



**CNB**  
For a Drug-Free Singapore

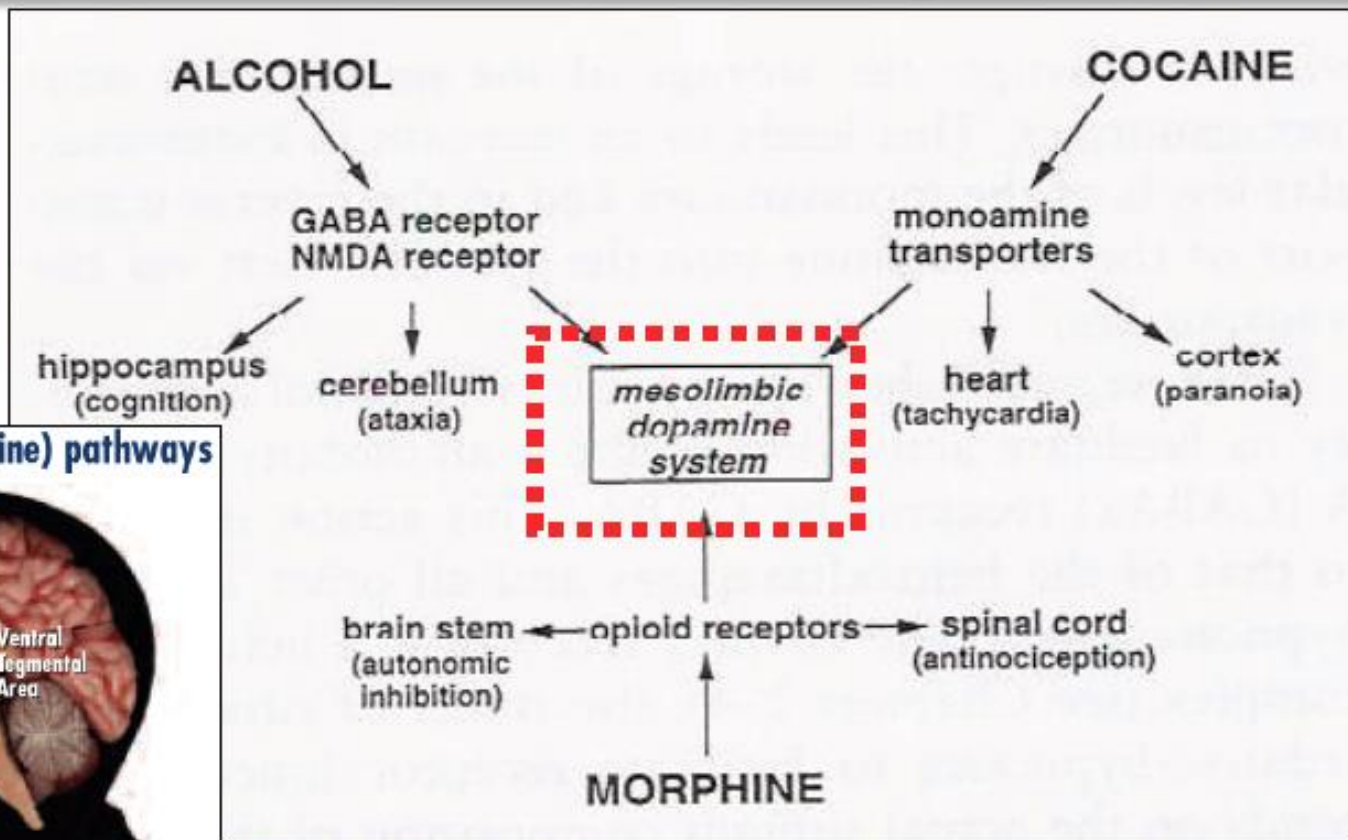
# **Topic 3: Understanding the Basics of Drugs**

# HARMS OF DRUGS

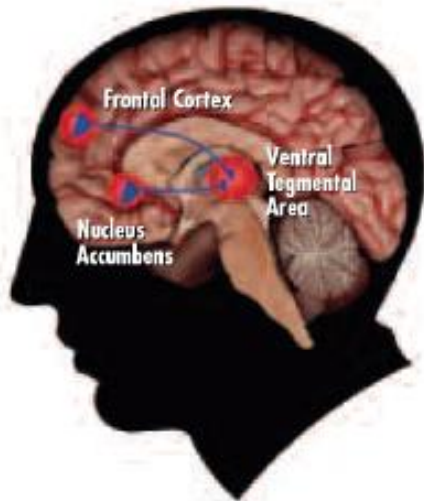
Addictive substances stimulate the « reward » mesolimbic system

Similar to:

- Food
- Sex
- ...



