THE BIOMECHANICAL EXPERT: A VALUABLE DEFENSE TEAM MEMBER

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In too many cases plaintiff and defense counsel fall into a trap of hiring too many experts. Sometimes in routine, soft-tissue injury cases counsel hire multiple liability and medical experts, when a simpler approach would suffice. However, in commercial motor carrier collision cases, using multiple liability and damages experts is often unavoidable. On the liability side, accident reconstructionists investigate collisions and help both counsel and client determine why a crash occurred. On the damages side, a sometimes overlooked expert is the biomechanical engineer. Biomechanical engineers are valuable because they can explain to counsel how the impact between vehicles, or vehicle and pedestrian, caused the injuries the claimant suffered. With this information, counsel can evaluate whether a claim should be defended or settled. However, counsel would be shortsighted to limit the use of these experts to trial as they can assist with early case assessment, deposition preparation, and disqualification motions. This article will first describe biomechanical engineers and then address the different roles these experts can play, including assisting with deposition preparation and strategizing with counsel on drafting motions to exclude plaintiff's experts from testifying.

A deposing attorney needs to understand how the component part or parts of a commercial vehicle that contacted a plaintiff's vehicle (or a plaintiff in a pedestrian case) could cause a traumatic brain injury, fractured pelvis, or spinal cord injuries.

1. The Biomechanical Expert.

Why hire a biomechanical engineer? Biomechanical engineers explain how the impact between vehicles resulted in (or could not have resulted in) a plaintiff's injuries. They examine the complex interaction between outside forces on the human body and its systems, and the nature, type, and characteristic injuries associated with those type of forces. Having taken coursework in anatomy, physiology, and internal medicine, these experts interpret radiology images, radiographs, medical records, coroners' reports, autopsy reports and photographs, collision scene photographs and measurements, 3-D surveys and photographs of the vehicles, and any simulation/animation prepared by the defense accident reconstructionist of the vehicles involved in the crash. Armed with this information, a biomechanical engineer can determine what outside forces were applied to the occupants of the vehicles, or the pedestrian, and, in turn, whether the injuries sustained are consistent with the type and direction of forces applied. For example, if the plaintiff complains that a rear-end collision caused a torn anterior cruciate ligament in her knee, a biomechanical engineer can evaluate the crush dynamics of a motor vehicle collision and opine whether the forces generated by a rear-end collision could have caused such an injury. A biomechanical engineer's defense value in this example would be explaining to a jury that the impact forces generated by a rear-end collision could not cause a plaintiff to tear a knee ligament.

2. Early Case Assessment.

It is almost never too early to consult with biomechanical engineers. After the rapid response investigation is completed, defense counsel should consider consulting with these experts to formulate liability and damages strategies, or, in appropriate cases, pre-suit settlement strategies. A biomechanical engineer can shed light on the directional path of a pedestrian moments before impact based on the nature of the injuries and the impact damage to the vehicle. The expert's analysis of this information, combined with the investigation analysis conducted by the defense accident reconstructionist, can help counsel determine whether a comparative negligence defense exists and how strong that defense might be. Ideally, the client should understand the viability of such a defense even before suit is filed, rather than months later after discovery has been conducted and significant defense costs incurred. It is during these times that cases can often be settled, especially catastrophic ones.

3. Deposition Preparation.

A biomechanical expert also can help you to prepare for depositions of a plaintiff, fact witnesses, and,

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we will be working with law enforcement to determine what took place."

These are just a few tips to ensure the company and driver are presented in the best possible light and that your company emerges from an initial investigation in the best position possible.

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especially, plaintiff's experts. Given the sometimes sketchy qualifications of and methodology employed by experts in these fields, it is worthwhile to consult with your experts to develop a strategy to attack plaintiff's experts' credentials and investigation of the collision to set up your *Daubert* and summary judgment motions.

Preparation is imperative when deposing any witness, especially an expert witness. Before preparing for the deposition and drafting a deposition outline, establish the goals you want to achieve from the deposition—a "wish list," or, as one of my partners calls it, a "Christmas List." On this list should be the admissions or answers to questions you want to (or need to) have before you finish the deposition. Your biomechanical engineer will have his or her own wish list of information he or she would like to have for his or her investigation, opinions, and reports. Ask the expert what information is needed from the deposition as you prepare your list. On this list can be topics such as: qualifications, CV, experience investigating truck—automobile collision cases, causation, re-creation/simulation/animation of the collision sequence, plaintiff's role in collision, factors contributing to collision, factors that did not contribute, seatbelt usage, airbag deployment, and other issues relevant to your case. For biomechanical experts, you also might want to include topics such as point of impact, crush injuries, trauma, and time sequence between impact and death.

