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# All-Terrain Vehicle–Related Nonfatal Injuries Among Young Riders in the United States, 2001 –2010

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# All-Terrain Vehicle–Related Nonfatal Injuries Among Young Riders in the United States, 2001–2010

**WHAT'S KNOWN ON THIS SUBJECT:** Because children often lack the physical strength, cognitive abilities, and fine motor skills to operate all-terrain vehicles (ATVs) properly, their risk of injury is greater.

**WHAT THIS STUDY ADDS:** During 2001–2010 in the United States, ~361 000 children aged ≤15 years were injured while riding ATVs. The decline in the injury rate during 2005–2010 might be related to the economic recession and decreased sales of new ATVs.


## abstract

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**OBJECTIVE:** To estimate the numbers and rates of all-terrain vehicle (ATV)–related nonfatal injuries among riders aged ≤15 years treated in hospital emergency departments (EDs) in the United States during 2001–2010.

**METHODS:** National Electronic Injury Surveillance System–All Injury Program data for 2001–2010 were analyzed. Numbers and rates of injuries were examined by age group, gender, primary body part injured, diagnosis, and hospital admission status.

**RESULTS:** During 2001–2010, an estimated 361 161 ATV riders aged ≤15 years were treated in EDs for ATV-related injuries. The injury rate peaked at 67 per 100 000 children in 2004 and then declined to 42 per 100 000 children by 2010. The annualized injury rate for boys was double that of girls (73 vs 37 per 100 000). Children aged 11 to 15 years accounted for two-thirds of all ED visits and hospitalizations. Fractures accounted for 28% of ED visits and 45% of hospitalizations.

**CONCLUSIONS:** The reasons for the decline in ATV-related injuries among young riders are not well understood but might be related to the economic recession of the mid-2000s and decreased sales of new ATVs. Although many states have regulations governing children's use of ATVs, their effectiveness in reducing injuries is unclear. Broader use of known effective safety measures, including prohibiting children aged ≤15 years from riding adult-sized ATVs, always wearing a helmet while riding, not riding on paved roads, and not riding as or carrying a passenger could additionally reduce ATV-related injuries among children. Last, more research to better understand ATV crash dynamics might lead to safer designs for ATVs. *Pediatrics* 2013;132:282–289



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**KEY WORDS**

all-terrain vehicles, pediatric injuries, injury prevention, epidemiology, accidents


**ABBREVIATIONS**

ATV—all-terrain vehicle
CI—confidence interval
CPSC—Consumer Product Safety Commission
ED—emergency department
GAO—Government Accountability Office
NEISS-AIP—National Electronic Injury Surveillance System–All Injury Program

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All-terrain vehicles (ATVs) are motorized, gasoline-powered vehicles, weighing up to 1000 pounds, with oversized, low-pressure tires, a seat to be straddled by the user, and handlebars for steering. These vehicles are designed primarily for use by riders on off-road, nonpaved surfaces. As ATV use gained in popularity over the past 30 years, ATV-related fatalities and nonfatal injuries have increased among both children and adults.[1–7] Because children often lack the physical strength, cognitive abilities, and fine motor skills to operate ATVs properly, their risk for injury is greater.[8] By 2001, an estimated 7.2 million (11%) children aged ≤15 years had ridden an ATV at least once in the previous year.[1] There were 133 ATV-related deaths among this age group in 2001, representing 26% of all ATV-related deaths, and an estimated 34 300 children were treated in hospital emergency departments (EDs), accounting for 31% of all ED-treated ATV injuries. By 2004, ATV-related deaths among children aged ≤15 years had increased to 182 (24% of the total), with ED-treated injuries rising to 44 700 (33% of the total).[1] This increase may have been due, in part, to the increased number of ATVs in use, from 4.9 million in 2001 to 7 million in 2004.[7]

Previously, Shults et al[3] described ATV-related nonfatal injuries among riders aged ≤15 years who were treated in EDs during the 3-year period of 2001–2003. This study adds 7 years of data, providing a 10-year timeframe (2001–2010), to assess trends and demographic characteristics of injury among this young ATV rider group.

