

Crashworthiness

Simple in Theory, Complex in Application

By Keith D. Heinold

The basic concept of “crashworthiness” is relatively simple: A vehicle manufacturer may be held liable for producing a vehicle that does not offer its occupants adequate protection from injury in collisions. This concept has been extended to vehicles other than mass-market passenger cars. *See, e.g., Habecker v. Clark Equipment Co.*, 36 F.3d 278 (3d Cir. 1994) (applying

Pennsylvania law to a case involving forklifts); *Trust Corp. of Montana v. Piper Aircraft Corp.*, 506 F. Supp. 1093 (D. Mont. 1981) (applying Montana law to a case involving an airplane).

This doctrine, as with many facially simple doctrines, becomes difficult to apply to particular facts. Complications arise particularly from the need to assess not only the accident as it happened, but also the accident as the plaintiff alleges it should have happened, *i.e.*, a hypothetical accident. This article identifies and discusses some of those complexities.

Origins: *Larsen* and Enhanced Injury

The crashworthiness doctrine was given its first full articulation in *Larsen v. General Motors Corp.*, 391 F.2d 495 (8th Cir. 1968). *Larsen* involved a head-on collision where the driver alleged that the solid steering shaft exposed him to an

unreasonable risk of injury from the rearward displacement in the event of a head-on collision. The issue before the court was whether the duty of a manufacturer to produce a vehicle reasonably fit for its “intended use” must include the duty to make a vehicle reasonably safe for occupants in an accidental collision.

The Eighth Circuit Court of Appeals found that the intended use of a vehicle must include reasonably protecting occupants from injury in accidents, due to the foreseeability of accidents. *Larsen* is significant in the history of American products liability law because at that time, the predominant view among courts was that no crashworthiness cause of action existed. The intended use of a vehicle did not include collisions. *See, e.g., Evans v. General Motors Corp.*, 359 F.2d 822 (7th Cir. 1966), *cert. denied*, 385 U.S. 836 (1966), “[t]he intended purpose of an automobile

does not include its participation in collisions with other objects, *despite the manufacturer’s ability to foresee the possibility that such collisions may occur.*” *Evans*, 359 F.2d at 825, *quoted in Larsen*, 391 F.2d at 499 (emphasis added). The *Larsen* court’s innovation was in finding that an intended use of a product should encompass such reasonably foreseeable concomitants, even if they are, strictly speaking, unintended.

In expanding the orbit of intended uses of vehicles, the *Larsen* court emphasized the high probability of accidents occurring in the course of normal uses of vehicles. An event may be theoretically foreseeable, but relatively infrequent. However, the court noted that vehicular accidents are not merely foreseeable, but are frequent:

Automobiles are made for use on the roads and highways in transporting persons and cargo to and from various points. This intended use cannot be carried out without encountering in varying degrees the statistically proved hazard of injury-producing impacts of various types. The manufacturer should not be heard to say that it does not intend its product to be involved in any accident when it can easily foresee and when it knows that the probability over the life of its product is high, that it will be involved in some type of injury-producing accident.



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Larsen, 391 F.2d at 501–02 (emphasis added). *Larsen* thus may be said to have rested its definition of intended use of vehicles upon the reality that automobile accidents were a frequent, rather than occasional, occurrence.

However, the *Larsen* court cautioned that liability under the crashworthiness doctrine is not absolute:

We do agree that under the present state of the art an automobile manufacturer is under no duty to design an accident-proof or fool-proof vehicle or even one that floats on water, but such manufacturer is under a duty to use reasonable care in the design of its vehicle to avoid subjecting the user to an unreasonable risk of injury in the event of a collision.

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The manufacturers are not insurers but should be held to a standard of reasonable care in design to provide a reasonably safe vehicle in which to travel.... While advances in highway engineering and non-access, dual highways have considerably increased the safety factor on a miles traveled ratio to accidents, the constant increasing number of vehicles gives impetus to the need of designing and constructing a vehicle that is reasonably safe for the purpose of such travel. At least, the unreasonable risk should be eliminated and reasonable steps in design taken to minimize the injury-producing effect of impacts.

Id. at 502, 503 (citations omitted). In other words, a manufacturer is not required to design the absolutely safest of all possible designs, but only to provide a *reasonably* safe design, consonant with the state of the art.

