Module 6

How Drugs Work
How Drugs Work

Topic 1

Introduction
Learning outcomes

When you have completed this module you should be able to:

✓ Classify common psycho-active drugs according to their effect on the central nervous system (CNS)

✓ Outline the major short and long-term effects of psycho-active drugs

✓ Describe key issues in pharmacology such as tolerance, withdrawal, overdose, dependence and interaction

✓ Describe the harmful effects on young people resulting from AOD use
How Drugs Work

Topic 2

Introduction to how drugs work
Pharmacology

To understand how drugs work in the body we need to know:

- Type of drug used
- Quantity of drug used
- Time taken to consume the drug
- Tolerance
- Gender, size and amount of muscle
- Other psycho-active drugs used
- Mood or attitude
- Expectation
- Setting or environment
- Method of drug administration
Psycho-active drugs

✓ Substances that alter mood, thoughts, or behaviour as a result of changes in the functioning of the brain.

✓ In this module, the term 'drug' will be used to include all psycho-active drugs including alcohol.
Why is it important to know how drugs work

Allows workers to:

✓ Build a better rapport and have more confidence when dealing with young people

✓ Develop a better understanding of factors influencing the young person

✓ Take appropriate action in critical situations

✓ Provide emergency service workers with accurate information about the state of a young person

✓ Meet their obligations in regard to duty of care

✓ Meet occupational health and safety legislation requirements
How drugs work

Summary

✓ Pharmacology is the study of how drugs work in the body

✓ Psycho-active drugs commonly act upon the brain to affect a person’s mood, behaviour and thinking ability

✓ Other drugs are purely medicinal and do not have a psycho-active effect (e.g. cholesterol-lowering medication)

✓ Young people are the largest consumers of drugs in our community so it is necessary for frontline workers to understand how drugs work
How Drugs Work

Topic 3

Classifying drugs
Classifying drugs

Drugs can be classified in a variety of ways. The most useful system is classification by their effect on the central nervous system (CNS).

- Stimulants *speed up* the CNS
- Depressants *slow down* the CNS
- Hallucinogens *distort* the message that is being carried in the CNS
- Other - those drugs that do not easily fit into the preceding groups

Some drugs such as cannabis and ecstasy can fit into more than one category.
How Drugs Work

Topic 4

How psycho-active drugs act on the body
How Drugs Work

Topic 5

How drugs move through the body
Eliminate drugs from the body and drug half-life

Elimination

✓ Most drugs need to be metabolised to leave the body

✓ Metabolisation is a chemical process in which the liver transforms the drug into a substance called a metabolite that can be passed out of the body

✓ Metabolites are mostly excreted by the kidneys into urine. Drugs can also be excreted through:
  - breath
  - sweat
  - saliva
  - breast milk

✓ Drug testing often detects the metabolites of specific drugs in urine, rather than the drug itself
Speed of drug effect

- Injecting
- Inhaling
- Snorting
- Smoking
- Swallowing
- Rectal

Fastest

Slowest
How drugs move through the body

Summary

✓ Methods of drug administration include:
  - Injecting
  - Smoking
  - Inhaling
  - Snorting
  - Swallowing
  - Rectal

✓ Intravenous drug use and inhaling the fumes of a substance are the two fastest methods of achieving a psycho-active drug effect.

✓ Once metabolised, drugs can leave the body via urine, breath, sweat, saliva and breast milk.
How Drugs Work

Topic 6

Drug effects
Factors influencing drug effects

- Type of drug
- Quantity of drug used
- Method of drug use
- Time taken to consume
- Tolerance
- Gender, size and amount of muscle
- Use of other psycho-active drugs
- Mood or attitude
- Expectation
- Setting or environment
Drug effects are different

- Having less experience with the drug means that a person is less likely to have developed a tolerance for the drug. The drugs will therefore have a greater effect on them.

- The social context (e.g. excitement at party) in which young people take drugs will also impact on a drug effect.
Drug effects are different Cont…

- Since the development of the brain continues until approximately 18 years of age, a young person can be more vulnerable to the harmful effects of drugs
- Personal context (e.g. emotional)
- Smaller body size
- Placebo effect
- Experience
Differences in young people vs adults

- Smaller body size
- Lack of experience and judgement
- Lowered tolerance
- Personal context (e.g. emotional)
- Social context (excitement of a party)
- The brain is still developing
- Peer influence
- Strong expectations
How Drugs Work

Topic 7

Effects of specific psycho-active drugs
Drug effects

Summary

- The effect of a drug is determined by many factors (not just type and amount of drug consumed)
- Drugs can have short-term and long-term effects
- The placebo effect can have a powerful influence when young people use psychoactive drugs
How Drugs Work

Topic 8

Key issues in pharmacology
Intoxication

Intoxication involves significant changes in perception, mood, thinking processes and motor skills resulting from the effect of a drug(s) on the central nervous system.
Tolerance

✓ Tolerance
  - occurs when a regular user of a drug gradually becomes less responsive to that drug. The person then needs to take larger amounts of the drug to achieve the same effect.

