

# Defeating the Defense BioMechanical Expert in 'Low - Speed' Accidents

## **I. Introduction**

What the heck is Biomechanical Engineering, and why do I care? The short answer is that Biomechanical Engineering is an advanced sub-specialty of mechanical engineering that merges engineering and medicine. Biomechanical Engineering research stands on the cutting edge of everything from nanotechnology and robotics to safer product design. Unfortunately, a full blown litigation industry has developed in recent years purporting to be based on the science of Biomechanics for the purpose of defeating the compensation claims of people injured in accidents involving cars and trucks, slip and falls, industrial accidents, power tools, falling debris, carnival rides, etc.

More often than not, the “expert” hired by the defense in these types of cases is unqualified and untrained in the actual field of Biomechanical Engineering, fails to apply sound scientific protocols, and relies on junk science ‘studies.’ In a typical ‘low speed’ rear end collision case, the defendant’s biomechanic will spit out a form report, citing certain ‘studies’ which he claims support his conclusion that there is just no way the forces presented in this accident could have caused your client’s injuries.

His ‘scientific analysis’ will have more holes than Swiss cheese. The basis of his initial calculations will likely be mere guesses heavily weighted in the defendant’s favor. He may get into the case long after most of the scene evidence is gone, but won’t bother to search out much evidence that is still available to him. He will address only a few of the dozens of factors that should be considered in a true scientific BioMechanical Modeling of the event. However, if you are not prepared to demonstrate the problems with his analysis, this expert can be very convincing and can kill your case in front of a jury.

## **II. How They Play the Game**

There are litigation support companies that exist for the sole purpose of supplying insurance companies and personal injury defendants with “experts” in Biomechanical Engineering to perform an “Accident Causation Analysis” and to present their “findings” to juries at trial. The science that the defense Biomechanical Engineer uses to discredit your client’s injuries is based on a collection of studies primarily funded and conducted by insurance companies or litigation support companies. A close reading of most of these studies show them to be significantly flawed and/or obviously biased in pursuit of an agenda. In these studies, the researchers use volunteers (sometimes employees of the litigation consultant conducting the study) to conduct a series of low speed crashes. The study may be as simple as recording the speed of the vehicles and interviewing the volunteers for complaints of injury, or they may be

significantly more involved using high speed cameras, equipment, and sensors to record and measure both occupant and vehicle kinematics, forces, and changes in velocity throughout a crash event.

Some of the more thorough studies will conduct diagnostic imaging studies of the volunteers before and after the crash event, although very few track or report on changes in the condition of the volunteers for any significant period of time following the crash events. Commonly, the studies will look at a series of crashes over a range of speeds from 1 to 8 mph. One often-cited study set out to prove that people could not be injured in rear end collisions of 10-15 km/h [6.2-9.3 mph]. The study was based on 19 test subjects (14 men and 5 women) who together were subjected to a total of 20 crashes. The article states that the purpose of the study was to “find out” whether whiplash injuries can occur in rear end accidents with velocity changes between 10 and 15 km/h. Three of the 20 test crashes were with bumper cars, 17 used motor vehicles, of those 17 test crashes, **7 were less than 10 km/h crashes, and 10 were between 11 and between 11 km/h and 14.3 kmh.**

Out of the ten volunteers that participated in crashes above 10 km/h five experienced complaints of pain. Only one woman participated in the higher speed crashes [13.6 km/h or 8.45 mph] and she was one of the volunteers complaining of pain. (She experienced soreness in the cervical spine for 3 days and painful sensations upon left rotation of her cervical spine.) Computer assisted motion analysis confirmed that all participants had a reduced range of motion in at least one direction of motion. The researchers never conducted an actual 15 km/h test crash. The volunteer who planned to participate in the higher velocity experiment (a 30 year old male) *declined to continue* after enduring a 14.2 km/h crash. This volunteer also experienced nausea and vomiting ½ hour after the crash, but the researchers noted it might have been related to medication the volunteer had taken shortly before the experiment. Despite never actually conducting a single crash test at 15 km/h, the researchers nonetheless concluded that “the Biomechanical limit of harmlessness” in two-car rear-end collisions lies at a velocity change (Delta V) due to collision of between **10 and 15 km/h.**<sup>1</sup>

In a nutshell, the scientific analysis of the defense Biomechanic goes something like this.

1. Studies A, B, and C conducted “low speed” crash tests (under very controlled and/or contrived conditions).
2. No one was injured in these studies.
3. Therefore, the forces encountered in *all* “low speed” crashes are below the ‘*injury threshold*’.
4. Government and insurance industry crash tests on the car your client was driving lets the Biomechanic assign a ‘stiffness’ factor to your client’s vehicle, which allows for

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<sup>1</sup> Do “whiplash injuries” occur in low-speed rear impacts”, Castro *et.al.* Eur spine J (1997) 6: 366-375 – These are just a few examples of the issues with this article championed by many defense Biomechanical Engineers. This list is by no means all the problems with this particular *scientific study*.

correlation of crush damage to speed of impact, *i.e.*: a deeper dent = a higher speed of impact.

5. Looking at pictures of the vehicles, the Biomechanic will 'estimate' the crush depth of one or both vehicles involved in the accident.
6. The Biomechanic then enters values for each vehicle involved in the accident into a computer modeling software program: 1) estimated crush depths (usually in inches); 2) stiffness factor; and, 3) vehicle weights. The software program then estimates the Delta V (*change in velocity*) that would be forced upon your client's car in the crash.
7. Since the estimated Delta V cause by your client's accident was less than that of the crashes in the cited studies, the forces experienced by your client were also below the threshold of force necessary to cause injury.
8. Therefore, any injury or condition your client may now suffer did not occur as a result of this unfortunate, but very low impact accident.

Upon close inspection, it becomes obvious that the analysis of these so-called 'experts' really isn't science at all. Even if the studies which constitute the foundation of the defense Biomechanic opinions were legitimate scientific studies, the most a person could rationally conclude from these studies is that a person involved in a particular type of crash event is statistically unlikely to be injured. Based on the sheer number of rear-end motor vehicle collisions each year, this is a statistically irrelevant conclusion (even if true). However, the defense Biomechanic is not attempting to make a prediction about the statistical likelihood of injury in a future event. Instead, he is attempting to use statistics to disprove an event that has already happened.

To illustrate the point, giving the defense Biomechanic the benefit of the doubt, let's assume that the following hypothesis is true. The odds are 1 in 5000 that a 30 year old, 50<sup>th</sup> percentile female would suffer a herniated disc at C4/5 as a result of a 5 mph Delta V accident under the following conditions: she is occupying a 1997 Honda Accord, in a stopped position, with the seat back inclined at 5 degrees, her foot on the brake, with the top of the seat back 2 inches below her shoulder, the top of the head rest 3 inches below the top of her head, the back of her head is 4 inches from the head rest, 3-point harness properly fastened, not anticipating the impact, but her head happens to be facing exactly straight forward.<sup>2</sup>

Assuming the above statistical probability is true, the defense Biomechanic would be scientifically sound if he testified that your client **would be** unlikely to suffer a herniated disc if she were in such an accident **tomorrow**. However, once the accident and injury occur, the probability for this particular woman becomes 100%. The Biomechanic's analysis ignores the fact that there are hundreds of thousands of motor vehicle accidents every year. Statistically, some of these accidents will result in injuries. However, the defense Biomechanic will argue

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<sup>2</sup> Each of the details listed above are recognized factors that can affect the potential for injury. Since the defense Biomechanic has no way of knowing the answers to most of these questions, he just ignores them.

‘probabilities of events’ that have **already** occurred to say “no, they didn’t.” Once an event has already occurred, the probability of it occurring is no longer 1 in 5000, it is one hundred percent.

According to one source, your odds of dying in a commercial aircraft crash between the years 1996 to 2000 were 1 in 4,178,464 based on the total numbers of commercial flights during that time period [50,141,570].<sup>3</sup> However, if you happened to be one of the 450 people who died in the twelve airline crashes during that five-year period, as of the day after the crash, your odds went up dramatically! (All the way to 100%.) Applying the logic of the defense Biomechanic, if it rained on a day when there was just a 5% chance, it really didn’t rain at all. No one has ever been struck by lightning or been hit by a foul ball at an Astros game.

### **III. Knocking the Bad Guys off Their Junk Science Horse**

This paper will examine and discuss tactics that have been successful in exposing the junk science used by the defense Biomechanic, and hopefully, assist the reader in protecting his or her clients from these types of attacks.

At the outset, it is worth noting that the real science of Biomechanical Engineering can be quite impressive. The University of Texas at Austin describes the field of Biomechanical Engineering on its website as follows:

Biomechanical Engineering is the application of Mechanical Engineering science and technology to problems in medicine and biology. The human body is usually the centerpiece or component of a Biomechanical Engineering enterprise. It is the interface between engineering and the human. Areas of application include: medical devices; medical instrumentation; research in medical physiology, materials, pharmaceuticals, musculoskeletal biomechanics, rehabilitation, and radiation cancer therapy. The mechanical engineer with a specialization in Biomechanical Engineering might be involved in the design of heart valves, blood pumps, prosthetic devices, methods of blood preservation, thermal protective clothing. He/she might also develop robotic systems for surgical procedures, aided hearing systems, materials for implantation into the body, or sterile packaging.

Noticeably absent from the University of Texas description of Biomechanical Engineering is any reference to litigation consultants examining pictures of wrecked cars and opining that the occupants of the vehicles could not have been injured.

