# United States Court of Appeals
## FOR THE EIGHTH CIRCUIT

No. 00-3458

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| Katie Bonner, | * | |
| | * | |
| Plaintiff/Appellee, | * | |
| | * | |
| Esau Bonner, | * | |
| | * | Appeal from the United States |
| Plaintiff, | * | District Court for the |
| | * | Eastern District of Missouri. |
| v. | * | |
| | * | |
| ISP Technologies, Inc., | * | |
| | * | |
| Defendant/Appellant, | * | |
| | * | |
| Crawford & Company, Inc., | * | |
| | * | |
| Movant. | * | |

Submitted: May 16, 2001

Filed: August 3, 2001

Before WOLLMAN, Chief Judge, HANSEN, Circuit Judge, and BARNES,[1] District Judge.

[1]The Honorable Harry F. Barnes, United States District Judge for the Western District of Arkansas, sitting by designation.

WOLLMAN, Chief Judge.

ISP Technologies, Inc. (ISP) appeals the judgment entered by the district court[2] on a jury verdict against it for damages sustained by Katie Bonner. We affirm.

**I.**

Taking the facts in the light most favorable to the verdict, Katie Bonner was twice exposed to FoamFlush, an organic solvent manufactured by ISP, during her employment on an assembly line in a urethane filter production plant. In March of 1995, the solvent partially dissolved a neoprene hose near Bonner's work station and sprayed over her in a dense mist. In July of 1995, FoamFlush vapors were released from a drum near her work station. Foamflush was used in the plant to clean urethane byproducts from manufacturing equipment. The product was marketed as a "drop-in" replacement for methylene chloride, a carcinogenic solvent, that could be used with systems designed for methylene chloride. FoamFlush contains 57% gamma-butyrolactone (BLO) and three other chemical compounds in smaller quantities. In the human body, BLO metabolizes into gamma-hydroxybutric acid (GHB). Bonner's work station was poorly ventilated at the time of the first exposure, and her protective gear was limited to gloves and goggles.

Bonner alleged three distinct permanent injuries: (1) psychological problems resulting from both her initial exposure and her health problems, (2) cognitive impairment and personality disorders caused by damage to her brain, and (3) Parkinsonian symptoms caused by damage to her brain. At trial, Bonner presented expert witness testimony tending to show that her exposure to FoamFlush caused all three injuries. The case was tried twice in the district court, and Bonner prevailed both

[2]The Honorable Charles A. Shaw, United States District Judge for the Eastern District of Missouri.

times. After the first trial, the district court granted ISP's motion for a new trial because one of Bonner's experts had given testimony that went beyond the scope of his deposition. This appeal is from the second jury verdict, which awarded Bonner $2.2 million for her personal injuries.

**II.**

ISP argues that the court should have excluded expert witness testimony, that Bonner's evidence was insufficient to support the jury verdict, that the court improperly refused to give two of ISP's proposed jury instructions, and that the court should have granted ISP's motion for a new trial because of the excessiveness of the verdict.

ISP contends that the district court erred in admitting testimony of Dr. Terry Martinez, a pharmacologist and toxicologist, and of Dr. Raymond Singer, a neuropsychologist and neurotoxicologist. It further contends that, because Bonner could not show causation without their testimony, it is entitled to judgment as a matter of law.

To prove causation in a toxic tort case, a plaintiff must show both that the alleged toxin is capable of causing injuries like that suffered by the plaintiff in human beings subjected to the same level of exposure as the plaintiff, and that the toxin was the cause of the plaintiff's injury. See Wright v. Willamette Indus., Inc., 91 F.3d 1105, 1106 (8th Cir. 1996). In other words, the plaintiff must put forth sufficient evidence for a jury to conclude that the product was capable of causing her injuries, and that it did. We have held, however, that "[t]he first several victims of a new toxic tort should not be barred from having their day in court simply because the medical literature, which will eventually show the connection between the victims' condition and the toxic substance, has not yet been completed." Turner v. Iowa Fire Equip. Co., 229 F.3d 1202, 1208-09 (8th Cir. 2000). Bonner did not "need to produce 'a mathematically precise table equating levels of exposure with levels of harm' in order to show" that she

was exposed to a toxic level of FoamFlush, "but only 'evidence from which a reasonable person could conclude'" that her exposure probably caused her injuries. Bednar v. Bassett Furniture Mfg. Co., 147 F.3d 737, 740 (8th Cir. 1998) (quoting Wright, 91 F.3d at 1107).

