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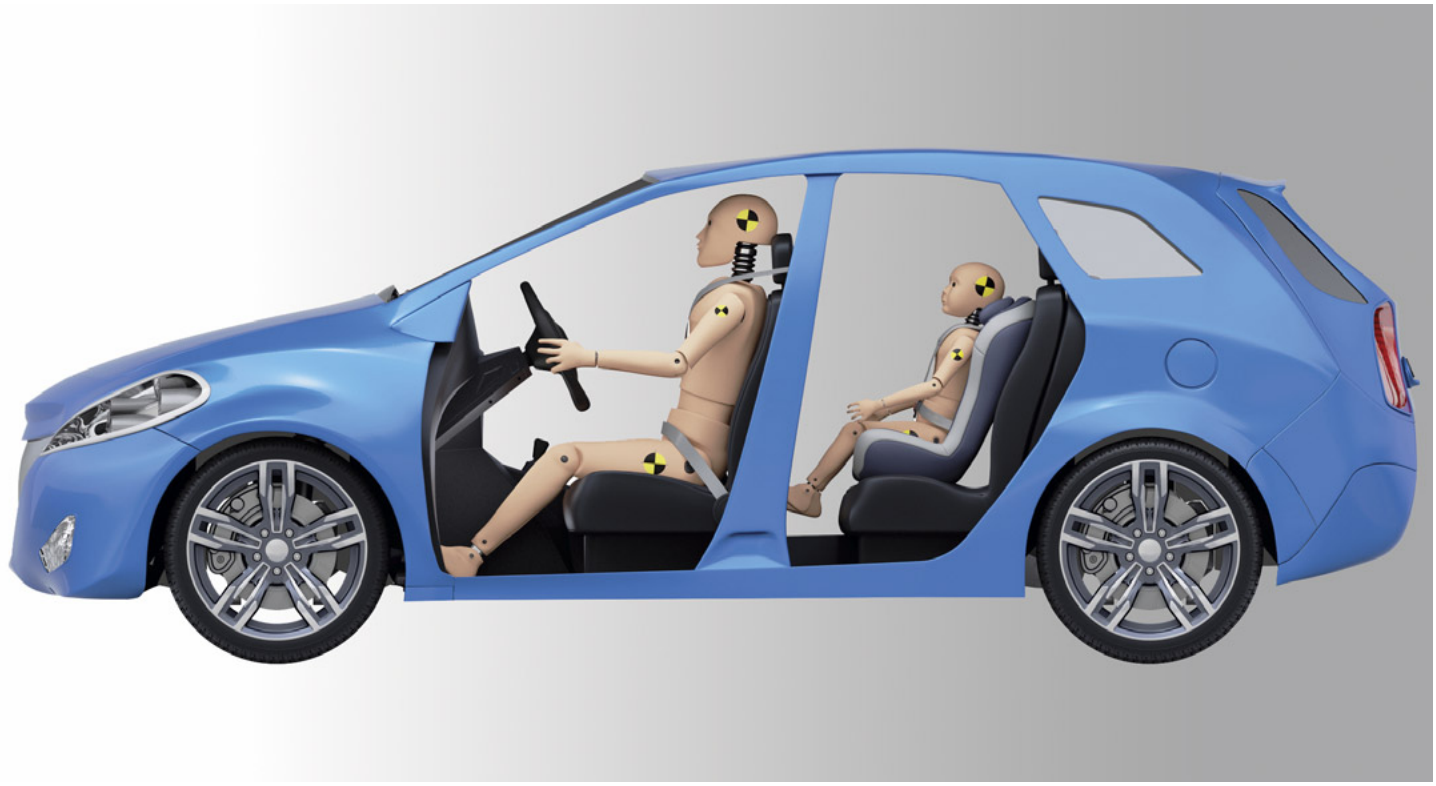

Defeating defendant's "junk science" in a rear-ender trial

TAKING AIM AT THE BIOMECHANICS EXPERT

"What do you mean by seatbelts?" – these were the last words uttered by the defense biomechanics expert before he left the stand. With that answer, the jury burst into laughter, affirming that the biomechanics expert's testimony was misleading and made up of "junk science." The cross examination of this expert was a key part of obtaining a $2.1 million verdict by a Van Nuys jury on a low-speed rear-ender case. The road to this laughable moment, however, was a long one.

On his way home from work, plaintiff's vehicle was struck from behind by a large commercial-plumbing van and then collided with the vehicle in front of him. Defendant's vehicle was being driven at fifteen miles-per-hour when it struck plaintiff's vehicle. Plaintiff returned to his job as a construction framer the very next day. The plaintiff sustained cervical and lumbar pain, as well as pain in his wrists. After initially conservative treatment, he needed a single level lumbar fusion surgery.

