“Attacking the Bio-Mechanic”

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Background/Education:

Alexander Begum is a founding shareholder of the Begum Law Group LLC and Villarreal & Begum LLC with offices in San Antonio, Laredo, Brownsville and McAllen. Mr. Begum completed his undergraduate studies at Trinity University in San Antonio earning a double major in Marketing and Finance. Thereafter, he attended Harvard University in Boston where he studied finance and legal writing. Following the completion of his undergraduate studies, Alex acquired a Doctorate of Jurisprudence and a Masters of Business Administration with a concentration in Finance from Texas Tech University.

In 2010 Mr. Begum was chosen to be among the elite few that are accepted into the Jerry Spence Trial Lawyers College. This intense program is intended to push each individual student toward a greater understanding of themselves and others

Professional Experience:

Since graduating law school, Alex has tried over 50 trials to verdict. Alex Begum practices civil trial law with an emphasis on insurance litigation, trucking and auto accident litigation. He has handled thousands of personal injury cases and has tried or settled over ONE HUNDRED MILLION DOLLARS ($100,000,000.00) in cases. Alex has been named as one of the best personal injury lawyers in San Antonio for years 2013, 2014 and 2015 by SA Scene magazine in a poll voted on only by lawyers. He was also named as a TOP TEN personal injury lawyer under 40 in the nation by the National Academy of Personal Injury Attorneys for 2014 and 2015.

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State Bar of Texas

American Bar Association

Cameron County Bar Association

Cameron County Trial Lawyers Association

Texas Trial Lawyers Association

San Antonio Trial Lawyers Association

The American Association of Justice

Table of Contents

INTRODUCTION……4

A. STATUTORY AND CASE LAW……5
B. ATTACKING BIOMECHANIC'S QUALIFICATIONS……7
C. ATTACKING THE METHODOLOGY/JUNK SCIENCE OF A BIOMECHANIC……8
D. PREVENTING THE BIOMECHANIC FROM PROVIDING MEDICAL TESTIMONY……11
E. LOW PROPERTY DAMAGE DOES NOT EQUAL NO INJURY……13
F. COMMON SENSE ARGUMENTS TO THE COURT/BE CREATIVE……16
G. POLLUTE THE ORDERS YOU DO GET STRIKING THE EXPERTS……17
H. APPENDIXES
    1. Sample Motion to Exclude Defense Witness—Cormier
    2. Sample Motion to Exclude Defense Witness-Bain
    3. Study--Lack of relationship between Vehicle damage and occupant Injury, Malcom C. Robbins, Motor Vehicle Safety Design Innovations (SP-1226)
    4. NASS Crash Study—Are Vehcile damage photographs reliable predictors of injury?, Michael D. Freeman Phd MPH ACTAR
    5. Study-Sound Science in Low Damage Collisions, Trial Magazine, John Smith

INTRODUCTION:

In the past, plaintiff injury lawyers rarely were concerned with the force involved in a car crash accident. If the force was great and photographs depicted heavy property damage, those photographs would be blown up and shown to the jury to further enhance the claim of the severity of plaintiff's injuries. In contrast, low-impact collisions, historically, rarely concerned the trial Lawyer. With the intense propaganda of insurance carriers and corporate tort reform organizations since the early 1990's and well into the 2000's and with the cry for the need of tort reform, the defense has now seized on the low-impact crash as an arrow to deflate a plaintiff's claim. Defendants argue that it is impossible for a person to have sustained the damages and harms claimed where the impact was minimal, and the property damage low to non-existent.(1)

Armed with poisoned pro tort reform juries, defense lawyers argued and persuaded juries that the low property damage and trivial motor vehicle collision certainly could not have caused the harms claimed. Recently, defense lawyers have begun retaining biomechanics and biomechanical engineering experts to further advance the false propaganda. However, despite the hot air put forth by many of these so called experts, their testimony consists of nothing more than simply holding up photographs showing Minimal if any damage and opining that the plaintiff could not have sustained the harms claimed in the car crash. The natural reaction when receiving defendant's accident reconstruction/biomechanical engineering report is to laugh and scoff in the belief that this is just another hired gun which the defense has hired to convince plaintiff to accept less. However, the reality is that your low impact case has been selected as an example case to be tried. Many times I have seen lawyers fail to take seriously the strong effect that this so called expert will have in persuading the jury that the plaintiff is not entitled to compensation. On the other hand, receipt of these reports should not cause plaintiff's counsel to shake and quiver and consider dropping the case. Rather, it calls for a great deal of work and preparation to diffuse these opinions and strike the junk science being put forth. With hard work, the opinions of most accident reconstruction experts in low impact-collision can be diffused and eliminated. (1)

We are in a new dawn of aggressive insurance defense tactics that go well beyond the typical "deny, defend and delay" tactics historically utilized against those individuals audacious enough to attempt to make a claim for injuries or losses they have suffered. A new cottage industry of defense "junk science" professionals has emerged to satisfy the insatiable demand of the insurance defense industry. Defense lawyers and adjusters utilizing medical reviews' and billing experts to discount medical expenses, engineers to sing adjusters' favorite phrases like "low impact" or "Mist case" have magically appeared in droves. A low impact case that you accepted in your office because you believed your clients were hurt now seems like an unsurmountable challenge with the defense filing counter affidavits, hiring a defense bio-mechanic to say your client could not have been injured in the crash. How do you handle this case? While injured, your client's medical expenses are less than ten or fifteen thousand dollars. To add salt to the wound, the defendant's insurance policy only has the minimum state limits of $30,000.00. Do we cut our losses and run? Do we settle cheap and move on? No! We fight!

