

INTRODUCTION

Accidental and deliberate drug overdose – is a common problem met by Ambulance Clinicians. Accidental poisoning with ingestion, inhalation and skin contact with noxious chemicals is a more rarely encountered emergency. The majority of these episodes of poisoning are dealt with along similar lines with general supportive care, but some require more specific action.

Intentional overdose/self harm – urgently establish the likely physical risk, the person's emotional and physical state, and any requirement for further support services e.g. police, in an atmosphere of respect and understanding.

A rapid mental health assessment should be undertaken including assessment of suicide risk (e.g. The SAD PERSONS scale).¹ (*refer to mental disorder guideline*)

Principles of treatment

In all cases of overdose, management is based upon:

- identification of poisons
- specific treatment for specific poisons
- rapid access to hospital.

HISTORY

Take a history of:

- the event e.g. when did it happen?
- the drug/substance ingested
- the quantity of the drug/substance ingested
- collect all suspected drugs/substances
- mode of poisoning e.g. ingestion, inhalation
- any other factors that may be relevant, e.g. paracetamol taken with alcohol is more toxic to the liver than if taken alone
- has any treatment occurred yet, either by the patient, carers, or health professionals.

ASSESSMENT

Assess **ABCD's**

Assess the nature of the drug or substance involved. Expert advice should be available to all ambulance crews from the **National Poisons Information Service**. Individual ambulance services will have different arrangements for accessing this information.

Evaluate if there are any **TIME CRITICAL** features present. These may include:

- impaired ABCD's
- impairment of consciousness and respiration are often combined in overdose (*refer to decreased level of consciousness guideline*)
- extreme hypotension (BP <70 mmHg) is common in sedative and anti-depressant overdose
- arrhythmias (*refer to cardiac rhythm disturbance guideline*)
- convulsions (refer to fitting guideline)
- hypothermia – especially if patient has been unconscious for a time (*refer to hypothermia guideline*)
- hyperthermia.

Overdose with a number of drugs is potentially **TIME CRITICAL** – see **ADDITIONAL INFORMATION**.

If any of these features are present, **CORRECT A AND B PROBLEMS ON SCENE THEN COMMENCE TRANSPORT** to Nearest Suitable Receiving Hospital

Provide a **Hospital Alert Message / Information call**

En-route continue patient **MANAGEMENT** (*see below*).

MANAGEMENT

Follow Medical Emergencies Guidelines, remembering to:

Start correcting:

- **AIRWAY**
- **BREATHING**
- **CIRCULATION**
- **DISABILITY** (mini neurological examination)

Specifically consider:

- provide effective **AIRWAY** management
- administer high concentration oxygen (O₂) (*refer to oxygen guideline*) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients, to ensure an oxygen saturation (SpO₂) of >95%, except in patients with chronic obstructive pulmonary disease (COPD) (*refer to COPD guideline*). Oxygen should not be given in paraquat poisoning
- ensure adequate ventilation. If respiration and levels of consciousness are decreased, and drugs such as morphine, heroin or other related drugs are

Overdose and Poisoning in Adults

suspected, provide respiratory support to relieve respiratory depression. Consider the use of naloxone (IV/IM) to reduce respiratory depression (**refer to naloxone protocol for dosages and administration**). Be aware that naloxone can induce sudden recovery with severe agitation and acute withdrawal symptoms

- establish IV access as appropriate en-route to hospital
- if patient is exposed to chemicals, remove patient from the source of chemical at once. In the case of **SKIN CONTAMINATION** with chemicals, remove clothing with care **NOT** to contaminate rescuers, and IRRIGATE with generous amounts of water
- if patient has impaired consciousness (**refer to decreased level of consciousness guideline**) **ALWAYS** check blood glucose level and correct if low (blood glucose <4.0mmol/l) with glucose 10% IV (**refer to glucose 10% protocol for dosages and information**). Glucagon is often not effective in overdoses
- collect any **MEDICINE CONTAINERS** or **ACTUAL MEDICINES** for inspection at hospital
- if patient vomits, retain a sample, if possible, for inspection at hospital
- **NEVER** induce vomiting
- in the case of swallowed caustics and petroleum products dilute by giving a glass of **milk** at the scene wherever possible

- activated charcoal may be of benefit if given within one hour of ingestion. However, at present, it is not routinely recommended for use in pre-hospital care because of the difficulty of administration and the risks of aspiration (which are exacerbated by the risk of motion sickness).