"If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Fed. R. Evid. 702. We review under an abuse of discretion standard a district court's ruling admitting expert witness testimony under Rule 702. General Electric Co. v. Joiner, 522 U.S. 136, 141-42 (1997). In Daubert v. Merrill Dow Pharmaceuticals, Inc., 309 U.S. 579 (1993), the Supreme Court detailed the Rule 702 standard for admission of scientific evidence. Although Daubert offers four general criteria[3] for assessing the reliability of scientific evidence, it also emphasizes that "[t]he inquiry envisioned by Rule 702 is . . . a flexible one. Its overarching subject is the scientific validity--and thus the evidentiary relevance and reliability--of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." 509 U.S. at 594-95. The district court performs a gatekeeping function with respect to scientific evidence, ensuring that evidence submitted to the jury meets Rule 702's criteria for relevance and reliability. Id. at 590-91. The rule's concern with "scientific knowledge" is a reliability requirement, while the requirement that the evidence "assist the trier of fact to understand the evidence or determine a fact in issue" is a relevance requirement. Id.

[3]We have described the Daubert factors as "(1) whether the expert's methodology has been tested; (2) whether the technique has been subjected to peer review and publication; (3) whether the technique has a known or knowable rate of error; and (4) whether the technique has been generally accepted in the proper scientific community." Turner, 229 F.3d at 1207-08.

There is no requirement "that a medical expert must always cite published studies on general causation in order to reliably conclude that a particular object caused a particular illness." Heller v. Shaw Indus., 167 F.3d 146, 155 (3d Cir. 1999); see Turner, 229 F.3d at 1207-08 (citing Heller, 167 F.3d at 155). "[E]ven if the judge believes there are better grounds for some alternative conclusion, and that there are some flaws in the scientist's methods, if there are good grounds for the expert's conclusion, it should be admitted . . . . [T]he district court could not exclude [scientific] testimony simply because the conclusion was 'novel' if the methodology and the application of the methodology were reliable." Heller, 167 F.3d at 152-53 (internal quotation marks and citation omitted). Likewise, there is no requirement that published epidemiological studies supporting an expert's opinion exist in order for the opinion to be admissible. National Bank of Commerce v. Associated Milk Prods. Inc., 191 F.3d 858, 862 (8th Cir. 1999). Both our cases and the decisions of the Supreme Court make clear that it is the expert witnesses' methodology, rather than their conclusions, that is the primary concern of Rule 702. See Kuhmo Tire Co. v. Carmichael, 526 U.S. 137, 152 (1999); Daubert, 509 U.S. at 594-95; Turner, 229 F.3d at 1209.

Although the district court's gatekeeping function includes an analysis of the reliability of scientific evidence, neither Rule 702 nor Daubert requires that an expert opinion resolve an ultimate issue of fact to a scientific absolute in order to be admissible. Compare Turner, 229 F.3d at 1208 (differential diagnosis admissible when it identifies "the most probable cause" of a condition) with Glastetter v. Novartis Pharm. Corp., 252 F.3d 986, 989 (8th Cir. 2001) (per curiam) (no abuse of discretion in exclusion of differential diagnosis that is "scientifically invalid"). The only question relevant to the admissibility of the scientific evidence is whether it is sufficiently reliable and relevant to assist the jury's determination of a disputed issue. Daubert, 509 U.S. at 594-95.

> As a general rule, the factual basis of an expert opinion goes to the credibility of the testimony, not the admissibility, and it is up to the opposing party to examine the factual basis for the opinion in cross-examination. Only if the expert's opinion is so fundamentally unsupported that it can offer no assistance to the jury must such testimony be excluded.

Hose v. Chicago Northwestern Transp. Co., 70 F.3d 968, 974 (8th Cir. 1996) (internal citations and quotations omitted). "Although it is common that medical experts often disagree on diagnosis and causation, questions of conflicting evidence must be left for the jury's determination." Hose, 70 F.3d at 976.

In a pre-trial motion, ISP sought to preclude the admission of Dr. Martinez's opinion that Bonner suffered from permanent and progressive Parkinsonian-type tremors because her exposure to FoamFlush damaged the dopaminergic receptors in her brain, as well as Dr. Singer's opinion that Bonner suffers from permanent organic brain dysfunction consistent with exposure to FoamFlush. The district court precluded Dr. Martinez from testifying that Bonner's permanent Parkinsonian symptoms were caused by FoamFlush exposure, but permitted him to testify that Bonner's acute symptoms were caused by FoamFlush. Dr. Singer was permitted to testify that Bonner suffers from organic brain dysfunction and personality disorders consistent with exposure to a toxic level of FoamFlush.

