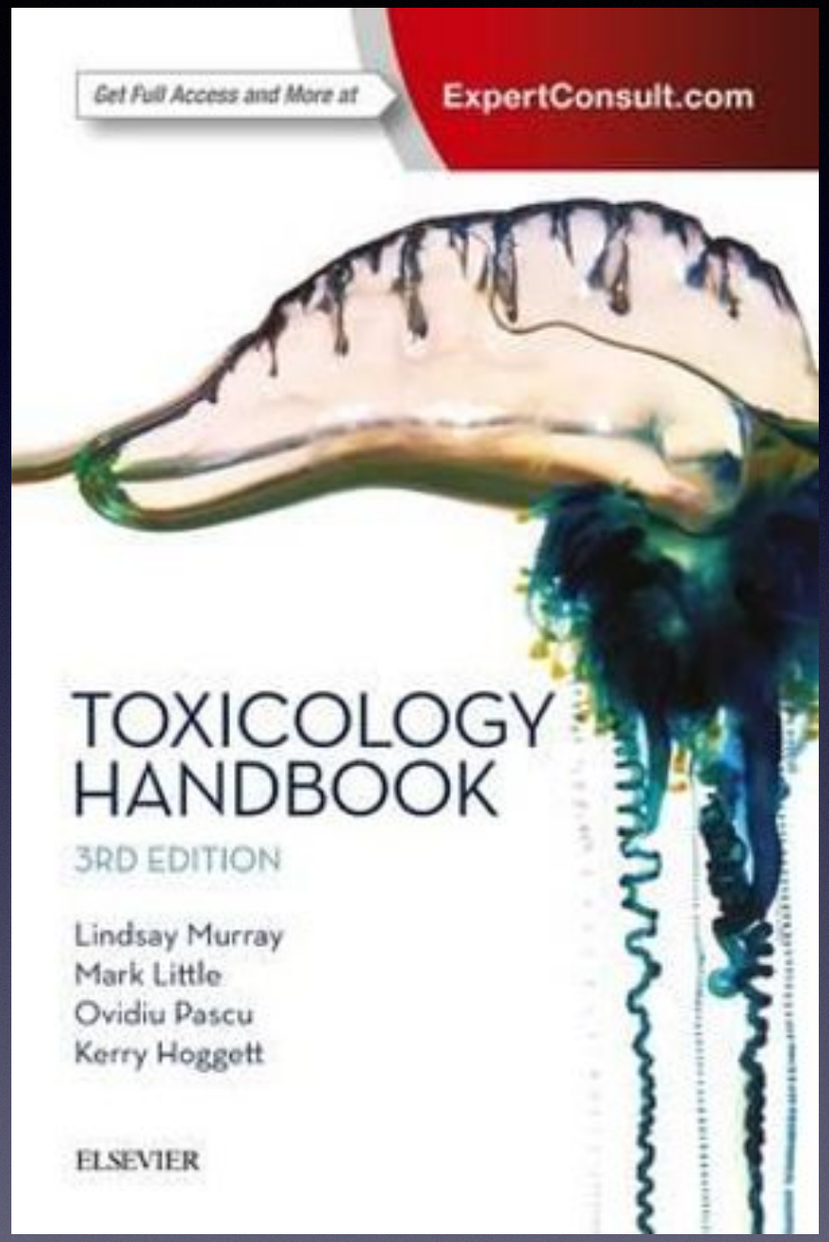
One Pill or Sip Can Kill

Dr. Mark Ballinger
ED Fellow, WDHB

Toxicology Handbook

Murray, 3rd Edition
Elsevier



Definition

A pharmaceutical or non-pharmaceutical product with potential for severe toxicity if 1-2 tablets, sips or mouthfuls are ingested by a 10kg toddler.

Objectives

- Background of poisoning in young children
- Identify some non-toxic household exposures
- Identify some toxic pharmaceutical and non-pharmaceutical products
- Explore the clinical features, management and discharge criteria
- Approach to managing a toddler with an unidentified ingestion

Accidental Paediatric Exposures

Pharmaceuticals	40%
Household Cleaning Products	14%
Plants	13%
Cosmetics	10%
Pesticides	6%

Non-Toxic Household Exposures

Antacids	Steroids	Hair products	Matches	Shoe polish
Antibiotics	Cosmetics	Hand lotions	Newsprint	Silica
Bath oil	Deodorants	Incense	OCP	Soap
Candles (wax)	Detergents	Inks	Paint	Suntan lotion
Chalk	Fertilisers	Laxatives	Shampoo	Thermometer mercury
Perfumes	Glues	Lipstick	Shaving cream	Vaseline

Toxic Pharmaceutical Agents

Class	Example
Amphetamines	Meth, MDMA (ecstasy)
Beta Blocker	Propranolol specifically (& sotalol)
Calcium channel blocker	Verapamil, diltiazem
Quinolone related	Hydroxy/chloroquine
Opioids	Oxycodone, methadone, morphine
Opioid related	Dextropropoxyphene
Sulphonylurea	Gliclazide, glibenclamide
Methylxanthine	Theophylline
Tricyclics	Amitriptyline, Dothiepin, Trimipramine

Toxic Non-Pharmaceutical Agents

Agent
Organophosphate and carbamate insecticides
Paraquat
Hydrocarbons - solvents, eucalyptus oil, kerosene
Oil of Wintergreen (methylsalicylate)
Camphor
Naphthalene (one mothball)
“Sherlock Holmes” agents - arsenic & strychnine!

Let the Game Begin!!!

