

**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF ALABAMA  
NORTHEASTERN DIVISION**

<b>MELISSA ANN BOBO and</b>	)	
<b>SHARON JEAN COX, as</b>	)	
<b>Co-Personal Representatives of the</b>	)	
<b>Estate of Barbara Bobo,</b>	)	
	)	
<b>Plaintiffs,</b>	)	
	)	
<b>vs.</b>	)	<b>Civil Action No. CV 12-S-1930-NE</b>
	)	
<b>TENNESSEE VALLEY</b>	)	
<b>AUTHORITY,</b>	)	
	)	
<b>Defendant.</b>	)	

**MEMORANDUM OPINION AND ORDER**

Barbara Bobo commenced this action against nine defendants.<sup>1</sup> Eight of those were dismissed pursuant to stipulations for dismissal,<sup>2</sup> leaving only her claims against

---

<sup>1</sup> See doc. no. 1 (Complaint), asserting claims against: (i) Agco Corporation, *formerly known as Allis Calmers Company, sued as successor to Massey Ferguson Limited* (“Agco”); (ii) CBS Corporation, *formerly known as Viacom, Inc., sued as successor-by-merger to CBS Corporation, formerly known as Westinghouse Electric Corporation* (“CBS”); (iii) Conopco, Inc., *doing business as Unilever United States, Inc., sued individually and as successor-by-merger to Helene Curtis Industries, Inc.* (“Conopco”); (iv) Consolidated Aluminum Corporation, *also known as Conlaco, Inc. (“Consolidated Aluminum”)*; (v) Dana Companies LLC, *sued individually and as successor-in-interest to Victor Gasket Manufacturing Company* (“Dana”); (vi) Ford Motor Company (“Ford”); (vii) Metropolitan Life Insurance Company (“MetLife”); (viii) TVA; and (ix) Unilever United States, Inc., *sued individually and as successor-by-merger to Helene Curtis Industries, Inc.* (“Unilever”).

<sup>2</sup> The following claims were dismissed in accordance with stipulations of dismissal filed by Mrs. Bobo and the defendants noted: doc. no. 18 (Ford); doc. no. 19 (Order Dismissing Ford); doc. no. 44 (AGCO); doc. no. 45 (Order Dismissing AGCO); doc. no. 47 (Conopco and Unilever); doc. no. 48 (Order Dismissing Conopco and Unilever); doc. no. 53 (Consolidated Aluminum); doc. no. 56 (Order Dismissing Consolidated Aluminum); doc. no. 60 (CBS); doc. no. 61 (Order Dismissing CBS); doc. no. 62 (Dana Companies); doc. no. 64 (Order Dismissing Dana Companies); doc. no. 78 (MetLife); doc. no. 79 (Order Dismissing MetLife).

the Tennessee Valley Authority (“TVA”). Plaintiffs, who are the co-personal representatives of the estate of Mrs. Bobo,<sup>3</sup> maintain a variety of claims against TVA based on Mrs. Bobo’s contraction of pleural mesothelioma from laundering her husband’s work clothes, purportedly containing asbestos dust originating from his job duties at TVA’s Browns Ferry Nuclear power general facility in Limestone County, Alabama. The action is presently before the court on TVA’s motions to exclude the specific causation opinions of Doctors Virginia Wells Wulsin and Eugene Mark.<sup>4</sup> For the following reasons, the motion to exclude the specific causation opinion of Dr. Victoria Wulsin is MOOT, and the motion to exclude the specific causation opinion of Dr. Eugene Mark is DENIED.

### **I. Motion to Exclude the Testimony of Dr. Virginia Wells Wulsin**

TVA contends that the testimony of Dr. Virginia Wells Wulsin should be excluded because she failed to consider other potential exposure sources, and she “fail[ed] to bridge the analytical gap” between her opinions in this case and the scientific evidence upon which she relied.<sup>5</sup> In response, plaintiffs state that they have “elected not to offer any specific causation testimony from Dr. Wulsin.”<sup>6</sup> Rather,

---

<sup>3</sup> See doc. no. 179 (Order substituting parties).

<sup>4</sup> Doc. no. 129.

