

**EIGHT U.S. COURT CASES WHERE A DEFENSE BIOMECHANICAL  
EXPERT WAS PRECLUDED FROM PREDICTING INJURY  
LIKELIHOOD OR SEVERITY FROM DELTA V AND THE SIXTEEN  
THEORIES USED TO WIN**

**Harrison vs Smith, Court of Appeal of the State of California, First Appellate District, Division Five, No. A114436, July 9, 2008. THIS IS A NON-PUBLISHED CASE (CANNOT BE CITED OR RELIED ON).** This case involved a rear-end impact with a herniated disc in the cervical spine. In 2005, Dr Nordhoff submitted a declaration for the purpose of precluding a Jeffrey Lotz, PhD (biomechanics), who estimated the delta-V was 3-4 mph for the target vehicle and a minimum of 8 mph delta-V was necessary to herniate a lumbar disc and a second expert, a Paul Mills, MD, who testified that based on the delta-V given by Dr Lotz that the plaintiff suffered no physiologic injury in this case. This declaration was submitted to the court with the plaintiff's attorney motion. Both of these experts were precluded in using delta-V method as the court determined that these experts had failed to meet the burden of establishing that the delta-V method (both testified in depositions that the force was below the minimum threshold to cause injury) was generally accepted within the scientific community. The court ruled that Dr Mills could not testify about the relationship between delta-V and medical causation. The insurance carrier appealed the courts decision. **In 2008, the Court of Appeals affirmed the lower courts decision.** Dr Lotz averred that there are over 700 articles that study forces within the spine that describe the strength of the spinal tissues and estimate the body's ability to resist acute trauma. Dr Lotz acknowledges that many of the studies were generated for other purposes, e.g., design safer cars. When reviewing the 17 papers that Lotz offered to the court addressing the general acceptance of the delta-V method, the court concluded that most if not all of the studies focused on or had the purpose of designing head restraints and not to rule out to a high degree of probability whether a particular injury was caused by a particular automobile collision and the studies do not indicate that a consensus has been reached in the scientific community. The Court of Appeals ruled that the scientific literature in the record does not demonstrate that there is a general acceptance in the scientific community of a particular correlation between the change in velocity and probability of human injury and that investigations into the correlation between change of velocity and the possibility of injury is a relatively recent undertaking (short life), thus affirming the lower courts decision.

**Clemente vs Blumenberg, Supreme Court, Richmond County, New York, August 6, 1999.** Rear-end crash of female driver with two bulging discs in lumbar spine. Defense used a biomechanical engineer (Kenneth Salazar), who used repair estimates, photographs, and 5 mph barrier test repair estimates to give a 5 mph delta-V for target vehicle. Concluded that rear impacts of 6 mph or less do not yield long-term serious injuries to occupants. Salazar presented court several papers using human crash subjects in rear impacts. The court ruled that these articles were not independent or reliable because several volunteers were associated with the authors or sponsors or of too small of sample size to make general conclusions to the riding population in rear-end impacts. Court ruled that using repair costs and photographs as a method for calculating the change of velocity of both vehicles at impact is not a generally accepted method in any relevant field of engineering. The expert was precluded in testifying about the seriousness of injuries.

**Cromer vs Mulkey Enterprises, No. A01A2305, Court of Appeals, Georgia, March 21, 2002.** This is a rear-end impact with a subsequent frontal impact. Injuries included herniated disks in neck and low back and torn rotator cuff. Plaintiff had shoulder surgery. Court ruled that there was insufficient evidence to show that the field of biomechanics had reached a scientific stage of verifiable certainty, as would be needed, to show how much force and movement was needed to herniate a disc or tear a rotator cuff. Defense used Alan Watts, PhD, a physicist and low speed author. The court limited Watts testimony due to it being cumulative of other testimony, he had not seen all relevant data of the accident, and that his testimony could be unhelpful, confusing, or misleading. The court ruled that they found limited evidence in the record that the field of biomechanics includes a technique of determining if specific injuries result from specific accidents, let alone, that that technique has reached a scientific stage of verifiable certainty.

**Hisenaj vs Kuehner, Superior Court of New Jersey, August 3, 2006.** This is a rear-end impact. The female plaintiff had 3 herniated cervical discs and one lumbar disc herniation and she underwent two extensive surgical procedures with significant disability. Plaintiff had her head turned 45 degrees. The defense used a biomechanist, Harold Alexander, PhD, who gave less than a 5 mph delta-V estimate. He identified 17 human volunteer studies consisting of 151 men and 52 women. Court ruled that there was no evidence that they were peer reviewed. One paper that was submitted reported that if subjects had their heads turned that the potential for injury increases. Few of the studies included females of similar age (over age 40). Alexander's sweeping opinion that the crash could not have caused these injuries to this plaintiff is not reasonably and reliable supported by 17 studies. The record does not establish that experts in the field accept the soundness of the methodology, including underlying data and information.

