

NO. 10-0775

In the Supreme Court of Texas

**SUSAN ELAINE BOSTIC, INDIVIDUALLY AND AS PERSONAL
REPRESENTATIVE OF THE HEIRS AND ESTATE OF TIMOTHY SHAWN
BOSTIC, DECEASED; HELEN DONNAHOE; AND KYLE ANTHONY BOSTIC,**
Petitioners,

v.

GEORGIA-PACIFIC CORPORATION,
Respondent

**Petition for Review Arising From the Court of Appeals
For the Fifth Judicial District
Dallas, TX
No. 05-08-01390-CV
(Hon. Robert M. Fillmore)**

PETITIONERS' REPLY BRIEF ON THE MERITS

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REFERENCE CITATION GUIDE

Abbreviations

Susan Elaine Bostic, Helen Donnahoe, & Kyle Bostic (Petitioners)..... Plaintiffs

Georgia-Pacific Corporation..... Georgia-Pacific or Defendant

Record References

Cites to the Reporter’s Record are in the form of ([vol. #] RR [page #]).

Cites to the Clerk’s Record are in the form of ([vol. #] CR [page #]).

Cites to Plaintiffs’ Exhibits are in the form of (PX #).

Cites to Defendants’ Exhibits are in the form of (DX #).

Cites to Petitioners’ Brief on the Merits are in the form of (“PB”).

Cites to Respondent’s Brief on the Merits are in the form of (“RB”)

Cites to the Appendices attached hereto are in the form of (App. [appendix tab]).

ISSUES NOT RAISED BY PLAINTIFFS (RESTATED)

1. Whether the Court of Appeals erred in holding that Timothy Bostic was exposed to Georgia-Pacific asbestos joint compound?
2. This Court in [*Merrell Dow Pharmaceuticals, Inc. v. Havner*, 953 S.W.2d 706 \(Tex. 1997\)](#) and [*Merck v. Garza*, 347 S.W.3d 256, 265 \(Tex. 2011\)](#) held that “when parties attempt to prove general causation using epidemiological evidence, the evidence must demonstrate a statistically significant doubling of the risk.”

Where Plaintiffs have shown, in accordance with *Havner*, epidemiological studies demonstrating that exposure to a toxin used in the Defendant’s products more than doubles the risk of developing disease, does this Court additionally require that the Plaintiffs provide epidemiological studies on the Defendant’s specific products—e.g. a “double layer” of epidemiology?

3. To warrant a new trial based on alleged improper conduct of a judge, bailiff or juror, there must be a showing of injury in the rendition of an improper verdict. See [*Tex. Employers Ins. Assoc. v. Draper*, 658 S.W.2d 202, 209 \(Tex. App.—Houston \[1st Dist.\] 1983, no writ\)](#); [*Redinger v. Living, Inc.*, 689 S.W.2d 415, 418 \(Tex. 1985\)](#); [*Rosell v. Cent. W. Motor States, Inc.*, 89 S.W.3d 643, 660 \(Tex. App.—Dallas, pet. denied\)](#).

Did the trial court abuse its discretion in refusing to grant a new trial, when there was no misconduct by any judge, bailiff or juror, and Georgia-Pacific is not able to show any injury from any alleged misconduct in the form of the rendition of an improper verdict?

4. The Fifth, Ninth, Seventh, and Second Circuits all recognize that when a witness becomes unavailable after direct examination but before cross-examination because of death or invocation of privilege, the proper remedy is to strike the witness’s testimony.

Did the trial court abuse its discretion in striking Harold Bostic’s direct examination testimony, and allowing Plaintiffs and Georgia-Pacific to instead read in his direct and cross-examination from the first trial, for which Georgia-Pacific does not dispute it had an opportunity and similar motive to develop?

I. INTRODUCTION

Plaintiffs requested that this Court grant review of this case, because continued misinterpretation of this Court's holding in [*Borg-Warner Corp. v. Flores*, 232 S.W.3d 765 \(Tex. 2007\)](#) by the Courts of Appeal has both created conflicts in the Courts of Appeal as to how to prove causation in an asbestos case, and has made it scientifically impossible for Plaintiffs to prove asbestos causation. The Court of Appeals' decision in this case adds another level of misinterpretation by requiring Plaintiffs to prove "but for" causation by tracing which asbestos fiber instigated the asbestos cancer, despite the fact that this Court held in *Borg-Warner* that this is neither necessary nor possible. [*Borg-Warner*, 232 S.W.3d at 770](#). Further, the Court of Appeals held that Plaintiffs, in order to prove substantial contributing factor, must recreate the precise dose of asbestos inhaled by the decedent, despite the fact that this Court held that an "approximate dose" would suffice.

In its Response Brief on the Merits ("RB"), Georgia-Pacific does not address the primary issues set forth in Plaintiffs' Brief. Georgia-Pacific has no answer to the fact that this Court expressly held that "but for" causation—*e.g.* tracing an individual defendant's fiber to the source of the asbestos cancer such that one can say without this exposure the cancer would not have occurred—is not required in an asbestos case, and yet, the Court of Appeals required this very proof. Georgia-Pacific also does not respond to the numerous factual errors in the Court of Appeals' evidentiary review, and instead merely parrots the Court of Appeals' recitation of facts in a grossly inaccurate exposure chart. *Contrast* RB at App. G with App. A, attached hereto. Nor does Georgia-Pacific address

the fact that the Court of Appeals failed to recognize that that (i) Timothy Bostic was exposed to highly friable asbestos from joint compound, and (ii) Timothy's disease—mesothelioma—is caused by extremely low levels of exposure to asbestos, which would, as this Court has held, affect the substantial factor causation analysis such that lower levels of asbestos may be required to show causation.¹ [Borg-Warner, 232 S.W.3d at 771-72](#). Georgia-Pacific does not mention the undisputed evidence that children like Timothy Bostic were more susceptible to asbestos, and thus would have required lower doses of exposure to cause disease. 4 RR 149-50; 5 RR 101; 14 RR 29-30. Georgia-Pacific fails to explain the numerous conflicts in the Courts of Appeals that have arisen in interpreting the *Borg-Warner* standard. PB at 32-33. Finally, Georgia-Pacific's scant comment on the Court of Appeals' insurmountable dose requirement is that even if it is "scientifically impossible" to calculate a precise dose, "Plaintiffs are not relieved of their burden of proof under the substantial factor causation standard." RB at 27.

Instead, Georgia-Pacific seeks alternative grounds, not reached by the Court of Appeals, to overturn the judgment. Georgia-Pacific argues that Georgia-Pacific was deprived of a "constitutional right to a fair trial" because a witness, Harold Bostic, became ill in front of the jury in the second trial of this case. Specifically, during the second trial in this case, Georgia-Pacific chose not to cross-examine Harold Bostic at the time of his direct examination, but instead to reserve its cross-examination for Georgia-Pacific's case-in-chief. 9 RR 159. When Harold Bostic became unavailable for cross-examination, the trial court ordered the jury to disregard Harold Bostic's testimony, and

¹ Contrary to Georgia-Pacific's claims, Plaintiffs raised this issue in their Appellate Brief at 27-29, 33, n.18.

allowed Plaintiffs and Georgia-Pacific to read in the direct and cross-examination of Harold Bostic from the first trial, at which time Georgia-Pacific did not dispute its motive and opportunity for cross-examination. 12 RR 12-13. The Fifth Circuit, Ninth Circuit, Seventh Circuit, and Second Circuit uniformly hold that when a witness dies or pleads the Fifth after direct examination but prior to cross-examination, the proper remedy is an instruction to disregard that witness's testimony, which the trial court properly did here. Georgia-Pacific also claims that there was misconduct on the part of the judge, jurors, and bailiff surrounding the illness and subsequent death of Harold Bostic. However, Georgia-Pacific neglects to inform this Court that, after the verdict, the trial court allowed counsel for Georgia-Pacific to interrogate every juror on the record, and each and every juror testified that none of the events surrounding Harold Bostic's illness and death influenced them in any way. 16 RR 121-153. Thus, Georgia-Pacific cannot show that any alleged misconduct caused a juror to vote differently than he otherwise would have, which is required in order to show injury warranting a new trial. [See Rosell v. Central West Motor Stages, Inc.](#), 89 S.W.3d 643, 660 (Tex. App.—Dallas 2002, pet. denied) (injury arises when a juror votes differently than he would otherwise have done on "one or more issues vital to the judgment.").

Georgia-Pacific's attempt to obfuscate the important issues before this Court reveals that Georgia-Pacific has, in essence, no valid response to the Court of Appeals' failure to follow the asbestos causation standards as set forth by this Court in *Borg-Warner*, and the resultant insurmountable bar that the Court of Appeals' decision places on asbestos plaintiffs in Texas. Since 2007, the conflicts in the Courts of Appeals in

interpreting this Court's holding in *Borg-Warner*,² as well as the concerned attention of the Texas legislature,³ have made clarification of the Texas Supreme Court's decision in *Borg-Warner* both necessary and ripe for review. Plaintiffs pray that this Court grant this Petition for Review, clarify the asbestos causation standard, and reverse the decision of the Court of Appeals.⁴

II. ARGUMENT

A. The Court of Appeals erred in holding that *Borg-Warner* requires proof of “but for” causation in an asbestos case.

1. This Court held that Plaintiffs in an asbestos case are *not* required to trace the exposure to an asbestos fiber “without which the injury would not have occurred.”

Asbestos cases, as is the case here, often involve situations in which exposures to asbestos from multiple different sources combine to produce a plaintiff's asbestos injury. See [Borg-Warner, 232 S.W.3d at 772](#) (citing [Rutherford v. Owens-Illinois, 941 P.2d 1203, 1218 \(Cal. 1997\)](#)). This Court acknowledged in *Borg-Warner* that it is not possible to pinpoint which asbestos fiber(s) from each of the individual defendant's products were the ones that created an aberration in an otherwise healthy cell, and thus began the malignancy: “We recognize the proof difficulties accompanying asbestos claims. The long latency period for asbestos-related diseases, coupled with *the inability to trace*

² See PB at 32-33, 49-50.

³ See PB at 2-3.

⁴ Georgia-Pacific states that Plaintiffs have waived the preservation of the issue of the punitive damages claim. RB at 50 n. 47. Plaintiffs did not waive this issue. The Court of Appeals disposed of punitive damages without reaching Georgia-Pacific's claim that there was no evidence of gross negligence, because it said that the “first issue” – causation—negated punitive damages (in other words, in the absence of a negligence finding, one cannot have punitive damages). Plaintiffs have made clear that they are appealing the “first issue,” and thus the Court of Appeals' derivative decision on punitive damages. See Tex. R. App. P. 52.3(f) (“The statement of an issue or point will be treated as covering every subsidiary issue that is fairly included.”).

precisely which fibers caused disease and from whose product they emanated, make this process inexact.” [Id. at 772](#) (emphasis added). Thus, this Court recognized that it is not possible to state that an asbestos cancer would not have occurred without exposure to a defendant’s product (in other words, “but for” a defendant’s product), because it is not scientifically possible to trace the fibers from defendant’s product to the cell that originates the cancer.⁵ Therefore, in asbestos cases, this Court struck a balance between the “needs of our legal system” and the “limits of science”⁶ and held that plaintiffs’ causation burden requires proof of substantial factor causation, but not “but for” causation: “Thus, substantial-factor causation, which separates the speculative from the probable, need not be reduced to mathematical precision. Defendant-specific evidence relating to the approximate dose to which the plaintiff was exposed, coupled with evidence that the dose was a substantial factor in causing the asbestos-related disease, will suffice.” [Borg-Warner, 232 S.W.3d at 773](#).

