**Toxic Tort Substantial Factor Causation: 2018 Update**

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“[D]ose matters."

[*Bostic v. Georgia-Pacific Corp.*, 439 S.W.3d 332, 360 (Tex. 2014)](https://scholar.google.com/scholar_case?case=6310285983111892558&q=%22substantial+factor+causation%22+2018&hl=en&as_sdt=6,24) .[[1]](#footnote-1) One of toxicology's central tenets is that "the dose makes the poison." Bernard D. Goldstein & Mary Sue Henifin, *Reference Guide on Toxicology*, in Fed. Jud. Ctr. Ref. Manual on Scientific Evid. 401, 403 (2d ed. 2000). Even water, in sufficient doses, can be toxic. *Id*., at 403. Dose "refers to the amount of chemical that enters the body," and is "the single most important factor to consider in evaluating whether an alleged exposure caused a specific adverse effect." David L. Eaton, *Scientific Judgment and Toxic Torts – A Primer in Toxicology for Judges and Lawyers,* 12 J.L. & Policy, 5, 11 (2003-2004). That primer on dose informs the discussion that follows.

Toxic tort liability requires plaintiff to prove that defendant’s defective product caused injury. The *Restatement (Second) of Torts,* Sections 431 and 433, obligates plaintiff to show that defendant’s action was a “substantial factor” in bringing about the harm at issue. If the conduct of others is the predominant factor in bringing about the harm, then defendant’s action is not the substantial factor or legal cause of the harm.  *Id.,* §433, comment d (1965). Application of that test in the toxic tort context has generated substantial controversy that is ongoing. Cases involving asbestos, benzene, coal dust, lead paint, creosote, fertilizers, pesticides, and uranium (radiation), for examples, have triggered judicial scrutiny over efforts by the plaintiffs’ bar to loosen causation proof standards. Approaches to causation in these contexts are often based on cutting-edge research, and resolving the claims requires difficult factual or technical determinations in establishing a causal link between the offending substance and the claimed injury. Note, *Causation in Environmental Law – Lessons from Toxic Torts,* 128 Harv. L. Rev. 2256 (2015). This is so because the injuries are not discovered until long after the exposure occurred, and the injured party may have been exposed to a variety of harmful substances over the years. *Id.* We summarize those developments here.

Historically the American causation approach has relied essentially on a “but-for” determination, meaning that but for the defendant’s conduct, plaintiff’s injury would not have occurred. But that approach proved problematic in the multiple defendant realm, because each defendant could simply blame the other(s) and prevent a showing of causation. That conundrum proved especially challenging for plaintiffs in toxic tort litigation:

As with any other type of expert evidence, we recognize the danger in allowing unreliable or speculative information (or "junk science") to go before the jury with the weight of an impressively credentialed expert behind it. But, it is similarly inappropriate to set an insurmountable standard that would effectively deprive toxic tort plaintiffs of their day in court. It is necessary to find a balance between these two extremes.

One problem with establishing causation in toxic tort cases is that, often, a plaintiff's exposure to a toxin will be difficult or impossible to quantify by pinpointing an exact numerical value. Here, for example, defendants did not monitor the level of benzene in the air at the service stations. Nor were they required to do so by law or regulation. Further complicating the process of arriving at a specific quantification in this case is that a significant portion of Parker's benzene exposure was through dermal contact—a factor that would not be addressed in the air-based ppm-years standard.

*Parker v. Mobil Oil Corp*., 7 N.Y.3d 434, 448, 857 N.E.2d 1114 (N.Y. 2006).

The result was that in general, American courts now view toxic tort claim causation through a two-phase lens. First, a plaintiff must prove that the substance in question is capable of causing the injury in question. This is known as “general causation.” Second, a plaintiff must show that the substance caused his or her injury. This is known as “specific causation.” The focus in toxic tort cases typically is on specific causation,²[[2]](#footnote-2) and that requires plaintiff to prove that he or she was exposed to a sufficient dose of the substance and disease or injury resulted. *See generally* David E. Bernstein, *Getting to Causation in Toxic Tort Cases,* 74 Brooklyn L. Rev. 51, 52-53 (2008). In addition, when the plaintiff was exposed to the substance through more than one source, plaintiff must also prove that the particular defendant’s substance was a substantial cause of the disease or injury. *Id.,* at 55. Factual causation has proven to be the most durable, controversial, and intractable difficulty in toxic tort cases. Steve C. Gold, *Drywall Mud and Muddy Doctrine: How Not to Decide A Multiple-Exposure Mesothelioma Case*, 49 Ind. L. Rev. 117 (2015).