## METHODS

### Data

Estimates for ATV-related injuries among riders aged ≤15 years were obtained from the US Consumer Product Safety Commission's (CPSC's) National Electronic Injury Surveillance System–All Injury Program (NEISS-AIP). This database is a nationally representative, stratified probability sample taken annually from ~66 hospitals that have at least 6 beds and 24-hour ED services. The hospitals that participate in the NEISS-AIP are a subset of the ~100 NEISS hospitals. The NEISS monitors consumer product–related nonfatal injuries, whereas the NEISS-AIP monitors all nonfatal injuries regardless of whether they are product-related.[9,10] The data are abstracted from medical records of initial ED visits due to all types and causes of nonfatal injuries and poisonings treated in EDs. For this study, NEISS-AIP data housed at the Centers for Disease Control and Prevention were used because they contain the full brief narratives abstracted from the medical records, which are not available to the public.

### Analysis

The analysis included children aged ≤15 years whose NEISS-AIP record indicated that they had sustained an ATV-related injury during 2001–2010. We reviewed the narrative portion of each record ($n$ = 5991) and excluded 519 cases in which the patient was not riding the ATV (eg, patient injured while being pulled on a sled behind an ATV) or if ridership could not be clearly determined, which left 5472 cases. ATV-related injuries were classified by age, gender, diagnosis, primary body part injured, and disposition from the ED. Diagnosis and primary body part injured were classified according to the most severe presenting injury.[10] National estimates of the number of injuries were produced by weighting cases by the inverse of the probability of selection.[11] The linear trend of the annual number of injuries during the 10-year study period was examined, and tests of significance were produced by using Joinpoint regression software (National Cancer Institute, Bethesda, MD).[12] The model was constrained to identify at most 1 change in the trend, due to the limited number of years under study. Annual injury rates per 100 000 children aged ≤15 years were calculated by using US Census Bureau population estimates for 2001–2010.[13] Annualized rates per 100 000 children for the 10-year period were calculated by dividing the sum of the annual estimate of injuries by the sum of the annual population of children aged ≤15 years (Table 1). To account for the complex sampling design, SUDAAN, release 10.0.1 (RTI International, Research Triangle Park, NC), was used to calculate 95% confidence intervals (CIs) for the estimated counts. $\chi^2$ Tests were used to test differences between proportions. The distributions of diagnosis and primary body part injured by age among hospitalized children are based on unweighted data because of small cell sizes and therefore cannot be considered national estimates.

## RESULTS

### Injury Estimates and Rates

ATV-related injuries among riders aged ≤15 years increased 35% from an estimated 32 280 in 2001 to 43 450 in 2004 (test for trend, $P$ = .07), then decreased 37% between 2004 and 2010 to 27 517 (test for trend, $P < .01$) (Fig 1). The corresponding population-based injury rates increased 34% from an estimated 50 per 100 000 children aged ≤15 years in 2001 to 67 per 100 000 in 2004 ($P$ = .07), then declined 37% to 42 per 100 000 in 2010 ($P < .01$). Although the number of ATV-related injuries fluctuated over time, the age and gender of the children treated, characteristics of their injuries, and the proportion of those injured who were

**TABLE 1** Estimated Average Annual Number, Percentage, and Annualized Rate per 100 000 Population of ATV-Related Injuries Among Riders Aged ≤15 Years Presenting to Hospital EDs by Age Group, Gender, and Selected Injury Characteristics: United States, 2001–2010