## **IV. Preparation for Deposition**

### **A. Gathering Ammo**

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<sup>3</sup> WHAT’S more dangerous? - AIRPLANE VERSUS AUTOMOBILE ACCIDENTS; MIKE BOROWSKY

Items/Documents needed from Expert or Defense Attorney through written discovery:

In Federal cases, review the expert's report carefully to make sure it provides all the information required by FRCP 26(a)(2)(B). In state court, make the defendant give you an expert report, even if you have to file a motion under Rule 195.5, and make sure the defendant has provided all documents responsive to TRCP 194.2(f). To date, no defense attorney has sent me a truly complete 194.2(f) response first time around. After the defendant has provided disclosure responses, I will send a letter outlining additional items regarding the retained experts that I believe should be included in disclosure responses. This is especially helpful in state court cases, because Rule 194.2(f)(4)(A) is worded so broadly with respect to the items that must be produced:

194.2(f)(4)(A) **all documents, tangible things**, reports, models, or data compilations that have been **provided to, reviewed by, or prepared by or for** the expert in anticipation of the expert's testimony

I submit that this encompasses an expert's entire file. Therefore, I send a letter itemizing all the things I know are contained in the expert's file that are not produced in response to my request for disclosure: summaries of evidence prepared for or by the expert; bills and invoices for the expert's work; copies of checks sent to the expert as payment; cover letters attached to any document, check or other item sent to or from the expert; and, copies of articles cited in the expert's report.

Of these items, the category about which I get the most resistance (or at least sarcasm) is production of the attorney's and expert's cover letters for the items they have sent each other. Many defense attorneys can't believe I insist on cover letters because they are usually only one or two lines long and do not appear to contain any useful information. However, the only information I am after is the date each was sent and what items were enclosed. (Obviously, I don't tell defense counsel this.) By comparing this information to the expert's billing entries, expert report date, as well as the run dates on the various EDCRASH reports he has produced, you can create a time line of his work on the file. Because expert witnesses use form reports and often do not really **learn** the case until just before the deposition, you can often use the dates on these documents to show that he drafted the report before conducting any serious review of the records.

Although sending a letter requesting Defendant supplement its disclosure responses will often get some additional items, rarely will defense counsel voluntarily produce prior to the expert's deposition all the items I request in my letter. How hard you want to push the issue before deposition is purely a judgment call. I have found that normally, if you attach a subpoena *duces tecum* to the notice of deposition, the expert will bring his entire file. Often, this is also the first time defense counsel has seen the expert's entire file, so it is less likely items have been removed. In short, although it is nice to have everything in advance so that you can

prepare, you may actually get more if the file has not yet passed through the “defense counsel filter.”

Items to include on your subpoena *duces tecum*:

- bills
- letters to and from
- medical records reviewed
- summaries by staff (issue: education and training of staff)
- all software crash and modeling simulations - EDCRASH reports, etc.
- notes
- draft reports
- FRCP 26(a)(2)(B)(v) prior testimony list
- witness depositions reviewed in the case
- any authored seminar or CLE materials
- advertisements of the expert and his firm during the previous five years
- client list

At the deposition, make sure you remember to take a moment before you go on the record to review everything the expert has brought with him to the deposition and incorporate the matters into your outline. When the expert shows up with a large amount of documents I am seeing for the first time, I send everyone for coffee and take all the time I need to thoroughly review the documents. I don't want my document review time taken off my allowed record time with the witness. Any protest from defense counsel is quickly put down by reminding them of the letter I sent weeks ago requesting many of these items.

## **B. Information needed from your expert witness**

It may be necessary to retain a biomechanical engineer or ‘injury causation analysis’ expert to testify for the plaintiff at trial. However, it is a good idea to have an accident reconstructionist to estimate the real speeds and forces of the crash and treating physicians to prove up causation in the traditional manner. Your accident reconstructionist can be a valuable tool in preparing to depose the defense expert. True accident reconstructionists usually do a good job of measuring and photographing the scene and vehicles involved, whereas the Biomechanic will often rely on assumptions and ignore unknown variables about the facts of the accident. Your expert may catch assumptions and “didn't do's” in the Biomechanic's report that you might have missed.

If you have access to the damaged vehicles, have your expert measure the actual crush depths. If photos are all that is available, make sure someone on your side conducts a Scaled

Forensic Analysis in estimating crush.<sup>4</sup> Then, have your expert run his own EDCRASH report to find the real Delta V involved in the accident.

### **C. Items/Documents needed from research**

Internet research can be very helpful in preparing against the defense Biomechanic. There is no limit to the information available and the ways in which that information can be used against this type of expert. In this section, I provide examples of information I found along with a brief explanation of how I made use of each category of information.

#### 1. List Serve & Trial Smith

With a little research on the TTLA List Serve and Trial Smith, followed by a few phone calls to other attorneys, you can put together a large collection of prior depositions, trial testimony, affidavits, and motion and orders to exclude just about any professional expert witness.

I have found that most plaintiff attorneys are willing to help by providing anything they have on the defendant's expert witness. As always, these items can provide opportunities to impeach the witness with his prior testimony.

#### 2. Get articles cited in report (must pay a fee for some).

As noted above, the defense attorney should provide you with copies of all studies cited by his expert. If you don't want to wait, you should be able to find most articles by researching online publications. Most web sites charge a fee to print copies of the articles. Once you are able to read the cited articles in their entirety, you will find many different ways to attack their voracity. One good internet resource for articles is [www.sciencedirect.com](http://www.sciencedirect.com).

#### 3. Operating manuals and tutorials for the applicable computer modeling software

Many software companies have operating manuals and tutorials for the reconstruction software available on their website. This information may help prove the expert has not used the software correctly. Software operating manuals set very limited parameters for the usefulness of their programs. There are many necessary variables that must be considered and accounted for in order for the program's results to be reliable, and the software designers make this very clear in the written manuals. The expert witness usually will not have access to enough information to obtain a reliable result from the software program, and he probably did not read the manual. Some examples of the more common software programs used in the field are: HVE (Human Vehicle Environment) software suite; EDCRASH; EDSMAC (Engineering Dynamics Simulation Model of Automobile Collisions); and, GATB (Graphical Articulated Total Body).

#### 4. Degree plans offered at universities in Biomechanical Engineering

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<sup>4</sup> See discussion below explaining how to conduct a scaled examination of photos.

Several major universities across the country now provide undergraduate and graduate degrees in Biomechanical Engineering. Print their degree plans and compare the courses offered to the expert's C.V. and bibliography. You may find that the expert has not been trained or educated, or has conducted any (non-litigation related) research in the field of Biomechanical Engineering.

5. Review expert's website

Many experts or their companies have web sites promoting their services. Many of these web sites will list seminars the expert has given as well as provide copies of materials, papers, and demonstrations presented at those seminars. The web sites may provide copies of publications authored by the expert or other experts within the same company. The site may provide a client list which will show that they mostly work for insurance companies or automobile manufacturers in the context of litigation defense.

6. Google them

Always Google the expert and the company he works for. You never know what you might find. This will often lead to many of the items listed above, or maybe something even better.

### **Deposition 'Blocks' or Subject Areas**

I usually begin these types of Expert deposition with a thought towards setting up the defense expert to look like a jerk if/when he acts like a jerk. This is pretty easily done in a conversational manner with a few added questions as a follow up to the introduction that we do in every deposition.

**Intro:**

All the standard introductory items, stating name for record, I represent the plaintiff in the case, he has been hired by Defendant, purpose of deposition is to learn his opinions and basis for them, only fair to both sides - no one wants to be surprised with a different story at trial, he agrees that's only fair.

**Setting Up for Expected Shenanigans:**

Some of the defense Biomechanic experts can be as bad as any when it comes to evasive, non-responsive, and argumentative answers. Since we have come to expect this type of behavior from many experts, it is worth the time to lay the ground work to put the witness in the worst possible light if (when) he decides to play those games. One way that seems to have worked well for me is beginning with a conversation on the record along the lines of:



- Although we are on different sides, I am sure that you will agree with me that it is still important to treat each other with professional courtesy and respect.
- I can promise you before we get started that I will do my very best to hold up my side of that bargain. One way we can show each other courtesy is that I will do my best to let you answer every question without trying to interrupt you or to argue in the middle of your answer no matter how much I might disagree with whatever it is you're saying, Okay?
- Likewise, you can be fair to me by answering fully and honestly the questions that I ask. Can I have your agreement and promise to do that?
- **I am sure that you have been doing this long enough that you have seen attorneys who constantly interrupt the witness?** (They always seem to agree to this one)
- **...and you have probably also seen professional witnesses try to dodge questions that are bad for their side, or give evasive answers, right?**
- **As a matter of professionalism, can we agree that both of those things are improper and that neither one of us will attempt to cheat the process in that manner?**

\* *By including the additional questions (in bold) to our standard introductory questions, we have now effectively tied the evasive answers we expect to dishonesty and an intentional effort to "cheat the process".*

I usually continue my demonstration of how good a guy I am and how we can all get along by giving the witness a road map to his deposition similar to:

As a show of good faith, I will tell you pretty much everything that I plan to ask you today, kind of outlining it so there are no surprises. Basically, we are going to start off with my letting you tell us about your:

- G. Education background
- H. Work history
- I. History testifying in this kind of cases, and with the defendant's attorney
- J. Information that you have been provided, or have gone out and gotten on your own in this case, and of those things, what you have reviewed, or considered (or decided not to consider) in reaching your opinions
- K. I will let you tell us any opinions you might have and the basis for them
- L. I will let you tell me the things you have done and haven't done in the process of working on this case

M. And finally, I will let you tell us about your payment arrangements with the defense in this case....in other words how you're being compensated for your time here today.

“And that’s it. How long it takes will pretty much depend on how we work together getting these questions answered. Okay. Ready to get started?”<sup>5</sup>

### **Education and Training:**

Walk him through all education and training. Get times and dates, whether it was a certificate type course, how many class room hours, how many ‘lab’ hours or hands on training he got, if any. How many levels of training are available? [For example, there are several levels of accident reconstruction training (Texas State Troopers have 7.). It is nice to point out that Defendant’s expert has the lowest level of training in the field – enough to call himself ‘certified’, but nothing beyond that.] Q. If we look at the available formal classroom instruction like a ladder, you’re on the 1<sup>st</sup> step, correct?

Who else was in the class with him (often, it is other employees of the firm and new police recruits... which leads to the follow-up question of “O’kay, what you’re describing is the same class that every police cadet has to take in order to graduate from the police academy. So you have that same basic ‘classroom’ training about accidents as a new police officer.”