A. <u>Statutory and Case Law:</u>

1. Under Texas Rules of Evidence 702, 703, 401, and 403, as well as E.I. DuPont de Nemours & Co. v, Robinson, 923 S.W.2d 549 (Tex. 1995), Daubert v. Merrell Dow Pharms., 509 U.S. 579 (1993), and their progeny, the trial judge plays the role of gatekeeper in determining the admissibility of expert evidence. Under Rule 702, it is the court's duty to determine whether the expert's testimony is sufficiently reliable and relevant to assist a jury. Gammill v. Jack Williams Chevrolet, Inc., 972 S.W.2d 713, 725 (Tex. 1998). Once the party opposing the expert testimony objects to an expert's testimony, the proponent of the expert testimony bears the burden of demonstrating its admissibility by a preponderance of the evidence. Robinson, 923 S.W.2d at 557; Texas Mut. Ins. Co. v. Lerma, 143 S.W.3d 172, 175 (Tex. App. - San Antonio 2004, pet. denied). Rule 702 of the Texas Rules of Evidence allows for a witness qualified as an expert by their "knowledge, skill, experience, training, or education to testify on scientific, technical or other specialized subjects if the testimony would assist the trier-of-fact in understanding the evidence or determining a fact issue." Gammill v. Jack Williams Chevrolet, 972 S.W.2d 713, 718 (Tex. 1998).

2. Rule 702 of the Texas Rules of Evidence requires that, not only must an expert witness be qualified, but his testimony must also be shown to be both relevant to the issues in the case and based upon a reliable foundation. Gammill v. Jack Williams Chevrolet, Inc., 972 S.W.2d 713, 727-28 (Tex.1998); Robinson, 923 S.W.2d at 554. To be relevant, the testimony must be "sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute." Robinson, 923 S.W.2d at 556. In determining reliability, the factors that a trial court may consider include, but are not limited to: the extent to which the theory has been or can be tested; the extent to which the technique relies upon the subjective interpretation of the expert; whether the theory has been subjected to peer review and/or publication; the technique's potential rate of error; whether the underlying theory or technique has been generally accepted as valid by the relevant scientific community; and the non-judicial uses which have been made of the theory or technique. Robinson, 923 S.W.2d at 557. If the trial judge determines that the expert's testimony meets the tests of both relevancy and reliability, the court must then determine whether to exclude the evidence because its probative value is outweighed by the danger of unfair prejudice, confusion of the issues or misleading the jury. Id.; Tex. R. Evid. 403.

3. An expert's opinion must be based on sufficient "underlying facts or data" under Rule 702 and Rule 703. Tex. R. Evid. 705(c). The opinion may not be admitted if it is based on unreliable foundation evidence. Merrell Dow Pharms. v. Havner, 953 S.W.2d 706, 714 (Tex. 1997). For instance, in Robinson, the court held that the expert's testimony was not based on a reliable foundation because he did not conduct a test to exclude other possible causes. Robinson, 923 S.W.2d at 558-59. This "foundation" requirement is consistent with the rule that the Court must exclude the opinion of an expert if the testimony is not reliable. Whirlpool Corp. v. Camacho, 298 S.W.3d 631, 637 (Tex. 2009); see Merrell Dow Pharms., Inc. v. Havner, 953 S.W.2d 706, 712 (Tex.

1997); E.I. du Pont de Nemours & Co. v. Robinson, 923 S.W.2d 549, 557 (Tex. 1995). All testimony, not just scientific expert testimony, must be shown to be reliable before it is admitted. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 147 (1999); Gammill v. Jack Williams Chevrolet, Inc., 972 S.W.2d 713, 726 (Tex. 1998). While an expert may be qualified and credible, when the expert's conclusions are based on unreliable evidence or methodology, they amount to nothing more than inadmissible speculation. Tex. R. Evid. 702; Cooper Tire & Rubber Co. v. Mendez, 204 S.W.3d 797, 801 (Tex. 2006); Robinson, 923 S.W.2d at 557. "The trial court is not to determine whether the expert's conclusions are correct, but only whether the analysis used to reach them is reliable." Keo v. Vu, 76 S.W.3d 725, 30 (Tex. App. - Houston [1st Dist.] 2002, pet. denied), citing Gammill, 972 S.W.2d at 728.

4. This reliability requirement is critical. General Electric Co. v. Joiner, 522 U.S. 136 (1997) and Gammill require the gatekeeper to ensure that an expert's extrapolation from the basis of the opinion to the expert's conclusion is sound. See also Kerr-McGee Corp. v. Helton, 133 S.W.3d 245 (Tex. 2004). This test, which is referred to as "connective reliability," focuses on the reasoning used by the expert to lead from certain data or assumptions to the expert's conclusion or opinion, and whether an analytical gap exists between the data and the expert's conclusion. Brown, Eight Gates, 36 Hous. L. Rev. at 749, 804-810. In Merrell Dow Pharms., Inc. v. Havner, 953 S.W.2d 706, 714 (Tex. 1997), the court explained that "a flaw in the expert's reasoning" makes the opinion unreliable. If an expert's methodology or foundational data is sound but the expert's reasoning process applying that methodology or data is not sound or is not demonstrated, the opinion will not be admissible. Connective reliability requires the expert to explain her reasoning. In Volkswagen of America, Inc. v. Ramirez, 159 S.W.3d 897, 906 (Tex. 2004), the court noted six times that the plaintiff's experts did "not explain" or offered an "insufficient explanation." The only evidence "to connect [the expert's] objections with his conclusions" was the expert's "say-so." Id. at 912 (Hecht, J., concurring)

