

When Reliable is Reliable Enough: The Use of Expert Testimony After *Kumho Tire v. Carmichael*

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I. INTRODUCTION

In *Kumho Tire Co. v. Carmichael*¹ the Supreme Court held that the district court judge serves as the gatekeeper for determining the reliability of nonscientific expert testimony.² In doing so, the Court officially placed responsibility for determining the reliability of both scientific and nonscientific expert testimony in the hands of district courts.³ Some commentators regard the Court's holding as symbolically putting the brakes on the runaway use of "junk science,"⁴ where experts tailor their findings to fit the theory of the highest bidder.⁵ Others view it as the final step by the Court to open the door to well-reasoned, yet novel scientific or technical approaches.⁶ Regardless of one's view, little doubt exists that coupled with the growing use of expert testimony,⁷ the Court's decision in *Kumho* will impact seriously all areas of litigation.⁸

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1. 526 U.S. 137 (1999).

2. *Id.* at 141.

3. *Id.* Along with this gatekeeping function, the Court granted district courts the flexibility and discretion necessary to determine reliability based on the facts of the individual case. *Id.* at 141-42.

4. PETER W. HUBER, GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM 2 (1991). See also *Kumho*, 526 U.S. at 158 (Scalia, J., concurring) (describing the gatekeeping function as the "discretion to choose among reasonable means of excluding expertise that is *fausse* and science that is junky" (emphasis in original)).

5. Kenneth S. Geller & Michael E. Lackey, Jr., *Supreme Court's Decision A Boon To Public*, 17 PROD. LIAB. L. & STRATEGY, Apr. 1999, at 1, 3 (noting that the fact that an expert makes a living testifying in courtrooms rather than in a laboratory is a factor bearing on reliability).

6. William H. Latham, *The "Gatekeepers' Discretion:" Flexible Standards on Admissibility of Expert Evidence in Wake of Kumho*, S.C. LAWYER, July-Aug. 1999, at 15.

7. Cynthia H. Cwik, *Guarding The Gate: Expert Evidence Admissibility*, LITIGATION, Summer, 1999, at 6 (reporting that one expert consulting company claims to have over 7,600 different categories of experts available to assist in litigation).

8. *E.g.*, *Libas, Ltd. v. United States*, 193 F.3d 1361 (Fed. Cir. 1999) (fabric testing);

The problem facing district courts is that while *Kumho* settled the debate over the applicability of *Daubert v. Merrell Dow Pharmaceuticals*⁹ to nonscientific expert testimony, the *Kumho* holding did little to clarify the broad, vague concepts by which the district courts should determine reliability.¹⁰ This Note examines the effect that this lack of guidance has had within the district courts. Part I examines the evolution of the law governing the reliability and admissibility of expert testimony. Part II reviews recent cases and illustrates the level of uncertainty faced by litigants. In addition, Part II discusses the shortcomings of current interpretations as they relate to the roles of the judge and jury and the proper functioning of the adversarial system. Part III explains proposals currently under consideration by various commentators and by an Advisory Committee poised to revise the Federal Rules of Evidence. Part IV proposes a model approach to the reliability inquiry and discusses its advantages over current interpretations.

II. THE BACKGROUND AND EVOLUTION OF THE RELIABILITY INQUIRY

A. *Frye and the General Acceptance Test*

In *Frye v. United States*,¹¹ the Court of Appeals for the District of Columbia addressed the admissibility of systolic blood pressure deception test results.¹² The court determined that for such scientific

Allapattah Servs., Inc. v. Exxon Corp., 61 F. Supp. 2d 1335 (S.D. Fla. 1999) (contract damages); *Nemir v. Mitsubishi Motor Sales of Am.*, 60 F. Supp. 2d 660 (E.D. Mich. 1999) (products liability); *Smith v. Rasmussen*, 57 F. Supp. 2d 736 (N.D. Iowa 1999) (psychiatry); *United States v. Hines*, 55 F. Supp. 2d 62 (D. Mass. 1999) (handwriting analysis); *In re Doe*, 981 P.2d 723 (Haw. Ct. App. 1999) (child abuse).

9. 509 U.S. 579 (1993). In *Daubert*, the Court held that district courts are required to act as "gatekeepers" to ensure that all scientific expert testimony is based on reliable data and methodology. *Id.* The district court judge must also ensure that the expert applied the methodology to the facts of the case in a reliable manner. *Id.*

10. The *Daubert* Court listed four nonexhaustive factors, or signposts, to guide the district courts in their reliability determination: (1) whether the theory or technique has been tested; (2) whether it has been subjected to peer review and publication; (3) whether the technique has a known or potential rate of error; and (4) whether the theory has gained general acceptance within the relevant scientific community. *Id.* at 593-94.

11. 293 F. 1013 (D.C. Cir. 1923).

12. *Id.* at 1014. The systolic blood pressure deception test was the predecessor of the

evidence to be admissible, the theory and methodology of the expert testifying to the evidence must be generally accepted within the relevant scientific community.¹³ In *Frye*, the court held that the evidence was not admissible because the blood pressure deception test had not achieved sufficient recognition in relevant scientific communities.¹⁴

The general acceptance test,¹⁵ as it came to be known, remained virtually unchallenged until the adoption of the Federal Rules of Evidence (the Rules) in 1975.¹⁶ The Rules generated disagreement in the legal community regarding the future viability and applicability of the *Frye* standard.¹⁷ Despite this period of substantial debate, the *Frye* general acceptance test remained the standard for determining the reliability and admissibility of proffered expert testimony for almost seventy years.¹⁸

B. Daubert: Federal Rule of Evidence 702 and the District Court's Gatekeeper Role

In 1993 the Supreme Court decided *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,¹⁹ holding that Rule 702²⁰ superceded the *Frye*

modern polygraph test.

13. *Id.*

14. *Id.* (holding that the systolic blood pressure deception test had “not yet gained such standing and scientific recognition among physiological and psychological authorities . . .”).

15. *Id.* The court stated the general acceptance test: “[T]he thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field which it belongs.” *Id.*

16. FED. R. EVID. 102 states that the purpose of the federal rules is to secure fairness, eliminate unjustifiable expense and delay, and promote the growth of the law of evidence to the end that truth may be justly determined. The Supreme Court interprets this to mean that there should be a liberal standard of admission and that Congress designed the rules to depend on lawyer-adversaries and sensible triers of fact. *See Daubert*, 509 U.S. at 579, 587.