**[Practice Tip** - if you leave out the word ‘classroom’, the witness will explain how all of his other training makes him *much more qualified than a police officer*. He will probably do this anyway, which will just give you an opportunity to emphasize that you will give him every opportunity to tell us about his training one thing at a time so that we get the total picture, but you just wanted to make sure there was no misunderstanding that his formal classroom training - where there is a professional instructor, course materials, and he gets some kind of certificate if he passes - is limited to the same basic course that new police officers take.

When you get to the end, confirm with the witness that he has had no formal outside training since (date of the class).]

Inquire as to what classes, tests, or certifications are available that he could have taken and did not.

### **Work history:**

Take the witness through all relevant work history: duties, dates of employment, supervisor, interest or shares in the business, income, reason for leaving.

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<sup>5</sup> What he probably doesn’t realize is that we have just truthfully summarized what is likely to be a six-hour deposition demonstrating his bias, faulty science, assumptions, omissions, and errors.

[Often, the witness will share his annual income 15 years ago, but claim not to know, or refuse to tell you how much he makes doing this work, which leads to the question, is there a reason he remembers what he made working as a waiter 20 years ago, but he doesn't know how much he made last year in the professional witness business.]

**Ask about:**

14. His history testifying in this kind of cases, and with the defendant's attorney
15. Information that he has been provided, or has gone out and gotten on his own in this case. Of those things, what has he reviewed, or considered (or decided not to consider) in reaching his opinions

Confirm what he did and did not bring in response to the subpoena *duces tecum*.<sup>6</sup>

- If he did not bring all items requested, discuss date on your notice faxed to defendant attorney on same day, when it was forwarded to his office, if there was a delay, does he know why this was not sent immediately to his office, he understood this was a subpoena, but decided not to bring something. Establish the things not brought by witness do exist. *Politely*, reserve right on the record to reconvene the deposition for questions on the items not produced by the witness.

**“Didn't Do's”:**

This section of the deposition is used to highlight everything the expert did not do. If we ask 50 questions at deposition (and he didn't do 25 of them), at trial, it will be a continuous bullet point list of 25 things he didn't do. Before you start, get the witness to agree with you that with scientific investigation, it is preferable to have as much information available as possible. This is a basic, fundamental principle, correct? And, he is attempting to apply scientific principles in his review of the case, correct? Does he feel like he has been thorough in his work on the case? Does he feel like he has done all the work he needs to do? Is there anything that he has not done, that as we sit here today, he can say to himself, 'you know, I really should have done this or that'? So, he is happy and pleased with how thorough he has done his job in this case, correct?

In all likelihood, his ego and partisanship will lead him to say what a good and thorough job he has done. Now the fun part. You will have brainstormed everything that you can think of that a defense expert could do in his investigation. There will be some things he did not have an opportunity to do because he got called into the game late. There will be many others that he could have done and didn't bother. **Blast him with both.** He will protest and make the excuse that some of the evidence was not available to him, *i.e.*, the cars were already sold for

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<sup>6</sup> He should certainly have his entire file in response to the *duces tecum* as well as his testifying case list required if he testifies in Federal court.

salvage, skid marks were gone, etc. Great: “So if I understand your testimony, doctor, you are agreeing that an actual inspection of the vehicles is something that you would have liked to have (*showing with tone of voice and inflection the importance*), you were just deprived of that evidence because of how late you were in getting the call on this case?”

After we have finished our list, we will go back over the ones that he could have done one-by-one with a question similar to: “Now doctor, I just want to make sure that I am being fair to you, and that I have my notes right. According to my notes, there is a number of these things that we have been discussing that you could have done, or information that you could have located, and for one reason or another, you just decided not to. So, just so that I can insure that I have it down right in my notes, please, confirm for me: You could have done A, correct? You could have done B, correct? You could have done C, correct?”

### **Vehicle & Scene Examples:**

#### **Did the Expert:**

- ☺ go to the scene,
- ☺ take all relevant scene measurements, record the location of initial impact [How was that determined?], record the final resting place of all vehicles and distance traveled post impact,
- ☺ examine the vehicles [What part of the vehicles were examined if any, what evidence was preserved, notes taken?],
- ☺ measure the seat back position of incline, examine the seat back for indications of failure, strain, or bending,
- ☺ measure the position of the head rest,
- ☺ measure and record occupant spaces,
- ☺ inspect the interior for indication of places where the victim’s body impacted any part of the vehicle’s interior, if appropriate,
- ☺ look to see if the impact involved a particularly stiff part of either vehicle, *i.e.*, trailer hitches on trucks and SUV’s,
- ☺ look under the vehicles for frame damage,
- ☺ take frame damage into consideration with crush estimates (There are rarely photos taken of undercarriage damage by adjusters but the body shop estimates usually list it.),
- ☺ examine *all* body shop estimates of damage, consider all damages noted in repair estimates, *i.e.*, ‘Repair shop says frame was bent and estimated it would take three hours to repair. Your report mentions a broken tail light but fails to mention the frame was bent.’?,
- ☺ Were bumpers, covers, fenders, or core supports removed in order to inspect hidden damage?,
- ☺ take actual crush measurements,
- ☺ measure pre-impact skid marks,
- ☺ measure post-impact stopping distances of the vehicles,

- ☺ use post-impact stopping distances to calculate post-impact speeds of each vehicle  
[Note: These calculations could be used to support or refute the assumptions of impact speed based on the estimated crush depth from pictures.],
- ☺ determine the weight of all vehicles involved, including the weight of cargo and passengers,
- ☺ use actual lengths of vehicles, (with correct wheel base) - or estimate lengths,
- ☺ input the body type, age, sex, height, and weight of your client measured, and input into any software simulations, or use generic people numbers, if generic, what sex, male when your client is female, [Certainly a lot of my client's information was available through medical records.],

**[Practice Tip:** He will likely evade with something along the lines of ‘this is such a low impact collision those individual factors would not make any statistical difference’. This allows us a great opportunity to say: The software you used allows for a place to put these things into the equation, doesn't it? The people who make the software thought it was important enough to include a place in the reconstruction for this information. Nowhere in the operating manual does it say we don't need this information. If you have reviewed and have a copy of the manual, you can hammer him on this issue.]

- ☺ measure the friction co-efficient of the actual road or use a generic,
- ☺ use actual or estimated skid numbers for the vehicles and tires involved,
- ☺ examine the condition of the tires and the brakes of the vehicles involved,
- ☺ conduct software modeling,
- ☺ consider the injury potential, or vehicle and occupant kinematics of anything at all that happened after the initial impact,

In one of our recent cases, the defense hired Dr. Ted Bain with BRC to testify that our client could not have been injured by the *low impact collision* with the defendant's 18 wheeler.<sup>7</sup> Dr. Bain considered the initial impact, only. He ignored the fact that our client's vehicle was knocked off the highway, into a ditch, skidded sideways into a concrete culvert and still had sufficient speed to be propelled over the culvert, across the highway, and into the median before coming to a final stop. At deposition, Dr. Bain testified that the initial impact event was the only event worth considering since everything else would merely be mild deceleration as the vehicle came to a stop. When I asked, “What about when his Blazer hit the concrete culvert?”, Bain's response was “Culvert....there was a culvert?”

- ☺ actually interview any of the witnesses (police officer, Plaintiff, Defendant, third party witnesses),

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<sup>7</sup> Our client's 1996 Blazer was totaled, the frame was bent, and the seat back failed.

- ☺ interview any of Plaintiff’s friends, co-workers, employers, or doctors regarding Plaintiff’s prior medical condition and whether he had ever had these types of problems prior to the accident, and
- ☺ examine Plaintiff [If the expert is also a medical doctor, point out that he has not examined the plaintiff. I like to point out that he never even asked to examine the plaintiff.].

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**“Don’t Know’s”:**

A lot of the ‘didn’t do’s’ are going to result in ‘don’t know’s’. Because the expert did not measure the scene, he *doesn’t know* exactly how far your client’s vehicle traveled before she was able to stop after being hit by Defendant’s truck.

- Q. When professionals such as yourself are attempting to use science to discover the truth about what happened in a crash like this, using the most accurate information possible helps you find the truth, right?
- Q. So, when your trying to be as accurate as possible (so that you can find the truth), is it generally preferable to use actual numbers, or is it preferable to use estimated and generic numbers?
- Q. All right, doctor, with that understanding, I assume then that you would agree that it is a fair inquiry to ask about things that you don’t know, or maybe have not considered in this case, correct?

**Examples of Common “Don’t know’s”:**

- actual scene measurements,
- **actual crush measurements** (as opposed to estimated)

[**Practice Tip**, if you have scaled the photographs and can show that his estimates are wrong, ask him how comfortable he is with his estimates. When he says he is comfortable with them, confirm and emphasize with something along the lines of:

- “The reason I ask how comfortable you are with these crush depth estimates, doctor, is, and I think you will agree with me, these estimates you’re giving are the first building block in the analysis that you use to determine speed, correct? And, of course, vehicle speed is one of the primary pieces of data you’re using as a starting place for all of your calculations, and conclusions, correct? Kind of like if you were building a house, these crush depth numbers would be like the foundation, right? So it’s important that you’re as comfortable as possible with

these estimated numbers you're building the house on, correct? And you're telling us we don't need to worry about your comfort level, you feel good about it?"]