5. Four distinct but inter-related tests allow a trial court to properly evaluate the admissibility of expert testimony: (a) whether the expert has the requisite qualifications; (b) whether the expert has the requisite "scientific, technical or other specialized knowledge" to form opinions; (c) whether the expert's testimony and opinions are both reliable and relevant so as to assist the trier-of-fact in formulating its decision(s); and (d) whether the opinion has reliable foundation based upon admissible evidence. See Roberts v. Williamson, 111 S.W.3d 113, 121 (Tex. 2003); Helena Chem. Co. V. Wilkins 47 S.W.3d 486, 500 (Tex. 2001); K-Mart Corp. V. Honeycutt, 24 S.W.3d 357,360-362 (Tex. 2000); Robinson 923 S.W.2d at 558-559. If an expert fails to satisfy any one of these four tests, his or her opinions and testimony are to be excluded by the trial court. It is a well-accepted legal principle that Rule 702 requires that expert testimony be helpful to the jury's ultimate determinations by being both relevant and reliable. E.l. Du Pont de Nemours & Co. V. Robinson, 923 S.W.2d 549, 550 (Tex. 1996). The Texas Supreme Court has also determined that an expert's testimony should be excluded when the jury "is equally competent to form an opinion about the ultimate fact issues or the expert's testimony is within the common knowledge of the

jury." K-Mart Corp. V. Honeycutt, 24 S.W.3d 357, 360 (Tex. 2000). Under Rule 702, it is this Court's duty to determine if the expert's testimony is sufficiently reliable

B. <u>ATTACKING THE BIOMECHANIC'S QUALIFICATIONS:</u>

1. There is no bright-line test for qualifications, but experts sometimes overreach. Examine the expert's qualifications for each opinion. Challenge those qualifications in the same manner, opinion by opinion. The offering party must demonstrate the witness "possess[es] special knowledge as to the very matter on which he proposes to give an opinion." *In Gammill v. Jack Williams Chevrolet, Inc.,* the Supreme Court of Texas held that an engineer was not qualified to opine on cause of death even though he was qualified to opine on a vehicle's seat belt system. The engineer was a professor and licensed professional engineer with a doctoral degree in engineering from the University of Pennsylvania. The engineer had extensive knowledge of "mechanics, dynamics, biomechanics, vehicle occupant kinematics, and vehicle occupant restraint systems." He "had occasion to examine and test many vehicle restraint systems." But he had no medical training. The engineer provided an affidavit in which he gave opinions regarding the seat belt system in the vehicle at issue. The Supreme Court of Texas found those opinions to be reliable. But the court found that he went too far when he opined that "'[a] properly fitting and secure lap and shoulder seat belt system (three-point system) would have prevented Jaime Gammill's fatal injuries."' As the court tersely noted, the engineer "lacks any qualifications to testify concerning the cause of Jaime's death."

2. Don't allow an opposing expert to creep beyond her qualifications and offer opinions in an area in which she has no expertise. Chavez v. Davila illustrates this principle. In this personal injury action arising out of an automobile accident, the trial court did not err in striking two expert affidavits that concluded that the plaintiff was of unsound mind. The first expert's affidavit stated that the expert was a self-employed, licensed counselor with a doctorate in counseling. The expert did not, however, demonstrate that she was qualified to give an opinion as to whether the plaintiff was of unsound mind. The court refused to presume that all mental health professionals are qualified to address whether a person is of sound mind. The second expert, a licensed chiropractor, demonstrated no qualifications that would support allowing the expert to opine that the plaintiff was of unsound mind.

3. Many times, so called bio-mechanics obtained their degree through an online course or through a "distant learning" center. Some have no engineering license and are prohibited from "investigating" a car crash or conducting investigative work as a non-licensed engineer in a particular State. Some bio-mechanic's claim to be experts on property damage because they worked at an auto body shop. Many Junk science proponents have never researched or studied vehicle dynamics until they got hired by a defense junk science company and then started taking continuing education classes. It is critical to delve into both their education and training and challenge the sufficiency of one or both. In Texas, testimony on accident causation must be given by a qualified person in that science. Gainsco County Mut. Ins. Co. v. Martinez, 27 S.W.3d 97, 104

(Tex. App. - San Antonio 2000, pet. dism'd by agr.); Lopez-Juarez v. Kelly, 348 S.W.3d 10, 20 (Tex. App. - Texarkana 2011, pet. denied) Irrespective of the expert's qualifications, those opinions that go beyond the reasonable confines of their training must be excluded. For example, in Dawsey v. Olin Corp., 782 F.2d. 1254, 1264 (5th Cir. 1986), the Fifth Circuit affirmed the trial court's ruling to exclude plaintiff's expert witness. The plaintiffs had tendered the expert "in the field of physical organic chemistry with knowledge of the chemical components and composition of phosgene." The expert, however, had admitted that he was not a toxicologist or a pharmacologist and that he had never done any studies regarding the toxicological effect of phosgene on humans or animals. The court found no abuse of discretion in excluding the testimony since the issue of whether soldiers were killed by phosgene was beyond the confines of the expert's expertise.

C. ATTACKING THE METHODOLOGY/JUNK SCIENCE OF A BIOMECHANIC

1. An expert's opinion must flow from facts, data, or other opinions, and not the other way around. Any opinion drawn from an unreliable foundation is, by definition, unreliable. "Expert opinions must be supported by facts in evidence, not conjecture." Any underlying data the expert relies on should be independently evaluated in determining whether any opinions drawn from that data are reliable. If your opponent has stacked his experts, move to exclude those experts whose foundations include the opinions of other experts who have been, or are subject to being, excluded. Two cases exemplify why a reliable foundation is necessary. *In Moore v. Memorial Hermann Hospital System, Inc.,* the trial court properly excluded as unreliable the testimony of a workplace safety expert because he had no foundation from which to draw his conclusions. The worker, a food service attendant, suffered a back injury while pulling a large, fully-loaded food cart to one of the hospital's patient wings. During his deposition, the expert testified that the hospital failed to properly select the patient food carts in accordance with the safety concerns for its employees. But the expert had not seen the carts in person, and did not know how big they were, how much they weighed, or how much weight they could carry. He also did not know which factors would influence the amount of force necessary to move a loaded cart.