<sup>5</sup> Doc. no. 130 (Brief in Support of TVA’s Motion to Exclude the Specific Causation Opinions of Doctors Wulsin and Mark), at 1-2 (alteration supplied).

<sup>6</sup> Doc. no. 133 (Plaintiffs’ Memorandum in Opposition to Defendant Tennessee Valley

plaintiffs assert that Dr. Wulsin will *only* testify concerning issues of general causation, including the topics of the relevant epidemiological literature, state of the art, public health, and regulatory matters.<sup>7</sup> Based upon plaintiffs' certification that Dr. Wulsin "will not testify that Barbara Bobo's mesothelioma was specifically caused by her exposure to asbestos originating at TVA,"<sup>8</sup> the court finds TVA's motion to exclude Dr. Wulsin's specific causation opinion moot.

## **II. Motion to Exclude the Testimony of Dr. Eugene Mark**

TVA next argues that Dr. Eugene Mark's testimony should be excluded on the grounds that his "every exposure" or "single fiber" causation theory lacks a reliable scientific foundation, and that he failed to sufficiently connect his opinions in this case to the scientific evidence upon which he relied.<sup>9</sup>

Federal Rule of Evidence 702 provides that:

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

(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to

---

Authority's Motion to Exclude the Specific Causation Opinions of Doctors Wulsin and Mark), at 1.

<sup>7</sup> *Id.*

<sup>8</sup> *Id.*

<sup>9</sup> Doc. no. 130 (Brief in Support of TVA's Motion to Exclude the Specific Causation Opinions of Doctors Wulsin and Mark), at 1-2.

determine a fact in issue;

(b) the testimony is based on sufficient facts or data;

(c) the testimony is the product of reliable principles and methods;  
and

(d) the expert has reliably applied the principles and methods to  
the facts of the case.

Fed. R. Evid. 702. That rule compels district courts to “conduct an exacting analysis of the foundations of the expert opinions to ensure they meet the standards for admissibility under Rule 702.” *United States v. Abreu*, 406 F.3d 1304, 1306 (11th Cir. 2005) (quoting *United States v. Frazier*, 387 F.3d 1244, 1260 (11th Cir. 2004) (internal quotation mark and emphasis omitted)).

[T]he objective of that requirement is to ensure the reliability and relevancy of expert testimony. It 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.

*Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 152 (1999) (alteration supplied).

“The inquiry . . . is a flexible one,” because “[m]any factors will bear on the inquiry, and . . . [there is no] definitive checklist or test.” *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 593-94 (1993) (alterations supplied). Factors

that may be relevant include:

(1) whether the theory or technique can be (and has been) tested, (2)

whether the theory or technique has been subjected to peer review and publication, (3) in the case of a particular . . . technique, the known or potential rate of error, and (4) whether the theory or technique is generally accepted by the relevant . . . community.

*Hendrix ex rel. G.P. v. Evenflo Co., Inc.*, 609 F.3d 1183, 1194 (11th Cir. 2010)

(internal quotation marks and alterations omitted).<sup>10</sup>

### **1. Dr. Mark's background and qualifications**

Dr. Mark obtained his medical degree from Harvard Medical School in Boston, Massachusetts.<sup>11</sup> He completed a one-year internship in internal medicine at Stanford University Medical Center in Palo Alto, California, and four years of residency in anatomic and clinical pathology at Massachusetts General Hospital in Boston, Massachusetts.<sup>12</sup> Dr. Mark is licensed to practice medicine in Massachusetts, and is

---

<sup>10</sup> Additional factors that may be taken into account by a district court include:

(1) Whether the expert is proposing to testify about matters growing naturally and directly out of research he has conducted independent of the litigation, or whether he has developed his opinion expressly for purposes of testifying;

(2) Whether the expert has unjustifiably extrapolated from an accepted to an unfounded conclusion;

(3) Whether the expert is being as careful as he would be in his regular professional work outside his paid litigation consulting;

(4) Whether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give.

Fed. R. Evid. 702 advisory committee's note to 2000 amendments (internal citations omitted).

<sup>11</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 2.

