May 27, 2024

LawyerFirst LawyerLast Esquire

SampleFirmName

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RE: *Pl1FirstName Pl1LastName; Pl2FirstName Pl1LastName; ThirdOne ThirdName et al. v SampleCaseDefendantName et al., Case No: CaseNoSample, SampleCourtName*

Date of Crash: January 1, 2020

Date of Birth: *Pl1FirstName Pl1LastName:* January 1, 1999 [20 years old at time of crash]

*Pl2FirstName Pl1LastName:* January 2, 1990 [29 years old at time of crash]

*ThirdOne ThirdName:* January 4, 1994 [25 years old at time of crash]

Dear Mr. LawyerLast,

I am in receipt of your correspondence regarding the above-named action. I have reviewed the documentation accompanying your correspondence including medical records, information regarding the subject crash, litigation documents, and other materials.

The purpose of this report is to provide an analysis of the causal relationship between the subject driver-side impact collision and Ms. and Mr. Pl1LastName and Mx. ThirdName’s subsequently diagnosed shoulder injuries and need for treatment.

As I have already outlined my qualifications in my January 5, 2023, report in this matter, I will not repeat them here, but rather refer the reader to my current CV, which is attached.

*Post-crash history, Pl1FirstName Pl1LastName (driver)*

*Post-crash history, Pl2FirstName Pl1LastName (front passenger)*

***Injury Causation Analysis***

A crash-related injury causation analysis for a specific individual is performed by assessing the risk of injury from the collision and comparing it to the probability that the injuries or conditions would have been present at the same point in time if the collision had not occurred. The process is referred to as a "3-step" injury causation method in which improbable alternative causes are ruled out and the single most likely cause is identified. The analysis is accomplished via the application of crash reconstruction, biomechanical, medical, and epidemiologic (risk assessment) principles.[[1]](#footnote-1),[[2]](#footnote-2) This 3-step methodology has been extensively described in the peer-reviewed literature, been deemed generally accepted by Courts in the United States, and has been adopted as part of case law in the U.S.[[3]](#footnote-3),[[4]](#footnote-4) See the Appendix at the end of this report for more information.

The three fundamental elements or steps of an injury causation analysis are as follows:

Whether the injury mechanism had the potential to cause the injury in question (aka general causation);

The degree of temporal proximity between the injury mechanism and the onset of the symptoms reasonably indicating the presence of the injury; and

Whether there is a more likely alternative explanation for the occurrence of the symptoms at the same point in time (aka differential etiology).

As applied to the facts in the subject case, these 3 steps are as follows:

*Reconstruction of the crash*

*Injury biomechanics*

The initial impact would have resulted in Ms. and Mr. Pl1LastName and Mx. ThirdName’s body initially being thrown forward and to the left at around a 10:30 vector at around 10 mph and into their restraining shoulder belts and toward the driver’s side door as well as the steering wheel. They would have sustained substantial complex loads on theirspines in the collision, loads that include compression, rotation, forward and lateral flexion, and shear all occurring at the same time and to varying degrees in less time than it takes to blink an eye (around 250 msecs). Ms. and Mr. Pl1LastName and Mx. ThirdName’s left shoulder would have sustained a sudden transient load potentially exceeding 500 lbs. as it interacted with the shoulder belt, or possibly the driver’s side door.

*Discussion*

The types of spine and extremity injuries that Ms. and Mr. Pl1LastName and Mx. ThirdName were diagnosed with are highly consistent with the injury mechanism of the crash. Traumatic loading of the spine that results in axial (up and down) compression, particularly in combination with the other load types occurring with the subject collision, has the potential to damage the peripheral disk annulus, which surrounds and holds in the disk nucleus. Women in their early 3rd decade, like Ms. Pl1LastName (who was 20 at the time of the crash) typically have asymptomatic age-related degenerative changes of the disks of the spine, a fact that makes the post-crash findings in Ms. and Mr. Pl1LastName and Mx. ThirdName’s imaging more likely due to a combination of the trauma of the crash, and some degree of pre-existing degeneration. The same principles apply to Ms. and Mr. Pl1LastName and Mx. ThirdName’s left shoulder injury; 20-year-old women typically have some degenerative changes in the joints and rotator cuff of the shoulder, but the frank tear and other injuries observed in Ms. and Mr. Pl1LastName and Mx. ThirdName’s MRI and during the arthroscopic procedure performed on their left shoulder are likely a result of the acute trauma of the subject collision, rather than purely a pre-existing asymptomatic condition that was converted to symptomatic by the crash.

