



Fighting for Product Safety

# **MAGNET INGESTION: ARE WE MOVING IN THE RIGHT DIRECTION TO ENSURE CHILDREN'S SAFETY?**

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## EXECUTIVE SUMMARY

Kids In Danger (KID) analyzed the most recently available information regarding injuries associated with magnet products among children ages 18 and under. Using data from the National Electronic Injury Surveillance System (NEISS), KID compiled injury statistics associated with magnet product ingestion from 2014 to 2018. These products include children's toys, adult desk toys, personal use items, home supplies, and other miscellaneous magnet sets.

## MAIN FINDINGS

- Magnet-related ingestion cases have increased substantially since 2014. In 2014, there were an estimated 31,500 emergency department-treated ingestion injuries associated with magnet products. In 2018, there was an estimated 250,900 injuries.
- Children ages 0-4 years appear to be at a greater risk for magnet-related ingestion in comparison to children ages 5-18 years.
- Emergency department visits due to magnet ingestion for children ages 0-4 years has more than doubled since 2014.
- A large majority of magnet product vendors fail to effectively communicate the hazard associated with ingestion of their product.
- The U.S. Consumer Product Safety Commission (CPSC) approved a final rule in 2014 restricting the size of rare-earth magnets, but the rule was vacated by a U.S. federal court in November 2016.
- Magnet-related ingestion injuries have increased following the 2016 overturn of the CPSC rule that implemented magnet restrictions.

## INTRODUCTION

Pediatric foreign body ingestion is a common occurrence that presents a challenge to physicians.<sup>1</sup> In recent years, magnet products have been known to be a large safety risk to small children and teens. Some of the most commonly used magnet products are loose magnets and high-powered magnet sets. These products are typically designed for adults and can cause serious injury if swallowed.<sup>2</sup> Recent cases suggest that severe magnet-related ingestion cases are increasing, resulting in medical intervention. Internal injury from magnets can pose serious health risks. When two or more magnets are swallowed, they can link together inside a child's intestines and adhere to body tissues, resulting in intestinal obstructions, perforations, sepsis, and even death.<sup>3</sup>

## METHODOLOGY

To best conceptualize the significance of magnet-related hazards, datasets from the National Electronic Injury Surveillance System (NEISS) were utilized, as well as the recall list regarding magnet products from the CPSC.<sup>4</sup> It was imperative to include all magnet injury reports since 2014. Magnet-related ingestion cases were pulled from the NEISS database with treatment dates from January 1, 2014 to December 31, 2018.

To gather all possible data related to the magnets of interest, a keyword search was completed and any case that mentioned “magnet” in the narrative field was considered. This was completed across all products. All ingestion injury reports were queried for children ages 0-18 years. Queries were generated based on the product group, age, and diagnosis.

Emergency department-treated injuries were formulated by using the weights of magnet-related cases of interest.

## **SAFETY MEASURES**

Magnet sets are aggregations of separable magnetic objects that are marketed to consumers and commonly used for entertainment. It's important to distinguish between adult desk toys that contain magnets such as Bucky Balls and magnetic children's toys such as Magnetix. In recent years, magnet sets have presented great risk and injury to young children who have mouthed and ingested them.<sup>5</sup>

In 2005, a 21-month-old child died after ingesting a number of small cylindrical magnets that came from a Magnetix magnetic building set. The magnets formed a bulbous completely blocking the child's intestine. Following the tragedy, in 2006, Rose Art Industries Inc. recalled all of the building sets. <sup>6</sup>

The recall was expanded in April 2007.<sup>7</sup> Like many suspected, the magnet product was defective—tiny magnets could fall out of the building pieces, creating a safety hazard for young children.

Magnets often offer a new and fun element to children's toys. Federal toy safety regulations prohibit the use of certain magnets as a component in any toy that is intended for children under the age of 14 years old and is small enough to be swallowed.

A standard specification for toy safety, ASTM F963 was adopted as a rule in conjunction with the Consumer Product Safety Improvement Act of 2008. ASTM F963 includes guidelines and testing methods relating to toy safety in an effort to prevent potential hazards. The standard is reviewed and revised regularly.

In a persistent effort to reflect the most recent issues in toy safety and address emerging hazards, in 2008 ASTM International Committee on Consumer Products approved revisions to the standard. Revisions took into account ingestion incidents due to magnetic components that were part of a toy and also reflected the age of children involved in the incidents. In addition, the update included special use and abuse requirements to prevent magnets from detaching from toys during use.<sup>8</sup>

The CPSC continued to bring awareness to the dangers of magnets and were unsuccessful in banning high-powered magnets from the market. However, in February 2012, the CPSC accepted the ASTM F963 manufacturing standard as a mandatory standard. The standard took effect in June of that year.

In 2011, Mega Brands (who bought Rose Art) reached a settlement in a New Jersey Federal Court which would compensate consumers who purchased magnetic toys that were the subject of recalls from 2006 through 2008.<sup>9</sup>

In November 2011, the CPSC issued a safety warning regarding the dangers of high-powered magnets.<sup>10</sup> Despite this warning, magnet-related injuries persisted.

