

CERTIFIED FOR PUBLICATION

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

SECOND APPELLATE DISTRICT

DIVISION FOUR

NICKOLE DAVIS, as Personal
Representative, etc.,

Plaintiff and Respondent,

v.

HONEYWELL INTERNATIONAL
INC.,

Defendant and Appellant.

B256793

(Los Angeles County
Super. Ct. No. JCCP4674/BC469472)

APPEAL from a judgment of the Superior Court for Los Angeles County,
Victor E. Chavez, Judge. Affirmed.

Perkins Coie, Brien F. McMahon, Aaron R. Goldstein; Horvitz & Levy, Lisa
Perrochet and Robert H. Wright for Defendant and Appellant.

Karst & Von Oiste and George H. Kim for Plaintiff and Respondent.

In *Rutherford v. Owens-Illinois, Inc.* (1997) 16 Cal.4th 953 (*Rutherford*), the California Supreme Court addressed the burden on a plaintiff in an asbestos-related cancer case to prove that the defendant's product was a legal cause of the plaintiff's (or the plaintiff's decedent's) injuries. The Supreme Court held that such a plaintiff "may prove causation . . . by demonstrating that the plaintiff's exposure to 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 pp. 976-977, fn. omitted.) To meet this burden, many plaintiffs in asbestos cases (including the plaintiff in *Rutherford*) present testimony from medical experts who espouse the theory that exposure to even low doses of asbestos contributes to the development of mesothelioma, an asbestos-related cancer. (See *id.* at p. 984 [plaintiff's expert opined "that each exposure, even a relatively small one, contributed to the occupational 'dose' and hence to the risk of cancer," and therefore the plaintiff's exposure to defendant's product, even if very small, was a substantial factor in contributing to the risk of developing cancer].)

In the case before us, plaintiff Nickole Davis¹ presented such expert testimony at trial in support of her claim that her father's exposure to asbestos in Bendix brake linings that he used when performing brake jobs in the 1960s and 1970s was a substantial factor in contributing to his risk of developing mesothelioma. In this appeal from the judgment entered on a jury verdict in

¹ Nickole Davis appears in this action in her capacity of personal representative of her deceased father, Sam Davis. To avoid confusion, we will refer to Nickole Davis as "plaintiff" and to Sam Davis as "Davis."

plaintiff's favor, defendant Honeywell International Inc. (Honeywell)² contends that this opinion testimony – which commonly is referred to as the “every exposure,” “any exposure,” or “any fiber” theory – should have been excluded under *Sargon Enterprises, Inc. v. University of Southern California* (2012) 55 Cal.4th 747 (*Sargon*), because it is speculative and devoid of evidentiary and logical support.

Having reviewed much of the commentary and scientific literature cited in support of and against the “every exposure” theory, we conclude the theory is the subject of legitimate scientific debate. Because in ruling on the admissibility of expert testimony the trial court “does not resolve scientific controversies” (*Sargon, supra*, 55 Cal.4th at p. 772), it is for the jury to resolve the conflict between the every exposure theory and any competing expert opinions. (*Rutherford, supra*, 16 Cal.4th at p. 984 [noting conflicting expert opinions were presented to jury, and jury rejected defense expert's testimony that “a very light or brief exposure could be considered ‘insignificant or at least nearly so’” in assessing whether the exposure was a substantial factor in contributing to plaintiff's risk of developing cancer].) Therefore, we hold the trial court did not abuse its discretion by allowing plaintiff's medical expert to testify.

The other issue presented in this appeal is whether the trial court erred in refusing to give Honeywell's proposed supplemental jury instruction based upon language in *Rutherford* regarding factors that may be relevant in determining whether a plaintiff's exposure to a particular asbestos-containing product should be deemed a substantial factor in causing the cancer at issue. We conclude the issue of causation was adequately covered by the jury instructions given, and therefore

² Honeywell concedes it is responsible for injuries caused by brake products manufactured by The Bendix Company.

hold the trial court did not err by refusing to give Honeywell's proposed instruction.

BACKGROUND

Plaintiff's father, Sam Davis, was born in 1943, in Mobile, Alabama. As a child, he travelled around the country with his family picking crops. In the early 1960s, when he was around 20 years old, he moved to Downey, California, where he lived until the late 1970s. In 1963 or 1964, Davis began doing automotive work (primarily brake jobs) and home remodeling jobs to support himself.

From 1963 or 1964 until 1978 or 1979, Davis did one or two brake jobs a day, on average. For each brake job, he replaced old brake linings with new Bendix linings. Each brake job required the replacement of four linings; there were two linings per tire, two tires per axle. Before installing the new brake linings, Davis would sand each lining for one to two minutes. The sanding produced dust, which Davis would inhale. At the time Davis was performing brake jobs, Bendix linings were made up of resin material into which chrysotile asbestos fibers were mixed; the linings were 50 percent chrysotile asbestos by weight.³

In addition to doing one or two brake jobs a day, Davis also did two or three home remodeling projects per month during that same period. The home remodeling work he did consisted of installing sheetrock and ceramic tile flooring. When installing sheetrock, Davis would apply a joint compound (also called

³ "Asbestos" is used to describe a number of different minerals that occur naturally in the environment; what they have in common is a fibrous structure. There are two main types of asbestos: serpentine (or chrysotile), and amphiboles, which include amosite and crocidolite. Amphibole fibers, which are straight fibers that can stay in the lungs for decades, are considered to be more potent or toxic than chrysotile fibers, which are wavy and generally stay in the lungs for months rather than years.

