

## Batteries Included...

Many of the toys and electronics that will be given as gifts this holiday season are powered by small disc batteries. These batteries are often unintentionally swallowed by small children, and sometimes adults. Although the majority of these batteries pass through the gastrointestinal tract without incident, occasionally they will lodge in the esophagus and cause injury.

The most commonly ingested disc batteries are 11.6 mm in diameter or smaller. Other standard battery diameters are 15.6 mm and 23.0 mm. The chemical systems that are in these batteries include mercuric oxide, silver oxide, manganese dioxide, zinc and lithium. An alkaline electrolyte is also present and is usually 26 to 45% sodium hydroxide or potassium hydroxide. Lodged batteries may cause local tissue injury through several different mechanisms. Sodium hydroxide or potassium hydroxide might leak from within the battery and cause tissue necrosis. In addition, electrolysis of sodium chloride generates sodium hydroxide with subsequent tissue injury even in the absence of actual cell leakage. Another contributing factor might be an electrical current that passes through the tissue. A lodged battery may exert constant mechanical force against the tissue resulting in pressure necrosis. Although, mercury-containing batteries often leak, no cases of clinical mercury toxicity have been seen.

X-ray localization is recommended in all cases of suspected button battery ingestion to confirm the diagnosis and location of the battery. Batteries located in the esophagus require immediate endoscopic removal. Esophageal damage can occur within 6 hours of ingestion. If the battery has passed beyond the esophagus, the patient may be sent home and instructed to inspect the stools to confirm the passage of the battery. The patient should return for a repeat X-ray in 4-7 days if the battery is not seen in the stools, or if the patient develops symptoms such as vomiting, tarry or bloody stools, fever, abdominal pain, or decreased appetite. In some cases, it might take up to 14 days for the battery to pass. Endoscopic or surgical removal may also be considered in cases where the battery stops progressing through the GI tract. A word of caution: it is sometimes impossible to distinguish between batteries and coins on the x-ray. This has led to devastating results from delayed removal of the battery.

### ***DID YOU KNOW THAT...*** Hearing aids are a common source of batteries ingested by small children?

A study of 2382 cases of battery ingestions reported to a national registry showed that 44.6% of batteries were obtained from hearing aids. In 32.8% of these cases, the battery was removed from the child's own hearing aid. Occasionally, adults swallow disc batteries as a result of putting them in their mouths while changing batteries, or when mistaken for their pills.