2. General Electric Co. v. Joiner, 522 U.S. 136 (1997) and Gammill require the gatekeeper to ensure that an expert's extrapolation from the basis of the opinion to the expert's conclusion is sound. See also Kerr-McGee Corp. v. Helton, 133 S.W.3d 245 (Tex. 2004). This test, which is referred to as "connective reliability," focuses on the reasoning used by the expert to lead from certain data or assumptions to the expert's conclusion or opinion, and whether an analytical gap exists between the data and the expert's conclusion. Brown, Eight Gates, 36 Hous. L. Rev. at 749, 804-810. In Merrell Dow Pharms., Inc. v. Havner, 953 S.W.2d 706, 714 (Tex. 1997), the court explained that "a flaw in the expert's reasoning" makes the opinion unreliable. If an expert's methodology or foundational data is sound but the expert's reasoning process applying that methodology or data is not sound or is not demonstrated, the opinion will not be admissible. Connective reliability requires the expert to explain her reasoning. In Volkswagen of America, Inc. v. Ramirez, 159 S.W.3d 897, 906 (Tex. 2004), the court noted six times that the plaintiff's experts did "not explain" or offered an "insufficient explanation." The only evidence "to connect [the expert's] objections

with his conclusions" was the expert's "say-so." Id. at 912 (Hecht, J., concurring). That is the situation here.

3. How does one attack the methodology of a bio-mechanic? See what he did, or more importantly, what he didn't do. Here are some sample questions: Did the bio-mechanic inspect the cars? Inspect the scene of the crash? Did he interview witnesses? Did he interview the police officer? Did he come up with the weight of the vehicles by taking into consideration any cargo? Any fuel? Any weight of the occupants? Did the bio-mechanic re-create the crash and crash test the two exact cars involved in the collision? Has the bio mechanic ever run actual crash testing on the same vehicles involved in the crash? Did the bio-mechanic run any testing at all (other than reviewing the pictures)? Did the bio mechanic consider reaction times? Weights of the passengers? Gender of the passengers? Whether occupants were braced for impact? The age of the occupants? Did the bio-mechanic utilize crash studies that are identical to the crash he is opining on? Who conducted the studies he is relying on? How many participants were there in the sample size of his studies? Is it fair or scientific to extrapolate the results of a limited sample size to the plaintiff's in the case?

4. DEFENSE MISUSES OF DATA AVERAGE VERSUS PEAK

One approach used by the defense engineer employs a sleight-of-hand tactic in these low-impact collision cases. It must be understood that in a collision, the amount of force applied by the bullet vehicle (defendant) to the target vehicle (plaintiff), when plotted, is on some type of curve, rather than linear. That is, at some point during the collision there is a peak moment when the force is greatest. For example, as the two cars first touch, the force is small, but as the collision progresses, the force becomes greater and decreases again as the cars come apart. In this deceptive approach, the expert uses an average g force, which is usually about half the peak g force. The engineer then compares the average g force of a particular collision with studies showing how G forces at a particular level failed to cause injury. It is improper, let alone unethical and unfair, to compare an average g force with a peak g force. (1)

5. STIFFNESS COEFFICIENT

In calculating deltaV, most of the computer programs used to calculate G forces require as one of its input factors, the stiffness coefficient of a particular vehicle - that is, how hard or soft the vehicle is. The stiffer the vehicle, the less energy it will absorb or dissipate in a crash, and the greater the energy that will be applied to the vehicle's occupants. Stiffness coefficients can be obtained either from the National Highway Safety and Transportation Administration (NHSTA) or from an independent testing facility. The government data is not specific to any one particular vehicle or make. Rather, NHSTA divides cars by groupings such as subcompact, compact and the like. In determining the stiffness coefficient using NHSTA data, one matches the type of car with the applicable NHSTA category. Studies using NHSTA data indicate, however, that in low impact

crashes, the data underestimates the delta V in rear-end impacts. Some engineers, rather than using NHSTA data, use data collected privately, such as that from Neptune Engineering in California (A favorite for defense biomechanics). Unfortunately, the Neptune data was obtained using higher speed collisions with greater delta V. Neptune provides no stiffness coefficients to use in low-speed impacts. The reason that stiffness coefficients are different in low-speed impacts than in high-speed impacts is because in high-speed impacts, there is more crush of stiffer portions of the vehicle. For instance, the stiffness of a bumper is less than the stiffness of the frame. Using Neptune data is inappropriate for low-speed impacts. Furthermore, use of that data in low-impact collisions will severely underestimate the delta V. While the NHSTA data underestimates it as well, that underestimation can be quantified. No such studies exists using Neptune data. Therefore, it is impossible to calculate a proper delta V. Nevertheless, it is misleading not to this underestimation. (1)

6. IMPACT ON THE PERSON - NOT THE CAR

Computer programs will quantify delta V and the g force impact on a vehicle only, but not on a particular human being. This must be done with a proper human dynamics analysis program. However, many experts will simply calculate the g force applied to the vehicle and not to the person and decline to state this in the report. Again, the engineer simply looks at the impact of the vehicle and compares those g forces with the g forces used by other favorable defense studies on the lack of injury associated with a particular G force. (1)

7. USE OF STUDIES

Even when the experts are qualified and the calculations accurate, one still must be cautious of the experts' use of scientific and experimental test data or studies comparing your crash to a random sized sample of studies. It is important to determine whether the factual circumstances of the case, are identical, similar or dissimilar to the test methodology used in the studies. Changes in the occupant's physical characteristics and body position, as well as the absence, presence and/or location of a headrest can greatly affect the results. This is why some people in a crash sustain significant and serious injuries while other occupants in the vehicle walk away without a scratch. The majority of low speed accident investigations and studies have used young healthy volunteers with no preexisting spinal deficiencies. Most defense oriented studies use males aged 25-43 who were of normal physical condition for their ages and none of whom had any preexisting spinal deficiencies. It is important to dive into each study and ask the expert about the demographic population and sample size of the study. (1)

A Society for Automotive Engineering's highway vehicle report provides this analysis:

“If the head is turned to one side at the onset of a rear-end collision, the neck ligaments will be re- strained and less articulation of the neck will be required to produce high resistive forces.

