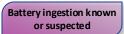
Button Battery Ingestion Management





X-Ray Immediately to locate battery

Batteries lodged in esophagus may cause serious burns in 2 hours. Batteries in the esophagus may be asymptomatic initially

Do not wait for symptoms,

Give Honey

- 10mL every 10 mins if child >= 12 months, lithium coin
- >= 12 months, lithium coin cell possibly ingested, and ingestion within prior 12 hours. (See guideline). Do not delay going to ER to give honey. Otherwise, NPO until esophageal position

Take up to 5 minutes to determine imprint code (or diameter) of companion or replacement battery.

Consult National Battery Ingestion Hotline at 800-498-8666 for assistance with battery identification and treat ment

Is there concern for Nasal or Ear Foreign Body?

Consider imaging (Skull XR Adequate) for nasal foreign bodies that may be button

What to look for:

- Black Discharge from Nose
- Facial Swelling with isolated pain and/ or fever
- E pi sta x is
- Purulent nasal discharge
- Unable to extract foreign body

Battery in

Esophagus?

No

(Battery in Stomach or Beyond)

Was a magnet

co-ingested?

No

Are related signs

or symptoms

present?

No

>= 15mm cell ingested by child <6 years

No

Yes

Yes

Unsure if there is a foreign body (or unclear history, age of child makes it difficult to obtain a clear history

"Coin" Ingested

Carefully check AP x-ray for battery's double-rim or halo-effect and lateral ew for step off. Use magnification

Suspect a battery ingestion in these situations

Symptomatic patient, no ingestion history Consider battery ingestion if:

- Airway obstruction or wheezing
- Drooling
- Vomiting
- Chest Discomfort
- Difficulty swallowing, decreased appetite, refusal to eat
- Coughing, choking, or gagging with eating or drinking
 - Developmental Delay
- Patient not responding to standard therapies for URI or without classic infectious symptoms

Immediately remove batteries lodged in the esophagus

- Consider sucralfate suspension or honey if <= 12h post ingestion (See Guideline)
- Do not delay removal if patient has eaten.
- Prefer endoscopic removal (instead of retrieval by balloon catheter or magnet affixed to tube) for direct visualization of tissue injury. Inspect mucosa for extent, depth, and location damage. Not position of battery and direction negative pole faces.
- If no endoscopic evidence of perforation, irrigate injured areas with 50-150 mL 0.25% sterile acetic acid to neutralize residual al kali (See Gui deline)

Do not wait for symptoms Remove endoscopically if possible Surgically if not

If battery in stomach, remove endoscopically from symptomatic patient, even if symptoms appear to be minor.

- If battery beyond reach of endoscope, surgical removal reserved for unusual patients with: Occult or visible bleeding Persistent or severe abdominal pain
- Vomiting Signs of acute abdomen and/or fever

Profoundly decreased appetite Unless symptoms unrelated to battery

After removal, if mucosal injury was present, observe for and anticipate delayed complications:

- Trache oes ophageal Fistula Esophageal Perforation
- Mediastinitis
- Vocal Cord Paralysis
- Tracheal Stenosis or Tracheomalacia
- Aspiration Pneumonia
- Empyema
- Lung Abscesses
- Pneum othorax
- **Spondylodiscitis**
 - Exsanguination from perforation into a large vessel.

Anticipate specific complications based on injury

location, battery position and orientation (negative

Determine length of observation, duration of esophageal rest, need for serial imaging or

- endoscopy/bronchoscopy based on severity and location of injury. Monitor patients at risk of perforation into vessels
- as inpatients with serial imaging and stool guaiacs. Intervene early to prevent fatality.
- Monitor for respiratory symptom's, especially those associated with swallowing, to diagnose TE fistulas
- Expect perforations and fistulas to be delayed (98% diagnosed by 48 days after battery removal) and esophageal strictures delayed weeks to months.

Manage patient at home

- Regular diet.
- Encourage activity.
 Confirm battery passage by inspecting stools.
- Consider x-ray to confirm passage if passage not observed in 10-14 days.

endoscopically (Even if asymptomatic)

X-ray 4 days post ingestion (Sooner if symptoms develop)

If still in stomach, remove

If symptoms Develop later, promptly

re-evaluate.

Notes:

- 1: NPO except for honey or sucralfate suspension.
- 2: X-ray abdomen, esophagus, and neck. Batteries a bove the range of the x-ray have been missed. If battery in the esophagus, obtain AP and lateral to determine orientation of negative pole. If ingestion suspected and no battery visualized on x-rays, check ears and nose. 3: If battery diameter is unknown, estimate it from the x-ray, factoring out magnification (which overestimated diameter).

Tips, Pitfalls, & Caveats

- 3 "N's": Negative-Narrow-Necrotic.
 - The negative battery pole, identified as the narrowest side on lateral
 - x-ray, causes the most severe, necrotic injury.

 The negative battery pole is the side opposite the "+" and without the
- 20mm lithium coin cell is most frequently involved in esophage alinjuries; smaller cells lodge less frequently, but also cause serious injury or death.
- Definitive determination of the battery diameter prior to passage is unlikely in at least 40% of ingestions.
- Assume hearing aid batteries are <12mm.
- Manage ingestion of a hearing aid containing a battery as an ingestion of a small (<- 12mm) battery.
- Do not induce vomiting or give cathartics. Both are ineffective.
- Assays of blood or urine for mercury or other battery ingredients are unnecessary.