Nonetheless, despite this careful admonition by this Court against requiring Plaintiffs to “trace precisely which fibers caused the disease,” the Court of Appeals held that Plaintiffs in this case did not meet their causation burden, because Plaintiffs’ expert Dr. Hammar “testified that he could not opine that Timothy would not have developed mesothelioma absent exposure to Georgia-Pacific asbestos joint compound.” [Georgia-Pacific Corp. v. Bostic, 320 S.W.3d 588, 596-7 \(Tex. App.—Dallas, 2010\)](#). In other words, the Court of Appeals required that which this Court stated explicitly is not

⁵ Indeed, Georgia-Pacific’s expert in internal medicine, Dr. Richard Kronenberg, concurred that a scientist cannot isolate any one exposure as the sole cause of a person’s mesothelioma. 11 RR 139; 15 RR 222.

⁶ [Merrell Dow v. Hays, 953 S.W.2d 706, 718 \(Tex. 1997\)](#).

Plaintiffs' burden in an asbestos case: that Plaintiffs must be able to prove which fibers caused the neoplastic process, or, in other words, which fibers were the "but for" causation components.

Georgia-Pacific fails to address this Court's clear holding that a plaintiff does not need to "trace the unknowable path of a given asbestos fiber," and fails to cite to anywhere in this Court's *Borg-Warner* decision where this Court held that in asbestos cases plaintiffs must show "but for" causation.⁷ Georgia-Pacific claims that this Court's reference to Section 431 of the Restatement (Second) of Torts means that this Court intended to hold that asbestos causation proof includes a "but for" requirement. RB at 19. However, this Court's reference to Section 431 of the Restatement (Second) of Torts was to emphasize the importance of proving substantial factor causation, and not to impose a "but for" requirement. PB at 22-23; [Borg-Warner, 232 S.W.3d at 770](#). Further, the case law cited by Georgia-Pacific in support of its argument that "but for" causation is required by this Court in an asbestos case is inapposite, as the cases cited involve facts in which it is possible to isolate independent causal factors as producing an event.⁸

⁷ Georgia-Pacific draws the Court's attention to the jury charge's definition of "proximate cause" in support of its argument that Plaintiffs necessarily were required to prove "but for" causation. RB at 20, n.18. However, Georgia-Pacific strategically omits the fact that the causation standard for Plaintiffs' strict liability claims was "producing cause." CR 1207. The jury charge defines "producing cause" as "an efficient, exciting, or contributing cause that, in a natural sequence, produces the injury. There may be more than one producing cause." CR 1205. Such definition neither encompasses nor suggests a "but for" causation standard.

⁸ See e.g. [Transcon. Ins. Co. v. Crump, 330 S.W.3d 211, 224-25 \(Tex. 2010\)](#) ("but for" a knee injury would the plaintiff have died); [Akin, Gump, Strauss, Hauer & Feld, LLP v. Nat'l Dev. and Research Corp., 299 S.W.3d 106, 122-23 \(Tex. 2009\)](#) ("but for" the attorney's negligence would the plaintiff have had to pay appellate attorney's fees and expenses); [LMB, Ltd. v. Moreno, 201 S.W.3d 686, 688-89 \(Tex. 2006\)](#) ("but for" the conditions at LMB's premises would Mrs. Moreno have been hit by a car); [Marathon Corp. v. Pitzner, 106 S.W.3d 724, 727-730](#) ("but for" Marathon's negligence would the repairman have fallen off the roof). Georgia-Pacific also cites [Tex. Indem. Ins. v. Staggs, 134 S.W.2d 1026, 1030 \(Tex. 1940\)](#), in which this Court held that "but for" causation "should not be read into separate and distinct issues as to different injuries," and thus the plaintiff did not need to show that "but

2. Dr. Hammar did not rely on the “each and every exposure” to conclude that the Georgia-Pacific asbestos exposure was a substantial contributing factor.

Georgia-Pacific, like the Court of Appeals, erroneously insists that Plaintiffs’ experts concluded that Timothy Bostic’s exposure to Georgia-Pacific asbestos joint compound was a substantial contributing factor on the basis that “each and every exposure” contributes to the risk. While it is a scientific truth, as Georgia-Pacific’s experts recognized, that every exposure to asbestos will necessarily contribute to a person’s risk of developing asbestos disease, this was not the methodology used by Dr. Hammar to determine whether Timothy Bostic’s Georgia-Pacific asbestos exposure was a substantial contributing factor.⁹ In fact, Dr. Hammar testified as to a minimum threshold of asbestos exposure necessary to cause mesothelioma (0.1 fibers/cc years), analyzed the frequency, proximity, and duration of Timothy’s exposure to Georgia-Pacific asbestos joint compound, and testified it was so substantial that it was, in and of itself, enough to have caused Timothy’s mesothelioma:

Q. Was Timothy Bostic exposed at high enough levels, to your knowledge, in doing this drywall work, in mixing, sanding, and cleaning up of drywall material sufficient to cause the disease mesothelioma?

A. Yes.¹⁰

11 RR 37, 48-49.

Thus, Dr. Hammar did not rely on the “each and every exposure” theory to conclude that

for” the gas leak at the plant her husband would have died, as opposed to the head injury that he suffered at home earlier in the day.

⁹ See PB at 16-19.

¹⁰ Harold Bostic testified that he used Georgia-Pacific asbestos joint compound with Timothy for 98 percent of the time or more, and that between the time that Timothy was 5 years old, to 15 or 16 years old he used Georgia-Pacific joint compound on a continual basis and “many, many times.” 12 RR 39, 137. See also PB at 37.

Timothy Bostic's exposure to Georgia-Pacific's asbestos joint compound was a substantial contributing factor toward his development of mesothelioma.

B. The Court of Appeals applied the wrong evidentiary standard of review by disregarding all evidence favorable to Plaintiffs and giving weight only to evidence elicited by Georgia-Pacific on cross-examination.

This Court is clear that in the event of a jury verdict, the reviewing court is required to credit evidence favorable to the verdict if the jury could do so, and is required to reject evidence contrary to the verdict unless the jury could not do so. [*City of Keller v. Wilson*, 168 S.W.3d 802, 827 \(Tex. 2005\)](#). The Court of Appeals did not follow the law.

Plaintiffs' Brief meticulously sets forth, based on citations to the record, Timothy Bostic's extensive exposure to Georgia-Pacific asbestos joint compound while working with his father from 1967 to 1977, and the multiple instances where the Court of Appeals either ignores or resolves in favor of Georgia-Pacific evidence showing Timothy Bostic's exposure. *See* PB at 38-40. In response, Georgia-Pacific attaches as an appendix a "summary chart," much of which lacks any record citations, that merely parrots the Court of Appeals' error-ridden analysis by (i) incorrectly limiting Timothy's exposure to the eight jobs Harold recalled by name at trial (when in fact Harold testified that there were many more), and (ii) inaccurately reciting the evidence even as to the those eight jobs. For example, Georgia-Pacific's chart indicates that Harold Bostic only worked on eight drywall projects he was able to identify at trial. However, Harold testified that there was no doubt in his mind that he worked on other jobs, and he was simply having trouble recalling the specific names over thirty years later. 12 RR 115, 136-37. Additionally,

Georgia-Pacific's chart is limited to Harold Bostic's testimony involving drywall work, stating that there could be no exposure to Georgia-Pacific asbestos joint compound at his mother's house. In fact, the evidence shows that joint compound is used for patching in addition to drywall work, which Harold specifically testified that he did on that job. *See* PX-26, 12 RR 117. Further, contrary to Georgia-Pacific's classification of Harold and Timothy's home remodel project as solely a "utility room remodel," Harold actually testified that the sheetrock "cracked solid all over" the house and "they all had to be repaired."¹¹ 12 RR 115, 131; *see also* Chart of Timothy Bostic's Exposure, App. A.

Finally, in [*Jackson v. Anchor Packing Co.*, 994 F.2d 1295, 1308 \(8th Cir. 1993\)](#), cited by Georgia-Pacific, the Eighth Circuit held that while evidence of the use of an asbestos product "many times" satisfies the "frequency, regularity, and proximity" test, the plaintiff did not testify that he used defendant's gaskets "many times." *Id.* In contrast, Harold Bostic testified that for ten years while he while he worked with Timothy, he used Georgia-Pacific asbestos joint compound "many, many times," and that he used Georgia-Pacific asbestos joint compound 98% of the time or more. 12 RR 39, 137. If the Court of Appeals had followed the proper standard of review, and viewed this evidence in a light most favorable to Plaintiffs, it would have concluded that Plaintiffs had satisfied the "frequency, regularity, and proximity" test.¹²

¹¹ Georgia-Pacific's refusal to acknowledge the record evidence is further exemplified by the fact that Georgia-Pacific points to Timothy's later exposures at Knox Glass as the culprit, despite the fact that Georgia-Pacific's own expert Dr. Kronenberg testified that Timothy's exposures at Knox Glass were "on really the extreme low end of exposure for the folks out at the glass plant." Contrast 15 RR 218-19 with RB at 4.

¹² Georgia-Pacific also claims that the Court of Appeals erred because there is "no evidence that Timothy Bostic was ever exposed to Georgia-Pacific asbestos-containing joint compound." RB at 34. This claim is wholly without merit. Georgia-Pacific sold bags of asbestos Triple-Duty dry joint compound, and one and five-gallon containers of

C. The Court of Appeals erred in holding that Plaintiffs are required to prove the precise dose of asbestos inhaled by Timothy Bostic to satisfy the substantial factor standard.

This Court held that substantial factor causation “need not be reduced to mathematical precision.” [Borg-Warner, 232 S.W.3d at 773](#). In accord with this requirement, Plaintiffs offered testimony from an expert in asbestos products and their potential to release airborne asbestos fibers, Dr. William Longo,¹³ based on studies Dr. Longo performed that recreated, in a controlled environment, the same tasks performed by and around Timothy Bostic with Georgia-Pacific asbestos products. PB at 9-11, 46-47. The Court of Appeals held that this evidence would not suffice;¹⁴ instead, the Court of Appeals erroneously held that Plaintiffs were required to recreate Timothy’s exact dose,¹⁵ despite the fact Plaintiffs cannot recreate Timothy Bostic’s environmental conditions of exposure, as it is not only impossible to go back in time, but also illegal to

asbestos pre-mixed Ready-Mix joint compound from 1965 to 1977. 8 RR 158-59, 176; see also PB at 5-6. Georgia-Pacific did not make an asbestos-free Ready-Mix joint compound until after 1977. PX-20. Harold and Timothy Bostic used Georgia-Pacific asbestos Ready-Mix joint compound through 1977. 12 RR 25-27, 34-37.

¹³ Georgia-Pacific, for the first time, questions the reliability of Dr. Longo’s studies because he is not an industrial hygienist. See R.B. at 28. However, because Respondent did not previously object to Dr. Longo’s qualifications as a material scientist, neither in the trial court nor to the appellate court, Respondent has waived such objection. Tex. R. App. P. 33.1. Moreover, Dr. Longo’s area of expertise is the measurement of asbestos fibers released from asbestos products. PB at 9-11, 46-47. If the witness has acquired a specialized knowledge that will help the trier of fact examine the evidence, the witness may testify based on that knowledge; it is not necessary that the witness have a particular license in the field of study. [Southland Lloyd’s Ins. Co. v. Tomberlain, 919 S.W.2d 822, 828 \(Tex. App.—Texarkana 1996, no writ\)](#); see, e.g., [Ponder v. Texarkana Memorial Hosp., Inc. 840 S.W.2d 476, 477-478 \(Tex. App.—Houston \[14th Dist.\] 1991, den.\)](#); [Petrolia Ins. Co. v. Everett, 719 S.W.2d 639, 641 \(Tex. App.—El Paso 1986, no writ\)](#).

¹⁴ Georgia-Pacific incorrectly asserts that the Court of Appeals decision in *Smith* regarding the sufficiency of Dr. Longo’s dose testimony does not conflict with the Court of Appeals decision in this case. RB at 29. Georgia-Pacific argues that in *Smith*, the Court was able to combine Dr. Longo’s testimony with the plaintiff’s testimony about how often he was exposed and the size of the rooms in which he worked, and there is no such exposure evidence in this case. However, here, just as in *Smith*, the Court of Appeals had similar testimony that it could have “combined” with Dr. Longo’s testimony if it felt his testimony was insufficient. See 7 RR 178; 12 RR 22-23; 33-36; 39; 136.

