



# *"I Took It - You Bind It, Wash It, Cleanse It... Just Get Rid of It!"*



Nadder Sharif, MD, MSc; and Trevor Langan, MD, FRCPC



## Jane's Case

Jane is a 35-year-old female who presented to the ED appearing distraught. She admitted to taking "a bunch of pills" in an attempt to end her own life. Her mother promptly called 911 after finding her crying on the bathroom floor with an empty bottle of acetaminophen lying beside her. Jane refused to elaborate, stating "I wish my mom would have just let me die." Jane complained of hopelessness and sadness, but denied any other symptoms. She also denied taking any other drugs or alcohol. Her mother saw her over dinner, then not again until finding her in the bathroom. Based on this, the likely time of ingestion was four hours prior to presentation to the ED. A count of the total possible pills ingested revealed a maximum exposure of 50 x 500 mg tablets, for a possible total of 25 grams of acetaminophen. Jane's mother told the paramedic that her daughter had recently lost her job, and that she had a history of suicide attempts. Jane is otherwise healthy and takes no medications other than the oral contraceptive pill.

Upon examination, the patient looked well. Her vital signs were normal: RR 14; HR 76; BP 110/76; O<sub>2</sub> sat 96% on RA; Temp (oral) 37.1; C/S 5.6. Her GCS was 15/15; PEARLA @ 3 mm; cranial nerve and neurological exams were grossly normal. Auscultation of her chest revealed equal air entry to the bases bilaterally, with normal heart sounds. Her abdomen was soft, non-tender with normal bowel sounds.

[Read on for more on Jane.](#)

ABCs (airway, breathing and circulation).<sup>1</sup> The patient should be placed on a cardio-respiratory monitor with pulse oximetry and IV access, and provided with supplemental oxygen. Even if the patient initially shows no sign of respiratory distress or hemodynamic compromise, it is prudent to place them in a monitored setting should their status change quickly. Resuscitation, including orotracheal intubation, should be initiated immediately if there is failure to oxygenate or ventilate, or if there is evidence of airway compromise (including risk of aspiration). Initial vital signs should include a bedside blood glucose, and any evidence of hypoglycaemia should be corrected immediately. Consider the addition of IV thiamine (100 mg) for malnourished or alcohol abusing patients prior to administration of dextrose. Administration of naloxone (0.01 mg/kg IV, titrated to effect) should be considered if exposure to opioids is likely, or if an opioid toxidrome is suspected (slow, shallow respiration rate, pinpoint pupils, altered level of consciousness).

Initial investigations should include CBC, electrolytes, urinalysis, chest x-ray and ECG. Serum salicylate and acetaminophen levels are routinely added to laboratory tests in cases of toxic ingestion; further testing should be tailored to the specific toxin. Tests may include measurement of specific toxins in the blood, anion gap, osmolar gap, venous or arterial gases, and liver function tests. Qualitative assays for drug presence or abuse may be used when the clinical picture is unclear; however, these results should be interpreted with

## Questions and Answers

### **1.** *How should we approach this case?*

The initial approach to a child or adult with suspected overdose begins with assessment of the

### Back To Jane

Jane's condition was stable, and she showed no signs of intoxication or delirium. She was treated supportively in a monitored setting. The treating team discussed options for GI decontamination, but deferred them due to the lack of evidence to support their use and the four hour delay in presentation after ingestion. Bloodwork revealed a four-hour serum acetaminophen level of 3.2 mmol/L. The Rumack-Matthew nomogram was consulted, and treatment with the antidote N-acetylcysteine (NAC) was initiated.

Based on treatment algorithms, there is no urgency to begin treatment with NAC in patients presenting less than four hours after acetaminophen ingestion; rather, a four-hour serum level should be obtained to determine toxicity before deciding on treatment. Levels taken prior to four hours can be used as screening measures of exposure, but as acetaminophen levels peak at four hours post-ingestion, they are insensitive for toxicity. For patients who present more than seven hours post ingestion, NAC should be started promptly while waiting for the drug level. In delayed presentations, waiting for the results of the drug level may worsen liver injury.

In Jane's case, NAC was started, and the patient was admitted to the hospital for the duration of her treatment. Jane was placed on a mental health form for depression and suicidal ideation. After a brief stay on the medical unit, the NAC protocol was completed, and she was cleared medically. Jane was then transferred to the psychiatry unit for further treatment.

caution as the assays lack sensitivity and specificity, and may be falsely positive or negative. As well, a positive screen may not mean that drugs are the causative agents of overdose; bedside care should instead be tailored to the clinical scenario.

