

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

DARIN RUARK,

Plaintiff,

v.

BMW OF NORTH AMERICA, LLC,
et al.

Defendants.

Civil Action No. ELH-09-2738

MEMORANDUM

This suit arises out of a single-vehicle accident that occurred on July 30, 2006. Plaintiff Darin Ruark, then a 17-year-old rising high school senior, suffered a catastrophic neck injury on that date, when the 1995 BMW 325is coupe (the “subject vehicle”) in which he was riding as a front-seat passenger experienced a rollover, either two or three times. Plaintiff, who was wearing his seat belt, was in the trailing position in the rollover sequence and, during the first rollover, his head came in contact with the roof of the BMW. As a result of the accident, plaintiff’s cervical spine was fractured at C5/6, rendering him a quadriplegic.¹

Following the accident, plaintiff filed suit against BMW of North America, LLC, the distributor of the subject vehicle, and BMW AG, the manufacturer of the subject vehicle (collectively, “BMW”), alleging, *inter alia*, that the subject vehicle was defective and unreasonably dangerous. ECF 2.² In sum, plaintiff claims that he was injured as a result of the

¹ The defense asserts that plaintiff is a tetraplegic. However, there is no dispute that the injuries were catastrophic. Nor is the discrepancy material to the resolution of the pending motions.

failure of the occupant restraint to keep him firmly in his seat, and because the strength-to-weight ratio (“SWR”) of the roof was deficient, causing the roof to intrude into the passenger compartment during the rollover, where it came into contact with plaintiff. BMW disputes those contentions. With regard to the roof crush, BMW maintains, *inter alia*, that the SWR met federal standards and that the roof intrusion occurred after plaintiff had already sustained his catastrophic spinal injuries. In its view, a stronger roof would not have prevented plaintiff’s injury.

At the trial, scheduled to begin in May, the parties intend to rely heavily on expert testimony, and each side has filed a motion seeking to exclude certain expert opinions proffered by the opposing party. *See Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993); Fed. R. Civ. P. 702. In particular, defendant filed a motion to exclude certain of the expert opinions of Gerald Rosenbluth and Stephen Batzer, Ph.D, P.E. (“BMW Motion,” ECF 113), supported by a Memorandum (“BMW Memo,” ECF 113-1) and voluminous exhibits. Plaintiff opposes that motion (“Ruark Opp.,” ECF 120), and BMW has replied (“BMW Reply,” ECF 122). In addition, plaintiff filed a motion to exclude three aspects of the causation testimony of Robert Banks, M.D. (“Ruark Memo,” ECF 114), supported by exhibits. BMW opposes that motion (“BMW Opp.,” ECF 119).

² Suit was originally filed in the Circuit Court for Baltimore City and was removed to this Court on the basis of diversity jurisdiction, pursuant to 28 U.S.C. § 1441 and 28 U.S.C. § 1332. ECF 1. The case was originally assigned to Judge Legg but was subsequently reassigned to me. The driver of the subject vehicle, James Bradford, and the owner of the vehicle, George Bradford are third party defendants. *See* ECF 44.

The Court held an evidentiary hearing on January 16, 2014,³ at which three witnesses testified: Dr. Batzer, Dr. Banks, and Jeffrey Croteau, a mechanical engineer and expert for the defense. During the hearing, counsel for plaintiff withdrew several of his *Daubert* challenges.⁴ As a result, the issues at the hearing were substantially narrowed.

Remaining for resolution are: (1) BMW's objection to Dr. Batzer's testimony regarding a reasonable alternative design of the vehicle's A-pillars which, according to plaintiff, would have strengthened the roof; and (2) plaintiff's objection to Dr. Banks's testimony about conclusions he drew from the presence of two marks on the interior of the vehicle, allegedly imprinted from a hat found in the vehicle, and which may have been worn by plaintiff at the time of the crash.⁵

After setting forth the governing standards, I will describe each expert's methodology and conclusions and then determine the admissibility of the challenged opinions.

Standard of Review

³ No transcript is available at this time. Therefore, in writing this Opinion, I have relied on my notes from the hearing. Unless otherwise noted, each expert witness's testimony at the hearing was consistent with his affidavit and/or report, and so I have quoted primarily from those exhibits.

⁴ In particular, plaintiff's counsel abandoned his *Daubert* challenge to the "diving theory" of causation and to Mr. Croteau's use of Hybrid III instrumented dummies during his testing. Additionally, counsel for plaintiff advised that Mr. Rosenbluth would not offer at trial the opinion that was the subject of BMW's challenge, concerning a proposed alternative design for the subject vehicle's restraint system, involving a roll sensor and a pyrotechnic pretensioner. This concession mooted another *Daubert* issue.

⁵ At the hearing, counsel agreed that Mr. Ruark does not recall whether he was wearing the hat at the time of the accident.

