

Amusement Ride Injuries... Serious Business!

According to a recent study focusing on twenty years (1990-2010) of emergency room reports, more than 4,400 children are treated each year for injuries involving amusement rides. The study, published in the May 2013 issue of Clinical Pediatrics, found that the head and neck region were the most frequently injured areas, followed by the arms, face and legs. Soft tissue injuries and strains and sprains were the most prevalent, but broken bones were also common. The most frequent causes of injury were falls (especially off or against the ride while entering or exiting) and being struck by the ride.

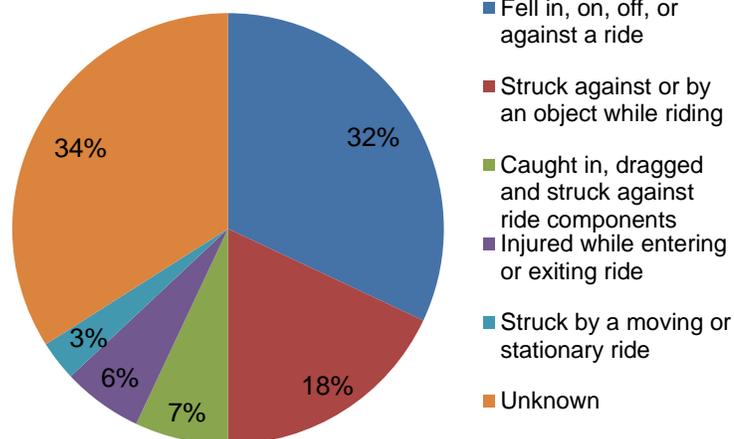


Fixed and mobile rides including roller coasters, bumper cars, merry-go-rounds, log flumes, alpine slides, mechanical bulls, mini-train rides and coin-operated rides were included in the study.

Key findings from this study include:

- Fixed rides accounted for 34% of the injuries. Mobile rides accounted for 29% and coin-operated rides were involved in 12% of the injuries.
- With a majority of the injuries resulting from falling in, on, off, or against a ride, there may be opportunities to improve rider safety by:
 - Enhancing ride restraints, access, loading and unloading

Percent of Total Injuries



Source: Clinical Pediatrics, May 2013



- Improving restraints, secondary restraints and restraint inspections
- Strengthening operator training and enforcement of safe rider conduct
- Training operators to be held accountable for diligently observing rider conduct from loading to unloading
- Ride malfunction was cited as a contributing factor in just 3.5% of injuries, illustrating that ride design, management, and operation may be the greatest opportunities to improve rider safety.

The ASTM International Committee on Amusement Rides and Devices, F24, has published 16 voluntary standards addressing safe ride design, maintenance, and operation. Ride owners and operators should assure that they meet these requirements. The following link lists a few safety practices that ride owners should follow.

Operator training

- Assure that ride operators are fully trained in safe ride operation and emergency procedures. Training should include supervised observations until operators have demonstrated good safe ride handling capabilities. Routine observations by management should continue and additional training should be provided as needed.
- Prominently display rider qualifications, warnings and safety rules. Operators must be knowledgeable of the rules, enforce them and prohibit access to anyone who may pose a hazard to themselves or others.
- Operators should be trained to keep a close eye on teenagers and young children. Teenagers often perceive ride safety restraints as a challenge to conquer, while young riders, especially those under 8 years old, may become frightened during the ride and attempt to escape.
- Oversized riders and those with special needs may pose challenges that operators need to be trained to handle.
- Operators should conduct a documented daily pre-opening inspection of each ride, including all passenger-carrying devices, restraints and latches, and all entrances, exits, stairway and ramps. Test all communication equipment necessary for operating the ride and operate the ride at least one full cycle before carrying passengers.
- Operator stations should be designed so that the operator can continually observe all riders. This will enable them to stop the ride if they observe a patron defeating a restraint or leaving a safe riding position.
- Regular ride inspection should be conducted to identify inoperative restraints, missing safety devices, sharp edges, corners, protruding components, missing or damaged parts, or other conditions that may increase the severity of an injury. When identified, the ride should be removed from service until repairs are made.

Restraint safety

- Falls are a leading cause of ride-related injuries and rider restraints are critical in preventing these injuries. To assure optimal safety, ride owners should contact the manufacturers to determine if:



- Existing restraints are or can be made more tamper-resistant, especially for rides designed for children under 8 years old
- Additional secondary restraints are available
- Restraint systems can be made fail-safe, prohibiting the ride from operating or stopping if a restraint is not secured or is defeated.
- The operating station can be modified or re-located to improve rider observations. Operators should be able to view riders to detect restraint defeat or failure or the ride should be designed to alert the operator or disrupt operation safely in the event of restraint failure.

Maintenance and inspection

- Owners should have a scheduled, documented inspection and maintenance program in place, specific to each ride.
- Ride maintenance and inspections must follow the manufacturer's specifications and maintenance staff should be trained to these requirements. Maintenance and inspections should **only** be performed by trained staff. Ride-specific inspection and maintenance checklists should be used to assure proper completion, observations of ride inspections and maintenance should be routinely performed by management and records should be maintained.
- Ride maintenance staff should perform daily, documented and signed pre-opening inspections of all rides. These inspections should include:
 - All passenger carrying devices, restraints and latches
 - Entrances, exits, stairways, and ramps
 - Fencing, guarding and barricades
 - Ride structure
 - Testing of all:
 - Communication equipment needed for ride operation
 - Automatic and manual safety devices
 - Brakes: including service, emergency, parking, and back stops
 - Daily inspections must include a minimum of one complete ride cycle
 - These inspections should also be performed immediately following an unscheduled cessation of operation, due to a rider injury, malfunction, significant adjustment, mechanical, electrical, or operational modification or an environmental condition.



- Only manufacturer's approved ride replacement parts and drawings should be used. Manufacturer's notices of ride maintenance and inspection changes should be retained, dated and immediately incorporated into your inspection and maintenance program.

Record retention, reporting and analysis

Many jurisdictions require ride owners to report and maintain specific operator, maintenance, inspection and injury records. Ride operators should meet these minimum requirements. A recordkeeping program that also includes analyses of these records can go a long way toward improving safety. Ride-specific injury records detailing the event, cause and contributing factors can be used to identify safety opportunities and monitor the effectiveness of these changes once implemented. Documented ride inspection and maintenance records are also key to claim defense. They illustrate the efforts made to provide a safe amusement ride for the general public.

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