

## ***Position Statement***

# **Safety Belts and Other Restraints of Motor Vehicle Occupants**

*This Position Statement was developed as an educational tool based on the opinion of the authors. It is not a product of a systematic review. Readers are encouraged to consider the information presented and reach their own conclusions.*

***The American Academy of Orthopaedic Surgeons (AAOS) strongly believes that all motorists should be required by law to wear safety belts.***

According to the National Highway Traffic Safety Administration (NHTSA), seat belt use nationwide has increased to 87 percent in 2014<sup>1</sup> from less than 60 percent in 1993.<sup>2</sup> Although the numbers have improved year by year, more than 45 million Americans still fail to buckle up when operating or riding in a motor vehicle. Both NHTSA and the Centers for Disease Control and Prevention estimate more than 2.2 million adult drivers and passengers were treated in emergency departments as the result of being injured in motor vehicle crashes in 2012.<sup>3,4</sup>

The safety belt is the most effective safety device available to every motorist because it prevents the “second collision,” which occurs when the occupant collides with the inside of the vehicle. Medical costs for unrestrained occupants are 50 percent higher than for persons wearing safety belts. To be effective, the safety belt must be buckled around the person. There have been no reported medical reasons not to use safety belts. The risk of injury for pregnant women and for motorists with arthritis, osteoporosis, stiff joints, and many other medical conditions is greater if safety belts are not used. Although it is true that a few injuries have been attributed to seat belt use, statistically, the risk of injury from wearing safety belts is far less than the benefits of using them.

Safety belt usage costs the motorist only a little thought yet provides the most critical crash protection. Safety belts hold the occupant within the vehicle, preventing him or her from being thrown out. They protect the head and chest, the most frequent sites of fatal damage in motor vehicle accidents.

Half of all front-seat occupants killed in crashes in 2012 were unrestrained, and 61 percent of those killed in back seats were unrestrained.<sup>5</sup> The NHTSA estimates that lap/shoulder seat belts, when used correctly, reduce the risk of fatal injury to front-seat passenger car occupants by 45 percent<sup>6</sup> and the risk of moderate-to-critical injury by 50 percent.<sup>7</sup> In 2013, 49 percent of passenger vehicle occupants in vehicular crashes who did not wear their seat belts—an average of 26 people every day—were killed.<sup>8</sup>

Since 1967, federal law has required that all cars and light trucks sold in the United States be equipped with safety belts. Observational studies mark an increase in use of safety belts throughout the years, yet, in 2013, 49 percent of the 21,132 fatalities of passenger vehicle crashes were not using a restraint.<sup>9</sup> The highest number of these fatalities—61 percent—were among the unrestrained vehicle occupants in the 13 to 15, 21 to 24, and 25 to 34 age groups. Many motorists have not yet been convinced to protect their own lives and fasten their safety belts.

Among the developed nations, only the United States does not require safety belt usage by national law. Comprehensive seat-belt laws covering all occupants of a vehicle are in place in 111 countries—69 percent of the world's population.<sup>10</sup> But, according to the World Health Organization, more is needed to improve seat belt legislation enforcement: only a quarter of all countries rate their seat belt enforcement as “good.” In Canada, the national rate of seat belt use climbed up to 93 percent in 2013.<sup>11</sup> As of 2015, in the United States, only New Hampshire lacks a state law requiring drivers to wear seat belts. Thirty-four states have primary enforcement laws and 15 states have secondary enforcement laws. Secondary enforcement laws allow an officer to stop someone for a different violation and only then to write a citation for a seat belt violation. In states with a primary seat belt law—failing to use a seat belt can be the reason for stopping a motorist—belt use increases from 9 percent to 14 percent.<sup>12</sup>

It is evident that highway accidents are clearly a problem of great consequence for this country and injuries can be reduced by a combination of mandatory safety belt legislation and a thoughtfully conceived and implemented educational campaign, like *Click it or Ticket*, which generates awareness of increased enforcement efforts and increased chances of getting a ticket if motor vehicle occupants are not buckled up.

***The AAOS strongly endorses the use of airbags as an adjunct to safety belts.***

The Federal Motor Vehicle Safety Standard on Occupant Crash Protection requires that all passenger cars manufactured in 1998 to present be equipped with both driver and front-seat passenger air bags. Light trucks and vans manufactured from 1999 to present must be similarly equipped.

Maximum passenger protection is provided by the combination of a lap and shoulder belt and the air bag restraint. The combination of seat belt use and air bags reduces fatality risk in frontal vehicular impact crashes by an estimated 60 percent.<sup>13</sup> Airbags should be used in conjunction with safety belts and are not effective in impacts from the side or rear. Additional passive protection through improved dashboards, windshields, steering wheels, door and seat designs is an achievable objective and is being incorporated in most newly designed vehicles.

***The AAOS believes proper height positioning of head restraints is critical to reduce hyperextension and damage to the nerves and ligaments of the neck.***

Headrests have been mandated by federal law since 1960 and have reduced both the frequency and severity of neck injuries. According to *Consumer Reports*,<sup>14</sup> maximum whiplash protection from head restraints occurs only when the headrests are properly positioned. The top of the restraint should reach at least as high as the top of the ears, preferably the top of the head, and be relatively close—4 inches or less—to the back of the individual's head.

***The AAOS believes that all motorists who transport children should properly install and use child safety seats. The AAOS urges manufacturers to simplify and improve the design of child restraints to encourage and facilitate their use.***

Child safety seats are required in all 50 states<sup>15</sup> the District of Columbia, Puerto Rico, and other territories of the United States; 48 states require booster seats or other appropriate devices for children who have outgrown a child safety seat but are still too small to use an adult seat belt safely.<sup>16</sup> Child safety seats provide children with the same degree of crash protection available to adults using safety belts. The NHTSA estimates child safety seats reduced the risk of fatal injury by 71 percent for infants (younger than 1 year old) and by 54 percent for toddlers (ages 1 to 4 years) in passenger cars. Additionally, child restraints saved an estimated 263 lives of children younger than age 5.

Many child restraints are not properly installed or used. Improper positioning of the restraint, improper attachment of the restraint to the vehicle, or improper buckling of the belt within the restraint are common mistakes that can lead to injury of a restrained child.

***The AAOS believes that lap belts and padding on the backs of seats should be required on all newly manufactured school buses.***

Laws require the use of child restraints or safety belts for children while riding in passenger cars. As part of their education and to protect them, children should be required to continue this life-saving habit while riding on school buses. Safety belts in school buses provide additional protection in side impacts and rollover accidents. Padding on the seat backs provides extra head protection.

Mandatory safety belt usage, fixed-design head restraints, simplified child restraint systems, and seat belts in new school buses are the most cost effective measures this country should adopt to prevent further death and injury to children from motor vehicle crashes.

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