Brain reward (dopamine) pathways



Eric J. Nestler, *Cellular and molecular mechanism of drug addiction*, in *Neurobiology of Mental Illness*. 2004.

Decision Making Process:  
two competing neuronal systems

## Reflexive

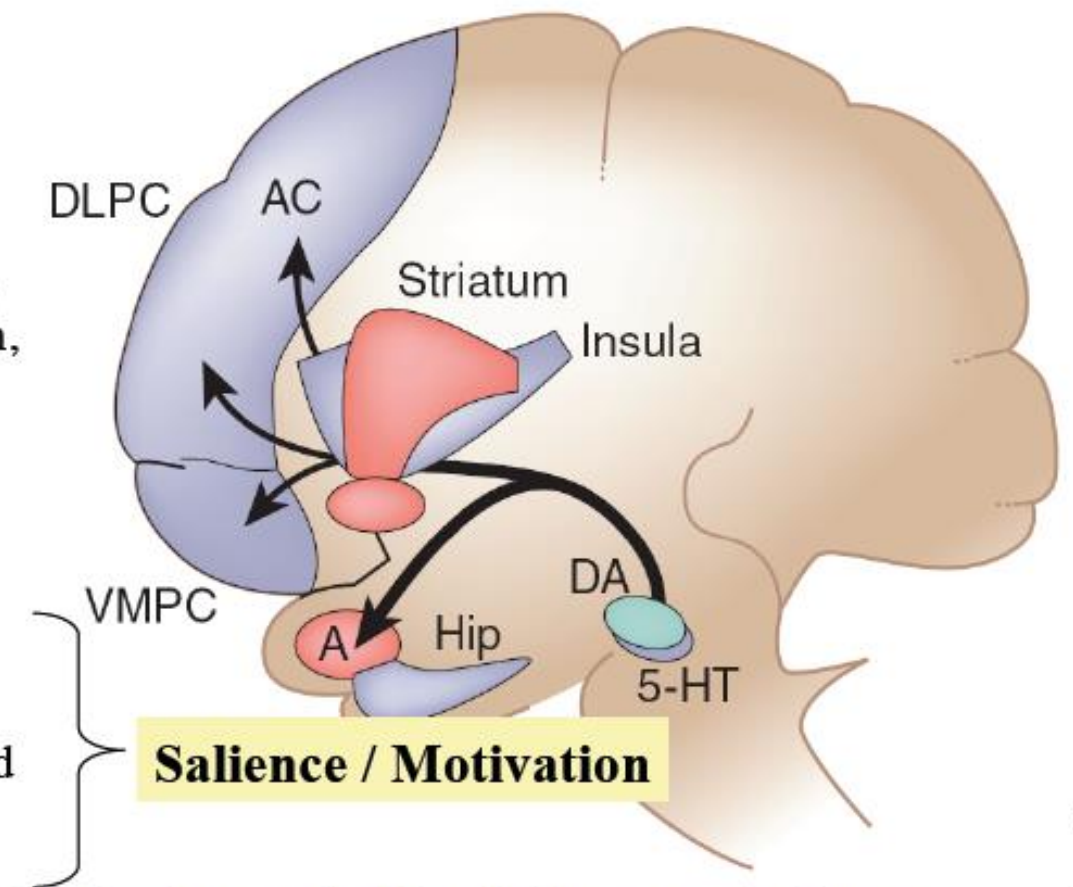
*Prefrontal cortex*

Executive function:

working towards goal,  
anticipation, prediction,  
thinking about  
consequences

## Impulsive

amygdala (valence + / -),  
**n. accumbens (NAcc)**,  
pallidum ventral associated  
regions



Antoine Bechara. *Decision making, impulse control and loss of willpower to resist drugs: a neurocognitive perspective*. *Nature Neuroscience* (2005)

# HARMS OF DRUGS: METHAMPHETAMINE



• 'Also known as: Ice', Glass, Crystal, Speed, 'Quartz', 'Ice Cream', 'Ya ba', Shabu or Syabu.