OTHER SUBSTANCES MAY ALSO CAUSE MAJOR PROBLEMS

Carbon Monoxide (CO) poisoning

Organophosphate insecticides:

- respiratory depression
- fits
- wheezing and sweating
- atropine may be needed (**refer to atropine protocol for dosages and administration**).

Paraquat:

- pulmonary
- renal
- liver damage which is progressive and irreversible
- **O₂ THERAPY IS CONTRA-INDICATED IN THESE PATIENTS.**

ADDITIONAL INFORMATION²

Overdose with a number of drugs is potentially **TIME CRITICAL**, some of which are dealt with in more detail in the table below:

Table 1 – Potentially Time Critical Drugs

Tricyclic antidepressants: amitriptyline (Tryptizol) clomipramine (Anafranil) dothiepin (Prothiaden) imipramine (Tofranil)	Serious effects: • cardiac arrhythmias, hypotension. Immediate care: • symptomatic treatment, avoid anti-arrhythmic drugs.
Opiate and opioid drugs: morphine, diamorphine (heroin) compound drugs containing an opioid drug (co-proxamol)	Serious effects: • respiratory and cardiac depression. Immediate care: • naloxone.
Beta-blockers: Atenolol Sotalol Propranolol	Serious effects: • bradycardia. Pre-hospital care: • atropine, external pacing.
Digoxin	Serious effects: • cardiac arrhythmias. Pre-hospital care: • dependent on arrhythmia.

