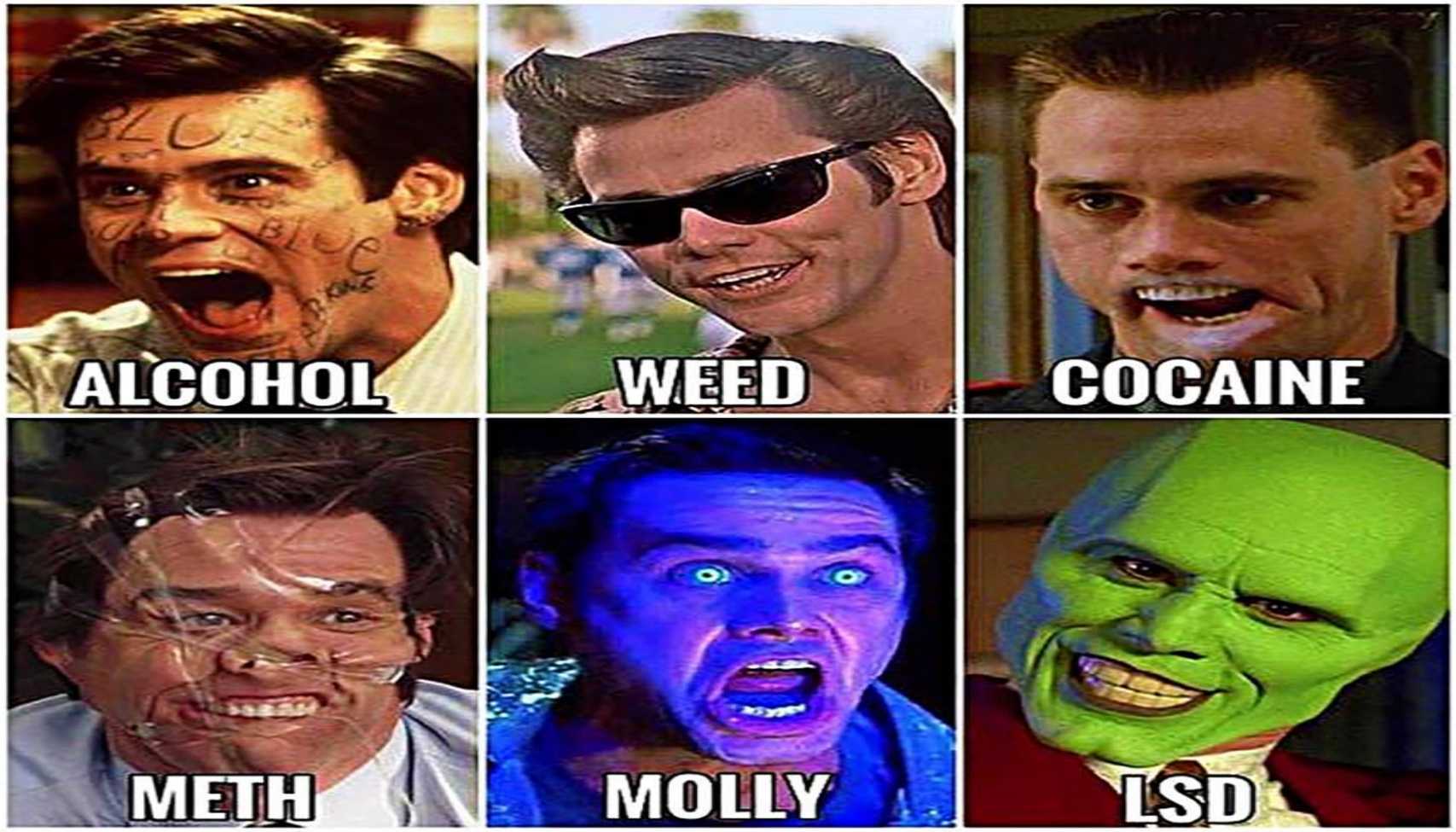
DRUGS DESCRIBED THROUGH THE MANY FACES OF JIM CARREY



Overview

- Different classes of drugs
- Cannabis
- Opioids
- Hallucinogens

SUBSTANCES

STIMULANTS

- Speed up the CNS and create a feeling of alertness and ↑energy.
- Called "uppers" →ability to make you feel very awake. When the effects of a stimulant wear off, the user is typically left with feelings of sickness and a loss of energy.