¹⁵ [Bostic, 320 S.W.3d at 601](#).

use asbestos products outside of strictly controlled situations, and certainly not outside nor in a home.

Citing to this Court's decision in *Havner*, Georgia-Pacific claims that such "scientific difficulties" must nonetheless be trumped by a rigid adherence to a perceived need for a precise dose. *See* RB at 27. Such indiscriminate adherence to legal principles over scientific reality has never been adopted by this Court. On the contrary, this Court in *Havner* emphasized that a proper balance must be struck between the "needs of our legal system" and the "limits of science." [*Havner*, 953 S.W.3d at 718](#).

In fact, the Federal Reference Manual on Scientific Evidence condones the very type of exposure assessments performed by Dr. Longo in order to derive Timothy Bostic's approximate dose upon exposure to Georgia-Pacific asbestos joint compound. Specifically, the Federal Reference Manual states that dose estimates based on recreated laboratory models, like those performed by Dr. Longo, are the "only method available for estimating exposure," when, for example, the operations to be measured have, as here, "ceased to operate." *See* Rodricks, *Reference Guide on Exposure Science*, in FEDERAL REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 505, 531 (3d ed. 2011). (App. D).

Response to Issues Not Raised By the Plaintiffs.

A. *Havner, Merck, and Borg-Warner do not require product specific epidemiological studies.*

Georgia-Pacific next asserts that in order to prove substantial contributing factor in an asbestos case, Plaintiffs must provide not only epidemiological studies showing that the toxin in the defendant's product more than doubles the plaintiff's risk of developing

disease in compliance with *Havner*, but additionally, that Plaintiff must provide epidemiological studies to show that defendant's individual product type more than doubled the risk of harm. RB at 30-34. Such a proposition is a logical absurdity, and, not surprisingly, Georgia-Pacific is unable to cite to any case from this Court where this "double layer" of epidemiological studies is required. If Georgia-Pacific's argument is correct, then a manufacturer could produce a new asbestos product today without fear of liability in the courts, because the manufacturer could argue, as does Georgia-Pacific, that it is not enough to show that asbestos exposure more than doubles the risk of asbestos-disease; one must wait and perform epidemiological studies on the manufacturer's new product in order to ascribe causation.

Moreover, there is ample evidence in this record, which Georgia-Pacific fails to mention to this Court, that the chrysotile asbestos in Georgia-Pacific's asbestos joint compound more than doubles a person's risk of developing mesothelioma.¹⁶ Dr. Richard Lemen, an epidemiologist, is the former Assistant Surgeon General of the United States and the former Deputy Director of the National Institute for Occupational Safety and Health ("NIOSH").¹⁷ Dr. Lemen testified that the World Health Organization, the International Program for Chemical Safety, OSHA, NIOSH, the Environmental Protection Agency, the Public Health Service, the Center for Disease Control have all concluded that chrysotile asbestos causes mesothelioma. 5 RR 99. In concluding that

¹⁶ The studies that Georgia-Pacific criticizes as insufficient epidemiological studies [RB at 31-33] were different studies than the ones set forth above, and were offered by Plaintiffs to show the extraordinary levels of exposure to asbestos experienced by joint compound workers. See PB at note 15 and text accompanying.

¹⁷ Dr. Lemen's credentials are extensive; they are set forth on the record at 5 RR 10-31.

chrysotile asbestos causes mesothelioma, and in accord with *Havner* and *Merck*, Dr. Lemen relied upon epidemiological evidence showing more than a doubling of the risk in developing mesothelioma as a result of exposure to chrysotile asbestos.¹⁸ Georgia-Pacific's expert in pulmonology, Dr. Alan Feingold, agreed that chrysotile asbestos causes mesothelioma. 13 RR 173. Dr. Feingold testified that he is not aware of one scientific or regulatory body that is of the opinion that chrysotile cannot cause mesothelioma. 13 RR 203, 225.

Finally, while product-specific epidemiological studies are not required by *Borg-Warner*, the Consumer Products Safety Commission ("CPSC") banned asbestos-joint compound in 1977 based on risk-analysis models and epidemiological studies showing that use of asbestos joint compound for four days per year is an "unacceptable risk." 5 RR 145; 6 RR 11; PX-26. According to the CPSC calculations, the increased risk of death induced by use of asbestos joint compound for only six hours a day, four times in one year is between 10 and 2,000 per million. *See id.* Given that the expected mesothelioma rate is one case per million persons, that is an increased risk of ten to 2,000 times over the expected rate. 11 RR 37.

¹⁸ See Lemen, "Chrysotile Asbestos as a Cause of Mesothelioma: Application of the Hill Causation Model," *Int. J. Occup. Environ. Health*, 10:233-239 (2004); Pialotto et al, "An Update of cancer mortality among chrysotile asbestos worker in Balangero, Northern Italy," *Br. J. Ind. Med.*, 47:810-4 (1980) (showing ten times increased risk of developing mesothelioma after exposure to chrysotile asbestos); Cullen, M. et al, "Chrysotile asbestos and health in Zimbabwe: I. Analysis of miners and millers compensated for asbestos-related disease since independence," *Am. J. Ind. Med.*, 19:161-9 (1991) (showing a five-fold increase in risk in developing mesothelioma from exposure to chrysotile asbestos); Camus, et al, "Nonoccupational exposure to mesothelioma and the risk of cancer," *N. Engl. J. Med.*, 338:1565071 (1998) (showing a seven-fold increase in risk of mesothelioma for women with bystander exposure to chrysotile asbestos miners). 5 RR 112-127.

B. The trial court did not abuse its discretion in refusing to grant Georgia-Pacific a new trial, because there was no injury to Georgia-Pacific as a result of Harold Bostic's death.

Every complaint that Georgia-Pacific makes with respect to the “prejudice” it suffered in this trial is as a result of the illness and subsequent death of one witness, Harold Bostic, during the second trial of this case. It is well-established, however, that dramatic illness or even the death of a witness or a party to a case does not in and of itself rise to the level of prejudice necessitating a mistrial.¹⁹ Georgia-Pacific cites no authority or evidence to support its position that it does, and instead, simply attacks the cases that were cited by Plaintiffs in their appellate brief in support of the basic legal tenet that illness or death of a witness does not necessitate a new trial. R.B. at 37, n.24. Georgia-Pacific argues that Plaintiffs’ reliance on such cases was in error because most of the cases did not involve a party’s death but, rather, the vast majority of the cases “involved far less emotionally prejudicial events like witnesses fainting or crying out.” *Id.* However, Georgia-Pacific never explains how the event at issue—the jurors seeing Harold Bostic “kind of semi [sit] down” in the hallway after appearing to get “light-headed”—was far more “emotionally prejudicial” than the cases cited by the Plaintiffs.²⁰ Compare Georgia-Pacific’s chart of the Mistrial Cases, R.B. at App. H, with Plaintiffs’ Chart of Death/Injury Cases, attached hereto at App. B.

¹⁹ See Death/Injury Chart, at App. B.

²⁰ See [Tex. Employers Ins. Ass’n v. Schaffer](#), 161 S.W.2d 328 (Tex. Civ. App.—Amarillo 1942, writ ref’d w.o.m.) (plaintiff suffered a vicious seizure on the witness stand in front of the jury); see also [McGloin v. Metro. St. Ry. Co.](#), 75 N.Y.S. 593 (N.Y.A.D. 1902) (plaintiff became prostrate in front of the jury for a period of twenty minutes and was attended to by a physician in front of the jury).

Moreover, Georgia-Pacific neglects to inform this Court that, upon questioning from counsel for Georgia-Pacific after the verdict was rendered, each of the jurors testified that Harold Bostic's illness and absence from trial *had no influence on their verdict*. 16 RR 121-51. Because to show probable injury there must be some indication that the alleged misconduct likely caused a juror to vote differently than he otherwise would have on one or more issues vital to the judgment, Georgia-Pacific's claim that there was misconduct causing error must fail. See [Redinger, 689 S.W.2d at 419](#).

1. The trial court did not err in refusing to grant a new trial.
 - a. *Judge Montgomery never suggested to the jury her opinion on a matter that the jury must decide.*

Georgia-Pacific states that Judge Montgomery's remarks to the jury were "in violation of the rule commenting on the weight of the testimony," and were "reversible error." RB at 39. To constitute error, a trial court's comment on the weight of the evidence must be direct; it must suggest to the jury the trial court's opinion concerning a matter upon which the jury must decide. [Barham v. Turner Construction Co., 803 S.W.2d 731, 737 \(Tex. App.—Dallas 1990, writ denied\)](#); [Charter Builders v. Durham, 683 S.W.2d 487, 491 \(Tex. App.—Dallas 1984, writ ref'd n.r.e.\)](#). Reversal of a judgment should not be ordered unless there is a showing of impropriety, coupled with probable prejudice, and the rendition of an improper verdict. [Texas Employers Ins. Assoc. v. Draper, 658 S.W.2d 202, 209 \(Tex. App.—Houston \[1st Dist.\] 1983, no writ\)](#).

Georgia-Pacific complains of the only two comments that Judge Montgomery made to the jury with respect to Harold Bostic's illness, neither of which are a comment

on the weight of the evidence.²¹ First, after Harold Bostic fell in the hallway in the presence of three of six the jurors, Judge Montgomery stated: “I talked to the EMT, and Mr. Bostic’s vital signs are fine. And I’m hoping this is just a matter of -- you all know he’s on medication and light-headed from the stress of the testimony. And so hopefully we’ll get a report to you on Tuesday morning. And I’ll see you -- remember your instructions. I’ll see you back here Tuesday morning.”²² 9 RR 161.

Next, Judge Montgomery told the jurors to disregard Harold Bostic’s testimony:

Harold Bostic gave testimony in this case but is not available to be cross-examined by the Defendant. So because Mr. Bostic’s testimony was not subject to cross-examination, it cannot be considered as evidence in this case and you must disregard it I am instructing you to disregard the previous testimony you heard from Harold Bostic. If you recall, you have a right to cross-examine, and in this case, Mr. Bostic’s not going to be available for cross-examination. So you’ve got to totally disregard what he stated previously. We’re starting over. 12 RR 12-13.

Neither of these comments were error, because neither expressed the trial court’s opinion concerning a matter upon which the jury must decide.²³ In the first instance, the trial court acted to allay the jurors’ concerns after witnessing Harold Bostic fall in the

²¹ Georgia-Pacific states that Judge Montgomery should have provided a curative instruction, but Georgia-Pacific refused to provide her with any suggested curative instruction at the time of trial. 10 RR 26.

²² Georgia-Pacific states Judge Montgomery informed the jury that the “cause” of Harold Bostic’s “sudden collapse” was “the lawsuit against Georgia-Pacific.” R.B. at 38. Contrary to this dramatic rendition of the facts, Mr. Bostic did not “suddenly collapse.” Rather, Judge Montgomery stated, immediately after witnessing the event, that Harold Bostic “didn’t pass out” but “kind of semi [sat] down” after appearing to get “light-headed.” 9 RR 165, 171. Judge Montgomery had Harold Bostic lie down on a bench, and instructed Juror Jackson, an emergency medical technician, to rearrange his legs and retrieve something elevate his feet. 9 RR 166. The jurors were moved to the jury room before an ambulance was summoned. 9 RR 169.

²³ The cases cited by Georgia-Pacific are entirely inapposite, because they involve situations in which the trial court directly commented on key evidentiary issues to be decided by the jury. See [Murray v. Morris, 17 S.W.2d 110, 112 \(Tex. Civ. App.—Amarillo 1928, writ dism’d w.o.j.\)](#) (trial court commented on the credibility of a witness by testifying as to the market value of the land at issue); [Hargrove v. Fort Worth Elevator Co., 276 S.W.426, 428 \(Tex. Comm’n App. 1925, holding approved\)](#) (trial court attempted to discredit the testimony of a key witness as to the source of an environmental nuisance in an environmental nuisance case); [Am. Express Co. v. Chandler, 231 S.W. 1085 \(Tex. Comm’n App. 1921, holding approved\)](#) (trial court chastised defendant for requesting time to put their key medical witness on the stand, which the trial court himself admitted was error).

hall. In the second instance, the trial court properly instructed the jury to disregard Harold Bostic's live testimony, because Georgia-Pacific did not cross-examine him at that time. The jury was not asked to award any damages to Harold Bostic, so nothing in the court's comments could be construed as commenting on the weight of the evidence. Further, Georgia-Pacific provides no evidence that either comment led to an improper verdict. Indeed, every juror testified that these events had no influence whatsoever on their verdict. 16 RR 121-51.

b. The trial court did not abuse her discretion in ruling on Georgia-Pacific's motion for mistrial.

