

Battery Ingestions: An Emerging Hazard

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Recent evidence suggest that severe and fatal button battery ingestions are increasing in the United States, and that parents are largely unaware the rapid increase in products containing these batteries, and the hazard posed.

In the period between 1985 and 2009, there was an almost 7-fold increase in the number of button battery ingestions in children, and a corresponding increase in major or fatal outcomes. Outcomes were significantly worse for large-diameter (≥ 20 mm, about the size of a penny) lithium cells, and children who were younger than 4 years.

The 20-mm lithium cell was implicated in most severe outcomes. Severe burns occurred within just 2 to 2 ½ hours, and most fatal (92%) or major outcome (56%) were not witnessed. Even when witnessed, injuries still occur after battery removal, with unanticipated and delayed esophageal perforations, tracheoesophageal fistulas, fistulization into major blood vessels, and massive hemorrhage.

Yes, these are all as bad as they sound.

In 1992, a study of almost 2400 battery ingestions in childhood found no deaths and only two major outcomes. Batteries of ≤ 18 mm in diameter generally passed through the gut uneventfully, and removal was rarely necessary.

However, in just the past six years there have been 13 child fatalities due to battery ingestion. All were in children less than 3 years of age. In the past ten years, 92% of batteries that were identified in major and fatal ingestions were 20mm lithium cells, and most ingestions causing such outcomes were unwitnessed.

Unlike other button batteries, lithium coin cells are 3-Volt cells, twice the 1.5 V of other button cells. They generate more external current, which can “dissolve” local tissue through a corrosive chemical process resulting from electrolysis and the production of hydroxide. New cells are 3 times more likely to cause significant injury or death than spent cells, which still generate enough current to cause harm.

Virtually all currently marketed large-diameter button cells in household use today are lithium cells.

The window of opportunity for injury-free removal of a lithium cell lodged within the esophagus is 2 hours. Given that most button battery ingestions are unwitnessed, damage is already being done and medical attention is being received by the time it is realized that an ingestion has occurred.

Batteries that do NOT become lodged in the esophagus, and instead pass to the stomach, are allowed to pass spontaneously without medical intervention. A follow-up X-ray is obtained in 10 days to assure clearance, unless the battery is seen within the child's stool.

The best treatment of battery ingestion is PREVENTION. Never keep batteries of any kind within the reach of small children, ESPECIALLY not lithium (button) cell batteries. The most commonly ingested lithium battery, and the one most likely to cause major or fatal outcome, is the CR 2032 cell. “CR” represents the lithium manganese dioxide chemistry, “20” is the diameter in millimeters, and the “32” indicates the height (3.2mm). Similar lithium cells include the CR2025, and the CR2016. **IF YOU HAVE ANY OF THESE BATTERIES AT HOME, PLEASE KEEP THEM WELL OUT OF THE REACH OF SMALL CHILDREN.**

Parents must also be aware that 62% of lithium cell batteries that were ingested by children were obtained from products. In other words, the young child opened the all-too-often-easily-opened battery compartment, removed the battery, and swallowed it. Parents must therefore also **KEEP PRODUCTS THAT USE LITHIUM CELLS OUT OF THE REACH OF SMALL CHILDREN.**

Examples of such products include: remote controls, electronic games or toys, calculators, watches, thermometers, cameras, greeting cards, key chains, jewelry and clothing with blinking lights, and personal digital assistants.