Accordingly, the *Larsen* court held that although a manufacturer may not be responsible for the initial collision, it may be held liable “for that portion of the damage or injury caused by the defective design *over and above the damage or injury that probably would have occurred* as a result of the impact or collision *absent the defective design.*” 391 F.2d at 503 (emphasis added). In other words, a manufacturer was responsible only for injury that was “enhanced” over and above the injuries that would have been sustained even if the plaintiff’s preferred, allegedly safer design had been implemented. Some of the impli-

cations of *Larsen*’s limitation of crashworthiness liability to “enhanced injury” are discussed in the next section.

The Hypothetical Accident and Proving Enhancement of Injury: the Huddell/Caiazzo and Fox/Mitchell Approaches

Perhaps the most controversial aspect of a crashworthiness claim, and the one this article will address in the most depth, is proof of enhanced injuries. The clear implication of the *Larsen* court’s formulation of the crashworthiness doctrine is that assessment of the vehicle manufacturer’s liability requires the evaluation of a hypothetical accident. The finder of fact must determine what would have happened to the occupant if the plaintiff’s proposed alternative design had been implemented. The difference, if any, between the actual and hypothetical injuries represents the damages for which the manufacturer is liable.

Although the injuries that the occupant sustained may be readily ascertainable, determining how they were caused during the course of the accident typically is a complex task, involving analysis based on physics, mechanical engineering, occupant kinematics, and biomechanics, among other disciplines. The crashworthiness doctrine adds yet another layer of complexity to the analysis because it examines not only what actually happened, but also what would have happened if the plaintiff’s favored design had been implemented.

Given both the central role of proving an enhanced injury in a crashworthiness case and the complications involved in proving causation, fixing the burden of proof with respect to causation of enhanced injury may be critical to the outcome of a case. *Larsen*, however, did not explicitly address what quantum or quality of evidence is necessary to prove the enhanced injury. Two lines of cases have emerged on this issue.

Under the so-called *Huddell/Caiazzo* approach—named after *Huddell v. Levin*, 537 F.2d 726 (3d Cir. 1976), and *Caiazzo v. Volkswagenwerk A.G.*, 647 F.2d 241 (2d Cir. 1981)—the plaintiff has the burden not only of proving that the alleged defect caused his or her enhanced injury, but also of demonstrating a method for quantifying the degree of enhancement:

...the plaintiff must offer proof of what injuries, if any, would have resulted had the alternative, safer design been used.... [And] as a corollary to [this] aspect of proof, *the plaintiff must offer some method of establishing the extent of enhanced injuries attributable to the defective design.*

Huddell, 537 F.2d at 737 (emphasis added).

By contrast, under the *Fox/Mitchell* approach (based on *Fox v. Ford Motor Co.*, 575 F.2d 774 (10th Cir. 1978), and *Mitchell v. Volkswagenwerk, A.G.*, 669 F.2d 1199 (8th Cir. 1982)), “the plaintiffs’ burden of proof should be deemed satisfied against the manufacturer if it is shown that the design defect was a substantial factor in producing damages over and above those which were probably caused as a result of the original impact or collision.” *Mitchell*, 669 F.2d at 1206. If the plaintiff succeeds in meeting this burden of proof, the defendant then bears the burden of proving the amount of enhancement. “If the manufacturer’s negligence is found to be a substantial factor in causing an indivisible injury such as paraplegia, death, etc., then absent a reasonable basis to determine which wrongdoer actually caused the harm, the defendants should be treated as joint and several tortfeasors.” *Id.*

As set forth in the RESTATEMENT (THIRD), the *Fox/Mitchell* approach has become the majority view, although many states’ courts apparently have yet to opine definitively on the issue. See RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY §16 cmt. d (1998) (surveying decisions from 31 states). The rationale for the adoption of *Fox/Mitchell* over *Huddell/Caiazzo* is rooted mainly in public policy preferences, even though the *Huddell/Caiazzo* approach seems more in line with the reasoning of *Larsen*.

In *Huddell v. Levin*, the plaintiff alleged that the defectively designed head rest of a General Motors vehicle was the cause of the occupant’s death, and that the decedent would have survived with a different design. Although the plaintiff had proven that a feasible alternative design was available, she had not shown what injuries would have ensued had the alternative design been used. The Third Circuit reversed a verdict in the plaintiff’s favor. “It

was not established whether the hypothetical victim of the survivable crash would have sustained no injuries, temporary injuries, permanent but insignificant injuries, extensive and permanent injuries, or, possibly, paraplegia or quadriplegia.” *Huddell*, 537 F.2d at 738.