The *Restatement* comments upon the “substantiality” requirement:

The word “substantial” is used to denote the fact that the defendant’s conduct has such an effect in producing the harm as to lead reasonable people to regard it as a cause, using that word in the popular sense in which there always lurks the idea of responsibility, rather than in the so-called “philosophic sense,” which includes every one of the great number of events without which any happening would not have occurred. Each of these events is a cause in the so-called philosophic sense, yet the effect of many of them is so insignificant that no ordinary mind would think of them as causes.

*Restatement (Second) of Torts,* §431, comment a (1965). Stated simply, a "substantial factor" or "substantial contributing factor" means something more than a possible cause.  *Kilty v. Weyerhaeuser Co.,* 317 F. Supp. 3d 1027, 1038 (W.D. Wis. June 8, 2018). The problem lies in converting this concept of substantiality into an adequate dispositive motion argument or jury instruction in cases pending before sympathetic judges involving plaintiffs with awful diseases.

Epidemiological testing is often proffered to address specific causation. Although epidemiological studies are not an exact science, they are useful in linking exposure to substances with injures. Comment, *A Dose of Reality: The Struggle with Causation in Toxic Tort Litigation*, 51 Houston L. Rev. 1147, 1163 (2014). The parties will wrangle over the distinction between correlation and causation in examination of the epidemiologists at trial. Consider:

General causation exists when a substance is capable of causing a particular injury or condition in the general population.  Because direct experimentation may not be possible to prove causation, a plaintiff may try to demonstrate that exposure to the substance at issue increases the risk of the particular disease through epidemiological studies.  Such studies examine existing populations to attempt to determine if there is an association between a disease or condition and a factor suspected of causing the disease or condition.  General causation as established through epidemiological studies is relevant only insofar as it informs specific causation.  Where direct evidence of specific causation is unavailable, specific causation may be established through an alternative two-step process whereby the plaintiff establishes general causation through reliable studies, and then demonstrates that his circumstances are similar to the subjects of the studies. This burden includes proof that (1) the injured person was exposed to the same substance, (2) the exposure or dose levels were comparable to or greater than those in the studies, (3) the exposure occurred before the onset of injury, and (4) the timing of the onset of injury was consistent with that experienced by those in the study. Proof of substantial factor causation requires some quantification of the dose resulting from plaintiff's exposure to defendant's products. However, those in the studies need not exactly match the plaintiff's exposure, but the conditions of the study should be substantially similar to the claimant's circumstances.

*E.I. Du Pont de Nemours & Co. v. Hood,* 2018 WL 2126935, \*4 (Tex. App. May 8, 2018) (reversing plaintiff’s judgment on insufficient substantial factor causation evidence).

Whether a defendant’s product was a substantial factor leading to plaintiff’s disease has spawned hundreds of summary judgment motions to dismiss cases, *Daubert*³[[3]](#footnote-3) or *Frey*⁴[[4]](#footnote-4) motions to exclude evidence, and in limine motions, also to exclude evidence. In general, the basis for the motions is that plaintiff’s expert opinions on causation are too speculative to support substantial factor causation, and without such opinion evidence the case cannot proceed. This challenge for plaintiffs is shown plainly in the asbestos cases, where plaintiffs often claim exposure to several defendants’ asbestos-containing products, and the exposure can vary from slight to heavy. Can a plaintiff proceed against a defendant whose products plaintiff was exposed to occurred over a course of mere days or a few weeks in the context of years of exposure to others’ products overall?