Other common 'Don't know's':

- the exact position and incline of Plaintiff's seat;
- was Plaintiff's foot on the brake, (*This one doesn't really matter much because the force of the collision will make his/her foot come off the brake, but I enjoy letting the expert say that, so I can confirm, "Oh, that's right. That's one thing that all the literature agrees on. The speeds that both sides are talking about in this case, the force in this kind of impact is enough that no matter how hard my client might have tried, there is no way my client would have been able to keep her feet on the brakes, right? So, I guess that one doesn't really matter, correct?)\** Another great reason for including this question in your outline is to set the witness up to expose a common *dirty trick* used by most of his 'studies'. You will find that in most of the 'studies' cited by the defense Biomechanic, the researchers will set the parking brake on the target vehicle (supposedly to mirror 'real world' conditions being stopped at a red light). Hmmm, wonder why they don't just tell the volunteer to keep his foot on the brake? Setting the emergency brake creates more resistance in the target vehicle (locked tires), which lowers the Delta V of the target vehicle and passenger. Likewise, since the target vehicle has a higher resistance, it should result in a higher crush damage to the test vehicle;
- position of the top of the seat in relation to the top of the client's torso (*Was the plaintiff leaning back in the seat or forward, and if forward at all, how much?*);
- position of the head rest in relation to the top of Plaintiff's head;
- position of the seatbelt strap across Plaintiff's torso; and,
- was Plaintiff facing perfectly straight forward, or was his head turned to any degree (*If turned, how much?*).<sup>8</sup>

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<sup>8</sup> In your questions regarding his scientific studies, ask him to confirm that in none of the studies he cites were any of the volunteers allowed to position their heads in a turned position for the impact. Ask him to explain to the jury why that would be dangerous for the researchers to allow that to happen. Q. Of course, we can agree that people turn their heads when they drive, correct? Q. Very few people are looking exactly straight ahead at all times, correct? Q. And, again, you simply do not know the exact position of Plaintiff's head at the time of the collision, correct?

Your particular case may lend itself to case specific “Don’t know’s”, which you can use to beat the defense Biomechanic about the head and shoulders. For example, the seat back may have failed in your case. No doubt, the Biomechanic will have opined on the Delta V created by the crash. Delta V numbers (along with mass/weight) can be converted to G force numbers, which also convert to foot pounds of force. Many seats have been tested for failure and have known strength ratings.

We may well find that the Delta V numbers *estimated* by the defense Biomechanic result in forces significantly lower than what would be required to break the seat support structure according to the manufacturer (or crash tests). If you have a broken seat back case, make sure you also ask the expert if he has ever testified, been hired, or written reports in any cases involving broken seats. If he has, make him tell you the style of the case and venue. It is always possible he or his company has worked on an auto products liability case and previously testified that it would take an enormous crash to break the seat.

If your case has events occurring after initial impact, running through a ditch, hitting other objects or vehicles, make the expert admit he lacks many of those details and/or has not considered them.

- Q. What was the plaintiff’s position in the car when he was trying to regain control, was his head turned at any angle when the second car hit him? Can you tell us if his head struck the door frame, window, or any other part of the car?

\* I often conclude my “*Don’t know’s*” block by using my notes to loop back over his answers on the “*Didn’t do’s*,” *i.e. conclude by listing all the things he doesn’t know because he didn’t look, measure, or ask.*

### **“Did wrong’s”:**

Have I mentioned that these guys will occasionally slant, exaggerate, and mislead? It is helpful to understand that deposing the defense Biomechanic is very much like an Easter Egg Hunt. Hunting and fishing can sometimes be an exercise in futility because, on some days, the deer are asleep and the fish are just somewhere else (or vice versa). On an Easter Egg Hunt, you know there are prizes out there. Someone has just hidden them from you, because they think it’s funny to watch you run around the yard.

It is much the same deposing the defense Biomechanic. You can count on his pulling every trick he can. Knowing his character and expecting the sham has made it much easier for me to spot the tricks. When I am deposing these guys, I am just looking for Easter Eggs.

### **◆ Errors in the Utilization of Accident Reconstruction Software**

The software modeling programs commonly used by reconstruction experts (and Biomechanics) include such programs as EDCRASH, and EDSMAC. These are pretty sophisticated programs, but, like anything else, all things have their limitations. It is worth



while to learn what you can about the program used by the opposing expert. If you have your own expert, he or she should be your first resource. You want to know if your opponent cut corners, fudged data, used the program correctly, the way intended by the designer? Did he input all available data? [For example, if this were an offset crash, is that shown in the simulation by an offset PDOF (primary direction of force), or did the expert run the simulation like it occurred at a straight 180 degrees from the rear?

Find and review the user's manual. You may find that the particular software used by the expert is not intended for multi-vehicle crashes, or articulating vehicles (truck-trailer combinations). You may find helpful statements in the manual about how important accurate information is to the result and that slight errors in crush or stiffness numbers can significantly affect the simulated result. Specific limitations and warnings contained in the user's manual make for great cross responses when the expert testifies that small errors would not affect the result.

- Who actually ran the software simulation? Was it the expert or a staff member? What is the training and qualifications of the staff member? Was the witness trained to use the software?
- **How many simulations were run?** Often you will find that the expert ran dozens of EdCrash simulations on the computer with a wide range of weights, crush numbers, stiffness factors, changes in wheel base, length, and PDOF.

This is great cross material. Why would he do that? Dr. Bain testified that he always runs multiple simulations with different numbers because he liked to see "how the changes affect the indicated Delta V." I just bet he does!!! But, he did not care as much for the continued follow-up questions.

- Q. "Why doctor? Why would you care what the Delta V is in a totally different accident with crush and stiffness numbers that are not what actually happened?"
- Q. "You have an opinion about the real numbers in this case, right?"
- Q. "You were hired to give an opinion about what happened in this case, right? So why would you run two dozen simulations on the wrong numbers, unless you are trying to manipulate the data in favor of your client?"

The best answer he had for running so many different scenarios was that he just liked to see how it affected Delta V. If you can show that the expert is running scenarios with numbers outside the range of numbers he has testified to, I believe it is a pretty powerful impeachment of his testimony.

### ***Spoliation Opportunity***

In the beginning of the deposition (while going over the background information), you will have casually established that the expert: *has a lot of experience testifying in Federal and state court, and you're sure he has had a lot of experience working with attorneys and keeping accurate records of all his material and things reviewed, because as he knows, anything an expert reviews has to be made available to the other side. This is a basic fairness requirement that is set out in the rules, and since he is aware of that, can you assume he has complied with that and has not destroyed any of the materials or information he has reviewed?*

If he has run multiple scenarios, his file should contain print-outs of each of those scenarios. If you don't see them in his file produced in response to your subpoena *duces tecum*, establish that he did print and review the reports on each of the scenarios, what he thought about them, and why he decided to throw them away. After you have established that he reviewed and considered the other print-outs:

*Q. Doctor, can you tell us why you decided to violate that rule we talked about that requires you to keep and give our side everything you have reviewed in this case?*

*Q. Doctor, do you know what the term 'spoliation of evidence' means? (Assuming he says 'yes')*

*Q. So, you are aware that when one side destroys evidence, the other side can request that the jury be instructed to assume that the evidence would have been bad for the side that destroyed it?*

*Q. You were aware of the rule that we are entitled to see everything you review? And, you were aware that bad things can happen to whatever side gets caught destroying evidence? But you threw that stuff away?*

### ***Other common simulation software cross points***

All of the software simulations have the ability to input the direction of force in the crash. Anything other than a straight-on collision will result in a Delta V on not just the X axis, but also on the Y axis. This increases the shearing forces of the accident and can certainly increase the injury potential. If you have an off-center crash, is he citing 'studies' where the 'volunteer victim' was subjected to an off-center crash? Likewise, did the expert account for the angled impact in the simulation? This is shown as the PDOF [Primary Direction of Force]. If he did include the right PDOF in his simulation, did he consider and address the Y axis Delta V in his report? Remember, if you have an off-center impact, it will **reduce** the X axis Delta V, but **create a Y axis Delta V**. Under the rule of conservation of momentum, the *total force* is the same, except now, your client is actually being hit from two directions at once. If the defense Biomechanic runs the simulation correctly (from an off-center PDOF), but fails to address the 'injury potential' of the Y axis Delta V, it actually makes it seem like your client was in a *less severe* accident because impact force is moved off the X axis.

- Do the numbers he used in his simulation match his best estimates of crush depth as well as published stiffness numbers for your client's vehicle? (*Stiffness numbers used might be actual, generic, estimated, or manipulated*).
- Was the impact on either vehicle in an area that would skew the numbers, *i.e.*, directly impacting a trailer hitch? For that matter, did either vehicle have any aftermarket add-ons that would affect the stiffness or the crush? Many SUV's and trucks have added tow systems that bolt directly to the frame.
- Did the crush numbers he used match numbers you were able to determine from scaled photographs? (*See discussion below on how to scale accident scene photographs.*)
- If you have determined different crush numbers by your analysis of scaled photos that you believe you can demonstrate to the jury, create an exhibit with your crush numbers (and the correct stiffness numbers), and ask the expert to take a few minutes on a break and run the simulation at those figures. [*The reason you're asking for him to do so is something you will want to save for trial, or at least until after he runs the simulation.*]
- Did the expert leave any known numbers out of the simulation?
- Did he perform any actual modeling of the crash or just a Delta V?

### **Picture Analysis:**

One of the jobs that the defense Biomechanic may have 'done wrong' is the analysis of vehicle photographs for 'crush damage' [assuming there was not a physical inspection].

Having already taken the witness' file from him so he does not have his notes to refer to, hand him back the pictures and ask him to pick out the pictures that he feels are the best to show the crush damage to the vehicles.

The pictures chosen should be copied and made an exhibit for the record. Ask the witness to then look again at the pictures and give you his best estimate of the crush damage. Don't let him look back at his file. You don't want to know what he already wrote down. You want to know what he thinks. In the case our firm had with Dr. Bain [BRC], he looked at the picture and confidently rattled off crush numbers that did not match any of the EdCrash simulations he had run prior to the deposition! It was clear that Dr. Bain never attempted to perform any kind of scaled analysis of the photos. He was just making a SWAG. [Scientific Wild Ass Guess]

- ◆ After we see if he is willing to pick numbers out of the air during the deposition, ask if he has had any training in forensic photo analysis. Is he aware of what training, certification, or education is available?
- ◆ Did the expert conduct a scaled examination or make a SWAG? (If he did scale the photos, how was it done?)
- ◆ Ask if he is aware of any studies, or peer-reviewed articles that validate the accuracy of his process.

**Not** the studies he cites to say no one can be injured in ‘low speed’ car wreck, but studies where speeds, and crash forces are measured, pictures of the cars are taken, someone such as he examines the picture and gives the researchers the right answer on speeds and crash forces. In other words, is he aware of any study that validates that his technique is reasonably accurate?