✓ Main mechanisms
  - liver increases the level of enzymes
  - brain’s receptors respond to a regular presence

✓ New user of a drug has no tolerance to it
Physical and psychological dependence

- **Physical dependence**
  - Person depends on drug to avoid withdrawal symptoms and to function normally
  - Symptoms have been called addiction
  - Physical dependence can result from heavy daily use

- **Psychological dependence**
  - Occurs when a drug becomes central to a person’s thoughts, emotions and activities
  - Strong urge to use drug
  - It is possible for any drug to lead to psychological dependence
Some of the key issues in pharmacology include:

- intoxication
- tolerance
- dependence (both physical and psychological)
- drug interaction
- potentiation
How Drugs Work

Topic 9

Managing overdose
What is an overdose?

✓ The amount of the drug taken exceeds the individual's tolerance for the substance.
Overdose - extreme case of intoxication

✓ In the event of overdose, the young person experiences physical and/or psychological distress (e.g. when the person has collapsed, has decreasing levels of consciousness, breathing difficulties or is experiencing hallucinations).

✓ The following steps are recommended:
  - call an ambulance
  - ensure the safety of yourself and others in your care or supervision
  - administer first aid
Overdose - extreme case of intoxication

- stay calm, stay with and observe the young person
- talk calmly to the young person to reduce anxiety
- place them in a coma position and check whether the airway is unobstructed
- observe vital signs - breathing, pulse
- apply CPR (cardiopulmonary resuscitation) if no pulse, or EAR (expired air resuscitation) if pulse
- arrange for transfer to hospital by ambulance as soon as possible
- thoroughly document the incident and your involvement
- debrief with your supervisor
Overdose - What to do

✔ Seek medical assistance, then monitor the following indicators:

- Decreasing levels of consciousness
- Breathing difficulties
- Abnormal pulse (irregular or below 60, or above 120)
- Convulsions
- Increasing agitation
- Changing mental state (hallucinations, panic or deep depression.)
Overdose – What to do Cont...

✓ Risk factors related to overdose:
  - Heroin use
  - Poly-drug use (mixing drugs)
  - Past overdoses
  - Recent release from a correctional centre
  - Age
  - Using drugs alone
Management of overdose

Potentially life-threatening overdose

Suggested response:

- Call ambulance (000)
- Ensure the safety of yourself and others in your care or supervision
- Administer first aid - DRABC principles
- Take young person to emergency department or medical centre
- Thoroughly document the incident and your involvement
Management of overdose

Non life-threatening

Suggested response:

- Make contact with a health professional and seek a second opinion
- Observe young person - don’t let young person leave until OK
- If young person leaves, try to have someone stay with them
- Thoroughly document the incident and your involvement
Heroin overdose — a special case

Heroin overdose

✓ Heroin is usually injected which results in a quick and intense effect

✓ Large enough amounts of heroin can not only cause the user to lose consciousness (pass out), but can act on the brain stem to stop the person from breathing

✓ The dangerous effects of heroin can be exaggerated by the taking of other CNS depressant drugs, such as alcohol or Benzodiazepines in conjunction with heroin
Heroin overdose Cont…

✓ Naloxone (Narcan)

An opiate antagonist, which reverses the effect of heroin and other opiates within seconds. Naloxone works by dislodging the opiates from the receptor sites in the brain.

It has a short half-life, and wears off quickly. This means that if a person who has overdosed and has been given naloxone has another shot of heroin, the first shot of heroin can ‘kick in’ again, leading to another overdose. After being given naloxone a person will wake up immediately and often experience withdrawal symptoms.
How Drugs Work

Topic 10

Management of withdrawal
Symptoms and the rebound effect

Some possible reasons for the differences in withdrawal include:

- **Expectation** of what withdrawal will be like. If someone expects to have a very severe withdrawal, it is more likely they will

- **General physical health** of the person. Someone who is less healthy is more likely to experience serious withdrawal symptoms

- **Social supports** that the person is able to rely upon
Assisting young people withdrawing from drugs

Summary

Withdrawal:

✓ is the set of symptoms a daily user of a drug experiences when they stop taking that drug

✓ symptoms can be difficult to predict

✓ effects are often opposite to the effect of the drug that has been used. This is known as the ‘rebound effect’.
How Drugs Work

Topic 11

Reducing drug-related harm
Understanding drug-related harm

Public Health Model

Diagram:

- Drug
- Drug use Experience
- Individual
- Environment
Reducing drug-related harm

Thorley’s Model – Drug-Related Harm

**Dependence**
Problems associated with dependence:
- Discomfort when refraining from use
- Inability to rest
- Phobias
- Isolation
- Withdrawal
- Anxiety
- Social problems
- Homelessness
- Loss of control

**Regular Use**
Continued use over a longer period of time can result in the following:
- Medical and health problems
- Child neglect
- Withdrawal
- Family problems
- Relationship problems
- Financial problems

**Intoxication**
The following problems can arise from a single occasion of use:
- Accidents
- Aggression/Violence
- Marital disputes
- Suicides
- Drink driving
- Drowning
- Legal Problems
The Four L’s Model

Liver: Anything to do with a person’s health involving physical, psychological or emotional health problems

Lover: Problems associated with a person’s relationships, family, friends, children, lovers etc

Lifestyle/livelihood: Problems which relate to accommodation, work, finances, education, recreation etc

Legal: Any problems associated with the law (criminal or civil proceedings)