## **Acute Physiologic Effects**

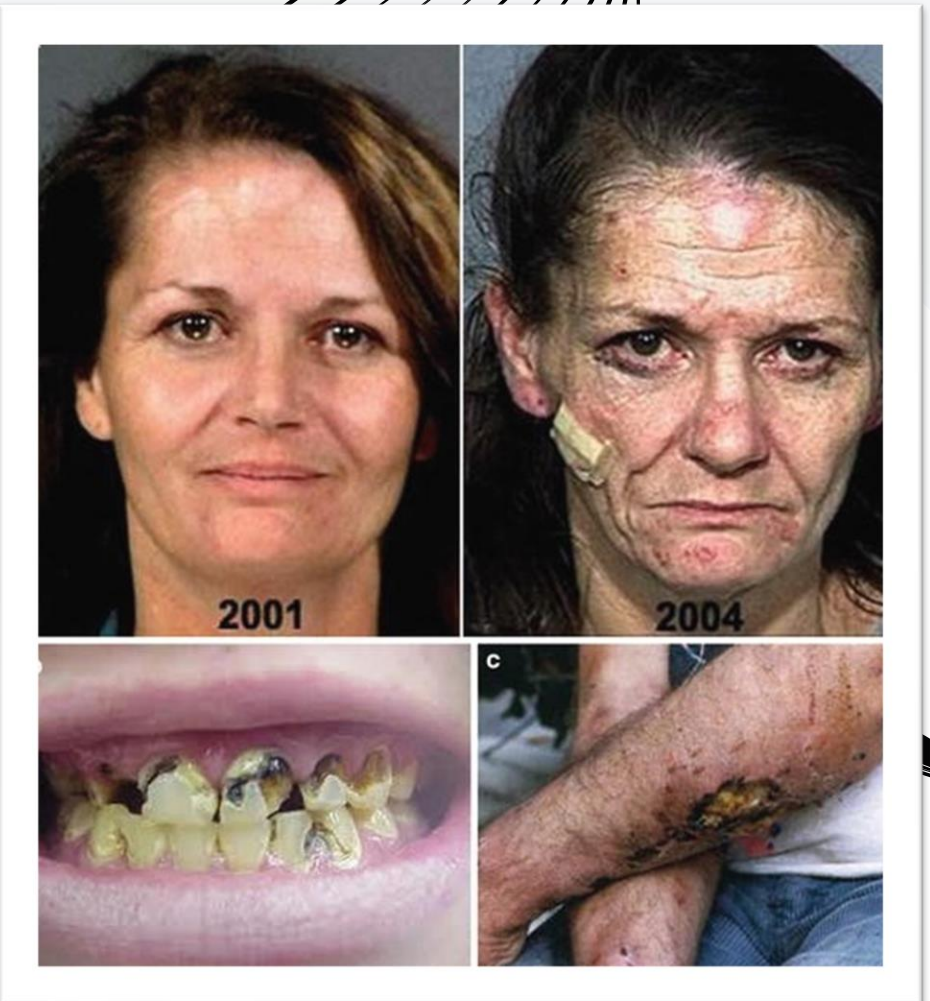
- Increased heart and respiratory rates
- Elevated blood pressure and body temperature
- Pupillary dilation
- Irregular heart rate, and damage to small blood vessels in the brain
- Dangerously elevated body temperature and severe damage to the liver occur with high-dose

## **Acute Psychological Effects**

- A heightened sense of well-being or euphoria, and increased alertness
- High doses may produce repetitive and compulsive acts and may cause irritability; excitement; visual, auditory, or tactile hallucinations; and altered perceptions of reality, characterised by delusions and psychosis
- Emotional lability

## **Chronic Physiologic & Psychiatric Effects**

- Multiple dysfunctions of the heart (e.g., hypertension, aortic dissection, acute coronary syndromes, pulmonary hypertension, cardiomyopathy)
- Among people who inject the drug, skin abscesses and damaged blood vessels at the injection site
- Chronic use may also lead to episodes of protective behaviours, paranoia, anxiety, confusion, and insomnia
- Heavy use is linked to progressive social and occupational deterioration
- Psychotic symptoms may sometimes persist for months or years after use has stopped



# HARMS OF DRUGS: CANNABIS



- Also known as: weed, pot, and ganja

## Acute Cannabis Use:

- Impaired learning
- Memory
- Attention
- Motor coordination
- Executive functioning (ability to plan, organize, solve problems, make decisions)
- Risky decision making

## Psychiatric Manifestations

- Marked feelings of anxiety
- Paranoia
- Cannabis induced psychosis (hallucinations)

