

SUSPECTED FOREIGN BODY (FB) AND BUTTON BATTERY (BB) INGESTION - MANAGEMENT OF PRACTICE GUIDELINE[®]

DOCUMENT SUMMARY/KEY POINTS

- Button batteries (BB) are high risk objects which require urgent x-ray imaging and removal within 2 hours of ingestion.
- Magnets are high risk objects and require urgent x-ray imaging. Ingestion of >1 magnet or 1 magnet + other metallic object requires urgent removal.
- The majority of ingested foreign bodies (FB) are low risk and can be managed without intervention.
- Large sized objects and objects impacted in the oropharynx require specialist review.
- Ingested objects may be toxic – consider consulting local poison information centre.

CHANGE SUMMARY

- New Document

READ ACKNOWLEDGEMENT

- Read Acknowledge Only - clinical staff, nurses and medical officers working in the Emergency Department, Gastroenterology, ENT and Anaesthetics.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
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Purpose

To formulate a decision-making pathway for ED clinical staff when a child presents with a suspected foreign body (FB) or button battery (BB) ingestion to ensure timely management.

This clinical practice guideline is primarily aimed at clinicians caring for children in an emergency department setting. This document provides a framework for the assessment and management of ingested foreign bodies and button batteries.

Related Guidelines

This guideline is adapted from the Paediatric Improvement Collaborative (PIC) guideline: Foreign body ingestion

https://www.rch.org.au/clinicalguide/guideline_index/Foreign_body_ingestion/

Flowchart

Box A: X-rays to request

Suspected button battery or unknown object: AP airway + chest + abdomen

Other radio-opaque foreign bodies: AP airway + chest +/- abdomen

Magnet(s) ingestion or no BB/ FB seen on AP x-rays: lateral airway and chest x-ray

At CHW: Use the "X-ray Foreign Body" order item when requesting an AP airway + chest + abdomen x-ray.

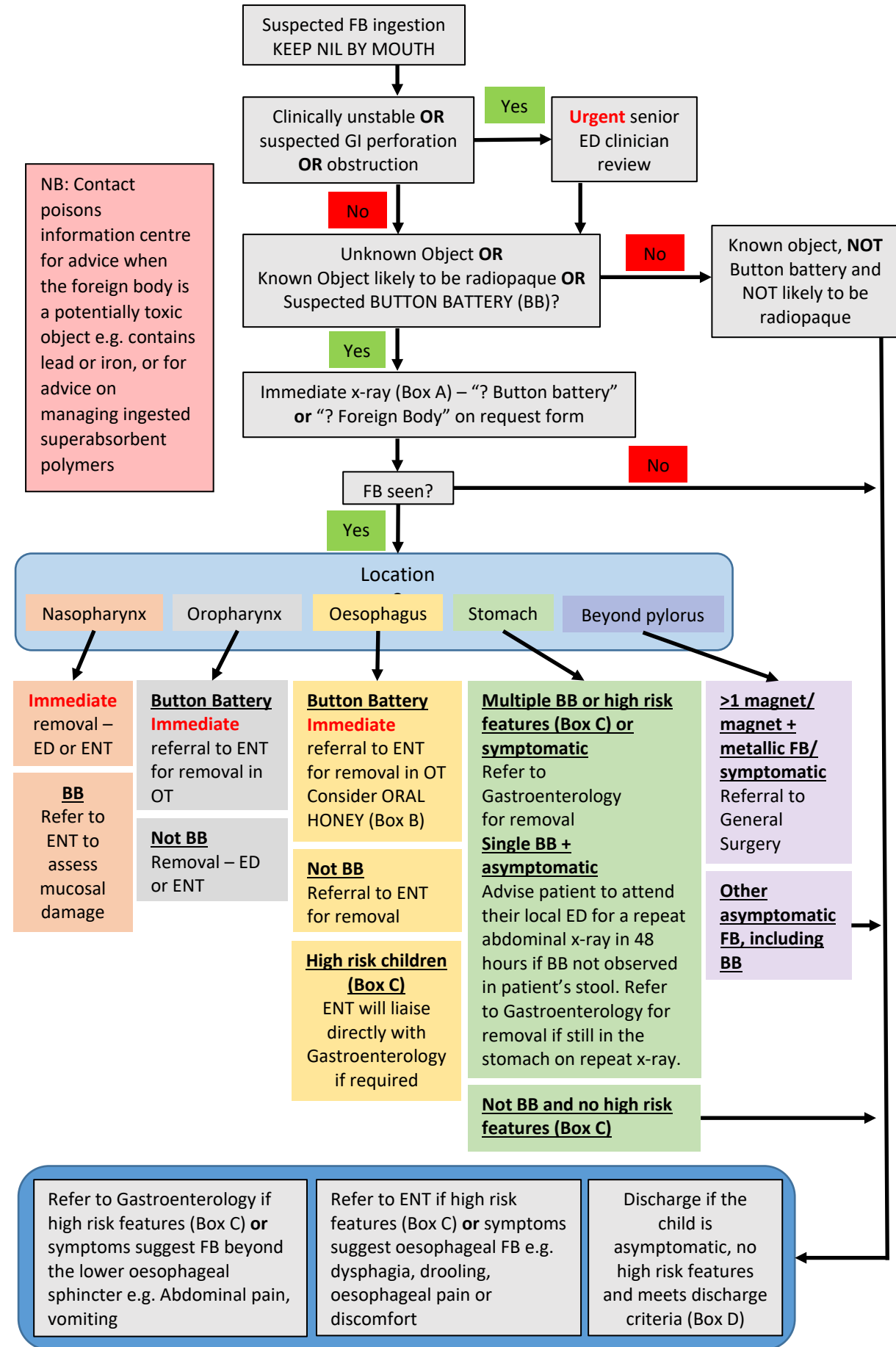
At CHW: Nursing staff at triage may use a metal detector to localise a low risk metallic foreign body and request the appropriate initial x-ray.