17. 509 U.S. at 586 n.4. Like the scholarly community, courts also began to depart from the traditional *Frye* analysis. *Compare* United States v. Shorter, 809 F.2d 54 (D.C. Cir. 1987) (applying the “general acceptance” standard), *with* DeLuca v. Merrell Dow Pharm., Inc., 911 F.2d 941 (D.C. Cir. 1990) (rejecting the “general acceptance” test).

18. 509 U.S. at 585. To date, eleven states specifically rejected *Daubert* in favor of retaining the *Frye* standard: Alabama, Arizona, California, Florida, Maryland, Mississippi, New Jersey, New York, Pennsylvania, and Washington. The majority of the states include the *Daubert* factors as either helpful or controlling in their tests. *See* Phillips v. Indus. Mach., 597 N.W.2d 377 (Neb. 1999) (adopting *Daubert* standards).

19. 509 U.S. 579 (1993).

20. FED. R. EVID. 702. The rule states: “If scientific, technical, or other specialized

general acceptance test.²¹ The *Daubert* Court reasoned that a rigid general acceptance requirement would conflict with the liberal thrust of the Rules and their general approach of relaxing the traditional barriers to opinion testimony.²² The Court tempered this liberalized standard by stating that while *Daubert* and Rule 702 allowed a wider range of expert testimony to be admitted, district court judges must act as gatekeepers to ensure the reliability of the proffered expert testimony.²³

The *Daubert* Court listed four nonexhaustive factors to guide district courts in their reliability inquiry under Rule 702.²⁴ Rather than discard the *Frye* general acceptance test completely, the Court incorporated it as a factor in its newly crafted inquiry.²⁵ The *Daubert* factors, as they are now known, are: (1) whether the theory or technique has been tested; (2) whether it has been subjected to peer review and publication; (3) whether the technique has a known or potential rate of error; and (4) whether the theory has gained general acceptance within the relevant scientific community.²⁶

The Court expressly limited its discussion to scientific testimony.²⁷ This limitation spurred substantial confusion and debate

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." *Id.*

21. *Daubert*, 509 U.S. at 587. In *Daubert*, plaintiffs Jason Daubert and Eric Schuller were born with severe birth defects. The children and their parents brought suit claiming that the birth defects were caused by the mother's use of the prescription drug Bendectin, an anti-nausea medication marketed by Merrel-Dow. *Id.* at 582.

22. *Daubert*, 509 U.S. at 588.

23. *See Phillips*, 597 N.W.2d at 388 (Gerard, J., concurring) (noting that twenty-seven states have held that the *Daubert* standards are either helpful or controlling in their determinations regarding the admissibility of expert opinion evidence: Alaska, Arkansas, Connecticut, Delaware, Hawaii, Indiana, Iowa, Kentucky, Louisiana, Maine, Massachusetts, Montana, Nebraska, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Texas, Utah, West Virginia, and Wyoming).

24. *Daubert*, 509 U.S. at 593-94.

25. *Id.* at 594.

26. *Id.* at 593-94. *See also* Schmerling v. Danek Med., Inc., No. Civ.A.96-2749, 1999 WL 712591, at *1 (E.D. Pa. Sept. 10, 1999). While most courts have not departed much from the factors enumerated in *Daubert*, some have begun to expand and now include such additional factors as: (1) the existence and maintenance of standards controlling the technique's application; (2) the relationship of the technique to methods which have been established as reliable; and (3) the nonjudicial areas where the method has been used.

27. *Daubert*, 509 U.S. at 590 n.8. The Court limited its discussion to scientific expert

among the circuits as to the scope of *Daubert's* application in regard to nonscientific testimony.²⁸ Post-*Daubert* decisions quickly fractured into two distinct camps. Several circuits adopted the narrow position that *Daubert* confined the gatekeeping responsibility to scientific expert testimony.²⁹ Others took a broader view, applying *Daubert's* holding to all proffered expert testimony.³⁰

C. Kumho: Extending *Daubert* to "All" Experts

In 1999, the Supreme Court resolved the *Daubert* controversy in *Kumho Tire Co. v. Carmichael*.³¹ In *Kumho*, the right rear tire of a minivan driven by Patrick Carmichael exploded, resulting in an accident that killed one occupant and severely injured seven others.³² The survivors and the decedent's representative brought suit against the tire manufacturer, Kumho Tire Company.³³ The plaintiffs' case depended largely on the deposition testimony of tire-failure analyst Dennis Carlson, Jr., who testified that a defect in the tire's manufacture or design caused the blowout.³⁴ He based his opinion on a visual and tactile inspection of the tire and also on his own theory that the absence of at least two of the four specific physical signs of tire abuse indicated that a defect was the probable cause of the blowout.³⁵

testimony because that was the nature of the expertise offered in the case. *Id.*

28. *See id.* at 600. Chief Justice Rehnquist clearly recognized this when he said:

Questions arise simply from reading . . . the Court's opinion, and countless more questions will surely arise when hundreds of district judges try to apply its teaching in particular offers of expert testimony. Does all of this dicta apply to an expert seeking to testify on the basis of technical or other specialized knowledge . . . ?

Id. (internal quotations omitted).

29. *See, e.g.,* Thomas v. Newton Int'l Enters., 42 F.3d 1266, 1270 n.3 (9th Cir. 1994) ("*Daubert* was clearly confined to the evaluation of scientific testimony").

30. *See, e.g.,* Navarro v. Fuji Heavy Indus., Ltd., 117 F.3d 1027 (7th Cir. 1997); Tenbarge v. Ames Taping Tool Sys., 128 F.3d 656 (8th Cir. 1997).

31. 526 U.S. 137 (1999).

32. *Id.* at 137.

33. Carmichael v. Samyang Tires, Inc., 923 F. Supp. 1514 (S.D. Ala. 1996).

34. *Kumho*, 526 U.S. at 142.