Consequently, there will be less time available for the neck muscles to respond to aid in accelerating the head, placing a greater burden on the ligaments. For this condition, the neck can be more susceptible to injuries."

One of the basic misuses of the engineering literature is equating the defense attorney's characterization of a particular crash as "low speed, low impact" with the definitions assigned in actual scientific studies to the terms "low speed, low impact." In the studies used by the defense, the common definition of low speed, low impact is under 5 mph. It is important not to permit the defense attorney who so characterizes the particular incident to equate the accident in the case at hand with the conditions in the scientific studies.

8. MISUSE OF THE FEDERAL BUMPER STANDARDS

One defense approach in no-damage collisions is to argue that the delta V had to be less than the applicable bumper standard, since all bumpers manufactured since 1982 are required to sustain a minimal impact before damage occurs. This concept that no damage to the bumper means a delta V of less than 5 mph is incorrect. Crash research has consistently shown that vehicular bumper systems can outperform the federal bumper standard with delta V values for change in velocity for the target vehicle as high as 10 mph without any permanent structural damage. It must be kept in mind that the federal standard is a minimum requirement and that most manufacturers will overdesign their bumper system to not only ensure compliance with the federal standard, but to ensure integrity of the vehicle at higher speed than the minimum required. (1)

D. PREVENTING THE BIOMECHANIC FROM PROVIDING MEDICAL TESTIMONY

1. General "knowledge" about medical issues is also not enough, even if the expert has a medical degree. For example, when a "doctor is not a psychopharmacologist or epidemiologist," he or she "[t]herefore is not qualified to testify as an expert regarding the ability of clinical trials, scientific studies, or case histories" nor opine on causal relationships between a drug and the disease.20 Smith v. Pfizer Inc., 2001 WL 968369, at *7-8 (D. Kan. Aug. 14, 2001). This is because such an expert: "has no expertise in either of the disciplines which might potentially explain to the jury (1) if the evidence establishes an association and the strength of the association (epidemiology) and (2) the mechanism whereby the drug affects the person (pharmacology)." As such, the doctor's testimony would not help, and might tend to confuse, the jury. Id. at 8. In addition, without the proper qualification, an expert cannot opine on causation using textbooks in the field or scientific articles when such an expert "is not qualified to explain the textbooks or scientific articles in the field." Id.

2. An engineer is not qualified to testify on spinal injuries or the causation of those injuries. See Broders vs. Heise, 924 S.W.2d 148,1S3 (Tex. 1996) (emergency room doctor was not qualified to testify in death case about cause of brain injury); Houghton vs. Port Terminal RR,

999 S.W2d 39,47-49 (Tex. App. - Houston [14th Dist.] 1999, not pet), (railroad engineer excluded because party could not show connection between engineer's experience and training and the pertinent inquiry at issue). To constitute evidence of causation (in a personal injury case) an expert opinion must rest on reasonable "medical" probability. Burroughs Wellcome Co. v. Crye, 907 S.w\2d 497, 500 (Tex. 1995).

3. In Rodgers v. State, the Court of Criminal Appeals identified three factors relevant to the determination of whether a proffered expert is qualified. Courts should demand more education, training, or experience: (1) the more complex the field; (2) the more conclusive the expert's opinion; and (3) the more central the opinion to the resolution of the case. The expertise must, of course, be measured against the particular opinion the expert is offering. The Texas Supreme Court emphasized this point in Broders v. Heise. Although the plaintiffs' expert, an emergency room doctor, was permitted to testify as to the proper standard of care for emergency room doctors and nurses, the Court held that the trial court properly excluded his opinion that the defendants' failure to order more promptly a CT scan caused the patient's death. The trial court has the responsibility to ensure that "those who purport to be experts truly have expertise concerning the actual subject about which they are offering an opinion. Clearly, engineers do not have the experience, training or expertise to opine on medical issues and/or opine as to whether a person could have been injured in a particular event. The use of biomechanical engineering principles to determine that a specific injury cannot occur to a specific individual in a specific accident has not been generally accepted in the scientific community, and as a result has been rejected by numerous courts throughout the nation as not meeting either Frye or Daubert admissibility standards.

4. In Smelser v. Norfolk Southern Ry. Co., 105 F.3d 299, 46 Fed. R. Evid. Serv. 468, 1997 FED App. 0033P (6th Cir. 1997), it was the plaintiff who proffered a biomechanical engineer to testify that a shoulder belt, not a lap belt, failed in an automobile accident, causing him injury. The Sixth Circuit found the expert's opinion as to causation should have been excluded because it went beyond his expertise in biomechanics, and also lacked reliability. This was in part based on the biomechanical engineer's admission:"… that biomechanics are qualified to determine what injury causation forces are in general and can tell how a hypothetical person's body will respond to these forces, but are not qualified to render medical opinions regarding the precise cause of a specific injury. He acknowledged that each individual person has his own tolerance level, and therefore, admitted he could testify only in general terms, i.e., that "X" forces would generally lead to "Y" injuries and "Y" injuries are consistent with those the plaintiff claims to have suffered." [Emphasis added.] Impressive credentials are no substitute for a medical (or even chiropractic) license. The plaintiffs' expert in Gammill v Jack Gammill v. Jack Williams Chevrolet, Inc., 972 S.W.2d 713, Prod. Liab. Rep. (CCH) P 15362 (Tex. 1998), a professor of mechanical engineering who had "conducted research in mechanics, dynamics, biomechanics, vehicle occupant kinematics, and vehicle occupant restraint systems" (id. at 716), while qualified to opine whether a seatbelt was defective, lacked any qualifications to testify as to the cause of an infant's death in a car crash.In Cromer v. Mulkey Enterprises, Inc.,

254 Ga. App. 388, 562 S.E.2d 783 (2002), causation testimony was precluded despite the biomechanical engineer's Ph.D. in physics, his 22 years of university study of the behavior of materials under different levels of stress, impact, and assault, his participation in seminars on low-speed automobile accidents, and his authoring a book on low-speed impacts and biomechanics. Even if the expert has some medical education, this does not qualify him to render an injury-causation opinion. In Salerno v. Tudor, 2002 WL 120608 (Cal. App. 1st Dist. 2002), the biomechanical engineer, who had taught anatomy at Davis Medical School and worked in the spine clinic at California Davis Medical Center, testified that there was "no mechanism for a herniation—herniated disk" in the subject rear-end collision. Ruling this was improper, the appellate court stated:

"Since Liptai was not a medical doctor, she was improperly providing the jury with assistance in determining the ultimate issue: whether the force could have caused Salerno to suffer a herniated disk. She had a specialized knowledge about the forces caused by the accident, but she did not have the training and experience to testify that Salerno did not suffer a herniated disk. [Emphasis added.]"