In light of this shortcoming in the evidence, the *Huddell* court emphasized that the vehicle manufacturer’s liability under the crashworthiness doctrine was limited to enhanced injury.

The crashworthy or second collision theory of liability is a relatively new theory, its contours are not wholly mapped, but one thing, at least, is clear: *the automobile manufacturer is liable only for the enhanced injuries attributable to the defective product. This being the essence of the liability, we cannot agree that the burden of proof on that issue can properly be placed on the defendant manufacturer.*

Id. (emphasis added). The Third Circuit’s allocation of the burden of proving enhanced injury to the plaintiff thus flowed from its perception that the proof of enhanced injury is one of the prima facie elements of a crashworthiness claim.

In *Fox v. Ford Motor Co.*, the plaintiffs alleged that the defective design of the rear seat belts, which were lap-only belts, and the backs of the front seats caused the deaths of the two rear-seated passengers, who “jack-knifed” over their lap belts and collided into the backs of the front seats. The Tenth Circuit recognized that the crashworthiness doctrine, as articulated in *Larsen*, limits the vehicle manufacturer’s liability to enhanced injury. Nonetheless, as opposed to the court in *Huddell*, it declined to require the plaintiffs to prove the degree of enhancement on the basis that death could not be characterized as a divisible injury. “This [*Huddell*’s] position, however, fails to recognize that wrongful death is different from [a] cause of action for injuries, which has different elements and a different measure of damages such as pain and suffering.” *Fox*, 575 F.2d at 787.

The *Huddell* court, however, already had anticipated and rejected *Fox*’s distinction between death and other injuries as a reason for easing the plaintiff’s burden of proof:

Plaintiff cannot have the argument both ways. Plaintiff may not argue that the

ultimate fact of death is divisible for purposes of establishing G.M.’s liability and then assert that it is indivisible in order to deny to G.M. the opportunity of limiting damages. Moreover, to consider the corollary of the argument, if the nature of the proceedings precludes dividing the damages flowing from the death, then Levin and S. Klein [the tortfeasors

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who caused the initial accident] may be in a position to contend that they are not liable at all because, by plaintiff’s own proof, Levin’s negligence was survivable. Presumably, no wrongful death claim would lie against one who did not cause death. This argument, of course, boggles the mind. Plaintiff’s brief takes the more reasonable position that “the injury for which recovery was sought . . . would not have occurred but for the individual’s negligence generating the forces necessary for harm to occur.” (Appellee’s Brief, at 24–25). *We simply do not accept the proposition that suing for wrongful death suffices to convert limited, second collision, enhanced injuries liability into plenary liability for the entire consequences of an accident* which the automobile manufacturer played no part in precipitating.

Huddell, 537 F.2d at 739 (emphasis added).

Given the *Huddell* court’s rejection of indivisibility as a basis for shifting the plaintiff’s burden of proof, the *Fox* court’s argument seems cursory, as it largely stopped with the above-quoted statement. See *Fox*, 575 F.2d at 787. The only other indication given for the *Fox* court’s holding was its agreement with the trial judge that placing the burden of apportionment on the plaintiff was “unfair.” *Id.* at 788.

In *Mitchell v. Volkswagenwerk*, a more explicit analysis supported easing the crashworthiness plaintiffs’ burden of proof. The *Mitchell* plaintiff alleged that a design defect allowed him to be ejected from a vehicle during a rollover, resulting in paraplegia. Reiterating *Fox*’s point that plaintiffs should not bear the burden of proving apportionment of an indivisible injury, where paraplegia is considered indivisible, the *Mitchell* court cited a case holding that, notwithstanding the usual rule of apportionment in cases of enhanced injury, “where wrongdoers each play a substantial role in creating an indivisible harm, they are treated as joint and several tortfeasors.” *Mitchell*, 669 F.2d at 1207, citing, at n.9, *Gilson v. Mitchell*, 131 Ga. App. 321, 326–27, 205 S.E.2d 421, 424 (1974), *aff’d*, *Mitchell v. Gilson*, 233 Ga. 453, 211 S.E.2d 744 (1975).

