

CATEGORY II – SPECIALITIES & SETTINGS: DRUG MISUSE IN THE EMERGENCY DEPARTMENT

1.0 Introduction

Substance use is a global phenomenon, but whilst many people worldwide will experiment with illegal drugs, only a minority will develop an addiction (National Treatment Agency 2012).

Recreational drug use may be defined as the use of any psychoactive substance for pleasure.

A variety of substances may be used for recreational purposes including traditionally recognised illicit drugs, classified by the Misuse of Drugs Act (such as cannabis, cocaine, MDMA [ecstasy], amphetamines), but also prescription medications (such as benzodiazepines, opiates) and plants with psychoactive properties, such as khat and psilocybin mushrooms.

In recent years there has also been increasing use of novel psychoactive substances (NPS) previously known as “legal highs” available via the internet (often marketed as research chemicals) and in “head-shops”. Many of these novel psychoactive substances are manufactured to mimic the effects of traditional drugs, including stimulants such as cocaine and MDMA. Potential consumers may incorrectly assume that, as these drugs were previously marketed as “legal highs”, they are safe, despite the availability of little or no data on the pharmacology, toxicology and safety profiles of these substances (*Advisory Council on the Misuse of Drugs 2011*).

Data on UK individuals’ drug use is collected within the Crime Survey of England and Wales. In 2016/17 8.5% (1 in 12) of adults aged 16-59 years had taken a drug in the last year. Use is higher in younger adults (16-24yrs) with 1 in 5 reporting drug use in the last year (C.S.E.W 2016/17).

Recreational drug use data for specific groups such as clubbers, Lesbian, Gay, Bisexual and Transgender community, and individuals in the Criminal Justice system, is reported to be at higher levels (*Buffin et al 2012*).

Drug misuse results in Emergency Department (ED) attendances for a variety of reasons. These may include acute toxicity, injuries, psychological or psychiatric complications of drug use, or as a result of withdrawal.

LEARNING OUTCOMES

Medical students will:

1. Appreciate the dynamic nature of the recreational drug scene and the rapid emergence of new psychoactive substances.
2. Appreciate the need to remain up to date with emerging patterns whilst recognising that in most cases the emergency management will be symptomatic and supportive care.
3. Be aware of available antidotes and their indications for use.
4. Recognise the importance of asking all patients about their use of alcohol, tobacco and recreational drugs, including prescription medication misuse, over the counter, and the use of NPS.
5. Recognise that attendance at an Emergency Department provides an opportunity for brief intervention and health promotion advice.
6. Be aware of available local services to signpost individuals who require help with drug or alcohol use.

2.0 Context

Accurate data on the impact and cost of recreational drug use on Emergency Departments is not routinely collected in the UK, although some data is available for England. In England, there were 13,917 hospital admissions (not including all Emergency Department episodes) coded with a primary diagnosis of recreational drug toxicity

(HSCIC 2014) and 2,472 deaths attributed to drugs controlled by the Misuse of Drugs Act 1971, in 2015 for England and Wales. (ONS 2016).

Attendances at Emergency Departments will show geographical variability, which may be influenced by local availability and trends in drug use. Over the past few years a range of novel psychoactive substances (NPS) have been emerging. These drugs are analogues of more traditional drugs, such as amphetamines. The rapidity of development of new drugs poses significant challenges to Emergency Departments, with limited data available on the health risks associated with new substances, either through acute exposure and/or chronic use. Young people reporting problems with NPS tend to present at acute services such as ED departments (PHE 2015).

3.0 Management of patients in the Emergency Department

The symptoms and signs associated with acute intoxication are dependent on the drug ingested. A variety of psychoactive substances may be used, but broadly speaking these may be divided into drugs with depressant or stimulant effects.

Often limited or no history is available. It is important to gain as much information as possible and frequently the only history available may come from the paramedics.

Detailed information and advice on the management of toxicity for most substances are available 24/7 from the National Poisons Information Service via telephone or by hospital password for on-line access.

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Depressants

- Opiates: Heroin or prescription opiates including morphine, fentanyl, methadone, oxycodone, codeine, dihydrocodeine and others
- Benzodiazepines: diazepam, temazepam, lorazepam, alprazolam and others
- Gamma Hydroxybutyrate (GHB)/ Gamma butyrolactone (GBL)/ 1,4 butanediol (1,4BD)

1. Opiates

Opiates act on opiate receptors in the brain providing an analgesic effect. Individuals may experience euphoric effects due to dopamine release in the mesolimbic area of the brain. A variety of opiates (such as codeine, morphine, oxycodone, fentanyl) are used in medical practice due to their potent analgesic effects (British National Formulary 2014). As a result of the euphoric and addictive properties of these medications they may be prone to misuse. Non-prescription opiate misuse includes the use of heroin, which may be smoked or injected. Individuals may also ingest the long acting opiate methadone, which is prescribed to counteract the severe withdrawal symptoms that may be experienced by chronic heroin users. Excess opiate exposure may occur via oral ingestion, inhalation, intravenous / intramuscular administration and trans-dermal routes (opiate patches).