E. LOW PROPERTY DAMAGE DOES NOT EQUAL NO INJURY

1. In an attempt to understand collisions, organizations like the National Highway Traffic Safety Administration (NHTSA) began to run full scale crash tests. Eventually, the NHTSA testing grew to include most of the vehicles on the roads in the United States. Vehicles were tested in collisions with fixed barriers, collisions with movable barriers, collisions with other vehicles and collisions with objects. In an attempt to understand the effect on vehicle occupants surrogates were developed. These "crash dummies" improved over the years as technology increased from the Hybrid, to the Hybrid 2, to the Hybrid 3 and eventually into an entire family of crash dummies. These dummies allowed for the determination of the applied loads on the surrogate occupant in a variety of collisions. While the data obtained was useful in setting performance standards and understanding the locations of applied forces, the testing also spawned several myths. (24)

While the NHTSA was crashing a multitude of passenger vehicles, another endeavor was being pursued by the agency to understand how real people are injured in real collision. This included programs such as the Fatal Accident Reporting System (FARS) and the National Automotive Sampling System (NASS). A significant gap in the crash testing performed by the NHTSA involved collisions at speeds such as 10 to 15 m.p.h. and lower. This gap was partially filled by organizations, groups and individuals. One of the largest test sets has been performed by the Insurance Institute for Highway Safety. Unfortunately, this testing also spawned several myths, some propagated by the IIHS and some proliferated by the litigation based industry. In addition to IIHS, the testing by groups also created both useful data and another series of myths. (24)

At the same time, numerous Universities around the world were evaluating the effects of impacts at under 10 to 15 m.p.h. on occupants. While this data often provided valuable insight into the

effect of these collisions on people, the data was often ignored by the litigation industry. The myths that have appeared over the years have been repeated so often they are assumed to be true when in reality; they are at best urban legends. (24)

2. Myth 1: There is a 5 m.p.h. threshold for injury.

   Source: Testing by defense firms for litigation.

   Error: To understand this myth it is necessary to discuss the origins of the theory. In the early 1990s, a group of consultants who testify primarily for insurance companies and automobile manufacturers decided to run a set of safety optimized kinematic studies, using themselves as volunteers. Only individuals with a financial interest in the company were allowed to participate in order to limit the potential liability. Steps were specifically taken to prevent injury such as not impacting the researcher by surprise, the use of bite blocks and other safety measures. (24)

   The consultants reported their observations regarding their own injuries and then asserted that since they were not injured, they had determined a "threshold" for injury. It has not been established that these researchers did not have long term complications but regardless of this, it was asserted that the threshold for injury was a 4 to 5 m.p.h. change in velocity. (It is informative to note that there was reported to be no damage to the vehicles in the tests.) After the initial work of the consultants, several other groups of consultants who worked primarily for insurance companies and manufacturers ran tests using themselves as subjects. The fallacy of researchers using themselves as subjects was demonstrated by the assertion of the President of one company who stated when discussing their 1994 paper , that the researchers were hired to prove an injury would not occur. However, even though this paper clearly cannot be used to establish a threshold, it is routinely cited as an example, of a case where an older woman with pre-existing radiographic findings was not injured. Omitted from the discussion is the fact that the woman had a financial interest in not being injured and violated standard research protocol. (24)

   Since that time, it has become routine for an accident Reconstructionist to assert that the change in velocity of a collision was 5 m.p.h. or less, regardless of the damage to the vehicles. This occurs despite the fact that the researchers failed to establish an actual threshold for the public at large. The researchers did not even establish that change in velocity is the relevant measure of injury potential in rear impacts. As an example, the differential movement of L3 versus L4 versus L5 is more important than the actual change in velocity or the peak acceleration. Subsequently, some researchers have attempted to test non employees, although still in safety optimized conditions. This research has shown that symptoms can occur in collisions with a change of velocity of only 1 m.p.h. Missing in this approach is a consideration of clearly identified aggravating factors which can increase the rate of injury. Also absent is the discussion of actual injury studies that have looked at actual collisions of the motoring population versus using preselected safety optimized volunteers. (24)

3. Myth 2: Volunteer test data can establish if a person in a real collision car was injured:

   Source: Testing by defense firms for litigation.