### **Do-It-Yourself Forensic Photo Analysis:**

Instruction on basic photo analysis is available via internet sources and experts can be found to assist you if the case merits. In many cases, however, you may be able to conduct an in-house, low tech, photo analysis on your own that easily demonstrates that the defense expert is making up numbers.

You will need: good photos from the proper angles,<sup>9</sup> a scanner to digitize and enlarge the photos, and a scientific ruler or other measuring device. Technical specifications on the vehicles can be helpful, *i.e. knowing the vehicle is 58 inches wide helps scale the photo.*

Working with an enlargement, use the size of something with known dimensions to scale other objects in the picture. Once the dimensions of the second object has been determined, details can be extrapolated to other photos containing the same object.

- For example, a Texas License plate is 6 inches x 12 inches. Looking at a picture of the rear of our client’s Chevy Blazer, we can measure the license plate to scale that picture. Knowing the scale, we can determine that the spare tire and cover bolted to the rear hatch is 29.27 inches across.

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<sup>9</sup> This, of course, is the biggest challenge. Unless your office took them, most photographs will not be from the best angle. Pictures at 90 degree angles above and below to the damage are helpful....pictures direct-on for scale, straight down from above for crush etc.

- Another photo that shows the crush to the rear of the vehicle also depicts the tire which we now know is 29.27 inches across. This allows us to now assign a scale to the second picture and grid the crush damage.
- By drawing a grid across the photo we can measure crush with a pretty good degree of accuracy. The two photos discussed in our case example (with notes) are included with the attachments to this paper. [See files labeled “Car Analysis” 1 & 2]

### **Attacking the Defense Biomechanic’s Studies:**

Technically, most of what the defense Biomechanic attempts to do with his ‘scientific studies’ would fall under the category of something ‘done wrong’, but it is easier to address the studies separately from other deficiencies. Using his report, put a fence around him on what he is relying on, and when he decided to rely on it.

- How applicable are the articles cited in his report to the facts of this accident and the claimed injuries? Look for every way the studies cited by the expert can be distinguished from your case.
- Examine the study for bias. Does the study even include a conflicts of interest statement? Many do not, and this seems to me to be a significant red flag. Are there obvious conflicts of interest? Was the study conducted by a litigation consulting firm? Do they give any information at all as to how the ‘volunteers’ are compensated and by whom? Are the volunteers employees of the consulting firm, or is that information simply not provided at all by the researchers?
- Analyze the scientific basis and conclusions of the study. Are there obvious overreaching statements and conclusions?
- Does the study have a sufficient sampling size representative of society?

**[Practice Tip:** None of them have a sufficient representative sampling size.]

- Does the study itself reflect that there was participation of medical doctors and actual engineers? If so, to what extent?
- Did the study include actual diagnostic or imaging testing of the volunteers?
- If so, how long were the volunteers followed for complications?

Look for dirty tricks and data manipulation. Some of my favorites are seat backs full up and braced, parking brakes set, and lowered front ends on the bullet vehicle.

#### Seat backs Braced

The literature now shows that one key aspect of injury potential is caused by the body of the person being hit, not just moving backward in relation to the vehicle, but also ‘ramping’ up the back of the seat towards the ceiling of the vehicle. As a result, the structures of the neck are subjected to acceleration forces upwards and backwards at the same time. Researchers have confirmed that this causes a shearing effect on the structures of the neck and an actual pressure pulse in the victim’s spinal cord. Many factors contribute to the amount of ‘ramping’ that would be encountered: Delta V, seat design, the angle of incline of the seat, as well as the weight, height, sex, and body type, of the person in the target vehicle. Obviously, in the real world, people drive with their seats in various stages of incline.

The researchers are choosing which cars (and seat designs) to include in their study. Every defense-oriented study that I have reviewed has the seats position in their full upright position (*to simulate real world conditions, of course*). Many studies have also added additional seat back bracing. The pessimist in me leads me to believe that many people interested in developing this type study also perform litigation support for, or insure, the automotive industry and likely do not want to create a record of seat back failures, but that’s just me. Additionally, having the seat back braced will prevent the seat itself from leaning backwards in the impact (even if it did not actually break). This will, of course, reduce the whiplash effect and G-forces being subjected on the passenger of the test. I wonder: How many people in the real world drive around with their seat back fully upright with aftermarket bracing designed by Biomechanical Engineers?  
☺

#### Parking Brakes Set

You just almost have to love these guys for the creative juices that flow through their little brains.

It is generally accepted that even in low speed crashes, if the driver of the target vehicle happens to be stopped at a light, the force of the impact will cause the person’s foot to come off of the brake. It doesn’t too much matter how big and strong the driver is because the car goes forward while he (and his braking foot) are still stationary.

By setting the parking brake, however, you increase the drag effect of the target vehicle. Now, instead of wheels that roll, the impact has to force the tires to skid across the pavement forward. The effect is to artificially slow the Delta V of the target vehicle (and person inside) while simultaneously increasing the amount of crush damage to the study vehicles.

#### Lowering the Front End of the Bullet Vehicle

Several studies have stated things along the lines of: “In the real world, drivers often apply the brakes immediately prior to impact. This can have the effect of causing the front end of the bullet vehicle to ‘nose dive’. Therefore, the front ends of (*all*) the bullet vehicles were lowered to simulate real world conditions.” Hmmmmm. They don’t say how far they lowered the front end. If nose diving happens ‘sometimes,’ why not just lower the front ends on *some* of the bullet vehicles? (This would also let us know the Delta V effect of lowering the front end, by the way). Why not just have the driver of the bullet car hit his brakes at the last minute ... to ‘mirror real world conditions’? Although the study will not tell you how far the front end was lowered and whether the bumpers of the bullet and target vehicles match up anymore, you can bet they don’t. Now, you will have the soft structures of the bullet vehicle (grill, radiator, core supports, and fenders) absorbing much of the impact energy instead of transferring it into the target vehicle.

Pick a target car with a good seat design, brace the seat, put the emergency brake on, lower the front end of the bullet car, and we can show how a 5-6 mph car crash translates into just a little bump to the person in the plaintiff’s car (and keep those bad trial lawyers from taking advantage of the poor, helpless insurance company)

If you expect the studies relied on by the defense expert to be shady, and you examine the studies looking for the tricks, they are not hard to find.

#### **Peer Review of the Expert’s Scientific Process:**

##### Daubert/Robinson Challenges

The expert will no doubt argue that the studies he relies on are peer-reviewed studies that support and validate his opinions in your case. For the purpose of a Daubert/Robinson challenge, the expert’s scientific analysis can be attacked on several fronts.

As has already been discussed, there is a very good argument that, to the extent they attempt to conclude that a particular accident at any particular Delta V is below an ‘injury threshold’, these studies are open to attack for a number of reasons from insufficient representative sample to all the various factors that can and do affect the risk of injury. The defense studies are woefully inadequate in actual sample size to reach such broad generalized

conclusions denying that any particular type of accident has the “potential for injury,” *i.e.* representative sample size (sex, age, and body type of drivers), type of vehicle, real world conditions in vehicle (seat design, seat position and head rest position), body position of occupant (head turned or straight, etc.). While this argument seems obvious and self-evident, you will likely need your own expert to support you in making this kind of attack.

However, another angle of attack occurs to me that may be even more persuasive should you chose to bring a challenge to Defendant’s expert. Giving the *studies* cited by the defense Biomechanic every benefit of the doubt, the most that they can support scientifically would speak to the risk of injury in a particular type crash in the future. My research has not revealed any peer review articles or studies that validate the scientific method of what **the defense expert is doing**.

In other words, I am not aware of any studies that validate his process by:

- Step One      conducting crashes at various speeds, recording actual Delta V’s, real world conditions (no lowered front ends, set parking brakes, or braced seat backs), and medically following the volunteers;
- Step Two      giving defense experts pictures of the cars, and allowing them to estimate crush depths; and,
- Step Three    seeing if the expert can give the correct Delta V based on the picture. Can he correctly state the Delta V of not just the car, but the person? How well can he guess the Delta V of the person’s head in comparison to the torso? Did he correctly estimate peak Delta V times of various body parts? How does not knowing other factors, like seat height and incline or head rest position affect his accuracy?

Maybe it’s out there and I haven’t seen it, but I am not aware of any study that validates what these guys actually do.

Finally, it is always a good idea to do your best to locate and learn studies confirming the possibility and/or likelihood of injury in your type of case. If you have retained your own Biomechanic or Injury Expert, he should be a good source for this kind of information. As you might expect, there are many resources available through the internet. One good internet source for locating publications and peer review studies from a variety of different publications is [www.sciencedirect.com](http://www.sciencedirect.com). The website allows searches by author, publication, and key words. Most search results include a short abstract that gives you a pretty good idea of article subject matter and the conclusions drawn. The charge to download most articles is about \$32.00.

### **Attacking on Bias & Credibility:**



I often use the review of the witness' billing records to lead into the Bias and Credibility Section.