Targeted health initiatives and educational campaigns resulted in the introduction of methadone prescribing and needle exchange programmes, with the aim of reducing crime and blood borne virus (BBV) transmission associated with heroin use and also to reduce the numbers of new users. It appears that investment in these schemes, in combination with criminal justice effects on supply reduction, have been successful in reducing the number of new intravenous opiate and crack cocaine drug users. Data collected by the National Treatment Agency for Substance Misuse shows a significant reduction in the number of young people (18-24 years) seeking help for crack cocaine and heroin addiction in 2011/12 when compared to 2005/6 (NTA 2013).

ED attendance following opiate misuse, most frequently occurs as a result of acute toxicity (respiratory depression, coma and collapse) but may also occur due to the physical consequences of intravenous use of heroin, including deep vein thrombosis, (BBV) related illness, accidental arterial puncture, or more rarely, as a result of a withdrawal syndrome.

Failure to recognise and treat severe opiate toxicity may result in respiratory arrest and subsequent death.

Antidote

Naloxone is an opioid receptor antagonist that competitively binds to opioid receptors in the brain. Indications for naloxone administration include respiratory depression, resulting in respiratory acidosis on blood gas analysis, and/or hypotension, in the context of suspected opiate ingestion. Naloxone should be titrated to response as it may precipitate acute withdrawal in opiate dependent patients. Ideally, naloxone should be administered intravenously to facilitate accurate titration.

Attaining intravenous access may be difficult in intravenous drug users, due to venous damage from repeated puncture and injection. Naloxone may also be administered intramuscularly, although absorption is highly variable via this route, making it difficult to titrate to response.

The half-life of naloxone is approximately 1.5hrs. This is shorter than the half-life of most available opiates, thus there is a risk of relapse opiate toxicity. Patients who require naloxone administration should be observed and patients who require repeated doses of naloxone, may require a naloxone infusion.

2. Benzodiazepines

Benzodiazepines are sedative hypnotics that act on GABA receptors in the brain.

Common symptoms of acute toxicity include drowsiness, ataxia, slurred speech, and reduced consciousness. Symptoms may be potentiated by the co-ingestion of alcohol or other CNS depressants. Severe toxicity may result in hypotension and bradycardia.

Patients who have ingested supra-therapeutic doses of benzodiazepines, who present within one hour of ingestion should be considered for administration of activated charcoal (European Association of Poisons Centres and Clinical Toxicologists Position Statement).

Emergency Department care focuses on supportive care with close monitoring of respiratory rate, oxygenation, blood pressure and level of consciousness (Glasgow Coma Score). The majority of patients do not require any treatment.

Co-ingestion of alcohol or other CNS depressants may result in vomiting or significant respiratory depression. Reduced GCS may inhibit the patient's ability to adequately protect themselves from aspiration. Consequently, intubation and ventilation may be required.

Antidote

Flumazenil is benzodiazepine antagonist. Its use is generally confined to iatrogenic benzodiazepine overdose. Its use in pre-hospital overdose is not advised unless under the expert advice of the National Poisons Unit. Flumazenil administration in mixed overdose may reduce the seizure threshold and result in difficulty in controlling seizures should they occur.

3. Gamma Hydroxy-butyrate (GHB), Gamma Butyrolactone (GBL), 1,4 Butanediol (1,4BD)

GHB and its analogues GBL and 1,4BD are ingested orally as a liquid and act on GHB and GABA (B) receptors in the brain. There is a significant risk of overdose due to the extremely low doses required for the intended effects, which include euphoria and relaxation. The difference in dose between intended effect and acute overdose, resulting in collapse, respiratory depression and possible respiratory arrest, may be as little as 0.5mls. The risk of toxicity is increased if co-ingested with alcohol and other CNS depressants. Severe toxicity may result in coma, respiratory arrest, seizures or death if supportive care is not initiated promptly. Bradycardia and miosis are also common signs.

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Antidote

No antidote exists. Supportive care is the mainstay of Emergency Department care in acute toxicity. In the majority of cases, patients may be monitored in the Resuscitation room and will wake up within 2hrs. In a minority, respiratory depression or vomiting will require intubation and ventilation until the effects of the drug have worn off.