   Error: Based on the material discussed above, the limitations of volunteer testing in any form is readily apparent. The injuries to a person in a real collision cannot be equated to injuries sustained by crash test volunteers for numerous reasons. In crash tests, safety is optimized. Often the volunteer is a healthy young male. Sometimes special seat belts are used. Bite blocks are employed to prevent injury to the teeth and jaw. The test subject is aware that the crash is about to take place. The test subject is positioned to receive the forces of the crash. The subject is looking straight ahead and sitting upright. In the few cases where a crash subjects head was turned, the injuries suffered were significantly worse. The sample size in crash tests is quite small. These tests are fairly expensive, therefore the number of vehicles employed and the number of test subjects used are limited. The statistical accuracy of these tests is questionable considering the number of vehicle speeds that are tested and the various vehicle impact angles that need to be evaluated. This uncertainty is compounded by the variations in the human body's tolerance to injury as a function of age, gender, position in the seat, and possible predisposition to injury as a result of prior medical problems. Even some of the authors of these tests state that they cannot be extrapolated to the general public. (24)

4. Myth 3: The injuries to the person can be determined by looking at the photographs of the car.

   Source: No known valid source

   Error: As was demonstrated with the NHTSA data, the applied forces on the exterior of the vehicle do not define the applied forces on an occupant. If there is not extensive crush into the occupant compartment, the applied forces on the occupant will tend to be greater and more diverse than on the vehicle. Research from Michael Freeman using the NASS database demonstrates that it is not possible to look at a vehicle and predict the injury suffered by the occupant. (SEE EXHIBIT A ATTACHED TO THIS PAPER). (24)

5. Myth 14: Minor damage means the collision was low speed.

   Source: Misapplication of Newton's Third Law of Motion and the First Law of Thermodynamics

   Error: In a barrier impact, virtually all energy must go into damaging the vehicle. In a vehicle to vehicle collision, the energy first goes into accelerating the struck car. Research has shown that in a collision involving the bumpers of both vehicles it is rare to have any damage beyond scuffing of the bumpers in collisions up to and exceeding 10 m.p.h. Damage beyond the bumper system often doesn't occur until the impact speed has exceeded 15 m.p.h. (24)

6. As the data above demonstrates, it is not possible to look at the vehicle damage in these types of collisions and determine if a person has or has not been injured. There is no engineering or scientific basis for asserting a person was not injured in a collision unless there were no forces applied. A valid scientific approach is to start with the diagnosed injuries and determine if forces were applied where the injuries are located. If there is a match in location, the researcher can consider if the injuries reported are consistent with the injuries known to occur in a given impact. A diagnosis comes from a treating medical provider. It is typically improper for a person, be they a doctor, engineer or scientist, to look at a vehicle and conclude the injuries did not occur in a given collision. (24)

F. <u>COMMON SENSE ARGUMENTS TO THE COURT</u>

1. Few Judges have a foundation in physics or engineering. The more complicated explanation the junk science proponent gives to the Court, the more likely the Court is to say he is qualified. The Court may reason that "this stuff sounds complex and thus must be scientific". The only way to fight junk science to the Court is by exposing the proponents of junk science as nothing more than charlatans who are trying to use scientific principles to cover up the utter lack of methodology or science behind their opinions.

2. Argument: "All this proponent of Junk science is doing is comparing pictures and trying to extrapolate injury to the occupants".

   This expert failed to utilize a crash study using the exact same cars, he failed do a crush analysis of the vehicles, he failed to inspect the vehicles in question, he failed to download black box data from the vehicles, he failed to take the vehicle occupants age, weight, height, race, gender, particular medical conditions, bone density, or inability to brace for an impending impact into consideration.

   All this proponent of Junk Science did is take his subjective opinion of similar crash pictures from an insurance funded crash test study using dissimilar vehicles, using controlled safety enhanced testing conditions, from a small population of paid volunteers who are mostly young healthy men and who are told to brace for impact and then applies those findings to our clients accident to say they were not injured.

3. Argument "This proponent of junk science is ignoring basic and simple lessons of statistics and sample size that we all learned in high school, by applying the finding of a defense paid small sample size of 2-10 people and attempting to extrapolate those findings to the entire world's population of people."

4. Show the Judge the NASS crash picture study attached as an appendix to this paper. Explain to the Judge that looking at pictures tells us nothing. NASS shows big crashes and no injuries and small crashes and vehicle damage leading to fatalities.

5. Arm the Court with studies and articles showing that vehicle crush/damage has no correlation to occupant injury also attached as an appendix to this paper.

6. There are also numerous video and crash sequence studies and testing that show minor impacts at 5mph, 7mph causing significant Delta V changes in the human occupants in the studies. Dr. Arthur C. Croft has put out a series of this videos. In slow motion it shows the violent jolting of heads and torsos in rear, side and frontal impacts. In fact, the studies and research had to be stopped because the volunteers in these studies were getting injured.

7. Show the Court other orders striking the same or similar experts. Particularly with defense outfits like BRC, most of their engineers have been struck in the past. Showing the Court that this particular expert is part of a group of junk science proponents that have been struck before.

G. <u>POLLUTE THE ORDERS YOU DO GET STRIKING THE EXPERTS</u>

1. If and when a Judge grants your order striking these experts, make sure your order explains the basis for the strike. As an example: The Court finds that the scientific methodology of Dr. Sonso is unreliable and lacks scientific basis. This makes it easier for other colleagues to utilize these orders effectively.

End Notes

1*: Diffusing The Defendant's biomechanical Engineer, Trial Diplomacy Journal, Vol. 21, 1-7 (1998)*

2. Backaitis SH (ed) "Biomechanics of Impact Injury and Injury Tolerances of the Head-Neck Complex." SAE PT-43.

3. Ziejewski M. "Engineering Aspects of Head-Neck Injury" in head and Neck Injury Handbook, Smith, LJ (ed). Shepard's McGraw-Hill.

4. West DH, Dough JP and Harper GTK. "Low Speed Rear-End Collision Testing Used In Human Subjects." Accident Reconstruction Journal pp. May/June, 1993, 12-28.

5. Allen ME, Weir-Jones I, Eng P, Motiuk DR, Flewin KR, Goring RD, Kobetitch R and Broadhurst A. "Acceleration Perturbations of Daily Living - A Comparison to Whiplash," Spine Vol. 19, No. 11, pp 1285-1290 (1994).

6. West et al., supra note 4, at 25-26.

7. National Center for Statistics and Analysis, U.S. Department of Transportation, Accuracy and Sensitivity of Crash, March 1982 Technical Report DOT HS-806 152, at 40 (available from National Technical Information Service, Springfield, VA 22161)

8. Day TD and Hargens RL. "Application and Misapplication of Computer Programs for Accident Reconstruction. SAE paper 890738 (1989).