Under Federal Rule of Evidence 104(a), the court is responsible for determining “preliminary questions concerning the qualification of a person to be a witness” and “the admissibility of evidence,” including the admissibility of expert testimony under Federal Rule of Evidence 702. “The party seeking admission of the expert testimony bears the burden of establishing admissibility by a preponderance of the evidence.” *Fireman’s Fund Ins. Co. v. Tecumseh Prods. Co.*, 767 F. Supp. 2d 549, 553 (D. Md. 2011); *see Daubert*, 509 U.S. at 590; *Cooper v. Smith & Nephew, Inc.*, 259 F.3d 194, 199 (4th Cir. 2001); *Maryland Casualty Co. v. Therm-O-Disc., Inc.*, 137 F.3d 780, 783 (4th Cir. 1998); *Casey v. Geek Squad ® Subsidiary Best Buy Stores, L.P.*, 823 F. Supp. 2d 334, 340 (D. Md. 2011) (Grimm, J.).

Fed. R. Evid. 702 provides that a properly qualified expert witness may testify regarding technical, scientific, or other specialized knowledge in a given field if it would assist the trier of fact in understanding the evidence or to determine a fact in issue. The rule “was intended to liberalize the introduction of relevant expert evidence.” *Westberry v. Gislaved Gummi AB*, 178 F. 3d 257, 261 (4th Cir. 1999). Federal Rule of Evidence 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

In *Daubert*, 509 U.S. at 597, the Supreme Court held that scientific evidence is admissible under Rule 702 if “it rests on a reliable foundation and is relevant.” The Supreme Court explained that expert scientific testimony must be grounded “in the methods and procedures of science,” and it must be something more than subjective belief or unsupported assumptions. *Id.* at 589–90. Moreover, the evidence or testimony must be relevant to the extent that it will “assist the trier of fact to understand the evidence or to determine a fact in issue.” *Id.* at 591; *see also United States v. Forrest*, 429 F.3d 73, 80–81 (4th Cir. 2005). In *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999), the Supreme Court extended the principles pertaining to scientific expert testimony to other expert testimony requiring technical or specialized knowledge.

Under *Daubert*, the trial court serves as the gatekeeper, making a pretrial determination “of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.” 509 U.S. at 592–93. This gatekeeper role helps ensure that the jury hears reliable and relevant evidence that will assist the jury in factual determinations, clarify issues, and has probative value. *Id.* at 596. As to reliability, *Daubert* articulated five factors that the trial court should consider in evaluating the reliability of an expert’s reasoning or methodology: (1) whether the particular scientific theory has been or can be tested; (2) whether the theory has been subjected to peer review and publication; (3) the known or potential rate of error; (4) whether there are standards controlling the method; and (5) whether the technique has gained general acceptance in the relevant

scientific community. *Daubert*, 509 U.S. at 593–94; *see United States v. Crisp*, 324 F.3d 261, 265–66 (4th Cir. 2003).

As a whole, the factors are meant to ensure that “an expert, whether basing his testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” *Kumho Tire*, 526 U.S. at 152. The factors are meant to be “helpful, not definitive,” and not all factors necessarily apply in a given case. *Id.* at 151. Indeed, the Supreme Court has said that the factors are not a “checklist.” *Id.* at 150. Regardless, the court “should meticulously focus on the expert’s principles and methodology, and not on the conclusions that they generate.” *McDowell v. Brown*, 392 F.3d 1283, 1298 (11th Cir. 2004).

As indicated, to satisfy the admissibility requirements of Rule 702, an expert’s opinion must be “based upon sufficient facts or data.” Fed. R. Evid. 702. An expert must also opine based on reliable principles and methods, applied reliably to the facts. With regard to an expert’s qualifications, the Advisory Committee’s notes to Rule 702 provide that experience alone, or in conjunction with “other knowledge, skill, training or education,” can provide sufficient foundation for expert testimony. *See Kumho Tire*, 526 U.S. at 156 (stating that “no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience.”). On the other hand, an expert witness may not offer an opinion where the subject matter goes beyond the witness’s area of expertise. *See Berry v. City of Detroit*, 25 F.3d 1342, 1351 (6th Cir. 1994); *see also Smith v. Central Admixture Pharm. Servs., Inc.*, 2010

WL 1137507, at *3 (D. Md. Mar. 19, 2010) (“It is well established that ‘general expertise is not sufficient to qualify [an expert] to testify on a matter that requires particularized knowledge, training, education, or experience.’” (quoting *Fitzgerald v. Smith & Nephew Richards, Inc.*, 1999 WL 1489199 (D. Md. Dec. 30, 1999))).

Moreover, proposed testimony that concerns matters within the common knowledge and experience of a lay juror does not pass muster. *United States v. Dorsey*, 45 F.3d 809, 814 (4th Cir. 1995); *Kopf v. Skymr*, 993 F.2d 374, 377 (4th Cir. 1993). “While the fit between an expert’s specialized knowledge and experience and the issues before the court need not be exact . . . an expert’s opinion is helpful to the trier of fact, and therefore relevant under Rule 702, ‘only to the extent the expert draws on some special skill, knowledge or experience to formulate that opinion.’” *Shreve v. Sears, Roebuck & Co.*, 166 F. Supp. 2d 378, 392–393 (D. Md. 2001) (quoting *Ancho v. Pentek Corp.*, 157 F.3d 512, 518 (7th Cir. 1998)).

