

Prevention Strategies for Infant Walker-Related Injuries

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Melissa McCoy, RN, MSN, of the department, collected, coded, and analyzed data. Partial funding for this research was provided by the University of Maryland School of Nursing Designated Research Initiative Fund.

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Synopsis

The estimated number of walker-related injuries to infants increased during the 1980s, and standards for walker design safety remain voluntary with no monitoring to assess compliance. Although banning the walker has been proposed, this preven-

tion strategy has not been employed. The most recent statistics available indicate that there were an estimated 27,804 walker-related injuries requiring emergency room attention among ages 0-4 years in 1991.

Results of a survey of parents of 3-12-month-olds indicated considerable use of walkers, with greater use among parents with lower educational levels. Reported reasons for using walkers were for the infant's entertainment, enjoyment, and containment, as well as to help infants learn to walk.

The authors recommend the consideration of a series of preventive strategies according to the epidemiologic framework for injury control and prevention designed by William Haddon, Jr. These include, but are not limited to, prohibiting the manufacture and sale of the walker, mandatory standards, redesign of the walker, design of an alternative to the walker, and consumer education to reduce use and to change patterns of use.

In the early 1980s, studies indicated that infant walkers were widely used and were associated with a significant risk of injury (1-3). For example, in one pediatric practice 31 percent of the infants who had used walkers received accidental injuries, and 77 percent of parents used walkers for their infants (2). In 1981, 17,125 walker-related injuries requiring emergency room visits were estimated by the Consumer Product Safety Commission (CPSC), up from 10,016 only 1 year earlier. Of these injuries, 90 percent were to the head, eye, face, or mouth (4).

Due to the impetus of the CPSC, a performance standard, No. F977-89, was promulgated by the American Society for Testing and Materials (ASTM) in 1986 (5). Walker design issues addressed by the standard include stability, seating systems, and folding mechanisms. In addition, instructional literature must accompany the walker, and a warning label must be attached to the walker. The literature must state that children in

walkers should never be left unattended or out of view. Warning labels must state that walkers should never be used near stairs, steps, or thresholds, and that they are to be kept away from ranges, radiators, space heaters, and fireplaces to avoid burns. These safety standards for walker design are voluntary, and compliance is not monitored.

In 1990 and 1991, the level of hazards associated with walker use remained high. For example, in 1991 more than 27,000 walker-related injuries requiring emergency room visits were estimated to have occurred, with 90 percent of the injuries to the head, eye, face, or mouth (6). Banning walkers has been debated as a strategy to eliminate the hazards related to their use, but a ban has not been employed. Public health efforts need to be escalated to prevent injuries associated with walkers, a device designed to entertain infants (7).

The purposes of this paper are (a) to report the most recent data on walker-related injuries, (b) to

explore reasons for their continued occurrence, and (c) to propose a broad range of strategies to prevent such injuries.

Methods

Data on infant walker-related injuries were compiled from the CPSC's National Electronic Injury Surveillance System (NEISS) for 1990 and 1991, in the form of national estimates based on projections from a probability sample of injuries treated in 91 sampled emergency departments. NEISS data were also obtained on the nature of walker-related injuries—for example, fracture or contusion as well as location on the body, and month of occurrence.

In addition, a survey of walker use was conducted in the office of a large pediatric practice in a metropolitan area in Maryland. Caregivers of prewalking infants visiting the office for well-child care were eligible to participate. Informational signs were posted in the waiting area, blank questionnaires were available beside the sign-in sheet, and a closed box with a drop slot was available to receive completed questionnaires. Closed-ended questions were used to obtain information about the characteristics of the caregivers, infants, homes, and walker use, including level of use and reasons for use.

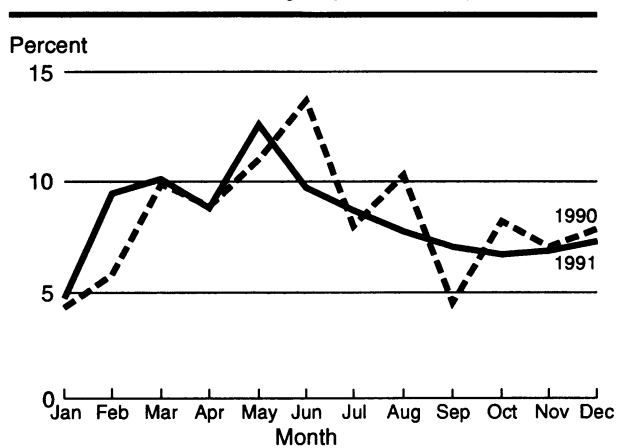
The sample consisted of 108 parents (91 percent mothers) of infants between the ages of 3 and 12 months (mean = 7.2 months). Among respondents, 80 percent were married, 30 percent were nonwhite, 60 percent were college graduates, and 47 percent were first-time parents. The infants' locomotor development reported by parents at the time of the survey ranged from immobile to walking with assistance.