Aside from the risks of acute toxicity, users may develop physical dependence with regular use. This may result in repeated dosing at 1-2hrly intervals, including waking overnight. Withdrawal symptoms include agitation, anxiety, tremor, seizures, and marked neuropsychiatric symptoms including hallucinations

and psychosis. In severe cases, patients may require high doses of benzodiazepines and/or intubation and ventilation to manage withdrawal syndromes.

Vignette One

An unknown male, approximate age 20 is brought to the Emergency Department. He has been found collapsed in a park. On arrival in the ED, he is unresponsive to painful stimuli. His respiratory rate is 6 breaths per minute with oxygen saturations of 92% on 15L/min of supplemental oxygen. His heart rate is 64bpm and his blood pressure is 96/50mmHg.

A	Airway (& Cervical spine)	<p>Is the airway clear? Administer high flow oxygen as required.</p> <p>Consider added noises:</p> <ul style="list-style-type: none"> - snoring suggests partial airway obstruction. This may occur due to reduced conscious level. Always consider alternative causes of reduced GCS (e.g. hypoglycaemia, head injury, sepsis). - gurgling may occur due to blood from facial trauma or vomit. <p>Patients with reduced GCS may require airway support.</p> <p>Patients with evidence of a head injury and reduced GCS should be assumed to have a cervical spine injury and appropriate immobilisation applied.</p>
B	Breathing	<p>What are the respiratory rate and oxygen saturations?</p> <p>Is there equal air entry bilaterally?</p> <p>Are there any added sounds in the lung fields?</p> <p>Patients who have vomited are at risk of aspiration.</p> <p>Chest trauma may occur following collapse / falls. Look for bruising or deformity, reduced air entry or asymmetrical chest wall movement.</p> <p>Ingestion of depressants may result in reduced respiratory rate, low oxygen levels and hypoventilation leading to respiratory acidosis – these patients will require supported ventilation.</p> <p>Consider naloxone administration in suspected opiate overdose.</p>
C	Circulation	<p>What is the pulse rate and blood pressure?</p> <p>Depressant ingestion may result in hypotension but consider other causes including trauma and sepsis.</p> <p>Consider occult injury in patients who are acutely intoxicated. Falls may result in chest/abdominal/ pelvic injuries or fractures. Patients may not always report pain.</p> <p>Patients with tachy/bradyarrhythmia will require a 12 lead ECG and cardiac monitoring. Treat as per ALS (Advanced Life Support) algorithms.</p>
D	Disability	<p>Is the patient alert? (AVPU /Glasgow Coma Score (GCS) (alert, voice, pain, unresponsive)</p> <p>Pupil examination: Size, symmetry, reactivity – pinpoint pupils are suggestive of opiates but may also be seen with GHB/GBL.</p> <p>Does the patient have external evidence of a head injury? Patient with reduced GCS and evidence of head injury will require CT brain to exclude intracranial bleed as a cause for reduced GCS.</p>
E	Exposure	<p>Check the patient for other injuries.</p> <p>Look for “track marks” evidence of multiple venous punctures.</p> <p>Temperature – risk of hypothermia following depressant ingestion.</p>
G	Glucose	<p>Blood glucose – check as alternative cause of reduced GCS.</p>

Stimulants

– Amphetamines, ecstasy (MDMA), cocaine, mephedrone, benzylpiperazine, novel psychoactive substances such as 4-MA & MPA

Symptoms following stimulant use may include anxiety, palpitations, chest pain, sweating, disorientation, agitation,

hallucinations or delusions, psychosis. Examination may identify tachycardia, hypertension, hyperpyrexia (increased temperature), neuromuscular excitability (bruxism [jaw-grinding], clonus, increased tone), dilated pupils, seizures and altered GCS.

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Management

There is no antidote to stimulant toxicity. Supportive care should be initiated utilising an ABC approach. Ensure airway is clear and the patient has a normal respiratory rate and pattern. Patients may have significant tachycardia and hypertension. Perform a 12 lead ECG. The first line treatment of tachycardia and hypertension is benzodiazepines, either orally or intravenous. Benzodiazepines may also help with agitation. Patients may report chest pain following stimulant use and benzodiazepines are the first line treatment. Chest pain may occur for a variety of reasons including coronary artery spasm, acute myocardial infarction and aortic dissection. Patients who insufflate (snort) stimulants may develop pneumothoraces from increased intrathoracic pressures following vasalva manoeuvre. Patients who complain of chest pain should have a 12 lead ECG (serial ECG if pain continues) and a chest x-ray. Patients should have their temperature monitored and may require active cooling if temperature rises above 38 degrees. Patients are at risk of developing serotonin syndrome, a triad of autonomic instability, including hyperpyrexia, tachycardia and neuromuscular

hyperactivity with increased tone. Rhabdomyolysis may occur due to muscle hyperactivity.