In 1986, the Fourth Circuit formulated what is known as the “frequency, regularity, and proximity” test for asbestos causation in *Lohrmann v. Pittsburgh Corning Corp.,* 782 F.2d 1156, 1162-63 (4th Cir. 1986). It held that when a plaintiff alleges multiple exposures to asbestos, he or she must produce evidence: (1) of exposure to a specific product of the defendant, (2) that the exposure occurred on a regular basis over some extended period of time, (3) in proximity to where plaintiff actually was present, and (4) such that it is probable that exposure to defendant’s product caused injury. Id. The *Lohrmann* test is the most common test and is applied in several jurisdictions. *See, e.g.,* *Rost v. Ford Motor Co.,* 151 A.3d 1032 (Pa. 2016) (allowing, however, Dr. Frank’s testimony because he purported to rely upon the frequent, regular and proximate exposure to asbestos from the defendant’s products); *Schwartz v. Honeywell Int’l., Inc.,* 2018 Ohio 474 (2018) (noting the Ohio legislature adopted the *Lohrmann* test and rejecting claim that substantial factor causation may be met through a cumulative exposure theory which postulates that every non-minimal exposure to asbestos is a substantial factor in causing mesothelioma); *Holcomb v. George Pacific, LLC,* 289 P.3d 188, 195 (2012) (finding, however, that plaintiff had met the test against several defendants); *Borg-Warner Corp. v. Flores,* 232 S.W.3d 765, 770 (Tex. 2007) (agreeing with Lohrmann); *but see Hays v. A.W. Chesterton, Inc.*, 2012 WL 3096534, \*1 (E.D. Pa. Apr. 19, 2012) (applying Florida law and rejecting *Lohrmann*); *In Re Asbestos Litig.*, 2017 WL 6334980, \*4 (D. Del. Dec. 12, 2017) (noting Delaware has also rejected the *Lohrmann* test).

The *Lohrmann* test has also been evaluated in the “bystander” exposure context. Consider:

Whether the exposure of any given bystander to any particular supplier's product will be legally sufficient to permit a finding of substantial-factor causation is fact specific to each case. The finding involves the interrelationship between the use of a defendant's product at the workplace and the activities of the plaintiff at the workplace. This requires an understanding of the physical characteristics of the workplace and of the relationship between the activities of the direct users of the product and the bystander plaintiff. Within that context, the factors to be evaluated include the nature of the product, the frequency of its use, the proximity, in distance and in time, of a plaintiff to the use of a product, and the regularity of the exposure of that plaintiff to the use of that product.

*Scapa Dryer Fabrics Inc. v. Saville,* 190 Md. App. 331, 988 A.2d 1059, 1066 (2010); *accord, Wallace & Gale Asbestos Settlement Trust v. Busch,* 2018 WL 3814962, \*5 (Md. App. Aug. 10, 2018) (ruling that the evidence in the bystander case, “though slight,” was sufficient to allow the case to go to the jury under *Lohrmann)*. Whether the exposure of a bystander to an asbestos-containing product will be legally sufficient to permit a finding of substantial factor causation is fact specific, and circumstantial evidence of the plaintiff's exposure to asbestos-containing products is sufficient for a finding of substantial factor causation.  *Lloyd E. Mitchell, Inc. v. Rossello,* 2018 WL 3323799, \*6 (Md. App. July 6, 2018).

As time followed from 1986, the *Lohrmann* standard developed detractors on both the plaintiff and defense fronts. Plaintiffs felt it was too restrictive, while defendants were concerned about its perceived lack of emphasis on dose even with the “regularity” prong.

To create substantial factor causation arguments to challenge the *Lohrmann* standard, innovative plaintiffs’ counsel working with plaintiff’s experts in mesothelioma or lung cancer cases, for examples, developed what is derided by defense counsel as “single fiber” causation, “every breath” causation, “any exposure” causation, or “every exposure” causation. The theory is that every exposure to asbestos contributes cumulatively to a plaintiff’s above-background asbestos burden and is a substantial factor leading to the disease. The argument is couched with rhetoric suggesting that were the court to toughen the obligatory causation proof standard cancer victims will go uncompensated because specific fiber counts, percentage allocations of exposure among products, and other mathematical approaches to specific defendant exposure is rarely available given product content, dose differences, and long lag times to disease manifestation. They say once the disease manifests, it is impossible to determine which fiber triggered the cell mutation process. So plaintiffs are deserving of a friendlier causation standard in toxic tort cases, they contend.

