

Display Hook Injuries to Children

By **Lawrence C. Dinoff, A.I.A., NCARB, CPSI**

No safety-minded individual would consider it reasonable to construct a wall with spikes projecting into the adjacent aisle ways. However, that is what some shoppers are exposed to when retailers use unprotected or inadequately protected display hooks to display merchandise. Unprotected display hooks pose an unnecessary threat to shoppers and most especially to young children. Eye injuries are the most common. As safety consultants, my colleagues and I also investigate impalements, cuts and snagging injuries of other body parts.

The presence of unguarded display hooks in the retail environment demonstrates a decision to put merchandising efforts ahead of safety. Retailers and display manufacturers are aware of the hazards posed by unguarded display hooks.

Consumer Product Safety Commission (CPSC) has tracked and published incidents of injuries associated with display hooks for more than 20 years. A review of CPSC's National Electronic Injury Surveillance System (NEISS) injury reports for hook-related eye injuries yields a dozen reported incidents for 2002 through 2005.

Types of Display Hooks

Display hooks are commonly formed from wire, bent to shape and affixed to a back bracket that mounts on pegboard or slatwall-based displays. Most hooks are formed from wire between about 1/8 in. to 1/4 in. in diameter. These hooks project straight out from the display and usually include an upward bend at the end to help retain items.

The most common and hazardous hook types lack effectively guarded ends. These generally consist of a single wire with a blunt-cut end. The resulting display presents a cutting and impalement hazard to the patrons.

Variations on cut-end hooks include hooks where the end of the hook is formed into a rounded end approximating an air-gun pellet (BB). While reducing the sharp-edge cutting hazard, this type of hook provides little protection from impalement.

Wide varieties of alternative safer hooks have been available for many years. These include hooks where the wire ends are formed into J, U or loop shapes, forming

an integral guard against penetration hazards. Other hooks include a barrier guard that prevents contact with the display hook tip. A secondary wire typically supports such guards, which offer retailers the ability to support a label holder. As long as the holders do not pose a cutting or scratching hazard, they can be an effective protection.

Hook-Based Display Systems

Slatwall and pegboard displays offer many advantages to retailers, manufacturers and the shopping public. These display systems rely on hooks to display products. Systems based on hook displays can effectively present a wide variety of merchandise and they help retailers make efficient use of expensive store space. Freestanding and wall displays facilitate grouping merchandise by type and size. Wall-hung displays help maximize sales along the store perimeter and dividing partitions. Freestanding display towers are easily located throughout the store.

While conventional display tables, bins and shelves become disorganized as customers sort through merchandise, display hook systems help maintain uniform and orderly merchandising. Hook displays provide other benefits such as price tags directly on display hooks, anti-theft features on specialized display hooks and ease of inventorying to see which items or sizes need restocking.

Items that do not lend themselves to conventional self-service displays are typically displayed in glass showcases. Hooks are suited to displaying these items and hook-hung header cards permit self-service without the products becoming entangled or damaged.

Product manufacturers have developed packaging systems that take advantages of display hooks. The "blister pack" is a popular method by which manufacturers can use small or oddly shaped products.

A blister pack consists of a header card and a thermoformed plastic blister. This form of packout is highly efficient. An operator simply drops a product into a plastic blister on a turntable sealer. In addition to efficiency, the manufacturer enjoys the ability to take oddly shaped or small products and unitize them for uniform handling and packaging. This sys-

tem allows for printed material and bar-codes on header cards, the addition of anti-theft devices with the product, insertion of instruction sheets as well as provides a tamper-proof form of display.

Shoppers enjoy the ease of selecting merchandise from an orderly array of types and sizes. In addition to blister packs, manufacturers have developed plastic hangers for many items, such as neckties, belts and socks. Standard chipboard unit cartons, such as those used for envelopes, have been modified to accommodate display hooks by adding an additional flap opposite the standard closure flap.

Hazards to Children

The hazards generally associated with ineffectively guarded hook ends can cause cuts and penetration injuries to patrons as well as store personnel who stock the displays. Young children are particularly susceptible to impacts with hooks that protrude from tower displays and wall displays into adjacent aisle ways.

Children in the toddler and post-toddler stages are especially at risk. Children in this age range commonly accompany their parents into retail stores. A significant number of retail stores sell children's products and include product displays specifically targeted to the children. Retailers that do not sell to children often provide parents with accommodations for young children, such as changing tables in restrooms, thus encouraging parents to bring their children along when they shop. Retailers must be attentive to eliminating child hazards because the time and attention parents devote to shopping and product selection detracts from their ability to completely limit their children.

Piaget characterized four stages of children's cognitive development. Children between ages 2 and 6 are in Piaget's preoperational stage. They are at an increased risk in hazardous environments because of their limited abilities to assimilate and accommodate their surroundings. It is not reasonable for retailers to rely on young children to identify and avoid the ends of thin wire hooks. Children less than age 6 are limited in their ability to process cues in their peripheral visual field, so the risk of

walking into hook ends that project into aisles is high. A 1980 study in *Ophthalmic Surgery* analyzed a series of injuries to children under 10 and to one teenage store employee. It noted:

Because the hooks are very thin and project out from a cluttered background, they are very difficult to see. The unprotected and slightly upturned end of the hook creates a dangerous prong for someone bending down and striking the tip.

Because young children are still developing their motor and attention abilities, they lack skills to effectively protect themselves. Colorful marketing displays are attractive to children. Since children are limited in their ability to visually identify risks or to distinguish hazards from safe conditions, unguarded hook ends put them at risk.

Standard hook-based display practices expose young children to contact with unguarded hook ends. Young children are inclined to investigate on their own and are still building motor skills. Wandering and falls are common. Retail displays typically include hooks placed at a height below 48 in. and often as low as 12 in. Since the average eye height of a 5-year-old is about 43 in., the risk of eye contacts with hook ends is high.

