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MODIFICATIONS OF COIN CELLS WITH ANTI-INGESTION AND ENCAPSULATION DESIGN FEATURES

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Background Emergency department-treated injuries caused by ingesting coin batteries have increased two-and-a-half times in the USA since 1998. Victims are usually small children. Batteries (particularly 20 mm or greater) can lodge in the oesophagus and generate hydroxide from surrounding fluids, which can produce life-threatening injuries in 2 h. Given the widespread use of coin batteries in consumer products, a multifaceted approach to injury prevention is required.

Objective We will demonstrate coin battery concepts that could deter ingestion or slow hydroxide formation after ingestion.

Methods A battery with folding appendages made of sheet materials that flex outwards when the battery is removed from a device would have a greater surface area and sharper edges, which would deter ingestion. In another strategy, batteries could be insulated, sealing the battery until it is inserted into a coordinating battery compartment. This could slow or eliminate hydroxide formation. Modifications to battery compartments also may be needed. Batteries could be

retrofitted for use in existing devices that lack coordinating battery compartments.

Significance These strategies could save lives by reducing the likelihood of ingesting coin batteries or providing more time for medical intervention once swallowed. The need for consumers to retrofit batteries for their existing devices would enhance public awareness of the hazard.