“mud”) that contained asbestos. To make the mud, Davis would open bags of dry powdered joint compound (which created inhalable dust) and mix the powder with water. After applying the mud and letting it dry, Davis would sand it, either by hand or a machine, to make it smooth. Using a sanding machine created a lot of dust, which would get all over his face and hair.

In August 2011, Davis was diagnosed with malignant epithelial mesothelioma. In September 2011, he filed the instant lawsuit against Honeywell and other defendants.⁴ After Davis died in May 2012, plaintiff, as Davis’ personal representative, was substituted in place of Davis and filed a first amended complaint for wrongful death alleging causes of action for negligence, strict liability, false representation, and intentional failure to warn.

A. *Motion in Limine*

A month and a half before trial (before any depositions of plaintiff’s experts had been taken), Honeywell filed a motion in limine to preclude plaintiff from presenting expert opinion testimony that every exposure to asbestos above background levels contributed to Davis’s mesothelioma, or that Davis’s exposure to “encapsulated, short fiber chrysotile asbestos from automotive brake products” contributed to his disease. Honeywell supported its motion with plaintiff’s supplemental responses to interrogatories, orders or transcripts in other cases (a federal district court case and two Los Angeles Superior Court cases) in which the court granted motions to preclude “every exposure” testimony, and copies of cases from a Pennsylvania Superior Court and the Supreme Court of Pennsylvania, Eastern District in which “every exposure” testimony was excluded. Plaintiff opposed the motion on the ground it was premature, and the matter was continued.

⁴ It appears that the only defendant remaining at the time of trial was Honeywell.

Honeywell renewed its motion in limine after taking the depositions of plaintiff's medical experts, James A. Strauchen, M.D., a pathologist, and William Rom, M.D., a pulmonologist. It filed a supplement brief, along with excerpts from the depositions of both physicians. Both physicians testified at their depositions that they had reviewed Davis' medical records and deposition transcript, and both opined that Davis' exposure to asbestos from sanding the Bendix brake linings was a substantial contributing factor in the development of his mesothelioma. Dr. Strauchen was asked whether it would make any difference to his opinion if Davis had done only a single brake job (rather than one or two a day for many years, plus two or three home remodeling jobs per month); he responded that he would still consider that single exposure to be a contributing cause of his mesothelioma, but the fact that it was a single exposure might affect the way he would weigh contributing factors. Dr. Rom testified that, in his opinion, if a person did only one or two brake jobs in his life, the exposure he would have gotten from those jobs would not be a substantial factor in the development of mesothelioma, but if a person did a brake job five days a week for several months, the cumulative exposure could be a substantial factor. Both physicians discussed several studies and scientific articles that they asserted supported their opinions.

After considering Honeywell's supplemental brief, and hearing argument, the trial court denied Honeywell's motion and allowed Dr. Strauchen to testify.

B. *Trial*

At trial, plaintiff presented excerpts from Davis' videotaped deposition in which Davis described, among other things, his work doing brake jobs and home remodeling projects from 1963 or 1964 through the late 1970s. In addition to her own testimony, plaintiff also presented the testimony of Dr. Strauchen and a public health expert, Dr. Barry Castleman.

In his direct examination, Dr. Strauchen testified about his training and experience as a pathologist. He described how the respiratory system functions, and what happens when a person develops mesothelioma. He explained the different types of asbestos and what happens when asbestos fibers are inhaled. He testified that the principal cause, and only proven cause, of mesothelioma is asbestos, and that Davis died from that disease. He also testified that both forms of asbestos (serpentine, or chrysotile, and amphibole) cause mesothelioma, and that mesothelioma can occur with very low doses of asbestos exposure. He explained that asbestos exposure is cumulative because the fibers stay in the lungs for a long time, so each exposure adds to the previous exposures. He also explained that asbestos-related diseases, particularly mesothelioma, exhibit extensive latent intervals, and that mesothelioma typically occurs 20 to 50 years after the exposure to asbestos.

At the end of Dr. Strauchen's direct examination, plaintiff's counsel presented him with a hypothetical. Dr. Strauchen was asked to assume that a person did one to two brake jobs a day from 1962 to the late 1970s; for each job he sanded four brake liners for a minute or a minute and a half each, which created visible dust that he breathed in; and each brake liner contained 50 percent asbestos and 50 percent binder. Based on those assumed facts, he was asked whether that exposure was a substantial contributing factor in the causation of that person's mesothelioma. Dr. Strauchen said that in his opinion, it was, and that he held that opinion within a reasonable degree of medical certainty.

On cross-examination, Dr. Strauchen admitted that he did not perform any calculations or estimates of the dose of asbestos Davis may have received from any of the activities he engaged in. He testified, however, that he was familiar with an article that found that respirable asbestos fibers come off brake linings when they are washed with distilled water, and that it is generally accepted that if there is

visible dust from a product made from asbestos, it would include a substantial amount of asbestos.⁵ Dr. Strauchen also conceded that there are postulated causes of mesothelioma other than asbestos, but he said that asbestos was the only proven cause, and that up to 90 percent of men with mesothelioma have had asbestos exposure. He also admitted that everyone has some exposure to asbestos because small amounts of asbestos are present in the air we breathe, and that that exposure – referred to as background or ambient exposure – generally is not considered a substantial cause of mesothelioma, although he did not rule out that background exposure may be responsible for some cases of mesothelioma.

Plaintiff's other expert, Dr. Barry Castleman, testified regarding reports and articles that have been published, beginning in the 1890s, warning of the dangers of asbestos exposure. The trial court instructed the jury that the purpose of Dr. Castleman's testimony was not to say whether the conclusions reached in those reports and articles were correct, but rather to show whether Bendix had notice of possible dangers. Some of the reports or articles Dr. Castleman discussed specifically addressed the hazards of asbestos exposure in mechanics working on automobile brakes.