However, the bulk of the justification for easing the plaintiff’s burden of proof seemed to lie, not in a conceptual analysis of causation and joint and several liability, but in a straightforward public policy preference for granting injured plaintiffs relief where proof of causation might be nearly, if not completely, impossible. In *Mitchell*, the Eighth Circuit seemed to reject out of hand the proposition that crashworthiness doctrine requires the evaluation of hypothetical, non-enhanced injuries:

The primary difficulty we have with this analysis [in *Huddell* and *Caiazza*] is that it forces not only the parties but the jury as well to try a hypothetical case. Liability and damage questions are difficult enough within orthodox principles of tort law without extending consideration to a case of a hypothetical victim. More realistically, the parties and juries should direct their attentions to what actually happened rather than what might have happened.

Mitchell, 669 F.2d at 1204. After having characterized the establishment of hypothetical injuries as imposing “an impossible burden of proving a negative fact” the court concluded that:

. . . the rationale of *Huddell*, at least when related to second injury collision cases involving an indivisible injury, will generally result in complete exoneration of the negligent manufacturer. The novel approach of *Huddell* applied singularly

to enhanced injury cases effectively erodes the reasoning which this court enunciated in *Larsen* and contrary to the expressed concern of this court, leaves an injured victim as little more than a traffic statistic.

Id. at 1207–08 (citation omitted).

These rationales of the *Mitchell* court create conceptual difficulties for the crashworthiness doctrine. Despite avowedly adhering to the Eighth Circuit's holding in *Larsen*, in *Mitchell*, 14 years later, the same circuit court explicitly rejected what seemed to be a logical entailment of the *Larsen* holding, namely, that the vehicle manufacturer's liability had to be measured by reference to a hypothetical accident because the manufacturer was to be liable only for injuries enhanced "*over and above the damage or injury that probably would have occurred as a result of the impact or collision absent the defective design.*" *Larsen*, 391 F.2d at 503 (emphasis added).

The *Mitchell* court dealt with this problem by appealing to the concept of indivisible injury. *See* 669 F.2d at 1205, 1207–08. However, given that as noted above, the Third Circuit in *Huddell* had already anticipated this line of argument, the *Mitchell* court had to supplement its citation of the indivisible injury concept with further public policy argument:

Huddell states that if the plaintiff cannot prove the impossible (*e.g.*, apportioning death) he does not go away penniless since the original tortfeasor is still liable for the whole of the harm. Under this reasoning the greater wrongdoer may often escape responsibility. In addition, this ignores the financial responsibility problems the injured victim faces from receiving just compensation for serious injuries from an individual driver as compared to the manufacturer's ability to make recompense for the injury it helped cause.

Mitchell, 669 F.2d at 1208, n.10.

This response assumes two points: the impossibility of proving the hypothetical, non-enhanced injuries, and the lack of countervailing considerations of fairness to defendants. As to the first point, not only does this seem like an assertion of fact without solid basis, it also was addressed and rejected in *Larsen*. Ironically in *Larsen*, it

was the manufacturer defendant who had complained of the near impossibility of apportioning enhanced injury and the hypothetical non-enhanced injury. *See id.* at 503. The *Larsen* court responded that "[t]he obstacles of apportionment are not insurmountable. It is done with regularity in those jurisdictions applying comparative negligence statutes and in other factual situations as condemnation cases. . . ." *Id.* In other words, apportionment might be difficult, but it is not impossible. In *Mitchell*, by contrast, the court seems to elude the distinction between impossibility and difficulty.

As to the second point, in *Caiazzo v. Volkswagenwerk*, the Second Circuit warned that easing the burden of proof for plaintiffs would have the effect of placing liability based not the defectiveness of the vehicle, but merely on the depth of a defendant's pockets:

To require proof merely of the fact of enhancement permits a jury to engage in undue speculation as to the causes of various injuries and gives a jury dangerous latitude in assigning responsibility to the defendant who appears most able to pay a plaintiff's award. . . .

Caiazzo, 647 F.2d at 250–51. Indeed, according to *Caiazzo*, fairness to defendants requires that plaintiffs bear the burden of proving apportionment in crashworthiness cases even where it might seem impossible because the difficulty of proving apportionment may very well be inversely correlated to the liability of the manufacturer.

We realize that a plaintiff's burden of offering evidence of what injuries would have resulted absent the alleged defect will be heavy in some instances and perhaps impossible in others. *Where it is impossible, however, the plaintiff has merely failed to establish his prima facie case, i.e.*, that it is more probable than not that the alleged defect aggravated or enhanced the injuries resulting from the initial collision. Moreover, in those instances in which the plaintiff cannot offer any evidence as to what would have occurred but for the alleged defect, the plaintiff has not established the fact of enhancement at all.

