

# Toxicology - Part 1

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Addiction medicine & toxicology, onthepods

## Toxicology assessment

In this first of a 2-part series, James talks to Associate Professor Andrew Dawson on the toxicology assessment of a patient presenting with a polypharmacy overdose in the Emergency Department. You can [listen to Toxicology Part 2 - Treatment here](#), which focuses on how to manage a drug overdose and toxicology patients.

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**Interviewee:** Andrew Dawson

### About Andrew Dawson

Associate Professor of Clinical Pharmacology and Toxicology, working in primary care in Australia. Andrew is the Clinical Director of the Professor of Medicine Professor for the School of Medicine, University of NSW. Andrew is also a Senior Lecturer at the University of Peradeniya.

### Let's Talk

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used in Clinical Pharmacology and Toxicology ranges from teaching hospitals in Alfred Hospital and also a Clinical Lecturer and Conjoint Lecturer in Sydney and Medicine at the

### Toxicology Part 2

With Professor Andrew Dawson, Sydney University, New South Wales

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Addiction Medicine at

**Most junior doctor's main interaction with toxicology is in the Emergency Department.**

### Case

**You are a junior doctor and asked to see a 22-year-old female who presents to the Emergency Department. The triage note documents a polypharmacy overdose. She is a little drowsy, but apart from a pulse of 110, her vital signs are within normal limits.**



1. What is your initial approach to seeing someone like this in the emergency department?

- The first step is to try to perform an accurate risk assessment so that you can start to consider the likely things that will happen to them and their likely disposition
- In toxicology, the initial assessment is based around the vital signs; checking them early to form a baseline is a good first step. Also check the GCS level and examine for hyperreflexia
  - Repeated physical examination over time can give a good idea prognostically about where the patient's course is headed

## 2. In taking the history, what are the important questions, and how do you approach a patient who may be a bit drowsy, and what are other areas that the history can be gained from?

- The first step is to try to perform an accurate risk assessment so that you can start to consider the likely things that will happen to them and their likely disposition following a self-ingestion is usually to try to get hold of the patient. In the minority of cases, other sources of information can be used.
- Getting hold of the patient is obviously helpful, but if they have a reduced level of consciousness, you may not be able to get a reliable history from them. If the patient is drowsy, you may not be able to get a reliable history from them. A dose it can also be helpful to know if they have taken any other medication. This can provide useful information about the likely toxicity. If they have recently ingested a substance, it is important to know how much was ingested. 5g of a substance may be a significant dose, but 5g of another substance may be a very small dose. Matching on the patient's history with the symptoms they may be presenting with can help you to identify the likely cause of the poisoning.
- The ambulance crew can provide useful information about the patient's history and the circumstances of the poisoning. They may have seen the patient take the medication, or they may have seen the patient ingest the substance. They may also have seen the patient take any other medication. This can provide useful information about the likely toxicity.
- The timing of the poisoning is important. If the patient has taken the medication recently, it is important to know how long ago they took it. This can help you to determine the likely toxicity. If the patient has taken the medication a long time ago, it is important to know how long ago they took it. This can help you to determine the likely toxicity.
- If the patient is taking any other medication, it is important to know what they are taking. This can help you to determine the likely toxicity. If the patient is taking any other medication, it is important to know what they are taking. This can help you to determine the likely toxicity.
- Important factors to consider when taking the history include:
  - What medication has the patient taken?
  - How much medication has the patient taken?
  - Is the medication slow release?

## 3. Do the symptoms that the patient presents with influence your early management?

- Medications generally fall into two groups in terms of toxicity
  - Drugs causing respiratory depression
    - Most of these medications are psychiatric medications
    - Respiratory depression correlates very well with depressed level of consciousness
    - These patients may require respiratory support

- Many of these medications also have cardiotoxicity, which should be assessed for by looking at the ECG
- Drugs causing toxic damage to cells
  - A good example is paracetamol
  - These patients can be quite asymptomatic, so the question is not so much about supportive care, but more about do you have to administer specific treatment

#### 4. What is your approach to examining a toxicology patient?

- Vital signs, as mentioned above, are the first and most important step
- Much of the rest
  - Evidence
    - 
    -
  - Reflexes
    -
- Focal neurological
  - It is important to consider intracerebral events
    - Amphetamines and cocaine can predispose patients to vascular complications

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#### 5. What are the initial investigations?

- ECG
  - To screen for evidence of cardiotoxicity
  - Primary cardiac drugs are high risk for causing toxicity, but are relatively rare in overdose

- More common is psychiatric drugs, in which two things generally happen to the ECG
    - Widening of the QRS complex, which reflects blockage of the fast sodium channels
      - Once you see a QRS > 100ms in the context of an overdose, you should consider a sodium channel blocking drug such as one of the older neuroleptic medications or tricyclic antidepressants
      - If the QRS is widened, look to the AVR lead, if you have an R wave more than 4-5mm, that raises your suspicion of a sodium channel blocking drug
      - In sodium channel blocking drugs, the ECG changes can be somewhat of a marker for how
- 
- If you see and may be responsible
  - Blood gas
    - It is common will manage that some possible
    - It is also related to will often that the patient has either fitted recently, or have taken some poison that is affecting the mitochondria
    - In toxicology, pH is often managed much more actively. Acidosis enhances the movement of many toxins into cells, so a primary manoeuvre in treatment is to correct the acidosis
  - Other investigations that can be done
    - Urine screen for recreational drugs - although this rarely changes management
    - Paracetamol level - paracetamol is a very common toxin, has delayed toxicity and can be treated. The test should be performed even if patients deny paracetamol use
    - Specific drug levels - there is a number of drugs where the drug levels can be useful in making decisions around intervening. These include theophylline, sodium valproate, carbamazepine and salicylate

## Related Podcasts

- [Toxicology - Part 2](#)
- [Code Black](#)

**Tags:** #addict,#addiction,#drug overdose,#drugs,#OD,#overdose,#polypharmacy,#respiratory depression,#toxic damage,#toxicology,#toxicology assessment

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