In its case-in-chief, Honeywell presented expert testimony from an epidemiologist, an industrial hygienist, a pathologist, and an expert in brakes and brake safety. The epidemiologist, Dr. David Garabrant, testified about epidemiological studies that examined whether people employed full time as vehicle mechanics were at an increased risk for mesothelioma. In 2004, Dr. Garabrant had published in a peer-reviewed journal a meta-analysis examining all such epidemiological studies up to that time, and concluded there was no

⁵ Dr. Strauchen referred to one article that estimated that visible dust would contain five to ten fibers per cc, which he testified is substantially more than the OSHA limit of 0.1 fiber per cc.

association between employment as a mechanic and the risk of mesothelioma. He conducted a subsequent meta-analysis to include epidemiological studies done after 2004, and came to the same conclusion.

Industrial hygienist Kenneth White testified about how asbestos exposure is measured, and the exposure limits issued by the Occupational Safety and Health Administration (OSHA). He estimated Davis' probable exposure from his work with brakes, and concluded that his cumulative exposure was below the OSHA limits. He also testified that extremely high heat applied to the brake linings converts asbestos fibers into non-toxic substances.

Pathologist Dr. Michael Graham opined that exposure to brake dust does not cause mesothelioma. He testified that he was not aware of any study that showed that low exposure to chrysotile causes mesothelioma.

Brake expert Richard Radlinski testified about how brakes work, why chrysotile asbestos was used in brakes, and what goes into the development of brake linings.

C. *Jury Instructions, Deliberations and Verdict*

Honeywell proposed a special jury instruction on causation that stated: "The parties dispute whether Sam Davis's claimed exposure to asbestos-containing Bendix brakes was a substantial factor in causing his mesothelioma. [¶] Many factors are relevant in assessing the medical probability that any alleged asbestos exposure was a substantial factor in causing an injury. These factors include the type of asbestos, the nature of the exposure, the frequency of exposure, the regularity of exposure, the duration of exposure, the proximity of the asbestos-containing product, and the type of asbestos-containing product." The trial court refused that instruction, and instead instructed the jury using CACI No. 435 (Causation for Asbestos-Related Cancer Claims), as follows: "A substantial factor

in causing harm is a factor that a reasonable person would consider to have contributed to the harm. It does not have to be the only cause of the harm. [¶] Nickole Davis may prove that exposure to asbestos from Honeywell International Inc.’s product was a substantial factor causing Sam Davis’ illness by showing, through expert testimony, that there is a reasonable medical probability that the exposure was a substantial factor contributing to his risk of developing cancer.”

In the afternoon of the jury’s first day of deliberations, the jury sent a note to the judge, asking for a definition of “substantial” in question 4 of the special verdict form.⁶ The judge referred the jury to the “Causation for Asbestos-Related Cancer Claims” instruction already given. The following morning, the jury sent another note to the judge, asking whether the jury could either strike the word “substantial” from the questions on the special verdict form or just say “factor” in those questions. The judge responded that the jury was required to follow the instruction previously identified.

The jury reached its verdict the next day. The jury found against Honeywell on all but one of plaintiff’s claims (it found in favor of Honeywell on plaintiff’s strict liability claim for design defect under a risk-benefit theory) and found the total amount of damages suffered by plaintiff was \$2 million. It allocated 85 percent of the fault to Honeywell, and the remaining 15 percent in equal shares to each of the eight companies responsible for Davis’ asbestos exposure from his home remodeling jobs. Judgment was entered on the verdict, and Honeywell timely filed a notice of appeal from the judgment.

⁶ Question 4 asked: “Was the failure of Bendix brakes to perform as safely as an ordinary consumer would have expected them to perform a substantial factor in causing Sam Davis’ mesothelioma?”

DISCUSSION

Honeywell contends the judgment must be reversed because (1) the trial court failed to properly exercise its gatekeeper role and exclude Dr. Strauchen's expert opinion testimony that was based upon an "every exposure" theory, and (2) the trial court erroneously refused to instruct the jury with Honeywell's proposed special instruction on causation, which prejudiced Honeywell.

A. *Admissibility of Dr. Strauchen's Testimony*

In *Sargon, supra*, 55 Cal.4th 747, the California Supreme Court examined the trial court's duty to act as a "gatekeeper" with regard to expert testimony. The Court observed that, under Evidence Code sections 801 and 802, the trial court must "act[] as a gatekeeper to exclude expert opinion testimony that is (1) based on matter of a type on which an expert may not reasonably rely, (2) based on reasons unsupported by the material on which the expert relies, or (3) speculative." (*Id.* at pp. 771-772.) The Court cautioned, however, that "[t]he trial court's gatekeeping role does not involve choosing between competing expert opinions." (*Id.* at p. 772.) Importantly, "[t]he court does not resolve scientific controversies. Rather, it conducts a 'circumscribed inquiry' to 'determine whether, as a matter of logic, the studies and other information cited by experts adequately support the conclusion that the expert's general theory or technique is valid.' [Citation.] The goal of trial court gatekeeping is simply to exclude 'clearly invalid and unreliable' expert opinion. [Citation.] In short, the gatekeeper's role 'is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.' [Citation.]" (*Ibid.*) A trial court's ruling excluding or admitting expert testimony is reviewed for abuse of discretion. (*Id.* at p. 773.)