Results

Injury estimates. In 1990, the CPSC's National Electronic Injury Surveillance System projected 22,925 walker-related injuries among children ages 0–4 years (6). For 1991, this estimate was 27,804. (Since walkers are rarely used after a child learns to walk, it is assumed that most of these children were infants, and not 2-, 3-, and 4-year-olds). The male:female ratio for reported injuries was 60:40 for both years. The distribution of projected injuries by month revealed a seasonal pattern for both years, with a slightly higher proportion of injuries occurring in spring and summer—March through August (see figure).

In both 1990 and 1991, most injuries were

Percent distribution of walker-related injuries by month, 1990-91, U.S. emergency rooms, 0-4 years



classified as either internal (including concussions) or as lacerations and contusions or abrasions (table 1). Although the nature of injury data was not broken down by age, since 96 percent of walker-related injuries were among children ages 0–4, these data should accurately represent the distribution of walker-related injuries among infants. More than 90 percent of these injuries involved the head or face (table 2).

Walker use survey. Of the infants in the pediatric practice sample, 71 (66 percent) were currently using walkers or had used one before the survey. The remaining respondents either had a walker but were not yet using it (15 percent) or did not have or use one (19 percent). Among current users, the frequency of walker use ranged from daily use (48 percent) to only 1 day per week (6 percent). Parents reported use of the walker in a typical day ranged from light use—less than 30 minutes (29 percent)—to heavy use—more than 2 hours (16 percent). Extent of walker use (days per week multiplied by amount of time used per day) was predicted by infant's age and parents' level of education via multiple linear regression ($R^2 = .19, P < .05$). Greater weekly use was associated with the infant's being older ($P < .05$) and the parent having less than a college degree ($P < .05$). In homes with stairs where walkers were in use, 29 percent of parents reported that they were not using gates to block the stairwells.

Using a checklist, parents reported reasons that they used the walker. Since they were permitted to check as many reasons as applied, percentages do not add to 100. Parents used walkers because (a) infants enjoyed them (77 percent), (b) they entertained the infants (71 percent), (c) they helped

Table 1. Percent distribution of the type of walker-related injuries in U.S. emergency rooms, ages 0–4 years, 1990–91 estimates

Injury type	1990		1991	
	Number	Percent	Number	Percent
Internal injury including				
concussion	5,189.7	21.6	6,969.5	24.1
Laceration	3,152.1	13.1	3,573.9	12.4
Contusions or abrasions ..	12,324.0	51.4	13,972.0	48.3
All other	3,329.1	13.9	4,397.6	15.2
Total	23,994.9	100.0	28,913.0	100.0

SOURCE: National Electronic Injury Surveillance System, Consumer Product Safety Commission, 1992.

Table 2. Percent distribution of the walker-related injuries by body part affected, U.S. emergency rooms, ages 0–4 years, 1990–91 estimates

Body part	1990		1991	
	Number	Percent	Number	Percent
Head	10,575.0	46.1	13,606.0	48.9
Face (includes mouth, eyeball, ear)	10,463.7	45.6	11,913.7	42.9
All other	1,886.0	8.3	2,284.2	8.2
Total	22,924.7	100.0	27,803.9	100.0

SOURCE: National Electronic Injury Surveillance System, Consumer Product Safety Commission, 1992.

infants learn to walk (49 percent), and (d) they helped manage the baby when the parents were busy (76 percent). Parents' level of education was negatively associated with one of their stated reasons for use of a walker, "helping the infant learn to walk," $\chi^2(1) = 9.91, P < .01$. A higher percentage of noncollege graduates (72 percent) reported using the walker to help the infant learn to walk than did college graduates (32 percent).

Discussion

The most recent CPSC data indicate that injuries related to walker use are continuing to occur in large numbers; such injuries primarily involve the head or face (6). In conversation with an employee of the Juvenile Product Manufacturers' Association (JPMA), we learned that potential exposure to walkers was at a high level in 1988, with an estimated 1,525,000 sold to retail stores. Information on retail sales was not available. Data from the sample in one pediatric practice indicated that 66 percent were currently using walkers or had used one, and that greater weekly use was associated

with a lower level of parental education. Clearly, one reason for continued occurrence of these potentially preventable injuries is that many infants are exposed to this hazard.

The use of a voluntary standard, in contrast to a mandatory standard, could contribute to the current level of walker-related injuries. Manufacturers do not have to make walkers that comply, and there is no governing body responsible for assuring that walkers actually meet the standard. The JPMA does invite manufacturers to voluntarily submit their walker safety standard test results to the JPMA independent testing laboratory to receive JPMA "certification" that the walker complies with the standard.

To assess availability of walkers that manufacturers claim are in compliance with F977–89, walkers offered for sale in two Maryland retail stores were examined. Of 12 different walker models on display, 3 (25 percent) were not tagged as "in compliance." Instructional literature was not displayed with any of the walkers, even those tagged as complying with the standard. Warning labels on all complying walkers were affixed underneath the tray portion of the walkers; they could not be seen when the walker was in use. Implementation of a mandatory standard with a mechanism for assuring compliance could result in safer walkers and more informed consumers.