Id. at 251 (emphasis added). Impossibility of apportionment, then, may be simply an indicator that the vehicle is not to blame for the enhancement of injuries. *See gen-*

erally Estate of Bigham v. DaimlerChrysler Corp., 462 F. Supp. 2d 766, 780 (E.D. Ky. 2006) ("although the *prima facie* case for a crashworthiness claim is indeed a significant hurdle to overcome, it is a justifiable hurdle that ensures manufacturers are not held liable for accidents beyond their control without proof that the design utilized was indeed unreasonably dangerous to the consumer.").

Additionally, it is difficult to comprehend how the *Mitchell* court would determine either that the "complete exoneration of the negligent manufacturer" had in fact occurred or that "the greater wrongdoer may often escape responsibility" without proof by plaintiffs on that precise issue. *Mitchell's* policy concern with compensating injured plaintiffs thus necessitates discussion of the hypothetical accident that *Mitchell* nonetheless seems to reject. Indeed, the concept of indivisible injury seems to have diminished as a primary rationale for the *Fox/Mitchell* approach.

Proof of Alternative Design: Design Specifics, Not Generalities

Even before reaching the enhanced injury inquiry, a plaintiff must prove the existence of a reasonable alternative design. *See, e.g., Bigham v. DaimlerChrysler, supra*, 462 F. Supp. 2d at 773 (Kentucky law requires proof of "an alternative, safer design, practical under the circumstances," quoting *Toyota Motor Corp. v. Gregory*, 136 S.W.3d 35, 41 (Ky. 2004); *Kupetz v. Deere & Co.*, 644 A.2d 1213, 1218 (Pa. Super. Ct. 1994) (under Pennsylvania law, a plaintiff proceeding under a crashworthiness theory "must demonstrate 1) that the design of the vehicle was defective and that when the design was made, an alternative, safer design practicable under the circumstances existed. . . ."). *See generally* RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY, §16 cmt. b (surveying cases from various jurisdictions requiring a plaintiff to "establish that a reasonable alternative design could have been adopted. . . .").

The elements of alternative design and enhanced injury are conceptually intertwined, as the evaluation of enhancement should be made by reference to the hypothetical accident in which the plaintiff's putatively safer design would have been implemented. Just as placement of the bur-

den of proving enhanced injury can determine litigation outcomes, so can fixing the level of detail required in specifying an alternative design.

In *Bigham v. DaimlerChrysler*, the federal court in Kentucky provides a clear recent illustration of how lack of specificity in providing an alternative design undermined the plaintiff's case. The plaintiff, administrator of the decedent's estate, alleged that a Jeep Wrangler's roll cage and safety bar, sport bar, seat back, seat-belt tang, and seatbelt anchor points were defectively designed for a multi-roll accident into a rocky ditch. 462 F. Supp. 2d at 776. However, when the plaintiff's experts were asked for specifics on their suggested alternative designs, they could not offer any particular designs and could only reference other possible designs, which they had not tested or examined in any detail. *Id.* at 774–75.

Given this lack of specificity, the *Bigham* court found that the plaintiff had failed to prove a prima facie case with respect to the element of alternative design:

It is well-settled that Plaintiffs are required, by way of expert testimony, to provide proof of an alternative design through "competent evidence" that there was available to Defendant a "practicable, feasible, safer, alternative design" at the time of manufacturing.... It is essential in crashworthiness claims to put forth alternative designs that can be tested and scrutinized because the standard is not whether a different design would have prevented the injury, but instead whether the chosen design was indeed defective, which requires substantiated proof of an alternative design.... Not only have Plaintiffs failed to offer such evidence, but their failure to even formally identify at least one design alternative prevents any form of effective rebuttal by Defendant.

Id. at 776 (citations and quotations omitted).

The *Bigham* court thus explains the cardinal importance of insisting that plaintiffs provide more than general ideas about alternative design concepts without testing or full explanation of how such designs could be practicably implemented. Particularly in jurisdictions where the *Fox/Mitchell* approach has been adopted, as a matter

of basic fairness, plaintiffs must be held to strict standards in providing detailed alternative designs. Otherwise, a manufacturer saddled with the burden of apportioning the enhanced injury will have no way to disprove the efficacy of the plaintiff's design if only a vague idea, rather than a concrete, testable alternative design, is provided.