Types of drugs include:

- Caffeine
- Cocaine
- Methamphetamines
- Amphetamines
- Methylphenidate (Ritalin)

METHYLPHENIDATE (MPH)/RITALIN

- Only schedule 6 stimulant available in SA for treatment of ADD/ADHD and narcolepsy.[1]
- Used amongst students to strengthen academic performance by improving concentration and allowing one to study for long periods at a time.
- Adverse effects: loss of appetite, difficulty sleeping, dry mouth, irritability and depressed mood
- S Afr J Psychiat. 2016 → survey 818 undergraduate students in a South African university
  - 17.2% of students had used MPH in the past and only 2.3% had a diagnosis of ADD/ADHD[2]
- S Afr J Psychiat. 2017 → questionnaire 541 medical students in UFS from 1st-5th year
  - Different response rates from different years
  - Overall close to 10% used MPH, 30% had a diagnosis of ADD/ADHD[1]

SUBSTANCES

DEPRESSANTS

- Slow down CNS activity
- Called "downers" →give feelings of relaxation
- Large amounts →feeling less pain, more relaxed and sleepy
- Moderate use → more likely to result in euphoria than depression

Types of drugs include:

- Barbiturates
- Benzodiazepines
- Flunitrazepam (Rohypnol, "date rape drug")
- GHB (Gamma-hydroxybutyrate)
- Methaqualone (Mandrax, Buttons)
- Alcohol
- Tranquillisers

SUBSTANCES

INHALANTS

- Sniffed or huffed and give the user immediate results.
- When inhalants are taken, the body becomes hypoxic →sudden brain damage.
- Other effects include tachycardia, liver, lung and kidney problems, affected sense of smell, difficulty walking and confusion.

Types of drugs include:

- Glues
- Paint thinner
- Gasoline
- Laughing gas
- Aerosol sprays

SUBSTANCES

CANNABINOIDS

- Result in feelings of euphoria, cause confusion and memory problems, anxiety, tachycardia, as well as staggering and poor reaction time.
- Can produce hallucinations, esp with heavy use, or inexperienced users

Types of drugs include:

- Hashish
- Marijuana

SUBSTANCES

- Decriminalisation- removal of criminal sanctions for certain offenses (usually possession of small quantities of currently illegal drugs for personal use). Possession of drugs remains unlawful and a punishable offense (community service/fines) but no longer attracts a criminal record.
- Legalisation- removal of all types of penalty, criminal or administrative- for production, supply and possession
- Regulation- framework of rules that sets the parameters for the legal production, supply and possession of a potentially harmful substance. (Alcohol and Tobacco)
- UNODC ~4% of the global adult population have used cannabis in their life