35. *Id.* at 144-45 (citing Carlson's opinion as stating that in the absence of signs of misuse or "overdeflection," separation of the tread from the inner steel belted carcass is ordinarily due to a tire defect). If a tire has been subjected to sufficient overdeflection to cause separation, it should exhibit certain specific symptoms including:

Kumho's attorneys challenged Carlson's testimony and moved to exclude it on the ground that the methodology failed to satisfy Rule 702's reliability requirement.³⁶ The district court subjected Carlson's methodology to a *Daubert* inquiry and found that it was unreliable and, therefore, inadmissible.³⁷ The Eleventh Circuit reversed the district court, holding that *Daubert's* reliability analysis did not apply to testimony based on skill or experience.³⁸

The Supreme Court granted certiorari to settle the uncertainty as to whether *Daubert* applied to technical or other specialized knowledge, and if so, how the standard should be applied.³⁹ In a unanimous decision, the Supreme Court reversed the Eleventh Circuit, holding that the gatekeeping duty of *Daubert* extended to all expert testimony.⁴⁰

The Court reasoned that the testimonial latitude granted to expert witnesses by Rules 702 and 703⁴¹ assumes that an expert's opinion is reliably based on the knowledge and experience of that expert's discipline.⁴² The Court explained that the plain language of Rule 702 clearly extends testimonial latitude to all experts.⁴³ Moreover, since Rule 702 draws no distinction between scientific and nonscientific

(a) tread wear on the tire's shoulder that is greater than the tread wear along the tire's center . . . (b) signs of a "bead groove" where the beads have been pushed too hard against the bead seat on the inside of the tire's rim . . . (c) the sidewalls of the tire with [sic] physical signs of deterioration, such as discoloration . . . and/or (d) marks on the tire's rim flange.

Id. at 144 (internal citations omitted).

36. *Id.* at 145. The Court noted that Rule 702 imposes an obligation on the district court judge to make sure that proffered expert testimony is relevant and reliable. *Id.* at 147 (citing *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. at 579, 587 (1993)).

37. *Kumho*, 526 U.S. at 145-46. The district court did not question Carlson's qualifications, but rather found his analysis and methodology lacking.

38. *Carmichael v. Samyang Tire, Inc.*, 131 F.3d at 1435 (1997) (reviewing *de novo* the district court's decision to apply *Daubert*, and holding that *Daubert* was limited to testimony involving scientific principles and that Carlson's experience-based testimony was outside the scope).

39. *Kumho*, 526 U.S. at 146.

40. *Id.* at 149.

41. *Id.* at 148-49. Unlike an ordinary witness, the expert may testify in the form of opinion. That opinion need not be based on firsthand knowledge or observation. *Id.*

42. *Id.* at 148.

43. *Id.*

experts, neither should the courts.⁴⁴ The Court further reasoned that it would be difficult, if not impossible, for judges to exercise their gatekeeping function if they were required to distinguish between scientific, technical, or other specialized knowledge.⁴⁵

Therefore, the Court granted the district courts broad discretion to determine reliability.⁴⁶ The Court emphasized, however, that the factors enumerated in *Daubert* neither necessarily nor exclusively applied to all experts or all cases.⁴⁷

The *Kumho* holding is important because the use of expert testimony touches almost every area of law.⁴⁸ While *Kumho* settled the dispute over the scope of *Daubert*, the Court's desire to avoid a restrictive bright-line test left district courts fumbling to find consistent ways to apply its nebulous concepts to factual circumstances.⁴⁹ As a result, some courts regarded the reliability inquiry as a rigorous exercise, while others approached it only as a way to determine whether the expert's opinion is based on something more than mere speculation.

III. CURRENT APPLICATION: THE LACK OF CONSISTENCY AND PREDICTABILITY IN THE PROPONENT'S BURDEN OF PROOF

At the heart of determining the reliability of proffered expert testimony lies the court's ultimate decision whether to admit or exclude that testimony. The decision to exclude proves simple when, as in *Kumho*, the proffered testimony is clearly based on conclusory statements drawn from shallow or incomplete investigation.⁵⁰ However, the judge's responsibility under *Daubert* and *Kumho* becomes a far more daunting task when the issue of reliability is not as clear, especially in cases involving novel scientific research or

44. *Id.* at 148-49.

45. *Kumho*, 526 U.S. at 148.

46. *Id.* at 152-53.

47. *Id.*

48. *See supra* note 8.

49. Latham, *supra* note 6, at 19 (“[T]here is precious little guidance for the district courts to use in exercising their extremely broad discretion.”).

50. *Kumho*, 526 U.S. at 144-45. Despite the fact that the tire at issue was over five years old and exhibited all of the signs of wear that Carlson traditionally looked for, he concluded that the blowout was caused by a manufacturing defect. *Id.*

technological developments.⁵¹ In effect, *Daubert* and *Kumho* thrust district court judges into unfamiliar territory by obliging them to test the soundness of expert testimony even though they may be only slightly more suited for the task than the lay juror. However, the district court judge does have one familiar point of reference—namely, the proponent's burden of proof.⁵²

The proponent of an expert witness must first establish by a preponderance of the evidence⁵³ that the witness is qualified to testify as an expert on the issue in question.⁵⁴ This requires an inquiry into the expert's education, professional background, and breadth of experience.⁵⁵ Courts generally interpret Rule 702's expertise requirement liberally by allowing a broad range of knowledge, skills, or training to qualify an expert.⁵⁶ As such, courts should not impose overly rigorous requirements of expertise, but rather should hold that requirement satisfied with more generalized qualifications.⁵⁷ Experts should not be excluded simply because they do not have a certain degree or particular training deemed appropriate by the district court.

Once the proponent of expert testimony qualifies the witness, the proponent bears the burden of showing reliability of the expert's testimony⁵⁸ by a preponderance of the evidence.⁵⁹ This standard, as traditionally interpreted, requires that it is more likely than not⁶⁰ that

51. See, e.g., *Frye*, 293 F. at 1013 (asking the difficult question of “[j]ust when scientific principle or discovery crosses the line between the experimental and demonstrable . . .”).

52. Rule 104 provides that qualifications of a witness and the admissibility of evidence should be established by a preponderance of proof. FED. R. EVID. 104. See also *Daubert*, 509 U.S. at 592 n.10.

53. BLACK'S LAW DICTIONARY 1201 (7th ed. 1999) (defining “Preponderance of the evidence” as the standard of proof in which the evidence “is . . . sufficient to incline a fair and impartial mind to one side rather than the other,” or, in other words, shows that the fact sought to be proved is more probable than not).

54. *Daubert*, 509 U.S. at 593 n.10 (citing FED. R. EVID. 104a).