<sup>12</sup> *Id.*

board-certified in pathologic anatomy, clinical pathology, and dermatopathology.<sup>13</sup> He is currently a physician and a pathologist at Massachusetts General Hospital.<sup>14</sup>

The pathology department of Massachusetts General Hospital receives numerous lung biopsies every day because of the medical, surgical, oncology, and lung transplant services provided.<sup>15</sup> As director of the lung pathology service, Dr. Mark primarily receives, and then examines, biopsies of lung tissue.<sup>16</sup> In the course of his career, Dr. Mark has diagnosed or reviewed a few thousand cases for the presence of an asbestos-related disease.<sup>17</sup>

Dr. Mark is also a professor of pathology at Harvard Medical School.<sup>18</sup> He leads classes at a variety of levels, including training medical students, physicians, and nurses.<sup>19</sup> Further, Dr. Mark is a District Medical Examiner for the Commonwealth of Massachusetts.<sup>20</sup> He has also served on the editorial boards for various professional medical journals, including *Human Pathology*, *International Journal of Pathology*, *Archives of Pathology and Laboratory Medicine*, and *American Journal of Industrial*

---

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 2.

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

*Medicine*.<sup>21</sup> In addition, he has authored two books and published more than 150 original articles and 300 case records in the *New England Journal of Medicine*.<sup>22</sup> Many of those publications addressed diffuse malignant mesothelioma and its causes.<sup>23</sup>

Finally, Dr. Mark is the senior director of an annual week-long pathology course that is attended by pathologists from around the world.<sup>24</sup> The syllabus for that course includes many facets of surgical pathology, including pulmonary diseases such as those caused by asbestos exposure.<sup>25</sup>

## **2. Dr. Mark's report**

Dr. Mark submitted an expert report on April 18, 2013, and opined that “Mrs. Bobo’s exposure to asbestos fibers brought home on her husband’s clothing while he worked at the TVA was a substantial contributing factor and a medical cause in the development of her diffuse malignant mesothelioma of the pleura.”<sup>26</sup> He indicated that his conclusions were based upon a review of materials produced during the course of this litigation, as well as upon the basis of the scientific and medical

---

<sup>21</sup> *Id.* at 3.

<sup>22</sup> *Id.*

<sup>23</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 3.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.* at 27.

literature discussed in his report, and his training, education, and experience.<sup>27</sup>

Dr. Mark's conclusion that Barbara Bobo's exposure to asbestos fibers brought home on her husband's clothing was a substantial contributing factor in the development of her mesothelioma was based on several factors, including the following considerations:

- Ms. Barbara Bobo developed a diffuse malignant mesothelioma of the pleura;
- According to the depositions, work history sheets, and medical records, Ms. Bobo was exposed to asbestos through laundering her husband's work clothing. Her husband, Neil Bobo, worked for the Tennessee Valley Authority as a laborer. His job involved working around insulation as well as sweeping insulation materials up from the ground. His work activities at the Tennessee Valley Authority resulted in him bringing asbestos fibers home on his clothing.
- Mrs. Barbara Bobo testified about the visible dust that was created when she shook out Neil Bobo's work clothes prior to washing them. Visible dust creates exposures of 5 million particles or more of cubic air.
- All of the exposures to asbestos described here which took place prior to the occurrence of the malignancy are the types that have been proven by scientific evidence in their accumulation to cause diffuse malignant mesothelioma . . . .<sup>28</sup>

**a. Diffuse malignant mesothelioma**

---

<sup>27</sup> *Id.* at 3.

<sup>28</sup> *Id.* at 1-2.

Diffuse malignant mesothelioma is considered a “signal tumor” for asbestos exposure, because “[t]he causation link between asbestos exposure and diffuse malignant mesothelioma is so well established that when [the disease develops] it ‘signals’ prior asbestos exposure . . . .”<sup>29</sup> Therefore, Dr. Mark concluded that diffuse malignant mesothelioma is different from most other cancers, because the development of the disease itself reveals the cause to a reasonable degree of medical certainty.<sup>30</sup>

**b. Barbara Bobo’s exposure to asbestos**

In analyzing Mrs. Bobo’s alleged exposure to asbestos as a result of laundering her husband’s work clothing, Dr. Mark relied on the deposition testimony of James Bobo, Barbara Bobo, Jimmy Myhan, and Priscilla Carthen.<sup>31</sup>

Dr. Mark began this section of his report by providing the following summary of James Bobo’s work history with TVA:

On April 15, 1975, Neil Bobo began his employment with the

---

<sup>29</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 1-2 (alterations supplied).