Notably, “evidence that has a greater potential to mislead than to enlighten should be excluded.” *Westberry*, 178 F.3d at 261. However, to be admissible, the expert testimony need not be ““irrefutable or certainly correct.”” *United States v. Moreland*, 437 F. 3d 424, 431 (4th Cir. 2006) (citation omitted); *see Daubert*, 509 U.S. at 596; *Westberry*, 178 F.3d at 261. Rather, the proponent must show that it is reliable. *Oddi v. Ford Motor Co.*, 234 F. 3d 136, 145 (3rd Cir. 2000). In other words, the Supreme Court did not intend the gatekeeper role to “supplant the adversary system or the role of the jury: ‘[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means

of attacking shaky but admissible evidence.”” *Allison v. McGhan Medical Corp.*, 184 F.3d 1300, 1311–12 (11th Cir. 1999) (quoting *Daubert*, 509 U.S. at 596); *see Moreland*, 437 F. 3d at 431 (recognizing that “expert testimony is subject to testing by vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof.”).

However, a court will exclude testimony based on “belief or speculation,” *Oglesby v. Gen. Motors Corp.*, 190 F.3d 244, 250 (4th Cir. 1999), or when not supported by the record. *Bryte ex rel. Bryte v. Am. Household, Inc.*, 429 F.3d 469, 477 (4th Cir. 2005); *Tyger Const. Co. v. Pensacola Const. Co.*, 29 F.3d 137, 142 (4th Cir. 1994); *Casey*, 823 F. Supp. 2d at 340. Moreover, “nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.” *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). In *Benedi v. McNeil-P.P.C., Inc.*, 66 F.3d 1378, 1384 (4th Cir. 1995), the Fourth Circuit recognized that “epidemiological studies are not necessarily required to prove causation,” but a proposed expert must show that “the methodology employed . . . in reaching his or her conclusion is sound.” *McEwen v. Baltimore Washington Medical Center Inc.*, 404 F. App’x 789, 791–92 (4th Cir. 2010) (per curiam), although unpublished, is also instructive. In that case, the Fourth Circuit affirmed Judge Motz’s exclusion of expert medical testimony that was deemed to be conclusory. There, the doctor’s testimony on causation failed to identify any support in the medical literature, rendering it effectively “ipse dixit.” *Id.* Similarly, a court may exercise its “discretion to find that there is ‘simply too great an

analytical gap between the data and the opinion proffered.”” *Pugh v. Louisville Ladder, Inc.*, 361 F. App’x 448, 454 n.4 (4th Cir. 2010) (quoting *Joiner*, 522 U.S. at 146).

Finally, it is worth noting that Rule 702 does not relieve the party seeking admission of meeting the requirements of other applicable rules. This includes Rule 403’s instruction that evidence may be excluded for undue prejudice, confusion of the issues, or a potential to mislead the jury. *Casey*, 823 F. Supp. 2d at 341.

Stephen Batzer, Ph.D., P.E.

Plaintiff retained Dr. Batzer to provide an opinion on whether the roof of the subject vehicle was defective or unreasonably dangerous.⁶ Dr. Batzer has a master’s degree in manufacturing systems engineering and a Ph.D. in mechanical engineering. *See Curriculum Vitae of Stephen A. Batzer (“Batzer C.V.” ECF 120-11).* He has worked as an engineer for 25 years, specializing as a forensic engineer and failure analyst for over 10 years. *See Preliminary Forensic Report of Stephen A. Batzer (“Batzer Report,” ECF 120-10).* Dr. Batzer is a member of various professional organizations, has taught engineering coursework at four universities, and has authored over 60 peer reviewed publications, at least 30 of which relate to automotive roof design or rollover crashes. *Affidavit of Dr. Stephen Batzer (“Batzer Aff.” ECF 120-8) at ¶ 7i;* *see Batzer C.V.* In addition, he has investigated hundreds of accidents and product failures, and he has testified over 150 times as an expert forensic engineer and design analyst, including as to automotive roof structures. *Batzer Aff. ¶ 7n.*

⁶ Defendants have not raised a *Daubert* challenge to Dr. Batzer’s qualifications. Nonetheless, I have briefly summarized them to provide background for his testimony.

As part of his work in this case, Dr. Batzer reviewed or examined, *inter alia*, the police report from the accident, the subject vehicle, an exemplar 1995 BMW 325is coupe, an exemplar 1995 BMW 3 series convertible, engineering drawings and specifications for 1995 BMW vehicles, data and reports related to roof strength testing of 1995 BMW vehicles, and numerous documents produced during discovery by both plaintiff and BMW. Batzer Aff. ¶ 8a. From his review, Dr. Batzer opined that at the time BMW designed the subject vehicle, “there were a number of reasonable alternative roof support structure designs that had already been incorporated into various production vehicles.” *Id.* ¶ 8e.

