Car Accident Safety Research and Literature

There is no lack of research and data banks from which to draw specific information regarding collision speed and injuries. Case studies on neck and whiplash injury can be traced to Dr. Crowe, a surgeon who presented eight cases of neck injuries from traffic accidents in 1928. This concept was looked at more closely by the United States Navy after observing the phenomenon of neck injuries in pilots who were injured when catapulted from aircraft carriers. This research led to the finding that a high seat supporting the head, upper back, and neck during acceleration prevented hyperextension, which was identified as the main cause of those injuries.

Although books and articles can be found on a national and international level, probably the single largest data-base is with the Society of Automotive Engineers.

Since 1956, the Society of Automotive Engineers (SAE) has sponsored the Stapp Car Crash Conferences, which have been hosted by various colleges, universities, and technical institutions. These conferences publish studies that are cleared through the SAE advisory committee.

The focus of these research articles is on automotive design and occupant safety. Whether the research was generated and presented under the auspices of the SAE or otherwise, methodologies and technology have become more sophisticated over time. The earlier studies used primarily sled tests and impact barriers, which do not necessarily reflect the dynamics involved between two colliding vehicles on a roadway. The anatomical models first used were primarily male and not as sophisticated as the current models, which more closely match body mass, soft tissue, and bone structure. Cadavers sometimes were used; in earlier studies, rarely were human volunteers used.

More recent studies now include vehicle-to-vehicle crashes, current automotive, seatbelt, and seat designs, and more representative anatomical models of women and children. However, these studies always seem to rely on a compromise of an "average" person, and therein lies some major differences when applied to real world crash facts.

The current studies also focus on low speed crashes in which there is little property damage to cars. High speed, slow motion videography demonstrates the motion of dummies, cadavers, and live subjects in low speed impacts. These studies show the numerous variables discussed above, which strongly suggest that there is no constant threshold below which injury does not occur and above which injury does occur. We are all familiar with the scenario in which a person remarkably escapes injuries in a severe crash, even though another occupant of the same vehicle sustains serious injuries. There are infinite variables at both ends of the spectrum that can only be looked at on a case-by-case basis.

It must be kept in mind that the engineering research discussed in this article occurs in a controlled environment at low speeds with live subjects who are healthy and strong. For good reason, these studies do not subject live volunteers to high speed impacts or attempt to intentionally induce injury by having occupants sit improperly or by recruiting elderly or previously injured persons to participate as test volunteers. Even under strictly controlled conditions at low speeds when every precaution had been taken to avoid injury, some research volunteers have reported post-collision symptoms, including neck, back, and headache pain without hyperextension or hyperflexion.

About the Author

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