Another example exists in *Oddi v. Ford Motor Co.*, 234 F.3d 136 (3d Cir. 2000), where the plaintiff sustained injuries when he crashed a bread truck into a guard rail and a bridge abutment. The plaintiff's expert opined that the bread truck's bumper and floor board should have been made more rigid. However, he offered no specific designs that could have been practicably utilized in the bread truck. Although he offered concepts such as reinforced bumpers and thicker ribbed floorboards, the plaintiff's expert simply deferred answering questions about design specifics by referencing machine design books and general references to testing. *Oddi*, 234 F.3d at 149–50.

In light of this lack of specificity and the expert's failure to conduct any testing, the *Oddi* court stated that "[a]lthough it may well be that there is an ideal thickness that would have been able to absorb far greater force than the defendants' design yet still protect the truck's occupant, Noettl [the plaintiff's expert] was not able to identify that point." *Id.* at 157–58. Moreover, the expert's assertions regarding alternative designs that were "based on nothing more than his training and years of experience as an engineer" were insufficient to satisfy the alternative design requirement. *Id.* at 158. Thus, in *Oddi*, the Third Circuit made it clear that a plaintiff in a crashworthiness case must offer specific alternative designs supported by detailed testing rather than mere general "ideas" or design "concepts" based on nothing more than "experience" or intuition.

As the court in *Huddell v. Levin* suggested, plaintiffs should not be permitted to have the argument both ways. Courts should not place on the manufacturer the burden of apportioning the enhanced injury and, at the same time, not require plaintiffs to provide details regarding the design that the plaintiffs claim would have reduced the injuries actually suffered.

Wherever the burden of apportionment is placed, it cannot be satisfied properly without a high level of detail in alternative design specifications. For example, if it is asserted that a surface in the occupant compartment is insufficiently padded, leading to an enhanced injury, it is entirely appropriate to require of the proponent of the alternative design to provide details as to what type of padding should have been used, where it should have been placed, how thick it should have been, and the like. With specific design information, the court can assess whether the alternative design actually would work as alleged, whether it would interfere with the vehicle's utility or give rise to other problems, whether it would pass industry regulations, and a whole host of other considerations. In theory, if the courts permit a crashworthiness cause of action, then they must be prepared to address in the same level of detail what actually occurred and what a plaintiff asserts should have occurred with any proposed alternative design. This can only be accomplished if that alternative design is provided in detail.

The Role of Accident Reconstruction

As the above discussion indicates, expert testimony regarding issues of vehicular design and enhanced injury can be critical to a crashworthiness case. This section will focus on another area of expert testimony that may be overlooked, but is equally critical—accident reconstruction.

Though much of the focus of debates over crashworthiness doctrine is on what would have happened, *i.e.*, the hypothetical accident, determining what *actually* happened in a particular accident sets the stage for all other issues. In a simplified example, the complexion of a crashworthiness case would change markedly where the plaintiff claims that the vehicle frame collapsed excessively upon impact at 35 miles per hour, but the impact actually occurred at 75 miles per hour. In such a case, not only would the claim that the excessive frame collapse constituted a defect come into question—since "excessive" is a relative term, and at such high speeds substantial damage is to be expected—but the plaintiff's alternative design would also be thrown into question, as it may be that the plaintiff's design would not fare any bet-

ter in a 75-mile-per-hour impact. Further, if the plaintiff's design would not have made any difference in the outcome of the accident, there will be no enhancement of injury. The analysis of the various elements of a crashworthiness claim will be similarly affected if there is a dispute as to other aspects of the accident, such as the location or sequence of the impact or impacts.

Even where the parties' arguments over what happened in an accident turn on more subtle differences than those illustrated above, a plaintiff's inability to prove the circumstances of an accident with reasonable specificity through accident reconstruction may prove fatal to a crashworthiness claim. Some federal courts have entered summary judgment for vehicle manufacturer defendants where the expert for a plaintiff making crashworthiness claims had failed, among other things, to calculate the forces involved in the crash.

For example, in *Oddi v. Ford*, *supra*, the court's words are instructive.

...[the plaintiff's expert] did not even attempt to calculate the force that was inflicted on the truck by the guardrail at impact; he did not calculate the force of the bridge abutment on the truck; and he did not measure the strength of the guardrail or determine how much force the guardrail could sustain. He did not know how much was required to bend the bumper or penetrate the floor, or how much force the bumper or floor could withstand.

