

# Childhood Injuries From Power Lawn Mowers

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Children receive injuries from lawnmowers in a variety of ways, but the most severe injuries frequently occur from contact with the rotating blades of the lawn mower. These injuries, like most unintentional injuries, can be avoided and prevented.

This report summarizes childhood (ages 2 years to 16 years) injuries due to power lawn mowers (including riding power lawn mowers) based on data from two separate sources: the National Electronic Information Surveillance System (NEISS) for the United States for 2000-2002, and the Indiana 2002 Hospital Discharge Database. NEISS, operated by the U.S. Consumer Product Safety Commission (CPSC), is a database representing a national probability sample of hospitals in the U.S. and its territories. Patient level information is collected from 66 NEISS hospitals for every emergency department visit involving an injury associated with a consumer product. In the 2002 Indiana hospital discharge database, an injury-related hospitalization from power lawn mowers is defined as any person who was assigned a principle diagnosis (ICD-9-CM) code ranging from 800-999 and a supplemental External Cause of Injury Code (E code) of E920.0. It should be noted that only 44% of injuries in the hospital discharge database have an E code, so the Indiana data may be an underestimate of the number of lawnmower injuries that actually occur. In addition, E code 920.0 does not differentiate between riding mowers and other power lawn mowers.

## NEISS Database Analysis

This analysis specifically focused on injuries related to **riding** mowers. Based on NEISS data, there were 112 U.S. children between the ages of 2 and 16 years who were treated in hospital emergency rooms from January 1, 2000 to December 31, 2002 for injuries sustained by riding power lawn mowers. Among these, 20 percent were either admitted for hospitalization or treated and transferred, presumably to another hospital. One child sustained injuries that resulted in death. Based on this data, NEISS estimates that 1,700 to 2,000 youth each year sustain riding lawn mower injuries in the U.S.

NEISS case-specific data providing demographic information and surrounding circumstances is available only for year 2002. However, for previous years (2000-2001), there were 80 children between the ages of 2 and 16 years who presented in a hospital emergency department for riding mower injuries. Among these, 19 percent (15) were hospitalized or transferred. In 2001, 62 percent (8/13) of the children admitted for hospitalization were between the ages of 2 and 7 years. Four had injuries serious enough to require amputation and two were admitted for deep lacerations.

In our analysis of the U.S. case-specific data for 2002, 32 children were evaluated in a hospital emergency department for riding mower injuries. Among these 24 were treated and released, 7 were admitted for hospitalization or treated and transferred, and 1 died while in the ED, thus 25% received injuries resulting in hospitalization or death. It should be noted that among the 7 hospitalized or transferred, **six were age 3 to 5 years (86%)**. The majority of these preschooler injuries involved deep cutting traumatic injuries of the feet and toes, 5 of which required some degree of amputation. The patient who died was an 11-year-old who sustained a fracture in the neck from running into a branch while operating the riding mower.

Among those treated and released (n=24) in 2002, males dominated by a 2 to 1 ratio. The ages ranged from 5 to 15 years, with one-fourth under age 6 years. Forty-one percent (10) of the injuries resulted in lacerations. Other injuries included contusions and abrasions (8), fractures (2) and other unspecified injuries (4). The majority of the injuries were to the legs, feet, or toes. Other injuries were to the hand or fingers (5), head or face (5), trunk or shoulder (3), and total body (1). Common circumstances resulting in injury included 7 children (29%) operating the riding mower, which then flipped over or ran over a body part (age range from 8 to 15 years) and another 7 cases where a parent or relative was operating the riding mower with a child aboard, where the child fell off and sustained an injury, usually through contact with the mower blades (age range from 3 to 9 years). Two cases involved a mower collision with another object or vehicle containing a child, who then received injury from contact with the mower. Other cases include 2 children with cuts to the finger from touching the mower blade in the store, a 3-year-old who burned her hand by touching the hot exhaust vent after mowing was completed, and 5 injuries which did not involve mower blade contact.