9. Federal Rule of Evidence 702.

10. Buckelew v. Grossbard, 87 N.J. 512, 524 (1981).

11. Dwyer v. Ford Motor Co., 36 N.J. 487, 494 (1962).

12. Szabo TJ, Welcher JB, Anderson, RD, Rice MM, Ward JA, Paulo LR and Carpenter NJ. "Human Occupant Kinematic Response To Low Speed Rear-End Impacts." SAE Paper 940532 (1994).

13. West, supra. at 22.

14. Allen, supra. at 1297.

15. SAE Highway Vehicle Report. "Human Tolerance To Impact Conditions As Related To Motor Vehicle Design." SAE Paper JA 85 (1986).

16. King AI. "Point of View." Spine Vol. 19, No. 11, pp 1290 (1994).

17. Navin, FPD, McNabb, MJ, Romilly DP and Thompson RW. "An Investigation Into Vehicle and Occupant Response Subjected To Low-Speed Rear Impacts." Proc. Canadian Multidisciplinary Road Safety Conference, 1989.

18. Gravitational forces (or G-forces) often correlated to change in velocity (or Delta V).

19. It is worth noting, for example, that according to the National Highway Traffic Safety Administration, Bumper Q & A's, www.nhstat.gov (Dec. 16, 2001) "there [is no] way to determine how fast a car was going during a rear end crash based on the damage to the bumper(s). Many parameters such as vehicle masses, the pre- impact velocity of both vehicles, impact angles, crush resistance, metallurgical fatigue, etc, affect how the bumpers behave during an impaCt Each crash must be analyzed with respect to all of the parameters before an estimate can be made."

20. See also, Wilson v. Rivers, 350 S.C. 536, 567 S.E.2d 482 (Ct. App. 2002), cert. granted, (Feb. 20, 2003) and rev'd on other grounds, 357 S.C. 447, 593 S.E.2d 603 (2004). The biomechanical engineer testified that he arrived at his conclusion as to injuries based on his determination of the change in velocity at impact, which he reached by looking at vehicle damage, but then testified

that vehicle damage is not determinative of injury, and also that he did not know the speed or direction of either vehicle at impact The trial court's exclusion of the entire videotaped deposition as "confusing" was affirmed on appeal. The Court in Bonilla, likewise excluded the proffered expert, in part, because it was confusing. See Transcript at pp. 649–650.

21. See, eg. Gillum v. L & J Enterprises, Inc., 29 P.3d 266 (Alaska 2001) biomechanical engineer's testimony in head injury case disregarded in its entirety because he had assumed the garage door had fallen on plaintiff's head vertically, which was at odds with the testimony was that it had fallen at an angle. The decision was affirmed on appeal.

22. Judge Maltese's opnion in Clemente has been cited with approval by other jurisdictions: E.g., Suanez v. Egeland, 353 N.J. Super. 191, 801 A.2d 1186 (App. Div. 2002); Whiting v. Coultrip, 324 Ill. App. 3d 161, 258 Ill. Dec. 111, 755 N.E.2d 494 (3d Dist. 2001), as modified on denial of reh'g, (Sept. 12, 2001).

23. Those studies were: See, Thomas J. Szabo and Judson B. Welcher, et al., Human Subject Kinematics and Electromyographic Activity During Low Speed Rear Impacts, Society of Automotive Engineers, Inc. (1996); Whitman E. McConnell and Richard P. Howard, et al., Human Head and Neck Kinematics After Low Velocity Rear-End Impacts—Understanding "Whiplash," Society of Automotive Engineers, Inc. (1995); Whitman E. McConnell and Richard P. Howard, et al., Analysis of Human Test Subject Kinematic Responses to Low Velocity Rear End Impacts, SAE: The Engineering Society for Advancing Mobility Land Sea Air and Space International (1993); Thomas J. Szabo and Judson B. Welcher, et al., Human Occupant Kinematic Response to Low Speed Rear-End Impacts, SAE: The Engineering Society for Advancing Mobility Land Sea Air and Space International (1994). To the extent the defense expert purports to utilize any of these studies, or like studies, Plaintiff objects.

24. Understanding the facts and myths about minor property damage collisions., John J. Smith, PE BSGP MSEE MSBMT MSS

25. Low Speed Rear Impact Collision TOPTEC, SAE, 1994

26. Kullgren, Krafft, Tingvall and Lie, "Combining Crash Recorders and Paired Comparison Technique: Injury Risk Functions in Frontal and Rear Impacts with Special Reference to Neck Injuries", Paper no 404,

27. Gabler, Fitzharris, Scully,Fildes, Digges, Sparke, "Far Side Impact Injury Risk for Belted Occupants in Australia and the United States, Paper No. 05-0420

28. NASS data provided to Dr. Zimmer from Ted Bloomquist.

29. Minton, Murray, Stephenson & Gakasko, "A Study of Lower Back Strain Injuries Resulting From Road Accidents", Transportation Research Laboratory, TRL532, 2002

30. National Automotive Sampling System, Department of Transportation.

31. Farmer. Wells, Werner, "Relationship of Head Restraints Positioning to Driver Neck Injury in Rear End Crashes", Insurance Institute for Highway Safety, Arlington, VA

32. Elbel, Kramer, Huber-Lang, Hartwig, Dehner, "Deceleration During 'Real Life' Motor Vehicle Collisions – Predictors for the Risk of Sustaining a Cervical Spine Injury?", Patient Safety in Surgery, 2009, 35 BioMed Cental, Ltd.

33. Smith, Smith, "The Lack of Correlation Between Spinal Injuries and Change in Velocity in Rear Impacts – An Evaluation of Spinal Strain, Proceedings of the 2007 International Whiplash Trauma Congress, October 2007

34. Freeman, Michael, graph provided in email September 6, 2008

35. Michael D Freeman, "Are vehicle damage photographs reliable predictors of injury?"