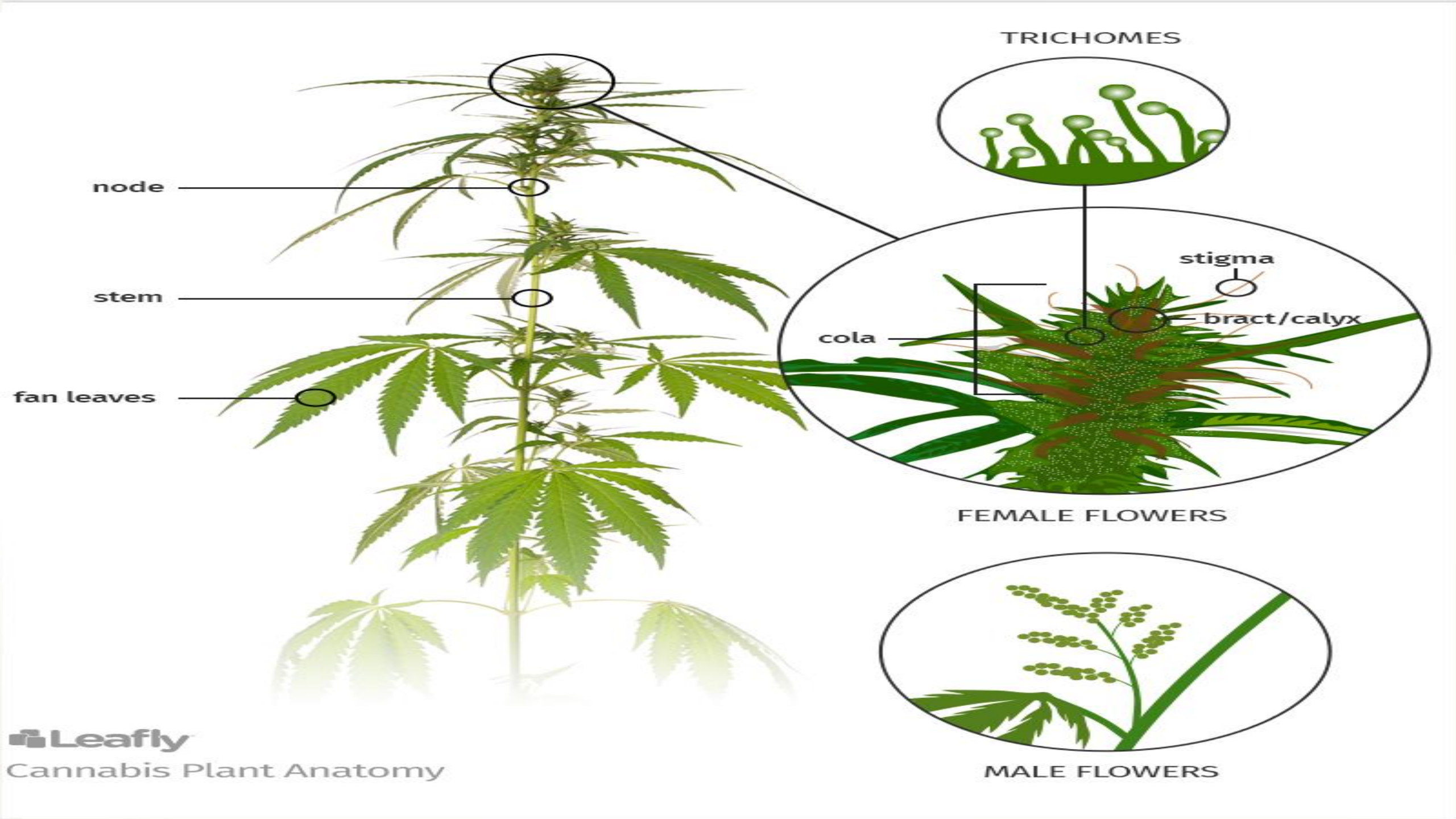
SUBSTANCES

CANNABIS PLANT

- The plant genus *Cannabis* is commonly divided in two species: *Cannabis sativa* and *Cannabis indica*.
- Male, female or hermaphrodite plants
- The cannabis plant is comprised of several structures.
- Cannabis grows on long skinny stems with its large, iconic fan leaves extending out from areas called ***nodes***.
- A ***cola*** →cluster of buds that grow tightly together.

CANNABIS PLANT CONT…

- The ***pistil*** contains the reproductive parts of a flower, and the hair-like strands of the pistil are called ***stigmas***.
- Stigmas serve to collect pollen from males.
- A ***bract*** is what encapsulates the female's reproductive parts and are heavily covered in resin glands which produce the highest concentration of cannabinoids of all plant parts.
- Enclosed by these bracts and imperceptible to the naked eye, the ***calyx*** refers to a translucent layer over the ovule at a flower's base.
- ***Trichomes*** →clear bulbous globes secrete oils called terpenes as well as cannabinoids like THC (Tetrahydrocannabinol)and CBD (cannabidiol)


TRICHOMES
node
stem
fan leaves
stigma
bract/calyx
cola
FEMALE FLOWERS
MALE FLOWERS
Leafly
Cannabis Plant Anatomy

CANNABINOIDS

PHYSIOLOGY/PHARMACOLOGY

- Endocannabinoids (eCBs) and their receptors are found throughout the human body: nervous system, internal organs, connective tissues, glands, and immune cells.
- The eCB system has a homeostatic role, characterized as “eat, sleep, relax, forget, and protect.
- It is known that eCBs have a role in the pathology of many disorders while also serving a protective function in certain medical conditions.
- It has been proposed that migraine, fibromyalgia, irritable bowel syndrome, and related conditions represent clinical eCB deficiency syndromes