| Characteristic | Boys | | | | Girls | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *n* | %[a] | Rate | 95% CI | *n* | %[a] | Rate | 95% CI | *n* | %[a] | Rate | 95% CI |
| Age group | | | | | | | | | | | | |
| 0–15 years | 24 238 | 100 | 73 | 55–91 | 11 876 | 100 | 37 | 28–47 | 36 114 | 100 | 56 | 42–69 |
| 0–5 years | 2202 | 9 | 18 | 13–23 | 987[b] | 8 | — | — | 3189 | 9 | 13 | 10–17 |
| 6–10 years | 6076 | 25 | 59 | 44–75 | 3127 | 26 | 32 | 24–40 | 9204 | 26 | 46 | 34–58 |
| 11–15 years | 15 960 | 66 | 150 | 112–188 | 7761 | 65 | 77 | 56–97 | 23 721 | 66 | 114 | 85–143 |
| Diagnosis | | | | | | | | | | | | |
| Fracture | 7066 | 29 | 21 | 16–27 | 2892 | 24 | 9 | 7–12 | 9958 | 28 | 15 | 11–19 |
| Contusion/abrasion | 6057 | 25 | 18 | 14–23 | 3647 | 31 | 12 | 9–14 | 9704 | 27 | 15 | 11–19 |
| Laceration | 4106 | 17 | 12 | 10–15 | 1316 | 11 | 4 | 3–5 | 5422 | 15 | 8 | 7–10 |
| Strain/sprain | 2390 | 10 | 7 | 5–9 | 1662 | 14 | 5 | 4–7 | 4052 | 11 | 6 | 5–8 |
| Internal injury | 2026[b] | 8 | — | — | 1023[b] | 9 | — | — | 3049[b] | 8 | — | — |
| Concussion | 802[b] | 3 | — | — | 420[b] | 4 | — | — | 1222 | 3 | 2 | 1–3 |
| Burn (thermal) | 428[b] | 2 | — | — | 264[b] | 2 | — | — | 692[b] | 2 | — | — |
| Other | 1362 | 6 | 4 | 3–5 | 652[b] | 6 | — | — | 2014 | 6 | 3 | 2–4 |
| Primary body part injured | | | | | | | | | | | | |
| Head/face/neck | 6971 | 29 | 21 | 14–28 | 3400 | 29 | 11 | 7–15 | 10 371 | 29 | 16 | 11–21 |
| Arm/hand | 6082 | 25 | 18 | 14–22 | 3477 | 29 | 11 | 9–13 | 9560 | 27 | 15 | 12–18 |
| Leg/foot | 6353 | 26 | 19 | 14–24 | 2925 | 25 | 9 | 7–12 | 9279 | 26 | 14 | 11–18 |
| Upper trunk | 3047 | 13 | 9 | 7–12 | 1204 | 10 | 4 | 3–5 | 4251 | 12 | 7 | 5–8 |
| Lower trunk | 1444 | 6 | 4 | 3–6 | 650[b] | 6 | — | — | 2094 | 6 | 3 | 2–4 |
| Other | 187[b] | <1 | — | — | 133[b] | 1 | — | — | 320[b] | <1 | — | — |
| Unknown | 154[b] | <1 | — | — | 85[b] | <1 | — | — | 239[b] | <1 | — | — |
| Disposition | | | | | | | | | | | | |
| Treated/released | 20 809 | 86 | 63 | 48–78 | 10 386 | 88 | 33 | 25–40 | 31 194 | 86 | 48 | 37–59 |
| Hospitalized | 3160 | 13 | 10 | 5–14 | 1383 | 12 | 4 | 2–6 | 4542 | 13 | 7 | 4–10 |
| Other | 261[b] | 1 | — | — | 108[b] | <1 | — | — | 369[b] | 1 | — | — |
| Unknown | 8[b] | <1 | — | — | 0[b] | 0 | — | — | 8[b] | <1 | — | — |

—, rates and CIs were not calculated on unstable estimates.

[a] Some percentages do not total 100% because of rounding.

[b] Estimates are unstable because the coefficient of variation was >30%, the unweighted number of sample cases was <20, or the weighted estimate was <1200. Rates and CIs were not calculated on unstable estimates.