Going into trial, we knew that the cross examination of the defendant's biomechanics expert would be crucial to our success. This was compounded by the fact that the case was referred to us when it was too late to designate an accident reconstructionist or biomechanics expert of our own. This article will discuss the strategies and methods used in preparing for and ultimately cross-examining the defendant's biomechanics expert and debunking junk-science theories.

Lock the defense expert into the most extreme position

To start, locking the defense expert into the most extreme position was our primary goal, since this helped reveal the expert's faulty assumptions and misleading opinions. With extreme positions that seem to belie common sense, the expert will often lose credibility in the eyes of the jury. Locking the expert into the far edge of their opinion range creates a dynamic of tension which is hard for them to wiggle away from at trial. The less they hedge with a reasonable opinion, the harder they fall.

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In our case, the defendant's car was traveling at around 10 to 15 miles per hour. Based on the defense expert's reconstruction of the accident, he calculated the change in velocity at impact (delta v) to be between 6.2 and 10 miles per hour. That calculation, according to the expert, would deem this collision to be a low-impact collision. The expert opined, that at those speeds, it would be impossible for a person in plaintiff's position to sustain any kind of a lumbar injury. At trial, we were able to get the expert to commit to the conclusion that it is impossible to sustain a lumbar injury in a rear-ender at *any* speed, unless there is a seat failure. On cross, plaintiff's lead trial counsel on the case, asked:

Q: It's your opinion in this case, sir, that even at a 20-mile-per-hour rear-end impact, that unless there's a failure of the seat back, the person in that car cannot have a lumbar disc injury, correct?

A: That's supported by the literature, yes.

Q: And your opinion is that no matter what the speed is, your opinion is that unless the crash is so huge that it breaks the seat, there's no mechanism for a disc injury, correct?

A: If you look at the literature…yes.

The same approach was taken on the mechanisms of a cervical-spine injury as well. In regard to the cervical spine, the biomechanics expert committed to the position that injuries cannot occur in a forty-mile-per-hour rear-ender. We had the expert commit to these extreme positions, although the case at hand was dealing with far lower speeds. As shown by the expert's responses, he often would refer to the "literature."

Expert withholds documents by using the "database" theory

In our case, the biomechanics expert used a "database" of twenty-three articles that purported to show that a person cannot suffer a lumbar injury in a rear-ender collision. The problem was that the expert refused to produce the database and likewise refused to produce all of the articles that the database relied upon. In fact, only two of the twenty-three articles were produced. The expert created a distinction between relying on the articles themselves versus the study results and data. Thus, the expert was able to "backdoor" or mask faulty articles by creating a "database." This is a common tactic used by engineering and biomechanics experts.

Plaintiffs brought a motion in limine to exclude the expert based on his failure to produce twenty-one of the twenty-three articles. The motion was made on the grounds that *People v. Sanchez* forbids experts from regurgitating hearsay, as well as the fact that the expert was obligated to produce all of the materials he reviewed to prepare his opinions. The court ultimately denied our motion and allowed the witness to testify that, based on his review of hundreds of articles and his own database, plaintiff could not suffer an injury in this collision which resulted in a delta v of 6.2 miles per hour.

Although plaintiff's motion in limine ultimately failed, that does not mean the theory relied upon in the motion was not still useful at trial. The spirit of the law and *why* the law believes certain evidence should be excluded is, at its core, rooted in sound logic. We believed and argued the expert should be excluded for failing to produce the articles used to create this database. The judge disagreed. The jury did not.

Something to hide

At trial, plaintiff's counsel asked, "Now sir, is there a reason why you didn't want to give us all the articles so we could ask you questions about them?" The witness answered, "You have a reference list. You can easily pull the articles yourself."

This exchange showed the jury that the biomechanics expert had something to hide. It was a point on cross that was easy for the jury to understand. This strategy was enhanced by the fact that our experts turned everything over. This contrasting point was used in closing argument, where we were able to show our supporting evidence and the defense was not. *Seeing is believing.*

Another way of dealing with articles and other documents relied upon by a witness but not produced, is citing Evidence Code section 771, which states:

> (a) Subject to subdivision (c), if a witness, either while testifying or prior thereto, uses a writing to refresh his memory with respect to any matter about which he testifies, such writing must be produced at the hearing at the request of an adverse party and, unless the writing is so produced, the testimony of the witness concerning such matter shall be stricken.

