PAEDIATRIC ACUTE CARE GUIDELINE	
Poisoning – Tricyclic Antidepressant	
Scope (Staff):	All Emergency Department Clinicians
Scope (Area):	Emergency Department

Poisoning – Tricyclic Antidepressant

This guideline is a general approach to tricyclic antidepressant poisoning. For specific details please contact **Poisons Information: 131126** or refer to the Toxicology Handbook.

Agents:

- Amitriptyline
- Clomipramine
- Dothiepin
- Doxepin
- Imipramine
- Nortriptyline
- Trimipramine

Background

Tricyclic antidepressants (TCAs) act on a variety of receptors whose actions include:

- Noradrenaline reuptake inhibition
- Central and peripheral anticholinergic effect
- Fast sodium channel blockade in the myocardium
- Peripheral alpha$_1$-adrenergic receptor blockade

The life threatening effects of acute tricyclic antidepressant (TCA) overdose are:

- Rapid onset of coma
- Seizures
- Cardiac dysrhythmias

Hypotension and central and peripheral anticholinergic effects may also be seen

Risk Assessment

- Most acute accidental paediatric exposures do not result in life threatening toxicity
- A 10kg child can develop life threatening poisoning with the ingestion of a single tablet (e.g. 150mg amitriptyline)
- Patients who ingest a large dose of TCA usually develop evidence of intoxication within 2-4 hours, and always within 6 hours
- If their is suspicion of deliberate self poisoning patients are to be referred for evaluation in hospital, regardless of the dose ingested

Typical Clinical Course

Common effects following acute TCA ingestion include:

- Drowsiness
- Ataxia
- Sinus tachycardia
- Dilated pupils
- Decreased bowel sounds
- Ileus and Urinary retention

Life threatening effects following acute TCA overdose are:

- Coma
- Seizures
- Ventricular dysrhythmia
- Hypotension
- Central and Peripheral anticholinergic effects may also be seen

Ingested Dose	Symptoms and Disposition
< 5 mg/kg	**Minimal toxicity** Patients do not require decontamination or referral to hospital except in cases of deliberate overdose
5 – 10mg/kg	**Major symptoms unlikely** **Mild anticholinergic effects may be present** • Drowsiness • Tachycardia Patients should be referred to hospital for evaluation and observation and may be discharged if asymptomatic at 6 hours post ingestion.

> 10mg/kg	**Life threatening effects:** • Coma • Seizures • Cardiac dysryhythmias • Hypotension Anticholinergic effects are likely but often masked by coma Patients are to be admitted to the PICU. Intubation and hyperventilation may be required.
> 30mg/kg	**Severe toxicity with pH-dependent cardiotoxicity and coma expected to at least >24 hours** Patients are to be admitted to PICU. Intubation and hyperventilation may be required.

Investigations

Screening (for deliberate overdose):

- BSL
- Paracetamol level (if deliberate ingestion)

Specific

- Serial 12 lead ECG
    - Prolonged QRS interval (sodium channel blockade)
        - > 100ms predicts risk of seizures
        - > 160ms predicts risk of ventricular tachycardia
    - Large terminal R wave in aVR
    - Increased R/S ratio (> 0.7) in aVR
    - Prolonged QT interval (potassium channel blockade)
- Blood gas (pH)

Management

Resuscitation

Overdose may be life-threatening and should be managed in a resuscitation bay with cardiac monitoring. Cardiac monitoring should continue for at least 6 hours post-ingestion or until resolution of toxicity.

Potential early life-threats that require immediate intervention include:

- Coma
- Respiratory compromise
- Seizures
- Cardiac dysrhythmia
- Cardiac arrest

Life-threatening overdose will require intubation and hyperventilation to a pH of 7.50-7.55. Bicarbonate boluses may be required just prior to intubation to optimise cardiovascular status.

Reduced level of consciousness

- Intubation and hyperventilation are indicated if the GCS falls below 12

Ventricular dysrhythmias

- Sodium bicarbonate boluses (100mmol or 2mmol/kg) IV every 1-2 minutes is given until restoration of the perfusing rhythm and normalisation of the QRS.
- Cardioversion and defibrillation are unlikely to be effective.
- Type Ia antidysrhythmic agents (e.g. procainamide), amiodarone and beta-blockers are **contraindicated.**
- Serial ECGs should be performed every 5-10 minutes until ECG abnormalities are stabilised.

Hypotension

- Treat with IV crystalloid solutions (10–20 mL/ kg) and assess response
- Refractory hypotension may require sodium bicarbonate and adrenaline or noradrenaline infusion

Seizures

- Benzodiazepines are first-line treatment
- Phenytoin is **contraindicated**

Decontamination

Activated charcoal 1gram/kg indicated for ingestions > 10mg/kg but should not be given until the airway is secured by ETT and after dealing with resuscitation requirements.

Enhanced Elimination

No role

Antidote

Sodium bicarbonate, as above

Disposition

- Any patient who is asymptomatic at 6 hours can be medically cleared.

- Patients who have mild ECG or mental state changes should be admitted to a medical ward and require ongoing careful observation and regular ECGs.
- Patients with significant TCA overdose will require PICU admission.

Nursing

- Baseline observations: 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
- Baseline ECG on arrival and as required throughout presentation
- Continual cardiac monitoring
- Blood sugar level for patients with reduce level of consciousness
- Ensure the patient is always aided when ambulating to prevent a fall
- Fluid balance (urinary retention is a common anticholinergic effect)

References

1. Murray L, Little M, Pascu O, Hogget K (2015) Toxicology Handbook, 3rd Edition, Churchill Livingston Australia
2. Poisons Information Service 131126
3. AMH Children's Dosing Companion (online). Adelaide: Australian Medicines Handbook Pty Ltd; 2015 January. Available from: http://childrens.amh.net.au
4. Australian Medicines Handbook (online). Adelaide: Australian Medicines Handbook Pty Ltd; 2015 January. Available from: http://amhonline.amh.net.au
5. Toxinz Poisons Information (2013) National Poisons Centre, New Zealand. Online – http://www.toxinz.com

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

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