

Provincial Protocol Button Battery Ingestion-Pediatrics

Focus

The purpose of this provincial guideline is to provide direction in the care and management of the pediatric patient who presents to any Emergency Department (ED) within BC with either a suspected or confirmed button battery ingestion.

This guideline has been adapted from the Alberta Health Services Emergency Network Provincial Management Pathway [Button Battery Ingestion in Children](#).

Need to Know

- If at any time a child presents to the Urgent and Primary Care Centre, the child should be redirected to the nearest ED for further assessment.
- The ingestion of a button battery can be devastating and can lead to esophageal injury within two hours post ingestion.
- Clinical presentation can vary according to the size and location of the battery, time of ingestion, age of patient and any co-morbidities.
- Lithium batteries and those 20mm or greater pose the greatest risk in children less than 6 years of age¹.
- All patients who present with a button battery ingestion should be considered a surgical emergency.

Practice Level

Compliance with the provincial guideline is recommended from the following health care professions within their relative scope of practice and job descriptions:

- ED Physician (trainees)
- ED RN, Employed Student Nurse, LPN (awareness only)
- General Surgeon (trainees)
- Gastroenterologists (trainees)
- Ear Nose Throat Specialists (trainees)
- Pediatricians (trainees)
- Nurse Practitioner
- Acute Care Staff

Practice Protocol

- When possible, obtain an accurate patient weight in kilograms/grams or estimated via the Broselow[®] tape.
- Honey should be administered soon as possible and ideally before the patient reaches the hospital.



¹ <https://www.cmaj.ca/content/193/38/E1498>

- The ED staff should immediately inform the Most Responsible Practitioner of any potential button battery ingestion that presents to the ED.
- Urgent imaging is required as soon as possible if not readily available PTN should be contacted to arrange transport and the child should be transferred to the nearest facility where imaging is available.
- Consider a consult with [BC Drug and Poison Information Centre](#) (BC DPIC) when possible.
- The ED physician or NP should consult Pediatric Gastrointestinal or Ear Nose or Throat Specialists **as soon as possible** via the Patient Transfer Network (PTN) to facilitate transfer to the nearest pediatric referral centre. If transfer of care to a pediatric specialist is not possible, then consultation with an adult General Surgeon, Gastroenterologist or ENT is appropriate.

Assessment and Treatment

- Confirmed or suspected esophageal button battery ingestions require urgent removal and should be triaged according to the Canadian Triage and Acuity Scale (CTAS) as a Level 3 or can be assessed by a MRP within 30 min of arrival. If the time of ingestion is unknown or if at any time the child has become hemodynamically unstable, or is showing signs of decline the CTAS level should be escalated as appropriate.
- Health care professionals should do the following:
 - Complete patient assessment including a provocation, quality, radiation, severity and time, assessment of pain and associated symptoms;
 - Obtain a full set of vital signs (BP, HR, RR, Temp, O2 Sat, Weight) including a PEWS score;
 - As soon as possible obtain the following diagnostic imaging
 - Posteroanterior (PA) or anteroposterio (AP) and lateral chest X-Ray
 - AP Supine radiograph of abdomen; and
 - AP and lateral neck radiograph

****If access to an urgent X-ray is not available within one hour do not delay transfer of the pediatric patient.***

- For stable witnessed or suspected/unwitnessed ingestion:
 - If ingestion is **less than** 12 hours:
 - Give 10 mls of honey every 10 minutes (up to 6 doses) or
 - Give 1 gram of sucralfate (5mls of 200mg/ml) every 10 minutes (up to 3 doses)
 - Point of care physicians or NP should be aware to look for evidence of a button battery including a "halo" sign on PA view or step-off on a lateral x-ray using magnified views (See appendix C)
 - If ingestion of the button battery timeframe is unknown:
 - Consult Pediatrics specialty for direction, GI, ENT, General Surgery and Anesthesia if appropriate. It maybe possible to manage care in local health authority.
 - Ensure nothing by mouth (NPO) or keep the child fasting if possible (other than as stated above);
 - Initiate one large bore intravenous (IV) saline lock 22G or 20G or larger; and
 - Consider transfer to higher level of care.
- For unstable or unwitnessed ingestions assess for the following conditions:

- Active bleeding; signs of hematemesis, or melena;
- Possible mediastinitis; and
- [Signs of sepsis](#) (temp greater than 38.0C or less than 36.0C , elevated WBC, abnormal HR for age, abnormal RR for age).
 - If any of the above conditions occur prepare for immediate transfer to higher level of care (HLC);
 - Call PTN; depending upon age of the child it maybe possible to manage care within local health authority;
 - Consult Pediatric GI, ENT or General Surgery, Anesthesia; and
 - Prepare patient for endoscopic removal in the OR with ENT, General and Cardiothoracic surgery (if possible).
- Post removal management:
 - Acetic Acid Irrigation - *done in the OR or post op not in the ED*
 - If no obvious perforation, irrigation of injured esophageal tissue with 50-150 ml of sterile 0.25% acetic acid to neutralize residual alkali.
 - Irrigate with aliquots, suctioning the excess from the stomach. Product comes sterile, in 250ml bottles and required SAP approval from Health Canada.

Documentation

Document in the patient's designated health record used in your health authority or the electronic equivalent.

All documentation should include the following:

- if known, the size and number of batteries ingested;
- time of Implementation of treatment, including date and time of physician/NP notification, time to call PTN and estimated/confirmed transfer time;
- initial assessment and reassessments and interventions; and
- The response to treatment.

Patient and Family Teaching

- Injuries from button batteries can still occur despite removal of the button batteries and therefore caregivers should monitor for symptoms including GI bleeding and vomiting.

Definitions

Pediatric patient in emergency care departments (EDs) and health authority-funded health centres: children up to their 17th birthday (16 years + 364 days)

Button battery means small batteries that are usually used to power small electronic devices or watches. They get their name because they are round and resemble buttons or coins. A button cell is a small single cell battery shaped as a squat cylinder typically 5 to 25 mm (0.197 to 0.984 in) in diameter and 1 to 6 mm (0.039 to 0.236 in) high — resembling a button. A metal can forms the bottom body and positive terminal of the cell.



Health care professional means an individual who is a member of a regulated health discipline, as defined by the Health Professions Act, and who practices within scope or role.

Most Responsible Practitioner can refer to either an Emergency Physician or Nurse Practitioner

Order means a direction given by a regulated health care professional to carry out specific activity as part of the diagnostic and/or therapeutic care and treatment to the benefit of a patient. An order may be written (including handwritten and or electronic), verbal, by telephone, or facsimile.

References

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- [BC Children's Ingested Foreign Bodies: Radiolucent Object](#)