The "every exposure" theory posits that any exposure to asbestos fibers whatsoever, regardless of the amount of fibers or length of exposure constitutes an underlying cause of injury. A minor variation of the "every exposure" theory states that every exposure to asbestos above a threshold level is necessarily a substantial factor in the contraction of asbestos-related diseases.  A further outgrowth of the "every exposure" theory is the "cumulative exposure" theory⁵[[5]](#footnote-5) the cumulative exposure to asbestos is the cause of the disease, but because each exposure, no matter how small, adds to that cumulative exposure, each exposure becomes a substantial contributing factor. The every exposure theory is unreliable because it is not tied to the severity of exposure, is not based on sufficient supporting facts and data, cannot be tested, and does not have a known error rate.  The "cumulative exposure" theory is also unreliable because it contains the same reliability problems that the “every exposure” theory does - namely that every exposure becomes a substantial factor based on one fact alone: that it was part of the total dose. *Jack v. Borg-Warner Morse TEC LLC,* 2018 WL 3819027, \*10 (W.D. Wash. Aug. 10, 2018).

Nevertheless, plaintiffs’ causation experts want to testify that:

• There is no safe level of exposure to asbestos below which people are not at risk for developing disease.

• All exposures contribute to the risk of developing asbestos-related cancer.

▪ Decedent’s work with defendant’s product was an important component of his cumulative exposure, and as such is a substantial contributing factor in his development if disease.

▪ Any exposure above background levels causes mesothelioma.

▪ Medically, scientifically, every exposure contributes to the totality of the exposure.

▪ Every exposure to asbestos increases an individual’s risk of developing an asbestos-related disease.

Consider *Schwartz v. Honeywell Int’l, Inc.,* 2018 Ohio 474, ¶7 (2018) in which,

Dr. Carlos Bedrossian, a pathologist, testified as Schwartz's expert on causation. According to Dr. Bedrossian, there is no known threshold of asbestos exposure "at which mesothelioma will not occur." He opined that Kathleen's exposures to Bendix brakes and to asbestos dust brought home from her father's electrician job were both contributing factors to her "total cumulative dose" of asbestos exposure. He explained that the exposures that contributed to this cumulative exposure were "significant meaning above background" and did not include "the elusive background level of asbestos" in ambient air. Thus, according to Dr. Bedrossian, Kathleen's "cumulative" exposure, including her exposure to asbestos from the Bendix brakes, "was the cause of her mesothelioma."

Or *Conda v. Honeywell Int’l, Inc.,* 2018 WL 2293530, \*4 (Minn. App. May 21, 2018) (agreeing that substantial factor causation could go to the jury based on the frequency with which decedent did brake work with Bendix brakes):

Honeywell's assertion that Conda's causation experts presented an "every exposure" theory mischaracterizes the experts' testimony at trial. Honeywell is correct that both Dr. Mark and Dr. Holstein testified that asbestos is the main cause of mesothelioma and that there is not a safe level of asbestos exposure such that a person is guaranteed not to develop mesothelioma from that exposure. But Conda's causation experts did not testify that all exposures to asbestos are substantial contributing factors to the development of mesothelioma. Instead, they based their causation opinions on specific exposure levels. For example, Conda's counsel asked Dr. Mark:

[I]f you have a product with one percent asbestos or more, regardless of what the product is, that releases visible dust or is measured to be at least .1 fiber per cc that repeatedly exposes a person over the course of months, if not years, given the right latency, and that person develops mesothelioma, would those exposures to any of those, to the Navy, NSP, any of them, would those be substantial contributing factors for that mesothelioma?

Dr. Mark replied, "Yes."

Dr. Holstein testified that studies establish that working with asbestos-containing brakes releases a significant amount of asbestos, ranging from tenths of a fiber to 87 fibers per cc, into the air and that, based on the frequency of decedent's work with Bendix brakes, brake work was a substantial contributing factor to his development of mesothelioma. And when Honeywell's counsel asked Dr. Holstein whether decedent's exposure to asbestos when using joint compounds in home remodeling projects was a substantial contributing factor to his mesothelioma, Dr. Holstein testified, "There are ranges of exposures from trivial to very heavy, and at some point as you move up that spectrum, it becomes a substantial contributing factor. And I haven't tried to determine whether that was true or not for the joint compounds."