**Hisenaj vs Kuehner, Supreme Court of New Jersey, March 6, 2008.** This is a rear-end impact where the defense used a biomechanist, Harold Alexander, PhD, who gave a 5 mph delta-V estimate. Dr Alexander likened the impact to riders in amusement park bumper cars and was highly improbable that the collision caused the herniations or chronic pain. He stated that there was no biomechanical mechanism existing that would cause chronic injury to result from this impact. Dr Alexander relied on 17 volunteer studies where over 200 people had been exposed to rear impacts with none having chronic injury. Court ruled that lower court was correct due to its not being sufficiently reliable.

**Tittsworth vs Robinsion, Supreme Court of Virginia, Record No. 951742, September 13, 1996.** Plaintiff in rear-end impact with a L5-S1 lumbar herniated disc injury. Defense used two experts, Alfred Cipraini, mechanical engineer and Peter Abbrecht, an expert in biomedical engineering. Cipraini estimated force in this crash from photographs and crash tests and did not do an inspection, estimating less than 1.6g for the vehicle and it is less than many persons experience in activities of daily living. Caprini assumed that there was ½ inch crush damage to both vehicles. Abbrecht relied on crash data of human testing from Engineering Dynamics Corporation where no subjects received injuries at 2.2g of force. Abbrecht conceded that there are no low back studies. Court ruled that there was no proof these experiments were conducted under circumstances substantially similar to those existing at the accident scene and the tests focused upon neck injuries and not lumbar injuries. The expert's testimony is speculative,

founded upon assumptions lacking sufficient factual basis, relies upon dissimilar tests, and contains too many disregarded variables.

**Schultz vs Wells, Colorado Court of Appeals, VIV. III. No. 99CA0688, August 17, 2000.**

The female plaintiff was rear-ended. The defense used an unnamed expert in the field of biomechanics, engineering, and reconstruction who gave a 4 to 4.5 mph delta-V impact. The expert was precluded from testifying that there was a “threshold force” below which a person probably could not be injured because there was no agreement in engineering as to the validity of that theory. The court looked at the papers he relied on and concluded that the tests were done for designing cars. Court precluded the use of crash tests using human subjects. The court ruled that the force threshold for probability of injury demonstrated in the test results could not be used to prove that a particular person was not injured or was likely not injured in this accident. The court refused to admit activities of daily living as it felt that the ‘g’ forces did not take into consideration the entire mechanical movement of a body during a car collision as it did not address forces from other directions. Expert tried to get bumper car data in but court ruled that bumper cars is a game in which a great deal of bracing action occurs.

**Suanez vs Egeland. Superior Court of New Jersey, appellate Division, July 11, 2002.**

Plaintiff was middle aged female in rear-end crash who incurred a herniated lumbar disc. Defense used Lawrence Thibault, a mechanical engineer, who gave 5 mph or less delta-V for the impact. Expert stated that there have been 646 volunteers exposed to rear impacts as high as delta-V of 11 mph. Never was a disc injury reported by the test subjects and only stiff necks were reported in some cases that resolved within 72 hours. The expert was unable to tell judge any rear impact study names for rear impact testing, however, he did cite military and cadaver studies. Thibault agreed that Military subjects were younger than plaintiff. The court determined that this expert did not have a scientific foundation for his opinions.

## **THE SIXTEEN THEORIES RELIED UPON BY THE COURTS WHICH PROVE DELTA V CANNOT PREDICT INJURY LIKELIHOOD OR SEVERITY**

1. Failure to meet burden of proof that there was a correlation between the change of velocity (Delta-V) of the plaintiff's vehicle (target vehicle) and injury.(Harrison)
2. The delta-V method correlating to human injury is generally not accepted within the scientific biomechanical/medical community. (Harrison)
3. Many if not all of the volunteer studies that were relied on by the defense biomechanists and submitted to the court were not focused on, or had a purpose, to rule out to a high degree of probability whether a particular injury was caused by a particular automobile collision.(Harrison)
4. Many volunteer studies submitted to the court were focused on designing safer cars (head restraints/seats) and mitigating injuries.(Harrison, Schultz)
5. Investigations into the correlation between the change of velocity and the possibility of injury is a recent undertaking.(Harrison)
6. Volunteer papers that the biomechanist relied on were not independent or reliable because several volunteers were associated with the authors or sponsors.(Clemente)
7. The volunteer papers that the biomechanist relied on had too small of a sample size to make any conclusions to the riding population.(Clemente)
8. Insufficient evidence to show that the field of biomechanics has reached a scientific stage of verifiable certainty, as would be needed, to show how much force and movement was needed to herniate a disc or tear a rotator cuff.(Cromer)
9. Few of the submitted studies included females of similar age.(Hisenaj 2006)
10. Volunteer studies presented to the court were not sufficiently reliable.(Hisenaj 2008)
11. No proof that the volunteer experiments submitted to the court were conducted under similar circumstances similar to those existing at the accident scene.(Tittsworth)
12. Tests of volunteer subjects were focused on the neck and not on lumbar injuries.(Tittsworth)
13. Use of military subjects who are younger than plaintiff not representative.(Suanez)
14. Experts testimony contains too many disregarded variables.(Tittsworth)
15. The use of activities of daily living did not take into consideration the entire mechanical movement of the plaintiff's body.(Schultz)
16. Bumper car data precluded because bumper cars is a game in which a great deal of bracing action occurs.(Schultz)