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## Laundry Detergent Capsule Exposure: Guideline for the ED

[Link to Flow Sheet](#)

### Aim

To provide an evidence based guideline on the management of patients presenting to the ED with exposure (splash and ingestion) to liquid detergent capsules

### Definition of terms

LDC; Liquid detergent capsules. FBC; full blood count, U&E; urea and electrolytes, VBG; venous blood gas, ECG; electrocardiogram, COAG; coagulation profile, CXR; Chest xray

### Target Patient Population

Children 1 to 16yrs with acute exposure to liquid detergent capsules who require immediate assessment and management.

### Target Users

Health-care professionals engaged in the care of infants and children presenting to the Emergency Department

### Introduction

Laundry Detergent capsules (e.g. Liquitabs) are household domestic products usually packaged as small, brightly coloured concentrated detergent sachets. While manufacturer's contents may vary, the majority of laundry detergent capsules contain a combination of agents, of which include, an anionic detergent (20-30%), a non ionic detergent, propylene glycol (15 – 20%), and ethanol (2 – 5%) and a cationic surfactant. These agents are dissolved in water to form an alkaline solution. (i)(ii)

### Epidemiology

The largest series of liquid detergent capsule exposures was published by the UK national poisons information service. (iii) 647 enquiries about LDC exposure were reported in a year. The majority of enquiries (96.1%) concerned children of 5 years of age or less.

Exposure to these products occurred mainly as a result of ingestion alone (80.1%), with eye contact alone (9.4%), and skin contact alone (1.1%) being less common. Multiple routes of exposure were involved in 9.4% of inquiries.

Following ingestion the most common symptoms recorded included vomiting (24%), coughing (4.1%), nausea (3.5%), drowsiness (1.7%), rash (1.7%), diarrhoea (1.5%), pulmonary congestion/bronchospasm (1.2%), stridor (1.2%), abdo pain (0.8%), pharyngitis/ esophagitis (0.8%), increased saliva production (0.8%) and chemical burn (0.2%)

With regard to severity of exposure published case reports include a range from mild oedema of the arytenoids, ulceration of oesophagus and gastro-oesophageal junction to subglottic oedema with resulting soft subglottic stenosis at follow up. (iv)

Features following eye exposure; Conjunctivitis (65.6%), eye pain alone (9.6%), Keratitis alone (3.3%)

A large UK case series has demonstrated the following:

- Most patients are <5yr old ( this is true for all our ingestions so may not be necessary to include)
- Exposure results in ingestion alone in 80% of cases
- Eye contact alone in 9% and skin only in 1%

**Symptoms post ingestion in order of likelihood are:**

- vomiting
- coughing
- nausea
- drowsiness
- rash
- diarrhoea
- pulmonary congestion/bronchospasm
- stridor
- abdominal pain
- pharyngitis / oesophagitis
- increased saliva production
- chemical burn

## Management of Ingestions

Establish history of liquid capsule exposure

- Activated charcoal is contraindicated
- Gastric lavage is not recommended.
- Assessment conducted and consideration for minor and major symptoms as described below.

## Assessment

If resuscitation is required, perform ABC assessment and treat as per APLS guidelines

**Always** assess the airway. If a supraglottic or epiglottic burn is apparent, seek expert airway input (anaesthesiology) as a priority. If erythema and oedema are present this is usually a sign that further oedema will occur that may lead to airway obstruction. It is an indication for consideration of early intubation.

Patients may then be divided into the symptomatic and asymptomatic groups

## Symptomatic

### **Major Signs and Symptoms**

Drooling, pain, dysphagia, vomiting, stridor, evidence of oesophageal burns or a history of ingestion of a substantial amount of material.

Burns to the mouth, lips, oesophagus and pharynx should raise concern for evolving oedema and again airway compromise. Early consideration for establishment of a definitive airway is recommended.