CANNABINOIDS

PHYSIOLOGY/PHARMACOLOGY CONTINUED

- Cannabinoid receptor type 1 (CB1) is the most abundant G-protein–coupled receptor.
- It is expressed in the central nervous system with particularly dense expression in (ranked in order): the substantia nigra, globus pallidus, hippocampus, cerebral cortex, putamen, caudate, cerebellum, and amygdala
- CB1 is also expressed in non-neuronal cells, such as adipocytes and hepatocytes, connective and musculoskeletal tissues, and the gonads.
- CB2 is principally associated with cells governing immune function, although it may also be expressed in the central nervous system
- Δ9 THC is known to be the major psychoactive component of cannabis mediated by activation of the CB1 receptors in the central nervous system
- Psychoactive and negative effects are related to concentrations of THC.

CANNABINOIDS

PHYSIOLOGY/PHARMACOLOGY CONTINUED

- Unlike THC, CBD elicits its pharmacological effects without exerting any significant intrinsic activity on CB1 and CB2 receptors.
- CBD appears to have the ability to counteract psychotic symptoms and cognitive impairment associated with cannabis use as well as with acute THC administration
- Several activities give CBD a high potential for therapeutic use, including antiepileptic, anxiolytic, anti- psychotic, anti-inflammatory, and neuroprotective effects.

CANNABINOIDS

MEDICINAL USE

- American Academy of Neurology (AAN) issued a Summary of Systematic Reviews for Clinicians → oral cannabis extract is effective for reducing patient-reported spasticity scores and central pain or painful spasms when used for MS
- Systematic Review and Meta-analysis 2016 →
- Moderate-quality evidence to support the use of cannabinoids for the treatment of chronic pain and spasticity.
- Low-quality evidence suggesting that cannabinoids were associated with improvements in nausea and vomiting due to chemotherapy, weight gain in HIV, sleep disorders, and Tourette syndrome

CANNABINOIDS

MEDICINAL USE

- Recently, 3 high quality placebo-controlled adjunctive therapy trials of a purified CBD product in patients with Dravet Syndrome and Lennox-Gastaut Syndrome →CBD superior to placebo in reducing the frequency of convulsive seizures in DS and frequency of drop-seizures in LGS
- In the US, 28 states allow comprehensive public medical marijuana and cannabis programs
- The most common conditions accepted by states that allow medicinal cannabis relate to relief of the symptoms of cancer, glaucoma, HIV/AIDS, and MS.

CANNABINOIDS

CHALLENGES

- Short-term use of cannabis has led to impaired short-term memory; impaired motor coordination; altered judgment; and paranoia or psychosis at high doses.
- Long- term/heavy use of cannabis, especially in individuals who begin using as adolescents →dependence; altered brain development; cognitive impairment; poor educational outcomes (e.g. dropping out of school); and diminished life satisfaction.
- Long-term/heavy use of cannabis associated with chronic bronchitis and an increased risk of chronic psychosis-related health disorders, including schizophrenia and variants of depression, in persons with a predisposition to such disorders

CANNABINOIDS

CHALLENGES

- Lancet Psychiatry (2019): Included patients aged 18–64 years who presented to psychiatric services across Europe and Brazil with first-episode psychosis. Between 1 May 2010 and 1 April 2015 obtained data from 901 patients with first-episode psychosis across 11 sites and 1237 population controls from those same sites
- Using Europe-wide and national data on the expected concentration of Δ9 THC in the different types of cannabis →divided the types of cannabis used by participants into: low potency (THC <10%) and high potency (THC ≥10%)
- Findings: Daily cannabis use was associated with increased odds of psychotic disorder compared with never users, **increasing to nearly five-times increased odds for daily use of high-potency types of cannabis**.