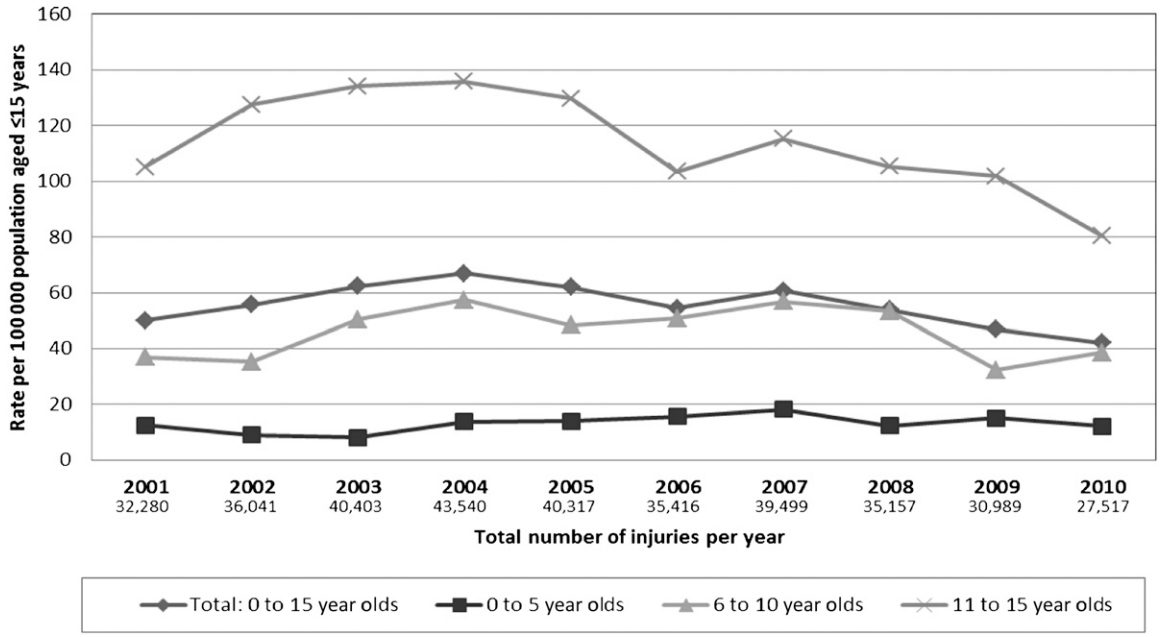


**FIGURE 1**
Estimated annual number and rate per 100 000 population of ATV-related injuries among riders aged ≤15 years presenting to hospital EDs by age group and year: United States, 2001–2010.

hospitalized did not vary substantially throughout the decade.

During 2001–2010, an estimated 361 161 children aged ≤15 years were treated in hospital EDs for nonfatal injuries sustained while riding ATVs. The overall annualized rate of injuries was 56 per 100 000. Children aged 11 to 15 years, who accounted for nearly two-thirds of all ED-treated ATV injuries in the study population, had an annualized rate of 114 per 100 000; boys in this age group had the highest rate (150 per 100 000) across all gender and age groups (Table 1). For each age group, the injury rate for boys was approximately twice the rate for girls (Table 1). The age distribution of injured children did not vary substantially by gender ($P = .67$).

**TABLE 2** Distribution of ATV-Related Injuries Among Riders Aged ≤15 Years Presenting to Hospital EDs, by Age Group and Selected Characteristics: United States, 2001–2010

| | 0–5 Years ($n = 31\,913$) | 6–10 Years ($n = 92\,035$) | 11–15 Years ($n = 237\,213$) | Total ($n = 361\,161$) |
|---|---|---|---|---|
| Diagnosis | | | | |
| Fracture | 20 | 29* | 28* | 28 |
| Contusion/abrasion | 23 | 29* | 27 | 27 |
| Laceration | 26 | 18* | 12* | 15 |
| Strain/sprain | —[a] | 8 | 14 | 11 |
| Concussion | —[a] | 3 | 4 | 3 |
| Burn (thermal) | 9 | 2* | 1* | 2 |
| Other | 8 | 4* | 6 | 6 |
| Internal injury | —[a] | —[a] | —[a] | —[a] |
| Primary body part injured | | | | |
| Arm/hand | 21 | 30* | 26 | 27 |
| Leg/foot | 15 | 23* | 28* | 26 |
| Head | 18 | 15 | 16 | 16 |
| Upper trunk | 9 | 10 | 13* | 12 |
| Face/mouth | 31 | 13* | 7* | 11 |
| Lower trunk | —[a] | 7 | 6 | 6 |
| Neck | —[a] | 2 | 2 | 2 |
| Other | —[a] | —[a] | —[a] | —[a] |
| Unknown | —[a] | —[a] | —[a] | —[a] |

Data are presented as percentages. Some percentages do not total 100% because of rounding.
*Significantly different from 0–5 Years, $P < .05$.
[a] Estimates are unstable because the coefficient of variation was >30%, the unweighted number of sample cases was <20, or the weighted estimate was <1200.

## Diagnosis

Fractures and contusions or abrasions collectively accounted for 55% of ED visits (Table 1). Fractures accounted for 29% and 28% of injuries among children in the 2 older age groups (aged 6–10 years and 11–15 years, respectively) and 20% among children aged 0 to 5 years (Table 2). Lacerations accounted for 26% of injuries among the youngest children, 18% among children aged 6 to 10 years, and 12% among children aged 11 to 15 years. The distribution of diagnosis varied by gender ($P < .01$) (Table 1). Contusions or abrasions (31%) were the most common diagnosis among girls, whereas fractures (29%) were most common among boys.