Provincial Development Group and Acknowledgments

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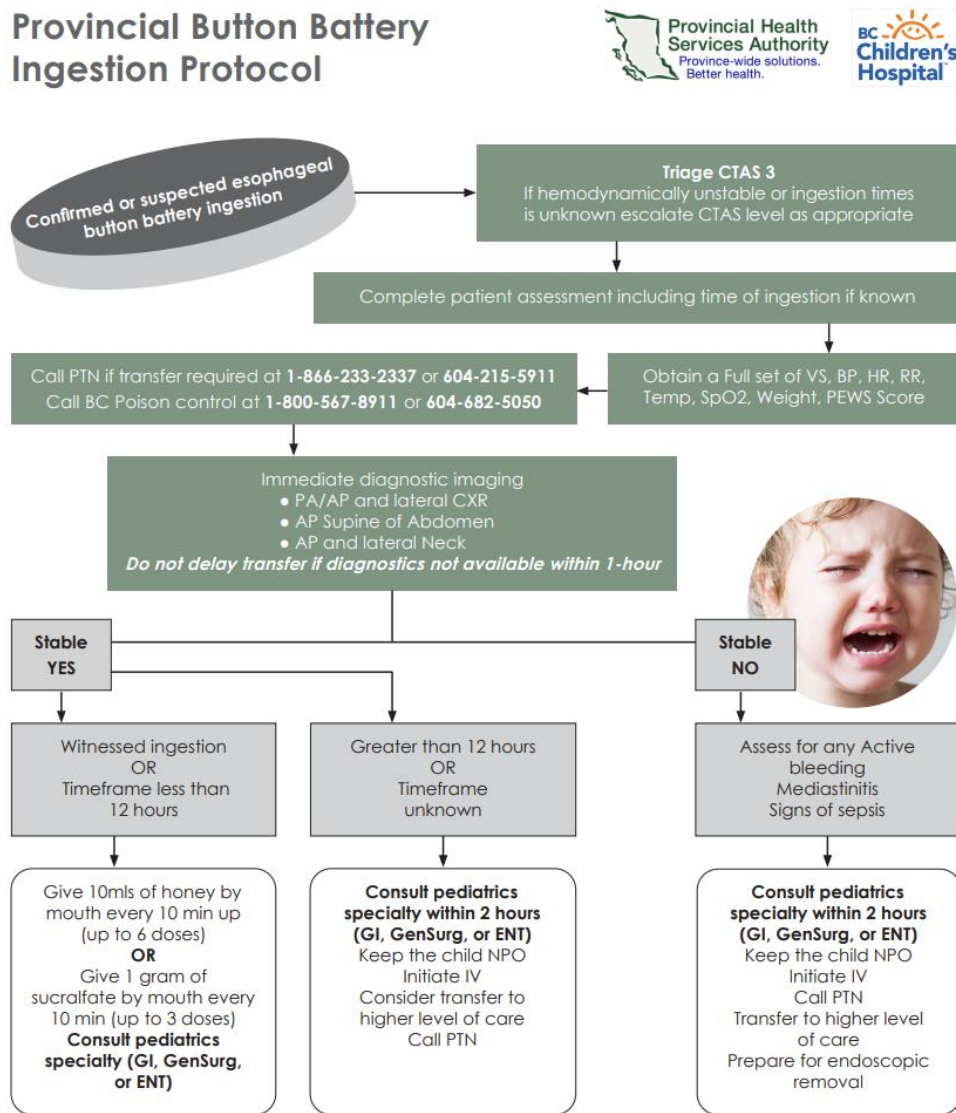
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Appendices

Appendix A: Provincial Button Battery Ingestion Protocol



Adapted from Alberta Health Services (2021) Button Battery Ingestion in Children

Appendix B: Management of ingested foreign bodies in children: A Clinical Report of the NASPGHAN Endoscopy Committee

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Mitigating Risks of Swallowed Button Batteries