Eye Injury Mechanism

The hazards of eye injuries to children are also of great concern. Playground safety evaluation systems classify threats to children's eyes as Class A hazards, requiring the highest level of attention. Play equipment standards prohibit protrusions capable of entering the orbital opening of children and the safety evaluation of play equipment requires testing with a gauge designed to screen out eye hazards. A 1980 article described hook contacts with eyes as the injury mechanism in a series of injuries to children under 10 and to one teenage store employee. Subsequent reports have appeared in other issues of both the *American Journal of Ophthalmology* and *Ophthalmic Surgery*.

In some cases, the ends of wire hooks are blunt-cut or slightly rounded. In other cases, the end of the hook is formed into a rounded end approximating a BB or covered by a plastic cap of about the same size. In all of these, the end of the hook remains small compared to the child's eye socket.



Photo 1: I-Type safety hook



Photo 2: Label guarded safety hook

Even low-energy impacts to the eye from small objects, such as the tip of a display hook, can produce an injury. Tests of impacts below one Newton-Meter (about 0.74 ft-lbs force) by BB-size objects produced blunt trauma injuries. Impact forces much greater than this are predictable results of children accidentally walking into or falling into small hook ends.

Since the tips of an ineffectively guarded display hook are small, impact energy is concentrated within a small area and the risk of a penetration injury is high. Only 10 lb of impact force from the end of a blunt-end $\frac{1}{8}$ in. wire hook generates penetrating pressures greater than 500 lb per sq in. Providing a small ball at the hook end does not increase the tip's surface area sufficiently to diffuse pressures to a safe level.

Although these hooks are sometimes marketed as "safety" hooks, ball-end hooks provide little in the way of injury prevention. In fact, impact by any hook end that is small enough to enter a child's eye socket and contact the eye will probably result in an injury. Since there is no bone protection behind the eye, a sufficiently long unsafe hook may even pass through the eye and penetrate the brain.

Alternatives to Dangerous Hooks

Any reasonable means of protecting against eye injuries or worse requires hook configurations that prevent the hook from entering the child's eye socket. Unsafe hooks are generally easily identified; however, a test with a test gauge will distinguish safe from unsafe hook ends.

Display hook designs that adequately protect children's eyes have been described



Photo 3: Loop safety hook



Photo 4: Non-safety hook

and recommended in safety literature for many years. Nearly a dozen U.S. patents were granted for safety hook designs between 1968 and 1984. The 1980 *Ophthalmic Surgery* survey concluded:

One suggestion of a design to improve the safety of these hooks . . . has a curved tip with the radius of curvature such that the end of the hook would be larger than the bony orbital rim (30 to 40 mm), making it impossible to cause a lid laceration. The hook could also be dipped in fluorescent paint to make it more visible against a cluttered background.

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Since 1974, National Safety Council has cautioned that “. . . unprotected display hooks at eye level or below can be extremely dangerous,” and the council’s 1983 pamphlet, “Shopping List for Safety,” directed store employees to be on the lookout for unsafe hooks, offering the simple and effective solution: “J hooks should have rubber tips and be curved at the end. If not, report it to your supervisor.”

Conclusion

While the display hook merchandising systems offer various benefits, many hooks pose a specific and unacceptable hazard to children. The hazard associated with display hooks is mechanical projection. The most commonly reported injuries are to the eye; however, even more serious injuries have occurred.

Display hooks have long been available with effective barrier guards, but many display hooks remain unguarded. While many retailers have switched over to hooks with protected ends, many oth-

ers continue to use straight hooks with unprotected ends.

A survey of the offerings of national hook manufacturers shows the wide availability of hook types with protective ends. However, most also offer single-prong hooks with cut wire ends and hooks with only small ball ends. The latter often are inappropriately marketed as safety hooks despite their ability to cause significant injuries.

Change is required to protect children from exposure to unnecessary hazards. CPSC has banned various products from the marketplace because they are inherently dangerous. Since the display hook is a commercial product and not a consumer product, it may have fallen outside the view of the commission. Fortunately, CPSC does track injuries associated with display hooks and this will hopefully provide a basis for future action should retailers and manufacturers choose not to address the hazard on their own. ■

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New Effective Date Announced for ANSI/ASSE Fall Protection Code

Recognizing the need to allow SH&E professionals more time to adjust to safety practices recommended in the Z359 Fall Protection Code, the ANSI/ASSE Z359 Accredited Standards Committee (ASC) recently announced an extension of the code’s effective date from Oct. 15 to Nov. 24, 2007.

The ANSI/ASSE Z359 Fall Protection Code is a series of voluntary national consensus standards written to offer more resources for employers to protect workers from fall hazards, which are one of the leading causes of on-the-job fatalities in the U.S. The code is designed to help employers prevent fall-related injuries and deaths.

“The Z359 Fall Protection Code is one of the most important safety-related voluntary national consensus standards in the last 20 years,” says Randall Wingfield, Z359 ASC chair and president of Gravitec Systems Inc. “In par-

ticular, the Z359.2 managed approach to fall protection standard will have significant impact on SH&E professionals. The Z359 ASC is eager to work with the safety profession to implement the new standards to better protect and train the worker at height.”

“The revised effective date will aid in an orderly transition to compliance,” adds Joseph Feldstein of Mine Safety Appliances and Z359 ASC member. “Since this is a voluntary standard, there is not provision for ‘grandfathering’ as in some regulatory programs. The 60-day extension of the effective date provides time for employers, SH&E professionals and suppliers who have not yet seen the document to review and understand its impact.”

To purchase the Z359 Fall Protection Code, contact ASSE Customer Service at (847) 699-2929 or visit www.asse.org. ■

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