<sup>30</sup> *Id.* at 9-10.

<sup>31</sup> James Bobo’s deposition testimony may constitute inadmissible hearsay. Even so, “expert opinions based on otherwise inadmissible hearsay” may be admitted, “if the facts or data are ‘of the type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject.’” *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 595 (1993) (citing Fed. R. Evid. 703). Upon consideration, this court finds that the contents of James Bobo’s deposition are “of the type reasonably relied upon by experts” in Dr. Mark’s field. *Id.*

Tennessee Valley Authority, at the Browns Ferry Nuclear Plant in Athens, Alabama. He was employed as a laborer throughout his entire employment with the Tennessee Valley Authority[.] Mr. Bobo was the laborer assigned to the crafts like the insulators that put up insulation. On occasion, he would help the insulators, but most often he just swept up the insulation that was torn off the pipes off the floor. One of the brands of pipe covering he cleaned up at the TVA was Kaylo pipe covering[.] Mr. Bobo first saw a box of Kaylo pipe covering when he started at the TVA in 1975. The Kaylo insulation was half-moon shaped, brownish on the inside, and rough to the touch. He first saw an Insulag bag when he first started at the TVA. Mr. Bobo was around when the insulators would mix the Insulag with water in a skip pan. This happened on more than 10 occasions, maybe even 50 times. Sweeping up after the insulators was one of the dusty tasks he performed.

Mr. Bobo remembered working with gaskets and packing during his time at the TVA, including sheet gasketing. He occasionally cut gaskets and helped remove a gasket, but his primary involvement with gaskets involved throwing away the scraps. Mr. Bobo first saw sheet gasketing when he began at the TVA in 1975. He remembers his coworkers cutting gaskets. Mr. Bobo also assisted the boilermakers by cleaning up after they used firebrick in the ovens and furnaces. He was also close by when the boilermakers had to cut the firebrick.

Mr. Jimmy Myhan was employed at the TVA Browns Ferry plant starting March 12, 1976. He remembered working alongside Mr. Bobo for a number of years beginning in approximately 1976. Mr. Myhan worked at Browns Ferry until 1993, except for [a] two year time period (between October 1978 – August 1980) where he left for other employment. Laborers [such as Mr. Bobo] at the Browns Ferry plant would work all over the plant, escorting visitors, standing fire watch, and primarily performing cleanup. The “plant side” laborers would do the clean up inside the plant and some of the outside buildings. The plant side laborers were typically annual (salaried) employees. The “outside” or “construction side” employees were typically paid hourly, and were in charge of construction outside of the buildings.

Mr. Myhan worked with Mr. Bobo, at times on the same crew, cleaning floors, wiping piping down, and changing laundry. Between 1976 and when Mr. Myhan left to work at another place, they would get job assignments to do various tasks, including clean up and sweeping the floors.

Approximately once a month, Mr. Bobo and Mr. Myhan worked together cleaning up insulation that had been removed from pumps and pipes overhead. The pipe insulation was brown and shaped like “half rounds” that fit together to cover the pipe. The white insulation covering the pipes had a chalk-like consistency. Mr. Myhan believed that the pipe insulation that he and Mr. Bobo cleaned up would have been the insulation installed in 1966 when the plant was built, because there would be no reason to change it. When they swept up the insulation, the dust from the insulation would become airborne and land everywhere, including Mr. Bobo’s clothes. They performed this cleanup work all over the plant, in all three units.

Mr. Myhan now associates asbestos with several places at the Browns Ferry plant, including pipe insulation. The insulation was brown or white. Both Mr. Myhan and Mr. Bobo cleaned up insulation from pieces of equipment. At some point in time, the pipefitters were not allowed to work with certain potentially asbestos-containing equipment, but there was no such prohibition on the laborers that came up and cleaned the insulation behind them. The laborers would use brooms, rags and mops to clean up the insulation, which was dusty[.]