In this case, Honeywell contends the trial court erred by admitting Dr. Strauchen's testimony because (1) his opinion was speculative and illogical; (2) the regulatory standards he relied upon cannot establish causation; (3) no appropriate scientific literature supports his theory, and epidemiology studies contradict it; and (4) the "every exposure" theory is contrary to California causation law as set forth in *Rutherford, supra*, 16 Cal.4th 953. We conclude the trial court did not abuse its discretion in admitting the testimony.

1. *Speculative/Illogical*

Honeywell argues that Dr. Strauchen's opinion that every one of Davis' exposures to asbestos contributed to Davis' mesothelioma, except for his exposure to background or ambient levels, is speculative and illogical. It asserts that Dr. Strauchen gave contradictory testimony by conceding that there is no scientific support for the proposition that background levels of asbestos exposure can be a substantial factor contributing to the disease, while also testifying that any exposure to asbestos from working on brake linings is a substantial factor. Similarly, it asserts that Dr. Strauchen's testimony that mesothelioma is dose dependent (i.e., the greater the exposure, the greater the risk of developing the disease) cannot be reconciled with his opinion that every exposure, even very low exposures, can be a substantial factor in causing the disease. Neither of these examples demonstrates that Dr. Strauchen's testimony was speculative or illogical.

First, Dr. Strauchen did not concede that exposure to background levels of asbestos cannot be a substantial factor in causing mesothelioma. Instead, he testified that "[v]ery little is actually known about the health effects of the ambient exposure. Since everybody has it, it's exceedingly difficult to study because there is no control group. You can't find anybody who does not have that exposure; and although it's not considered a substantial cause of mesothelioma, it's possible that

some of those cases . . . where there is absolutely no other exposure are actually due to the ambient asbestos we are all exposed to.” In other words, Dr. Strauchen posited that because it is difficult to create a valid study, background exposure has not been scientifically deemed a substantial factor in causing mesothelioma.

Nonetheless, there may be cases in which, where no other exposure has occurred, background exposure *is* a substantial factor in causing mesothelioma. That opinion is consistent with his opinion that other low levels of exposure can be a substantial factor.

Second, the fact that mesothelioma is dose dependent does not render Dr. Strauchen’s opinion that every exposure can be a substantial factor in causing the disease illogical. Nor does it, as Honeywell asserts, necessarily treat the correlation between exposure and risk of disease as purely linear. Dr. Strauchen explained that asbestos exposure is cumulative, because asbestos fibers stay in the lung for long periods of time. Therefore, even if there is a threshold level of exposure below which there is no likelihood of developing mesothelioma, it is not illogical to conclude that each exposure – even a low exposure – when added to other exposures (including other low exposures) could result in a cumulative exposure that is above the threshold level, giving rise to the risk of developing mesothelioma.

We emphasize that in acknowledging this conclusion, we do not mean to imply it is the only conclusion that can be reached regarding low exposures to asbestos. We simply recognize that, in light of Dr. Strauchen’s testimony regarding the properties of asbestos and how it affects a person’s lungs, his reasoning is neither speculative nor illogical.

2. *Regulatory Standards*

Honeywell asserts that Dr. Strauchen's testimony should have been excluded because he improperly relied upon regulatory standards promulgated by regulatory agencies such as OSHA to support his theory that every exposure to chrysotile asbestos raises the risk of developing mesothelioma. It argues that regulatory standards cannot be used to establish causation because those standards are prophylactic in nature, and may be based upon evidence that gives rise only to a suspicion of causation. (See *Matrixx Initiatives, Inc. v. Siracusano* (2011) 563 U.S. 27 [131 S.Ct. 1309, 1320] [regulatory agency often makes regulatory decisions based upon evidence that gives rise only to a suspicion of causation]; *McClain v. Metabolife Intern., Inc.* (11th Cir. 2005) 401 F.3d 1233, 1250 [public health guidelines cannot be used to establish causation because they are based upon evidence that points to a need for caution rather than proof of a causal relationship]; *Rider v. Sandoz Pharmaceuticals Corp.* (11th Cir. 2002) 295 F.3d 1194, 1201 [improper for medical causation expert to rely upon FDA statement withdrawing approval of drug for some purposes because FDA used a risk-utility analysis, which involves a much lower standard than required to show legal causation].) Honeywell also observes that even if regulatory standards could be used to support an expert's opinion, the OSHA standards for exposure to asbestos do not distinguish between different types of asbestos (or the toxicity of those different types), and in any event, Dr. Strauchen did not determine whether Davis' exposure from the Bendix brake linings exceeded the OSHA exposure limit.

Honeywell misconstrues Dr. Strauchen's references to the regulatory agencies and their standards. Dr. Strauchen did not rely upon the regulatory standards to develop his opinion; he testified that he relied upon his own research and the scientific literature regarding the relationship between asbestos exposure and mesothelioma and other lung diseases. He merely referred to OSHA and other

regulatory bodies to show that there is a consensus that all forms of asbestos are carcinogenic, and noted that OSHA, by indicating that there is no guarantee that disease does not occur below its prescribed exposure limit, acknowledges that there is no identified level of exposure below which disease does not occur. Those references do not render Dr. Strauchen's testimony inadmissible under *Sargon*.

Moreover, to the extent Dr. Strauchen relied upon *studies* conducted or relied upon by OSHA or any other regulatory agencies, his reliance was not improper. As the Eleventh Circuit noted in one of the cases Honeywell cites, the data regulatory agencies use to establish their standards “are useful for both . . . establishing guidelines for protection of public health and establishing “causation.”” (*McClain v. Metabolife Intern., Inc.*, *supra*, 401 F.3d at p. 1249.)

