South West Paediatric Major Trauma Network
Button Battery Ingestion:
Guideline for Initial Management and Transfer

Authors:	N. Jain, P. Davis, J McNally, R Garrett-Cox
Approved by:	South West Paediatric Trauma Network
Date Approved:	
Date for Review:	

RECOGNITION of potential Button Battery ingestion in any child < 16 yrs:

- **Airway obstruction/wheezing**
- **Drooling**
- **Vomiting**
- **Chest discomfort**
- **Refusal to eat, difficulty swallowing, anorexia**
- **Haematemesis, epigastric pain**

OBJECTIVES:

- **Early diagnosis and management to prevent further oesophageal injury e.g. trachea-oesophageal fistula, aorto-oesphageal fistula (See flow chart overleaf, including imaging)**

- **HIGH RISK: <5 years of age, multiple batteries, or battery ≥ 20mm diameter in oesophagus = TIME CRITICAL**

⇒ For emergency endoscopy in theatre LOCALLY; aim to remove batteries WITHIN 2 HOURS of ingestion

A Maintain airway
Intubate for emergency endoscopy (see RSI) +/- transfer

B High flow oxygen 15L/min via face mask as needed pre-intubation

C **DO NOT DELAY EMERGENCY ENDOSCOPY AWAITING OPTIMAL CONDITIONS**

- ***Access:*** At least one large bore IV access

IF ANY BLEEDING (Usually late presentation):
MONITOR ACTIVELY & RESUSCITATE
Give tranexamic acid:

- Loading dose: 15mg/kg (max 1g) as bolus
- Maintenance infusion 2mg/kg over 8 hours

ACTIVATE MAJOR HAEMORRHAGE PROTOCOL
***Send blood samples*:**

- Crossmatch 4 units of Packed Red Cells (PRC) (x2 samples)
- FBC, Coagulation (PT/APTT/Fibrinogen)
- U+Es, LFTs, Calcium, phosphate
- Blood gas incl. ionised Calcium

Give blood products via blood warmer:

- Group O negative (or O Positive for boys) for immediate use
- 10ml/kg bolus of PRC
- 1:1 ratio of PRC: Fresh Frozen Plasma (FFP)
- 5ml/kg aliquots of each to total 30ml/kg

(*FFP takes 30mins to defrost, PRC alone may be used initially*)
Insert Sengstaken tube /balloon catheter at level of injury

D Assess & document GCS/pupils/neurology prior to RSI

E Maintain normothermia (36-37°C)

COMMUNICATION

On recognition:
1) Activate local EMERGENCY ENDOSCOPY protocol plus contact appropriate surgical teams (General/ ENT)
2) Contact **Paediatric Trauma Team Leader (Consultant ED PTMC) Call: 0300 0300 789, choose Option 2**
PTTL must conference-call:
- On-call Paediatric Surgery Consultant
PTTL may conference-call WATCh transport service for advice on transfer (see over page)

RAPID SEQUENCE INDUCTION

Avoid gas induction
Use local RSI checklist

Induction agents:	Ketamine 1-2mg/kg +/- Fentanyl 1-3 micrograms/kg
Muscle relaxant:	Rocuronium 1-2 mg/kg

Maintenance: Morphine, midazolam and rocuronium infusions.

TRANSFER

Senior clinician and assistant (nurse/ODP) appropriately trained to safely transfer children
Use transfer checklist / trolley / bags

Call early for transport either by road or air
(BRI helipad open 9am - 7pm)
Contact PTTL (0300 0300 789) when 15 minutes away

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A) Witnessed or suspected Button Battery ingestion:

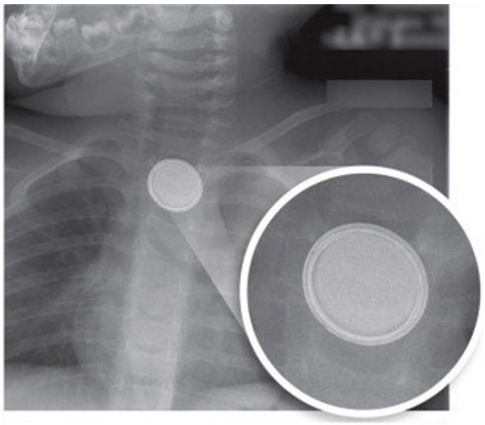
Suspect Button Battery ingestion in a child with these symptoms and no history of viral illness :

- Airway obstruction/wheezing
- Drooling
- Vomiting
- Chest discomfort
- Refusal to eat, difficulty swallowing, anorexia
- Haematemesis, epigastric pain

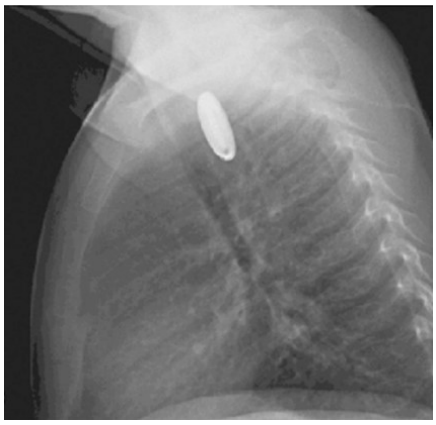
B) Metal Detector helps to identify item (sensitivity 100%, specificity 91%) and location (73%)

C) Imaging to confirm location CXR + AXR (Nasopharynx to anus)

AP view - double halo (Image 1)



LATERAL view "step off" (Image 2)



Oesophageal

Emergency endoscopic removal by Local TRAUMA UNIT team

Plan to wake and extubate child at the end of the procedure

Any bleeding:

Call Paediatric Surgeons at PMTC as emergency (use PTTL number 0300 0300 789, Option 2)

Try to achieve stability prior to transfer (see over page)

a) TRAUMA UNIT TEAM TIME-CRITICAL TRANSFER TO PMTC

b) Keep nil by mouth

c) Transfer with appropriate fluids/blood products

Gastric/beyond

"GASTRIC" HIGH RISK

< 5 years AND BB ≥20mm

URGENT TRANSFER TO PMTC within 12 hrs (by WATCh if available) for endoscopy within 24hrs

"GASTRIC" LOW RISK

> 5 years AND/OR BB <20mm

Outpatient observation

If failure to pass in stool:

BB ≥20mm Rpt X-ray 48Hr

BB <20mm Rpt X-ray 10-14 days

If child in nappies, note risk of contact burn when BB passed in stool

If persistent GI symptoms or not passed stomach on X-ray:

URGENT REFFERAL PMTC PAEDS SURGERY for urgent endoscopic removal within 24 hrs