Other than radioactively contaminated (“C zone”) areas, employees of the Browns Ferry plant were not required to wear respiratory protection. In “C zones,” the laborers would wear white cloth coveralls, booties, gloves, a surgical cap and sometimes masks. When they came out of the C zone, the laborers would put their gloves and face mask in one bag, and their coveralls in another bag. If the laborers were not in a C zone, they would wear their street clothes to work, and wear their same street clothes home. Laborers, including Mr. Bobo, did not shower or do any personal clean up before going home. Mr. Bobo wore blue jeans and shirts to work. He wore the same clothes

home from work.<sup>32</sup>

Dr. Mark then turned to consider Barbara Bobo's exposure to asbestos as a result of laundering her husband's work clothes:

Barbara Bobo married James "Neal" Bobo on September 28, 1964. Mrs. Bobo was exposed to asbestos by washing her husband's work clothes. Mrs. Bobo washed her husband[']s clothes twice a week in the approximately four foot by five foot wash room located in the center of her house. First, she would walk around the house and pick up her husband's clothes wherever he laid them. Then[,] she would go into the washroom and shut the door, empty the pockets out, shake them out[,] and then put them in the washing machine. Shaking out the clothes caused dust to go in the air, and she breathed that dust. Mrs. Bobo would clean the floors of the washroom with a small broom and dust pan. Sweeping the floors also created airborne dust that Mrs. Bobo breathed.<sup>33</sup>

Dr. Mark then provided a list of various materials he had reviewed that discuss how asbestos fibers can be released from clothing while an individual performs household tasks, like those described by Mrs. Bobo.<sup>34</sup>

### **c. General causation opinions**

According to the report, "[a] reasoned and thorough and multi-disciplinary scientific approach" is necessary in determining the cause of a disease.<sup>35</sup> Such an

---

<sup>32</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 5-6 (alterations supplied) (internal citations to the record omitted).

<sup>33</sup> *Id.* at 6 (alterations supplied) (internal citations to the record omitted).

<sup>34</sup> *Id.* at 6-7.

<sup>35</sup> *Id.* at 8.

approach is often referred to as the “scientific method,”—*i.e.*, where a hypothesis is posed, such as the cause of a disease, and through repeated testing the hypothesis is either proven or disproven.<sup>36</sup>

Dr. Mark stated that he followed the scientific method in determining the cause of Mrs. Bobo’s diffuse malignant mesothelioma.<sup>37</sup> In applying that approach, Dr. Mark followed the “Hill Model” which includes nine criteria for establishing causation of a disease: “(1) strength of association; (2) temporality; (3) biologic gradient; (4) consistency; (5) specificity; (6) biologic plausibility; (7) coherence; (8) experimental evidence; and (9) analogy.”<sup>38</sup>

Strength of association reflects the strength of effect in a particular study.<sup>39</sup> Dr. Mark stated that “[i]n determining the association of diffuse malignant mesothelioma with exposure to asbestos, the medical and scientific community universally accepts the proposition that the overwhelming majority of diffuse malignant mesotheliomas are caused by asbestos.”<sup>40</sup> Specifically, he opined that more than ninety-nine percent of diffuse malignant mesothelioma cases in the United States are caused by exposures

---

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 8.

<sup>39</sup> *Id.*

<sup>40</sup> *Id.* (alteration supplied).

to asbestos.<sup>41</sup> Because the association between inhalation of asbestos dust and diffuse malignant mesothelioma is so strong, he reported that “proof of significant exposures is proof of specific causation.”<sup>42</sup> Further, Dr. Mark noted that studies have demonstrated that individuals exposed to asbestos through the work clothing of family members have contracted diffuse malignant mesothelioma.<sup>43</sup>

Temporality considers whether “the cause precede[d] the effect.”<sup>44</sup> Dr. Mark found this criteria satisfied, because malignant mesothelioma develops after exposure to asbestos.<sup>45</sup> As further proof of temporality, Dr. Mark noted that the disease did not exist prior to the commercial use of asbestos.<sup>46</sup>

Biologic gradient concerns “the existence of a dose-response relationship for the proposed association.”<sup>47</sup> In Dr. Mark’s opinion, diffuse malignant mesothelioma is a dose-response disease—*i.e.*, “the more someone is exposed to and thereby breathes asbestos, the greater his risk for developing diffuse malignant mesothelioma.”<sup>48</sup> Dr. Mark described the cumulative effect of the inhalation of

---

<sup>41</sup> *Id.* at 9.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.* at 8.