## Primary Body Part Injured

The body part with the most severe injury varied by age (Table 2). Among children aged 0 to 5 years, face or mouth injuries were most common, accounting for 31% of ED visits. Among the 2 older age groups, upper and lower extremity injuries were about equally common, together accounting for >50% of all injuries in both age groups (Table 2). The distribution of the body part most severely injured varied statistically by gender ($P = .02$), but no large, notable differences existed (Table 1).

## Disposition

Eighty-six percent of the children with ATV-related injuries were treated and released from the ED; the proportion of children hospitalized was similar for boys and girls (13% and 12%, respectively) (Table 1) and across age groups (12%–13%). The hospitalization rate among boys (10 per 100 000) was more than double that of girls (4 per 100 000) (Table 1). Children aged 11 to 15 years accounted for two-thirds of hospitalizations.

Compared with ED visits for all injuries among children aged ≤15 years, those with ATV-related injuries were nearly 7 times as likely to be hospitalized (13% vs 2%).[9] Compared with ED visits for motor vehicle crash injuries among children, those with ATV-related injuries were twice as likely to be hospitalized (13% vs 6%).[9] Based on unweighted data, the diagnoses accounting for the largest proportion of hospitalizations among the injured ATV riders were fractures (45%) and internal injuries (32%) (Table 3). The head was the most common body part injured among hospitalized children in each age group, accounting for 33% to 38% of all hospitalizations, followed by leg or foot injuries (17%–24%).

## DISCUSSION

During 2001–2010, >361 000 children aged ≤15 years were treated in hospital EDs for nonfatal injuries sustained while riding ATVs. The annual population-based injury rate peaked at 67 per 100 000 children in 2004, and by 2010 had declined by 37% to 42 per 100 000 children. According to the CPSC, the proportion all ATV-related injuries that occurred among children aged ≤15 years declined from a high of 33% in both 2002 and 2004

**TABLE 3** Unweighted Distribution of ATV Riders Aged ≤15 Years Hospitalized, by Age Group and Selected Characteristics: United States, 2001–2010

| | 0–5 Years (*n* = 87) | 6–10 Years (*n* = 243) | 11–15 Years (*n* = 644) | Total (*n* = 974) |
|---|---|---|---|---|
| Diagnosis | | | | |
| Fracture | 44 | 44 | 45 | 45 |
| Internal injury | 30 | 31 | 33 | 32 |
| Laceration | 9 | 9 | 7 | 7 |
| Other | 8 | 7 | 6 | 7 |
| Contusion/abrasion | 6 | 5 | 5 | 5 |
| Concussion | 2 | 3 | 5 | 4 |
| Strain/sprain | 0 | <1 | <1 | <1 |
| Burn (thermal) | 1 | 0 | <1 | <1 |
| Primary body part injured | | | | |
| Head | 38 | 33 | 37 | 36 |
| Leg/foot | 17 | 20 | 24 | 23 |
| Arm/hand | 17 | 15 | 12 | 14 |
| Upper trunk | 9 | 12 | 10 | 10 |
| Lower trunk | 6 | 9 | 8 | 8 |
| Face/mouth | 8 | 8 | 6 | 7 |
| Neck | 4 | 3 | 2 | 2 |
| Other | 0 | <1 | <1 | <1 |
| Unknown | 1 | 0 | <1 | <1 |

Data are presented as percentages.

to 25% in 2010.[7] A similar pattern occurred for ATV-related fatalities among children, with reported deaths peaking in 2004 at 184 and declining to 94 in 2009 (2010 reporting is ongoing).[7] In addition, the proportion of all ATV-related deaths that occurred among children aged ≤15 years declined from 26% in 2001 to 14% in 2009, which is a 46% reduction.[7] However, based on our findings related to diagnosis and proportion of ED patients hospitalized, the severity of nonfatal ATV-related injury appears to have remained constant over the decade. On average, 13% of ATV-related injuries among children ≤15 years resulted in hospitalization each year, a rate nearly 7 times higher compared with ED visits for all injuries and 2 times higher compared with motor vehicle occupant injuries among children aged ≤15 years.