3. *Scientific Literature/Epidemiological Studies*

Honeywell argues that Dr. Strauchen's testimony was not supported by the materials he relied upon because he admitted there have been no studies at the low exposure level that Davis experienced from working with Bendix brake liners, and there are several epidemiological studies that have shown no association between employment as a motor vehicle mechanic and the risk of mesothelioma. It asserts that Dr. Strauchen improperly extrapolated down from studies involving high-dose exposures to amphibole asbestos to draw conclusions regarding low-dose exposures to chrysotile asbestos, and ignored the epidemiological studies, which it contends are the best evidence of causation in toxic tort cases.

However, Honeywell's arguments rest upon premises that are not correct. First, Dr. Strauchen's “admission” at trial was not exactly what Honeywell asserts. He was asked, “But there have been no studies at that low exposure level [meaning OSHA's exposure limit] that specifically have identified a minimum level of increased risk; isn't that true?” Dr. Strauchen responded that that was correct. But

this “admission” is not, as Honeywell implies, an admission that there have been no studies of the association between mesothelioma and the kind of low dose exposure Davis experienced. In fact, when asked at his deposition what scientific articles he relied upon in reaching his opinion that Davis’ work with brake dust caused his mesothelioma, Dr. Strauchen (who noted that he could not name off the top of his head all of the studies he reviewed) named three studies.^{7 8}

One of the named studies, by Jacques Ameille and other French scientists, was published in *The Annals of Occupational Hygiene* in 2012. The scientists studied 103 French automobile mechanics with no other known occupational exposure to asbestos and found a five percent incidence of pleural plaques. (Ameille, et al., *Asbestos-Related Diseases in Automobile Mechanics* (2011) 56 Ann.Occup.Hyg. 55-60.) Dr. Strauchen testified that if the levels of exposure are enough to cause pleural plaques, they would be high enough to cause mesothelioma.

The second study that Dr. Strauchen identified was a cancer registry study in Massachusetts. That study, by Cora R. Roelofs and other scientists, was published in the *American Journal of Industrial Medicine* in 2013, and was based upon an examination of mesothelioma and other cancer cases recorded in the Massachusetts Cancer Registry (the MCR) from 1988 to 2003. (Roelofs, et al., *Mesothelioma and*

⁷ At oral argument, counsel for Honeywell argued that we should consider only the testimony at trial, and noted that Dr. Strauchen did not cite these studies in his trial testimony. But Honeywell moved to exclude Dr. Strauchen’s testimony based upon his (and Dr. Rom’s) *deposition* testimony, and we are reviewing the trial court’s denial of that motion. Thus, we must look to the deposition testimony “to ‘determine whether, as a matter of logic, the studies and other information cited by experts adequately support the conclusion that the expert’s general theory or technique is valid.’” (*Sargon, supra*, 55 Cal.4th at p. 772.)

⁸ Dr. Rom also testified at his deposition that there have been studies that describe the risk of mesothelioma at low-dose exposures.

Employment in Massachusetts: Analysis of Cancer Registry Data 1988-2003 (2013) 56 Am.J.Ind.Med. 985-992.) Since 1982, all hospitals or organizations holding a clinical license in Massachusetts have been required to report newly diagnosed cancer cases to the MCR, with diagnostic and demographic information, including descriptions of the patient's usual occupation and industry. Using this data, the authors of the study examined the association between mesothelioma incidence and usual occupation and industry, and found that 17 occupations – including automobile mechanics – had statistically significant elevated “Standardized Morbidity Odds Ratios” for mesothelioma. Although the authors noted that a major limitation of a cancer registry-based surveillance study is that the reported usual occupation and industry may not include all possible sources of asbestos exposures, they nevertheless concluded that their findings support the continued monitoring of automobile mechanics and efforts to prevent their exposure to asbestos.

The third study Dr. Strauchen identified, by James Leigh and other scientists, analyzed data from the Australian Mesothelioma Surveillance Program and the Australian Mesothelioma Register. (Leigh, et al., *Malignant Mesothelioma in Australia, 1945-2000* (2002) 46 Ann.Occup.Hyg. 160-165.) According to the authors, Australia has one of the world's most complete national surveillance systems for mesothelioma, which has been in operation since January 1980. (*Id.* at p. 160.) Cases of mesothelioma are reported to the Australian Mesothelioma Register (from 1980 to 1986, the cases were reported to the Australian Mesothelioma Surveillance Program), and a full occupational and environmental history is obtained for each case from the patient or next of kin. (*Id.* at pp. 160-161.) The authors investigated, among other things, associations between mesothelioma and occupational and environmental asbestos exposure histories, and lifetime risks for mesothelioma in different exposure categories. They found that

four percent of the cases reported had exposure only to chrysotile. (*Id.* at p. 164.) They also found that two percent of the cases had exposure to brake linings. (*Ibid.*) Finally, they found that the lifetime risk of mesothelioma for vehicle mechanics was nearly double that of all Australian men. (*Ibid.*)

In addition to those three studies, Dr. Strauchen also pointed to an article by Dr. Richard Lemen, the former Assistant Surgeon General with the United States Public Health Service and retired Deputy Director and Acting Director of the National Institute for Occupational Safety and Health. Dr. Lemen's article, which was published in the *American Journal of Industrial Medicine* in 2004, discussed studies that looked at the decomposition of asbestos fibers in brake linings, the toxicity of short chrysotile asbestos fibers (Dr. Lemen noted that some studies have reported that the majority of chrysotile fibers from brakes that remain during decomposition are short fibers), and exposure levels of asbestos released from brakes. Dr. Lemen also discussed the evidence of disease in persons exposed to asbestos from brakes, including evidence from epidemiological studies and numerous case reports of people with mesothelioma or other asbestos-related diseases who were exposed to chrysotile asbestos through brake work. (Lemen, *Asbestos in Brakes: Exposure and Risk of Disease* (2004) 45 Am.J.Ind.Med. 229.)