Oddi, 234 F.3d at 158. Without testing of the plaintiff's expert's alternative design under conditions reasonably approximating the actual accident conditions, "there was no way of knowing if his suggested alternative would better protect the cab's occupant, or if the suggested modifications were practical." *Id.*

Decisions such as *Oddi* suggest that, for the practitioner defending manufacturers in crashworthiness cases, detailed discovery regarding the plaintiff's accident reconstruction can effectively set the stage for favorable disposition. In expert depositions, for example, careful, persistent queries regarding each dimension of the plaintiff's expert's reconstruction of the accident may yield crucial admissions of inability to state what happened in the accident, as they did in *Oddi*. Exacting scrutiny

of expert reports may also reveal ambiguities and inaccuracies that can be attacked in a *Daubert* motion. And, of course, these tactics can be extended to expert testimony regarding other issues such as alternative design and proof of enhanced injury.

The Role of the Original Tortfeasor

Given that vehicular accidents frequently

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With specific design
information, the court
can assess whether the
alternative design actually
would work as alleged.

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involve multiple potential tortfeasors, including drivers other than the injured plaintiff, the question arises as to what the liability of defendants other than the manufacturer—particularly the defendant who caused the accident, *i.e.*, the "original" tortfeasor—should be. The RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY has taken the position that original tortfeasors and manufacturers may be held jointly and severally liable. Section 16(d) states (with emphasis added):

A seller of a defective product that is held liable for part of the harm suffered by the plaintiff under Subsection (b), or all of the harm suffered by the plaintiff under Subsection (c), is *jointly and severally liable or severally liable with other parties who bear legal responsibility for causing the harm, determined by applicable rules of joint and several liability.*

Although this position appears simple enough, Section 16(d) leaves unanswered an important question: for *what* harm are the original tortfeasor and the manufacturer jointly and severally liable—the *entire* harm, *i.e.*, both non-enhanced and enhanced injuries, or only *part* of the harm, *i.e.*, the enhanced injury?

There does not appear to be much well-developed case law to answer this question definitively. Section 16(d), seems to

be in keeping with traditional principles of joint and several liability. On the traditional majority view, a tortfeasor can be held jointly and severally liable not only for the initial, "original" injury that he causes, but also for all subsequent injuries that were foreseeable consequences of the original injury. *See, e.g.*, RESTATEMENT (SECOND) OF TORTS §§457, 460 (1965), which provide examples of the Section 16(d) position in the context of subsequent harm due to medical malpractice (§457) or physical incapacity caused by original tortfeasor (§460). Translated into the terms of crashworthiness doctrine, joint and several liability would define the original tortfeasor's liability as encompassing both the non-enhanced and enhanced injuries.

The cases cited in support of Section 16(d) appear to have been decided in the context of a determination that the injury at issue was indivisible under the *Fox/Mitchell* approach. Indeed, *Mitchell v. Volkswagenwerk*, *supra*, is the first decision cited by the RESTATEMENT (in comment e) in support of Section 16(d). Similarly, two other decisions cited by comment e also found that the injury in question was indivisible. *See General Motors Corp. v. Edwards*, 482 So. 2d 1176 (Ala. 1985), *overruled on other grounds*, *Schwartz v. Volvo North America Corp.*, 554 So. 2d 927 (Ala. 1989); *Oakes v. General Motors Corp.*, 257 Ill. App. 3d 10, 628 N.E.2d 341 (1993). In *McDowell v. Kawasaki Motors Corp. USA*, 799 S.W.2d 854 (Mo. App. 1990), the court treated the injury as effectively indivisible, with both the manufacturer and the original tortfeasor liable for all injuries. *McDowell*, 799 S.W.2d at 858. To the extent that Section 16(d) relies on decisions adopting the *Fox/Mitchell* approach regarding indivisible injury, it appears to envision that an original tortfeasor and a manufacturer are jointly and severally liable for *all* harm, *i.e.*, both the enhanced and the non-enhanced injuries. Thus, Section 16(d) (re)introduces the debate over the burden of proving enhanced injury, limiting its assistance in understanding the complexities of the issue.

By contrast, the *Huddell v. Levin* court stated that "if the theoretical underpinnings for liability in this case are to be given effect, Levin [one of the original tortfeasors] may be held liable for *all* injuries,

but General Motors may only be held liable for ‘enhanced injuries.’” 537 F.2d at 738. Along the same lines, the *Huddell* court also stated that “the brute fact is that the negligent driver would *not* escape liability on the same ground” as the manufacturer against whom the plaintiff failed to prove enhancement of injury. *Id.* at 739.