Estimates presented in this article differ somewhat from those produced by the CPSC.[7] For example, the CPSC estimated that 28 300 children aged ≤15 years were treated in EDs for ATV-related injuries in 2010, compared with our estimate of 27 517. Although not statistically different, this small difference is possible for several reasons. The CPSC derives data from a probability sample of ~100 NEISS hospitals, whereas estimates in this article were derived from a subsample of ~66 hospitals that participate in the NEISS-AIP.[11] In addition, the CPSC includes all ATV-related injuries regardless of whether the child was riding the ATV and adjusts its estimates downward by ~8% to compensate for incorrect classification, whereas we reviewed narratives abstracted from the patient's ED medical record and excluded cases in which the injured child was not riding or rider status could not be determined.

There are several limitations to the findings presented in this article. The NEISS-AIP provides national estimates and does not allow for estimates by region, state, or local jurisdiction. Some areas with previously reported high rates of ATV-related injury, such as Alaska and West Virginia,[14] are not represented in the database. There were a few changes in the sample of hospitals in NEISS-AIP (dropouts and replacements) during 2001–2010. However, these changes should not have had an appreciable impact on the ATV injury estimates because sample weights were calculated and redistributed monthly on the basis of the contributing hospitals.[11] Because the NEISS-AIP does not include physicians' offices, clinics, or urgent care facilities, the estimates produced in this article likely underestimate the problem. In addition, NEISS-AIP does not capture other important variables such as ATV size or number of wheels, rider's seating position, frequency of ATV use, or helmet use.

The reasons for the decline in ATV-related deaths and injuries among children since 2004 are not well understood, in part because ATV ridership information is lacking. The most recent, published, nationally representative survey of ATV riders was conducted by the CPSC in 2001. At that time, an estimated 5.6 million ATVs (86% of which were 4-wheeled ATVs) were in use, and an estimated 7.2 million (11%) children aged ≤15 years had ridden an ATV at least once in the previous year.[1] Since 2001, the CPSC has used annual ATV sales data to estimate the number of 4-wheeled ATVs in use. In 2010, an estimated 10.6 million 4-wheeled ATVs were in use, an increase of 120% since 2001.[7] The reductions in nonfatal injuries reported here and the reduction in the proportions of all ATV-related deaths and nonfatal injuries occurring among children point to the possibility that fewer children aged ≤15 years were riding ATVs over time despite the increase in the number of ATVs in use. To our knowledge, there have not been any ATV design changes that might have contributed to observed trends. We did not locate any information about ATV design changes in the peer-reviewed literature, and our request for information from an industry representative at the Specialty Vehicle Institute of America was not answered.

Research on motor vehicle travel trends during the recent economic recession might have implications for ATV ridership among children. During economic downturns, discretionary travel and travel by drivers with limited funds, including teen drivers, decline most.[15] Because much of ATV riding is recreational,[16] and thus discretionary, the increase in gasoline prices in 2007 and lingering effects of the economic recession might have also disproportionately affected children's ATV riding patterns compared with those of adults. In addition, sales of new ATVs have declined steadily since 2007, a trend attributed in part to the economic recession.[16,17] This trend might have led to fewer children beginning to ride ATVs in recent years, which in turn, might have contributed to the disproportionate decline in ATV-related deaths and injuries for 2 reasons. First, inexperienced ATV drivers, regardless of age, are at higher risk of injury; and second, risk of injury is higher among drivers aged ≤15 years compared with their older counterparts even after accounting for experience.[1]

Riding adult-sized ATVs is a longstanding and well-documented risk factor for ATV-related injuries among children.[18,19] A 1997 national survey conducted by the CPSC reported that 96% of children injured while driving ATVs were on vehicles that were larger than recommended for their age.[20] A decade later, in its Report to Congressional Committees, the Government Accountability Office (GAO) reported that children continue to ride and crash adult-sized ATVs; during 2006–2008, 87% of children who died of ATV-related injuries were riding adult-sized ATVs.[16] Despite voluntary agreements by ATV manufacturers and distributers "to use their best efforts to prevent dealers from selling adult-sized ATVs for use by children,"[17] undercover checks conducted by the GAO indicated that 7 of 10 dealers were willing to sell adult-sized ATVs for use by children.[16] The GAO concluded that, on the basis of their undercover checks and previous similar checks by the CPSC, noncompliance on the part of ATV dealers "is a persistent problem."[16] These findings reveal the challenge in addressing important risk factors for ATV-related injuries among children using voluntary standards.