Amphetamines

Features	Agitation, confusion, hypertension, hyperthermia Seizures, ACS, SAH/ICH AKI, rhabdo, hyponatraemia and cerebral oedema
Management	Benzos, cooling (if >39.5), supportive, GTN. (Not β-blockers - unopposed α-blockade)
Discharge	If asymptomatic at 4 hours

β-blockers - Propanolol & Sotalol

Features	β-blockade - hypotension, brady-dysrhythmias, hypoglycaemia Propranolol (Na channel blockade) - wide QRS, seizures, VT Sotalol - long QT, Torsades de Pointes
Management	CVS - atropine, isoprenaline, adrenaline, high dose insulin Wide QRS - sodium bicarbonate TdP - isoprenaline, magnesium, overdrive pacing *NB - glucagon no longer recommended*
Discharge	6 hours if asymptomatic and normal ECG

Calcium Channel Blockers*

Features	Delayed onset bradycardia, hypotension, conduction defects, refractory shock
Management	Early I&V, Ca gluconate, fluids, atropine (works in 25%), adrenaline, ***high dose insulin***, WBI, pacing (max rate 60bpm), ECMO, methylene blue (vasoplegia), intralipid (perhaps)
Discharge	4 hours (standard prep) 16 hours (sustained release) If normal vitals and ECG

**Verapamil and diltiazem*

Hydroxy/Chloroquine

Features	Rapid onset coma, seizures, cardiovascular collapse/ arrest ECG - long QT, wide QRS, various heart blocks, tachy Hypokalaemia
Management	I&V if decreased LOC. Fluid and adrenaline for low BP. Broad complex tachys - sodium bicarbonate Seizures - benzos. High dose diazepam 0.5mg/kg then 1mg/kg over 24 hours - protective mechanism unclear
Discharge	6 hours if asymptomatic

Opioids*

Features	Coma, respiratory arrest, miosis, vomiting Dextropropoxyphene - VT, seizures (fast Na channel blockade)
Management	Supportive, naloxone Benzos for seizures, bicarb for Na blockade (dextrop.)
Discharge	Varies depending on agent 4 hours for most preparations 12 hours for controlled release preps or codeine

**One mouthful of methadone or 60mg codeine*

Sulphonylureas*

Features	Delayed hypoglycaemia
Management	5ml/kg 10% glucose Octreotide 1mcg/kg bolus then 1mcg/kg/hr Early octreotide may negate need for high dose glucose
Discharge	8 hours if no drop in BSL

**Gliclazide, glibenclamide*

Theophylline

Features	Seizures, vomiting ECG - SVT, A.fib, A.flut, VT Refractory hypotension, hypo-K/PO_4/Mg
Management	Supportive until urgent haemodialysis ready Multi-dose activated charcoal Fluid, noradrenaline Benzos for seizures β-blockers for SVT and AF
Discharge	Syrup - 6 hours MR tablets - 12 hours

Tricyclics*

Features	CNS - sedation, delirium, coma, seizures CVS - sinus tachy and mild hyper-T. Hypo-T due to α- blocking, BC tachydysrhythmias and BC bradycardia pre-arrest Anticholinergic effects
Mgmt	Intubate and hyperventilate if any decreased LOC Sodium bicarb, sodium bicarb, sodium bicarb Benzos for seizures Fluid and pressors for hypotension Lignocaine, Mg and phenytoin can be rescue antiarrythmics
Discharge	6 hours if asymptomatic, normal vitals, normal ECG, normal mentation, no seizures

**>10mg/kg amitriptyline, dothiepin, trimipramine potentially lethal*

Hydrocarbons*

Features	CNS - Rapid decreased LOC, seizures Aspiration pneumonia - SOB, hypoxia, haemoptysis, APO CVS - VT, VF, dysrhythmias (usually early, prehospital)
Management	Decontaminate patient VT/VF - ACLS, propranolol or metoprolol IV, avoid catechols. Pneumonitis - O_2 and bronchodilators. No steroids or abx. Benzos for seizures
Discharge	6 hours if no cough, SOB, wheeze or abnormal vitals (inc sats) *Pitfall - not recognising dry cough as evolving pneumonitis*

**rapid onset coma with 5ml of eucalyptus or other essential oils*

Organophosphates

Features	Cholinergic symptoms, seizures, decreased LOC
Management	PPE for staff, decontamination Escalating doses of atropine (50mcg/kg, double every 5 mins) Benzos for agitation Pralidoxime - give before irreversible inhibition of AChE
Discharge	Minimum of 12 hours Do not discharge at night

Paraquat*

Features	Almost invariably fatal Oropharyngeal burns, oesophageal perforation Multiorgan failure Pulmonary fibrosis
Mgmt	Food, dirt, charcoal (Fullers Earth) at the scene - anything to reduce absorption Keep sats <91%, no O_2 unless sats <90% (makes things worse) HD, NAC, Vit C, steroids - worth trying anything if borderline
Discharge	If clinically well, no oral burns, negative dithionite test, can be discharged. Dithionite reduces paraquat - done on urine or gastric fluids

**5ml in an adult is potentially fatal*

Oil of Wintergreen*

Features	GI - nausea and vomiting CNS - tinnitus, agitation, seizures, cerebral oedema and death Metabolic - resp alk, met acid, hypo-K, altered BSL
Management	Intubation and hyperventilation (maintain alkalosis) Benzos for seizures Urinary alkalinisation - promotes ionisation and excretion Haemodialysis
Discharge	6 hours if asymptomatic

*>5ml oil of wintergreen may cause serious toxicity or death

Unidentified Tablet Management

- Admit for minimum 12 hour observation period
- Check BSL at presentation, at discharge, and any evidence of hypoglycaemia
- Monitor level of consciousness and vital signs
- Cardiac monitoring if any reduced LOC or abnormal vital signs
- Brief staff regarding clinical features for which the patient is being observed
- Discharge patient only during daylight hours

Thank you!

Any questions?