

PAEDIATRIC ACUTE CARE GUIDELINE

Poisoning Overview			
Scope (Staff):	All Emergency Department Clinicians		
Scope (Area):	Emergency Department		

This document should be read in conjunction with this DISCLAIMER <u>http://kidshealthwa.com/about/disclaimer/</u>

Poisoning Overview

This guideline provides an outline of the general approach to poisoning. Specific information about poisoning presentations can be obtained from **Poisons Information: 131126** or refer to the Toxicology Handbook.

Background

- The vast majority of morbidity and mortality in toxicology arises from complication of the poisoning not the poisoning itself, particularly
 - $\circ\,$ Aspiration due to sedation
 - Urinary retention
- Good supportive care is the best way to prevent this
- Poisonings follow a highly predictable path
- Risk assessment is an essential cognitive step during assessment that outlines ongoing care
- If information is unclear always base the risk assessment upon a "worse case scenario"
- Know your list of "<u>2 pills can kill</u>" in a toddler.
 - Most accidental paediatric ingestions are only 1-2 tablets and a risk assessment will be low. Nevertheless, there are some toxins which can kill a young child with a very small exposure. These should be aggressively managed with early senior advice and/or Toxicology service input.
- The general approach to all poisonings should follow the "RRSIDEAD" format
- **R** Resuscitation
- **R** Risk Assessment
- **S** Supportive Care
- I Investigations

- **D** Decontamination
- E Enhanced Elimination
- A Antidotes
- **D** Disposition

Management

Resuscitation

Follow traditional ABC approach with modification

- Airway
- Breathing
- Circulation
- Control/Correct
 - Seizures with midazolam (phenytoin contraindicated)
 - Hypothermia
 - Hyperthermia
 - Temperature > 38.5^o requires core monitoring
 - Temperature > 39.5° is an indication for intubation, ventilation and paralysis

Risk Assessment

The following five factors will provide an accurate prediction of clinical course, potential complications and time coarse of poisoning to direct management.

- Agent/s
- Dose
- Time of ingestion
 - $\circ\,$ Use the latest possible time if uncertain
- Patient factors
 - Weight
 - Comorbidities that may affect prognosis, for example:
 - Heart disease complicating calcium channel overdose
 - Morbid obesity affecting airway patency
- Clinical status (features and progress)
 - Agents commonly affect the autonomic, CNS and neuromuscular systems and may produce a recognisable "toxidrome"
 - $\circ\,$ Does the clinical presentation of the patient fit with the predictable profile of the overdose?

			Anticholinergic	Sympathomimetic	Serotonergic
--	--	--	-----------------	-----------------	--------------

Examples		Antihistamines Antidepressants Antipsychotics Oxybutinin	Street amphetamines Dexamphetamine Methylphenidate	SSRIs/SNRIs TCAs MAOi MNDA
Autonomic	Vital Signs	Elevated	Elevated	Elevated
	Temperature	Elevated	Elevated	Elevated
	Pupils	Dilated	Dilated	Dilated
	Skin/Mucous Membranes	Flushed, Dry	Flushed, Sweaty	Flushed, Sweaty
CNS	Mental Status	Agitated delirium	Euphoria, Agitated	Agitated, Coma
	Seizures	Rarely	Yes	Yes
Neuromuscular	Tone	Normal	Increased/Rigidity	Increased/Rigidity
	Reflexes	Normal	Hyperreflexic	Hyperreflexic/clonus
Complications		Urinary retention Hyperthermia Rhabdomyolysis Injury to self	Severe hypertension Dysrhythmias Myocardial infarction Pulmonary edema Rhabdomyolysis Hyponatreamia SAH	Hyperthermia Rhabdomyolysis

Supportive Care and Monitoring

- Supportive care is tailored to the risk assessment and may involve:
 - IV hydration
 - Control of agitation and seizures with titrated benzodiazepines
 - Ensuring normoglycaemia
 - Bladder care (especially monitoring for urinary retention)

Investigations

Investigations are done for either specific purposes, to identify occult overdoses, or specific tests to determine the presence or level of a known ingestant

Screening

- 12 lead ECG
 - Wide QRS (sodium channel blockade)
 - Long QT (potassium channel blockade, anti-psychotic overdose)
 - Heart blocks (calcium channel and beta blockers/calcium channel poisoning
- Serum Paracetamol level (4 hours)
- Blood glucose level (BGL)

Specific

- Drug levels
 - Paracetamol (in known ingestion)
 - \circ Iron
 - Alcohols
 - Lithium
 - Salicylate
 - Theophylline
 - \circ Anti-epileptics
 - Others

Other adjunctive tests as indicated:

- Blood gas:
 - High anion gap metabolic acidosis
 - TCA
 - Salicylates (late)
 - Iron
 - Toxic alcohol
 - Metformin
 - Respiratory alkalosis
 - Salicylates
 - Respiratory acidosis
 - Sedatives
- Abdominal X-Ray:
 - $\,\circ\,$ Confirmation of iron or other heavy metal ingestion
- Blood tests:
 - LFT (delayed paracetamol)
 - \circ UEC
 - INR (Warfarin, delayed paracetamol)

Decontamination

- Consider but rarely required
 - Activated charcoal
 - Will not bind to hydrocarbons or alcohol, corrosives and metals
 - Reserved for life threatening intoxications in which other measures are not expected to result in a good outcome
 - Contraindicated in un-intubated patient if decreased conscious level, vomiting or seizures are expected
 - Can be considered where the toxin is likely to remain in the gastrointestinal tract (generally within the first hour post ingestion for most agents)
 - Other methods: e.g. **whole bowel irrigation** should not be instigated in the ED and should only be commenced on advice of Poisons Information