Many states have laws or regulations governing the use of ATVs. For example, in 2012, 31 states had a helmet requirement and 33 states had a minimum age requirement.[21] These regulations include a wide variety of qualifiers, such as when and by whom helmets must be worn, and exceptions for age requirements if a child is supervised by an adult, riding on private property, or has a safety certificate. Effectiveness studies of such state-imposed regulations in reducing injuries and deaths among young riders have revealed equivocal results.[2,14,22–24] Enforcement of these regulations is limited in part because many states' laws pertain only to the use of ATVs on public lands, and jurisdiction becomes problematic at the public land–private property interface. Furthermore, a 2008 ATV owners' survey obtained by the GAO reported that nearly 80% of ATV riding was for recreational purposes and that most of these activities occur on private property.[16]

Although helmets are known to reduce the number and severity of head injuries in ATV crashes,[25,26] helmet use remains low among young ATV riders. More than half of riders aged 8 to 18 years in 3 rural states reported never or almost never wearing a helmet.[27–29] In Arkansas, where the universal motorcycle helmet law had been recently repealed, both adult and youth focus group participants felt that if motorcyclists were not required to use helmets, ATV helmet laws would be difficult to promote and enforce.[29] This viewpoint is of note because as of January 2013, only 19 states and the District of Columbia had universal motorcycle helmet laws,[30] which require all motorcyclists to wear a helmet.

Last, on-road ATV crashes are an issue of increasing concern. Although ATVs are designed for off-road use, a recent report of ATV-related fatalities among riders aged ≤15 years and those aged ≥16 years reported that more deaths occurred from on-road rather than off-road crashes among both age groups.[31] Among riders of all ages combined, on-road crashes were ∼10 times more likely than off-road crashes to involve a collision with another vehicle, which may increase the likelihood of a fatal injury. Riders who were killed in on-road crashes were less likely than their off-road counterparts to be helmeted and more likely to have a passenger or be riding as a passenger. Indeed, on-road crashes were 3 times more likely to involve multiple victims than off-road crashes. Children riding as passengers, whether on-road or off-road, is especially concerning in light of a recent finding that child passengers are at greater risk of death or serious injury, particularly head or neck injury, than child drivers.[23]

The recent decline in ATV-related nonfatal injuries among young riders is welcome news. Although the reasons for the decline are not well understood, broader use of known effective safety measures could additionally reduce these injuries. The CPSC recommends prohibiting children aged ≤15 years from riding adult-sized ATVs, always wearing a helmet while riding, not riding on paved roads, and never carrying or riding as a passenger unless the ATV is specifically designed to carry passengers.[32] The CPSC

also recommends taking a hands-on safety training course,[32] although the effectiveness of these courses in reducing injuries has not been thoroughly evaluated.[14] Alternatively, the American Academy of Pediatrics recommends prohibiting all use of ATVs by children ≤15 years old.[33] Last, more research to better understand ATV crash dynamics might lead to safer designs for ATVs of the future.[34]


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***COFFEE AND MENTAL HEALTH:*** *I begin each day with at least one large cup of coffee (usually two), and I often have one more cup mid-morning. While I do not think I have a "problem," I do occasionally wonder what would happen if I suddenly stopped all caffeine consumption. According to the latest version of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, coffee consumption is associated with two – and possibly three – mental health disorders. Coffee intoxication and coffee withdrawal are mental health disorders when they impair function, and caffeine use disorder – now a research diagnosis requiring further study – is diagnosed when a coffee drinker complains of adverse effects and cannot quit. As reported in* The Wall Street Journal *(Your Health: June 10, 2013), such designations were not without controversy. Some argue that clinically significant side effects of coffee withdrawal are uncommon and labeling an individual experiencing them as having a mental health disorder is excessive. Others argue that individuals in many studies report withdrawal symptoms, and that health care professionals need to include the possibility in the differential diagnosis and be able to manage it. The diagnosis of caffeine withdrawal is supported if an individual reports at least three of following symptoms within a day of discontinuing caffeine consumption: headache, poor concentration, nausea or muscle pain, irritability or decreased mood, and fatigue or drowsiness. Symptoms may occur at different times, as the half-life of caffeine ranges from two to eight hours, and tend to last two to nine days. In patients who have experienced withdrawal symptoms, some recommend stopping cold turkey, but most seem to recommend tapering caffeine consumption over a few weeks. As for me, I do not think I will attempt to see what happens, but continue to savor freshly brewed coffee in the morning with my wife.*

*Noted by WVR, MD*

# All-Terrain Vehicle–Related Nonfatal Injuries Among Young Riders in the United States, 2001 –2010

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