Georgia-Pacific claims that it was error for the trial court to refuse to rule on Georgia-Pacific's motion for mistrial arising from Harold Bostic's death until after the jury returned its verdict. RB at 44. Georgia-Pacific made the same complaint in a Petition for Writ of Mandamus to the Court of Appeals during the trial of this case, and the Court of Appeals denied Georgia-Pacific's petition that the trial court failed to act within a reasonable amount of time. *See In re Georgia-Pacific Corp.*, No. 05-06-00758-CV, 2006 Tex. App. LEXIS 5459, at *1 (Tex. App.—Dallas June 28, 2006, orig. proceeding) (mem. opp), attached hereto at App. C.

Georgia-Pacific also complains that the trial "was not conducted fairly," based upon the manner in which Judge Montgomery informed counsel that Courtney Jackson, the juror who was excused because he rendered aide to Harold Bostic, had asked the Bailiff why Plaintiffs' counsel was wearing black. RB at 48-49. The heart of Georgia-Pacific's complaint is that the court reporter claimed that the trial court learned about the

juror's clothing question on Monday, June 5, 2006, and did not inform counsel for Georgia-Pacific and Plaintiffs' counsel until Wednesday, June 7, 2006. The trial court disputed this, stating that "[W]hen I found out about it, I told you. And that's why I let you question [the Bailiff]." 16 RR 164-65.

Based solely on the testimony of Judge Montgomery's court reporter, who had engaged in *ex parte* conversations during the trial with counsel for Georgia-Pacific, Georgia-Pacific makes the serious allegations that Judge Montgomery was "untruthful," and that she fired her court reporter because the court reporter "disputed the completeness and accuracy of her statements." 17 RR 26; RB at 50. Georgia-Pacific's attack on the judiciary based on the court reporter's self-interested and one-sided evidence is a baseless attack on Judge Montgomery and an affront to our judicial system. Moreover, Georgia-Pacific offers no evidence that the dispute as to the timing over the trial court's disclosure of the juror clothing question in any way affected the result of the verdict or prejudiced Georgia-Pacific. Thus, there simply is no injury warranting a mistrial.

2. There was no jury misconduct warranting a new trial.

To warrant a new trial for jury misconduct, the movant must establish that (i) misconduct occurred; (ii) it was material; and (iii) probably caused injury. [*Golden Eagle Archery v. Jackson*, 24 S.W.3d 362, 372 \(Tex. 2000\)](#). Misconduct is material when it is reasonably calculated to prejudice the rights of the complaining party. *See* [*Sharpless v. Sim*, 209 S.W.3d 825, 829 \(Tex. App.—Dallas 2007, pet. denied\)](#). To show probable injury, there must be some indication in the record that the alleged misconduct most likely caused a juror to vote differently than he otherwise would have done on one

or more issues vital to the judgment. [Redinger, 689 S.W.2d at 419](#). Whether misconduct occurred is a question of fact for the trial court. *Id.* If there is conflicting evidence on the finding of jury misconduct, the trial court's finding must be upheld on appeal. [Pharo v. Chambers County, Texas, 922 S.W.2d 945, 948 \(Tex. 1996\)](#).

Georgia-Pacific erroneously states testimony from jurors regarding the effect of any outside influence on their decision is impermissible under Texas law. RB at 45. While a juror may not testify about any alleged misconduct involving a matter or statement raised during deliberations, a juror “may testify as to whether any outside influence was improperly brought to bear upon any juror.”²⁴ Tex. R. Civ. P. 327b; see [Sharpless, 209 S.W.3d at 828](#) (allowing testimony from juror that outside internet research “had no effect on her deliberations or her vote, and she did not communicate the information to the other jurors,” to determine whether the movant suffered injury).

The juror “misconduct” complained of by Georgia-Pacific is that Juror Jackson “contacted [a] co-worker at the hospital and learned that Mr. Bostic died after his collapse . . . [and] then informed other jurors that Mr. Bostic had died.” RB at 43. First, the trial court dismissed Mr. Jackson from the jury prior to deliberations. 15 RR 243. Second, Mr. Jackson only told one of the jurors, Ms. Woitas, that Mr. Bostic had passed away. 16 RR 130. Ms. Woitas did not repeat this information to any other juror. 16 RR

²⁴ This Court differentiates between misconduct that allegedly occurs during deliberations, versus juror misconduct that occurs outside of deliberations. Thus, while testimony may not be heard about any outside influence arising during deliberations, such as for example the juror in *Golden Eagle* who brought up evidence of a prior settlement of the plaintiff, testimony is “still permitted on the issues of juror misconduct, communications to the jury, and erroneous answers on voir dire, provided such testimony does not require delving into deliberations.” [Golden Eagle, 24 S.W.2d at 372](#).

132. Moreover, even in response to leading questions from counsel for Georgia-Pacific, Ms. Woitas testified that this information had no effect on her decision in this case:

Q. And as you saw the family since this point, has that been something you've thought about? I guess it's hard to divorce your--your feelings from what you observed, knowing what Mr. Jackson told you. Is that fair?

A. I understand what you're saying, but I think I did. I didn't -- I didn't hold that -- I don't know how to say it. Even though I knew he passed away, I don't think that had any [effect] on my decision, what we came up with. 16 RR 131-32.

Additionally, Courtney Jackson told Juror Jones that Mr. Bostic "may have had a stroke," and told Juror Barbosa that Mr. Bostic was in intensive care. 16 RR 123; 138. Both jurors testified that they completely erased this information from their minds immediately upon hearing it. Juror Jones stated: "You know, that information wasn't really relevant to anything. So as such, it came in one ear and it left." 16 RR 127. Juror Barbosa testified that the day that she heard this information, "When I left here, I completely forgot about it."²⁵ 16 RR 140. Indeed, every juror testified that the fact that Mr. Bostic became ill outside the courtroom had no bearing on their decision in this case. 16 RR 121-151.

Applying the law to these facts, Georgia-Pacific cannot meet its burden to show misconduct, materiality, or injury. First, it is impossible to contemplate a circumstance under which the update on the health status of a witness rises to the level of being misconduct; it is not material information with respect to a fact to be decided by the jury (especially, where, as here, Harold Bostic was not on the verdict form), nor does it

²⁵ Juror Jackson did not communicate any further information to Jurors Mosely, Berryman, and Brown. 16 RR 142-151.

represent an attempt to discuss the issues presented by case. Second, it is not “material,” because updating a health status cannot be construed as reasonably calculated to prejudice the rights of Georgia-Pacific. [Sharpless, 209 S.W.3d at 829](#). Third, Georgia-Pacific makes no showing whatsoever that anything about this information caused any juror to vote differently on an issue; thus, Georgia-Pacific does not meet its requisite burden to show injury. In fact, the evidence from the jurors demonstrates the opposite; each juror testified that this information simply had no relevance to their deliberations.

Finally, Georgia-Pacific makes the incredible statement that the damages evidence presented in the second trial was “less compelling,” suggesting that the jury’s verdict of \$7,554,907 in compensatory damages was not supported by the evidence. The damages evidence in this case was devastating and extraordinary.²⁶ Georgia-Pacific’s claim that a man who dies from asbestos cancer at the age of 41, leaving behind a wife and teenage son, is less than “compelling,” defies credulity.

3. There was no bailiff misconduct warranting a new trial.

To warrant a new trial for bailiff misconduct, Georgia-Pacific must prove that (i) there was misconduct; (ii) it was material; and (iii) it caused injury. [Rosell v. Central](#)

²⁶ Because of his exposure to asbestos, Timothy Bostic died from asbestos cancer at age forty-one, leaving behind a wife, a teenage son, and his mother and father. Two separate juries assessed the Bostic family damages and awarded \$9 million (100% liability apportioned to Georgia-Pacific and \$6.2 million in punitives) and \$13 million (75% liability apportioned to Georgia-Pacific and \$6 million in punitives), respectively. Timothy’s physical and mental anguish were extreme. Timothy described the surgery he endured: “[The doctor] went in and made about a 14-inch incision in my back, removed one of my ribs; removed my lung, my right lung; removed my right-side abdomen and replaced it with Gortex; removed my heart and scraped the outside lining off my heart and replaced it with some kind of biodegradable lining . . . and sewed me back up.” 7 RR 194. Because mesothelioma involves a process of slow suffocation, there were many times that Timothy simply could not breathe. His mother testified: “[A]ll you had to do would be to look at him and tell the pain that was on his face. And he could not breathe.” 7 RR 158. Timothy’s mother testified that it was only her faith that sustained her: “I do not know how anyone could get through the death of a child, and he wasn’t a child exactly, but he was my child. He wasn’t a baby, but he was my baby. I can’t imagine how anybody could get through such a thing if they did not have the hope that lies within my faith.” 7 RR 163.

[West Motor Stages, Inc.](#), 89 S.W.3d 643, 660 (Tex. App.—Dallas 2002, pet. denied)

(holding that statement by bailiff to jury that it must deliberate another day was neutral and therefore not misconduct). To show probable injury, there must be some indication that the alleged misconduct most likely caused a juror to vote differently than he would otherwise have done on “one or more issues vital to the judgment.” *Id.* at 660. Here, as set forth above, when asked why Plaintiffs’ counsel was wearing black, the Bailiff told Juror Jackson, who was later excused from jury service: “I told . . . him that maybe she liked black. And he asked me -- he says what about, you know, Mr. Bostic? Anything wrong? I said, nothing that I know of. I can’t tell you that. I told you earlier that I would let y’all know how he was doing after the trial was over with.” 16 RR 158-59. First, as this statement is entirely neutral, it is not misconduct. [Rosell](#), 89 S.W.3d at 661. Second, Georgia-Pacific presents no evidence that the Bailiff’s statement that “nothing” was wrong caused a juror to vote differently than he would have otherwise done “on one or more issues vital to the judgment.”

With respect to the timing of the disclosure of this statement to counsel for Plaintiff and Georgia-Pacific, Georgia-Pacific does not demonstrate any alleged delay in giving notice to Georgia-Pacific resulting in an injury to Georgia-Pacific, namely that any juror voted differently because of the “delay.”²⁷

²⁷ The cases cited by Georgia-Pacific are not applicable to these facts, because they involve statements or conduct by a bailiff concerning issues to be decided by the jurors. [See Pharo](#), 922 S.W.2d at 950 (holding that bailiff’s comment about raising taxes in a suit against the County was improper, but did not result in probable injury to the plaintiffs); [Logan v. Grady](#), 482 S.W.2d 313, 321-22 (Tex. App.—Ft. Worth 1972, no writ) (holding that bailiff’s refusal to allow the jury to request the court to hear the testimony of a witness was prejudicial error).

- C. **Georgia-Pacific was not denied its right to cross-examine Harold Bostic, because the trial court properly struck Harold Bostic’s testimony, and entered into evidence the cross-examination from the first trial pursuant to Texas Rule of Evidence 804(b)(1).**

Mistrial is a “drastic” remedy that imposes a significant burden on the parties and the Court. [Texas Cities Gas Co. v. Ellis, 63 S.W.2d 717, 722 \(Tex. Civ. App.—Waco 1933, no writ\)](#). The trial court has broad discretion in considering a request for a mistrial. [Onstad v. Wright, 54 S.W.3d 799, 808 \(Tex. App.—Texarkana 2001, pet denied\)](#). In determining whether to grant a mistrial, the court must consider whether less drastic remedies would protect the defendant’s right to a fair trial. See [Hill v. State, 90 S.W.3d 308, 313 \(Tex. Crim. App. 2002\)](#) (noting that a judge is required to consider and rule out less drastic alternatives before granting a mistrial.)