These studies and article belie Honeywell's assertion that Dr. Strauchen admitted there are no studies of the association between mesothelioma and the kind of low dose exposure Davis experienced from Bendix brake linings.

The second faulty premise for Honeywell's argument that there is no scientific support for Dr. Strauchen's opinion testimony is its assertion regarding epidemiological studies. While Honeywell is generally correct that in many (or even most) instances epidemiological studies provide the best evidence of causation, its implied argument that it is improper for an expert to rely upon any

other tools to determine causation, such as case reports,⁹ is not universally accepted. Indeed, a well-regarded textbook on occupational epidemiology observes that “[c]ase series reports are particularly informative in situations where there are identified occurrences of very rare conditions for which there are few, if any, established causal factors. . . . In fact, recognition of even a small number of cases of the ‘sentinel’ diseases – such as liver angiosarcoma and malignant mesothelioma, which is strongly related to asbestos exposure [citation] – can sometimes be invoked as prima facie evidence of exposure to the putative causal agent.” (Occupational Epidemiology, *supra*, at p. 60.) The textbook goes on to discuss other kinds of epidemiological studies, such as cohort studies and case-control studies (i.e., the kinds of studies that Honeywell asserts are the best evidence of causation) and concludes that case series reports can be sufficient by themselves for drawing conclusions regarding causation for diseases, like mesothelioma, that are very rare with one major causal factor: “Case series reports can be virtually conclusive in their own right when the health outcome identified is a very rare disease or an uncommon manifestation of a relatively common condition.” (*Id.* at p. 78.)

In short, Honeywell’s assertion that Dr. Strauchen’s testimony was not supported by the materials he relied upon is not correct. Although Honeywell – and others – may disagree about the methods used in those materials or the conclusions Dr. Strauchen drew from them (see, e.g., Anderson, et al., *The “Any Exposure” Theory Round II – Court Review of Minimal Exposure Expert*

⁹ Case reports are reports by a clinician of the occurrence of a disease in a particular individual. When there are multiple case reports regarding an unusual occurrence of a certain disease among a group, the study is referred to as a case series report. (H. Checkoway, et al., *Research Methods in Occupational Epidemiology* (2d ed. 2004) p. 59 (Occupational Epidemiology).)

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Kan.J.L.&Pub.Pol’y 1), many members of the scientific community do not (see, e.g., Welch, et al., *Asbestos Exposure Causes Mesothelioma, But Not This Asbestos Exposure: An Amicus Brief to the Michigan Supreme Court* (2007) 13 Int.J.Occup.Environ.Health 318).

We caution that our discussion of the materials Dr. Strauchen relied upon should not be seen as approval of either side in that scientific dispute. Rather, we rely upon the rule of *Sargon* that although trial courts “have a substantial ‘gatekeeping’ responsibility” in evaluating proposed expert opinion (*Sargon, supra*, 55 Cal.4th at p. 769), the gate tended is not a partisan checkpoint. It bars expert opinion only if it fails to meet the minimum qualifications for admission. If the opinion is based on materials on which the expert may reasonably rely in forming the opinion, and flows in a reasoned chain of logic from those materials rather than from speculation or conjecture, the opinion may pass, even though the trial court or other experts disagree with its conclusion or the methods and materials used to reach it. (*Id.* at pp. 771-772.) The aim, as we have stated, is not to admit only persuasive expert opinion; it is to exclude only “‘clearly invalid and unreliable’ expert opinion,” that is, opinion that does not employ the “‘same level of intellectual rigor that characterizes the practice of an expert in the relevant field.’ [Citation.]” (*Id.* at p. 772.) Here, it is clear that there is support in the scientific literature for Dr. Strauchen’s expert opinion, and it cannot be said that his opinion fails to adhere to standards applicable to his field of expertise.

4. *California Causation Law*

In Honeywell’s final challenge to Dr. Strauchen’s testimony, it argues that the “every exposure” theory does not satisfy the Supreme Court’s direction in *Rutherford* that a causation analysis must proceed from an estimate concerning

how great a dose was received. (Citing *Rutherford, supra*, 16 Cal.4th at pp. 969, 975, 982.) Because Dr. Strauchen did not attempt to undertake any “dose level estimations” and was not provided with a “dose level estimation,” Honeywell argues that Dr. Strauchen did not comply with *Rutherford*.

However, contrary to *Honeywell’s* assertion, *Rutherford* does not require a “dose level estimation.” Instead, it requires a determination, to a reasonable medical probability, that the plaintiff’s (or decedent’s) exposure to the defendant’s asbestos-containing product was a substantial factor in contributing to the risk of developing mesothelioma. (*Rutherford, supra*, 16 Cal.4th at pp. 976-977.) The *Rutherford* court itself acknowledged that a plaintiff may satisfy this requirement through the presentation of expert witness testimony that “each exposure, even a relatively small one, contributed to the occupational ‘dose’ and hence to the risk of cancer.” (*Id.* at p. 984.)

In any event, in this case, Dr. Strauchen was presented with a hypothetical based on the facts surrounding Davis’ exposure to dust from his work on Bendix brake linings, and testified as to estimates of the amount of asbestos fibers contained in visible dust. Therefore, his conclusion that Davis’ exposure to Bendix brake linings was a substantial factor in contributing to the risk of mesothelioma was not based simply on “any exposure” to asbestos, but instead related to an estimate of actual exposure.