In 2015, the CPSC approved a final rule restricting the size of rare-earth magnets in an effort to protect children from the hazard. Unfortunately, the rule was vacated by a U.S. federal court in November 2016 and only resulted in a partial recall of the rare-earth magnet sets, specifically magnet sets sold by the Zen magnet cooperation (Zen Magnets).<sup>[11](#)</sup>

Thereafter, in October 2017, the CPSC issued a final decision and order proposing that Zen Magnets implement a corrective action plan that would stop the sale of their high-powered magnet sets, including a consumer refund and a notice to the public.<sup>[12](#)</sup> According to the CPSC, over 11 manufacturers of strong magnet sets have voluntarily agreed to the CPSC's request that they stop the manufacture, distribution, and sale of their magnet products as a result of child injury.

On June 3, 2020, CPSC staff released an informational briefing package addressing a petition filed by Zen Magnets, LLC, regarding high-powered magnet sets. The petition requested that the Commission establish a safety standard for magnet sets that would address the risk of injury associated with magnets.<sup>[13](#)</sup>

Data suggests that there has been an increase in magnet ingestion incidents and injuries since the magnet set deregulation in November 2016. CPSC staff concluded that there is a major risk to children and teens as a result of ingesting high-powered magnets and that moving forward, the Commission should initiate steps toward rule-making regarding magnets.<sup>[14](#)</sup>

Planning ahead for future months, the Commission is working to implement additional research on magnet strength and hazards, details about magnets involved in injuries, as well as developing other information to support a final decision and standard.<sup>15</sup>

## MAGNET INJURY TRENDS

Since 2014, the estimated emergency department-treated injuries associated with magnet ingestion is shown in Table 1. Estimates show that children over the age of five are less likely to suffer from a magnet-related ingestion injury. In the past five years, magnet-related ingestion cases have risen dramatically (See Table 2).

**Table 1: Estimated Emergency Department-Treated Injuries for Children Age 18 and Under Associated with Magnet Products**

Calender Year	Estimated Injuries
2014	31,500
2015	96,500
2016	75,300
2017	184,500
2018	250,900

Source: NEISS  
Note: Estimates rounded to the nearest 100.



Analyzing data from 2014 to 2018, KID compiled injury statistics associated with magnet products. Magnet-related ingestion injuries have increased substantially in the past five years. Although magnets pose a health risk to children of all ages, children under the age of five are at the greatest risk for magnet ingestion injury (See Table 2).

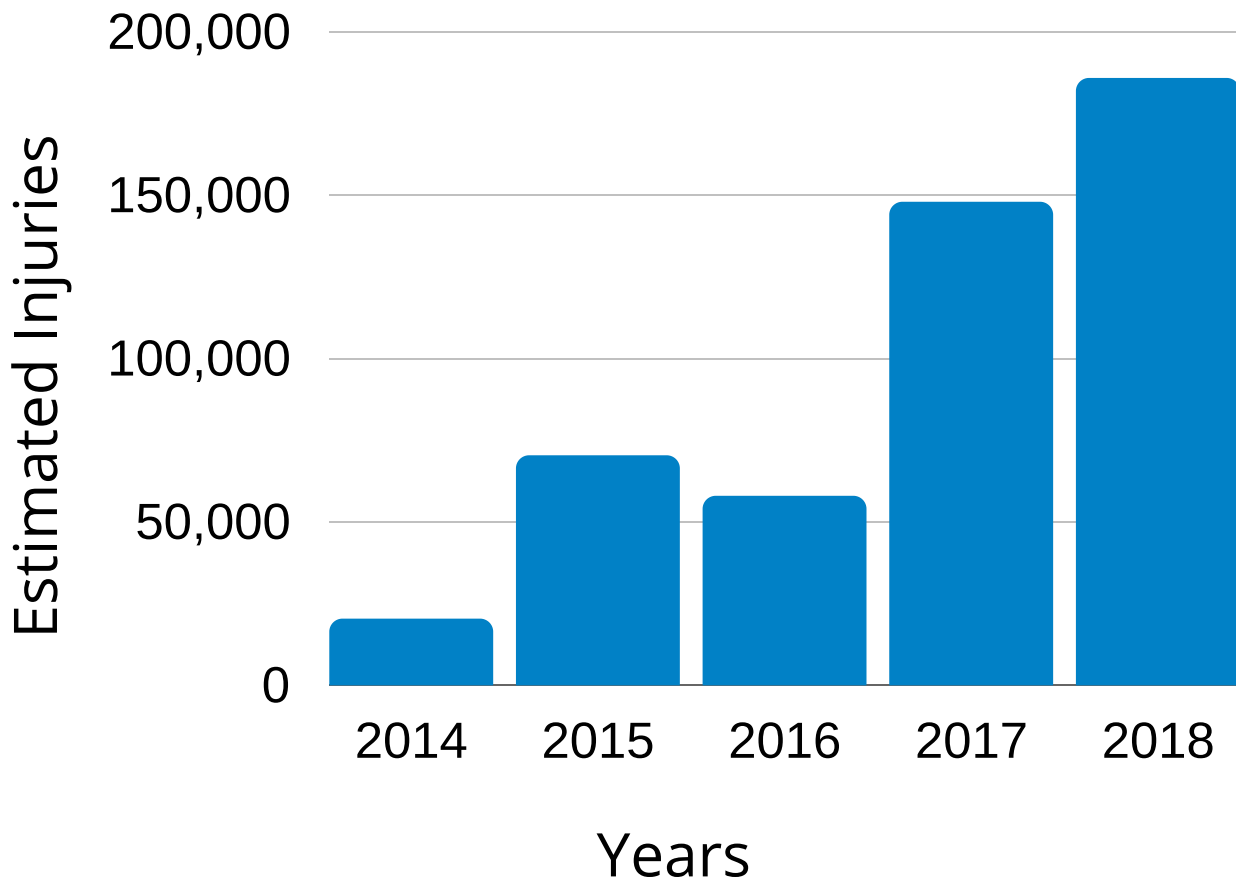
**Table2: Estimated Emergency Department-Treated Injuries Associated with Magnet Products by Age**