55. *Id.*

56. See generally *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 741-47 (3d Cir. 1994).

57. But see *O'Brien v. Sofamar*, No. CIV.A.96-8015, 1999 WL 239414, at *1, *3-4 (E.D. Pa. Mar. 30, 1999).

58. This assumes that the opponent made a valid challenge to the expert's qualifications or methodology.

59. See *supra* notes 49-54 and accompanying text. See also *Tanner v. Westbrook*, 174 F.3d 542, 546-47 (5th Cir. 1999).

60. See *Bourjaily v. United States*, 483 U.S. 171, 175-76 (1987) (finding preliminary factors should be established by a preponderance of proof); *Colorado v. Connelly*, 479 U.S. 157, 167-69 (1986) (stating that the preponderance standard ensures that the court finds it more

the methodology used by the expert in formulating his opinion is reliable.

Despite the preponderance of the evidence standard, many courts hold proponents of expert testimony to a higher burden of proof.⁶¹ The cases in this section illustrate that the unpredictable burdens of proof applied by courts yield disparate results in factually similar cases. Furthermore, these cases show that some courts wrongfully exclude testimony based on factors that do not significantly impact reliability.

A. Must an Expert's Data Be Exact To Be Reliable?: Evidence of Exposure in Toxic Substance Exposure Litigation

In toxic substance exposure litigation, an expert's failure to identify the precise exposure dose level can be fatal to an expert's qualification and to the plaintiff's case.⁶² However, given that the burden of proof is only a preponderance of the evidence standard, the question remains whether knowledge of the precise exposure dose is really necessary to make the expert's methodology and testimony reliable. The following two cases clearly illustrate the disparity on this issue.

1. Case I: *Goeb v. Tharldson*⁶³

In April, 1990 Tharldson sprayed the Goeb residence with Dursban,⁶⁴ a pesticide manufactured and distributed by the Dow Chemical Company.⁶⁵ Shortly after Tharldson applied the pesticide, members of the Goeb family began suffering a wide variety of ailments.⁶⁶ The Goeb family contacted Dow seeking advice and were

likely than not that the technical issues and policy concerns of the Federal Rules of Evidence have been satisfied).

61. See, e.g., *infra* notes 63-85 and accompanying text (where burden on proponent is closer to the reasonable doubt standard).

62. See, e.g., *infra* notes 63-85 and accompanying text.

63. No. CX-98-2275, 1999 WL 561956, at *1 (Minn. Ct. App. Oct. 21, 1999).

64. See University of Texas Southwestern Medical Center at Dallas, *UT Southwestern Team Traces Gulf War Illness to Chemicals* (Nov. 13, 2000), available at http://www.swmed.edu/home_pages/epidemi/gws/gws.htm (last visited Feb. 12, 2001).

65. *Goeb*, 1999 WL 561956, at *1.

66. *Id.* at *6. The family's ailments included nausea, diarrhea, excessive salivation,

informed that Dursban was neither hazardous nor toxic.⁶⁷ Dow also advised the Goebes that it was safe to remain in the home.⁶⁸

The Goebes' condition worsened and they brought an action⁶⁹ against Tharldson and Dow Chemical Company alleging personal injury and property damage.⁷⁰ The Goebes' case relied heavily on the testimony of two expert witnesses, Dr. Sherman and Dr. Kilburn,⁷¹ who testified that the Dursban exposure caused the family's illnesses.⁷²

Dr. Sherman conducted both a differential diagnosis⁷³ and a temporal analysis.⁷⁴ She interviewed the Goebes regarding their medical histories, conducted physical examinations of the family members, reviewed their medical records, and examined the results of air monitoring tests conducted six weeks after the Dursban application.⁷⁵ Dr. Sherman found dramatic changes in the overall health of each family member that corresponded precisely with the Dursban exposure.⁷⁶ Further research confirmed that the scientific

dizziness, headaches, intestinal cramping, tingling of the tongue, lightheadedness, throat irritation, burning sensation in the respiratory tract, difficulty breathing, lethargy, anxiety, decreased level of coordination, and vomiting. *Id.*

67. *Id.* at *1.

68. *Id.*

69. *Id.* The Goebes claimed not only strict liability, but also that Tharldson negligently applied the pesticide and that Dow was negligent in manufacturing, marketing, and selling Dursban. In addition, the Goebes alleged that Dow negligently failed to provide adequate warnings and instructions for the proper use and application of the chemical. *Id.*

70. *Id.* The district court dismissed all claims based on inadequate warnings and instructions on the ground that those claims were preempted by the Federal Insecticide, Fungicide and Rodenticide Act. *Id.* at *2.

71. Interview with Dr. Arthur Zahalsky, Physician and Expert Medical Witness, in St. Louis, Mo. (Nov. 29, 1999). Dr. Zahalsky consulted with both Dr. Sherman and Dr. Kilburn on this case. He believes both possessed all the necessary raw data with which to draw a reliable conclusion. However, he believes they failed to extrapolate the information in the manner in which this particular court wished to see it. *Id.*

72. *Goeb*, 1999 WL 561956, at *2.

73. *See generally* Baker v. Dalkon Shield Claimants Trust, 156 F.3d 248, 252-53 (1st Cir. 1998). A differential diagnosis is generally performed after a physical examination. It requires a review of the patient's medical history, clinical tests, and any existing relevant literature. The physician eliminates potential causes of the patient's condition until arriving at one that cannot be ruled out. *Id.*

74. *Id.* Temporal analysis merely looks at the time differential between exposure and the onset of symptoms. *Id.*

75. *Goeb*, 1999 WL 561956, at *4. A review of the family's medical records, history, and physical examinations revealed no significant prior conditions or illnesses. *Id.*

76. *Id.* at *4.

literature on Dursban exposure, as well as a number of Dow publications, outlined symptoms consistent with those displayed by the Goeb family.⁷⁷ Dr. Sherman concluded within a reasonable degree of certainty that, more likely than not, the Goeb's adverse reactions and illnesses resulted from their exposure to Dursban.⁷⁸

The court excluded Dr. Sherman's testimony because she could not state the Goeb's exact dose of exposure to Dursban.⁷⁹ The court reasoned that if she could not determine the exact exposure level, her conclusion that the family members had been exposed to a dose sufficient to cause their illnesses was not reliable.⁸⁰

Dr. Kilburn also testified that the Goeb's symptoms were the result of exposure to Dursban.⁸¹ In explaining his methodology, Dr. Kilburn stated that he first determined whether the Goeb's were exposed to Dursban. He then reviewed relevant medical and scientific literature to determine the toxicity and adverse health effects of the agent. Finally, Dr. Kilburn considered the dose response relationship of the agent.⁸² Using this method, Dr. Kilburn concluded that the Goeb's were clearly exposed to Dursban because the chemical was applied to the interior of their home. Further, the peer-reviewed literature regarding the adverse health effects of Dursban established that the Goeb's symptoms were wholly consistent with exposure to the chemical.⁸³

Despite Dr. Kilburn's clear explanation of his methodology, the court found his testimony unreliable because, like Dr. Sherman, he could not state the Goeb's exact exposure dose.⁸⁴ Thus, the court granted summary judgment in favor of Dow and Tharldson.⁸⁵

77. *Id.* at *5. The Dow publications described the condition as organophosphate poisoning. *Id.*

78. *Id.* at *4.