As mentioned above, we should have already received the billing records ahead of the deposition by needling the defense attorney to fully respond to disclosure. *[His time record was created by him; he probably reviewed his time entries and that of staff. The record is a tangible thing and was 'obtained from the expert' when it was sent to the defense attorney].*

The billing record contains a wealth of potential cross info. It can tell us not only how much money the expert has billed to date, but it can also allow us to create a time line of his work. From the billing record, we can usually determine:

- when the expert was first contacted by the lawyer (and can relate that to when he got in the case, and what evidence was available at that time that he had the opportunity to review but didn't bother),
- how long the initial call was with the defense attorney,
- letters from the defense attorney forwarding medical records, depositions, etc. for the witness' review should show when the witness received evidence, and the bill should show us when he reviewed them, and how much time was spent (*i.e.*, one hour reviewing 1000 pages of medical records),
- if he produced his report in the case **before** he received/reviewed relevant records,
- **when** he performed **specific** tasks (*For example: His report in Oct 2009 may conclude the crash Delta V was 4 mph, when the billing time sheet shows he did not run the EdCrash simulation until February 2010.*),
- how much time he spent on the file,
- how much time his staff spent on the file and what work was done by him and what work was done by staff,
- in larger cases, you will often find that a staff member (usually a nurse or paralegal) has billed 30 hours to *summarize* all Plaintiff's medical records while the Biomechanic/Doctor has billed about 1 hour reviewing *both* summaries and medical records prior to writing his report or attending the deposition. (*I suspect these time entries are often lumped together to avoid showing 55 minutes reviewing the summary, and 5 minutes reviewing actual records.*)

**[Practice Tip:** We can score some points with the fact that his staff summarized the records and he clearly does not have enough time logged to be relying on anything but the summaries for his knowledge of the medical. He will no doubt laud his own qualifications and explain how that makes him so much better qualified to make his conclusions than Plaintiff's treating physicians. From a strategy standpoint, you may want to save the point for trial, or you may want to strike in the deposition. I will usually ask the witness questions along the lines of:

- Would it be fair to say that your staff assistant does not have your level of training? .
- I assume that if she did have your level of training, she would be billing at \$350.00 per hour like you instead of \$75.00 /hour?
- As we sit here today are you familiar enough with her education and training that you can confidently tell us exactly what her qualifications are *in the same way that you can talk about your own experience and training?* (That will be a “No.”)
- Okay, then, go ahead and tell us what you do know about this person’s education and training. *[Then]*
- Okay doctor, tell me then, since Ms. Smith does not have your level of training and experience, do you leave room in your mind for the possibility that when she is drafting these medical summaries for you, she might have missed something that you would not have missed? *[I have yet to meet the doctor willing to admit his nurse is as smart as he is.]*

**[Practice Tip:** Likewise, we can also beat up on his lack of time spent reviewing actual records. Early in the deposition, ask the witness if he has reviewed the medical records in the case. Confirm he ‘thoroughly reviewed’ them and move on to other subjects.

Have one page of the medical picked out that contains some detailed information that would make for good questions (dates, conditions, histories, etc.) Then, shortly before crossing the witness on the billing records, tell him that you want to ask him some questions about some of the medical records. Tell him what record you are looking at. Then, without showing him the record, begin asking detailed questions about the findings or conclusions the doctor found on that particular visit. He will ask to see the record. Make him see he "needs" to see the record before answering that type of question. Then, gladly show him the record and tell him to take as much time as he needs to be able to answer questions regarding that particular visit or exam. When he finishes reading the document take it back from him, and then build into your first question how long it took him to review the document (*i.e.*: "Now that you have taken about 60 seconds to review this two-paged operative report, do you now feel prepared to answer the question I asked you about this document?") You will of course have to repeat your original question, but this time, he will be able to answer it. Now, you have a record of how long it takes him to "thoroughly" review a two- paged report. When you get ready to cross him about his bill, quickly calculate the average time he spent per page in his review of medical records by taking the total number of pages of your client’s medical records and dividing it by the number of minutes he billed for reviewing medical records. I guarantee that it will be far less than the amount of time he spent reviewing the document he knew you were about to question him on.]

**Attacking on Bias & Credibility Continued:**

- how much defense work does he do? Percentage plaintiff versus defense, prior work of him and his firm with the defense attorney and/or his firm. List the cases.
- income made from litigation, testifying, reviewing records, consulting, etc.
- types of cases he claims, or has claimed, to be an expert in. It can be kind of funny if you spend a little time going through everything about which he claims to be an expert. Make him list every type of injury case he has ever worked on. Confirm he held himself out as an expert in each situation. Crashes, slips, falls, crushes, drags, twists, turns, punctures; it doesn't matter. He will be an expert in railroad and forklift injuries without ever having operated either.
- Highlight the difference between practicing medicine and what he does...
  - ....is he offering an opinion on whether surgery is indicated for a procedure that he is not even qualified to perform on his own? [This is as good as any way that I have found to phrase the question.]
  - Does the witness have operating privileges at any hospital?
  - Q. Doctor, you have testified that you don't think my client needs surgery, correct? Is there any hospital where you have privileges that would allow you to make the final decision to perform the surgery that Plaintiff needs (*or had*), or would you have to get another doctor with more experience to make that final decision?

### **Attacking the Expert Through His Report**

Most of my focus in dealing with hostile junk science experts has been centered around attacking them on bias and dishonesty. The expert's report presents a good opportunity for this kind of attack. On one hand, we can count on the report to state in absolute and certain terms that Plaintiff simply did not get hurt in whatever accident our case is about. It will use lots of impressive and scientific sounding words and contain a long list of studies that supposedly support the expert's conclusions. It is however, hearsay, and we should be able to keep it out of evidence at trial. Do we want to?

As described in more detail in another section of the paper, I often prefer to let the expert tell me how honest and professional he is and how he would never slant things in favor of his client, omit things that are bad for his client, ignore evidence bad for his side, or lean his opinions in favor of his client in anyway. That would be unethical and he is too much of a professional to do that. He agrees that in the application of science, it is important to consider all information and research and not merely consider views that favor the conclusion you prefer.

This presents a real problem for a biased expert when it comes to his report. The real purpose of his report is (a) impress his client with how much of a team player he can be and (b) put something down on paper that makes a stab at complying with the requirement of an expert report under state and federal rules. He is not seriously attempting to do any real work with his report. Certainly, he is not trying to weigh and consider evidence unfavorable to his side. However, if you ask him, he will tell you he is all of these warm, fuzzy, ethical, and wonderful

things, and that applies equally to the report he wrote and sent to the defense attorney in this case.

All we now have to do is read the report with a critical eye for all the slants, omissions, assumptions, etc. in favor of the defendant.

**Examples:**

- A) The medical history of doctors X, Y, & Z all record the fact that prior to this accident, my client had absolutely no prior back problems and had never been to a doctor about his back. Your staff made a special note of that fact in four places in that medical summary they drafted for you on pages 4, 7, and 8, correct? But, you left that out of your report to the defense attorney in this case. You would agree that the fact that my client never had back problems before the accident is something that probably favors our side? But you left that out of your report?
- B) In your research, you will have found studies that conflict with his studies. In response to your questions, he has probably testified that he was aware of them, but disagrees with them for whatever reason. In setting up the Report Cross, you have gotten him to agree that he doesn't ignore the scientific literature that disagrees with his point of view. However, his report will not contain one single study that disagrees with him.

So, Doctor, here, again, we have another example of your report leaving out information unfavorable to your client. He will squirm and make excuses, which will allow you to say, again, Doctor, the point I am wanting to clarify is somewhat different. You have already told us that you knew about other studies that disagree with the ones in your report, correct? I guess you could have mentioned these other studies in your report and then given whatever reason that you wanted for why you weren't going to use the ones that were against you, right? You could have done that? But you didn't. These studies that disagree with you, they are not acknowledged or talked about anywhere at all in your entire file on this case? So, this is an example of something that you knew about, that favored our side, not yours, that you decided not to talk about in your report, or anywhere else in your file? You didn't send any letters or emails to the defense attorney telling him about these studies that are bad for your side? You certainly didn't send me any letters telling me about them, right?

There will be any number of important facts that are bad for his side or good for yours that are left out of his report. Each of these present an opportunity to make the defense expert look biased and crooked for trying to hide things. In general, you are looking for assumptions inconsistent with evidence and testimony, omissions (especially of injury potential events ignored by expert), slants, improper citations to studies, citing whiplash studies for back injury case, etc.

### **Case Testifying List:**

Most experts will maintain a case testifying list which is required if they testify in Federal court. This should be one of the items included on your subpoena *duces tecum*. This is a good item to discuss in his deposition. Make sure the list he has provided list enough information for you to locate the Plaintiff's attorneys involved in his prior cases. If it doesn't list the full style, courts, venue, or party names, make him give you that information. Questions about his case list should include:

- Identify which of these cases, if any, where you testified on behalf on the injured person;
- Identify which cases dealt with circumstances similar to this case (so we can get prior depositions from other plaintiff's attorneys);
- Any other cases with this defense attorney or firm;

### *My Personal Favorite*

- Identify every case where your testimony was excluded or limited by the court. (This lets us contact the prior plaintiff's attorneys and obtain prior orders of exclusion, copies of motions or briefs that have been successful in excluding this particular expert, compare notes, exchange depositions, etc.);
- What was the basis for your disqualification or limitation; and,
- What were you attempting to testify about that the court refused.

### **Additional Deposition Strategies:**

#### **A) Getting the answers you want**

We need to have an understanding of: "Who am I dealing with?"

- People can be expected to act/ behave consistently with their fundamental character traits. So .... what traits can we expect from our opponent and how can we use that information to our advantage.

Medical Doctor: If he is a full time Biomechanic Expert, he is probably not practicing medicine any longer, works for insurance companies and defense attorneys, and makes significant money putting a 'science' label on crap arguments to say that people don't get hurt by car wrecks, industrial accidents, amusement park rides, crush injuries, cranes, forklifts, power tools, etc. He is financially tied to the industry that supports them, and he is very willing to lie, exaggerate, slant, omit, mislead, hide the ball, and slander your client in the process. His decision to leave the prestige associated with the active practice of medicine may implicate a lack of competence and/or laziness and willingness to go the easy route. Psychologically, he knows his own character, but his ego will not allow him to accept it, so he

projects his character flaws onto you and your client and yet, will **always be more than happy to testify how honest, fair, and even-handed he is every time you give him a chance.**

Knowing this information can help us get the answers we need because:

**Juries do not believe liars.**

Once a jury is convinced they have been lied to, they will not believe anything the witness has to say. So, we are looking for good examples of lies, exaggerations, slants, and omissions to show the jury. The best hunting grounds for these items will be the expert report, billing records, medical records and summaries prepared by his staff (as compared to his report), reconstruction analysis, EdCrash numbers, weights, speeds, crush depth assumptions, stiffness coefficients, **assumptions in favor of his client (especially if contradictory to the testimony of his client)**, and the *studies* cited by his report.