Table 2 – Specific Common Poisons

Alcohol	Alcohol intoxication is a common emergency, and is usually a transient problem. However, when combined with drugs in overdose, it may pose a major problem. When combined with opiate drugs or sedatives, it will further decrease the level of consciousness and increase the risk of ASPIRATION OF VOMIT. In combination with paracetamol it increases the risk to the liver. Remember to check the blood glucose levels especially in children and young adults who are “drunk”, as hypoglycaemia (blood glucose <4.0mmol/l) is common and requires treatment with oral glucose, glucose 10% IV (<i>refer to glucose 10% protocol for dosages and information</i>). NOTE: Glucagon is not effective in alcohol induced hypoglycaemia.
Carbon monoxide poisoning	The essential requirement with carbon monoxide poisoning is to be alert to the possibilities of the diagnosis. Any patient found unconscious or disorientated in an enclosed space, for example, a patient involved in a fire in a confined space, where ventilation is impaired, or a heating boiler may be defective, should be considered at risk. The supposed cherry red skin colouration in carbon monoxide poisoning, is rarely seen in practice. The immediate requirement is to remove the patient from the source (and administer 100% oxygen) as carbon monoxide is displaced from haemoglobin more rapidly the higher the concentration of oxygen. This must be given continuously.
CS gas	CS gas is now carried by police forces for defensive purposes. CS spray irritates the eyes (tear gas) and respiratory tract. AVOID contact with the gas which is given off from patient’s clothing. Where possible keep two metres from the patient and give them self-care instructions. Symptoms normally resolve in 15 minutes but may however potentiate or exacerbate existing respiratory conditions. If symptoms are present: • remove patient to a well ventilated area • remove contaminated clothes and place in a sealed bag • remove contact lenses • do not routinely irrigate the eyes as CS gas particles may dissolve and exacerbate irritation. If irrigation is required use copious amounts of saline. Patients with severe respiratory problems should be immediately transported to hospital. Ensure good ventilation of the vehicle during transfer to further care.
Cyanide	Cyanide poisoning is fortunately exceedingly rare and requires specific treatment outside the remit of ambulance Paramedics and technicians. However full supportive therapy should be given to these patients who should be transported immediately to hospital. Poisoning may occur in certain industrial settings. Cyanide “kits” should be available and the kit should be taken to hospital with the patient. The patient requires injection with Dicobalt edetate 300ml IV over 1 minute followed by 250 ml of glucose 10% IV or administration of the currently unlicensed drug hydroxycobalamin.
Iron	Iron pills are regularly used by large numbers of the population including pregnant mothers. In overdose, especially in children, they are exceedingly dangerous. They may cause extensive damage to the liver and gut and these patients will require hospital assessment and treatment. Charcoal is contra-indicated as it may interfere with subsequent treatment.
Paracetamol and Paracetamol-containing compound drugs	Remember that many analgesic drugs contain paracetamol and a combination of codeine or dextropropoxyphene. This, in overdose, creates two serious dangers for the patient. The codeine and dextropropoxyphene are both derived from opioid drugs, and may well produce profound respiratory depression, especially if alcohol is involved. This can be reversed with naloxone (<i>refer to naloxone protocol for dosages and administration</i>). The second problem is the paracetamol that, even in modest doses (20 – 30 tablets), may induce severe liver and kidney damage in susceptible patients. There is no evidence of this initially and this may lull the patient and ambulance clinician into a false sense of security. It frequently takes 24 to 48 hours for the effects of paracetamol damage to become apparent and urgent blood levels are required to assess the patient’s level of risk.
Tricyclic Antidepressants	Poisoning with these drugs may cause impaired consciousness, profound hypotension and cardiac arrhythmias. They are a common treatment for patients who are already depressed. Newer anti-depressants such as fluoxetine (Prozac) and paroxetine (Seroxat) have different effects. ECG monitoring and IV access should be established early in the treatment of tricyclic overdose. Arrhythmias with a pulse should be treated with oxygen initially and anti-arrhythmic only given if there is circulatory collapse. The likelihood of fitting is high, this should be treated as per convulsions guidelines.