## **Hospitalizations, Indiana hospital discharge database, 2002**

In Indiana, there were 13 people admitted for hospitalization due to power lawn mower-related injuries, based on a query for injury hospitalizations resulting from power lawn mowers. Hospitalizations were more frequent among males (77 percent) and ages ranged from 4 to 55 years. Four cases (or 30 percent) involved children and adolescents age 4 to 15 years. Injuries included amputation (toe), fracture, open wound of the chest wall, and complicated wound of the foot. As noted less than half of all injury-related hospitalizations are E coded, so the 13 admissions may be a low figure.

## **Conclusion**

Power mower-related injuries frequently occur among children and are more common among males. Parent surveys completed in the early 1980s revealed that one-third of parents allowed their child in the yard while the lawn mower was in use—in suburban and rural areas this figure was 46%. Childhood power mower injuries occur from young children falling or slipping into the operating mower blade while playing and running nearby, by riding mowers running over children who fall off while riding on them, by mowers placed into reverse and the operator is not aware a child is behind them, and by rocks or other objects thrown by the mower striking a child, especially in the eyes or the head. In this study of NEISS 2002 data, 6 out of 10 children injured resulted from circumstances where the school-age child or young adolescent was either operating the mower or the younger child was riding on the mower with a parent who was the operator.

**In Indiana, 30% of the 2002 cases involved children below 16 years of age, who represent only 20% of the population, thus youth are disproportionately affected by these maiming injuries resulting mainly from riding mowers. Of special concern, supported by the U.S. data extracted from the NEISS database, are the 20% of children in 2001-2002 who required hospitalization due to the severity of their injuries, with the majority (70%) being between the ages of 2 and 7 years.** Many of the injuries from mower blade contact require amputation of portions of the foot or toes. These injuries frequently require multiple surgical operations to repair the body parts affected, and an extensive rehabilitation program to regain body function. The aftermath from the severe cutting/amputation injuries often results in permanent disfigurement. The resulting injury, or death following an injury, can be emotionally overwhelming, especially when the injuries relate to the mower being operated by a parent or relative of the victim. Prevention of such injuries should be included in all injury prevention efforts.

To prevent these injuries from occurring among children, the American Academy of Pediatrics recommends the following tips:

- While the lawn is being mowed, keep others, especially young children, away to ensure their safety.
- Do not allow children younger than 16 to use riding mowers. Do not allow children younger than 12 to use walk-behind mowers.
- Only use a power mower with a control that stops the mower if the handle is released. This control should never be disconnected.
- Make sure that blade settings (to set the wheel height or dislodge debris) are done by an adult with the mower off and the spark plug removed or disconnected.
- Prevent injuries from flying objects, such as stones or toys, by picking up objects from the lawn before mowing begins. Use a collection bag for grass clippings or a plate that covers the opening where cut grass is released. Have anyone who uses a mower wear protective eyewear.
- Make sure that sturdy shoes (not sandals or sneakers) are worn while mowing.
- Start and refuel mowers outdoors, not in a garage or shed. Mowers should be refueled with the motor turned off and cool.

## Commentary

Each spring emergency department and pediatric staff in hospitals begin to see injuries related to power lawn mowers, which then continue through the warm weather months when grass is growing. Twenty years ago one of the authors (CG) investigated children admitted to one Indianapolis hospital who sustained riding mower injuries as described above (preschoolers predominately affected by debilitating injuries), and it is discouraging that such injuries continue to occur. Especially alarming is the disproportionate share of young children and adolescents affected, and the severe injuries that preschool-age children receive from riding mowers. Health care providers need to educate families about the injury risks posed by power lawn mowers, particularly riding mowers. They also need to emphasize that young children should not be allowed in the yard or area being mowed while the mower is in operation because young children have no realistic concept of the dangers of power mowers. Children should never be allowed to “go for a ride” on the riding mower, as the risk of falling into the path of the mower blade is high. Families are often more aware of the risk of an object being propelled by a mower than of the severe cutting force posed by the rotating mower blade. The majority of power mower-related injuries are preventable, and certainly the injuries sustained by young children are entirely preventable if children are not allowed in the vicinity of the mower.

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