Such opinions ignore (intentionally and obviously) the critical concept of dose in disease causation. These single fiber causation theories “would be akin to saying that one who pours a bucket of water into the ocean has substantially contributed to the ocean’s volume.” *Moeller v. Garlock Sealing Technologies,* 660 F.3d 950, 955 (6th Cir. 2011). In *Betz v. Pneumo Abex LLC*, 44 A.3d 27 (Pa. 2012) the court considered the every fiber causation standard to be “in irreconcilable conflict with itself” given the dose-response nature of asbestos-related disease. “Simply put, one cannot simultaneously maintain that a single fiber among millions is substantially causative, while also conceding that a disease is does responsive.” *Id.,* at 56. To say that any non-minimal exposure is sufficient is "irreconcilable with the rule requiring at least some quantification or means of assessing the amount, duration, and frequency of exposure to determine whether exposure was sufficient to be found a contributing cause of the disease." [*In re New York City Asbestos Litigation,* 148 App. Div. 3d 233, 239, 48 N.Y.S.3d 365 (2017)](https://scholar.google.com/scholar_case?case=5116306825275005446&q=%22substantial+factor+causation%22+2018&hl=en&as_sdt=6,24). Expert testimony based upon the notion that "each and every breath" of asbestos is substantially causative of mesothelioma will not suffice to create a jury question on the issue of substantial factor causation. To create a jury question, a plaintiff must adduce evidence that exposure to defendant's asbestos-containing product was sufficiently "frequent, regular, and proximate" to support a jury's finding that defendant's product was substantially causative of the disease. *Gilbert v. Advance Auto Parts,* 2018 WL 3521971, \*5 (Pa. Superior Ct. July 23, 2018) (supporting the *Lohrmann* standard).

The jurisprudential task is to fashion a test of causation that is workable in toxic tort contexts, meaning that it can hold significant dose contributor defendants liable, while releasing those whose contributions to the plaintiff’s substance burden is minimal or de minimus. Here the defense position has been gaining ground. Critics of plaintiff’s “every exposure” theory include *Crane Co. v. DeLisle,* 206 So. 3d 94 (Fla. Dist. Ct. Nov. 9, 2016) (finding the theory’s judicial reception “has been largely negative” because it lacks sufficient support in facts and data, cannot be tested, has not been published in peer-reviewed works, and has no known error rate); *Bell v. Foster Wheeler Energy Corp.,* 2016 WL 876983 (E.D. La. Mar. 6, 2017) (rejecting the every fiber causation idea as premised upon the notion that just because we cannot rule anything out we can rule everything in); *Suoja v. Owens-Illinois, Inc.,* 211 F. Supp. 2d 1196, 1207 (W.D. Wis. Sept. 30, 2016) (noting the expert’s failure to tie his causation opinion to any specific quantum of exposure means “if there is exposure, then there is causation”); *Scapa Dryer Fabrics, Inc. v. Knight,* 788 S.E.2d 421 (Ga. 2016) (rejecting cumulative exposure opinion because it failed to address whether exposure at defendant’s facility was more than a de minimus contribution to the injury); *McIndoe v. Huntington Ingalls Inc.,* 817 F.3d 1170 (9th Cir. 2016) (concluding the every exposure theory would undermine the substantial factor standard and broaden asbestos liability based on fleeting or insignificant encounters with the defendant’s product).

The list continues. *See, e.g.,* [*Comardelle v. Pa. Gen. Ins. Co.,* 76 F. Supp. 3d 628, 632-33 (E.D. La. 2015)](https://scholar.google.com/scholar_case?case=5730450786270175167&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24); [*Anderson v. Ford Motor Co.,* 950 F. Supp. 2d 1217, 1225 (D. Utah 2013)](https://scholar.google.com/scholar_case?case=12429114334935440691&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24); [*Sclafani v. Air & Liquid Sys. Corp.,* 2013 WL 2477077, at \*5 (C.D. Cal. May 9, 2013)](https://scholar.google.com/scholar_case?about=15784617374820876422&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24); [*Henricksen v. ConocoPhillips Co.,* 605 F. Supp. 2d 1142, 1166 (E.D. Wash. 2009)](https://scholar.google.com/scholar_case?case=18324734393750206948&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24). Likewise, applying the Daubert factors, courts have found that the theory cannot be tested, has not been published in peer-reviewed works, and has no known error rate.  [*Anderson,*950 F. Supp. 2d at 1224-25](https://scholar.google.com/scholar_case?case=12429114334935440691&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24); [*Sclafani,* 2013 WL 2477077, at \*5](https://scholar.google.com/scholar_case?about=15784617374820876422&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24); *see* [*Wills v. Amerada Hess Corp.*, 379 F.3d 32, 49 (2d Cir. 2004)](https://scholar.google.com/scholar_case?case=17129598363398787746&q=%22substantial+factor+causation%22+2017&hl=en&as_sdt=6,24) (affirming exclusion of theory that decedent's cancer was caused by a single exposure to toxic chemicals, regardless of dosage, based on *Daubert*factors).

