



# Street Drugs & Medication Interactions

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# Group exercise



- Groups of 3
  - What street drugs do you come across in practice
  - What prescribed medication do come across

# Drug Interaction



- When one drug that you take affects the way another drug you take works in your body.
- An interaction can affect your body's ability to break down one drug or both drugs. It can also affect the strength or effectiveness of one drug or both drugs. May cause adverse effect which is not a affect of any drug.

# Pharmacokinetics

# Pharmacodynamics



- Pharmacokinetics
  - How the body acts on drugs
- Pharmacodynamics
  - How drugs act on the body

# Aims

- No specific research
  - a. What's going on in brain
  - b. Prescribed/non-prescribed drugs interaction in the body
  - c. Examples of interactions



# Dopamine



- Link between movement & madness
- Nigrostriatal enables for smooth movements
- Mesolimbic for pleasurable sensations, behaviour & euphoria
- Stimulants act on this system

# Serotonin



- It regulates emotions (panic & anxiety), cognitive functions, body temperature, appetite & sexual functioning
- Ecstasy has a effect on this system
- Excess can cause problems

# Noradrenergic

- Helps in “fight or flight” response
- Stimulants mimic its effect in the body





# GABA



- Calming effect
- Decrease anxiety, relaxation & causes sedation
- Controls breathing centres of brain
- Alcohol, barbiturates and Benzos activate GABA

# Opiate

- Three Mu, Kappa & delta
- Mu morphine and heroin- pain free & sedation



# Alcohol



- Women & elderly more effected
- Causes more drowsiness dizziness with sedatives, anti-allergic, anti-anxiety, anti-hypertensive, antiepileptic & viagra
- Antidepressants can cause depression, increased risk of overdose
- Stomach upset, ulcers and bleeding from NSAIDS
- Liver damage with most herbal preparations and high cholesterol medications
- Breathing difficulties with antipsychotics & sedatives
- Sedative- BDZ & antidepressants
- Warfarin elicit haemorrhage
- Unpredictable reactions with diabetes treatment

# Stimulants



- Arrhythmia with use of anaesthetics
- Cerebral/Cardiac – Cocaine & older antidepressants
- Hyperthermia/dehydration- ecstasy
- Reduce effect with antipsychotics & antidepressants
- Hypertension with MAO inhibitors, beta blockers
- Hepatotoxic/cardiotoxic with CBZ
- Oversedation with BDZ
- Bleeding risk with warfarin increases

# Examples



- Patient is on antipsychotic who uses amphetamines on occasions. No psychotic symptoms so antipsychotic stopped
- What might happen?



- Ecstasy (stimulates serotonin) + Moclobemide (Increases serotonin availability)
- 4 deaths have been reported with serotonin toxicity
- Ecstasy use- depression- prescription of SSRI-continuous use of Ecstasy
- Similarly with ADHD on dexamphetamine



- Patient on alcohol dependency sees GP with low mood, get a older antidepressant (Dotheipin)
- Intoxication takes an impulsive overdose
- Alcohol is involved in more deaths by overdose than any other single dose
- Most die of respiratory failure
- Increase in inhibitory effect of GABA which slows and stops breathing

# HIV medication

- Alcohol
- Amphetamines
- Ecstasy
- GHB
- Nothing reported with Cocaine and heroin





# Methadone



- Normally medication decreases levels in blood
- Antifungal, antidepressants, anti-anxiety and some anti-biotics increases the level of methadone in the body

# Methadone

- Substitute prescribing
- Long acting synthetic opiate
- At doses  $> 80\text{mg}$  produces near saturation of opiate receptors



# Methadone



- Alcohol
  - Increased sedation and respiratory depression
- Antidepressants
  - Some SSRI's can increase methadone plasma levels
  - citalopram drug of choice
- BZD
  - Sedation
  - Concomitant use can lead to accidental OD
- Carbamazepine
  - Decreases methadone levels
- Fluoxetine
  - lack of significant interaction
- Grapefruit juice
  - raised levels through CYP3A4 inhibition

# Methadone interactions



- Hypnotics
  - Enhanced sedation
- Risperidone
  - Irritability and aches
- TCA's
  - Enhanced sedation

# Cocaine

- Stimulant
- Increased energy
- Increased confidence
- Euphoria
- Diminished need for sleep
- Similar effect to mania
- Blocks the reuptake of dopamine
- Hallucinations and psychotic states



# Cocaine interactions



- Alcohol
  - Changes in HR and BP → CVS toxicity
  - Combined use → enhance cocaine-induced hepatotoxicity
- Antidepressants
  - Desipramine may reduce the effect
  - Fluoxetine → no significant effect
  - Trazodone → minor physiological effects
  - MAOI's → augment pressor effect

# Cocaine interactions



- Antipsychotics
  - Flupentixol may reduce cocaine craving
  - Haloperidol may moderate stimulant effects
  - Clozapine increases cocaine levels but reduces the cocaine 'high' and some cardiac events
- Buprenorphine
  - No notable interaction
- Cannabis
  - Enhanced cardiotoxicity (↑ HR)
- Carbamazepine
  - May enhance cardiac effects of CBZ
- Lithium
  - Little effect on cocaine
- Methadone
  - Cocaine may accelerate methadone elimination

# Cannabis



- Active ingredient  $\Delta$ -9-THC
- Different forms
  - ‘Grass,’/marijuana (herbal material), hash (resin), skunk
- Effects are apparent within minutes if drug smoked, peaking in 30 minutes, lasting 2-3 hours
- Immediate effects:
  - Mild euphoria, subjective sense of enhanced sensation, relaxation and increased appetite
  - Mild paranoia, panic attacks and delayed reaction time
- Chronic effects: amotivational syndrome, psychosis, anxiety, depression



# Cannabis interactions



- Alcohol
  - Decreased ethanol metabolism with enhanced CNS depression
- Antidepressants
  - Mental status changes consistent with delirium and tachycardia
  - Marijuana + TCA's → ↑ HR
  - Fluoxetine + Cannabis → Mania

# Cannabis interactions



- Antipsychotics
  - Chlorpromazine clearance increased by cannabis smoking
  - Additive drowsiness
- Benzodiazepines
  - Additive drowsiness
- Disulfiram
  - Hypomanic episode with marijuana
  - Acute confusional state

# Cannabis interaction

- Lithium
  - Increases levels
- Methadone



# Heroin



- Most abused opiate
- 3 times more potent than morphine
- Euphoriant effects within seconds-minutes
- Side effects of acute intoxication
  - Nausea/vomiting, constipation, pupillary constriction, drowsiness, respiratory depression

# Heroin interactions



- Generally can produce sedation/respiratory depression
- Anticholinergics
  - Misuse likely
  - Can cause hallucinations, elation and cognitive impairment
- Antidepressants
  - Avoid very sedative AD's
- Antipsychotics
  - Additive sedation
  - Reduce psychotropic effects of almost all drugs by blocking dopamine receptors
  - Sulpiride reasonably safe