In striking Harold Bostic’s testimony and substituting the direct and cross-examination from the first trial in this matter, the trial court granted the very remedy expressly condoned by the Texas case law, federal law, and Texas Rules of Civil Procedure. First, “[g]iven the strong curative power of an instruction to disregard, judicial economy demands that a party resort to such a remedy before he be allowed to move for a mistrial.” [Hooten v. State, 689 S.W.2d 328, 329 \(Tex. App.—Fort Worth 1985, no writ\)](#). Second, it is presumed that an instruction to disregard will cure error. See [S. Pac. Transp. Co. v. Peralez, 546 S.W.2d 88, 96 \(Tex. Civ. App.—Corpus Christi 1977, writ ref’d n.r.e.\)](#). Third, the Texas Rules of Evidence allow testimony from a non-party taken from another proceeding if (i) the witness is unavailable due to death; and (ii) the party against whom the testimony is offered had an opportunity and similar

motive to develop the former testimony by cross-examination. *See* Tex. R. Evid. 804(b)(1). Fourth, Georgia-Pacific erroneously states that Harold Bostic’s testimony from the first to the second trial “conflicted” in “several key areas.” RB at 41. In fact, Harold Bostic’s exposure testimony was virtually identical in all key aspects of method of exposure, time of exposure, and products used. *Compare* 12 RR 25-27 with 9 RR 134 (dates of exposure from 1967 to 1977); 12 RR 31-35 with 9 RR 128-133 (Timothy exposed while mixing and sanding asbestos joint compound); 12 RR 34-37 with 9 RR 130-31 (Harold and Timothy used both Georgia-Pacific dry and Ready-Mix asbestos joint compound); *see also* Comparison of Testimony Chart at App. E.

The Fifth Circuit, the Ninth Circuit, the Seventh Circuit, and the Second Circuit all recognize that when a witness becomes unavailable after direct examination but before cross-examination because of death or invocation of privilege, the proper remedy is to strike the witness’s testimony.²⁸ Not only did the trial court properly afford Georgia-Pacific the remedy of striking Harold Bostic’s testimony; the trial court also entered into evidence the cross-examination of Harold Bostic from the first trial. Georgia-Pacific did not dispute that it had an opportunity and similar motive to develop Harold Bostic’s former testimony by cross-examination in the first trial in this case. Thus, the trial

²⁸ In [*Fountain v. United States*, 384 F.2d 624, 628 \(5th Cir. 1967\)](#), the Fifth Circuit held: “Where the privilege is legitimately invoked by a witness during cross examination, all or part of that witness’s direct testimony may be subject to a motion to strike. The ultimate inquiry is whether the defendant has been deprived of his right to test the truth of the direct testimony. If he has, so much of the direct testimony as cannot be subjected to sufficient inquiry must be struck.” *Id.* *See also* [*United States v. Malsom*, 779 F.2d 1228, 1239 \(7th Cir. 1986\)](#) (holding that defendants were not denied a Sixth Amendment right to confront the witness when the witness died after direct testimony but before cross-examination where “the district court struck [the witnesses] testimony and took pains to instruct the jury to disregard it”[check cite]; [*United States v. Seifert*, 648 F.2d 557, 561 \(9th Cir. 1980\)](#) (“Where a witness asserts a valid privilege against self-incrimination on cross-examination, all or part of that witness’s testimony must be stricken if invocation of the privilege blocks inquiry into matters which are “direct” and not merely “collateral.”).

court's actions were directly in accord with the procedures afforded by the Rules of Evidence in the event of the unavailability of the witness.

In support of its position, Georgia-Pacific cites to [*Bruton v. United States*, 391 U.S. 123 \(1968\)](#), which is entirely inapposite. *Bruton* holds that in a joint trial of two criminal defendants, the admission of the confession of one defendant inculcating the co-defendant is prejudicial error if the defendant who made the confession does not testify and thereby subject himself to examination by the co-defendant. *See id. at 126*. In this limited circumstance involving the uniquely prejudicial incriminating extra-judicial statements of a co-defendant, the Supreme Court held that the right to cross-examination under the Sixth Amendment was violated, and could not be cured by instruction. As these are not the facts presented herein, *Bruton* does not apply.

III. PRAYER

Plaintiffs pray that this Court grant the Petition for Review, and for such other relief to which Plaintiffs may be entitled.

Respectfully submitted,

BARON & BUDD, P.C.

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CERTIFICATE OF SERVICE

I certify that pursuant to the Texas Rules of Civil Procedure, I have served a true copy of the foregoing Petitioners Reply Brief on the Merits electronically on December 5, 2011:

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Rick Thompson
Hankinson Levinger LLP
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/s/ Denyse F. Clancy

Denyse Clancy

TAB A

Harold Bostic’s Testimony Regarding Timothy’s Exposure to Georgia-Pacific Asbestos Joint Compound (1967–1977)

<u>Exposure</u>	<u>Timothy Present?</u>	<u>Georgia-Pacific Joint Compound Used?</u>	<u>Court of Appeals Error</u>
<p>Many, many times (12 RR 137); on numerous occasions (12 RR 34-36), from 1967 to 1977 (12 RR 137).</p>	<p>Yes (12 RR 28, 137, 141)</p>	<p>Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was “the No. 1 product.” (12 RR 33); Timothy worked with Harold Bostic using both dry and Ready-Mix Georgia-Pacific joint compound (12 RR 34-36).</p>	<p><u>Court of Appeals:</u> Harold only worked on the eight construction projects that he could specifically recall. <i>Bostic</i>, 320 S.W.3d at 593-94. If Harold could not recall Timothy working with drywall, Timothy was not exposed to asbestos joint compound, and therefore there were only three projects on which he may have been exposed. <i>Id.</i></p> <p><u>Contrary Evidence:</u> In fact, Harold testified that there was no doubt in his mind that he worked on other jobs, and he was simply having trouble recalling them over thirty years later after “old age has caught up” with him. 12 RR 115,136-37. Harold also testified that it was his normal practice to have Timothy by his side, stating “He could have worked on all of them. He could have worked on half of them. I never said that he did or didn’t that I recall. . . .” 12 RR 131.</p>
<p>Harold and Timothy began working together when Timothy was five years old. (12 RR 136)</p>	<p>Yes (12 RR 136)</p>	<p>Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was “the No. 1 product.” (12 RR 33).</p>	<p><u>Court of Appeals:</u> Skeptical that Timothy was “four or five years” of age at the time his father allowed him to mud and sand with him at the family home. <i>Bostic</i>, 320 S.W.3d at 593.</p> <p><u>Contrary Evidence:</u> In fact, Timothy testified that he helped his father mud the holes “as a little guy.” 7 RR 178. Harold testified that when Timothy was five to seven years old, Timothy would help mix the asbestos joint compound and help sand the asbestos joint compound as far up as he could reach. 12 RR 28, 32. Even Georgia-Pacific’s own marketing materials depict a father and a young toddler working with joint compound together. PX-17.</p>
<p>Harold and Timothy did not work on only one job at a time (12 RR 83-84)</p>	<p>Yes (12 RR 28, 137, 141)</p>	<p>Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was</p>	<p><u>Court of Appeals:</u> Harold Bostic only worked on remodeling job at a time, with each job taking a lengthy period of time to complete. <i>Bostic</i>, 320 S.W.3d at 593.</p> <p><u>Contrary Evidence:</u> In fact, Harold explicitly stated that he would not work on one job at a time and that there were side jobs and</p>

Harold Bostic’s Testimony Regarding Timothy’s Exposure to Georgia-Pacific Asbestos Joint Compound (1967–1977)

<u>Exposure</u>	<u>Timothy Present?</u>	<u>Georgia-Pacific Joint Compound Used?</u>	<u>Court of Appeals Error</u>
		“the No. 1 product.” (12 RR 33).	emergencies that came up “constantly” and “every day.” 12 RR 83-84.
Out of the eight projects that Harold specifically recalled, he performed joint compound work on at least seven of them and he was unsure as to the eighth. (12 RR 81-127).	Yes (12 RR 28, 137, 141)	Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was “the No. 1 product.” (12 RR 33).	<p><u>Court of Appeals:</u> Only three projects involved joint compound work. <i>Bostic</i>, 320 S.W.3d at 593. There was only one project out of those eight projects identified on which Harold Bostic used Georgia-Pacific joint compound. <i>Bostic</i>, 320 S.W.3d at 593.</p> <p><u>Contrary Evidence:</u> In fact, Harold testified that of the eight projects he recalled, he performed joint compound work on at least seven of them, and he was unsure as to the eighth. 12 RR 122 (joint compound used on “prefab” house); 12 RR 126-27 (joint compound used on utility room and cracks throughout family home); 12 RR 81 (“everything inside was drywalled” in the service station); 12 RR 92 (drywall “from one end to the other” in his sister’s older house); 12 RR 117 (patching work with joint compound at his mother’s house); 12 RR 117 (the “whole thing was drywalled” in the bathroom his brother’s house); 12 RR 81 (did drywall work building garage and living quarters for a friend); 12 RR 90-91 (cannot remember if he did joint compound work at his sister’s new house). Harold did not specifically deny using Georgia-Pacific asbestos joint compound on any of these projects.</p>
From the time that Timothy was five years old to 15 or 16 years old, Harold and Timothy used Georgia-Pacific asbestos joint compound on a	Yes (12 RR 28, 137, 141)	Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was “the No. 1 product.” (12 RR 33); Timothy worked with Harold Bostic using both dry and Ready-Mix Georgia-Pacific	<p><u>Court of Appeals:</u> If Timothy was merely present with Harold on a project, and not specifically performing drywall work, he would not have been exposed to asbestos joint compound. <i>Bostic</i>, 320 S.W.3d at 593-94.</p> <p><u>Contrary Evidence:</u> In fact, because asbestos in joint compound is not encapsulated, and instead becomes airborne by means of mixing, sanding, and clean-up, bystanders are exposed to asbestos. PX-26 The make-up of joint compound dictates that the dust will dissipate and “scatter” upon application and clean-up. 10 RR 101, 103-105.</p>

Harold Bostic's Testimony Regarding Timothy's Exposure to Georgia-Pacific Asbestos Joint Compound (1967-1977)

continual basis and many, many times. (12 RR 39, 137).		joint compound (12 RR 34-36).	
<u>Exposure</u>	<u>Timothy Present?</u>	<u>Georgia-Pacific Joint Compound Used?</u>	<u>Court of Appeals Error</u>
Harold and Timothy performed drywall work all over their house.	Yes (12 RR 115, 131)	Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was "the No. 1 product." (12 RR 33).	<p><u>Court of Appeals:</u> The Court limits the drywall work in the house in which Timothy lived with Harold to one instance when they remodeled the utility room. <i>Bostic</i>, 320 S.W.3d at 593.</p> <p><u>Contrary Evidence:</u> In fact, Harold testified that the sheetrock "cracked solid all over" the house, and "they all had to be repaired." 12 RR 115, 131.</p>
Harold and Timothy performed joint compound work patching cracks at Harold's mother's house. (12 RR 117).	Yes (7 RR 178; 12 RR 39, 131, 137)	Yes (12 RR 117); Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was "the No. 1 product." (12 RR 33)	<p><u>Court of Appeals:</u> Harold Bostic did no joint compound work at his mother's house. <i>Bostic</i>, 320 S.W.3d at 594.</p> <p><u>Contrary Evidence:</u> In fact, joint compound is used for patching in addition to drywall work. PX 26 at 38790. Harold never denied using Georgia-Pacific joint compound on this project.</p>
Harold and Timothy's drywall work on a project at Harold's sister's house. (12 RR 90-91)	Yes (7 RR 178; 12 RR 39, 131, 137)	Could not remember (12 RR 90-91); Harold Bostic used Georgia-Pacific asbestos joint compound when working with Timothy for 98% of the time or more (12 RR 39); while working with Timothy, Georgia-Pacific was "the No. 1 product." (12 RR 33)	<p><u>Court of Appeals:</u> There was no exposure to asbestos joint compound. <i>Bostic</i>, 320 S.W.3d at 593-94.</p> <p><u>Contrary Evidence:</u> In fact, Harold may have used joint compound on this project and he was simply having trouble recalling over thirty years later after "old age has caught up" with him. 12 RR 115,136-37. Harold never denied using Georgia-Pacific joint compound on this project.</p>