Overdose and Poisoning in Adults

Table 3 – Illegal Drugs

Drug	Description	Outward signs	Effects	Administration	Side effects	Treatment
Cocaine	Cocaine is an alkaloid found in the leaves of the South American shrub Erythroxylon Coca. It is a powerfully reinforcing psycho stimulant. Crack is made from cocaine in a process called freebasing.	- Hyperexcitability; agitated, irritable and sometimes violent behaviour - Sweating - Dilated pupils.	Induces a sense of exhilaration, euphoria, excitement, reduced hunger in the user primarily by blocking the re-uptake of the neurotransmitter dopamine in the mid-brain, blocks noradrenaline uptake causing vasoconstriction and hypertension. NOTE: Since crack is purer and therefore more potent than street cocaine, it enters the bloodstream more quickly and in higher concentrations. Because it is smoked, crack cocaine's effects are felt more quickly and they are more intense than those of powder cocaine. However, the effects of smoked crack are shorter lived than the effects of snorted powder cocaine.	Cocaine comes in the form of a powder that is almost always 'cut' or mixed with other substances. It can be: - snorted through the nose - rubbed into the gums - smoked - injected. Crack comes in the form of solid rocks, chips, or chunks that are smoked.	The symptoms of a cocaine overdose are intense and generally short lived. Although fairly uncommon, people do die from cocaine or crack overdose, particularly following ingestion (often associated with swallowing 'evidence'). All forms of cocaine/crack use can cause coronary artery spasm, myocardial infarction and accelerated ischaemic heart disease, even in young people. Various doses of cocaine can also produce other neurological and behavioural effects such as: - dizziness - headache - movement problems - anxiety - insomnia - depression - hallucinations. The unwanted effects of cocaine or crack overdose may include some or all of the following: - tremors - dangerous or fatal rise in body temperature - delirium - myocardial infarction - cardiac arrest - seizures including status epilepticus - stroke - kidney failure.	Cocaine toxicity must be treated as a medical emergency and the patient transferred rapidly to hospital. In addition to the usual management of overdose/poisoning, the specific treatment of acute cocaine poisoning in the pre-hospital environment should take into account the likely necessity for: O₂ therapy – administer high concentration oxygen (O₂) (refer to oxygen guideline) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients, to ensure an oxygen saturation (SpO₂) of >95%, except in patients with chronic obstructive pulmonary disease (COPD) (refer to COPD guideline) assisted ventilation – consider assisted ventilation at a rate of 12–20 breaths per minute if: SpO₂ is <90% on high concentration O₂, respiratory rate is <10 or >30, expansion is inadequate - monitoring ECG - administer aspirin and GTN if the patient complains of chest pain (refer to GTN protocol for dosage and administration). If the patient has a 12-lead ECG suggestive of myocardial infarction and a history of recent cocaine use then administer nitrates but do not administer thrombolytics. - administration of diazepam, or stesolid if the patient has severe hypertension, chest pain or is fitting (refer to diazepam protocol for dosage and administration) - administration of paracetamol and cooling if the body temperature is elevated (refer to paracetamol protocol for dosage and administration). NOTE: swallowed crack cocaine represents a severe medical emergency and needs URGENT transportation to hospital EVEN IF ASYMPTOMATIC.

Table 4 – Illegal Drugs (continued)

Drug	Description	Outward signs	Effects	Administration	Side effects	Treatment
Amphetamines Bennies, Billy Whizz, Black Beauties, Bumblebees, Clear Rocks, Co-pilots, Crank, Croke, Glass, LA Turnarounds, Mollies, Oranges, Pep Pills, Pink Champagne, Pink Speed, Bombs, Rippers, Rocks, Speed, Splash, Sulph, Sulphate, Wake Ups, Whizz	Amphetamines have been around since the 1930's and have been medically prescribed in the past for diet control and as a stimulant.	Mood swings, extreme hunger, sleeplessness, and hyperactivity.	Increases energy levels, confidence and sociability.	Swallowed, sniffed or rarely injected. Onset about 30 minutes. Lasts for several hours. Used with other drugs or alcohol, the effects are magnified.	Cardiovascular: - tachycardia can lead to heart failure even in healthy individuals (refer to cardiac rhythm disturbance guideline) - hypertension can produce pinpoint haemorrhages in skin, especially on the face and even lead to stroke. Central Nervous System: "High" feelings - panic - paranoia can produce mental illness picture in long term use - poor sleep - hyperpyrexia. Gastrointestinal: - liver failure.	Monitor pulse, blood pressure, cardiac rhythm. Control agitation and treat seizures with diazepam (0.1-0.3 mg/kg body weight for adults or children) or lorazepam (4 mg in an adult and 0.05 mg/kg in a child). Narrow-complex tachycardia with cardiac output is best left untreated. If systolic BP > 220 and diastolic BP > 140 mm Hg in the absence of longstanding hypertension give diazepam (0.1-0.3 mg/kg body weight in adults and children). Correct hypotension by raising the foot of the bed and/or by giving fluids as per medical emergencies. Hyperthermia requires rapid transport to hospital, cooling measures may be undertaken in transit (refer to heat stroke guideline).
LSD	Lysergic acid diethylamide (LSD) or "acid" is a "mind altering drug" that works on the brain to alter the brain's perception of things. It was discovered in 1943, and was used in the 1960s as a "recreational drug".	Agitated, unusual behaviour, clear mental disturbance. The patient may appear distant and display anxious behaviour. DO NOT interfere unduly as the trip will self limit, and communication is easier then. Keep patient safe, and remember other drugs and alcohol will aggravate the effects of LSD.	The alterations in perception may be pleasant or "nightmarish", or a mix of both, and last for some 12 hours.	Produced on patches of blotting paper, called tabs or trips, often with printed motifs including cartoon characters. Once swallowed they take 30-60 minutes to work. The trip will last up to 12 hours and cannot be stopped. LSD is not addictive but is illegal.	Central Nervous System: - visual hallucinations (distortion and delusions), which can cause dangerous behaviour - nightmarish perceptions "bad trips" may last for 12 hours. - nausea and vomiting - personality changes and psychiatric illness - nightmarish flashbacks that can last for years after drug use stops - delusions – false sensations or visions – may affect taste, hearing and vision - can trigger hidden mental illness in individuals - permanent eye damage can occur.	Usually self limiting but sedate if necessary with intravenous diazepam (10 milligrams starting dose for an adult).