Box B: Oral Honey

Dose: 10 ml (2 teaspoons) PO every 10 minutes, max 6 doses (1 sachet of honey from the catering dept. is approx. 9.5ml.)

Suitable for: children >12 months; <12 hours since ingestion; child can swallow

Contraindications: child <12 months (risk of botulism); active GI bleeding; suspicion of mediastinitis, sepsis or clinical instability; time since ingestion of button battery >12 hours; honey is not immediately available/ obtaining honey would delay removal of button battery.



Box C: High-risk features

Magnet + metal object or >1 magnet

Large objects, >6cm long and/ or >2cm wide

Superabsorbent polymers e.g. grow-in-water toys

Toxic objects e.g. lead, iron tablets.

Multicomponent objects which may break apart and progress separately in the gastrointestinal tract (e.g. toys with lights, motors and batteries)

Sharp object in the oesophagus

Children with:

Pre-existing gastrointestinal tract abnormalities e.g. oesophageal atresia

Oesophageal strictures/ at risk of oesophageal strictures

Eosinophilic oesophagitis

Neuromuscular disease

Pre-existing oesophageal varices

An unsafe swallow

Box D: Discharge Criteria

Consider discharge from ED if the child:

Looks well

Is pain free

Has no respiratory distress

Is able to eat and drink

Has a reliable history, no **high-risk features** and FB is either not seen on x-ray or is seen in the stomach or beyond the pylorus.

Background

Children of all ages can ingest a foreign body (FB), however the highest incidence is between the ages of 6 months and 3 years, and in those with developmental or behavioural problems.

Older children with underlying psychiatric problems may intentionally ingest FBs and require a mental health review.

Gastrointestinal tract obstruction or impaction by a FB depends on the physical properties of the object, including its size, shape and composition.

It is rare for sharp objects to penetrate the mucosal wall of the GI tract, and these require no intervention if the child is otherwise well¹.

Assessment

High-risk features¹

- Button batteries
- Magnet + metal object or >1 magnet ingestion can cause serious and potentially life-threatening complications.
- Large objects, >6cm long and/ or >2cm wide, which may become entrapped at the pylorus.
- Superabsorbent polymers e.g. grow-in-water toys, may cause impaction.
- Toxic objects e.g. lead, iron tablets.
- Multicomponent objects which may break apart and progress separately in the gastrointestinal tract (e.g. toys with lights, motors and batteries) and may require removal.
- Sharp object in the oesophagus
- Children with:
 - Pre-existing gastrointestinal tract abnormalities e.g. oesophageal atresia
 - Oesophageal strictures/ at risk of oesophageal strictures
 - Eosinophilic oesophagitis
 - Neuromuscular disease
 - Pre-existing oesophageal varices
 - An unsafe swallow

Low risk ingestion: no high-risk features (see above).