TAB B

Chart of Death/Injury Cases

Cases	Overview
<i>United States v. Britt</i> , 27 F. App'x 862 (9 th Cir. 2001)	Holding that a juror's death on the second day of trial did not necessitate a mistrial.
<i>Fonts v. So. Pac. Co.</i> , 159 P. 215 (Cal. Ct. App. 1916)	Trial court properly denied mistrial where plaintiff fainted and fell from the witness stand after cross examination.
<i>Hudson v. Devlin</i> , 111 S.E. 693 (Ga. Ct. App. 1922)	Trial court properly denied mistrial where plaintiff fainted, and was carried from the courtroom, in front of the jury.
<i>Chicago & E. R. Co. v. Meech</i> , 45 N.E. 290 (Ill. 1896)	Holding that "[t]he fact that a plaintiff or defendant or witness, or any other person, suddenly swoons or faints, or gives vent to hysterical exclamations, or breaks down with hysteria, does not call for the granting of a new trial."
<i>Ill. Cent. R.R. Co. v. Rothschild</i> , 134 Ill. App. 504 (Ill. App. Ct. 1907)	Trial court properly denied mistrial where plaintiff fainted in front of the jury and his family rushed to his aid.
<i>Owens-Corning Fiberglas Corp. v. Garrett</i> , 682 A.2d 1143 (Md. 1996)	Trial court properly denied mistrial where, during trial, one plaintiff with mesothelioma died, a second plaintiff died of a heart attack, and a witness suffering chest pains was carried from the courtroom by ambulance.
<i>Hatton v. Stott</i> , 189 N.W. 850 (Mich. 1922)	Trial court properly denied mistrial where plaintiff fainted during examination on the witness stand.
<i>Chawkley v. Wabash Ry. Co.</i> , 297 S.W. 20 (Mo. 1927)	Trial court properly denied mistrial where plaintiff fainted in front of the jury during trial.
<i>Dickson v. Davis</i> , 284 S.W. 815 (Mo. Ct. App. 1926)	Trial court properly denied mistrial where plaintiff showed signs of suffering from an epileptic seizure in front of the jury.
<i>Hunt v. Van</i> , 202 P. 573 (Mont. 1921)	Trial court properly denied mistrial where plaintiff collapsed in front of the jury.
<i>Maidman v. Stagg</i> , 82 A.D.2d 299 (N.Y. App. Div. 1981)	Trial court properly denied mistrial where plaintiff died during trial after direct and cross examination.
<i>Ismail v. City of New York</i> , 18 Misc.2d 818 (N.Y. Sup. Ct. 1959)	Trial court properly denied mistrial where plaintiff passed out in the courtroom, his wife began to panic, and the jury remained in court for two to three minutes before they were dismissed.

Chart of Death/Injury Cases

<p><i>McGloin v. Metro St. Ry. Co.,</i> 75 N.Y.S. 593 (N.Y. App. Div. 1902)</p>	<p>Trial court properly denied mistrial where plaintiff became prostrate in front of the jury for a period of twenty minutes and was attended to by a physician in front of the jury.</p>
<p><i>Bugosh v. Allen Refractories Co.,</i> 932 A.2d 901 (Pa. Super. Ct. 2007)</p>	<p>Trial court properly denied mistrial where a plaintiff suffering from mesothelioma died during trial and the jury was informed of the death.</p>
<p><i>Poe v. Arch,</i> 128 N.W. 166 (S.D. 1910)</p>	<p>Trial court properly denied mistrial where plaintiff fainted in front of jury during argument, was carried out of court, and the jury then heard plaintiff screaming.</p>
<p><i>State v. McCray,</i> 614 S.W.2d 90 (Tenn. Crim. App. 1981)</p>	<p>Trial court properly denied mistrial where the child of a juror died during the trial and the juror continued to serve.</p>
<p><i>Consol. Underwriters v. Foster,</i> 383 S.W.3d 829 (Tex. Civ. App.— Tyler 1964, writ ref'd n.r.e.)</p>	<p>Trial court properly denied mistrial where plaintiff became overwhelmed with emotion during testimony.</p>
<p><i>Tex. Emp'rs Ins. Ass'n v. Schaffer,</i> 161 S.W.2d 328 (Tex. Civ. App.— Amarillo 1942, writ ref'd w.o.m.)</p>	<p>Trial court properly denied mistrial where plaintiff suffered a vicious seizure on the witness stand, and in front of the jury, lasting between two and three minutes while his counsel tried to subdue him.</p>
<p><i>Nami v. Harms,</i> 286 S.W. 558 (Tex. Civ. App.— Galveston, 1926, no writ)</p>	<p>Trial court properly denied mistrial where plaintiff became hysterical and fainted into her daughter's arms during argument before the jury, and was then placed on a bench outside the courtroom directly in the path jurors were obligated to walk to return to the deliberation room.</p>
<p><i>El Paso & S. W. R. Co. of Tex. v. Ankenbauer,</i> 175 S.W. 1090 (Tex. Civ. App.—El Paso 1915, writ ref'd)</p>	<p>Trial court properly denied mistrial where plaintiff's counsel carried plaintiff into the courtroom on a stretcher so that plaintiff could testify.</p>
<p><i>Galveston H. & S. A. Ry. v. Hitzfelder,</i> 66 S.W. 707, 708 (Tex. Civ. App.— Galveston 1900, no writ)</p>	<p>Trial court properly denied mistrial where plaintiff suffered epileptic seizures in front of the jury.</p>

TAB C



1 of 1 DOCUMENT

IN RE GEORGIA-PACIFIC CORPORATION, Relator

No. 05-06-00758-CV

COURT OF APPEALS OF TEXAS, FIFTH DISTRICT, DALLAS

2006 Tex. App. LEXIS 5494

June 28, 2006, Filed

SUBSEQUENT HISTORY: Released for Publication August 1, 2006.

PRIOR HISTORY: [*1] Original Proceeding from the County Court at Law No. 3, Dallas County, Texas. Trial Court Cause No. cc-03-01977-C.

DISPOSITION: Writ of Mandamus Denied, Opinion Nunc Pro Tunc issued.

COUNSEL: For RELATOR: Melvin David Bailey, Bailey/Crowe & Kugler, L.L.P., Dallas, TX; Deborah G. Hankinson, Law Offices of Deborah Hankinson, PC, Dallas, TX.

For RESPONDENT: Dallas County Judge, County Court at Law No. 3, Dallas, TX.

For REAL PARTY IN INTEREST: Charla G. Aldous, Chris Panatier, Baron & Budd, PC, Dallas, TX.

JUDGES: Before Justices Whittington, FitzGerald, and Lang-Miers. Opinion by Justice Lang-Miers.

OPINION BY: ELIZABETH LANG-MIERS

OPINION

MEMORANDUM OPINION NUNC PRO TUNC

In this original mandamus proceeding, relator Georgia-Pacific Corporation contends the trial court clearly abused its discretion by refusing to grant a mistrial when a plaintiff and key witness, before cross-examination, became ill, received medical assistance in front of the jury, and died the next day. Relator contends that mandamus is proper to compel a ministerial act and that courts have a ministerial duty to consider and act upon properly filed motions brought to their attention. Relator acknowledges that the court has a reasonable time within which to act.

The facts and issues are well known to the parties, so we need not recount them herein. Based on the record before us, we cannot determine that, as a matter of law, the trial [*2] court has failed to act within a reasonable period of time. *See TEX. R. APP. P. 52.8(a); Walker v. Packer, 827 S.W.2d 833, 839-44, 35 Tex. Sup. Ct. J. 468 (Tex. 1992)* (orig. proceeding). Accordingly, we **DENY** relator's petition for writ of mandamus.

ELIZABETH LANG-MIERS

JUSTICE

TAB D

Reference Manual on Scientific Evidence

Third Edition

Committee on the Development of the Third Edition of the
Reference Manual on Scientific Evidence

Committee on Science, Technology, and Law
Policy and Global Affairs

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Description by itself, however, often is inadequate. Attempts have to be made to quantify exposure, to arrive at estimates of the dose received by the exposed population, and to determine the duration of time over which that dose is received.

VI. Quantification of Exposure

A. Dose

The simplest dose calculations relate to situations in which direct exposures occur⁵³ Thus, for example, consider the case of a substance directly added to food (and approved by the U.S. Food and Drug Administration (FDA) for such addition). Suppose the chemical is of well-established identity and is approved for use in nonalcoholic beverages at a concentration of 10 milligrams of additive for each liter of beverage (10 mg/L).⁵⁴ To understand the amount (weight) of the additive ingested each day, it is necessary to know how much of the beverage people consume each day. Data are available on rates of food consumption in the general population. Typically, those data reflect average consumption rates and also rates at the high end of consumption. To make sure that the additive is safe for use, FDA seeks to ensure the absence of risk for individuals who may consume at the high end, perhaps at the 95th percentile of consumption rates.⁵⁵ Surveys of intake levels for the beverage in our example reveal that the 95th percentile intake is 1.2 L per day for adults.

The weight of additive ingested by individuals at the 95th percentile of beverage consumption rate is thus obtained as follows:

$$10 \text{ mg/L} \times 1.2 \text{ L/day} = 12 \text{ mg/day.}$$

For a number of reasons, toxicologists express dose as weight of chemical per unit of body weight. For adults having a body weight (bw) of, on average, 70 kilograms (kg), the dose of additive is

$$12 \text{ mg/day} \div 70 \text{ kg bw} = 0.17 \text{ mg/kg bw per day}^6$$

53. See, e.g., *McLaughlin v. Sec'y of Dep't of Health & Human Servs.*, 2008 WL 4444142 (Fed. Cl. 2008) (plaintiff exposed to known dose of thimerosal in vaccine; study using four times that dose was not reliable evidence that exposure caused his autistic symptoms).

54. See Appendix A for a discussion of units used in exposure science.

55. J.V. Rodricks & V. Frankos, *Food Additives and Nutrition Supplements*, in *Regulatory Toxicology* 51-82 (C.P. Chengcliss et al. eds., 2d ed. 2001).

56. To gain approval for such an additive, FDA would require that no toxic effects are observable in long-term animal studies at doses of at least 17 mg/kg bw per day (100 times the high-end human intake).

Doses from other ingested products containing specified amounts of chemicals are calculated in much the same way. It generally would be assumed that the duration of exposure for a substance added to a food or beverage would be continuous and would cover a large fraction of a lifetime. For other products, particularly pharmaceuticals, exposure durations will vary widely; dose calculations would be the same, regardless of duration, but the potential for harm requires consideration of exposure duration.

It will be useful, before proceeding further, to illustrate dose calculations for exposures occurring by the inhalation and dermal routes. Consider a hypothetical workplace setting in which a solvent is present in the air. Measurement by an industrial hygienist reveals its presence at a weight of 2 mg in each cubic meter (m³) of air. Data on breathing rates reveal that a typical worker breathes in 10 m³ of air each 8-hour workday. Thus, the worker dose will be

$$\begin{aligned} 2 \text{ mg/m}^3 \times 10 \text{ m}^3/\text{day} &= 20 \text{ mg/day} \\ 20 \text{ mg/day} \div 70 \text{ kg} &= 0.28 \text{ mg/kg bw per day.} \end{aligned}$$

As noted earlier, it is likely that only a fraction of this dose will reach and pass through the lungs and enter the bloodstream. As also noted earlier, if the chemical is a fiber or other particle, its dynamics in the respiratory tract will be different than that of a vapor, with a portion of the inhaled dose entering the GI tract.