Violating this code section should result in the witness's testimony being struck. This is a strong tool to use against any witness who avoids producing documents, especially when a biomechanics expert hides articles by use of a "database." Note, however, that it must be established that the witness reviewed the documents *and* that those documents refreshed his or her recollection. Without establishing that the witness's memory was refreshed, this section cannot be used.

Attacking articles the defense expert relies upon

In addition to the database mentioned above, there were 21 articles that the biomechanics expert did in fact produce. We used the literature the biomechanics expert relied on against him, finding it to be an effective method on cross-examination. In doing so, the method we used was to select a handful of the articles that were either faulty for some reason or were clearly distinguishable for our specific facts. If the expert relied on any faulty or distinguishable material, all of the opinions are subject to attack. (Editor — See a further discussion of this subject in the article by Alex Behar in this issue dealing with *Sargon Enterprises* and *People v. Sanchez*.)

When dealing with engineering concepts it is important to know your math and physics (consult with a biomechanics expert to prepare an effective cross) but not to get bogged down in egghead nonsense. Challenging

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the expert can be a double-edged sword: First, the expert has substantial knowledge in the area and you are in their world when talking math. This will usually give the expert the upper hand. Second, taking the risk in most cases does not justify the reward. This is because even in the event you do stump the expert, or prove their calculations to be off, it must be done in a way as not to lose the jury. There is of course, a happy medium. In our case we used some simple math concepts to quickly illustrate that the expert was trying to mislead the jury. Once that occurred, there was a palpable shift in the room that the defense was losing some credibility.

Anytime we attacked the defense biomechanics junk science, we did so with the use of the literature the expert relied upon. To illustrate, the biomechanics expert placed a significant emphasis on the low speed of the defendant's vehicle at the time of the collision and cited an article by the author Yang. We were prepared with the Yang article, which discussed that not only the speed but the *weight* of the vehicles involved in the collision will affect the force exerted on plaintiff's back, and that the speed alone is misleading.

Plaintiff's Jetta weighed 3,400 pounds, while defendant's commercial-plumbing truck weighed 5,300 lbs. At first, the biomechanics expert attempted to dispute this argument. Then, Spencer used the Yang article against him:

Q: You cited an article by an author named Yang. Do you remember that?

A: Yes.

Q: And isn't it true that in the Yang study they analyzed the mechanism of injury for a lumbar spine, and they discuss that the discrepancies in the weights of the vehicle further increase the risk of lumbar injury? Would you agree with that?

A: Yeah.

The crash dummy

Another common tactic of defense biomechanics is to rely on studies done with anthropomorphic test devices (ATD), commonly known as crash-test dummies. Many of the articles relied upon involve the Hybrid III family of crash-test dummies, which were initially developed back in 1976. A simple and effective method on cross-examination is attacking studies based on the use of human subjects versus the use of dummies.

In this case, of the numerous articles produced, only three involved human subjects. Plaintiff was able to show that the crash studies involving human subjects dealt with significantly lower delta v's than the delta v in this case. In contrast, when dealing with the relatively high delta v in this case, only dummies were used. We used this fact to draw a concession that the reason human subjects were not used in the study was because they would in fact get hurt:

Q: But at any rate you would agree that your partners wouldn't do impact testing at a range where they figured they were probably going to hurt people, right?

A: Sure.

Q: And that's why they did the impact testing at a significantly lower impact than what [plaintiff] went through, correct?

A: I mean, again, this is one of the earlier papers for doing human subjects testing, so I don't know the testing limits at that point, I suppose.

Another common theme we see in evaluating the legitimacy of the biomechanical research frequently relied upon by defense experts is that it is tainted with researcher bias. Researcher bias exists when the group performing the research influences the results, in order to portray a certain outcome. Many cases of researcher bias are apparent and easily understandable to a juror.

For example, in the instant case, we discovered that the partners who conducted a certain study were directly involved in the study themselves as test subjects. The crash test, taken at an extremely low delta v, was used to show that a subject would not have pain symptoms after a simulated rear-end collision. The method used to measure whether or not a subject was injured or in pain was simply by having the subject report their symptoms. So, when the biomechanics engineering firm works almost exclusively for the defense, would there be an inherent interest to sway the results to one side? This is clearly researcher bias. Even if the subject was injured, they had a bias or incentive not to report their symptoms. The line of questioning used was effective in trial:

Q: Sir, you're familiar with something called researcher bias, are you not?

A: Sure. I've heard the term.

Q: As an engineer who does testing, do you know what researcher bias means?

A: Sure.

Q: Okay. So in this case, this same study authored by your two partners, you know the researcher named Carley Ward. Have you heard that name?