History

- Clarify as much as possible what type of object was swallowed, the size, quantity and the timing of the ingestion.
- Identify potential for the ingestion of any high-risk objects (see above).
- Reported symptoms including: cough, stridor, drooling, pain on swallowing, reduced oral intake, abdominal pain/ discomfort, vomiting, melaena, GI bleeding, retrosternal/ chest pain, constipation, altered bowel habit.
- When the child last ate/ drank.

Examination

- ABC assessment
 - Signs of airway obstruction/ compromise – manage as acute airway obstruction.
 - Coughing, choking, respiratory distress – consider inhaled FB.
- Inspect oropharynx for excessive, drooling, abrasions, lacerations, FB.
- Tender abdomen on palpation, signs of peritonitis or obstruction.
- Examine the ears and nostrils for FB.

Investigations

X-ray^{2,3}

- Suspected button battery ingestion or ingestion of an unknown object require **immediate** x-rays
 - AP airway + chest + abdomen.
On the request form write, “suspected button battery ingestion”.
- Other foreign bodies that are likely to be radio-opaque
 - AP airway + chest +/- abdomen
On the request form write, “suspected foreign body ingestion”.

At CHW, use the “X-ray Foreign Body” order item when requesting an AP airway + chest + abdomen x-ray

Lateral airway and chest x-rays will be required for suspected **magnet ingestion** or if no BB/ FB is identified on the AP x-rays.

Most metallic objects will show up on x-ray with the exception of aluminium (variably detected).

Patients who have ingested a foreign body that is unlikely to be radio-opaque should have their management discussed with an ED senior clinician prior to imaging.

At CHW: Nursing staff at triage may use a metal detector to localise a low risk metallic foreign body e.g. coin or can ring-pull, and then request the appropriate initial x-ray.

Management

If signs of choking, respiratory distress, circulatory shock or altered level of consciousness are present, urgent review by a senior ED clinician is recommended

All children with a suspected foreign body ingestion should be nil by mouth (NBM), **except** for the administration of honey for button battery ingestion.

GI perforation or bowel obstruction

- Patients with suspected GI perforation or bowel obstruction secondary to foreign body ingestion should be referred to a surgeon urgently.

Button Batteries:

Nasal button battery

- **Immediate** removal. Refer to ENT for assessment of mucosal damage even if it is successfully removed in ED.

Oesophageal button battery^{2,4}

- **Immediate** referral to ENT for removal.
- Administer 10ml (2 teaspoons) of commercial honey PO every 10 minutes, max 6 doses IF:
 - The child is more than 12 months of age;
 - It is less than 12 hours since the time of ingestion;
 - The child can swallow
- 1 sachet of honey, provided by the hospital catering department, is roughly 9.5ml.
- **DO NOT** delay transfer to theatres in order to administer honey.
- Honey is contraindicated if:
 - Child <12months - due to the risk of botulism;
 - Active GI bleeding, suspicion of mediastinitis, sepsis or clinical instability;
 - Time since ingestion is >12hours;
 - Honey is not immediately available/ obtaining honey would delay removal of the button battery.

Complex cases e.g. children with oesophageal strictures/ structural abnormalities, often require a collaborative approach to management involving both ENT and Gastroenterology. For these cases, ENT will liaise directly with Gastroenterology and, if needed, both teams will be present in theatre for the removal of the button battery

Single gastric button battery

- Button batteries in the stomach can cause mucosal burns.
- If the patient is symptomatic, refer to Gastroenterology for removal.
- If a single button battery is visible in the stomach on the initial x-ray and the patient is asymptomatic, recommend that the patient attends their local ED for a repeat abdominal x-ray in 48 hours, if the button battery has not been observed in the patient's stool, to check for transit through the pylorus^{4,5}. If the button battery remains in the stomach on the repeat x-ray, refer the patient to Gastroenterology for removal. Document this advice in the discharge summary provided to the patient/ carer.

Button batteries are engraved with codes (e.g. CR2025); the first two numbers indicate the diameter in millimetres. The battery size can be helpful in determining the risk of impaction e.g. at the pylorus.

Multiple gastric button batteries

- Refer to gastroenterology for removal prior to transit through the pylorus.

Referral from another hospital

- **Button batteries** in the oesophagus require removal without delay. This should be supported at the referring hospital wherever appropriate facilities and expertise are available⁶.
- Patients will require transfer to CHW/ SCH to facilitate removal of the button battery/ foreign body when such a procedure is outside the scope of practice at the local hospital.
- For patients with an **oesophageal button battery** requiring transfer, advise the referring hospital to give honey whilst organising the transfer (see section on oesophageal button battery for guidance on indications, contraindications and dosing).