Asbestos defense counsel are well aware of plaintiff expert testimony by Drs. Jerrold Abraham, Arthur Frank, and Arnold Brody that "each and every" exposure to asbestos "cumulates" and should therefore be considered a cause of injury, regardless of the type of mesothelioma, the exposure "dose," or the type of asbestos involved in the case. The court in *Rockman v. Union Carbide Corp.,* 266 F. Supp. 3d 839, 843 (D. Md. 2017) excluded the opinions stating:

There is simply insufficient data to support their theory that any exposure to asbestos, no matter how brief, and regardless of the type of asbestos, should be considered a "substantial factor" in [plaintiff’s] developing peritoneal mesothelioma some thirty-eight years after his last alleged contact with any asbestos-containing product.

The court noted that the case involving peritoneal mesothelioma and low-level bystander exposure to chrysotile asbestos, and the experts based their opinions on prior research studying pleural mesothelioma and primarily high-level exposures to amphibole asbestos.

But some jurisdictions push back. In California, courts take a broad view of substantial factor causation, commenting that “undue emphasis should not be placed on the term “substantial.” *Rutherford v. Owens-Illinois, Inc.,* 16 Cal. 4th 953, 969, 941 P.2d 1203 (1997). In determining which exposures to asbestos-containing products contributed significantly enough to the total occupational dose to be considered "substantial factors" in causing the disease, "[t]he substantial factor standard is a relatively broad one, requiring only that the contribution of the individual cause be more than negligible or theoretical."  [*Rutherford v. Owens-Illinois, Inc.,* 941 P.2d 1203, 1223 (Cal. 1997)](https://scholar.google.com/scholar_case?case=159794494266494107&q=%22substantial+factor+causation%22+2018&hl=en&as_sdt=6,24). Thus in California, a plaintiff may prove causation by “demonstrating that the plaintiff’s exposure to [the] defendant’s asbestos-containing product in reasonable medical probability was a substantial factor in contributing to the aggregate dose of asbestos the plaintiff or decedent inhaled or ingested, and hence to the risk of developing asbestos-related cancer.” *Id.,* at 976-977. Note the distinction: a substantial factor in contributing to the dose/risk rather than to plaintiff’s disease.⁶[[6]](#footnote-6)

Under New York law, when plaintiff alleges the presence of visible asbestos dust at a work site, especially on a regular and prolonged basis, that is sufficient evidence for an expert to opine that the product was a substantial factor in causing asbestos-related disease.  *In Re NYC Asbestos Litig.*, 2016 NY Slip Op 32552(U) (N.Y. Dec. 21, 2016) (adding that a plaintiff need not quantify exposure levels precisely or use a dose-response relationship). It is the jury who must evaluate plaintiff's testimony of exposure to dust from defendant's product, with the aid of expert testimony, and decide whether plaintiff's exposure to defendant's products was a substantial factor in causing his mesothelioma. *Id.*  A causation expert must still establish that the plaintiff was exposed to sufficient levels of the toxin from the defendant's products to have caused his disease. *Matter of NYC Asbestos Litig.,* 148 App. Div. 3d 233, 236 (N.Y. 2017).

Another way in which plaintiffs’ experts have sought to stretch the scope of substantial factor causation in asbestos cases has been to offer the so-called “fiber-drift” theory of exposure:

The `fiber drift theory' as it is described by the plaintiffs here takes as its starting point that asbestos fibers may become airborne or re-entrained and thus be carried from their source to other areas. Under this theory, however, both the specific locale of the product's use and the specific areas of the plaintiff's employment become irrelevant. The substance of the fiber drift theory is that once an asbestos-containing product can be placed anywhere in the Firestone plant, any plaintiff working at any point within that plant is entitled to have the question of causation submitted to the jury because it is likely, given that fibers can drift, that a given plaintiff was exposed to fibers originating in a particular defendant's product.

[*Eagle-Picher Industries, Inc. v. Balbos*, 326 Md. 179, 216-217, 604 A.2d 445 (1992)](https://scholar.google.com/scholar_case?case=5449128641281279245&q=%22substantial+factor+causation%22+2018&hl=en&as_sdt=6,24) (ruling, however, that the fiber drift theory is inconsistent with the requirement of Maryland law that an actor's negligence be a substantial factor in causing the injury).