It is well established in science and medicine that an excessive level of force is not required to cause symptomatic injury to a degenerated disk, and that in most cases, the diagnostic imaging of the disk will not reveal whether related symptoms are of a traumatic origin or not, in the absence of fracture. Traumatic disk injuries have been described in the peer-reviewed literature as resulting from low to moderate force events, including minimal or no damage traffic crashes, roller coaster rides, and even more mild forces such as sneezing.[[5]](#footnote-5)-[[6]](#footnote-6)[[7]](#footnote-7)[[8]](#footnote-8)[[9]](#footnote-9)[[10]](#footnote-10)[[11]](#footnote-11) It is accurate to state that there is no established or generally accepted lower force threshold at which it can be said that an acute intervertebral disk injury in any part of the spine cannot occur. The same principle applies to traumatic derangement of the joints and rotator cuff of the shoulder.

Based on the preceding discussion there was ample and biomechanically appropriate force exerted on Ms. and Mr. Pl1LastName and Mx. ThirdName’s bodies in the subject collision to have caused their medically documented injuries, and associated need for evaluation and treatment, including their spinal pain management procedures, etc.

Shoulder three steps placeholder

**Conclusions**

Given the contiguous chain of causation from the day of the crash through Ms. and Mr. Pl1LastName and Mx. ThirdName’s most recent medical records, the lack of any significant pre-crash history of persisting spine pain and need for treatment in the years prior to the crash, as well as the relative risk of significant and persisting spine injury from the subject frontal impact crash, I conclude that the most probable cause of the post-crash acute and chronic neck and low back injuries described in Ms. and Mr. Pl1LastName and Mx. ThirdName’s medical records and summarized in this report, including their symptomatic cervical and lumbar disk derangements, is the subject January 1, 2020 driver-side impact crash.

I have examined neither Ms. nor Mr. Pl1LastName nor Mx. ThirdName and I therefore have no opinions about their diagnoses, treatment, or prognoses outside of what is reflected in the medical record. This is not to say that I am not qualified, licensed, and extensively experienced in performing such evaluations, but that I have not done so in this case.

The preceding opinions were given as reasonable medical, and scientific probabilities. I reserve the right to amend any of my opinions should new information come to light.

Very truly yours,



Michael D. Freeman, MedDr, PhD, MScFMS, MPH, FRCPath, FFFLM, FACE, DLM

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1. Melia P et al. Development of the INFERENCE (INtegration of Forensic Epidemiology and the Rigorous EvaluatioN of Causation Elements) approach to causal inference in forensic medicine. Int J Environ Res Public Health 2020;17:8353; doi:10.3390/ijerph17228353. [↑](#footnote-ref-1)
2. Freeman MD. A practicable and systematic approach to medicolegal causation. Orthopedics 2018;41(2):70-2. [↑](#footnote-ref-2)
3. Freeman MD, Centeno CJ, Kohles SS. A systematic approach to clinical determinations of causation in symptomatic spinal disc injury following motor vehicle crash trauma. PM R 2009;1(10):951-6. [↑](#footnote-ref-3)
4. Etherton v. Owner Insurance Company. U.S. District Court of Appeals, 10th Circuit. Case No. 14-1164. [↑](#footnote-ref-4)
5. Giuliano et al. The use of flexion and extension MR in the evaluation of cervical spine trauma: initial experience in 100 trauma patients compared with 100 normal subjects. Emerg Radiol. 2002;9(5):249-53. [↑](#footnote-ref-5)
6. Freeman et al. Significant spinal injury resulting from low-level accelerations: A case series of roller coaster injuries. Arch Phys Med Rehab 2005;86:2126-30. [↑](#footnote-ref-6)
7. Lutz et al. CT myelography of a fragment of a lumbar disk sequestered posterior to the thecal sac. Am J Neuroradiol 1990;11(3):610-1. [↑](#footnote-ref-7)
8. Sadanand et al. Sudden quadriplegia after acute cervical disc herniation. Can J Neurol Sci 2005;32(3):356-8. [↑](#footnote-ref-8)
9. Pappas et al. Outcome analysis in 654 surgically treated lumbar disc herniations. Neurosurgery 1992;30(6):862–6. [↑](#footnote-ref-9)
10. Smith J. An analysis of 72 real world impacts - an initial investigation into injury and complaint factors. SAE Technical Paper 1999-01-0640. [↑](#footnote-ref-10)
11. Freeman MD. Medicolegal causation analysis of a lumbar spine fracture following a low speed rear impact traffic crash. J Case Rep Prac 2015; 3(2): 23-9. [↑](#footnote-ref-11)