Huddell’s pronouncement that the original tortfeasor bears liability for both non-enhanced and enhanced injuries makes sense. Logically, the original tortfeasor should not be relieved of liability for any injuries that flow naturally from the original tort. For example, assume an accident where a heavily insured trucking company negligently collides with a passenger vehicle that catches fire and the occupants die. If the plaintiff chose to sue only the trucking company, no court should permit that trucking company to defend itself by claiming that its liability is limited to the minor injuries it asserts would have occurred but for the allegedly defective fuel system of the passenger vehicle. Clearly, if he or she chose to sue only the trucking company, the plaintiff would be entitled to recovery for all injuries, including enhanced injuries, from the trucking company. That should not change simply because the plaintiff also sues or only sues a crashworthiness defendant. Accordingly, as contemplated by *Huddell*, the original tortfeasor’s liability must include the enhanced injury as well as the non-enhanced injury, and the crashworthiness defendant’s liability should involve only the enhanced injury.

However, courts have not always adopted *Huddell*’s viewpoint regarding the liability of the original tortfeasor. In *Carrasquilla v. Mazda Motor Corp.*, 963 F. Supp. 455 (M.D. Pa. 1997), the Pennsylvania federal district court found that the original tortfeasor and the manufacturer were not jointly and severally liable. Rather, each was responsible only for its portion of damages. In *Carras-*

quilla, the manufacturer defendant had joined the original tortfeasor as a third-party defendant. The original tortfeasor moved to strike the third-party complaint on the grounds that he and the manufacturer shared none of the same liability to the plaintiff. As to the crashworthiness claims, the court agreed with the original tortfeasor, finding that the liabilities of the original tortfeasor and the manufacturer were not joint and several, and prohibiting the joinder. 963 F. Supp. at 459.

Carrasquilla was decided under Pennsylvania law. However, the Pennsylvania Supreme Court has recently indicated that its position on original tortfeasor liability may be closer to that of *Huddell*. In *Estate of Harsh v. Petroll*, 584 Pa. 606, 887 A.2d 209 (2005), the court held that the employers of a tractor trailer truck driver who collided into a passenger vehicle could be held jointly and severally liable for the deaths of the passengers where (1) the alleged defect of the vehicle caused the fire that led to the deaths, and (2) the truck driver’s negligence was deemed a substantial factor in causing the deaths.

The *Harsh* court suggested that the original tortfeasor is liable for all injuries following the accident that he or she causes, even while a vehicle manufacturer may be held liable only for enhanced injuries.

While in fashioning a just and coherent crashworthiness jurisprudence it has been necessary to rely on the concept of enhancement to delineate the basis for and extent of a manufacturer’s responsibility to answer in damages for an injury, *see, e.g., Larsen*, 391 F.2d at 503–04, *the interests of justice do not require that the same line of demarcation operate automatically to relieve from liability a negligent tortfeasor whose concurrent conduct also served as a substantial factor in producing the additional harm.*

Harsh, 887 A.2d at 219 (emphasis added).

Indeed, the Supreme Court observed in a footnote that “[t]here is no question, however, that General Motors [the manufacturer] should benefit from such division [between enhanced and non-enhanced injury], since the defect attributed to its product was not a substantial factor in causing the collision. Accordingly, General Motors *would have been entitled to apportionment of any damages specifically associated with the pre-fire injuries, upon request.*” *Id.* at 215, n.12 (emphasis added).

In sum, counsel for crashworthiness defendants should be aware of the complexities involved in assessing the liability of the original tortfeasor. The state of the law is unclear on this point even in jurisdictions where the topic has been broached, leaving room to assert *Huddell*’s expression that the manufacturer’s liability should be restricted to enhanced injury, but the original tortfeasor’s liability must include both non-enhanced and enhanced injuries.

Conclusion

The crashworthiness doctrine, though rife with variation throughout the states and the federal circuits, presents several common conceptual and practical problems stemming from the focus on the hypothetical accident as a metric of manufacturer liability. Where a practitioner has leeway to argue the proper scope of the doctrine, understanding the conceptual roots of crashworthiness may help to frame the debate in a proper perspective, *i.e.*, towards fault-based principles and away from pure loss-spreading or insurance rationales. Even where the doctrine is fairly settled, and especially where claimant-friendly approaches—exemplified by the *Fox/Mitchell* approach—have been adopted, opportunities nevertheless exist to show that the claimant has not proven the necessary elements of a crashworthiness case based on established scientific principles. ■