Obviously, asbestos litigation has dominated this discussion. But the debate about the scope of substantial factor causation extends to other toxic tort contexts as well.

In a recent lead paint opinion it was held that a defendant's negligence is a cause-in-fact of the plaintiff's injuries when it is "a substantial factor in bringing about the harm." This test eliminates the need to "rule out" or "exclude" other possible sources of the harm or show that one cause had a greater impact than any other substantial factor causing the harm.  The substantial factor test, by its very definition, permits more than one cause of injury. *Ervin v. Kennedy Krieger Inst., Inc.,* 2018 WL 3090454, \*12 (Md. App. June 22, 2018). Benzene case opinions also weigh in: “[b]ased on Plaintiff's deposition testimony that he was exposed to benzene while opening pipes at the Gulf Alliance Refinery and the Texaco Donaldsonville Refinery and his affidavit stating that Turner employees were working on and opening pipes that were connected to the lines, columns, and units that Plaintiff worked on, there remains some possibility that Plaintiff could recover against Turner. *Merritt v. Texaco Inc.,* 2018 WL 3640875, \*13 (E.D. La. July 31, 2018) (recognizing in substantial factor causation analysis a substantial factor for the injury need not be the sole cause).

Courts rejecting the every exposure theory in benzene litigation include *Parker v. Mobil Oil Corp.,* 857 N.E.2d 1114, 1122 (N.Y. 2006) (rejecting opinions that were based upon the unfounded assumption that low level exposures had the same effect as high doses); *Henricksen v. ConocoPhillips Co.,* 605 F. Supp. 2d 1142, 1165-66 (E.D. Wash. 2009) (concluding the theory “flies in the face of the toxilogical law of dose-response”); *Baker v. Chevron USA, Inc.,* 680 F. Supp. 2d 865, 878 n. 9 (S.D. Ohio 2010) (finding the theory failed *Daubert* because it rested upon the notion that one molecule of a cancer-causing agent has some finite possibility of causing a genetic mutation); *Pluck v. BP Oil Pipeline Co.,* 640 F.3d 671, 679 (6th Cir. 2011) (concluding the theory rested upon “pure conjecture”); *Hall v. ConocoPhillips Co.,* 248 F. Supp. 3d 1177, 1182 (W.D. Okla. 2017) (precluding plaintiff’s expert opinions on benzene causation). *But see* [*Schultz v. Akzo Nobel Paints, LLC,* 721 F.3d 426, 433 (7th Cir. 2013)](https://scholar.google.com/scholar_case?case=17654105929735455847&q=%22substantial+factor%22+causation+benzene+2016&hl=en&as_sdt=6,24) (stating "Schultz was not required to demonstrate that benzene exposure was the sole cause of his disease, so long as he showed that benzene contributed substantially to the disease's development or significantly increased his risk of developing AML").

A high percentage of APL cases are idiopathic (according to the record, roughly 70-80% of all APL diagnoses).  A plaintiff in benzene litigation must show that exposure to benzene can cause APL (general causation), and that exposure to benzene was, in fact, a substantial factor in the development of plaintiff's APL (specific causation). Some studies establish an increased risk of APL after a certain level of exposure, such as 8 ppm-years.  Other studies found no increased risk of leukemia with exposure at any level less than 40 ppm-years.  *Milward v. Rust-Oleum Corp.,* 820 F.3d 469, 475 (1st Cir. 2016).

*See also Abraham v. Union Pacific RR*, 233 S.W.3d 13, 23 (Tex. App. 2007) (holding the expert’s opinion failed *Daubert* because he could not establish the creosote exposure was sufficient to support disease development); *Cano v. Everest Minerals Corp.,* 362 F. Supp. 2d 814, 837 (W.D. Tex. 2005) (same, uranium exposure).

