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Research Note

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Injuries Associated With Hazards Involving Motor Vehicle "Rollaways"

NHTSA's National Center for Statistics and Analysis (NCSA) recently examined data from the Consumer Product Safety Commission's (CPSC) National Electronic Injury Surveillance System (NEISS) on cases involving injuries associated with motor vehicle "rollaways." "Rollaways" are defined as situations in which a motor vehicle, after the transmission has been locked into a parked position, is believed to have rolled either forward or backward by the transmission purposefully or inadvertently moving or slipping into another gear position. NEISS data on persons treated in hospital emergency rooms for these injuries were examined to determine the action or activity involved in producing the injury, the injury diagnosis and severity, the body region most often injured, and the age of the injured person.

CPSC's NEISS collects data on a nationally representative sample of consumer product-related injuries treated in hospital emergency rooms. NEISS is a 3-level system consisting of surveillance of emergency room injuries, follow-back telephone interviews with injured persons or witnesses, and comprehensive investigations with injured persons and/or witnesses. NEISS obtains data from a sample of 79 of the 6,127 hospitals nationwide with at least six beds that provide emergency care on a continuing 24-hour basis. The data on injuries associated with motor vehicle rollaways were obtained through an agreement between NHTSA and CPSC to collect data on injuries associated with specific motor vehicle hazards that may not involve a police-reported motor

vehicle crash. Incidents that do not involve a police-reported motor vehicle crash would not be captured in NHTSA's major crash data collection systems, e.g., the Fatality Analysis Reporting System (FARS), the National Automotive Sampling System (NASS) and Special Crash Investigations (SCI). NHTSA has used NEISS data previously to examine injuries related to other specific types of hazards involving motor vehicles (see NHTSA Research Notes: *Injuries Associated with Hazards Involving Motor Vehicle Power Windows*, May 1997 and *Injuries Associated with Hazards Involving Motor Vehicle Batteries*, July 1997).

During a one-year study period, November 1, 1994 through October 31, 1995, data from 12 cases of injuries associated with motor vehicle rollaways were obtained from NEISS. Based upon these 12 cases, an estimated 590 persons nationwide were treated in hospital emergency rooms for injuries resulting from an activity involving the rolling away of a motor vehicle during the one-year period. Tables 1 through 9 provide additional details on the persons injured in incidents involving motor vehicle rollaways by the action or situation which produced the injury, the type of vehicle involved, the most severely injured part of the body, the injury diagnosis and severity, and the age and sex of the injured person, respectively. (The percentages may not add to 100% in every table due to rounding.)

As shown in Table 1, the types of situations reported by persons injured in motor vehicle rollaways appear to be associated with entering/exiting the vehicle or repairing the vehicle in some way. Slightly less than half (44%) of the persons injured in motor vehicle rollaways were injured as a result of being struck by the vehicle when attempting to reenter it in an effort to stop the vehicle. Twenty-eight percent (28%) of those injured sustained injuries as a result of being thrown from the vehicle while entering or exiting. Approximately 22% were injured as a result of being in a collision between the rollaway vehicle and a fixed object of some kind (e.g., telephone pole, light pole, fence, etc.). The remaining 6% sustained crush-type injuries as a result of the vehicle rolling off of a ramp.

Table 1
Estimated Number of Persons Injured in
MV Rollaways by Injury Producing Action
November 1994 - October 1995

Injury Producing Action	Estimated No. Of Injured Persons	% Total
Struck by Vehicle While Attempting to Reenter	262	44%
Thrown From and Run Over/Struck by Vehicle	165	28%
In Collision Between Rollaway Vehicle and Fixed Object	129	22%
Crushed by Vehicle Rolling Off Ramps	34	6%
Total	590	100%

Almost two-thirds of the vehicles involved in motor vehicle rollaways during the study period were classified as passenger cars. Light trucks or utility vehicles comprised the remaining 34%, as shown in Table 2. Of the vehicles involved in these rollaway-type incidents, almost 90% involved vehicles with rear-wheel drive, accounting for an estimated 519 injured persons. Four-wheel drive utility vehicles were involved 3% of the time and were responsible for an estimated 20 injured persons. Of the 12 rollaway cases obtained during the study, none specifically identified involvement of front-wheel drive vehicles, therefore, injury estimates cannot be made for incidents of this type. The conclusion cannot be made, however, that no persons are injured in incidents involving rollaways of front-wheel drive vehicles. It may be that very few front-wheel drive vehicles are involved in rollaways, and as a result, no cases were captured during the study period. It is also possible that front-wheel drive vehicles may be present in the category of vehicles with unknown drive axle type. The distribution of persons injured by type of vehicle power axle can be seen in Table 3.

