

Outcomes of pediatric battery ingestion: a 10 year analysis

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Introduction

- Batteries are becoming a more frequent cause foreign body (FB) ingestion due to children's increasing use of electric toys¹
- Batteries with greater than 20mm in diameter can be impacted in esophagus¹
- Compared to other FBs, there is a unique risk of exothermic reaction from batteries active ingredients that cause mucosal burn injuries¹
- Rare complications include esophageal or aortic perforation, tracheo-esophageal fistula, bilateral vocal cord paralysis, and hemorrhagic shock¹

Methods

- The National Electronic Injury Surveillance System (NEISS) was queried for ingestion injuries involving batteries in 2012 through 2021
- National estimates from the NEISS database were also included
- Patients 0-18 years old were included
- Demographic information included: age, race, and sex of the patient
- Kruskal-Wallis tests were used when indicated

Methods

- Location where the injury took place and disposition of the patient following emergency department (ED) treatment were also recorded

Results

- A total of 2,799 battery ingestions were identified
- The mean age at time of ingestion was 3.5 +/-3.3 years
- National estimate of 67,768 injuries over 10 years
- No fatalities were reported

	N (%)
Sex	
Male	1,659 (59.3)
Female	1,140 (40.7)
Race	
Caucasian	1,453 (51.9)
African American	303 (10.8)
Hispanic	131 (4.7)
Location	
Home	1,653 (59.1)
In Public	52 (1.9)
School	27 (1.0)

Table 1. Demographics of patient and location of ingestion injury

Results

- Majority of injuries occurred in males (59%) and at home (59%) (Table 1)
- 13% of ingestions resulted in the patient being admitted for further treatment (Figure 1)
- The frequency of injuries per year significantly varied, with the highest number in 2020 (N=382) and the lowest in 2015 (N=207) (p<.001)

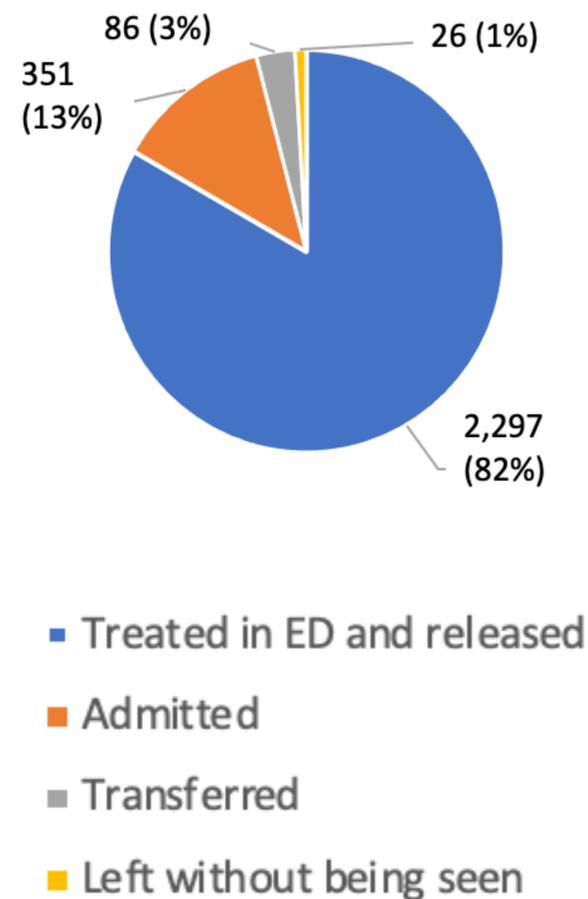


Figure 1. Disposition of battery ingestion injuries following ED treatment, N (%)

Discussion

- Serious complications of battery ingestion can occur within 2 hours of ingestion²
- Russel *et al.* found that the time from arrival in ED to battery removal was 183 minutes³
- With the increasing prevalence of battery ingestion found in the current study, it is important to implement prompt evaluation and treatment in the ED to prevent serious complications

Conclusion

- Frequency of battery ingestion injury is increasing in recent years
- 880 children per year in the U.S. are estimated to have battery ingestion injuries that require in-hospital treatment
- Public health measures should be taken so parents are aware of this health hazard

References

- Marom T, Goldfarb A, Russo E, Roth Y. Battery ingestion in children. *Int J Pediatr Otorhinolaryngol.* 2010;74(8):849-854. doi:10.1016/j.ijporl.2010.05.019
- Semple T, Calder AD, Ramaswamy M, McHugh K. Button battery ingestion in children-a potentially catastrophic event of which all radiologists must be aware. *Br J Radiol.* 2018;91(1081):20160781. doi:10.1259/bjr.20160781
- Russell RT, Griffin RL, Weinstein E, Billmire DF. Esophageal button battery ingestions: decreasing time to operative intervention by level I trauma activation. *J Pediatr Surg.* 2014;49(9):1360-1362. doi:10.1016/j.jpedsurg.2014.01.050