A: I've heard the name.

Q: She's a well-known biomechanical engineer in this field, correct?

A: I suppose, yes.

Q: All right. And, in fact, her daughter, Jennifer Ward, was also an author to this article along, with your two partners, isn't that true?

A: I suppose.

Q: Now, isn't it true that out of the subjects tested, one of them was a 58-year-old female named Carley Ward, and the other one was a 27-year older female named Jennifer Ward?"

Each accident is different

Lastly, rear-enders are not all the same. Just because there is one universal word for this type of vehicle collision, it does not do justice to the facts of the case to think that way. Each rear-ender is nuanced, resulting in different forces applied on the body. In our case, plaintiff's vehicle was hit from behind, causing one collision, and then collided with the vehicle in front of him, causing another collision. This fact was crucial, since none of the biomechanics expert's articles dealt with this scenario:

Q: Out of the studies that you analyzed, were any of them a similar configuration where there's first a rear impact and then a frontal impact?

A: I don't think any of the studies specifically did two impacts that I can recall.

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All these different points used on cross-examination made the expert increasingly frustrated. At the end of further recross-examination, we pinned the expert down on his use of studies from the 1970s. With so much current biomechanical information available, the defense expert relying on studies more than 40 years old, really highlighted how far he was reaching to advocate on behalf of the defense instead of offering up truly scientific and unbiased opinions. The final exchange:

Q: Have seatbelts changed since 1972?

A: What do you mean by seatbelts?

Q: Those are the things that you wear in the car. You know what, no further questions your honor.

At this point – once the jury caught its breath from laughter – they knew that the expert had a tendency to mislead. This shed a layer of skepticism over his entire testimony and ultimately was a fatal blow for the defense.

Aggravation of pre-existing condition

Another key point for cross examination is the concept of aggravation of a pre-existing condition. Often the defense biomechanics expert, along with the defense radiologist and orthopedic spine surgeon, will testify that your client suffered from a degenerated spine from aging and wear and tear.

You must force the defense expert to admit that she cannot state to a reasonable degree of scientific certainty that the collision did not exacerbate an underlying condition. CACI 3927 states "if plaintiff had a physical or emotional condition that was made worse by defendant's wrongful conduct, you must award damages that will reasonably and fairly compensate him for the effect on that condition."

Some sample prompts are, "You cannot rule out that the subject incident exacerbated the underlying condition that the plaintiff had, true?" Or, "You cannot say to a reasonable degree of scientific certainty that the subject collision did not exacerbate the underlying condition that the Plaintiff had, true?"

Smith v. Covell, the shield against unsubstantiated implications

The plaintiff testified in trial that he had no major health complaints or hospitalizations before the collision. Accordingly, there were no pre-collision medical records. We had difficulty obtaining records from a small clinic where our client and his family went for occasional treatment for the flu or other general family-practice issues. The defense tried to use this against us in trial by arguing that we did not get these records, so they must be bad for us. This type of argument is improper under *Smith v. Covell* (1980) 100 Cal.App.3d 947.

Smith dealt with the comments of defense counsel in final argument that the plaintiff failed to call certain treating doctors as witnesses, with the implication that these doctors would have testified adversely to plaintiff's case. *Smith* holds that this is an improper argument and constitutes attorney misconduct. (*Id*. at 957.) At trial, we were able to use this holding to preclude the defense from arguing that we failed to obtain records from a certain facility; records that would have been equally available to the defense by way of subpoena. This issue seems to pop up in many trials.

Deposition Tips

Ideally, an extensive review of the defendant biomechanics expert's literature would be done at the time of deposition. In the event that is not possible or realistic, there are still measures that can be taken to protect the case at trial. For example, a useful strategy is to ask the expert how the article cited is being used to support his or her opinion. This will prevent the biomechanics expert from attempting to evade or maneuver at trial.

In this trial, there were several instances where the expert would have attempted to mask the flaws within the articles produced by stating he used the article for another purpose. For example, on one of the expert's weakest articles, he stated that he cited the article only because it had a nice diagram of the spine, and not for any scientific purpose. Establishing at deposition the purpose for each article will prevent the expert from such evasiveness at trial.

Further, there are questions that can be asked in every biomechanics expert deposition that may help distinguish articles and studies at trial. The articles can be distinguished based on plaintiff's age, gender, weight, and whether the articles were peer reviewed. At deposition in our case, we went into depth on the various facts distinguishing the test subjects from our client.

Finally, never relent to a biomechanics expert who fights back. This is the best way to get "seatbelt" gems from the expert and hopefully a few laughs from the jury.

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