Table 4 – Illegal Drugs (continued)

Drug	Description	Outward signs	Effects	Administration	Side effects	Treatment
3-4 methylene-dioxymethamphetamine (MDMA) – Ecstasy “E”	Commonly known as doves, apples, strawberries, diamonds	Sweating, dilated pupils and elevated mood.	Feeling warm, energetic, and friendly, rising to a state of euphoria.	“E” tablets may be white embossed “headache” sized pills, or coloured capsules. Take 40 minutes to work, lasting for 2 – 6 hours. “E” may not be addictive but is illegal.	Cardiovascular System: - tachycardia (<i>refer to cardiac rhythm disturbance guideline</i>) - capillary rupture, causing red marking on the face in particular. Central Nervous System: - a few people develop hyperpyrexia which can be life-threatening. These patients need urgent transfer to hospital for specialist care. Cooling measures (<i>refer to heat exhaustion/heatstroke guideline</i>) may be helpful but should not delay transfer to further care - depression, panic and anxiety may also occur. Liver and Kidney damage: - liver failure and severe kidney damage may occur. Cystitis and heavy periods may occur in females who use “E”.	Give diazepam 0.1-0.3 mg/kg body weight orally or iv to control anxiety and agitation. Control convulsions with diazepam 0.1-0.3 mg/kg body weight or lorazepam (4mg in an adult and 0.05 mg/kg in a child). If the systolic BP > 220 and diastolic > 140 mm Hg in the absence of long-standing hypertension give diazepam (0.1-0.3 mg/kg body weight in adults and children). Correct hypotension by raising the foot of the bed and/or by giving fluids as per medical emergencies - cooling measures (refer to heat exhaustion/heat stroke guideline) may be helpful but should not delay transfer to further care - depression, panic and anxiety may also occur.

Duty of Care

It is not uncommon to find patients who have or claim to have taken an overdose and subsequently refuse treatment or admission to hospital. An assessment of their mental health state and suicide risk should be made. If, despite reasonable persuasion, the patient refuses treatment, it is not acceptable to leave them in a potentially dangerous situation without any access to care.

Assistance may be obtained from the medical/clinical director or a member of the clinical team and a judgement must be made to seek appropriate advice. Attendance of the Police or local mental health team may be required, particularly if the patient is at risk.

Key Points – Overdose and Poisoning

- Establish: the event, drug or substance involved, the quantity, mode of poisoning, any alcohol consumed.
- **NEVER** induce vomiting.
- If caustics and petroleum products have been swallowed dilute by giving **milk** at the scene wherever possible.
- If the patient vomits, retain a sample, if possible, for inspection at hospital.
- Bring the substance or substances and any containers for inspection at hospital.

SELECT BIBLIOGRAPHY

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- ³ National Institute for Clinical Excellence. Self-harm: The short-term physical and psychological management and secondary prevention of self-harm in primary and secondary care: NICE: London, 2004.

METHODOLOGY

Refer to methodology section.