BMW’s *Daubert* challenge concerns one of Dr. Batzer’s proposed alternative designs. Batzer observed that the A-pillars⁷ used by BMW in the subject vehicle and other 1995 BMW 325is coupes were “substantially less robust and weaker than the A-pillars it incorporated into its 1995 3 Series convertibles.” *Id.* ¶ 8b. In particular, Dr. Batzer observed that the A-pillars in the convertibles, unlike those in the coupes, were reinforced with a nested steel tube design. *Id.* Dr. Batzer hypothesized that “reinforcing the A-pillars in a 1995 BMW 325is coupe with two steel nesting tubes . . . would have substantially strengthened them and would have prevented any appreciable roof crush” in the subject accident. *Id.* ¶ 8g.

⁷ The A-pillar of a vehicle is the first pillar of the passenger compartment, typically running alongside the windshield and up to the roof of the vehicle. At the time, the BMW 325is coupe also had B-pillars and C-pillars, located toward the middle and back of the passenger compartment, respectively. BMW’s convertibles, however, did not have B-pillars or C-pillars, because of their soft roof design.

To test his hypothesis, Dr. Batzer directed SAFE Laboratories (“SAFE”), located in Goleta, California, to conduct comparison tests with a production model 325is coupe and a 325is coupe that Batzer modified by reinforcing the vehicle’s A-pillars with nested steel tubes akin to those used by BMW in its 1995 3 Series convertibles. *Id.* ¶ 8h. The test he proposed was an “inverted drop test,” which the parties agree is a generally accepted method of evaluating the strength of a vehicle’s roof. In this inverted drop test, the vehicle is lifted off the ground, inverted, and tilted in such a way that the passenger-side A-pillar bore the brunt of the force when the vehicle was dropped. *Id.* ¶ 8j. In the drop test with the production model, Batzer instructed that the vehicle be lifted 12 inches off the ground, that the pitch angle (*i.e.* the tilt forward) be set at 5 degrees, and that the roll angle (*i.e.* the tilt sideways toward the passenger side) at 25 degrees. *Id.* Dr. Batzer did not ask SAFE to place a crash test dummy in the passenger seat of the car, and SAFE did not do so. *Id.* ¶ 8m. With several cameras recording from several angles, the vehicle was dropped onto a plywood plate. *Id.* ¶ 8j.

Dr. Batzer then instructed SAFE to repeat the process, under the same parameters, with a vehicle in which he had reinforced the A-pillars with nested steel tubes. Dr. Batzer originally planned to remove the steel nesting tubes from a 1995 BMW convertible’s A-pillar and attach them in the A-pillar of the coupe. *Id.* ¶ 8k. However, because of the “the way the nesting tubes were incorporated into the A-pillar during manufacture, they could not be removed intact.” *Id.* After consulting with the engineers at SAFE, Dr. Batzer decided to create steel nesting tubes with the same properties and dimensions as those in the convertible and insert them into the A-

pillar of the coupe. *Id.* In Dr. Batzer’s opinion, this design “provided a reasonable approximation of a reinforced production A-pillar” that, if anything, was weaker than an A-pillar that had been originally produced with steel nesting tubes. *Id.*

After both vehicles were dropped, Dr. Batzer compared the amount of roof crush sustained by each vehicle. The production vehicle sustained 10.2 inches of static roof crush at the passenger side A-pillar, while the modified vehicle sustained only 4.4 inches of static roof crush at the same point.⁸ *Id.* ¶¶ 8j–8k. According to Dr. Batzer, these results demonstrated that “if the subject vehicle had reinforced A-pillars there would have been little, if any, roof crush (intrusion) in the subject crash.” *Id.* ¶ 8l.

BMW raises multiple objections to Dr. Batzer’s proffered testimony. As discussed, a *Daubert* inquiry focuses on whether an expert is qualified, whether he or she proceeds from reliable principles and sufficient facts or data, and whether the expert applied accepted methodologies. It is not a tool to challenge the persuasive value of an expert’s conclusions. Nor is it intended to take the place of vigorous cross-examination or intrude on the province of the jury. *See, e.g., Pipitone v. Biomatrix, Inc.*, 288 F.3d 239, 250 (5th Cir. 2002) (“[W]hile

⁸ As Dr. Batzer explained at the *Daubert* hearing, “static” roof crush refers to the residual amount of roof intrusion after the vehicle has reached a solid state. In contrast, “dynamic” roof crush refers to the peak amount of intrusion that occurs during the accident itself. The amount of static and dynamic crush may differ in a given case because the crushed portion of the roof typically “bounces” back toward its original state milliseconds after the peak dynamic intrusion. Batzer likened the effect to a baseball being struck with a bat: for milliseconds, the ball actually changes shape because of the force of the collision, but it soon reverts back to its usual shape. The static change in the baseball is essentially zero but the dynamic change is a measurable, positive amount.

exercising its role as a gate-keeper, a trial court must take care not to transform a *Daubert* hearing into a trial on the merits.”).