<sup>44</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 8 (alteration supplied).

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> *Id.* at 10.

asbestos fibers as follows:

The cumulative exposure that a diffuse malignant mesothelioma patient has received in his/her lifetime has impacted the lungs, and created a sequential series of cellular changes that eventuate in the diffuse malignant mesothelioma. This process takes place as fibers inhaled into the lungs are transported through the lung and genetic changes occur. Eventually in a person who develops diffuse malignant mesothelioma, there will be a conversion to a malignant phenotype, which then eventually grows into a tumor that presents clinically as a diffuse malignant mesothelioma.

Some asbestos fibers inhaled may be removed by the mucociliary escalator, some fibers will be deposited in the alveolar spaces, and some may be taken up by macrophages. Other fibers may work their way into the interstitium or make their way to the lymph nodes, pleura, or elsewhere in the body.

The more significant exposures to asbestos that a person has, the greater his/her chance of developing diffuse malignant mesothelioma, and all of these exposures contribute to the development of the disease.<sup>49</sup>

Consistency considers whether the association is repeatedly observed, even under varying circumstances.<sup>50</sup> Dr. Mark opined that diffuse malignant mesothelioma has developed following exposures to asbestos under a multitude of circumstances, including occupational, paraoccupational, and occult exposures.<sup>51</sup>

Specificity requires each cause to have a single effect.<sup>52</sup> Dr. Mark

---

<sup>49</sup> *Id.* at 10-11.

<sup>50</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 8.

<sup>51</sup> *Id.* at 8-9.

<sup>52</sup> *Id.* at 9.

acknowledged that this criteria is difficult to determine, because environmental carcinogens such as asbestos, can lead to many effects, including pleural plaques, lung cancer, and diffuse malignant mesothelioma.<sup>53</sup>

Biologic plausibility requires consideration of whether the cause produces an effect on the molecular level.<sup>54</sup> Dr. Mark opined that “asbestos fibers penetrate mesothelial cells, enter the nucleus and induce abnormal chromosome formation [by] dividing cells[,]” which is the type of molecular change known to produce cancers.<sup>55</sup>

Coherence considers “whether the association is consistent with what is known about the disease.”<sup>56</sup> Dr. Mark stated that the medical and scientific communities universally accept the idea that diffuse malignant mesothelioma is caused by asbestos exposure.<sup>57</sup>

Experimental evidence includes laboratory, animal, and observational pathology studies.<sup>58</sup> Dr. Mark reported that animal studies consistently show that exposure to asbestos, either through inhalation or injection, results in an increased number of diffuse malignant mesothelioma cases.<sup>59</sup>

---

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.* (alterations supplied).

<sup>56</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 9.

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

“Analogy is when one method of causing disease is analogized to another known method of causing a similar disease.”<sup>60</sup> Dr. Mark analogized the inhalation of asbestos fibers to the inhalation of cigarette smoke.<sup>61</sup>

**d. Specific causation opinions**

Dr. Mark then considered whether Barbara Bobo was exposed to asbestos at a level where diseases, such as mesothelioma, have previously occurred.<sup>62</sup> In making that determination, he examined whether Barbara Bobo’s exposures were similar to “exposures that have been documented to cause diffuse malignant mesothelioma in others . . . .”<sup>63</sup>

Dr. Mark began this discussion by stating that “[i]t is generally accepted in the scientific community that there is no known occupational or para-occupational level of asbestos exposure which has been shown not to contribute to the development of diffuse malignant mesothelioma.”<sup>64</sup> Indeed, cases have been reported in which the individual was only exposed to low levels of asbestos.<sup>65</sup> Therefore, Dr. Mark concluded that there is no known threshold or safe level of asbestos exposure, and

---

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 10-21.

<sup>63</sup> *Id.* at 10 (internal citation omitted).

<sup>64</sup> *Id.* at 15 (alteration supplied).

