

## **Forensic Issues of Young Children Falling Through Window Screens: A Set of Parallel Case Studies**

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### **1. Introduction**

Every year numerous young children fall out of screened windows from multi-story dwellings and are seriously injured or killed (Spiegel and Lindaman, 1977, U.S. Consumer Product Safety Commission, 1989). After this event occurs, caretakers in the U.S. sometimes file suit against the screen manufacturer and other involved parties (e.g., the builder and building owner). In the last few years, I have been retained as a human factors expert witness by plaintiffs attorneys (the side of the injured party) in four law suits involving window screens. In this article, I describe the general facts and my experiences in that role.

All of the cases are virtually carbon copies of the same event with minor fact differences. The caretakers opened the window of an upper story apartment (usually having no working air conditioning system) for air flow on a hot day. All caretakers report keeping a close watch on the child, but at some point it is discovered that the child and the window screen are missing. In all instances, the family recently moved into the residence and had not opened the window before or did so only a few times without inspecting or touching the screen. After the event, the parents report not knowing that slight finger pressure could cause the screen to pop out.

About two decades ago, the screen industry began changing their basic window screen design. Screen frames are now commonly held to the window opening by spring pins as opposed to older versions with a completely surrounding mounting bracket that gave greater support of the screen to the window frame. Thus the manner in which the screen frame is retained in the window opening is much less substantial than it was.

### **2. Method**

In my first screen case, the attorney located me after doing a review of the warning research literature. (I have authored approximately 80 articles on warnings and risk perception.) In subsequent cases, the attorneys found me either by referral from other attorneys or by reading a short article appearing in the *Product Liability Law Reporter* that noted I was the human factors expert in a case that settled for 1.5 million dollars (Boesenberg v. Windowmaster Products, 1993). In all instances, the plaintiffs attorney initiated contact by telephone and explained the basic facts of the case. After indicating preliminary interest, I routinely send a current curriculum vitae and a cover letter describing my consulting rates and retainer fee requirements. Also during the initial conversation with the attorney, it is usually possible to request certain kinds of information for review. In the window screen cases, this would include available depositions of (a) the caretakers and other relevant persons (e.g., relatives, neighbors), (b) representatives of the manufacturer, builder, and owner, and (c) other experts that had thus far been deposed. Photos and videos of the screen and environment in which the accident took place, as well as information on any warning labels and any other printed materials that might have been available to the caretaker are requested. Other information may be requested later depending on what the initial review of the material reveals as possibly being relevant. After examining the information provided, as well as knowledge of basic human factors principles, it is generally possible to offer an opinion.

### 3. Analysis and Discussion

My analysis and opinion in these cases is as follows. The industry should have performed a hazard analysis of their redesigned product. Had they done so, manufacturers would have found (a) that many people do not realize that the newer screen is extremely easy to push out of the window opening, (b) that many parents do not realize that small children would show an interest in the newly opened window, and (c) that the children (who of course would not be expected to know the danger) may lean or in some way put pressure to the screen and/or frame. Such an analysis could have been easily performed by testing relevant populations of target individuals (in this instance, caretakers of young children) on what they know and assume. Also, accident data from the U.S. Consumer Product Safety Commission (CPSC) is available encompassing obituary notices, newspaper reports of product-related accidents, and detailed statistics from a representative sample of hospital emergency room entrances across the U.S. The CPSC information shows that there is a problem with window screens with respect to children falling through them, and specifically, there is a hazard to 1 to 3 year olds who were being killed or severely injured. With this information plus formal error analyses, the industry should have known that there is a hazard associated with their product, that such accidents were foreseeable, and that it was important to take steps to reduce or eliminate the danger.

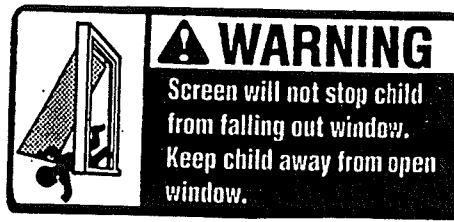
There are several basic strategies to prevent injuries. In general, the best strategy is to remove the hazard. A more secure frame mounting apparatus and stronger screen material would eliminate the hazard and both were available prior to the subject accident events. If they had been installed at the accident locations, it is likely that the accidents would have been prevented. While total elimination of the hazard is the ultimate strategy, earlier law suits claiming the defective nature of the newer screen's engineering design and materials were unsuccessful in producing favorable rulings for plaintiffs. The reason is that the industry has successfully made the counter claim that "screens are designed for the purpose of keeping insects and birds out—they not designed to keep children in." Industry representatives have also argued that in cases of fire, "fall proof" window screens would make it more difficult for occupants to egress and for fire fighters to ingress into the building through the windows. Clearly, however, a stronger window screen could still allow emergency egress and ingress while preventing many fall accidents of young children. Noteworthy, too, is the existence of industry standards (ANSI/SMA, 1985) concerning the integrity and strength of certain window screen components, for example, the minimum pressure on keeping the screen mesh from tearing or separating from its aluminum frame. However, there are no standards on the retention of the screen frame as it attaches to the window opening. Nevertheless, window screen industry is highly competitive, and so an expensive screen retention system could limit sales.