79. *Id.* at *5.

80. *Id.* *But see* Interview with Dr. Arthur Zahalsky, *supra* note 71 (stating the overall level of exposure is not as important as the level of the toxin absorbed into the tissues and, ultimately, the DNA).

81. *Goeb*, 1999 WL 561956, at *5-6.

82. *Id.* at *5.

83. *Id.* at *5-6.

84. *Id.* at *6.

85. *Id.* at *2. Without Dr. Sherman or Dr. Kilburn, the Goeb's could not show causation. *Id.*

2. Case II: *Anderson v. Quality Stores, Inc.*⁸⁶

Anderson, a sixty-seven-year-old retiree, used cans of spray paint to paint a number of window shutters.⁸⁷ The following evening, he began to have significant difficulty breathing and over the next two days experienced generalized weakness in his arms and legs, chest congestion, and indigestion.⁸⁸ He was admitted to the hospital and diagnosed with Acute Respiratory Distress Syndrome.⁸⁹ Anderson's condition continued to deteriorate and he died approximately three weeks later.⁹⁰

Anderson's wife brought an action claiming that her husband's death was the result of his inhaling toxic chemicals from the spray paint.⁹¹ Two experts testified that the inhalation of chemicals in the spray paint caused Anderson's respiratory condition and subsequent death.⁹² The district court concluded that neither expert's testimony was reliable because, like the experts in *Goeb*, they were unable to quantify Anderson's exact exposure level.⁹³

The Fourth Circuit reversed, holding that hard evidence of the exposure dose was not necessary to support expert testimony on causation so long as the exposure is harmful and the claimant was exposed.⁹⁴ The court further held that an expert's opinion based upon a differential diagnosis and a strong temporal proximity between the exposure and the onset or worsening of symptoms satisfies the reliability prong of Rule 702.⁹⁵

86. No. 98-2240, 1999 WL 387827, at *1 (4th Cir. June 14, 1999).

87. *Id.*

88. *Id.*

89. *Id.*

90. *Id.*

91. *Anderson*, 1999 WL 387827, at *1. Mrs. Anderson brought a diversity action alleging strict liability, negligence, and breach of warranty. *Id.*

92. *Id.*

93. *Id.* at *2.

94. *Id.*

95. *Id.* The court stated that the record clearly reflected that Mr. Anderson painted twenty-two shutters and that the relevant chemical and medical literature supported a conclusion that the presence of chemicals from the spray paint in the lungs could result in pulmonary problems. *Id.* The court found that because the experts based their opinions on a reliable differential diagnosis and a strong temporal relationship between exposure to the fumes and the onset of Mr. Anderson's symptoms, the district court abused its discretion by excluding the opinions. *Id.* at *2-3.

3. Exact Should Not Equal Reliable

When a district court engages in a microscopic analysis of every step of the expert's process, it loses sight of the appropriate level of scrutiny and the proponent's low burden of proof.⁹⁶ The *Goeb* court required the experts to quantify the exact exposure dose before it would consider their testimony reliable.⁹⁷ As a practical matter, this dooms most meritorious cases from the onset.⁹⁸ Symptoms infrequently occur immediately after exposure and ascertaining the exact exposure dose would require tests and samples before they were aware of a problem.⁹⁹ Such a requirement also ignores the fact that some individuals may suffer adverse reactions even at relatively low exposure levels. Further, an accurate analysis of exposure dose and the immediate administration of tests are unlikely to be achieved in a "real world" setting.¹⁰⁰ This exacting demand does not comport with either the "more likely than not" burden required to satisfy a preponderance of the evidence, or the "more liberalized approach" envisioned by the Supreme Court.¹⁰¹ By requiring an expert to identify the exact exposure dose, the *Goeb* court confused the "reliability" inquiry with a "correctness" or "accuracy" inquiry, thus effectively raising the standard of admissibility above the preponderance of the evidence standard.¹⁰²

In contrast, the Fourth Circuit took a more plaintiff-favorable

96. The proponent of the expert testimony bears the burden of establishing that they met the pertinent admissibility requirements by a preponderance of the evidence. *See Bourjaily v. United States*, 483 U.S. 171, 176 (1987).

97. *Goeb*, 1999 WL 561956, at *5.

98. Interview with Dr. Arthur Zahalsky, *supra* note 71 (explaining that by the time symptoms arise, it is generally too late to pinpoint the exact exposure dose).

99. *Id.*

100. *See Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 264 (4th Cir. 1999) (citing FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 187 (1994)) ("[O]nly rarely are humans exposed to chemicals in a manner that permits a quantitative determination . . . [H]uman exposure occurs most frequently in occupational settings where . . . it is usually difficult, if not impossible, to quantify the amount of exposure.").

101. *Daubert*, 509 U.S. at 588-92.

102. *See Lillis v. Lehigh Valley Hosp., Inc.*, No. CIV.97-3459, 1999 WL 718231, at *1 (E.D. Pa. Sept. 3, 1999). The Third Circuit recognizes that the standard of reliability is not a high one. The main goal is to exclude so-called 'junk science'. *See also Allison v. McGhan Med. Corp.*, 184 F.3d 1300, 1321 (11th Cir. 1999) (noting that courts find an abuse of discretion under *Daubert* when the admissibility bar is too high).

approach in *Anderson*. It adopted the position that a differential diagnosis and a strong temporal relationship will sufficiently satisfy the proponent's burden under Rule 702.¹⁰³ This view is consistent with the preponderance of the evidence standard because it acknowledges opposing viewpoints, incorporates reality, and accepts that information need not be perfect to be reliable.