Data from the survey conducted in the pediatric practice are limited due to the sampling technique and the sample size. However, data on the reasons why parents use walkers may provide insight into strategies to prevent injuries. Forty-nine percent of the parents reported using walkers to help their children learn to walk, but a growing body of evidence shows that walkers do not lead to earlier walking, and they may even delay the onset of walking (8,9).

Some manufacturers are reinforcing the belief that walkers promote the onset of walking in their advertisements. In one advertisement, walkers are promoted as useful for "practicing" walking, while another walker ad uses the slogan "our training wheels for tots." To counter these messages, health care professionals should teach parents that walkers do not help infants learn to walk.

Another frequently cited reason for using walkers was to manage the infant while the parent was busy, suggesting that infants are being left unattended in walkers. Health care professionals should counsel parents to use a crib or playpen when it is necessary for the infant to be out of their sight. This recommendation is consistent with the Ameri-

Examples of Measures to Prevent Walker-Related Injuries

1. *Prevent the creation of the hazard.* Ban the manufacture of walkers. (No new walkers would enter the stream of commerce although existing walkers could be used and re-used.)

2. *Reduce the amount of hazard that is created.* Ban the sale of walkers. (New and used walkers would not enter the stream of commerce). Reduce the speed of walkers so that "crash forces" would also be reduced. Limit the production of walkers.

3. *Prevent inappropriate release of the hazard or reduce the likelihood of release.* Promote a different type of walker with lower injury potential as a substitute. (For example, push-toy type walkers for children who can stand or walk with assistance). Promote the use of cribs or playpens as a safer substitute "containment device." Require prominent warning labels and literature to be included with all walkers sold. Adopt a mandatory standard and mechanism for monitoring compliance. Provide government incentives for private industry to create an alternative piece of equipment to entertain and contain the infant.

4. *Modify the rate or spatial distribution of the hazard from its source.* Redesign the walker to incorporate energy absorbing features adapted from motor vehicle design such as safety harnesses and rollover protection devices.

5. *Separate in time or space the hazard from that which is to be protected.* Health professionals could counsel parents to limit the amount of time their infant is in the walker, or walkers could be designed so that wheels would shut off after a time limit is

reached. Regulations could be promulgated which prohibit the use of walkers in day care centers and licensed day care homes.

6. *Interpose a material barrier between the hazard and that which is to be protected.* Promote use of helmets for all children using walkers to reduce the likelihood of head injury in a fall or collision. Recommend use of protective clothing, including covering extremities to prevent lacerations and contusions, and use of knee and elbow pads, as in other hazardous recreational activities. Promote use of gates to block stairs.

7. *Modify relevant basic qualities of the hazard.* Incorporate shock-absorbing bumpers into the walker design and an automatic braking system which stops the walker as soon as it hits a physical barrier.

8. *Increase the population's resistance to damage from the hazard.* Reduce the demand for walkers among parents by informing them of the injury potential, and discouraging walker use. Provide accurate information about infant motor development and walkers. Recommend that walkers not be used in homes with stairs and not be used out-of-doors due to uneven surfaces.

9. *Begin countering damage already done by the hazard.* Provide access to personnel trained in pediatric trauma so that injuries can receive proper treatment. Minimize the health consequences of sustained injuries.

10. *Stabilize, repair, and rehabilitate the injured person.* Provide medical care and therapy as needed. Recommend discontinuance of further use of walkers.

can Medical Association's position paper on use of infant walkers (10). Data on seasonality of injuries suggest that parents may be using walkers outside in spring and summer. Since outdoor surfaces are uneven, such use could lead to a higher likelihood of injury.

Finally, parents reported that they used walkers because their infants liked them. Older infants had greater weekly use of the walker, which could mean that they have learned to enjoy being in the walker. Clearly, most parents receive pleasure from watching a happily entertained infant, and this alone is a strong motivation for using any piece of equipment or toy. However, several parents indicated anecdotally that they decided to stop using a walker after an injury occurred. Alternative equipment that provides a similar entertainment value with less hazard to the infant could be designed.

Efforts to prevent walker-related injuries need to be increased and should include a number of options, one of which is to ban them entirely. Using the injury prevention framework devised by Haddon (11), we have identified a range of strategies which could help reduce walker-related injuries (see box). Strategies vary by their potential effectiveness. They also vary in the activities required to implement—from legislative activity (changes in the existing walker design standard or development of mandatory design standards) to educating parents by health care professionals.

Conclusion

The estimated number of walker-related injuries remains quite high. This is true in spite of the existence of voluntary walker safety standards.

Walker use is still widespread, as is the belief among some parents that they promote the onset of walking. Using Haddon's injury prevention framework, we have suggested multiple strategies for preventing walker-related injuries. These include banning the manufacture and sale of walkers, promulgation of a mandatory standard, redesign of the walker, design of walker alternatives, and consumer education to both reduce use and change patterns of use.

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