Another hazard reduction strategy is to guard against the hazard. Window guards and locks have existed and were available prior to the subject accidents. The accidents would likely not have occurred had these devices been used. Since 1976 New York City has required window guards be placed on the exterior of multi-story rental units where small children are residing (Spiegel and Lindaman, 1977). Window locks can be as simple as a nail placed in the glass-window frame track so as to prevent its opening beyond the point in which a child's head/body might squeeze through. The potential problem with the exterior guards is its negative impact on building aesthetics and the expensive in outfitting every upper-level window in multi-story buildings. Limiting the size of the window opening using locks restricts air flow (which is generally the purpose of opening the window in the first place). These negatives notwithstanding, guarding and locking can be useful accident prevention strategies.

The last strategy is to warn against the hazard. As indicated above, many people are not aware of the flimsiness of the newer window screens and do not realize that young children might be attracted to the window area. Therefore, hazard information needs to be communicated to residents of dwellings with these screens.

Review of the materials provided by the attorneys revealed that for many years after marketing the redesigned window screen frame, manufacturers failed to adequately warn about the hazard. Eventually a few manufacturers began placing a fairly cryptic message on the aluminum frame saying that the screen is not designed to retain objects from falling out of the window. This warning is defective because it was not only oblique in its wording but also it was too general as it does not explicitly tell what the the hazard is (and lacked other good warning design characteristics). More recently a better warning shown in Figure 1 was introduced by a

Figure 1. Warning Label for Window Screens



screen manufacturer Nichols-Homeshield that was subsequently proposed as an ANSI standard (ANSI/SMA 7001, 1992). This small pictorial and word warning intended to be placed on the screen frame was developed using human factors techniques (e.g., iterative design and testing with relevant target groups). While not a perfect warning (e.g., it also could mention the availability of window guards and locks as supplements), it is considerably better than no warning or the previously-used "objects" warning. Had this or a similar warning been on subject screens, it might have prevented the accident (or at least provided the opportunity for people to know about the hazard).

Moreover, a sticker label is not the only way to communicate the hazard. Other media could have been used such as mention of the hazard in baby books, public service announcements, and pamphlets. With the exception of a small portion of a brochure offered by the National Safety Council (which has had limited distribution) and a public information campaign in New York City in the 1970s and 1980s, there was virtually no information available to the public for many years after the newer screen design was introduced. I have maintained that the screen manufacturing industry could have employed a warning label earlier than they did, and could have communicated the risk in other ways (e.g., asking authors of existing baby books to include the information in the next edition of their book, contacting health and safety officials, informing the media, etc.). Instead the industry focused its efforts on legal defense of cases that arose from accidents that continued to occur. Indeed, the Screen Manufacturers Association (SMA) sponsored at least two conferences having the theme "Kids Can't Fly" that emphasized legal suit defense. Historical records show that the industry was aware of the hazard during the time the new screen was introduced or shortly thereafter, but used their resources in inappropriate ways with respect to the safety of small children. In short, they failed to inform the public.

In all of the screen cases in which I have been retained, no warning whatsoever was on the screen frame (and in some cases the manufacturer failed to include the warning even after the proposed ANSI standard was available and recommended by the SMA). The cost of a warning is much less expensive compared to the cost of a single legal case and the pain and suffering to the victims and families. These cases are generally resolved out of court by mutual agreement between opposing attorneys (i.e., settled), and the terms are usually not disclosed publicly. In summary, human factors experts can be useful at presenting the above information and describing the strategies and techniques that were available and could have been used to prevent or reduce the likelihood of accidents involving young children falling through screened windows.

#### References

- ANSI/SMA (1990). *Specifications for metal protection screens* (ANSI/SMA 6001). American National Standard. Chicago, IL: Screen Manufacturers Association.
- ANSI/SMA (1992). *Warning label standard for window insect screens* (ANSI/SMA 7001). Proposed Draft Standard. American National Standard. Chicago, IL: Screen Manufacturers Association.
- Boesenberg v. Windowmaster Products (1993). Window screen: Child falls from second story window: Failure to warn of illusion of security: Quadriplegia: Settlement. *Product Liability Law Reporter*, August, pp. 127 (San Diego County, California Superior Court, No. 638479, December, 1992).
- Spiegel, C. N., and Lindaman, F. C. (1977). Children can't fly: A program to prevent childhood morbidity and mortality from window falls. *American Journal of Public Health*, 67, 1143-1147.
- U.S. Consumer product Safety Commission (1989). National Electronic Injury Surveillance System (NEISS) data on windows/screens. Washington, DC: U.S. CPSC.