Once the patient has been stabilized, the clinician should obtain a detailed history; as patients are often not willing or able to provide a complete account of events, collateral information must be collected from friends, family and EMS personnel. Information regarding the type, amount, and time of ingestion, as well as any other co-ingestions, is crucial to patient management, as is determining access to all possible agents, including drugs

belonging to others in the household. The safest procedure is estimating ingestion to be the largest possible number of pills available. A simple approach to the overdose history is: "What? When? How? How much? Why? What else was taken?"

## 2. *What is gastrointestinal decontamination?*

Gastrointestinal (GI) decontamination options include activated charcoal, gastric lavage, whole bowel irrigation, cathartics and syrup of ipecac. Historically, GI decontamination has played an important role in the initial management of patients who have ingested toxins, accidentally or intentionally. It is also one of the most contentious issues in medical toxicology. There is limited evidence to guide therapy, and little proof that the benefits outweigh the associated risks. The treating physician must determine the likelihood that a significant amount of the toxin has yet to be absorbed, and that toxin removal will actually impact patient outcomes. One must consider: the degree of toxicity of the ingested agent, the elapsed time since ingestion, the dose ingested, and the clinical scenario. GI decontamination requires special consideration in the setting of sustained-release preparations, enteric-coated agents, and caustic agents.

## 3. *Should gastrointestinal decontamination be used in overdose?*

### *Activated Charcoal*

Activated charcoal is the most commonly used gastrointestinal decontaminant.<sup>2</sup> Most evidence indicates that it effectively decreases drug serum levels if it is administered within one hour of ingestion.<sup>3</sup> However, most drug overdoses present several hours after ingestion, limiting the potential utility of activated charcoal.<sup>3</sup> Contraindications to its use are: ingestion of toxins with a low affinity for activated charcoal (*e.g.*, caustics, hydrocarbons,

alcohols, heavy metals such as iron and lithium), a decreased level of consciousness (due to aspiration risk), and gastrointestinal perforation.<sup>2</sup>

### *Gastric Lavage*

Gastric lavage involves the placement of a large oro-gastric (OG) tube. Pills retained in the stomach are washed out by serially instilling and drawing out volumes of saline, until fluid is clear. This should be followed by activated charcoal. This method of decontamination should be reserved for rare cases, where the patient has ingested a potentially life-threatening amount of drugs within one hour of presentation, particularly if the amount ingested exceeds the binding capacity of activated charcoal.<sup>3</sup> Gastric lavage contraindications include: decreased level of consciousness, an unprotected airway, ingestion of an acidic or alkaline substance, ingestion of substances with a high potential for aspiration, and ingestion of drug packets or balloons, as packets are too large to fit in the lumen of the OG tube and may rupture.<sup>2</sup>

### *Whole Bowel Irrigation*

Whole bowel irrigation (WBI) is used in rare cases where toxic amounts of sustained-release drugs, enteric-coated drugs or large amounts of drugs for the purposes of smuggling are ingested. WBI is done by having the patient drink (or have infused via a nasogastric tube) large volumes of osmotically balanced polyethylene glycol solution. Fluid should be administered until rectal effluent is clear. WBI is contraindicated in patients with: an unprotected airway, ileus, bowel obstruction or perforation, intractable vomiting, and hemodynamic instability.<sup>2</sup>

### *Cathartics*


Due to the lack of defined indications, this method is rarely used in isolation. However, cathartics are often added to activated charcoal to speed GI transit. Relative contraindications to the use of cathartics are: suspicion of bowel obstruction, recent

## Take-home message

- The majority of overdoses present three to four hours after drug ingestion, and can be managed with supportive care; in most cases, GI decontamination has no role<sup>3</sup>
- The patient's condition must be carefully evaluated to ensure that there are no contraindications before considering GI decontamination
- If only one hour has elapsed between ingestion and presentation, activated charcoal therapy could provide some benefit
- In extraordinary cases, gastric lavage or whole bowel irrigation may be considered

bowel surgery, volume depletion, and electrolyte imbalance.<sup>2</sup> Evidence is lacking to support routine use of cathartics in practice.

### *Syrup of Ipecac*

Ipecac induces vomiting, theoretically reducing toxin exposure in the GI tract. Induced emesis will only decrease toxin absorption by a maximum of 30%. This small reduction has little clinical correlation, and when compounded with the undesirable effect of and patient dissatisfaction with vomiting, and the risk of aspiration, there is no role for ipecac in gastrointestinal decontamination.<sup>2,3</sup> 

#### References

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**Dr. Sharif** is a Resident in the Department of Family Medicine, University of Alberta, Edmonton, Alberta.

**Dr. Langhan** is a Clinical Assistant Professor in the Department of Emergency Medicine, University of Calgary, Calgary, Alberta.

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