The first question that should be asked when preparing for a biomechanical engineer deposition is a basic one—is the witness qualified to testify as a biomechanical engineer? In many cases we have encountered "experts" wearing two hats in the same case —offering accident reconstructionist and biomechanical engineering opinions, though they typically lack the credentials and expertise in the field of biomechanical engineering. Next, with your biomechanical expert's assistance, understand how the injuries occurred and whether what happened caused the injuries alleged. A deposing attorney needs to understand how the component part or parts of a commercial vehicle that contacted a plaintiff's vehicle (or a plaintiff in a pedestrian case) could cause a traumatic brain injury, fractured pelvis, or spinal cord injuries. Your expert can evaluate a plaintiff's biomechanical expert's conclusions and explain to you whether the expert's explanation of the crash dynamics matches the mechanism of injury and the injuries ultimately sustained. This analysis is particularly critical in seatbelt cases. Your biomechanical expert might be able to develop a working theory that a seatbelt failure, and not the collision, was the substantial contributing factor and proximate cause of a plaintiff's injuries. This point could be important in two respects. First, this analysis and defense theory provide significant cross examination questions. Second, they potentially allow your client to limit its liability and damages exposure.

These objectives cannot be achieved without your expert teaching you how a plaintiff was injured, and how the plaintiff's expert failed to recognize a potential alternative cause of the sustained injuries.

Finally, have your experts prepare questions for you to ask. Your experts are in the best position to draft the questions that they need answered to cross items off their wish lists. It is difficult to depose a plaintiff's expert with the hope of striking his or her opinions through *Daubert* without having a list of questions from your experts. Further, your experts can evaluate the plaintiff's testimony in response to these questions to determine whether the plaintiff's "recollection" of the collision matches the physical evidence gathered at the scene.

4. The Daubert Motion – Your Expert as "Brief Writer."

Federal Rule of Evidence 702 requires plaintiff's experts, among other things, to be qualified, knowledgeable, and have technical expertise in the field on which they offer an opinion. The Rule requires biomechanical experts to evaluate various factors associated with the collision—positions of occupants in the vehicles, position or location of pedestrians in relation to vehicles, restraint systems, whether vehicle structures such as support beams caused a blind spot that contributed to the collision—to determine how the resulting injuries were sustained. When these experts fail to do that, a *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 597 (1993) motion should be filed to exclude the expert from testifying.

Your biomechanical expert can also assist you to argue that plaintiff's expert is not a biomechanical engineer. This technical field requires an engineer to testify how the application of forces to the human body resulted in the injuries sustained. An accident reconstructionist should not be allowed to masquerade as a biomechanical engineer, as the latter must be trained in anatomy, physiology, medicine, body systems, and mechanical engineering. Further, your expert can help you highlight the gaps in the methodology employed by plaintiff's expert.

The *Daubert* motion has to distinguish between methodology arguments and credibility arguments—the former are proper for the court, as the gatekeeper, to consider, while the latter arguments are left for the jury to evaluate. *Daubert*, 509 U.S. at 590-91. The objective of the "gatekeeping" requirement is "to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire Co. v. Carmichael*, 526 U.S. 137,152 (1999). Further, by the time you are preparing the motion, you should have already established through deposition that the expert's opinions are nothing more than subjective beliefs unsupported by any facts. *Johnson v. Arkema, Inc.*, 685 F.3d 452 (5th Cir. 2012).

(a) What Happened, Why, and How?

These questions are critical in every case. As the trial lawyer, you must frame them for a jury, and then answer them through your opening statement, witness testimony, and then in closing argument. The same holds true for *Daubert* motions. With crowded dockets and motion calendars in every federal and state courthouse, judges and their law clerks do not have the time to devote countless hours sifting through your brief to understand the nuances of why and how the collision happened. Simplifying the collision to its essentials for the judge/clerk to understand is essential to succeeding on a *Daubert* or state-equivalent expert challenge. Because most judges (and certainly all juries) are not familiar with the physics of a motor vehicle collision, or how the body reacts to the forces generated by such a collision, a biomechanical expert needs to explain these factors in the expert report and at deposition before being permitted to testify. With the information obtained from your expert, the *Daubert* motion has to argue that a plaintiff's expert has fallen short of this essential requirement.