	2014	2015	2016	2017	2018
Age 0-4	20,200	70,200	57,800	147,800	185,700
Age 5-9	6,600	18,100	11,300	23,300	31,100
Age 10-14	4,600	8,200	6,200	13,200	34,100
Age 15-18	100	0	0	160	5

Source: NEISS

Note: Estimates rounded to the nearest 100.

**Figure 1: Estimated Emergency Department-Treated Injuries for Children Younger than Age Five Associated with Magnet Products**



An estimated 185,700 magnet product-related injuries among children younger than five years old were treated in U.S. hospital emergency departments in 2018, up from 20,200 in 2014.

## **MAGNET PRODUCT RECALLS**

Between January 1, 2014 and December 31, 2018, there were nine magnet product recalls (See Table 3). Four products: the **Rubber Ducky Magnets**, the **Magnetic Travel Maps**, the **Children's Magnetic Building Sets**, and **Gadget Pencil Cases**, were recalled prior to any injuries or consumer reports of product hazards.

Conversely, the **Magnetic Color Sorting Board** was not recalled until eight consumer reports were issued, the **Quartet Magnetic and Dry Erase Boards** was not recalled until seven consumer reports were issued, and the **Sardines Fishing and Starfish Fishing Game** was not recalled until 417 consumer reports were issued.

**Table 3: Recalled Magnet-Related Products Between January 1, 2014 and December 31, 2018. Recalls listed at [www.cpsc.gov/Recalls/](http://www.cpsc.gov/Recalls/).**

Product Name	Recall Date	Hazard	Manufacturer
Rubber Ducky Magnets <sup>16</sup>	3/6/14	Ingestion Risk	Design Ideas
Magnetic Color Sorting Boards <sup>17</sup>	5/7/14	Ingestion Risk & Excessive Lead Levels	Discount School Supply
Quartet Magnetic and Dry Erase Boards <sup>18</sup>	7/30/15	Laceration Hazard	ACCO Brand Corp.
Gadget Pencil Cases <sup>19</sup>	8/05/15	Ingestion Risk	Disney Store, USA
Sardines Fishing and Starfish Fishing Game <sup>20</sup>	9/10/15	Choking & Ingestion Hazard	Juratoys, US
Infant Bicycle Helmets with Magnetic Buckle Chin Straps <sup>21</sup>	5/17/16	Choking & Ingestion Hazard	Pacific Cycle Inc.
Magnetic Travel Maps <sup>22</sup>	8/4/16	Ingestion Risk	Cinmar, LLC
Magnetic Tic Tac Toe Games <sup>23</sup>	3/29/17	Choking & Ingestion Hazard	Target Corp.
Children's Magnetic Building Sets <sup>24</sup>	8/1/17	Choking & Ingestion Hazard	Panelcraft, Inc.

## CONCLUSION AND RECOMMENDATIONS

Magnets are hazardous to young children who have mouthed and ingested them. Magnet products are of great interest to small children who in some cases believe them to be candy. In addition, magnets pose a serious risk to older children and teenagers who use the magnets to mimic facial and mouth piercings. The prevalence of magnet-related ingestion continues to be a safety threat to children.

Following the 2016 overturn of the CPSC rule which set restrictions for rare magnet sets, magnet-related injuries have increased substantially.

A mandatory standard should be put in place to further protect the safety and well-being of children from magnet-related hazards. Without a mandatory magnet standard, magnet-related ingestion cases continue to negatively impact children. Standardizing magnet safety, enforcing consistent safety regulations, and increasing notifications to consumers will have a large impact on preventing child injury.

## **KID recommends the following for childcare providers and parents:**

- Keep products with small or loose magnets away from young children.
- Avoid purchasing sets with many small magnets, as it is difficult to recognize if a few magnets have gone missing.
- Routinely check the CPSC website for recent product recalls.<sup>25</sup>
- Stop using any and all recalled products to ensure child safety.
- Report any problems with magnets to [SaferProducts.gov](https://www.saferproducts.gov).<sup>26</sup>

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