Dose from skin exposure often is expressed as the weight of chemical per some unit of skin surface area (e.g., per m² of skin). The body surface area of an average (70 kg) adult is 1.8 m². Thus, consider a body lotion containing a chemical of interest. If the lotion is applied over the entire body, then it is necessary to know the total amount of lotion applied and then the total amount of chemical present in that amount of lotion. That last amount will then be divided by 1.8 to yield the skin dose in units of milligrams per square meter. If the chemical causes toxicity directly to the skin, that toxicity dose information also will be expressed in milligrams per square meter. Then risk is evaluated by examining the quantitative relationship between the toxic dose (milligrams per square meter) and the (presumably much lower) human dose expressed in the same units. If the chemical can penetrate the skin and produce toxicity within the body, then the dose determination must include an examination of the amount absorbed into the human body.⁵⁷

57. See, e.g., *Henricksen v. ConocoPhillips Co.*, 605 F. Supp. 2d 1142, 1164 (E.D. Wash. 2009) (benzene exposure on skin and by inhalation); *Bland v. Verizon Wireless (VAW) LLC*, 2007 WL 5681791, at *9 (S.D. Iowa 2007) (inhalation exposure to Freon in "canned air" sprayed into water bottle). For a discussion of the importance of assessment of dose as a measure of exposure, see Bernard D. Goldstein & Mary Sue Henifin, Reference Guide on Toxicology, Section LA.1.c, in this manual.

58. The 24-hour inhalation rate outside the workplace setting is ca. 20 m³. The lack of direct proportion to time reflects the fact that breathing rates increase under exertion.

59. Rates of absorption of chemicals into the body, through the GI tract, the lungs, or the skin, usually must be obtained by measurement; they are not readily predicted.

One final matter concerning dose estimation concerns the importance of body size, in particular that of the infant and the growing child. In matters such as food and water intake, and breathing rates, small children are known to take in these media at higher rates per unit of their body weights than do adults.⁶⁰ Thus, when a small child is exposed to a food contaminant, that child will often receive a greater dose of the contaminant than will an adult consuming food with the same level of contaminant. Children also tend to ingest greater amounts of nonfood items, such as soils and dusts, than do adults. In some cases, nursing mothers excrete chemicals in their milk. The exposure scientist generally conducts separate assessments for children that take into account the possibility of periods of increased exposure during the developmental period.⁶¹

B. Doses from Indirect Exposure Pathways

Recall that the goal of exposure assessment is to identify the media through which people will be exposed to chemicals of interest that are emitted from sources of interest. As will be seen, the assessment, when completed, will reveal the amount of the chemical of interest in a certain weight or volume of each of the media with which people come into contact. Once this is known, dose calculations can proceed in the manner described in the preceding section.

In the preceding section, firm and readily available knowledge was available about the amount of chemical present in a given weight of food or consumer product (the body lotion example) or in a given volume (cubic meters) of air. These measures are called concentrations of the chemicals in the media of exposure (see Appendix A). When a chemical must move from one or more sources, and then through one or more environmental media, before it comes to be present in the media with which people have contact (the media of exposure), determining the concentrations of the chemical in the media of exposure becomes difficult.⁶² Such a situation is clearly different from that in which a specific amount of an additive is directly added to a specific amount of food. The challenge faced by exposure scientists when the chemical comes to be present in the medium of human exposure not by direct and intentional addition, but by indirect means, through movement from source through the environment, is to find a reliable

60. See, e.g., *Northwest Coalition for Alternatives to Pesticides (NCAP) v. EPA*, 544 F.3d 1043 (9th Cir. 2008) (dispute over how much lower allowable pesticide levels should be to account for children's greater susceptibility).

61. For some substances, susceptibility to toxicity is also enhanced during the same periods. See Section VII.E.

62. See, e.g., *Hannis v. Shinseki*, 2009 WL 3157546 (Vet. App. 2009) (no direct measure of veteran's exposure to radiation was possible but VA's dose estimate was not clearly erroneous); *Fisher v. Ciba Specialty Chem. Corp.*, 2007 WL 2302470 (S.D. Ala. 2007) (allowing expert's qualitative account of DDT and its metabolites spreading from defendant's plant to plaintiffs' property, because quantification would necessarily rely on speculative data).

way to estimate concentrations in the medium of human exposure. Once concentrations are known, dose is readily calculated (as in Section VI.A), but reliably estimating concentrations can be difficult.

Two methods typically are used to estimate those concentrations. One involves direct measurement using the tools of analytical chemistry. The second involves the use of models that are intended to quantify the concentrations resulting from the movement of chemicals from the source to the media of human exposure.

C. Direct Measurement: Analytical Science

Once the media that could be subject to contamination have been identified through pathways analysis (Section V.C), one available choice for determining the concentrations of contaminants involves sampling those media and subjecting the samples taken to chemical analysis. The analysis will not only reveal the concentrations of chemicals in the media of concern, but should also confirm their identities. Environmental sampling and analysis is under way all over the world, at and near contaminated waste sites, in the vicinity of facilities emitting chemicals to air and water, and in many other circumstances.⁶³

One purpose of such sampling and analysis is to determine whether products and environmental media contain substances at concentrations that meet existing regulatory requirements. In many circumstances, regulators have established limits on the concentrations of certain chemicals in foods, other products, water, air, and even soils. These limits generally are based on assessments of health risk and calculations of concentrations that are associated with what the regulators believe to be negligibly small risks. The calculations are made after first identifying the total dose of a chemical that is safe (poses a negligible risk) and then determining the concentration of that chemical in the medium of concern that should not be exceeded if exposed individuals (typically those at the high end of media contact) are not to incur a dose greater than the safe one. The most common concentration limits are regulatory tolerances for pesticide residues in food, Maximum Con-

63. See, e.g., *Knight v. Kirby Inland Marine Inc.*, 482 F.3d 347, 352-53 (5th Cir. 2007) (study of people with much longer exposure to organic solvents could not support conclusion that plaintiffs injuries were caused by such solvents); *Kennecott Greens Creek Mining Co. v. Mine Safety & Health Admin.*, 476 F.3d 946, 950 (D.C. Cir. 2007) (because diesel particulate matter was difficult to monitor, MSHA's surrogate limits on total carbon and elemental carbon were reasonable).

64. See, e.g., *Genereux v. American Beryllia Corp.*, 577 F.3d 350, 366-67 (1st Cir. 2009) ("all beryllium operations should be periodically air-sampled, and a workspace may be dangerous to human health even though no dust is visible"); *Allen v. Martin Surfacing*, 2009 WL 3461145 (D. Mass. 2009) (where air sampling was not done, expert resorted to modeling plaintiff's exposure); *Jowers v. BOC Group, Inc.*, 608 F. Supp. 2d 724, 738 (S.D. Miss. 2009) (OSHA measurements showed that 30% of welders experienced manganese fumes at higher than allowable concentrations); *In re FEMA Trailer Formaldehyde Prod. Liab. Litig.*, 583 F. Supp. 2d at 776 (air sampling revealed formaldehyde levels higher than allowable).

taminant Levels (MeLs) for drinking water contaminants, National Ambient Air Quality Standards (NAAQS), and, for workplace exposure, Permissible Exposure Limits (PELs) or Threshold Limit Values (TLVs)⁶⁵ Much environmental sampling and analysis is done, by both government agencies and private organizations, for the purpose of ascertaining compliance with existing concentration limits (sometimes referred to as standards).

But sampling and analysis also are undertaken to investigate newly identified contamination or to ascertain exposures (and risks) in situations involving noncompliance with existing standards. As described earlier, information on concentrations in the media through which people are exposed is the necessary first step in estimating doses.

Although at first glance it might seem that direct measurements of concentrations would provide the most reliable data, there are limits to what can be gained through this approach.

- How can we be sure that the samples taken are actually representative of the media sampled?

Standard methods are available to design sampling plans that have specified probabilities of being representative, but they can never provide complete assurance. Generally, when contamination is likely to be highly homogeneous, there is a greater chance of achieving a reasonably representative sample than is the case when it is highly heterogeneous. **In the latter circumstance, obtaining a representative sample, even when very large numbers of samples are taken, may be unachievable.**

- How can we be sure that the samples taken represent contamination over long periods?

Sampling events may provide a good snapshot of current conditions, but in circumstances in which concentrations could be changing over time, and where the health concerns involve long-term exposures, snapshots could be highly misleading. This type of problem may be especially **severe when attempts are being made to reconstruct past exposures, based on snapshots taken in the present.**

- How can we be sure that the analytical work was done properly?

Most major laboratories that routinely engage in this type of analysis have developed standard operating procedures and quality control proce-

65. PELs are official standards promulgated by the Occupational Safety and Health Administration. TLVs are guidance values offered by an organization called the American Conference of Governmental Industrial Hygienists. See, e.g., *In re Howard*, 570 F.3d 752, 754 (6th Cir. 2009) (challenging PELs for coal mine dust); *Jowers v. BOC Group, Inc.*, 608 F. Supp. 2d 724, 735-36 (S.D. Miss. 2009) (PELs and TLVs for welders' manganese fume exposure); *International Brominated Solvents Ass'n v. American Conf of Gov. Indus. Hygienists, Inc.*, 625 F. Supp. 2d 1310 (M.D. Ga. 2008) (challenging TLVs for several chemicals); *Miami-Dade County v. EPA*, 529 F.3d 1049 (11th Cir. 2008) (MCLs for public drinking water).

dures. Laboratory certification programs of many types also exist to document performance. When analytical work is performed in certified, highly experienced laboratories, there is a reasonably high likelihood that the analytical results are reliable. But it is very difficult to confirm reliability when analytical work is done in laboratories or by individuals who cannot provide evidence of certification or of longstanding quality control procedures.

- How are data showing the absence of contamination to be interpreted?

In most circumstances involving possible contamination of environmental media, the analysis of some (and sometimes many) of the samples will fail to find the contaminant. The analytical chemist will often report "ND" (for nondetect) for such samples. But an ND should never be considered evidence that the concentration of the contaminant is zero. In fact, most chemists will (and should) report that the contaminant is "BDL" (below detection limit). Every analytical method has a nonzero detection limit; the method is not sensitive to and cannot measure concentrations below that limit. Thus, for each sample reported as BDL, all that can be known is that the concentration of contaminant is somewhere below that limit. If there is clear evidence that the contaminant is present in some of the samples (its concentration exceeds the method's BDL), then it is usually assumed that all the samples of the same medium reported as BDL will actually contain some level of contaminant, often and for reliable reasons assumed to be one-half the BDL. Practices for dealing with BDL findings vary, but assuming that the BDL is actually zero is not one of the acceptable practices.

Sampling and measurement are no doubt useful, but are nonetheless limited in important ways. The alternative involves modeling. In fact, a combination of both approaches—one acting as a check on the other—is often the most useful and reliable.

D. *Environmental Models*

A model is an attempt to provide a mathematical description of how some feature of the physical world operates. In the matters at hand, a model refers to a mathematical description of the quantitative relationship between the amount of a chemical emitted from some source, usually over a specified period of time, to the concentrations of that chemical in the media of human exposure, again over some specified time period.⁶⁶

66. See, e.g., *NCAP v. EPA*, 544 F.3d 1043 (9th Cir. 2008) (EPA was permitted to rely on modeling in developing allowable pesticide residual levels); *O'Neill v. Sherwin-Williams Co.*, 2009 WL 2997026, at *5 (C.D. Cal. 2009) (exposure model was inappropriate because it was based on a different type of paint than plaintiff was exposed to); *Hayward v. U.S. Dep't of Labor*, 536 F.3d 376

Models are idealized mathematical expressions of the relationship between two or more variables. They are usually derived from basic physical and chemical principles that are well established under idealized circumstances, but may not be validated under actual field conditions. Models thus cannot generate completely **accurate predictions of chemical concentrations in the environment**. In some cases, however, they are the only method available for estimating exposure-s-for example, in assessing the impacts of a facility before it is built or after it has ceased to operate. In such circumstances, they are necessary elements of exposure assessments and have been used extensively. Models are necessary **if** projections are to be made backward or forward in time or to other locations where no measurements have been made.