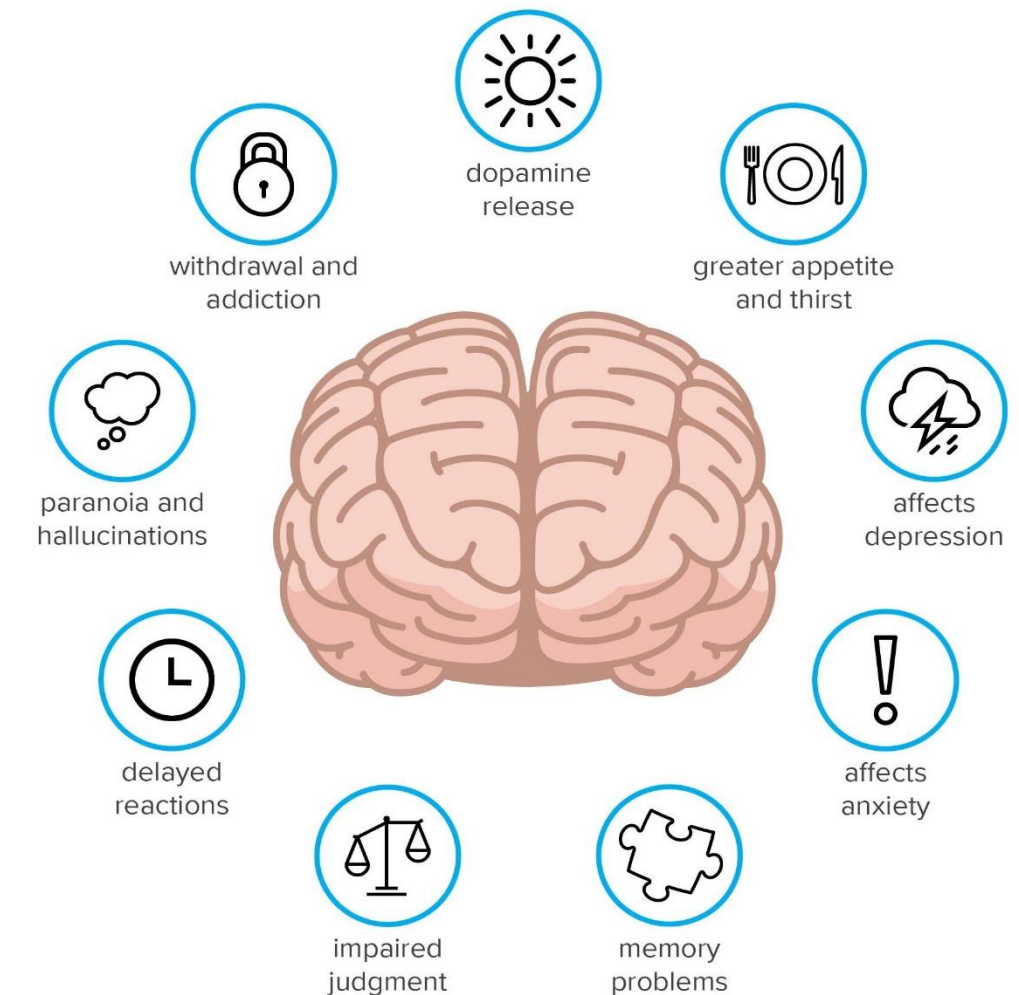
## Psychosocial Impact:

- Cannabis use disorder is associated with worsening functional status, including lower income, greater need for socioeconomic assistance, criminal behavior, unemployment, and decreased life satisfaction.

## Impact on other Psychiatric Disorder

- Worsen existing anxiety, depression, and bipolar disorder symptoms and to increase the likelihood of developing a depressive disorder (WHO)

## Effects on the Brain Marijuana



# HARMS OF DRUGS: CANNABIS



## Chronic Effects:

- Increased risk of cognitive difficulties, psychiatric illness, addiction and other systematic effects
- A dose-dependent association between cannabis use from baseline to 5-year follow-up and neurodevelopmental abnormalities, including accelerated cortical thinning, primarily in prefrontal regions of the brain. (Gruber et al) <sup>(1)</sup>
- Cannabis exposure is detrimental to the developing brain while also making individuals more susceptible to other addictive substances. Exposure to THC in the prenatal and adolescent periods can lead to impaired neural connectivity, particularly in the hippocampus, which may contribute to the association between early and regular cannabis use and decreased IQ (Zalesky et al.) <sup>(2)</sup>
- Cannabis use is not a definite “gateway drug” to use of other substances, but lifetime cumulative probability estimates indicate that 44.7% of individuals with lifetime cannabis use progressed to other illicit drug use at some time in their lives (Secades-Villa-R et al). <sup>(3)</sup>
- Cannabis and the cannabinoid THC are potentially addictive substances that may be associated with cannabis use disorder; tolerance and/or withdrawal develops in **10%-30%** of cases of cannabis use disorder <sup>(4)</sup>