The case of *Campbell v. Fawber*, ___ F. Supp. 2d ___, 2013 WL 1330153 (M.D. Pa. Mar. 29, 2013), is remarkably similar to the case at bar. It provides guidance in analyzing the *Daubert* challenges presented here.⁹

Campbell, an 18-year-old front seat passenger, was rendered a quadriplegic in 2004, when the vehicle in which she was riding, a 1996 Jimmy (a sport utility vehicle) was involved in a rollover accident. As in the instant case, the passenger had been wearing her seat belt, and the sport utility vehicle (“SUV”) rolled with the driver-side leading into the roll.

As in this case, the plaintiff in *Campbell* maintained that her catastrophic cervical spine injuries were caused by intrusion of the SUV’s roof into the passenger cabin as the vehicle rolled and a deficient restraint system. She argued that if the roof had been designed with a higher strength-to-weight ratio, she would not have suffered such injuries. *Id.* at *16. Campbell’s experts performed various tests and studies and concluded that the roof was unacceptably weak and that the dynamic roof collapse could have been limited with a feasible, alternative design.

For example, one of plaintiff’s experts, Dr. James Pugh, a biomedical engineer, opined that “it was economical and feasible to design the [SUV] so that dynamic roof collapse could be limited to five to seven inches, which would allow an occupant to resist injury due to a

⁹ At least one expert in *Campbell*, Jeffrey Croteau, is an expert in this case. In this case as in *Campbell*, Mr. Croteau’s opinion relies, in part, on the diving theory of causation, discussed *infra*.

collapsing roof” 2013 WL 1330153, at *11. In addition, he maintained that the seatbelt in the SUV “should have been equipped with a locking latch plate and a rollover sensor that ‘fully locks the seatbelt for the duration of the rollover, by means of a pretensioner. . . .’” *Id.* In his view, the seatbelt “likely unlocked and unspooled throughout the rollover, providing too much slack and failing to keep [Campbell] properly secured.” *Id.*

The defense retained experts with views to the contrary. According to General Motors Corporation (“GMC”), the manufacturer of the SUV, “Campbell’s injuries were caused not by roof collapse, but instead by [her] body colliding with the roof during the roll,” i.e., the “‘diving’ theory of causation” *Id.* at *16.

GMC challenged the admissibility of the proffered expert testimony of plaintiff’s multiple experts, claiming that the expert opinions were inadmissible under Rule 702.¹⁰ It advanced arguments similar to those advanced here by BMW. For example, GMC argued that Campbell’s “experts failed to conduct a roll test of a 1996 Jimmy with their proposed design improvements using instrumented crash-test dummies,” so as “to measure neck load or other indicia of injury. . . .” *Id.* at *15, *17. Rejecting the defense’s arguments, the *Campbell* Court noted that “Rule 702 does not impose such a demanding standard.” *Id.* at *15. The court reasoned, *id.* *16:

Campbell’s experts engaged in significant research and data-driven statistical analysis. Their reports are neither conjecture nor speculation, and rely upon generally accepted methodologies of systems and statistical analysis. To the

¹⁰ GMC advanced its argument in the context of a summary judgment motion.

extent that GM challenges the accuracy of their conclusions, such a challenge simply goes to the weight of the evidence rather than its admissibility.

Campbell raised a *Daubert* challenge of her own, moving to exclude GMC's expert testimony and moving for partial summary judgment on the issue of causation. Campbell challenged GMC's experts' reliance on torso augmentation, also referred to as the "diving theory." This refers to an effect similar to that which causes spinal injuries in individuals who dive into shallow bodies of water, when the head collides with a solid, stationary surface. It is a theory on which BMW relies here.

Campbell characterized the diving theory as one that has been "'debunked.'" *Id.* at *19. Notably, the *Campbell* Court rejected the plaintiff's arguments, with well-stated reasons. It concluded that plaintiff's motion "amounts simply to arguing the weight of the evidence, an issue which is inappropriate for resolution" by way of summary judgment. *Id.* at *16, 19. As the court said, "It is the province of the jury to determine the merits of the parties' competing theories." *Id.* at *17.

Just as in *Campbell*, most of BMW's objections essentially ask the Court to decide merits issues or weigh the persuasiveness of certain evidence. For example, BMW argued at the hearing that Dr. Batzer's proposed testimony is entirely irrelevant because, in BMW's view, Mr. Ruark's injuries occurred before the vehicle's roof intruded into the passenger compartment. In support of this argument, BMW called Mr. Croteau, who opined that Mr. Ruark's injuries resulted from torso augmentation.

According to Mr. Croteau, during the first rollover, the inverted automobile began to fall toward the ground, and Mr. Ruark's head was in contact with the headrail at that time. The downward motion of the vehicle stopped when the roof hit the ground. However, under Mr. Croteau's theory, Mr. Ruark's torso continued to move toward the ground, creating immense pressure on Mr. Ruark's neck. It was this immense pressure, which occurred upon impact, that caused the fracture of Mr. Ruark's cervical spine, according to BMW. *See generally Campbell, supra*, 2013 WL 1330153, at *13 (describing torso augmentation theory in detail in context of a similar accident). Milliseconds later, according to Mr. Croteau, the roof of the subject vehicle caved in. Thus, Mr. Croteau concludes, the alleged defect in the roof of the subject vehicle was not the cause of Mr. Ruark's spinal injuries.