Typically, a model is developed by first constructing a flow diagram to illustrate the theoretical pathways of environmental contamination, as shown in Figure 2 and for a hazardous waste site in Appendix B. These models can be used to estimate concentrations in the relevant media based on several factors related to the nature of the site and the chemicals of interest. Model variables include the following:

1. The total amount of chemical present in or emitted from the media that **are its sources**;
2. The solubility of the chemical in water;
3. The chemical's vapor pressure (a measure of volatility);
4. The degree to which a chemical accumulates in fish, livestock, or crops (bioconcentration or bioaccumulation factor);
5. The nature of the soil present at the site; and
6. The volumes and movement of water around and beneath the site.

Some of this information derives from laboratory studies on the chemical (the first four points) and some from an investigation at the site (the remaining two points). The development of the data and modeling of the site often require the combined skills of chemists, environmental engineers, and hydrogeologists. In addition to the information listed above, time projection models also require information on the stability of the chemical of interest. As noted earlier, some chemicals degrade in the environment very quickly (in a matter of minutes), whereas others are exceedingly resistant to degradation. Quantitative information on rates of degradation is often available from laboratory and field studies.

Models that assess the exposures associated with air emissions consider the fact that the opportunity for people to be exposed to chemicals depends upon their activities and locations.⁶⁷ These models account for the activity patterns of

(5th Cir. 2008) (a model was used to reconstruct the dose of radiation that the employee was exposed to); **Rodricks & Frankos**, *supra* note 55.

67. See, e.g., *Palmer v. Asarco Inc.*, 2007 WL 2298422 (N.D. Okla. 2007) (children allegedly were exposed to lead by "hand-to-mouth activity ingestion of soil/house dust"); **Henricksen**

potentially exposed populations and provide estimates of the cumulative exposure over specified periods.

Perhaps the most widely used models are those that track the fate and transport pathways followed by substances emitted into the air. Knowledge of the amounts emitted per unit of time (usually obtainable by measurement) from a given location (a stack of a certain height, for example) provides the basic model input. Information on wind directions and velocities, the nature of the physical terrain surrounding the source, and other factors needs to be incorporated into the modeling. Some substances will remain in the vapor phase after emission, but chemical degradation (e.g., because of the action of sunlight) could affect media concentrations. Some models provide for estimating the distributions of soil concentrations for those substances (particulates of a certain size) that may fall during dispersion. Much effort has been put into developing and validating air dispersion models.^v Similar models are available to track the movement of contaminants in both surface and ground waters.

The fate and transport modeling issue becomes more complex when attempts are made to follow a chemical's movement from air, water, and soils into the food chain and to estimate concentrations in the edible portions of plants and animals.^s Most of the effort in this area involves the use of empirical data (e.g., What does the scientific literature tell us about the quantitative relationships between the concentration of cadmium in soil and its concentration in the edible portions of plants grown in that soil?). This type of empirical information, together with general data on chemical absorption into, distribution in, and excretion from living systems, is the usual approach to ascertain concentrations in these food media.[?]

Many models for environmental fate and transport analysis are available. It is not possible to specify easily which models have established validity and which have not; rather, some are preferred for some purposes and others are preferred for different purposes.

Perhaps the best that can be done to scrutinize the work of an expert in this area is to

- Require that the expert describe in full the basis for model selection;
- Ask the expert to describe the standing of the model with authoritative bodies such as EPA;
- Require the expert to state why other possible models are not suitable;

v. *ConocoPhillips Co.*, 605 F. Supp. 2d 1142, 1164 (E.D. Wash. 2009) (expert calculated plaintiffs benzene exposure by adjusting study results to account for plaintiffs activities); *Junk v. Terminix Int'l Co.*, 2008 WL 6808423 (S.D. Iowa 2008) (study measured chlorpyrifos exposure of inhabitants of houses sprayed indoors); *In re W.R. Grace & Co.*, 355 B.R. 462 (Bankr. D. Del. 2006) (asbestos in attic insulation released by normal activity).

68. National Research Council, *Models in Environmental Regulatory Decision Making* (2007).

69. Ecologists also use modeling results to evaluate risks to wildlife, plants, and ecosystems.

70. National Research Council, *supra* note 68.

- Require that the expert describe the scientific basis and underlying assumptions of the model, and the ways in which the model has been verified:"! and
- Require the expert to describe the likely size of error associated with model results.

Other issues pertaining to the sources and reliability of the data used in the application of a model can be similarly pursued.

Results from modeling are concentrations in media of concern over time. If sampling and analysis data are available for the same media, they can be compared with the modeling result, and efforts can be made to reconcile the two and arrive at the most likely values (or range of likely values).

E. Integrated Exposure/Dose Assessment

We have shown the various methods used to determine the concentrations of chemicals in products and in various environmental media and also the methods used to determine doses from each of the relevant media. Dose estimation as described in Section VI.A applies to each of the relevant routes of exposure.

In many cases, the dose issue concerns one chemical in one product and only one route of exposure. But numerous variations on this basic scenario are possible: one chemical in several products or environmental media, many chemicals in one product or environmental medium, or many chemicals in many environmental media. Even though some exposure situations can be complex and involve multiple chemicals through both direct and indirect pathways, the exposure assessment methods and principles described here can be applied. Exposures occurring by different routes can be added together, or they can be reported separately. The decisions on the final dose estimates and their form of presentation can be made only after discussions with the users of that information—typically the toxicologists and epidemiologists involved in the risk assessment.^F The dose metrics emerging from the exposure assessment need to match the dose metrics that are used to describe toxicity risks.

One additional point should be highlighted. The principle that exposure to chemicals through foods and consumer products typically focuses on high-end consumers of those foods or products also applies in environmental settings. Thus,

71. This point is to ensure that the expert truly understands the model and its limits and that he or she is not simply using some "black box" computer software.

72. See, e.g., *American Farm Bureau Fed'n v. EPA*, 559 F.3d 512 (D.C. Cir. 2009) (challenging EPA's risk assessment for fine PM); *Miami-Dade County v. EPA*, 529 F.3d 1049 (11th Cir. 2008) (assessment of risk of wastewater disposal methods to drinking water); *Kennecott Greens Creek Min. Co. v. Mine Safety & Health Admin.*, 476 F.3d 946 (D.C. Cir. 2007) (risk assessment of diesel particulate matter to miners); *Rowe v. E.I. du Pont de Nemours & Co.*, 2008 WL 5412912, 12 (D.N.J. 2008) (risk assessment for proposed class).

for example, it is possible to assert with relatively high confidence that almost no one consumes more than 3.5 L of water a day and that almost everyone consumes less. If the dose calculation assumes a water consumption rate of 3.5 L/day, then the risk estimated for that dose is almost certainly an upper limit on the population risk, and regulatory actions based on that risk will almost certainly be highly protective. For regulatory and public health decisionmaking, such a precautionary approach has a great deal of precedent, although care must be taken to ensure adherence to scientific data and principles.^P

This approach becomes problematic, however, if applied to assessments of exposures that may have been incurred in the past by individuals claiming to have been harmed by them. In such cases, it would seem that there is no basis for a precautionary approach; an approach based on attempts to accurately describe the individual's exposure would seem to be necessary. Whatever the case, the exposure scientist must be careful to ensure accurate description of the exposure concentration (and resulting dose), so that the users of the information can understand whether upper limits or more typical exposures and doses have been provided.

VII. Into the Body

A. Body Burdens

Section V described how chemicals in the environment contact the three major portals of entry into the body—the respiratory tract, the GI tract, and the skin. For some chemicals, the dose contacting one or more of those portals may be sufficient to cause harm before those chemicals are absorbed into the body; that is, they may cause one or more forms of toxicity to the respiratory system, to the GI tract, or to the skin. Although these forms of *contact* toxicity can be important, it is also important to consider the many forms of systemic toxicity. The latter refers to a large number of toxic manifestations that can affect any of the organs or organ systems of the body after a chemical is absorbed into the bloodstream and distributed within the body. Recall also that most chemicals are acted upon by certain large protein molecules, called enzymes, contained in cells, particularly those of the liver, the skin, and the lungs, and are converted to new compounds, called metabolites (the process leading to these changes is called metabolism). Metabolite formation

73. National Research Council, *Evolution and Use of Risk Assessment in the Environmental Protection Agency: Current Practice and Future Prospects*, in *Science and Decisions: Advancing Risk Assessment* (2008). Those who must comply with regulations that were developed based on a high degree of caution often protest that more accurate assessments should be used as their basis. For several reasons, truly accurate prediction of risk is difficult to achieve (see Bernard D. Goldstein & Mary Sue Henifin, Reference Guide on Toxicology, in this manual), while predicting an upper bound on the risk is not. At the same time, unless carefully done and described, upper-bound estimates may be so remote from reality that decisions based on them should be avoided.

T A B E

Comparison of Harold Bostic’s Testimony From First and Second Trial

	<u>Testimony from First Trial</u>	<u>Testimony from Second Trial</u>
<p><u>Dates of Exposure</u></p> <p>Timothy Bostic was exposed to Georgia-Pacific asbestos joint compound products from 1967 to 1977 while working on residential construction with Harold Bostic.</p>	<p>In 1967, when Timothy was five or six years old, Timothy started working with Harold. 12 RR 25-27; 12 RR 78. Timothy would get a “payday” (i.e. a toy from the hardware store) for helping his father work. 12 RR 33.</p> <p>Timothy worked with Harold “on numerous occasions” using Georgia-Pacific products. 12 RR 34–36.</p> <p>Timothy was exposed to asbestos from Georgia-Pacific joint compounds from 1967 to 1977. 12 RR 25–27.</p>	<p>In 1967, Timothy started working with Harold. 9 RR 133. Beginning when he was five or six years old, Timothy got a “payday” for helping his father work. 9 RR 125.</p> <p>Timothy would work with Harold every time he could. 10 RR 133. Timothy worked with Georgia-Pacific joint compounds “many times.” 9 RR 134.</p> <p>Timothy was exposed to asbestos from Georgia-Pacific joint compounds from 1967 to 1977. 9 RR 134.</p>
<p><u>Method of Exposure</u></p> <p>Timothy was exposed to asbestos from Georgia-Pacific products when mixing and sanding the asbestos-containing joint compounds.</p>	<p>“[Timothy would] mix the mud, every kid likes mud. And he’d mix it for me the best he could. 12 RR 28–29.</p> <p>Timothy would sand the asbestos joint compound. 12 RR 32, 35. Harold and Timothy would have to sand it more than once depending on the number of coats and often would have to put on two or three coats of joint compound. 12 RR 30–31.</p>	<p>Timothy would mix the mud from the time he was young: “You know how kids like mud. And you just mentioned mix me some mud, and it was mixed. He liked to play in it.” 9 RR 133.</p> <p>Timothy would sand the asbestos joint compound. 9 RR 131–33. “We always like to sand it at least twice.” 9 RR 128.</p>

Comparison of Harold Bostic’s Testimony From First and Second Trial

	<u>Testimony from First Trial</u>	<u>Testimony from Second Trial</u>
	<p>Working with Georgia-Pacific joint compound products created dust in the air. 12 RR 35.</p> <p>Timothy inhaled the dust. 12 RR 35-36.</p>	<p>Working with Georgia-Pacific joint compound products was “dusty.” 9 RR 132.</p> <p>Timothy inhaled the dust. 9 RR 142.</p>
<u>Type of Product used</u>	<p>Georgia-Pacific was “by and far the No.1” product used. 12 RR 34.</p> <p>Timothy used dry and Ready-Mix Georgia-Pacific joint compound. 12 RR 34-37.</p>	<p>“[W]hen Georgia-Pacific came out, I tried that, and loved it. And I stuck with it all the way through.” 9 RR 135.</p> <p>Timothy used dry (“regular”) and Ready-Mix Georgia-Pacific joint compound. 9 RR 130–31.</p>