The Fourth Circuit's approach in *Anderson* comports with *Daubert* because it relies on the adversarial system to ultimately determine the accuracy of the testimony.¹⁰⁴ The *Daubert* Court expressly stated that the district judge's gatekeeping function was not intended to supplant the adversary system or the role of the jury.¹⁰⁵ Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof remain the appropriate means of attacking shaky, but admissible, evidence.¹⁰⁶ *Daubert*'s language crystalized the Court's intention to allow the adversary system to flesh out the reliability of evidence that is not necessarily beyond reproach.¹⁰⁷ This language also clearly indicates the Court's intention to admit less than perfect testimony;¹⁰⁸ an intent that the *Goeb* court clearly missed. As the Second Circuit stated in *McCulloch v. H.B. Fuller Co.*, trial judges acting as gatekeepers must not assume the role of St. Peter at the gates of heaven, usurping the role of the jury by "performing a searching inquiry into the depth of an expert witness's soul," thereby usurping the role of the jury.¹⁰⁹

103. See *Heller v. Shaw Indus.*, 167 F.3d 146, 154-56 (3d Cir. 1999) (stating that a medical expert may offer an opinion that the chemical caused the plaintiff's illness absent hard evidence of the level of exposure to the chemical in question); *Curtis v. M & S Petroleum, Inc.*, 174 F.3d 661, 671 (5th Cir. 1999) (noting that the law does not require the plaintiff to show the precise level of the chemical to which he or she was exposed).

104. *Daubert*, 509 U.S. at 588-89.

105. *Id.* at 589.

106. *Id.* at 588-90; see also *Allison*, 184 F.3d at 1311.

107. *Jarvis v. Ford Motor Co.*, No. 92 CIV.2900 (NRB), 1999 WL 461813, at *1, *2 (S.D.N.Y. July 6, 1999) (citing *Borawick v. Shay*, 68 F.3d 597, 610 (2d Cir. 1995), as advocating "a bias in favor of admitting evidence short of that solidly and indisputably proven to be reliable.").

108. *Lappe v. Am. Honda Motor Co.*, 857 F. Supp. 222, 228 (N.D.N.Y. 1994) (finding the fact that an expert may have neglected to perform some "essential" test goes to the weight of the testimony, not its admissibility).

109. 61 F.3d 1038, 1045 (2d Cir. 1995).

B. Ipse Dixit of the Court: When Testimony is Reliable Because the Court Says it Is

At the other end of the spectrum are cases in which courts engage in little or no reliability inquiry.¹¹⁰ The following examples illustrate how the nature of the case can dramatically affect the level of scrutiny employed by the court. As shown, courts often apply a lower bar of reliability in cases of murder¹¹¹ or sexual assault.¹¹²

1. Case I: *United States v. Charley*¹¹³

Charley concerned the alleged sexual abuse of two young girls.¹¹⁴ The government's¹¹⁵ expert witness, Dr. Junkins, testified that the girls' medical and psychological problems¹¹⁶ could be attributed to the presence of an incredibly stressful situation, such as sexual abuse.¹¹⁷ Despite the fact that the examination and review of the medical records¹¹⁸ revealed no physical evidence of abuse,¹¹⁹ Dr. Junkins stood by his diagnosis. He stated that the records were not inconsistent with sexual abuse because, in general, children's tissues heal quickly.¹²⁰ The district court allowed the testimony.¹²¹ On

110. See *infra* notes 110-28 and accompanying text.

111. See *Urias v. Texas*, No. 03-98-00673-CR, 1999 WL 546860, at *1 (Tex. Crim. App. July 29, 1999) (admitting police officer's opinion that a stab wound was "life threatening" because the trial court "could properly have determined that he possessed special knowledge and that his testimony would assist the jury . . .").

112. See *United States v. Romero*, 189 F.3d 576 (7th Cir. 1999) (allowing F.B.I. agent's testimony without a significant reliability inquiry because it was helpful to the jury in understanding how child molesters operate); *In re Doe*, 981 P.2d 723, 735 (Haw. Ct. App. 1999) (admitting testimony of a social worker after cursory review of her experience because there was a "reasonable basis to infer" that the opinion was "based upon an explicable and reliable system of analysis.").

113. 189 F.3d 1251 (10th Cir. 1999).

114. *Id.*

115. The alleged incident constituted a federal case because it occurred on an Indian reservation.

116. *Charley*, 189 F.3d at 1263. Both girls were suffering from urinary tract infections, kidney infections, bed-wetting, abdominal pain, paralysis, and nausea. *Id.*

117. *Id.*

118. *Id.* at 1256. Dr. Junkins based his testimony on his interview of the girls, a physical examination, and a review of their medical and treatment history. *Id.*

119. *Id.* at 1263. No signs of scars or bruising appeared on the girls and both girls had intact hymens. *Id.*

120. *Id.*

appeal, the Tenth Circuit held that the district court did not abuse its discretion because these types of general and conditional opinions were reliable.¹²²

Judge Holloway, in his part-concurring and part-dissenting opinion, noted that the majority had failed to show how the trial court determined that the admitted testimony was reliable.¹²³ The expert witness neither described any method by which his opinion was reached, nor discussed the factors bearing on the reliability issue.¹²⁴

2. Case II: *Deering v. Reich*¹²⁵

Deputy Sheriff James Reich shot and killed Reinhold Deering during an attempt to serve an arrest warrant.¹²⁶ Reich contended that his use of force was justified because Deering pointed a shotgun at him, and Reich claimed that he fired because he believed his life was in danger.¹²⁷ Reich sought to bolster his claim with the testimony of a forensic pathologist, Dr. Greenbaum, who stated that Deering's wound tracks were consistent with Deering aiming a shotgun at Reich at the time he was killed.¹²⁸

The court admitted Dr. Greenbaum's testimony without question, despite the fact that she did not perform the actual autopsy.¹²⁹ The court based its reliability determination on Dr. Greenbaum's involvement in at least seventy-five autopsies on bodies with bullet wounds.¹³⁰

121. *Id.* at 1258.

122. *Charley*, 189 F.3d at 1264-65. The majority stated that cross-examination is the proper tool for clarifying ambiguities in testimony. *Id.* at 1269.

123. *Id.* at 1276-77 (Holloway, J., concurring in part and dissenting in part).

124. *Id.*

125. 183 F.3d 645 (7th Cir. 1999).