SYNTHETIC CANNABINOIDS (SC)

- Synthetic drugs contain a mixture of psychoactive compounds that mostly bind cannabinoid receptors with high potency.
- Replicate the effects of natural cannabis and Δ9 THC but induce more severe adverse effects
- Chronic use of SC has been associated with serious psychiatric and medical conditions and even death
- Used recreationally, especially by young adults
- Compounds show differences in their selectivity, their potency and their function

SYNTHETIC CANNABINOIDS (SC)

- In general they are more potent and efficacious cannabinoid receptor agonists than THC
- Mostly undetectable via a simple urine test
- Major differences between the effect of cannabis and SC drugs, both in terms of spectrum and intensity of these effects
- In USA there were 37,500 reported cases of seizures and 3,682 reported cases of poisonings related to SC use during 2014

SUBSTANCES

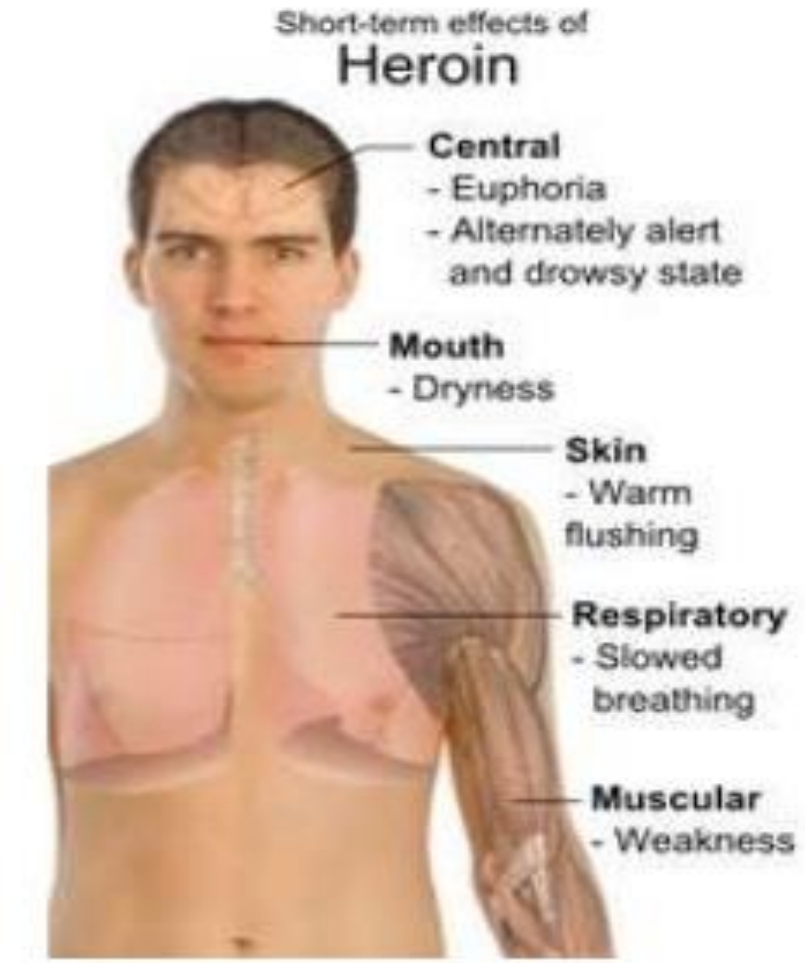
OPIOIDS & MORPHINE DERIVATIVES

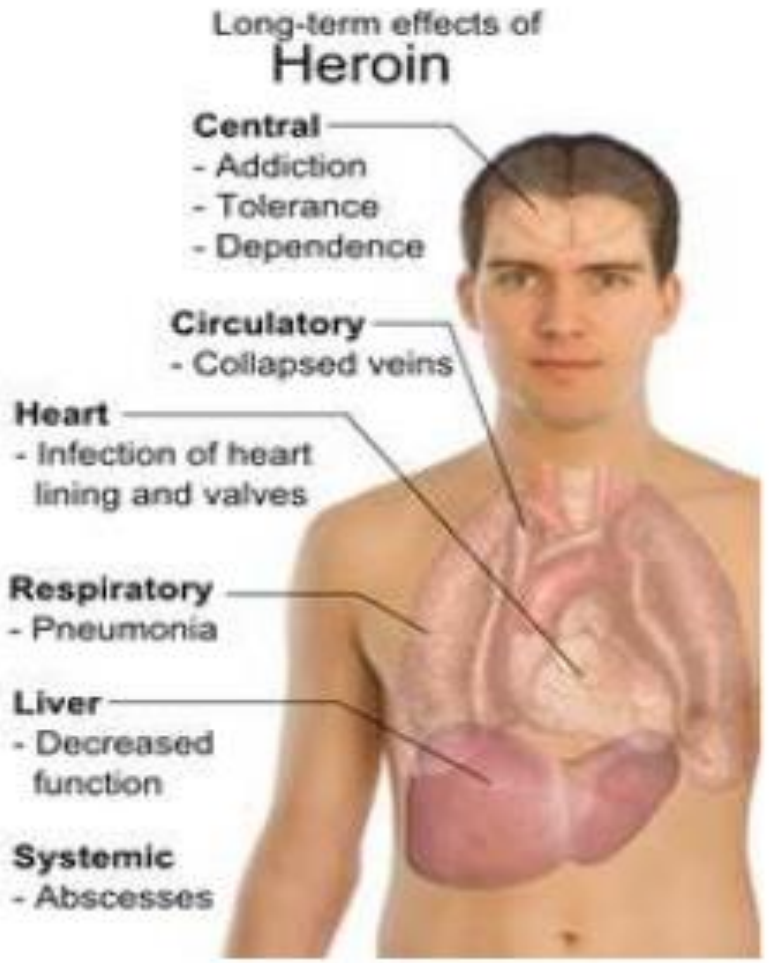
- Can cause feelings of euphoria, drowsiness, confusion, nausea, respiratory complications and relieve pain.