Enhanced Elimination

- Consider but rarely required
 - Techniques include: multiple dose activated charcoal, urinary alkalinisation, haemodialysis, haemofiltration, charcoal haemoperfusion

Antidotes

• The risk assessment should determine if the potential benefit outweighs the possible adverse effects of the antidote

Antidote	Poison	
N-acetylcysteine	Paracetamol	
Naloxone	Opiates	
Flumazenil	Benzodiazepines	
Desferrioxamine	Iron	
Sodium Bicarbonate	TCAs	

Disposition

- The disposition will be determined by:
 - The clinical risk assessment of the overdose
 - \circ The psychiatric safety of the patient (for deliberate overdoses)
 - \circ Other safety factors (parental neglect or drug use, domestic issues)
- Children should not be discharged home at night unless the risk assessment determines that the overdose is trivial and not requiring any form of observation

Discharge home with parental supervision:

- Trivial overdose with no requirement for observation
- Ensure safety issues such as accessibility to tablets are addressed and provide parents with <u>Kidsafe WA Poisoning Fact Sheet</u>
- Low risk overdose with minimal potential for deterioration during day-time hours
- Parents must be able to return to ED in the event of deterioration

Emergency observation ward

- Stable patient with low-risk overdose requiring observation
- Low risk overdose with minimal potential for deterioration during night hours

Medical ward

• Stable patient requiring medical or antidote therapy

• Any suspicion of NAI

PICU

• Unstable or intubated patient

Psychiatric Ward

• Medically cleared patient deemed at risk of deliberate self harm

Nursing

- Baseline observations include heart rate, respiratory rate, oxygen saturation, blood pressure and neurological observations
- Minimum of hourly observations should be recorded whilst in the emergency department
 - Any significant changes should be reported immediately to the medical team
- Nursing care specific to the presentation

Two Tablets - Potentially Lethal to a 10kg Child ²			
Agent	Principle Features of Severe Toxicity		
Amphetamines • Amphetamine • Metamphetamine • MDMA (ecstacy)	Agitation Confusion Hypertension Hyperthermia		
Baclofen	Coma		
Calcium Channel Blockers • Diltiazem CD • Verapamil SR	Delayed onset of bradycardia Hypotension Conduction defects Refractory shock		
Chloroquine Hydrochloroquine	Rapid onset of coma Seizures Cardiovascular collapse		
Dextropropoxyphene	Ventricular tachycardia		
Opioids • Oxycodone • Methadone • Morphine Sulphate • Diphenoxylate/Atropine	Coma, respiratory arrest Note: May be delayed with diphenoxylate/atropine and controlled release morphine		
Propranolol	Coma Seizures Ventricular tachycardia Hypoglycaemia		

Sulfonylureas • Glibenclamide • Glibenclamide/Metformin • Gliclazide • Glimepiride	Hypoglycaemia Note: Onset may be delayed up to eight hours.
Theophylline	Seizures Supraventricular tachycardia Vomiting
Tricyclic antidepressants • Dothiepin	Coma Seizures Hypotension Ventricular tachycardia
Venlafaxine XR	Seizures

Non-pharmaceutical agents considered potentially lethal to children ²			
Agent	Dose of concern for a 10kg child	Clinical Effects	
Organophosphate and carbamate insecticides	Single sip	Cholinergic symptoms Seizures Depressed level of consciousness	
Paraquat/Diquat	Sip	Oro-pharyngeal burns Multiple organ failure Pulmonary fibrosis	
Hydrocarbons • Solvents • Eucalyptus oil • Kerosene	Sip	Rapid depressed level of consciousness Seizures Aspiration pneumonia	
Camphor	5mL of 100%	Rapid depressed level of consciousness Seizures Hypotension	
Corrosives • Sodium hydroxide • Strong acids		Gastro-oesophageal injury including perforation	
Naphthalene	One mothball NB: Most mothballs contain paradichlorbenzene, which is non-toxic after a single accidental ingestion	Methaemoglobinaemia Haemolysis	
Strychnine		Rapid onset of generalised muscle spasm Death by respiratory failure	

References

1. Murray L, Daly F, Little M, Cadogan M (2011) Toxicology Handbook, 2nd Edition, Elsevier Australia

2. Murray L, Little M, Pascu O and Hoggett KA (2015) Chapter 2.23 Poisoning in Children, Toxicology Handbook, 3rd Edition, Elsevier Ltd

3. McCoubrie D, Murray L, Daly FFS and Little M. Toxicology case of the month: ingestion of two unidentified tablets by a toddler. Emerg Medicine J 2006; 23: 718-720.

4. Bar-Oz B, Levichek Z and Koren G. Medications That Can Be Fatal For a toddler with One Tablet or Teaspoon. Paediatric Drugs 2004; 6 (2): 123-126

This document can be made available in alternative formats on request for a person with a disability.

File Path:				
Document Owner:	Dr Meredith Borland HoD, PMH Emergency Department			
Reviewer / Team:	Kids Health WA Guidelines Team			
Date First Issued:	24 September, 2015	Version:		
Last Reviewed:	24 September, 2015	Review Date:	24 September, 2017	
Approved by:	Dr Meredith Borland Date: 24 September, 2015			
Endorsed by:	Medical Advisory Committee	Date:	24 September, 2015	
Standards Applicable:	NSQHS Standards: 🔍 🥝 💼			
Printed or personally saved electronic copies of this document are considered uncontrolled				