5. *Cases From Other Jurisdictions*

As additional support for its argument that the “every exposure” theory should be rejected by this court, Honeywell points to cases from other jurisdictions in which courts have rejected that theory. (Citing, among other cases, *Betz v. Pneumo Abex, LLC* (2012) 615 Pa. 504 [44 A.3d 27] (*Betz*); *Bostic v. Georgia-Pacific Corp.* (Tex. 2014) 439 S.W.3d 332 (*Bostic*); *Moeller v. Garlock Sealing*

Technologies, LLC (6th Cir. 2011) 660 F.3d 950 (*Moeller*.) We are not convinced.

First, and foremost, we are bound by our Supreme Court, which issued a clear statement of a plaintiff’s burden in an asbestos-related cancer case – to demonstrate that the defendant’s product was a substantial factor in contributing to the plaintiff’s aggregate dose of asbestos and hence to the risk of developing mesothelioma – and *affirmed* the judgment in favor of the plaintiff where the plaintiff met her burden through an expert witness who testified that each exposure to asbestos contributed to the aggregate dose and hence to the risk of cancer. (*Rutherford, supra*, 16 Cal.4th at pp. 976-977, 984.)

Second, the standards required by other jurisdictions for establishing causation differ from those in California. For example, in Texas, “in the absence of direct proof of causation, establishing causation in fact against a defendant in an asbestos-related disease case requires scientifically reliable proof that the plaintiff’s exposure to the defendant’s product more than doubled his risk of contracting the disease.” (*Bostic, supra*, 439 S.W.3d at p. 350.) There is no such requirement in California. Similarly, under Kentucky law (which governed *Moeller*), a plaintiff in an asbestos-related disease case must show that exposure to the defendant’s asbestos-containing product was a substantial cause of the disease – i.e., that it was “the probable cause, as opposed to a possible cause” (*Moeller, supra*, 660 F.3d at p. 954) – and therefore a plaintiff cannot prevail by showing only that his exposure may have *contributed* to his disease. (*Id.* at p. 955.) In contrast, our Supreme Court has held that the plaintiff need not “demonstrate that fibers from the defendant’s particular product were the ones, or among the ones, that *actually* produced the malignant growth,” (*Rutherford, supra*, 16 Cal.4th at p. 977), and may prevail by demonstrating that the defendant’s product was a

substantial factor in contributing to the *risk* of developing asbestos-related cancer. (*Id.* at pp. 976-977.)

Finally, we simply disagree with courts in other jurisdictions that conclude the “every exposure” theory cannot be reconciled with the fact that mesothelioma and other asbestos-related diseases are dose dependent. (See, e.g., *Betz*, *supra*, 615 Pa. at pp. 546, 550 [44 A.3d at pp. 53, 56]; *Bostic*, *supra*, 439 S.W.3d at pp. 338-339.) As we discussed in section A.1., *ante*, if (as in this case) the expert testifies that asbestos exposure is cumulative because the fibers remain in the lungs for a long period of time, it is not illogical to conclude that each exposure, when added to other exposures, can result in a cumulative exposure sufficient to cause mesothelioma or other asbestos-related diseases, and therefore each exposure is a substantial factor in contributing to the disease. Indeed, our Supreme Court has expressly stated that “[a]lthough the plaintiff must, in accordance with traditional tort principles, demonstrate to a reasonable medical probability that a product or products supplied by the defendant, to which he became exposed, were a substantial factor in causing his disease or risk of injuries, he is free to further establish that his particular asbestos disease is cumulative in nature, with many separate exposures each having constituted a ‘substantial factor’ [citation] that contributed to his risk of injury.” (*Rutherford*, *supra*, 16 Cal.4th at p. 958.)

B. *Denial of Honeywell’s Proposed Jury Instruction*

As noted, Honeywell proposed a special jury instruction on causation, which the trial court refused to give.¹⁰ Honeywell contends the trial court’s refusal to

¹⁰ The proposed instruction stated: “The parties dispute whether Sam Davis’s claimed exposure to asbestos-containing Bendix brakes was a substantial factor in causing his mesothelioma. [¶] Many factors are relevant in assessing the medical probability that any alleged asbestos exposure was a substantial factor in causing an injury. These factors include the type of asbestos, the nature of the exposure, the

give the proposed instruction was error, and that Honeywell was prejudiced by that error. We find there was no error.

“A party is entitled upon request to correct, nonargumentative instructions on every theory of the case advanced by him which is supported by substantial evidence.’ [Citation.]” (*Major v. Western Home Ins. Co.* (2009) 169 Cal.App.4th 1197, 1217.) “[T]he duty of the court is fully discharged if the instructions given by the court embrace all the points of the law arising in the case. [Citations.] [¶] A party is not entitled to have the jury instructed in any particular phraseology and may not complain on the ground that his requested instructions are refused if the court correctly gives the substance of the law applicable to the case. [Citation.]” (*Hyatt v. Sierra Boat Co.* (1978) 79 Cal.App.3d 325, 335; see also *Fibreboard Paper Products Corp. v. East Bay Union of Machinists* (1964) 227 Cal.App.2d 675, 719 [“Error cannot be predicated on the trial court’s refusal to give a requested instruction if the subject matter is substantially covered by the instructions given”].) We review the legal adequacy of jury instructions under the de novo standard of review. (*Isip v. Mercedes-Benz USA, LLC* (2007) 155 Cal.App.4th 19, 24.)