This is the quintessential jury argument. The timing and cause of Mr. Ruark's injury are very much in dispute, and each party has its own theories about the mechanics of the accident and the cause of the resulting injury. BMW's argument is essentially that under its theory of the case, the drop tests do not reveal any pertinent information. The jury need not accept BMW's theory of the case, however. To be sure, the jury may accept BMW's description of the cause of injury and reject Dr. Batzer's testimony about roof crush. But, the possibility that a jury might find an expert's testimony to be unpersuasive does not render that testimony deficient under *Daubert*. Put differently, BMW has not adequately challenged Dr. Batzer's methods or conclusions about the roof strength of the 1995 BMW 325is coupe. Rather, it has questioned whether those conclusions are persuasive evidence that the allegedly defective roof contributed

to Mr. Ruark's injuries. That is a question for the jury. *See Coffey v. Dowley Mfg., Inc.*, 187 F. Supp. 2d 958, 963 (M.D. Tenn. 2002) ("A *Daubert* hearing is not a battle of the experts, but an opportunity for the parties to debate the expertise of a proffered witness."), *aff'd*, 89 F. App'x 927 (6th Cir. 2003).

Similarly flawed is BMW's argument that Dr. Batzer's measurements of static crush at the A-pillar are inadmissible because Mr. Ruark's head was closer to the B-pillar than to the A-pillar. As an initial matter (and as counsel for plaintiff made clear at the *Daubert* hearing), the exact location of Mr. Ruark's head at time of the accident is in dispute. BMW is not entitled to rely on its own disputed version of the facts to discredit plaintiff's expert's testimony.

Moreover, even if the location of Mr. Ruark's head were not in dispute, BMW's argument would be improper at the *Daubert* stage. BMW does not contend that inverted drop tests are inherently flawed or otherwise unreliable, *see* BMW Reply at 18, and it does not claim that plaintiff's experts failed to conduct the inverted drop tests in compliance with accepted procedures for conducting such tests. Instead, BMW argues that Dr. Batzer's data concerning crush at the A-pillar lacks persuasive value because Mr. Ruark's head was not at the A-pillar. Although this argument may win the day at trial, the relevant question under *Daubert* is whether Dr. Batzer reliably collected his data with a proper methodology, not whether the conclusions he drew from the data are correct. *See Daubert*, 590 U.S. at 595 ("The focus, of course, must be solely on principles and methodology, not on the conclusions they generate.").

BMW also argues that the inverted drop tests were invalid because a crash test dummy was not used, and therefore the test did not capture whether the reinforced roof design would have reduced the force exerted on plaintiff's neck. As BMW puts it, the inverted drop tests should be excluded because they "did not serve to evaluate the forces imposed upon the human body during a rollover event." BMW Memo at 33. This argument does not render Dr. Batzer's testimony inadmissible under *Daubert*. *See Campbell, supra*, 2013 WL 1331053.

At the hearing, Dr. Batzer repeatedly stressed that he had no medical opinion about the impact that a stronger roof would have had on Mr. Ruark's injuries. Indeed, at the hearing, plaintiff's counsel indicated that such medical opinions would be provided by a medical expert to whom BMW had not objected. Dr. Batzer's opinion is simply that the roof structure of the vehicle did not have enough strength to withstand the forces of a reasonably foreseeable rollover crash and was not consistent with existing state-of-the art. His failure to measure the reduction in force placed on a dummy's neck in the second drop test does not impact the admissibility of his testimony that a reinforced A-pillar would have reduced the amount of roof crush. *See* Batzer Aff. ¶ 8m ("I was evaluating and analyzing the design and strength of a production vehicle and a modified vehicle with an alternative design. The presence of an instrumented dummy was simply not relevant to what I was doing.").

BMW also contends that Dr. Batzer's tests failed to account for the ways in which the addition of the nested steel tubes to the A-pillar might affect other aspects of the vehicle. However, Dr. Batzer *did* consider how the addition of the steel tubes would affect the vehicle. In

his Affidavit, Batzer explained that the reinforced pillars would have added only 26.8 pounds to the vehicle and would not have affected the vehicle's performance in any way. Batzer Aff. ¶ 8m. Further, he pointed out that BMW's subsequent models had reinforced roofs and did not suffer from performance or safety problems. *Id.* And, Dr. Batzer stated in his report that he had "investigated whether there are collateral risks associated with increasing a vehicle's roof strength. There are none." Batzer Report at 21.¹¹

The only argument put forth by BMW that is properly within the province of *Daubert* is its claim that "[t]here simply is no support for use of the inverted drop testing to extrapolate to the subject accident, for elimination of roof intrusion, and elimination of severe injury." BMW Reply at 21. In other words, BMW argues that the inverted drop tests do not have a "logical nexus" to the issues in the case because the tests bore no resemblance to the dynamic, multiple rollover accident in which Mr. Ruark suffered his injuries.