# HARMS OF DRUGS: CANNABIS



## Cannabis & Psychosis

- A recent multicenter study in psychiatric centers evaluated the relationship between first-episode psychosis and cannabis use. <sup>(1)</sup>
- Compared with control subjects who never used cannabis, daily users had a 3.2-fold increased risk (95% CI=2.2, 4.1) for developing psychosis, and use of high-potency types of cannabis brought the odds ratio up to 4.8 (95% CI=2.5, 6.3).
- Cannabis users may also experience cannabinoid hyperemesis syndrome, a condition marked by cyclic vomiting and abdominal pain that can lead to dehydration and anorexia



# HARMS OF DRUGS



## NEW PSYCHOACTIVE SUBSTANCES (NPS)

also known as Spice, K2, Bath Salts

- Severe intoxications
- Severe toxic reaction leading to death
- Paranoia (irrational fear or suspicion)
- Hallucination
- Adverse cardiovascular problems
- Renal failure
- Seizures



## HEROIN

also known as white, smack, Peh Hoon, and Ubat

- Damaged lungs, kidney and liver
- Lowered heart rate and respiration
- Tiredness and dull feeling



## LYSERGIDE (LSD)

also known as Acid, Trips, Stamp

- Hallucination
- Numbness
- Loss of control of thoughts
- Distorted sight, hearing, smell, touch and taste
- Increased heart rate, breathing and body temperature
- Severe panic, confusion, hallucination and paranoia (irrational fear or suspicion)



## ECSTASY

also known as MDMA, and Molly

- Hallucination
- Long term memory loss
- Kidney, liver and brain damage

# HARMS OF DRUGS



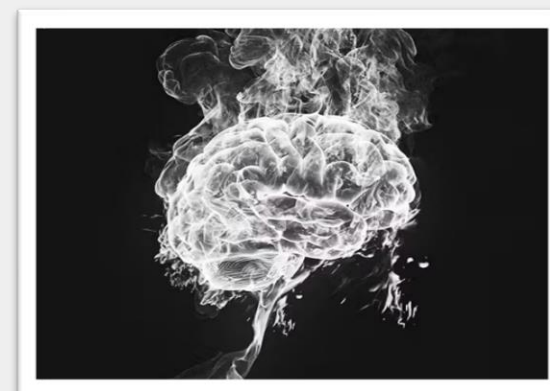
Cannabis use is linked to a higher risk of psychiatric conditions like **schizophrenia**, **bipolar disorder**, and **depression**. Frequent use, especially in adolescence, is associated with increased risks for schizophrenia and worsening bipolar symptoms. There is also evidence suggesting that cannabis may elevate the risk of depression



Drug use significantly **increases the risk of a fatal accident**, with studies showing that it can elevate the risk by two to seven times. <sup>(1)</sup> This heightened danger is largely due to impaired attention and slower reaction times caused by the effects of various substances.



**Adolescent cannabis use is linked to significant brain changes**, including alterations in brain structure and function. It can lead to a lower IQ and a lasting decline in cognitive performance, affecting memory, attention, and executive functions. These impairments may persist into adulthood, impacting academic and professional outcomes.



**Current evidence on medical cannabis is not yet sufficient** to conclusively establish its effectiveness across a wide range of conditions. More rigorous, large-scale studies with standardised methods and formulations are needed to provide a clearer understanding of its benefits and risks, ensuring that any claims of efficacy are well-supported by reliable data.





# QUIZ TIME!

Find out if you have understood the topics covered in this training!



<https://go.gov.sg/dfsgchampions-theme1quiz>

# RESOURCES

*for information*



*CNB's website*



*Drugs and Inhalants*



*Misuse of Drugs Act 1973*

*to watch*



*CNB's YouTube*



*PDE Video: Down the Rabbit Hole*



*PDE Video: Last Days*

# RESOURCES

*for parents, educators, counsellors*



*Smart Parenting articles*



*PDE toolkits*



*PDE message cards*



*Information booklet on Cannabis*



*Information booklet on New Psychoactive Substances (NPS)*

# THANK YOU

We hope you find this set of resources useful.  
Let's work together towards a drug-free society!