**Blue Light Special: Taking 2 for 1, and 3 for 1 Credit on BioMechanic Lies**

Understanding the witness' character, *i.e.*, that he will swear to his fair and honest nature as he lies, cheats, and misleads, gives the plaintiff's lawyer a perfect opportunity to emphasize and multiply the lie. This must be done in the most non-confrontational tone of voice possible, with the tone of your questions - instead of being accusatorial, conveying the message of:

- ◆ “can we agree on these obvious principles of fairness”
- ◆ “I am assuming, of course, that you're an ethical guy”
- ◆ “we all agree dishonesty is bad, and you wouldn't be that kind of guy”

**This can be done in three steps by asking questions similar to the following:**

**Step 1**

- Doctor, it is my understanding that, in your business, you hold yourself out as an expert in the field of Biomechanic Engineering, correct?
- The report that you provided the defense lawyer in this case, and which he forwarded to me, seems to be based on, and certainly discusses, Biomechanic Engineering principles, is that right?
  
- It is my understanding that the field of Biomechanic Engineering is intended to be based on scientific principles, correct?
- Science, at its most fundamental level, is a search for truth.
- Truth is the ultimate goal of any scientific exercise.

- Any person attempting to apply Biomechanic Engineering principles must at all times make every effort to use correct, truthful, information.
- Understanding that and understanding that I have a duty to protect my client in this process, I am sure you understand my need to ask if you believe that you might have a bias or a leaning towards the folks on the defense side because of the amount of work you do for that industry?
- You don't think so?
- Okay, and understanding the importance of this kind of thing, and to make sure that we are on the same page: Do you lean anything at all towards their side in this case because they're paying your bills?
- Can I assume that you would not slant anything at all when you talk about any of these 'studies' that you're telling us you have looked at?
- When you're writing your report, do you ever try to slant things in favor of the side that's paying you?
- I take it then that the same rules would apply when we are talking about things that are bad for your client. You don't purposely ignore or leave those things out of your report either, right? It would be important to address those kinds of things headon in an honest fashion?
- Do you make assumptions that favor your client when there's no scientific basis for it?
- You don't do any of those kinds of things?
- You would agree with me that if someone in your position did do those types of things, it wouldn't be a fair application, or use, of science?
- In fact, if someone in your position did those types of things, it wouldn't be 'science' at all, right?

**Result of the Setup:** The jury knows the witness is a 'hired gun' in a lawsuit. They expect him to slant and to make assumptions for his side to some degree. The fact that you have asked the bias questions, brings it to the front of their mind, and the fact that the witness denies the slightest favoritism makes them discount already his testimony.

Likewise, the jury knows that this is a trial. They watch TV and know you're a trial lawyer on the other side. They expect there is a reason behind your asking if the witness slants, assumes, omits, and exaggerates. They are now looking for the payoff in the form of examples.

**Step 2** You provide the payoff by bullet pointing: didn't do's, don't know's, omissions, assumptions, did wrong's, dis-similarities between your accident and his 'studies'.

**Step 3** Finally, we get to twist the knife one last time by going through the list again, but this time, with a bias question behind it.

**For example:**

- 1) · Doctor, when you decided to use the generic SUV stiffness numbers in your calculation instead of the specific stiffness numbers that were published by NHTSA for my client's 1996 Chevy Blazer, is it possible that when you made the decision to do that, that you were maybe slanting things a little bit in favor of your client?
- [A. No sir] (*Simmer and Savor the moment with the right follow-up*)
- Well, the generic stiffness numbers that you used were lower than what NHTSA shows for a 1996 Blazer, correct?
- If you used the NHTSA numbers, the reconstruction software you used would have spit out a higher Delta V. In other words, it would give us an answer indicating that this was a bigger wreck, with more significant impact to my client's vehicle and to his body?
- So this is an example of one of your decisions that tended to favor your client.
- Okay, but this is just a coincidence though, not something on purpose to favor your side?
- 2) Continue going through your list of 'didn't do's, don't know's (assumptions), and 'did wrong's' that you established; each time politely asking if it is possible on this one thing, perhaps, that, when he did something (or omitted something) that it might have been a lean, slant, or omission favoring his side.

It will vary from case to case, but common examples include:

- the medical records and medical summary prepared by his staff will say something important (like the plaintiff had no history of prior injury to his back] and it will be omitted from the expert report to the defense lawyer;
- basing crush numbers on pictures instead of actual measurements;
- citing 'studies' incorrectly, citing whiplash study with no diagnostics and your client hurt his back;
- failing to consider all forces of the accident (*i.e.*, considers the initial impact but not what happened when the plaintiff's car went off the road, through a ditch, hit a culvert, etc.); and,



· making any assumption contrary to the testimony and evidence (example: Expert's EdCrash simulation shows a 180 degree rear-end collision, but, Plaintiff and Defendant testified that the defendant turned his wheel to the left at the last second and the property damage is consistent with an angled impact)

**Final Result:** Instead of merely cross-examining the expert on his slanted testimony, we now have tripled the effect of his bias/dishonesty by:

- A. asking him if he slants testimony (which he will deny and the jury will not believe),
- B. showing the jury the obvious omissions, slants, and leans, and
- C. giving the witness another chance to admit his bias with a few obvious examples.

The net effect will be that the expert's credibility flaws will be highlighted for the jury, and they will much more likely perceive his testimony as repeated dishonesty as opposed to an acceptable level of '*adversarial favoritism*.'

### **Dealing with evasive or deceptive answers**

Tools I need:           Patience, Cool Head, Stay out of Rabbit Holes, Repeat the Question

Opportunity:           **I can destroy his credibility with the jury.**

**Expert's Strategy against you:       Concede Nothing, Evade, Confuse, Distract.**

**His weapons:**

1. Long rambling answers that lose the point, and rob the power of your question;
2. Rabbit Answers       answers that include argumentative statements off your main point, but which sting so much that you feel compelled to answer/defend/respond to the statement immediately;
3. Answering a different question than the one that you asked; and,
4. Claiming ignorance on any Bias/Impeachment matter, *i.e.*, percentage of defense work, income from testifying.

Dealing with evasive answers from the opponent's expert can be one of the most frustrating experiences a trial lawyer faces. You know the truth. The bad guy knows the truth.

Hell: You know that he knows that you know that he knows. But, he is going to do everything he can to destroy your client's case all because he plays for the other team and it's just that simple. Justice and Truth be Damned.

That said: Evasive answers from an expert present another opportunity to use the witness' ego and character flaws against him. He is sure that he is smarter than you (*often* a fair assumption in my cases), and he is willing to concede nothing (just as *often* a fatal mistake for him, if we plan for it).

**Our goal:** Proving an expert wrong is good, but is not usually in and of itself, a case winner.

Proving a witness is a liar is better than good. Its Great, and wins cases. Interestingly, subject matter or importance of the lie doesn't really matter. Proving any dishonesty is enough. Evasiveness is dishonest. We can highlight that dishonesty without making an accusation, allowing the witness to destroy his own credibility.

There are trial lawyers in this group with vastly more experience and expertise than I. I certainly do not profess to have all the answers on dealing with what is easily one of the most challenging aspects of our work. The suggestions below, however, are some things that have seemed to work for me in dealing with evasive experts.

➤ **KISS** (Keep it simple stupid) Put thought into making questions simple and clear.

➤ **Listen** *But, don't follow that bad man out into the street.*

### ***Dealing with Rabbits***

We all know that to be an effective cross-examiner, we must carefully listen to the witness' answer. However, the hostile expert is also going to use that trait (and your loyalty/affinity to your client) to draw you off any subject he perceives as dangerous for his side. One of the most common tactics we all see is what I call the *Rabbit Answer*. The hostile expert will give a disjointed answer incorporating argumentative, incorrect, or hostile statements off your main point, often stinging so much that you feel compelled to engage the statement immediately.

➤ My Best Advice is Don't. Instead, keep a special place on your yellow pad for rabbit issues. [I leave a 4 inch square blank at the top right of every page in my notes where I can write down the hostile Rabbits]

➤ I make myself pause while I write the Rabbit down, saying something along the lines of: "Doctor - you have made several statements in your answer that I am very interested in following up on. However, so that I don't get too far off track, I am going to just make a few notes about what you just said and we will come back to that. I am not sure that your

answer really addressed what I was trying to ask. Let me try again. What I am asking you is: [And then repeat the exact question, or a simpler version of the exact question.]

- Keep repeating, simplifying, circling, and pinning down. Always, Always, be nice using the most professional tones. I have found that you can ask the most pointed, harsh, question in a polite professional tone without coming across as the one being the jerk. Don't be afraid to ask: "Doctor, do you feel like you are answering the question that I asked?"

### **Long Rambling Answers That Lose the Point:**

How I deal with these really depends on the situation and how many times the witness has already used the technique in the deposition. The basic strategy that I have found most effective though is to simply repeat the question. Because he is evading, he will often times give a *different* long rambling answer. Great. Repeat the question. Sometimes you will want to repeat it exactly. Sometimes, you will want to repeat it exactly, but with a different preface so that you do not seem argumentative. Such as:

- Doctor, my question was – (and repeat the question or a simplified version)
- Doctor, as I understand your answer, your telling me [\_\_\_\_\_], but that's not my question. I apologize if I were unclear. My question is (and repeat the question or simplified version).
- Doctor, that long answer sounded like a 'yes'. Was that a 'yes' to my question?

### **Answering a different question than the one that you asked**

I usually handle this in the same manner. Repeating the question. Accepting the blame for any confusion. "Dr., maybe I am just not making myself clear. What I am trying to say is: (and repeat the question)."

After it has gone on long enough, you can start framing the issue in the context of fairness and decency, asking a series of questions similar to the following:

- He understands that there are serious issues at stake in this case.
- While on one hand the things we are talking about here today are important to him because this is his business, he also understands that this case and the issues in this case deal directly with my client's life.
- He has been hired by the defendant to give opinions in this case, and he has given opinions and made statements, that if the jury believes him, have the potential to affect my client's life in a very real way. You understand that, correct?
- In this country, as one of our core beliefs, it was decided a long time ago that everyone was entitled to his day in court. You agree with that basic fairness principle, right?