<sup>65</sup> *Id.*

that “a documented history of brief or low level exposure is sufficient to consider a mesothelioma as asbestos induced.”<sup>66</sup> In support of this conclusion, Dr. Mark relied on more than thirty different studies and documents, including the generally accepted attribution criteria of the Helsinki Report.<sup>67</sup>

Therefore, Dr. Mark opined that “it is the totality of significant exposures to asbestos that is the cause of the disease.”<sup>68</sup> In addition, because diffuse malignant mesothelioma is a dose-response disease, there is an inverse relationship between the amount of asbestos inhaled and the time period in which mesothelioma will develop.<sup>69</sup> Thus, as the level of exposure increases, the latency period decreases.<sup>70</sup>

In light of the foregoing, Dr. Mark opined that:

As each significant exposure to asbestos contributes to the total amount of asbestos that is inhaled, and in so doing shortens the necessary period for asbestos disease to develop, each significant exposure to asbestos is therefore a substantial contributing factor in the development of the diffuse malignant mesothelioma that actually occurred, when it occurred, in a given patient.<sup>71</sup>

---

<sup>66</sup> *Id.*

<sup>67</sup> *Id.* at 15-20. The Helsinki Consensus Report was published as a result of an international meeting regarding asbestos, asbestosis, and cancer, which took place in Helsinki, Finland in 1997. *Id.* at 17, n.3. The meeting was attended by nineteen individuals, including pathologists, radiologists, occupational and pulmonary physicians, epidemiologists, toxicologists, industrial hygienists, and clinical and laboratory scientists specializing in tissue fiber analysis. *Id.*

<sup>68</sup> Doc. no. 125 (Expert Report and Declaration of Eugene Mark, M.D.), at 26.

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

In applying that rationale to Barbara Bobo’s case, Dr. Mark concluded that she had a cumulative asbestos exposure that was substantial and in the range of exposures shown in the cited literature to cause diffuse malignant mesothelioma.<sup>72</sup> Therefore, Dr. Mark ultimately found that “with a reasonable degree of medical certainty [] Mrs. Bobo’s exposure to asbestos fibers brought home on her husband’s clothing while he worked at TVA was a substantial contributing factor and a medical cause in the development of her diffuse malignant mesothelioma of the pleura.”<sup>73</sup>

### **3. Analysis**

TVA raised two challenges to this court’s consideration of Dr. Mark’s opinion testimony when ruling upon its motion for summary judgment, as well as its admission at trial, in the event summary judgment should be denied. TVA first contends that Dr. Mark should be precluded from offering what it claimed to be “scientifically unreliable” testimony that any and every exposure to asbestos was “a substantial contributing factor in causing Barbara Bobo’s diffuse malignant mesothelioma.”<sup>74</sup> TVA also argues that Dr. Mark’s testimony should be excluded, because he “ha[s] no reliable scientific studies to support [his] opinions.”<sup>75</sup>

---

<sup>72</sup> *Id.*

<sup>73</sup> *Id.* at 27.

<sup>74</sup> Doc. no. 130 (Brief in Support of TVA’s Motion to Exclude the Specific Causation Opinions of Doctors Wulsin and Mark), at 5-6.

<sup>75</sup> *Id.* at 14 (alterations supplied).

In response, plaintiffs contend that Dr. Mark has not, and will not, testify that “every exposure” or a “single fiber” causes mesothelioma.<sup>76</sup> Instead, plaintiffs argue that Dr. Mark’s opinion was that each of Barbara Bobo’s “significant” exposures to asbestos, which occurred prior to the development of her mesothelioma, including those significant exposures arising from laundering her husband’s work clothes, was a substantial contributing factor in the development of her disease.<sup>77</sup> Plaintiffs further contend that Dr. Mark “relied on numerous studies regarding the amount of exposure measured from laundering asbestos-laden clothing, studies and case reports documenting the excess risk of mesothelioma from such household exposure, and epidemiological studies demonstrating that relatively low cumulative exposure levels have been shown to cause mesothelioma.”<sup>78</sup>

Upon consideration, the court agrees with plaintiffs’ position that Dr. Mark did *not* opine that every asbestos fiber inhaled causes mesothelioma, or that the inhalation of a single asbestos fiber was sufficient to cause mesothelioma. Instead, based upon a review of the report, the court concludes that Dr. Mark’s opinion, in sum, is that each “significant” exposure to asbestos constitutes a substantial contributing factor to the development of diffuse malignant mesothelioma. Dr. Mark defined

---

<sup>76</sup> Doc. no. 133 (Plaintiffs’ Memorandum in Opposition to TVA’s Motion to Exclude the Specific Causation Opinions of Doctors Wulsin and Mark), at 1.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.* at 25.