126. *Id.* at 648. The decedent's estate brought an action against Reich alleging the use of unreasonable force and deprivation of constitutional rights.

127. *Id.*

128. *Id.* at 654.

129. *Id.* at 653. The court made no inquiry into the methodology employed and did not seek any explanation as to why Deering's wounds indicated that he was aiming a gun at Reich at the time he was killed. *Id.* at 653-54.

130. *Id.* at 654. At best, Dr. Greenbaum's previous experience adds credence to her testimony that Deering died as a result of gunshot wounds.

3. The Standard Should Not Change Based on the Type of Case

The relaxed reliability inquiry and low level of scrutiny applied in both *Charley* and *Deering* are inconsistent with either *Goeb* or *Anderson*.¹³¹ While this approach may seem appropriate in cases of murder or sexual assault, it does little to bring consistency or predictability to the judicial process. Moreover, this “open door” approach is as incompatible with the principles espoused in *Daubert* and *Kumho* and the overly restrictive approach taken in *Goeb*. Justice Scalia, in his concurring opinion in *Kumho*, stated that the discretion granted to the district courts is neither “discretion to abandon the gatekeeping function . . . [nor] discretion to perform it inadequately.”¹³²

C. Material Flaws: Focusing on Issues Truly Germane to Reliability

In practice, no methodology is flawless and no expert opinion is immune from well-reasoned attack. However, when flaws are so severe that they cut to the heart of the expert’s methodology, they render the testimony unreliable. Uncertainty exists when an expert’s methodology falls in the gray area between almost flawless and severely flawed. When does a flaw go to the weight or credibility of the expert? When does it render the methodology and the accompanying testimony unreliable? Is it sufficient if the expert demonstrates that the methodology employed is generally accepted in the field, or should the district court examine every step of the expert’s process, from data gathering to reasoning the conclusion, to uncover any possible inconsistency? The following cases highlight the disparity and confusion surrounding the question of when a flaw sufficiently renders an expert’s testimony unreliable.

1. Case I: *Kinser v. Gehl*¹³³

On August 17, 1994, Tim Kinser, an alfalfa farmer, died when he

131. See *supra* notes 63-110 and accompanying text.

132. *Kumho*, 526 U.S. at 158-59 (Scalia, J., concurring).

133. 184 F.3d 1259 (10th Cir. 1999).

became entangled in the compression rollers of an alfalfa baler after he slipped while working in his field.¹³⁴ The decedent's wife filed a product liability action alleging that the Gehl baler was unreasonably dangerous and was negligently designed and manufactured.¹³⁵ The plaintiff's relied on the testimony of two expert witnesses—Dr. Jerry Purswell and Mr. William Kennedy—to make their case.

Dr. Purswell was a mechanical engineer with a doctorate in industrial engineering.¹³⁶ He consulted with agricultural manufacturers in litigation concerning the adequacy of instructions, warnings, and guarding on certain farm equipment; he taught classes on “product design from an ergonomics standpoint;” and he published articles concerning the ability of product warnings to influence the way individuals operate products.¹³⁷

Mr. Kennedy had a bachelor's degree in mechanical engineering and operated his own consulting firm specializing in product and vehicle accident reconstruction.¹³⁸ He reviewed the depositions of several farmers and traveled to the accident site to take measurements of the accident scene and watch Kinser's baler in use. In addition, he examined industry standards publications and various baler manufacturers' operator's manuals.¹³⁹

Both experts concluded that the manufacturer feasibly could have fit the Gehl 1870 baler that Kinser was using with a guard similar to the one used on other balers in the field.¹⁴⁰ The experts also agreed that such a guard would have prevented or at least greatly reduced the severity of Kinser's injuries.¹⁴¹

The Tenth Circuit concluded that Dr. Purswell's testimony did not satisfy *Daubert* because he had never published a paper on agricultural equipment or consulted on issues concerning this

134. *Id.* at 1264.

135. *Id.*

136. *Id.* at 1271.

137. *Id.*

138. *Id.* at 1271-72.

139. *Kinser*, 184 F.3d at 1272.

140. *Id.* The two experts pointed to the John Deere SIO and the Vermeer 504-C closed-throat balers that incorporated the suggested safety features years before the Gehl model was first marketed.

141. *Id.*

particular type of farm equipment.¹⁴² Mr. Kennedy's testimony, on the other hand, failed to satisfy *Daubert* because he never had designed a piece of agricultural equipment or operated a hay baler.¹⁴³

2. Case II: *Oglesby v. General Motors Corp.*¹⁴⁴

James Oglesby suffered serious burns while working on his pickup truck when the radiator hose detached from the radiator.¹⁴⁵ Oglesby filed a product liability action against General Motors, the manufacturer of the truck, alleging negligence, breach of warranty, and strict liability.¹⁴⁶ Douglas Bradbury, a former professor of mechanical engineering at Clemson University, testified that Oglesby's injuries resulted from a defective plastic hose connector between the radiator and the radiator hose.¹⁴⁷

Mr. Bradbury based his opinion on his visual inspection of the broken part, measurements of the part's physical dimensions, and photographs.¹⁴⁸ He concluded that the connector was "out-of-round" and that the condition must have been due to a defect because the plastic could not be remolded once it was set.¹⁴⁹ However, Mr. Bradbury did not test the connector or analyze the material from which it was made.¹⁵⁰ As a result, he failed to discover that the hose connector was not plastic but was actually a nylon composite.¹⁵¹ In addition, the physical properties of the composite were such that it was capable of being remolded or distorted under extreme heat and pressure.¹⁵²

The Fourth Circuit held that Mr. Bradbury's testimony was not reliable because he neither knew the type of material from which the

142. *Id.* at 1271.

143. *Id.* at 1272.

144. 190 F.3d 244 (4th Cir. 1999). The Supreme Court rendered the *Kuhmo* decision in the period between the district court and the Fourth Circuit rulings. The circuit court deferred to the district court's discretion in refusing to consider the expert witness' testimony. *Id.* at 249.

145. *Id.*

146. *Id.*

147. *Id.* at 247.

148. *Id.*

149. *Oglesby*, 190 F.3d at 248.