Vignette 2 – Stimulant Use

A 20 year old female student (Amy) is brought to the Emergency Department from a local nightclub following a collapse. Amy's friend (Sarah) has accompanied her to the hospital and states that she had bought what they had been told was a legal high from a friend. She cannot remember the name. Sarah tells you that they have both been drinking vodka and red bull, prior to taking the tablet, approximately 1hr ago. Sarah said that she feels fine, but Amy had become quite anxious after taking the tablet, complained of palpitations and chest pain, before collapsing in the toilet.

On arrival, Amy is unresponsive to voice. Observations: Respiratory rate 20/minute, Oxygen Saturation 100% on 15L/min, pulse - 156 beats per minute, Blood pressure 160/100 mmHg. Her temperature is 39.8°C. She is quickly transferred to the resuscitation room.

A	Airway (& Cervical spine)	<p>Is the airway clear? Administer high flow oxygen as required.</p> <p>Consider added noises:</p> <ul style="list-style-type: none"> - snoring suggests partial airway obstruction. This may occur due to reduced conscious level. Always consider alternative causes of reduced GCS (e.g. hypoglycaemia, head injury, sepsis). - Patients who have used stimulants may have seizures. This may occur due to hyponatraemia, cerebral oedema or intracranial bleeds secondary to rapid increases in blood pressure. - gurgling may occur due to blood from facial trauma or vomit. <p>Patients with reduced GCS may require airway support.</p> <p>Patients with evidence of a head injury and reduced GCS should be assumed to have a cervical spine injury and have appropriate immobilisation applied.</p>
B	Breathing	<p>What are the respiratory rate and oxygen saturations?</p> <p>Is there equal air entry bilaterally?</p> <p>Are there any added sounds in the lung fields?</p> <p>Patients who have vomited are at risk of aspiration.</p> <p>Chest trauma may occur following collapse / falls. Look for bruising or deformity, reduced air entry or asymmetrical chest wall movement.</p>
C	Circulation	<p>What is the pulse rate and blood pressure?</p> <p>Stimulant ingestion may cause marked tachycardia and hypertension.</p> <p>12 lead ECG should be performed and cardiac monitoring applied.</p> <p>First line treatment for tachycardia and hypertension is benzodiazepines.</p>
D	Disability	<p>Is the patient alert? (AVPU/Glasgow Coma Score (GCS))</p> <p>Reduced GCS following suspected stimulant use will normally result in CT brain being performed to exclude intracranial bleed or determine evidence of cerebral oedema.</p> <p>Pupil examination: Size, symmetry, reactivity - Dilated pupils are often present following stimulant use.</p> <p>Does the patient have external evidence of a head injury?</p> <p>Is the patient moving all 4 limbs equally?</p> <p>Assess tone and check for clonus. Patients may exhibit increased tone and clonus. If present, patients may be at risk of rhabdomyolysis - check serum creatine kinase, renal function and monitor urine output.</p>
E	Exposure	<p>Check patient for other injuries</p> <p>Temperature: risk of hyperthermia. Patients with temperatures above 39 degrees should be actively cooled. Advice should be sought from National Poisons Information Service.</p>
G	Glucose	<p>Blood glucose checked as alternative cause of reduced GCS.</p>

Toxicological sample testing

Toxicological testing is of limited use in the Emergency Department. The majority of patients attending the Emergency Department may be managed symptomatically, with supportive care. Access to toxicological tests will vary between hospitals. Routine toxicology test will identify only a limited number of substances, e.g. amphetamine, MDMA, opiates and will not detect novel psychoactive substances unless analysed at a specialist laboratory. Frequently results will not be immediately available and thus will not influence emergency management. In addition there is a risk of false positives, due to cross reactivity with prescribed drugs and/or drugs administered during resuscitation.

Further things to consider:

- **Previous history:** Has the patient had any other Emergency Department attendances related to recreational drug misuse or other substance misuse?
- **Head injury:** Patients who have a head injury should be assessed according to NICE Guideline 176 (2014) and a CT brain performed as indicated. On discharge they should be given appropriate written advice.
- **Self-harm:** Always consider that a patient may have taken a recreational substance as a method of self-harm. Enquire if the patient was taking the substance to have a good time or intentionally cause self-harm and document the response. Patients who admit to self-harm should have a psychiatric assessment prior to discharge.
- **Immunization:** Patients who have sustained cuts/lacerations/ abrasions should have tetanus status documented and receive immunization as appropriate.
- **Victimization:** Whilst under the influence of drugs patients may be at risk of sexual assault. Ask the patient if this is a possibility and manage accordingly.
- **Drug, alcohol and other substance history:** Explore patterns of drug use with the patient and if they feel their drug use is problematic. Provide information about local drug services as required.

4.0 References and useful resources

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