In this case, Honeywell argues the trial court’s refusal to give its proposed instruction was error because the instruction set forth “the requirement in *Rutherford* that causation be decided by taking into account ‘the length, frequency, proximity and intensity of exposure, the peculiar properties of the individual product, [and] any other potential causes to which the disease could be attributed.’” (Quoting *Rutherford, supra*, 16 Cal.4th at p. 975.) But *Rutherford* does not require the jury to take these factors into account when deciding whether a plaintiff’s exposure to an asbestos-containing product was a substantial factor in causing

frequency of exposure, the regularity of exposure, the duration of exposure, the proximity of the asbestos-containing product, and the type of asbestos-containing product.”

mesothelioma. Instead, those factors are ones that a medical expert may rely upon in forming his or her expert medical opinion.

The language Honeywell quotes appears in the Supreme Court's discussion of "the medical problems and uncertainties accompanying factual proof of causation in an asbestos cancer case" (*Rutherford, supra*, 16 Cal.4th at p. 974), in the context of determining whether it is appropriate to shift the burden of proof from the plaintiff to the defendant, and require the defendant to prove that its product was not a cause of the plaintiff's mesothelioma. The Court noted that "[a]t the most fundamental level, there is scientific uncertainty regarding the biological mechanisms by which inhalation of certain microscopic fibers of asbestos leads to lung cancer and mesothelioma." (*Ibid.*) The Court observed there is a question whether lung cancer and mesothelioma are caused by a single fiber or group of fibers that causes the formation of a tumor, or whether each episode of scarring by fibers contributes cumulatively to the formation of a tumor or the conditions allowing such a formation. (*Id.* at pp. 974-975.) Next, the Court noted, "[a]part from the uncertainty of the causation, at a much more concrete level uncertainty frequently exists whether the plaintiff was even exposed to dangerous fibers from a product produced, distributed or installed by a particular defendant. . . . [¶] Finally, at a level of abstraction somewhere between the historical question of exposure and the unknown biology of carcinogenesis, the question arises whether the risk of cancer created by a plaintiff's exposure to a particular asbestos-containing product was significant enough to be considered a legal cause of the disease. Taking into account the length, frequency, proximity and intensity of exposure, the peculiar properties of the individual product, any other potential causes to which the disease could be attributed (e.g., other asbestos products, cigarette smoking), and perhaps other factors affecting the assessment of comparative risk, should inhalation of fibers from the particular product be deemed

a ‘substantial factor’ in causing the cancer?’” (*Id.* at p. 975.) The Court concluded that “[p]laintiffs cannot be expected to prove the scientifically unknown details of carcinogenesis, or trace the unknowable path of a given asbestos fiber. But the impossibility of such proof does not dictate use of a burden shift. Instead, we can bridge this gap in the humanly knowable by holding that plaintiffs may prove causation in asbestos-related cancer cases by demonstrating that the plaintiff’s exposure to 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, without the need to demonstrate that fibers from the defendant’s particular product were the ones, or among the ones, that *actually* produced the malignant growth.” (*Id.* at pp. 976-977, fn. omitted.)

Following this discussion, the Supreme Court discussed how the jury should be instructed. It noted that “[t]he generally applicable standard instructions on causation [i.e., BAJI Nos. 3.76 and 3.77] are insufficient” because they do not “inform the jury that, in asbestos-related cancer cases, a particular asbestos-containing product is deemed to be a substantial factor in bringing about the injury if its contribution to the plaintiff or decedent’s *risk* or *probability* of developing cancer was substantial.” (*Rutherford, supra*, 16 Cal.4th at p. 977.) Therefore, the Court instructed that “the jury should be told that the plaintiff’s or decedent’s exposure to a particular product was a substantial factor in causing or bringing about the disease if in reasonable medical probability it was a substantial factor contributing to plaintiff’s or decedent’s *risk* of developing cancer.” (*Ibid.*)

The instructions given to the jury in this case included such an instruction. The jury was instructed that “[a] substantial factor in causing harm is a factor that a reasonable person would consider to have contributed to the harm. It does not have to be the only cause of the harm. [¶] Nickole Davis may prove that exposure

to asbestos from Honeywell International Inc.’s product was a substantial factor causing Sam Davis’ illness by showing, through expert testimony, that there is a reasonable medical probability that the exposure was a substantial factor contributing to his risk of developing cancer.”

Honeywell’s proposed instruction was unnecessary because it was not directed to facts that the jury was required to decide. While Honeywell was free to discuss during its closing argument the factors set forth in its proposed instruction as factors the jury might consider in assessing the credibility of Dr. Strauchen’s opinion testimony, instructing the jury on those factors was not required. The fact that the jury asked for further instruction on the meaning of “substantial” as it related to “a substantial factor in causing Sam Davis’ mesothelioma” and asked whether it could strike the word “substantial” from the special verdict form does not demonstrate, as Honeywell suggests, that the proposed instruction would have helped to avoid the jury’s confusion. Rather, the jury’s questions simply suggest that at least some of the jurors initially were uncertain about how important a factor Davis’ exposure from Bendix’s brake linings needed to be in order to be deemed a “substantial” factor in causing his mesothelioma. Honeywell’s proposed instruction did not address this uncertainty.

In short, because we find the jury was properly instructed on causation, the trial court’s refusal to give Honeywell’s proposed instruction was not error.

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DISPOSITION

The judgment is affirmed. Plaintiff shall recover her costs on appeal.

CERTIFIED FOR PUBLICATION

WILLHITE, Acting P. J.

We concur:

MANELLA, J.

COLLINS, J.