**Dr. Martinez**

Dr. Martinez testified at trial that the symptoms Bonner suffered immediately after her exposure to FoamFlush (nausea, headache, tiredness, respiratory problems, trembling, and skin irritation) were caused by that exposure. Dr. Martinez based his testimony on (1) the temporal connection between Bonner's exposure and acute symptoms; (2) animal studies of the effects of BLO; (3) studies of chemicals with similar structures; (4) his study of the mechanism of GHB and the way it acts on nerve

pathways; and (5) Bonner's medical records. ISP contends that the testimony should have been excluded as irrelevant because of Bonner's claim of permanent injuries and as prejudicial because the jury may have drawn an impermissible inference that if FoamFlush could cause temporary injuries similar to Bonner's permanent injuries, it could also be the cause of her permanent injuries. We do not agree, for whether or not such an inference would in fact have been impermissible, Bonner's acute symptoms were relevant both to Dr. Martinez's analysis of whether and to what extent she was exposed to BLO and to Dr. Singer's analysis of her exposure level.

ISP also argues that Dr. Martinez's opinion should have been excluded as unreliable because there was no epidemiological support for his conclusion that inhalation of FoamFlush could cause the short-term symptoms Bonner described. It argues that the sources Dr. Martinez relied on involve exposure through ingestion, rather than inhalation, of BLO, and do not describe symptoms like those manifested by Bonner after BLO exposure; that Dr. Martinez never determined the quantity of BLO to which Bonner was exposed; and that he failed to rule out other possible causes of her symptoms. In addition, it contends that the fact that Dr. Martinez had designed but not yet tested his theory evidences its unreliability.

As set forth above, our review of the district court's admission of Martinez's testimony is for abuse of discretion. General Electric, 522 U.S. at 141-42. In this case, the district court carefully reviewed Dr. Martinez's methodology and concluded that it was sufficiently reliable to allow him to testify to his opinion that FoamFlush caused Bonner's acute symptoms, but not his opinion that it caused her permanent symptoms. In comparing Martinez's conclusions on the causation of Bonner's acute and permanent symptoms, the court noted that Martinez had relied on substantially the same scientific bases for both conclusions, but that his conclusion as to the acute symptoms was more reliable because the temporal connection was a more reliable indicator of a causal relationship with respect to Bonner's acute symptoms than to her permanent symptoms. Dr. Martinez testified that he followed the same procedures with Bonner that he would

have followed had he seen her as a patient suspected of having suffered a toxic exposure rather than in preparation for litigation. The consumer information provided by ISP describes inhalation symptoms as ranging from no symptoms to "pallor, nausea, anesthetic or narcotic effects," while Bonner described nausea, headache, tiredness, respiratory problems, skin irritation, and trembling.

Under some circumstances, a strong temporal connection is powerful evidence of causation. See Heller, 167 F.3d at 154 ("if a person were doused with chemical X and immediately thereafter developed symptom Y, the need for published literature showing a correlation between the two may be lessened"). We recognize, as did the district court, that Dr. Martinez considered case reports, which this court held in Turner are not "generally considered reliable evidence of causation," 229 F.3d at 1209 n.5, among other factual bases in forming his opinion. The district court considered this shortcoming in Dr. Martinez's testimony, but determined that the immediacy of Bonner's acute symptoms to her exposure made Dr. Martinez's opinion on causation reliable enough to pass Rule 702 muster.

ISP's contentions notwithstanding, it was not necessary that Bonner's experts quantify the amount of FoamFlush to which she was exposed in order to demonstrate that she was exposed to a toxic level of BLO. See Wright, 91 F.3d at 1106. It is sufficient for a plaintiff to prove that she was exposed to a quantity of the toxin that "exceeded safe levels." Bednar, 147 F.3d at 740. Bonner presented witnesses who testified that her exposure to FoamFlush was of a duration and of a volume sufficient to support a conclusion that she inhaled and/or absorbed through her skin at least a quarter of a teaspoon of FoamFlush when she was sprayed with it. Dr. Martinez's conclusion that Bonner suffered a more severe acute reaction than those previously documented may have been novel; nonetheless, the district court conducted a thoughtful and thorough inquiry into its validity, and we find nothing in the record to suggest that it was the result of methodology so unreliable as to render its admission an abuse of discretion. See Glastetter, 252 F.3d at 992.