“significant” exposures as the type of exposures which have been proven by science to cause mesothelioma, including those rising to the level of occupational or para-occupational exposures. In Dr. Mark’s opinion, each of those “significant” exposures contributes to the total dose of asbestos fibers that causes diffuse malignant mesothelioma in a given patient and, therefore, shortens the period of time necessary for the disease to develop. Therefore, Dr. Mark concluded that each significant exposure to asbestos is a substantial contributing factor to the development of the disease that actually occurred, when it occurred.

In addition, both the former Fifth Circuit and the Alabama Supreme Court have accepted expert testimony that each exposure to asbestos can contribute to the development of asbestos-related diseases. *See Borel v. Fibreboard Paper Products Corp.*, 493 F.2d 1076, 1083 (5th Cir. 1973), (“[T]he effect of the disease may be cumulative since each exposure to asbestos dust can result in additional tissue changes.”) (alteration supplied);<sup>79</sup> *Sheffield v. Owens-Corning Fiberglass*, 595 So.2d 443, 456 (Ala. 1992) (holding that a jury question existed regarding causation because of the plaintiff’s expert’s opinion that each exposure to asbestos was causative).

---

<sup>79</sup> In *Bonner v. City of Prichard*, 661 F.2d 1206, 1209 (11th Cir. 1981) (*en banc*), the Eleventh Circuit adopted as binding precedent all decisions of the former Fifth Circuit handed down prior to the close of business on September 30, 1981.

Further, the court does not find Dr. Mark's opinions regarding the cumulative nature of asbestos diseases and the effect that each significant exposure of asbestos has on the development of such diseases to be inherently unreliable. Indeed, Dr. Mark not only provided an extensive summary of both James and Barbara Bobo's exposures to asbestos as a result of Mr. Bobo's employment with TVA, but also ample citations to scientific literature and studies to support each of the underlying bases to his opinion. In addition, Dr. Mark devoted an entire section of his report to scientific studies regarding the risks of household exposures to asbestos from laundering clothing laden with asbestos. Dr. Mark also relied on numerous epidemiological studies finding that even relatively low cumulative exposures to asbestos can cause mesothelioma.

Based on the foregoing, the court will not exclude Dr. Mark's opinion testimony on the grounds that his opinion is inherently unreliable and not supported by scientific evidence. Therefore, any remaining objections that TVA has regarding Dr. Mark's methodology and resulting opinion are best viewed as cross-examination material that may affect the *weight* to be accorded the testimony by the finders of fact, but not its *admissibility*. As the Eleventh Circuit stated in *Quiet Technology DC-8, Inc. v. Hurel-Dubois UK Ltd.*, 326 F.3d 1333 (11th Cir. 2003):

In the end, although “[r]ulings on admissibility under *Daubert*

inherently require the trial court to conduct an exacting analysis of the proffered expert's methodology," *McCorvey [v. Baxter Healthcare Corp.]* 298 F.3d [1253,] 1256 [(11th Cir. 2002)], it is not the role of the district court to make ultimate conclusions as to the persuasiveness of the proffered evidence. Indeed, as we said in *Maiz [v. Virani]*, 253 F.3d 641 (11th Cir. 2001), "[a] district court's gatekeeper role under *Daubert* 'is not intended to supplant the adversary system or the role of the jury.'" 253 F.3d at 666 (quoting *Allison v. McGhan*, 184 F.3d 1300, 1311 (11th Cir. 1999)). Quite the contrary, "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Daubert*, 509 U.S. at 596, 113 S. Ct. at 2798 . . . .

*Id.* at 1341 (first, sixth and seventh alterations in original, all other alterations supplied).

### III. CONCLUSION

In accordance with the foregoing, TVA's motion to exclude the specific causation opinion of Dr. Victoria Wulsin is MOOT, and TVA's motion to exclude the specific causation opinion of Dr. Eugene Mark is DENIED.

DONE and ORDERED this 25th day of August, 2014.



---

United States District Judge