ABC of Poisoning

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PREVENTING ABSORPTION

Emptying the stomach

Criteria for considering emptying the stomach

- A potentially dangerous dose of poison has been ingested
- Treatment can begin within four hours of ingestion of the poison (longer for salicylates and poisons which delay gastric emptying)
- Time of ingestion not known and patient is unconscious

Contraindications to emesis

- Impaired consciousness
- Poisoning by petroleum distillates
- Poisoning by corrosives
- Poisoning by antiemetics (relative)

Syrup of ipecacuanha dosage (Ipecacuanha paediatric emetic draught, BPC, or Ipecacuanha syrup, Adelaide Children's Hospital formula)

6-18 months
Older children
Adults

10ml

15ml

30ml

Take with a glass of water or fruit juice. The dose may be repeated once only if emesis has not occurred after 20 minutes. Save sample of vomitus for possible analysis

For ingested poisons, treatment which is designed to prevent absorption has obvious attractions. Indeed, serious adverse effects may be prevented by the prompt use of orally administered adsorbants or of measures designed to empty the stomach. All such treatments have their limitations, however, and it is important to use them only when appropriate.

Although these constraints may seem self evident, they are not always observed. There should be no routine use of these treatments for all poisoned patients since most will not have taken a potentially harmful poison and many present too late to benefit. There is also evidence that the use of these measures does not prevent repeated attempts at self poisoning.

Emesis

Emesis is easier to administer than gastric lavage and is usually less traumatic for the patient, especially a child. It must not be used when there is danger of aspiration into the lungs, either from volatile poisons, such as petroleum distillates, or from inhalation of gastric contents due to impaired consciousness. Emesis should also be avoided for corrosive agents, which may damage the oesophagus and stomach. Poisons with antiemetic effects are a theoretical contraindication to the use of an emetic, but few problems occur in practice, and emesis usually occurs satisfactorily.

Choice of emetic

Common salt should never be used. It is a poor emetic and excessive doses are easily given, resulting in hypernatraemia. There are many well documented deaths from this cause, even in recent years. Some lay texts may still advise the use of salt. Doctors should take every opportunity to educate others of this danger.

Stimulation of the pharynx with the fingers is safe but relatively ineffective. It may be used by parents on children before they reach hospital. Once the child arrives in hospital he should be given syrup of ipecacuanha, which is much more effective. Ipecacuanha is a plant extract which contains several alkaloids including emetine and cephaeline, both of which irritate the gastrointestinal tract and stimulate the medullary vomiting centre, giving it a dual mode of action. Syrup of ipecacuanha is highly effective and induces vomiting in 90-95% of patients within 20-30 minutes. There is less evidence about the amounts of poison removed, but most authorities accept its efficacy and recommend its use. Although originally advocated only in children, it is equally effective in adults and, when correctly used, may be preferable to gastric lavage. We do not normally recommend the use of ipecacuanha outside hospital since it may occasionally cause protracted vomiting and there have been cases where parents, although given adequate instructions, have used the emetic inappropriately in a moment of panic.

Examples of recommendations for gastric lavage or emesis

Gastric lavage should certainly be performed if there is reason to believe that one of the following agents has been ingested within the times stated (when the history is uncertain, or more than one agent has been taken, each case should be decided individually). The amounts given are for adults. For small children divide by 5.

Drug or poison	Amount over:	Within the previous:
Aspirin	15 g	12 hours
Paracetamol	10 g	4 hours
Benzodiazepines	Lavage is not indicated*	
Digoxin	5 mg	8 hours
Tricyclic antidepressants	750 mg	8 hours
Methanol	25 ml	8 hours
Ethylene glycol	100 ml	4 hours
Phenobarbitone	1000 mg	8 hours
Phenytoin	Lavage is not indicated*	
Sodium valproate	Lavage is not indicated*	
Theophylline	2.5 g	4h (8 hours†)
Dextropropoxyphene	325 mg	8 hours
Cyanide	Any case with symptoms	1 hour

*Except in massive overdose, when each case should be considered on its merits.

†If delayed release preparation taken.

Procedure for gastric aspiration and lavage

- 1 If unconscious, protect airway with cuffed endotracheal tube.
- 2 Place the head of the patient over the end or side of the bed so that mouth and throat are below the larynx and trachea.
- 3 Use a wide bore tube lubricated with Vaseline or glycerine (Jacques gauge 30 in adults; 50 cm will reach the stomach).
- 4 Ensure the tube is not in the trachea; aspirate first and save sample for possible analysis.
- 5 Use 300–600 ml water for washing. Repeat 3 to 4 times, or more if poison is obviously still being removed.

Gastric aspiration and lavage

Gastric aspiration and lavage is the only suitable way of emptying the stomach of an unconscious patient, adult or child. The patient's consent should be assumed and the procedure used if a serious overdose is suspected. The airway must be protected by first passing an endotracheal tube; then a wide bore orogastric tube is passed. The stomach is aspirated first. In some hospitals the aspirate is tested with litmus paper to ensure that the tube has entered the stomach. Aliquots (300–600 ml) of water at body temperature are passed in and allowed to pass out under gravity; if the tube becomes blocked gentle suction can be applied.

If a bezoar is suspected—as seen sometimes with carbamazepine and some sustained release formulations—it should be confirmed radiologically or endoscopically. Even in the most experienced hands, aspiration into the lungs may still occur. This procedure should also not be used if oesophageal varices are likely or if previous gastric surgery may have increased the rate of passage of the lavage fluid to the intestines.

Oral adsorbants

Effect of single and multiple doses of activated charcoal on peak plasma nortriptyline levels

Activated charcoal is the only recommended general purpose oral adsorbant. Earlier compounds were either potentially toxic (as with the "universal antidote" mixture) or less effective. "Activated" means only that the brand of charcoal meets certain absorbance standards. In the United Kingdom, activated charcoal is available as an effervescent formulation in 5 g sachets for administration in water (Medicoal) or in powder form in 50 g bottles (Carbomix).

To be fully effective, a ratio of about 10 parts of charcoal to 1 part poison is needed. Thus, activated charcoal is more likely to be beneficial for adsorbance of substances which are toxic in small amounts, such as tricyclic antidepressants, and less likely to be effective when large amounts of poison have been ingested—for example, in aspirin or paracetamol poisoning. There is little evidence of harm from this treatment, although vomiting may occur. As with emptying the stomach, treatment with charcoal is most effective during the first four hours after ingestion. Recent work, however, shows that some poisons are also adsorbed by oral activated charcoal many hours after ingestion (and even after intravenous administration), presumably by back diffusion or interruption of enterohepatic circulation, and the range of indications for this treatment will probably increase. Aspiration of charcoal into the lungs is a risk that should be guarded against. The nursing staff on the ward should be warned that the patient's stools will be black.

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