**Dr. Singer**

ISP argues that the district court abused its discretion when it permitted Dr. Singer to testify that FoamFlush caused Bonner permanent injury. Dr. Singer testified that, as a result of her exposure to FoamFlush, Bonner suffered permanent organic brain dysfunction manifesting itself in Parkinsonian physical symptoms, cognitive impairments, and personality disorders. Dr. Singer stated that he followed normal procedures for evaluating patients who might be suffering from toxic exposure. He testified that ingested doses of GHB, BLO's metabolite, as small as a quarter of a teaspoon can have toxic effects, and that inhalation is a more potent exposure mechanism than is ingestion.

ISP contends that Dr. Singer's opinion that FoamFlush could cause injuries like Bonner's was unreliable, pointing to a number of alleged infirmities. The testimony, it argues, should have been excluded because Dr. Singer's theory was developed for litigation, was not subjected to peer review, has not appeared in scientific literature, and is not supported by epidemiological studies. Moreover, ISP contends, the text relied on by Dr. Singer notes that not all organic solvents have similar toxic effects. Additionally, Dr. Singer was unable to offer a threshold exposure amount for injury to occur, failed to determine how much FoamFlush Bonner was exposed to, failed to rule out other possible causes of her injury, and failed to follow established guidelines for diagnosing brain injury.

Our role is not to determine whether Dr. Singer's opinion was correct; that was for the jury to decide. See National Bank of Commerce, 191 F.3d at 862. Nor is it our task to duplicate the district court's analysis of the scientific validity of expert testimony, for the gatekeeping function is reserved to the district court. General Electric, 522 U.S. at 142-143. We perform only the comparatively narrow analysis of whether the district court's determination that the opinion was sufficiently grounded in

"good science" to assist the jury constituted an abuse of that court's discretion. See National Bank of Commerce, 191 F.3d at 862-63. ISP's attacks on Dr. Singer's testimony indicate no more than that his conclusion is not yet established as fact in the scientific community. ISP has not indicated that any scientific theory or studies indicate that BLO is incapable of causing permanent damage. See Hose, 70 F.3d at 976. ISP presented its own experts to rebut Dr. Singer's testimony. The district court conducted an exacting review of the science involved and correctly concluded that, because Dr. Singer's methodology was scientifically valid, the scientific questions were best addressed by allowing each side to present its experts and then submitting their opinions to the jury.

ISP contends on appeal that Dr. Singer was not qualified to offer opinions about the impact of FoamFlush on Bonner because he has no degree in toxicology and has done no formal academic work in toxicology. This argument was not presented to the district court, whose pre-trial order noted that "[t]he credentials of the experts are not questioned." Accordingly, we decline to consider this argument. See Hogan v. Apfel, 239 F.3d 958, 961 n.3 (8th Cir. 2001).

ISP's sufficiency of the evidence argument is based on the premise that the expert testimony should have been excluded, and that without it, Bonner did not meet her burden of proof on causation, thus entitling ISP to judgment as a matter of law. Because the district court did not abuse its discretion in admitting the expert witnesses' testimony, it thus did not err in denying the post-trial motion for judgment as a matter of law.

We have reviewed ISP's other contentions, and we conclude that the evidence was sufficient to support the verdict and that the district court did not abuse its discretion regarding the proffered jury instructions. ISP's final contention is that the district court abused its discretion when it denied ISP's motion for a new trial based on an excessive verdict. A verdict should be set aside as excessive only when it is so

excessive that it shocks the conscience. Drotzmanns, Inc. v. McGraw-Hill, Inc., 500 F.2d 830, 835 (8th Cir. 1974). In reviewing the district court's decision, we give great deference to its judgment, because the district court has the benefit of hearing the testimony and observing the demeanor of the witnesses throughout the trial. Sandford v. Crittenden Mem'l Hosp., 141 F.3d 882, 884 (8th Cir. 1998). In this case, the jury heard evidence that Bonner's past and future earnings losses were expected to total some $600,000, and that she could be expected to suffer from disabling physical and psychological problems for the remainder of her twenty-five year life expectancy. In light of this evidence, we agree with the district court's determination that an award of $2.2 million does not shock the conscience.

The judgment is affirmed.

A true copy.

Attest:

CLERK, U.S. COURT OF APPEALS, EIGHTH CIRCUIT.