BMW's argument, although procedurally proper under *Daubert*, is without merit. The record demonstrates that inverted drop tests are a scientifically valid method for analyzing roof performance in rollover crashes, even though they do not replicate the precise circumstances of a rollover crash. Indeed, BMW does "not question that inverted drop testing is an accepted method for conducting analysis of certain aspects of motor vehicle accident damage," BMW

¹¹ To the extent that BMW suggested at the hearing that the video of the inverted drop test should be excluded from evidence because it will be unfairly prejudicial under Rule 403, such an argument is not properly raised in a *Daubert* motion.

Reply at 18, and it is difficult to fathom any real-world scenario *other* than a rollover crash in which the roof strength of a vehicle would be relevant.

In any event, as Dr. Batzer stated in both his affidavit and in a paper he submitted to the 19th International Safety Conference on the Enhanced Safety of Vehicles, “[i]nverted drop testing of vehicles is . . . used by industry, government organizations and independent engineers to determine vehicle safety with respect to rollover collision.” Batzer Aff. ¶ 8i; *see* ECF 120-12. In his report, Dr. Batzer relied on numerous published articles that utilized drop tests to simulate rollover accidents. *See* ECF 120-9 at 45–48. Further, Dr. Batzer testified that he has published numerous peer-reviewed articles discussing the use of inverted drop tests to evaluate vehicle performance in rollover crashes. On a similar note, Dr. Batzer testified at the *Daubert* hearing that BMW itself, in testing its production vehicles, conducts inverted drop tests to simulate rollover accidents. Indeed, BMW’s experts *in this case* conducted inverted drop tests to gather data about the forces that were present on Mr. Ruark’s neck during the rollover crash. *See* BMW Opp. at 32–34. Moreover, several other courts have permitted experts to offer opinions about rollover accidents based on data derived from drop tests. *See, e.g., Whitten v. Michelin Americas Research & Dev. Corp.*, Civ. No. 05-2761, 2008 WL 2943391 (W.D. Tenn. July 25, 2008); *Moody v. Ford Motor Co.*, Civ. No. 03-0784, 2006 WL 3354472 (N.D. Okla. Nov. 16, 2006); *cf. Campbell*, 2013 WL 1330153, at *13 (permitting expert to opine about rollover accident based on data taken from platen test). In light of the foregoing, it appears beyond cavil that inverted

drop testing is a scientifically valid method of simulating the impact of a rollover crash on a vehicle's roof.

In sum, Dr. Batzer engaged in significant research, field testing, and statistical analysis of the BMW 325is coupe. His conclusions about the vehicle's susceptibility to roof crush and about available alternative designs for its A-pillars were not based in conjecture or speculation, but rather were based on scientifically accepted methodologies. To the extent that BMW challenges the accuracy of Batzer's conclusions or their application to Mr. Ruark's injuries, "such a challenge simply goes to the weight of the evidence rather than its admissibility."
Campbell, 2013 WL 1330153, at *13. Accordingly, the BMW Motion will be denied.

Robert Banks, M.D.

BMW retained Dr. Banks to provide an expert opinion on the cause of Mr. Ruark's injuries. Dr. Banks received a bachelor's degree in civil engineering from the Royal Military College in Kingston, Ontario and an M.D. from the University of Toronto. Curriculum Vitae of Robert D. Banks ("Banks C.V.", ECF 126-2).¹² Dr. Banks is also an owner and employee of Biodynamic Research Corporation, a company that provides "consulting services . . . in the area of injury causation analysis or injury analysis, normally or most commonly in the context of litigation." Deposition of Dr. Robert Banks, ("Banks Dep.", ECF 114-1) at 25–26. Over the course of his career, Dr. Banks has "conducted detailed assessment of 1500 to 2000 [motor vehicle accidents] to date, including hundreds of rollover crashes." Affidavit of Robert D. Banks

¹² Plaintiff has not raised a *Daubert* challenge to Dr. Banks's qualifications, except with regard to his expertise in forensic science, as discussed, *infra*.

(“Banks Aff.” ECF 119-2) ¶ 53. However, Dr. Banks testified at the hearing that he has no formal training in forensic science.

As part of his work in this case, Dr. Banks reviewed, *inter alia*, the police report from the accident that caused plaintiff’s injuries, various medical records, the subject vehicle, photographs of the accident scene, other expert reports, and various pleadings and discovery materials in this case. Initial Report of Robert D. Banks (“Banks Report,” ECF 119-3) at 1–2. Dr. Banks also conducted an “exemplar-surrogate test,”¹³ a rollover spit inversion test,¹⁴ and an inverted drop test. Banks Aff. ¶¶ 15–18. From his review of the documents and the results of his tests, Dr. Banks concluded that “Mr. Ruark’s head was in direct contact with right roof rail very shortly after the beginning of the rollover and by the time ground contact was made during the first roll.” *Id.* at 4. As a result of this contact, “axial compressive loads developed in the neck that resulted in the injury” to Mr. Ruark. *Id.* In other words, Dr. Banks agreed with Mr. Croteau’s opinion, discussed *supra*, that Mr. Ruark’s injuries occurred as a result of “torso augmentation” and not because of any defect in the strength of the roof of the subject vehicle.

