

POLICY BRIEF

BUTTON BATTERIES



AT ISSUE

The incidence of button battery ingestion associated with severe, life-altering injuries is on the rise, with most ingestions occurring in children under the age of six. As button batteries have become increasingly prevalent in Canadian households – powering everything from toys to remote controls to flashlights – the risk they pose to infants and young children has grown. In 2020 alone, the Canadian Hospital Injury Reporting and Prevention Program received reports of over 100 button-battery related injuries.

The unintentional ingestion of button batteries can result in serious internal injury and death. In children under the age of six who ingest batteries >20mm, the rate of major complications is as high as 12.6%. If swallowed, button batteries can become lodged in a child's esophagus, and a resulting chemical reaction can burn through the esophagus, the windpipe and the major blood vessels.

Prompt recognition and removal is critical to avoid devastating complications including death. Button batteries can cause substantial tissue damage within two hours of ingestion, and delayed injury can present weeks to months later. Consequently, streamlined care and expedited removal is essential. As such, it is imperative that emergency care is sought as soon as possible after ingestion of a button battery.

Sucralfate, or pasteurized honey if sucralfate is unavailable, should be given immediately, so long as it does not cause a delay in removal of the battery (i.e. while presenting to care and medical teams are organizing removal). Both work by reducing pH and coating the battery to delay alkaline burns to tissue. In the event of a known or suspected button battery ingestion, the risk-benefit ratio favours administering pasteurized honey even to those under one year of age. The incidence of infant botulism attributed to the consumption of honey in Canada is extremely rare, with four laboratory-confirmed cases and zero deaths between 1979-2019, while the risk of devastating complications from button battery ingestion in this age group is extremely high.

RECOMMENDATIONS

- 1. Implement safety standards including but not limited to: battery compartments that close with a cover and screw, child-resistant packaging, and limitations to the diameter (<20mm) and voltage ($\leq 1.5V$) of button batteries.**
- 2. Invest in public education campaigns to inform parents about the risks of button batteries, the importance of safe storage, and what actions to take in the event of unintentional ingestion.**
- 3. Update public health guidance to encourage the administration of honey even in infants under the age of one in the case of known or suspected button battery ingestion.**
- 4. Support health care systems to streamline care and expedite the removal of button batteries, recognizing the importance of removal within two hours of identification.**

LEARN

[A recent report](#) from the U.S. Consumer Product Safety Commission showed an alarming 93% increase in battery-related emergency department visits from March-September 2020 compared to the same period in 2019 for children ages 5-9. Similar trends are being observed in Canada, with Health Canada issuing a [public advisory](#) on the life-threatening dangers of button batteries to young children in November 2021. Quality data, including consistent incident reporting is needed to inform timely and evidence-based decision-making.

The type and size of the battery influences the likelihood of complications. As larger lithium cell batteries have become more common, the risk of life-threatening complications from ingestion has increased. Recognizing that [serious complications and death from button battery ingestion are associated most frequently with 3V lithium batteries \$\geq 20\text{mm}\$](#) , industry and regulatory changes to reduce diameters to $< 20\text{mm}$ and energy densities to $\leq 1.5\text{V}$ would significantly reduce the [risk of fatal injury](#). Similarly, we know that improperly secured or stored batteries increase the risk of unintentional ingestion. Implementing safety standards such as warning labels and child-resistant battery compartments, both of which are legislated through [Reese's Law](#) in the United States, would also apply the lessons we have learned to improve health and safety. Continued surveillance, government regulation and industry changes each have an important part to play in limiting both the risk of unintentional ingestion and the severity of consequences that can result.

ADAPT

While awaiting removal, evidence has shown that [administering honey can help to mitigate tissue damage](#). To avoid the risk of infant botulism, honey should only be consumed by children over the age of one. However, given the almost inevitable risk of esophageal injury associated with button battery ingestion and the very low likelihood of infant botulism from consuming pasteurized honey in Canada, the CPS recommends that in cases of known or suspected button battery ingestion the risk-benefit ratio favours the administration of honey even in infants less than 12 months old. As such, we encourage public health guidance to be updated to reflect this exceptional circumstance.

It is well established that significant erosion and damage can occur within two hours of ingestion. Policy and practice must therefore prioritize expeditious removal including through prompt transport and streamlined triage processes and referrals. Paediatricians and primary care providers across Canada can also collaborate to adapt local processes and protocols to better streamline care, using current best practices and established evidence-based algorithms. To help inform this work, provincial governments should support the development of clinical care pathways such as the [Alberta Provincial Management Pathway for Button Battery Ingestion in Children](#).

EDUCATE

The most effective way to mitigate button battery injuries is to prevent them from ever taking place. Public engagement and knowledge translation is critical to informing parents/guardians of the dangers of button battery ingestion. Counselling families with young children about how to safely use, store, and discard of batteries can help to prevent devastating injuries. Simple tips such as storing batteries out of reach and sight, taping over battery compartments, and recycling used batteries can help to reduce the risk of unintentional ingestion. Alongside these essential public education campaigns, paediatricians and primary care providers can help to inform parents about the best course of action in the case of known or suspected button battery ingestion – including prompt administration of honey and immediately seeking emergency medical care.