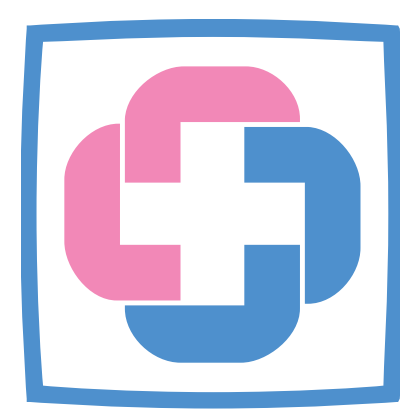




# Button Battery Foreign Bodies in Children – the KKH experience and a proposed Fast-track to reduce morbidity

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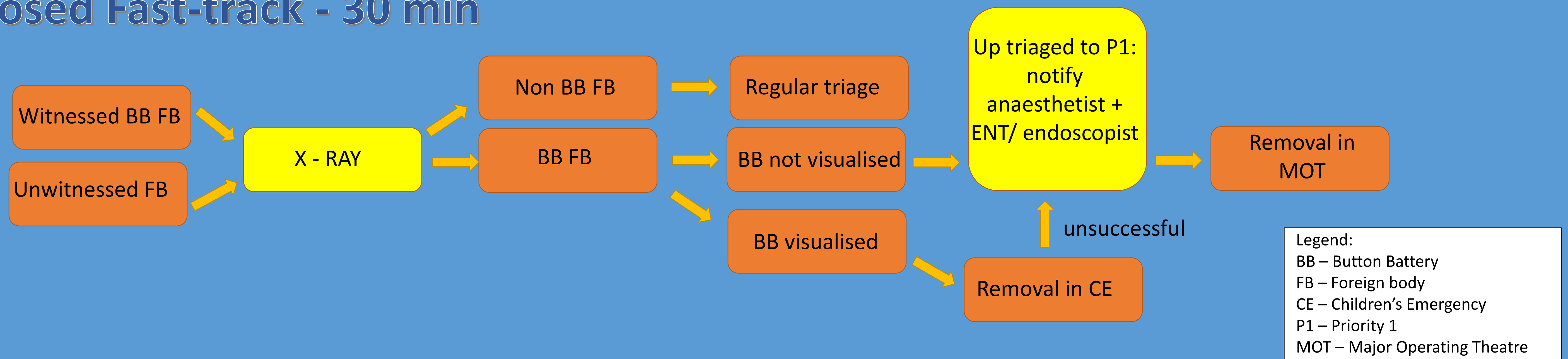
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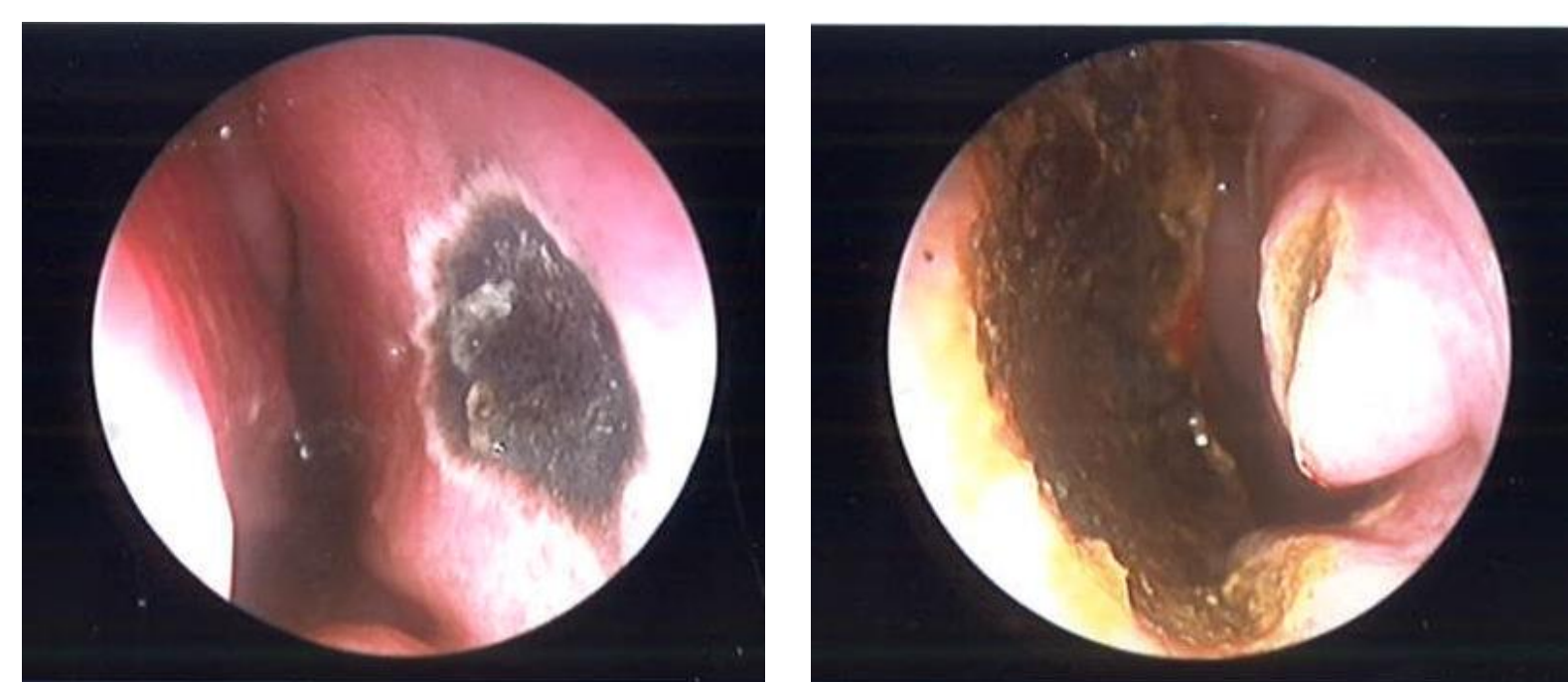
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## Proposed Fast-track - 30 min