- That's why both sides get a lawyer, right?.
- This is my client's opportunity to have his lawyer talk to you, discuss your opinions and ask questions. You understand that, right? You have been through this process many times and understand how it works?
- If a professional witness gets hired by either side and then comes to court or deposition, swears to tell the truth, and then intentionally tries to evade questions or intentionally refuses to give a straight answer, that's not fair is it?
- Do you feel like your giving my client a fair shake here? Your not purposely trying to avoid answering my questions are you?
- Okay, Dr. I am going to do my best then to try and simplify what I am asking. My question is: (Repeat the question)

**Claiming ignorance on Bias/Impeachment matters.**

- i.e. What percentage of his work is defense work,
- how much he charges, how much time he has spent on the file, and, of course, the expert never seems to know how much money he makes testifying in lawsuits.

My favorite way of dealing with this is to send a letter to the defense attorney well ahead of the deposition. Pointing out that a professional witness' financial incentives are always relevant at trial to show a bias or leaning to one side or the other. However, it has been my experience that some professional witnesses, surprisingly, claim to 'not know' how much money they make in the litigation business when asked at deposition. I am writing this letter to defense counsel and requesting that he forward it to his expert so that he will have every opportunity to obtain an answer to that question prior to the deposition, if, for any reason he can't recall it off the top of his head. We send it by fax, and bring a copy with the fax transmittal sheet for an exhibit if the witness claims not to 'know' how much money he makes in lawsuits. Did Mr. Defense attorney send you this letter? Did he tell you about it?

Often times the witness will simply refuse to answer the question. Have a copy of cases confirming the relevance of the questions going to financial bias with you and ask the witness if he is familiar with the cases. Offer to give him a highlighted copy of the case for his review at a break and that you will give him an opportunity to reconsider his position after reviewing the case. Ask him if he has ever answered the question. Often times they have answered before, but have decided not to answer anymore. If they have answered before, what case was it? What was their prior answer? Has he ever been Ordered to answer the question? If so, what case or court?

**Additional Daubert/Robinson Type Challenge Based on Occupations Code**

It occurs to me that both sides may be overlooking a statutory challenges to many "Biomechanical Engineer Experts" and accident reconstructionists. The Texas Occupations code seems to speak pretty clearly to the work these companies are doing and to require that they

be licensed as a Private “Investigations Company” pursuant to Sec. 1702.104 of the Occupations Code.

There is an exception under the statute if the person is a licensed engineer. However, many of these so-called experts are retired medical doctors with only a bachelor’s degree in engineering. This does not make them an ‘**engineer**’ under Texas law, and, the Occupations Code likewise requires a person or company to be a licensed engineer in order to perform any type engineering work. The most relevant code sections are set out below. Additional code sections dealing with Private Investigation Companies and Engineers are included as attachments to the paper.

\* Warning: This is an issue that I have not seen raised by either side and appears to be something that both sides in litigation may be ignoring. Remember, the goose/gander rule. It is probably a good idea to make sure that your expert is either a licensed P.I., or a licensed engineer.

Even if the judge allows the witness to testify, the language in the actual statute makes for a great cross at trial. Violation of the statute is a Class A misdemeanor.

#### Statute Regarding Private Investigations Companies

##### **Sec. 1702.104 Investigations Company**

**(a)A person acts as an investigations company for the purposes of this chapter if the person:**

**(1)engages in the business** of obtaining or furnishing, or accepts employment to obtain or furnish, information related to:

(A)crime or wrongs done or threatened against a state or the United States;

(B)the identity, habits, business, occupation, knowledge, efficiency, loyalty, movement, location, affiliations, associations, transactions, acts, reputation, or character of a person;

(C)the location, disposition, or recovery of lost or stolen property; or

**(D)the cause or responsibility for a fire, libel, loss, accident, damage, or injury to a person or to property;**

**(2)engages in the business of securing, or accepts employment to secure, evidence for use before a court, board, officer, or investigating committee;**

(3)engages in the business of securing, or accepts employment to secure, the electronic tracking of the location of an individual or motor vehicle other than for criminal justice purposes by or on behalf of a governmental entity; or

(4)engages in the business of protecting, or accepts employment to protect, an individual from bodily harm through the use of a personal protection officer.

(b)For purposes of Subsection (a)(1), obtaining or furnishing information includes information obtained or furnished through the review and analysis of, and the investigation into the content of, computer-based data not available to the public.

Acts 1999, 76th Leg., ch. 388, Sec. 1, eff. Sept. 1, 1999. Amended by: Acts 2007, 80th Leg., R.S., Ch. 906, Sec. 4, eff. September 1, 2007.

##### **Sec. 1702.101 Investigations Company License Required**

Unless the person holds a license as an investigations company, a person may not:

(1) act as an investigations company;

(2) offer to perform the services of an investigations company; or

(3) engage in business activity for which a license is required under this chapter.

## **Engineering Statutes:**

### Sec. 1001.003 Practice of Engineering

.....  
(b) In this chapter, "**practice of engineering**" means the performance of or an offer or attempt to perform any public or private service or creative work, the adequate performance of which requires engineering education, training, and experience in applying special knowledge or judgment of the mathematical, physical, or engineering sciences to that service or creative work.

(c) **The practice of engineering includes:**

**(1) consultation, investigation, evaluation, analysis, planning, engineering for program management, providing an expert engineering opinion or testimony, engineering for testing or evaluating materials for construction or other engineering use, and mapping;**

(2) design, conceptual design, or conceptual design coordination of engineering works or systems;

(3) development or optimization of plans and specifications for engineering works or systems;

(4) planning the use or alteration of land or water or the design or analysis of works or systems for the use or alteration of land or water;

(5) responsible charge of engineering teaching or the teaching of engineering;

(6) performing an engineering survey or study;

(7) engineering for construction, alteration, or repair of real property;

(8) engineering for preparation of an operating or maintenance manual;

(9) engineering for review of the construction or installation of engineered works to monitor compliance with drawings or specifications;

(10) a service, design, analysis, or other work performed for a public or private entity in connection with a utility, structure, building, machine, equipment, process, system, work, project, or industrial or consumer product or equipment of a mechanical, electrical, electronic, chemical, hydraulic, pneumatic, geotechnical, or thermal nature;

(11) providing an engineering opinion or analysis related to a certificate of merit under Chapter 150, Civil Practice and Remedies Code; or

(12) *any other professional service necessary for the planning, progress, or completion of an engineering service.*

### **Sec. 1001.301 License Required**

**(a) A person may not engage in the practice of engineering unless the person holds a license issued under this chapter.**

(b) Except as provided by Subsection (f), a person may not, unless the person holds a license issued under this chapter, directly or indirectly use or cause to be used as a professional, business, or commercial identification, title, name, representation, claim, asset, or means of advantage or benefit any of, or a variation or abbreviation of, the following terms:

(1) "engineer";

(2) "professional engineer";

(3) "licensed engineer";

(4) "registered engineer";

(5) "registered professional engineer";

(6) "licensed professional engineer"; or

(7)"engineered."

(c) Except as provided by Subsection (f), a person may not directly or indirectly use or cause to be used an abbreviation, word, symbol, slogan, or sign that tends or is likely to create an impression with the public that the person is qualified or authorized to engage in the practice of engineering unless the person holds a license and is practicing under this chapter.

(d) A person may not receive any fee or compensation or the promise of any fee or compensation for engaging in the practice of engineering unless the person holds a license issued under this chapter.

(e) A person, sole proprietorship, firm, partnership, association, or corporation that engages in or offers or attempts to engage in conduct described by this section is conclusively presumed to be engaged in the practice of engineering.

(f) Notwithstanding the other provisions of this chapter, a regular employee of a business entity who is engaged in engineering activities but is exempt from the licensing requirements of this chapter under Sections 1001.057 or 1001.058 is not prohibited from using the term "engineer" on a business card, cover letter, or other form of correspondence that is made available to the public if the person does not:

(1)offer to the public to perform engineering services; or

(2)use the title in any context outside the scope of the exemption in a manner that represents an ability or willingness to perform engineering services or make an engineering judgment requiring a licensed professional engineer.

(g)Subsection (f) does not authorize a person to use a term listed in Subsections (b)(2)-(6) or a variation or abbreviation of one of those terms.

\*\*\*\*\*

## **V. Cross Examination at Trial – Using the depo to chose and organize your topics**

The first order of business is to decide the method of attack. We can attack his credibility, his training, knowledge, omissions, methods, ‘*science*’, or combination of any of the above. In most cases, the defense Biomechanic is vulnerable to criticism on each of these fronts.

If we are sufficiently prepared, we could probably conduct a grueling six-hour trial cross similar to the deposition.

However, dragging it out too long runs the risk of watering down your best cross points and wearing out the jury. While it is perfectly acceptable (and even preferable) for the deposition to be long, grueling, tiring, and combative, the best trial cross is concise, direct, focused, and narrowed enough to prevent the evasions common in deposition. In preparing the trial cross, we can utilize the deposition to pick the last question where the witness finally gives up the favorable admission (after 5 pages of dodging). If he tries to dodge like he did the first five times you asked the question in the deposition, you have the last answer to impeach him. By reviewing deposition, you can pick and choose your best, cleanest, most concise points of attack.

In my experience, the best attack will highlight the witness’ bias and dishonesty in ways to let the jury see it for themselves. Once the jury learns a witness can’t be trusted, no amount of ‘*science*’ or fancy words can fix it for him. With litigation Biomechanics, many times some of the best examples of dishonesty can be found in the areas we have discussed. This approach creates the dual effect of attacking the witness’ sophistication and credibility.

That said, when reviewing the deposition and evidence to narrow down our trial cross, we are not necessarily focused on trying to put forward the absolute best scientific arguments, or even the most important facts. Instead, we are really looking for the best examples of the

witness' biased and unwarranted assumptions, misstatements, and omissions. We are looking for the best simple clear examples of his gamesmanship and dishonesty. We are looking for things to make the jury think, "Oh, I can't believe he did that!" Winning that battle is winning the war.

Our office maintains a file containing a fair amount of impeachment material on several popular defense Biomechanical Engineers including prior testimony, reports, orders of exclusions, etc. On request, we are more than happy to send you a Cd Rom with what we have on file. All we ask is that you send us back any additional information you obtain to add to the library. Good Luck.

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