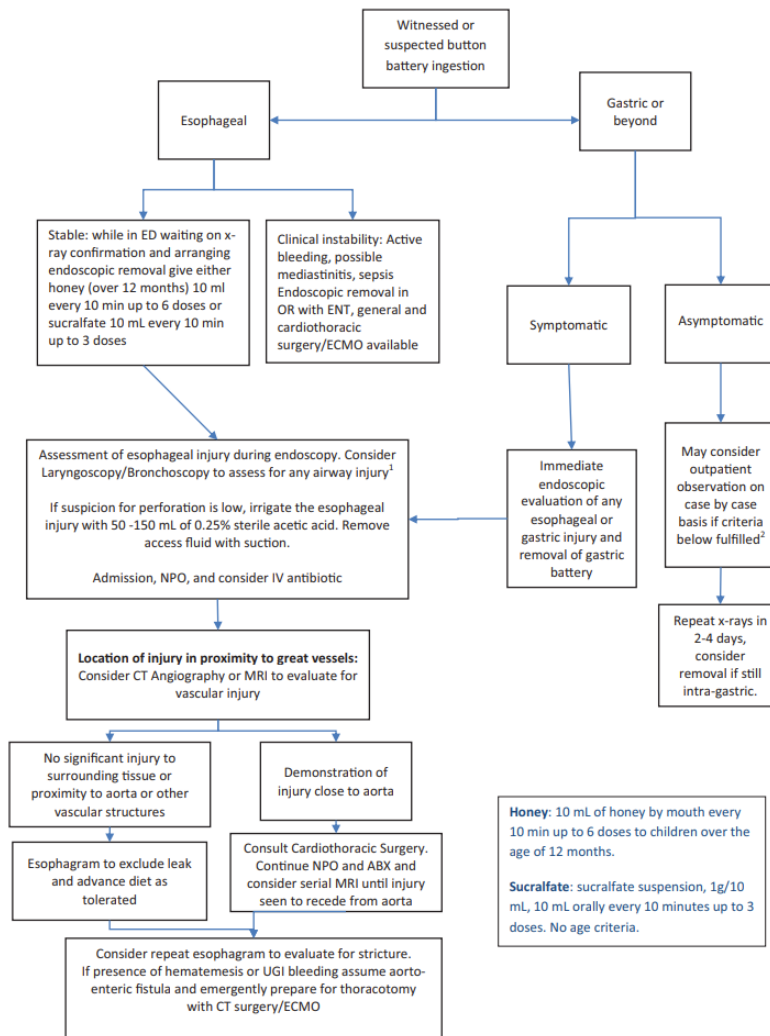
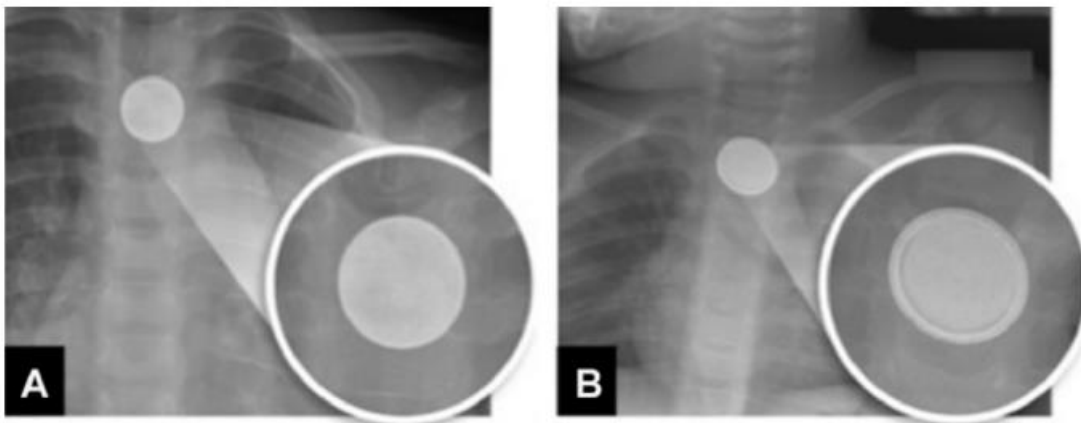


FIGURE 3. Management algorithm for ingestion of button batteries in children. Adapted from Kramer et al (18). ¹Consider airway evaluation if there is pre-operative concern for airway injury (TEF), especially when negative pole of battery is facing anteriorly or if any airway related symptoms are present. ²Criteria for gastric (and beyond) batteries for observation only: no history of prior esophageal disease, no magnet co-ingestion, and reliable follow-up. May require endoscopic evaluation on a case-by-case basis taking into consideration the timing of the ingestion if it was witnessed; and considering higher risk of injury in patients ≤ 5 years of age and battery size ≥ 20 mm.

Appendix C: Halo Sign indicative of BB



A= Coin; B= Button battery with characteristic "halo sign"

Jatana KR et al 2013.¹⁰

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Owner:	Provincial Pediatric Emergency Department Leads			
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