## Introduction

In the U.S. the number of children with serious injury or death from BB foreign bodies more than quadrupled between 2006 and 2010 compared to previous five years. The use of button batteries (BB) has risen over time due to the ubiquity of small hand-held electronic devices and toys. If not stored properly, these shiny small objects inadvertently end up as foreign bodies in the ears, nose and upper aerodigestive tract of curious children, with children under the age of 4 being most at risk. Recent data suggests that current management to minimize complications from BB foreign bodies may be inadequate. The rapid diagnosis and removal of BB Foreign bodies in children is crucial in improving the clinical outcome of these patients.



Right nasal cavity: Corrosion through the nasal septum to affect right side of the septum  
Left nasal cavity: Original site of button battery foreign body with severe corrosion of left side of the nasal septum and left inferior turbinate

Right nasal cavity Left nasal cavity

## Objectives

- To evaluate the management of BB foreign body of the ears, nose and upper aerodigestive tract of patients presenting to KKWCH and highlight the destructive nature of BB foreign bodies and its associated sequelae.
- To improve time taken from diagnosis of BB foreign body to time of removal in major operating theatre via a fast-track pathway.

## Methodology

Retrospective review of all patients that were brought to the operating theatre for removal of BB foreign bodies from 2007 to 2016 (9 years) with review of clinical management.

A fast-track pathway was proposed and agreed upon by the departments of ENT, Anaesthesia, Paediatric Surgery and Emergency medicine.

## Results

There were 346 cases of foreign body removal from the ear, nose or upper aerodigestive in KKWCH Operating theatre from 2007-2016 (9 years) of which there were 68 cases involving BB foreign bodies.

Of the 68 patients with BB foreign bodies, 62 patients had nasal BB, 5 patients had upper aerodigestive tract BB (esophageal or stomach) and 1 patient had a BB in the ear. The ratio of males to females was 1.5: 1. The youngest patient was 9 months old and the oldest was 8 years 10 months old. 20 of the 68 patients (30%) underwent at least 1 subsequent surgery to address injuries related to the initial insult. There was no observed increasing trend of BB foreign bodies year on year (Fig 1).