Types of drugs include:

- Codeine
- Fentanyl and fentanyl analogues
- Heroin
- Morphine
- Opium
- Oxycodone HCL
- Hydrocodone bitartrate

Heroin's effects on the body





SUBSTANCES

HALLUCINOGENS

- Different classes:
- Psychedelics (serotonin 2A receptor (5-HT2AR) agonists →lysergic acid diethylamide (**LSD**), psilocybin (**magic mushrooms**), and N,N-dimethyltryptamine (**DMT**), mescaline (cactus **Peyote** [Lophophora williamsi])
- Entactogens → MDMA (ecstacy)
- Dissociatives → Ketamine
- Atypical hallucinogens → Ibogaine
- Induce temporary but profound alterations of consciousness, involving acute changes in somatic, perceptual, cognitive, and affective processes

LSD

- Acts primarily as a serotonergic agonist, but also shows action at dopaminergic and adrenergic receptor sites
- Subjective effects →can last up to 12 hours, with rapid tolerance developed after repeated administration, and no evidence of withdrawal
- Acutely increases plasma cortisol, prolactin, oxytocin, and adrenalin levels
- Effects of LSD last slightly longer than other psychedelics such as psilocybin and mescaline
- Effects →altered mood, perception, cognition, the occurrence of elementary and complex hallucinations, as well as experiences described as insightful, transcendent, and/or mystical in nature

LSD

CLINICAL USE

- 2014 double-blind, randomized, active placebo-controlled pilot study →examined safety and efficacy of LSD-assisted psychotherapy in 12 patients with anxiety associated with life-threatening diseases
- Group comparison results supported positive trends in reduction of anxiety after two sessions of LSD-assisted psychotherapy

PSILOCYBIN

- Found in over 100 species of mushrooms
- Characterized as a prodrug, and is dephosphorylated by hepatic first pass metabolism into the 5-HT2A, 1A and 2C receptor agonist psilocin
- Subjective effects last 4-6 hours

PSILOCYBIN

CLINICAL USE

- Potential treatments for cluster headache
- Pilot studies looking at:
  - Anxiety secondary to a cancer diagnosis
  - Obsessive-compulsive disorder
  - Treatment-resistant depression
  - Smoking cessation
  - Alcoholism

SUBSTANCES

PRESCRIPTION DRUGS

- Can be very helpful drugs when used properly and when under the guidance of a qualified physician.
- Can be used as aids in surgery, to treat medical conditions and while controlling various symptoms.

Types of drugs include:

- Opioids: Codeine, Oxycodone, Morphine
- Central nervous system depressants: barbiturates, benzodiazepines
- Stimulants: dextroamphetamine, methylphenidate

SUBSTANCES

ANABOLIC STEROIDS

- Taken to improve physical performance as well as to enlarge muscles and increase strength.
- Negative effects of steroids include baldness, cysts, oily hair and skin, acne, heart attack, stroke and change in voice.
- Hostility is also a frequent side effect of anabolic steroids.

Types of drugs include:

- Anadrol
- Oxandrin
- Durabolin
- Stanozol
- Dianabol

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THANK YOU FOR YOUR ATTENTION ! ANY QUESTIONS?