¹³ According to Dr. Banks, an exemplar-surrogate test is conducted “using a matched vehicle and human surrogate closely matched for stature and weight.” Banks Aff. ¶ 15. Once the surrogate is positioned in the passenger seat, the distance from the surrogate’s head to the roof of the vehicle is measured. Supplemental Report of Robert D. Banks, ECF 119-4 at 2. In other words, an exemplar-surrogate test involves placing a passenger in the seat of the car and measuring the space between his head and the roof of the car.

¹⁴ In a rollover-spit inversion test, a vehicle is placed on a spit so that it can be rotated 360 degrees. A seatbelted surrogate is placed in the passenger seat, and the vehicle is inverted. The distance between the passenger’s head and the roof of the vehicle is then measured.

Plaintiff objects to one of the pieces of information on which Dr. Banks based his conclusion. At the hearing, Dr. Banks explained that, upon examination of the subject vehicle, he observed two notable scuff marks on the passenger-side headrail of the car. While examining the subject vehicle, Dr. Banks also found a hat in the front-seat passenger floor area of the car. In addition, he noted that a pattern or logo on the front of the hat appeared to match the pattern of one scuff mark, and that the button on the top of the hat appeared to match the other scuff mark. Moreover, when he compared the hat to the scuff marks, by holding the hat to the marks, he noted that the pattern on the hat and the button on the top of the hat lined up with the position of the two scuff marks. Dr. Banks did not conduct any trace analysis or other scientific testing on the scuff marks, however. Instead, he simply made the visual observation that the scuff marks appeared to match aspects of the hat. Dr. Banks reported that the scuff marks confirmed his opinion that Mr. Ruark's head was in contact with the headrail at the time of the first rollover.

See Banks Aff. ¶¶ 20–21.

Plaintiff argues that Dr. Banks's opinion about the scuff marks "is not based upon an adequate scientific or technical methodology" and that "the gaps in his reasoning are so significant that his opinion should be excluded." Ruark Memo at 13. In particular, plaintiff contends that Banks failed to conduct actual measurements of the scuff marks, did not conduct any forensic testing or trace analysis to confirm that the hat was responsible for the scuff marks, failed to rule out alternate causes of the scuff marks (*e.g.*, first responders or police officers at the scene of the crash), and that, even if the scuff marks did come from the hat, Dr. Banks could not

rule out the possibility that the scuff marks were made subsequent to the first rollover. *See id.* at 13–15.

In response, BMW contends that the marks in issue merely “serve as an element of confirmation of the otherwise established opinions regarding the location of the plaintiff’s head at the time of injury and nothing more.” BMW Opp., ECF 119, at 2. In its view, measurements and trace analysis were unnecessary because, from the “alignment of marks on the headliner to the actual features of the hat, Dr. Banks was able to conclude that the distance between each of the marks and the distance between the logo and button were both near perfect matches.” BMW Opp. at 6. And, according to BMW, “the unique pattern of the embroidered logo could be identified in the witness mark on the headliner and that was sufficient confirmation of the origin of that mark.” *Id.* at 6–7.

As I see it, BMW’s argument boils down to its belief that the match between the scuff marks and the hat was apparent from simple observation. BMW does not contend that Dr. Banks possessed any particular expertise that would help him in drawing the conclusion that the marks were made by the hat. Rather, it seems to argue that no expertise was needed to reach that conclusion.

As noted, “an expert’s opinion is helpful to the trier of fact, and therefore relevant under Rule 702, only to the extent the expert draws on some special skill, knowledge or experience to formulate that opinion.” *Shreve, supra*, 166 F. Supp. 2d at 392–393 (internal quotation marks omitted). This rule recognizes that expert testimony, simply by being designated as such, may

“assume a posture of mystic infallibility in the eyes of a jury of laymen.” *United States v. Addison*, 498 F.2d 741, 744 (D.C. Cir. 1974). Accordingly, experts are not permitted to express opinions on matters outside of their areas of expertise.

Dr. Banks’s ultimate opinion that the hat was responsible for the scuff marks—which BMW acknowledges is not based on any special skill or knowledge that Dr. Banks possesses—is not admissible under Rule 702 or *Daubert*. Nonetheless, Dr. Banks *may* testify as to when and where he found the hat; when and where he observed the scuff marks; that he lined up the hat with the scuff marks; and that features of the hat appeared to be the same distance apart as the scuff marks. BMW may also offer into evidence photographs of the scuff marks and the hat. But, the jury can form its own opinion about whether the hat was responsible for the marks. However, Dr. Banks may render an opinion, based on his expertise and scientific tests, as to where plaintiff’s head was situated during the rollover sequence.

Conclusion

For the foregoing reasons, BMW’s Motion (ECF 113) will be denied and plaintiff’s Motion (ECF 114) will be granted, in part, and denied, in part. An Order follows.

Date: January 30, 2014

/s/
Ellen Lipton Hollander
United States District Judge