Severe abdominal pain, abdominal distension, circulatory collapse and lactic acidosis should raise concern. Although no documented cases of perforation or necrosis have occurred there remains a potential for alkaline caustic burns to exert a potent solvent action on tissue lipoproteins. This can produce liquefaction necrosis with intense inflammation and saponification. (vi) The arytenoids, epiglottis and oesophagus are particularly vulnerable to exposure after ingestion.

Although no cases have been documented, ulceration may be sufficiently severe to cause perforation with complications including mediastinitis, pneumonitis and cardiac injury. The depths of the burns are usually much greater with alkalis, and may continue to develop some time after exposure.

- Erect chest x-ray (not always possible in very young) +/- PFA (supine & decubitus), supportive management (intravenous fluids, analgesia) +/- surgical assessment and consideration for early endoscopy/ CT are recommended. Broad-spectrum antibiotics if proven perforation.
- The use of antacids, (intravenous) H2 antagonists or proton pump inhibitors has not been studied in detail but given in the early stages they may help to reduce the extent of corrosive injury.

### Asymptomatic

- Observe for 6 hours post ingestion
- If asymptomatic treat with oral \*fluid dilution; 10ml/kg of water (max 250ml).
- If after 6 hours patient is able to drink and has remained asymptomatic throughout, the patient can be discharged safely with advice and reassurance with parent information sheet.

### Note:

A decrease in GCS has been documented to occur up to 4-6 hours post exposure (v)

**GCS 15/15** -> Observe for 6 hours, monitor vitals. 12 lead ECG should be performed assessing QRS and QT intervals. Repeat 12 lead ECGs are recommended, especially in symptomatic patients.

**GCS<15/15** -> Bloods of which include FBC, U&E, COAG, VBG, 12 lead ECG. Complete primary and secondary assessment.

### Exposure to Eye:

- Remove contact lenses if worn
- Assess conjunctival pH –place the strip into the pocket that is formed when the lower eyelid is retracted
- Anaesthetise the eye with topical anaesthesia (Tetracaine is local choice)
- Irrigation of eye thoroughly with 0.9% saline 1000ml for 10-15 mins. Using a giving set, irrigation is begun by holding the end of the IV tubing just above the eyeball and allowing free flow of the irrigation fluid. During irrigation, the eyelids must be held open. Gauze pads can further enable this. 2 operators are preferred and towels should be placed either side of the head to catch irrigation fluid. Ensure appropriate analgesia has been administered.
- Aim for a conjunctival pH of 7.5 to 8.
- Corneal damage may be assessed by administering fluorescein and examination under a cobalt blue light of ophthalmoscope.
- Patients with corneal damage, history of significant exposure and those whose symptoms or pH are resistant to therapy should be referred urgently to ophthalmology.

### Exposure to Skin

- Remove clothing.
- Immediate analgesia– paracetamol and consider opiates
- Irrigation with cold water for at least 10 -30 mins. This is done to dilute the effects of the chemical on the skin. Plastic cling wrap can be useful after cooling to limit evaporation and heat loss.
- Decontaminate open wounds first and particular attention is to be paid to mucous membranes. Areas such as skin folds/ joint surfaces, fingernails, perineum/genitalia, face, hands and ears should all receive special attention.
- Documentation should include extent and depth of burn, and first aid administered.
- Tetanus status and time of exposure should be recorded.
- A Lund-Browder chart should be used to accurately calculate the area affected, as per Burns guideline.



- Application of suitable dressing. Mepitel or a suitable non adherent dressing suitable for the initial covering of burns. Apply a non-fibrous secondary absorbent dressing such as a dressing pad and secure well with a light weight conforming bandage or a tubular gauze bandage. Fingers should be dressed individually and the hand elevated.
- As per guidelines, all chemical burns should be discussed with plastics team on call.

### **Links to useful websites**

[Toxbase](#)

[RCH Melbourne Clinical Guidelines](#)

### **Companion Documents**

[Link to literature search strategy](#)

[Link to reference list](#)

[Link to Flow Chart](#)

[Link to Parent Information Leaflet](#)