Table 2
Estimated Number of Persons Injured in MV
Rollaways by Vehicle Type
November 1994 - October 1995

Vehicle Type	Estimated No. Of Injured Persons	% Total
Passenger Cars	390	66%
Light Truck/Utility Vehicles	200	34%
Total	590	100%

Table 3
Estimated Number of Persons Injured in MV
Rollaways by Vehicle Power Axle Type
November 1994 - October 1995

Vehicle Power Axle Type *	Estimated No. Of Injured Persons	%Total
Rear-Wheel Drive	519	88%
4-Wheel Drive	20	3%
Unknown Drive Axle Type	51	9%
Total	590	100%

*No cases involving front-wheel drive vehicles were identified during the study period, therefore, it was not possible to estimate persons injured in rollaways of front-wheel drive vehicles.

Table 4
Estimated Number of Persons Injured in
MV Rollaways by Injury Diagnosis
November 1994 - October 1995

Diagnosis	Estimated No. Of Injured Persons	% Total
Contusions	260	44%
Fracture	129	22%
Strain/Sprain	115	20%
Crushing	34	6%
Laceration	34	6%
Internal Organ Injury	17	3%
Total	590	100%

Forty-four percent (44%) of the 590 persons estimated to have been injured by motor vehicle rollaways were diagnosed as having contusions,

as shown in Table 4. About 22% (129) of the persons injured were diagnosed with fractures, while another 20% (115) were diagnosed with strains or sprains. For the remaining 86 estimated injured persons, the injury diagnosis ranged from lacerations to internal organ injuries.

Table 5 presents the injury severity distribution for the estimated number of injured persons in motor vehicle rollaways. While about 21% of those injured received a minor or serious diagnosis, the majority of sustained moderate injuries (79%).

Table 5
Estimated Number of Persons Injured in MV
Rollaways by Injury Severity
November 1994 - October 1995

Injury Severity	Estimated No. Of Injured Persons	%Total
Minor	71	12%
Moderate	468	79%
Serious	51	9%
Total	590	100%

A large majority (84%) of those persons estimated to have been injured in rollaway incidents were treated and released, as shown in Table 6. Approximately 16% (94) of the injured were hospitalized, almost twice as many as the estimated 9% of those diagnosed as having serious injuries [see Table 5].

Table 6
Estimated Number of Persons Injured in MV
Rollaways by Medical Disposition
November 1994 - October 1995

Medical Disposition	Estimated No. Of Injured Persons	%Total
Treated and Released	496	84%
Hospitalized	94	16%
Total	590	100%

Less than half (41%) of those injured in rollaway incidents sustained injuries to either the upper trunk of the body (16%) or the upper limbs (i.e., arms, wrist, fingers, 25%), as shown in Table 7. A roughly equal number of persons are estimated to have received injuries to the lower limbs and lower trunk (31%) or head and face (28%).

Table 7
Estimated Number of Persons Injured in MV
Rollaways by Most Injured Body Region
November 1994 - October 1995

Body Part Injured	Estimated No. Of Injured Persons	%Total
Upper Trunk	94	16%
Upper Limbs	149	25%
Lower Limbs	68	12%
Head/Face	163	28%
Lower Trunk	115	20%
Total	590	100%

Table 8 presents the distribution, by age, of the estimated number of persons injured in incidents involving motor vehicle rollaways. The proportion of injured persons is almost evenly

distributed among the two age groups of 0 - 14 years (22%), 15 - 29 years (28%), while only 11% of those injured were in the 30 - 44 years age group. It is interesting to note the proportion of persons injured aged 60 and above represents 39% of the total. The proportion of persons injured in this age group is much larger for rollaway incidents than for other types of motor vehicle hazards, e.g., battery explosions and radiator cap scalding. For example, none of the persons injured in incidents involving battery explosions were 60 years of age or older, and approximately 4% of those estimated injured by radiator cap scalding were in this age group. (See *Injuries Associated with Specific Motor Vehicle Hazards: Radiators, Batteries, Power Windows, and Power Roofs*, DOT-HS-808-598, July 1997.)

Table 8
Estimated Number of Persons Injured
in MV Rollaways by Age
November 1994 - October 1995

Age of Person	Estimated No. Of Injured Persons	% Total
0 - 14 Years	129	22%
15 - 29 Years	166	28%
30 - 44 Years	63	11%
Over 60 Years	232	39%
Total	590	100%

The proportion of persons injured in incidents involving rollaways is evenly distributed when it comes to gender, as shown in Table 9. Females represent about 51% of the estimated number of people injured in these incidents while males represent 49%.

Table 9
Estimated Number of Persons Injured in MV
Rollaways by Gender
November 1994 - October 1995

Gender	Estimated No. Of Injured Persons	%Total
Female	298	51%
Male	292	49%
Total	590	100%

For additional copies of this research note, please call (202) 366-4198 or toll free, 1-800-934-8517. For questions, please contact Keith Poindexter at (202) 366-0018 or Kenneth Hardie at (202) 366-6987. This research note and other general information on traffic safety may be accessed by Internet users at <http://www.nhtsa.dot.gov/people/nca>.