(b) Connect the Dots.

Each state has its own standards for qualifying experts to testify at trial. However, no federal or state court allows an expert to testify based on "possibilities" or "subjective beliefs" regarding how the accident occurred or how the plaintiff sustained his or her injuries. Defense experts can help you explain to the court the gaps that exist in plaintiff's expert's analysis between the facts and data and the plaintiff's expert's conclusions. For example, your biomechanical expert can help you to argue that the mechanism for injury relied upon by plaintiff's expert is not based upon facts in the case, or that his or her methodology is flawed. Too often, a plaintiff's expert fails to provide any calculations regarding the speed, time, and distance of the motor vehicles involved in the collision other than the speed of the tractor trailer, which leaves a huge gap in the plaintiff's expert's analysis

of the impact forces applied to the plaintiff's vehicle that resulted in the plaintiff's injury. There is a void in the resulting analysis concerning how the plaintiff actually sustained the injuries. Your biomechanical engineer, working in conjunction with your accident reconstructionist, can expose flaws in your adversary's methodology to persuade the court to strike plaintiff's expert report.

5. Conclusion.

Defense biomechanical experts are important defense team members in appropriate cases. They are more than report drafters and can assist counsel in developing liability and damages strategies, and whether cases should be targeted for pre-suit resolution. Beyond these roles, biomechanical engineers provide significant value during a plaintiff's expert's deposition, and, ultimately, in the drafting and arguing of expert disqualification motions. ⚖

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> *(6) Has no current clinical diagnosis of high blood pressure likely to interfere with his/her ability to operate a commercial motor vehicle safely;*[7]

Detected failures by a driver to be medically fit to operate a commercial motor vehicle go towards a 'safety score' which is made available to their current and (with permission) future employers.[8]

4. Options for Employers

As noted above, employers face significant liability risks if a driver has a medical emergency on the road. However, there are a number of steps that can be taken to reduce the danger to all concerned.

4.1 Record Keeping

When hiring a new driver, an employer would be well advised to seek access to their inspection and crash records and a copy of their medical certification.[9] The importance of this step is made obvious by the case of *Wingfield v Hill Brothers Transportation Inc*.[10] In that case a driver claimed workers' compensation from his employer after suffering a deep vein thrombosis and pulmonary embolism after only a few weeks with the company. He had suffered two similar incidents in the preceding five years with other employers. The employer successfully had the claim dismissed on the basis that the necessary test of causation for a claimant with a pre-existing condition was not made out (that is, whether the exertion or stress experienced by the claimant in employment is greater than that experienced in ordinary non-employment life). Knowledge about this worker's risk profile provided the employer with a measure of protection against liability.

4.2 Working Conditions

The potentially catastrophic effects of a heavy vehicle accident mean an employer would be well advised to take steps beyond pre-employment checking in order to be confident of discharging its duty of reasonable care. These steps should include making working conditions for drivers more healthy. Simply advising employees about healthy food intake and lifestyles is likely to be inadequate to discharge a duty of reasonable care. Recording of food intake by test subjects is known to be affected by inaccuracy[11] and it can be inferred that self-monitoring by workers of their food intake and exercise will be patchy. This approach, then, would be effectively bound to fail.

4.2.1 Driver Diet

Guidance as to best practice in making food available to drivers can be had from the case of *Kalloponi Comércio*

7 49 CFR §391.41(b).

8 Chad C. Marchand, Ashley P. Griffin and Tamara L. Warn, *Assessing the Federal Motor Carrier Safety Administration's Comprehensive Safety Analysis 2010 Initiative*, 41(1) The Brief 14 at 15 (2011).

9 *Id.*, at 19.

10 288 Neb. 174 (2014)

11 Annelies Goris, Margriet Westerterp-Plantenga and Klaas Westerterp, *Undereating and Underrecording of habitual food intake in obese men: Selective Underreporting of Fat Intake*, 71 Am. J. Clin. Nutr. 130 (2000).