Magnet(s)

- Ingestion of multiple magnets or 1 magnet + another metal object requires early endoscopic removal. **Note:** Two magnets may give the appearance of one on x-ray¹.
- Patients who have >1 magnet or 1 magnet + a metallic object identified in the intestine following x-ray should be referred to surgeons for removal⁵.
- Rare-earth, high power magnets pose the highest risk when ingested⁷.

Other foreign bodies

Nasopharyngeal/ Oropharyngeal foreign bodies:

- Objects impacted in the nasopharynx/ oropharynx require **urgent** ENT evaluation if they are unable to be removed by ED staff.

Oesophageal foreign bodies

- FBs lodged in the oesophagus should be referred to ENT for removal.
- Patients with **high-risk features** should be referred to ENT.
- If FB is visible in distal oesophagus on the initial x-ray, repeat the x-ray immediately prior to taking the patient to theatre if it is more than 4 hours since the first x-ray to check for transit through the pylorus⁵.

Complex cases e.g. children with oesophageal strictures/ structural abnormalities, often require a collaborative approach to management involving both ENT and Gastroenterology. For these cases, ENT will liaise directly with Gastroenterology and, if needed, both teams will be present in theatre for the removal of the button battery.

Impacted food bolus

- Refer to ENT for endoscopic removal. If required, ENT will liaise directly with Gastroenterology.
- It is difficult to remove particulate material e.g. food bolus with fibre optic instruments due to the small size of the grasping forceps, narrow forceps channels and often narrow diameter of the oesophagus, limiting the use of baskets. ENT use a rigid endoscope and can deploy larger graspers and do not need to remove the scope every time they grasp a fragment.
- The use of Glucagon and/ or carbonated drinks to dislodge the food bolus are controversial management options in children⁵. Both are associated with an increased risk of vomiting.

Gastric foreign bodies

- Patients who are symptomatic or have **high-risk features** should be referred to gastroenterology
- If FB is visible in stomach on the initial x-ray, repeat the x-ray immediately prior to taking the patient to theatre if it is more than 4 hours since the first x-ray to check for transit through the pylorus⁵.
- Patients who have no high-risk features and who are asymptomatic can be discharged if they meet all other discharge criteria¹.

Intestinal foreign bodies

- Most foreign bodies (except magnets) do not require intervention or removal once they have transited through the pylorus.

Ingestion of toxic foreign bodies

- Contact poisons information centre for advice when the foreign body is a potentially toxic object e.g. contains lead or iron.

Ingestion of superabsorbent polymers

- Water expandable polymers are used to manufacture “grow-in-water” toys and decorative beads. Depending on their size and absorbency, there is a risk they will become impacted as they transit the GI tract following ingestion.
- Contact the NSW Poisons Information Centre for advice on the management of ingested superabsorbent polymers.

Nursing Care⁸

Patients need to be monitored for signs of complications arising from foreign body ingestion. In addition to vital signs (RR, HR, SaO₂, BP, GCS, pain score), the following signs and symptoms should be monitored:

Airway

- Persistent or atypical croup/cough/stridor
- Regurgitation or drooling
- Choking and/or gagging

Breathing

- Unexplained wheeze and/ or respiratory distress
- Shortness of breath

Circulation

- Haematemesis
- Melaena
- GI bleeding
- Epistaxis

Monitor for:

- Abdominal pain
- Persistent vomiting (observe for fresh blood or clots)
- Fever
- Young children may point to the neck/ throat as a site of pain
- Chest pain
- Unexplained food refusal/ difficulty swallowing
- Constipation or altered bowel habit.

The presence of any of these symptoms/ signs must be escalated urgently and the treating doctor informed.

Discharge

Consider discharge from ED if the child¹:

- Looks well
- Is pain free
- Has no respiratory distress
- Is able to eat and drink
- Has a reliable history, no **high-risk features** and FB is either not seen on x-ray or is seen in the stomach or beyond.

Parents/carers should be advised to seek medical advice or return to ED if any of the following symptoms occur¹:

- Breathing problems
- Pain on swallowing
- Abdominal pain
- Fever
- Vomiting
- Unable to tolerate food or drink
- Malaena or haematemesis
- New onset constipation or altered bowel habit

Follow-up

Patients should be reviewed by their GP and have a repeat abdominal x-ray if a **gastric** foreign body does not pass in the stool within 1 month following the ingestion⁵.

If the foreign body is in the stomach on repeat x-ray, the patient should be referred to Gastroenterology for removal.

References

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