In cases arising under the Vaccine Act,⁷[[7]](#footnote-7) causation requires that "the harm be attributable to the vaccine to some non-negligible degree," and noted that, although substantial is somewhere beyond the low threshold of but-for causation, it does not mean that a certain factor must be found to have definitively caused the injury.  Accordingly, a factor deemed to be substantial is one that falls somewhere between causing the injury to a non-negligible degree and being the "sole or predominant cause." This definition of substantial - somewhere between non-negligible and predominant - is applicable to respondent's burden to prove a sole substantial factor unrelated to the vaccine. Accordingly, a respondent's burden is to prove that a certain factor is the only substantial factor—one somewhere between non-negligible and predominant—that caused the injury.  *K.L. v. Secretary of The Dep’t of Health and Human Services,* 134 Fed. Claims 579, 598 (Ct. Fed. Claims Aug. 8, 2017) (finding insufficient proof of medical causation tying injury to a vaccination).

In a recent groundwater PCE contamination case the court noted that “although a finding of causation may not be based on mere speculation or conjecture, such finding may be predicated on reasonable inferences drawn from circumstantial evidence. Direct proof of each link in a chain of causation is not required. Circumstantial evidence of sufficient substantiality from which reasonable inferences can be drawn will support a finding of causation in fact.” *City of Modesto v. Dow Chemical Co.,* 19 Cal. App. 5th 130, 153, 227 Cal. Rptr. 3d 764 (Cal. App. 2018) (involving groundwater contamination by PCE). *See also Bradford v. Citgo Petroleum Corp.,* 237 So. 3d 648, 659 (La. App. 2018) (upholding admissibility of plaintiffs’ causation experts in a “slop oil” release case).

In Maryland’s lead paint litigation the causation issue was recently addressed in this manner:

The substantial factor test does not require experts to exclude other properties as possible contributing sources or the plaintiff to show that one cause had a greater impact than any other substantial factor causing the harm.  It would be illogical for us to require an expert to narrow the plaintiff's lead exposure down to a single source when the substantial factor test, by its very definition, permits more than one cause of injury.

*Levitas v. Christian,* 164 A. 3d 228, 238, 253 (Md. App. 2017) (adding that “we have only required that an expert be able to adequately explain how he determined that a property was a source of the plaintiff's lead exposure”).  The dissent argued that plaintiff’s expert lacked foundation to testify because he “did not identify any data or methodology to show that the Spaulding Property was a more probable source of the [lead-based] harm than the Denmore Property.”

In a recent uranium exposure case the court noted that an expert witness addressing substantial-factor causation in a dose-responsive disease case must offer a reasoned, individualized assessment of a plaintiff's or decedent's exposure history. *See McMunn v. Babcock & Wilcox Power Generation Grp.,* 869 F.3d 246, 271 (3d Cir. 2017) (rejecting an opinion that one millirem above background was "substantial”).

In conclusion, proof of substantial factor causation in toxic tort litigation will continue to bedevil judges, attorneys, experts and juries. The complexity of the science and law requires vigilance in keeping current on the latest state-of-the-art developments in this fascinating field.

1. Internal citations and case histories are omitted in case cites in this paper. [↑](#footnote-ref-1)
2. This is so in many cases involving substances that are known to produce certain diseases (e.g., asbestos/mesothelioma or benzene/AML), and thus general causation is often conceded. [↑](#footnote-ref-2)
3. *Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579, 597 (1993) (requiring scientific theories to be reliable, i.e., by proof the theory has been tested, been peer reviewed, and has gained acceptance in the scientific community). [↑](#footnote-ref-3)
4. *Frye v. U.S.,* 293 F. 1013, 1014 (D.C. Cir. 1923) (simply requiring the theory to be generally accepted in the scientific community). [↑](#footnote-ref-4)
5. The “every fiber” and “cumulative” exposure theories are really opposite sides of the same coin. *See Suoja v. Owens-Illinois, Inc*., 211 F. Supp. 3d 1196, 1204, 1207 (W.D. Wis. 2016) (agreeing that Dr. Frank's opinion, couched in terms of a person's "cumulative exposure," is no different from the "any exposure" theory).

   [↑](#footnote-ref-5)
6. When causation is premised on the total cumulative exposure (versus dose), a single exposure or set of exposures cannot be "considered a “substantial cause” of the disease unless that exposure or set of exposures had a *substantial* impact on the total cumulative exposure. *Haskins v. 3M Co.,* 2017 WL 3118017, \*7 (D.S.C. July 21, 2017).  [↑](#footnote-ref-6)
7. National Childhood Vaccine Injury Act of 1986, 42 U.S.C. §§ 300aa-1 to -34 (2012).  [↑](#footnote-ref-7)