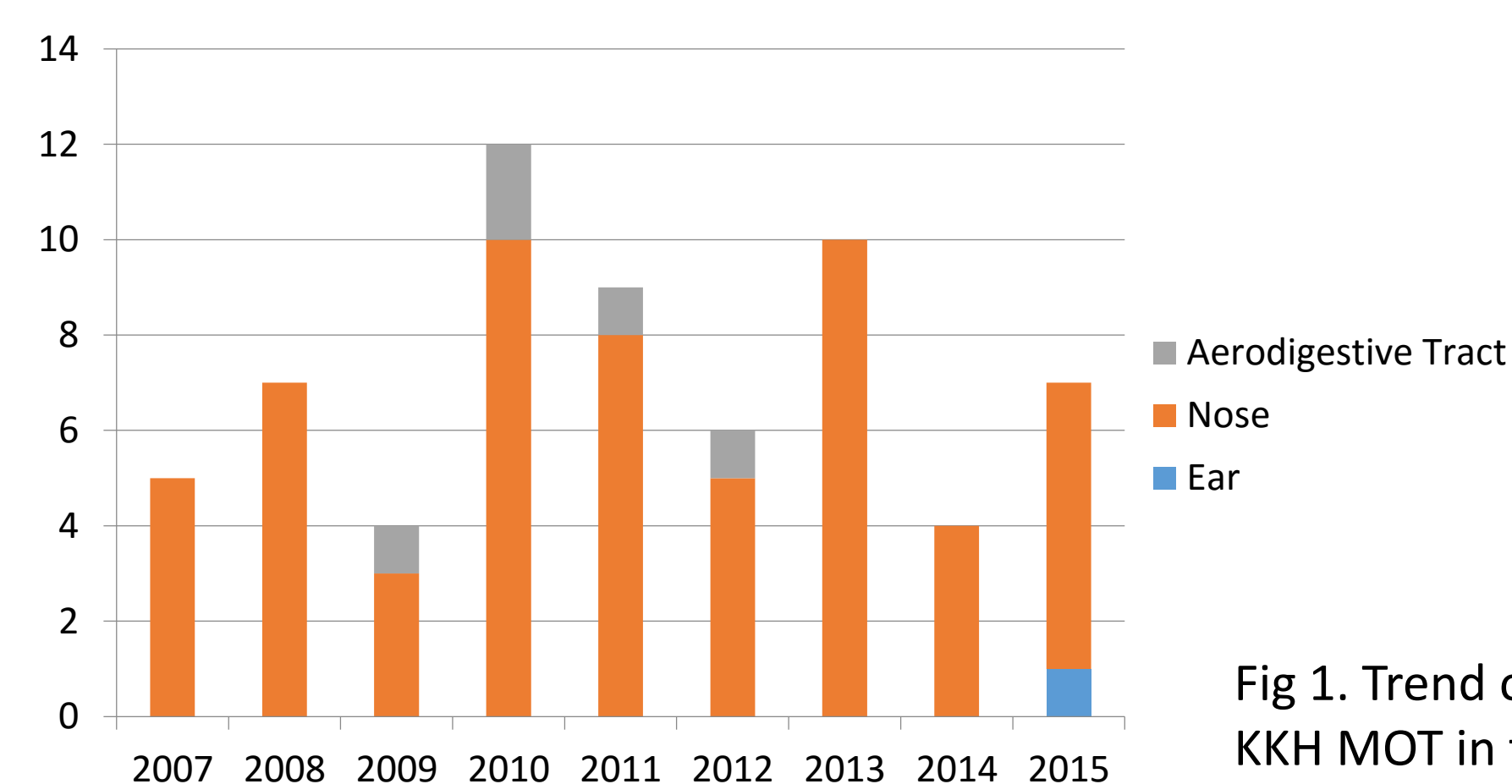


Fig 1. Trend of BB Foreign Bodies removed in KKH MOT in the past 9 years

## Discussion

It is heartening to know that there isn't an increasing trend in BB foreign bodies over the years despite the increased use of these objects. The high percentage of repeat surgeries attests to the severity of the injuries caused by these small objects, which cause corrosion via electrolysis when the battery comes into contact with wet mucous membranes.

We propose a fast-track for patients with BB foreign bodies that present to the Children's emergency (CE). At the point of triage, all patients with witnessed BB foreign body and unwitnessed foreign bodies should have an X-ray without delay. Once a BB foreign body is confirmed, a physician in CE should attempt removal immediately if the BB is visualised. If it is not visualised or if removal is unsuccessful, the patient should be up triaged to Priority 1 (P1) and the anaesthetist and ENT surgeon/ endoscopist should be informed to take the patient to operating theatre without delay. We aim for this fast-track to take less than 30 min.



Button battery in esophagus Same button battery after removal Button battery differentiated from a coin by a step seen on lateral view

## Conclusion

With increased collaboration between Emergency Medicine physicians, anaesthetists, ENT surgeons and Paediatric Surgeons through a fast-track pathway, we can potentially improve the clinical outcome of patients with accidental BB foreign body presenting to the Children's Emergency in KKH.

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