150. *Id.*

151. *Id.*

152. *Id.*

part was made nor had any knowledge of its properties. As such, Mr. Bradbury could not rule out the fact that the accident could just as likely have been caused by the pressure of Oglesby leaning on the radiator tube while the engine was overheated.¹⁵³

3. Flaws: When are They Material?

While both *Kinser* and *Oglesby* focused on very narrow and specific flaws, the relevant inquiry focuses on whether those flaws were material in determining reliability: Did they truly render the methodology unreliable and prevent the expert from reaching a well-reasoned and reliable conclusion? In *Kinser*, both Dr. Purswell and Mr. Kennedy had engineering backgrounds and extensive experience with agricultural machinery.¹⁵⁴ However, in order to render a reliable opinion on the feasibility of installing a safety guard that was commonplace in the industry, the court also found it necessary for these witnesses: (1) to have consulted previously on issues concerning that “particular type” of farm equipment;¹⁵⁵ (2) to actually have “designed” a piece of agricultural equipment;¹⁵⁶ or (3) to have personally “operated a hay baler.”¹⁵⁷ Essentially, the flaws identified by the *Kinser* court were qualification issues.¹⁵⁸

The fact that the experts could have been “better” qualified should have gone to the weight of the evidence, not to its admissibility.¹⁵⁹ As such, the flaws were not material to determining reliability because they neither undermined the information on which the methodology was based, nor the way in which the methodology was applied to or “fit” the facts.¹⁶⁰ Preventing Dr. Purswell and Mr. Kennedy from

153. *Id.*

154. *Kinser*, 184 F.3d at 1271-72.

155. *Id.* at 1272.

156. *Id.*

157. *Id.* at 1270, 1272.

158. See *Heller v. Shaw*, 167 F.3d 146, 152 (3d Cir. 1999) (warning courts not to mistake credibility questions for admissibility questions).

159. *Lillis v. Lehigh Valley Hosp., Inc.*, No. CIV.97-3459 1999 WL 718231, *5 (E.D. Pa. 1999) (citing *Holbrook v. Lykes Bros. S.S. Co., Inc.*, 80 F.3d 777, 782 (3d Cir. 1996), and ruling that it is an “abuse of discretion [for the district court] to exclude testimony simply because . . . the proposed expert [is not] the best qualified or because the proposed expert does not have the specialization that the court considers most appropriate.”).

160. See *Gen. Elec. v. Joiner*, 522 U.S. 136, 146 (1997). “Fit” refers to the expert’s ability

testifying was analogous to preventing a clothing manufacturer from testifying about garment construction because he does not know how to sew or preventing an architect from testifying about the proper construction of a building because he has never hung a steel girder or poured a concrete footing.

On the other hand, the flaw in *Oglesby* was much more material. Before his testimony would be admitted, the court required Mr. Bradbury: (1) to have identified the material used to manufacture the connector; (2) to know and understand the physical properties of that material; and (3) to investigate the stresses to which the connector was subjected. Unlike *Kinser*, the flaw identified by the *Oglesby* court was directly related to reliability. The fact that Mr. Bradbury neither knew the type of material from which the connector was made nor possessed any knowledge of the material's properties directly undermined the information on which he based his methodology.¹⁶¹ Thus, the flaw was material and the court rightly excluded his testimony.

IV. CURRENT PROPOSALS

As Part III clearly illustrates, the broad discretion granted to district court judges in *Kumho* resulted in trial courts arriving at disparate results in factually similar cases.¹⁶² This disparity increases uncertainty for litigants, undermines the public's faith in the judicial system, and opens the door to selective forum shopping.¹⁶³ Most commentators agree that courts need greater uniformity in the level of scrutiny and burden of proof required to establish reliability. To that end, a number of solutions have been proposed. This section discusses the two most prominent proposals.

to extrapolate a logical conclusion by applying the methodology to the facts of the case. The Court noted that exclusion is appropriate where "there is simply too great an analytical gap between the data and the opinion proffered." *Id.* See also *Daubert*, 509 U.S. at 591.

161. *Oglesby*, 190 F.3d at 248.

162. Compare *McCullock v. H.B. Fuller Co.*, 61 F.3d 1038 (2d Cir. 1995), with *Moore v. Ashland Chem., Inc.*, 151 F.3d 269 (5th Cir. 1998).

163. James E. Starrs, *There's Something About Novel Scientific Evidence*, 28 Sw. U. L. REV. 417, 437-38 (1999) (suggesting that forum shopping may be likely when federal prosecutors are involved in cases of interstate crimes touching more than one federal venue).

A. Court-Appointed Expert

One proposal currently promoted is the appointment by the court of its own independent expert. Under this approach, a court appoints an expert either by inviting them as a formal witness under Rule 706 or as an informal technical advisor.¹⁶⁴ If the expert serves as a witness, the court must adhere to the requirements of Rule 706.¹⁶⁵ However, the court may elect to have the expert serve only as a technical advisor and private consultant to the judge. Proponents suggest that this approach will eliminate bias and diversity of opinion; yet, significant debate remains over whether hearing one side of the story increases reliability.¹⁶⁶ In addition, evidence indicates that court-appointed experts have a disproportionate impact on the outcome of litigation.¹⁶⁷

Another concern regarding the use of court-appointed experts is that they are traditionally selected from professional organizations or societies.¹⁶⁸ These societies and their members frequently are active in various business or political issues.¹⁶⁹ Therefore, the court-appointed expert might not actually be the neutral referee presumed by the judge or jury because the expert is likely to have some sympathy or prejudice that conflicts with the position of one of the parties.

164. Jane Aiken & The Honorable Joel B. Rosen, Dealing with *Daubert* 12 (1998) (unpublished materials for the Federal Judicial Center Workshop for United States Magistrate Judges) (on file with author).

165. FED. R. EVID. 706. Rule 706 requires giving the expert notice of his duties, advising the parties of any of the expert's findings, and permitting deposition and cross-examination by both parties.

166. Marilee M. Kapsa & Carl B. Meyer, *Scientific Experts: Making Their Testimony More Reliable*, 35 CAL. W. L. REV. 313, 328 (1999).

167. Cwik, *supra* note 7, at 66. In a study of fifty-eight cases with court appointed experts, only two resulted in decisions that were inconsistent with the position taken by the expert. *Id.*

168. Kapsa & Meyer, *supra* note 166, at 328-29.

169. *Id.* A court seeking an expert on chemical safety or toxicity may select a member of the American Chemical Society, the world's largest professional society. However, the American Chemical Society is extremely active in defending, protecting, and promoting the chemical industry against public skepticism and litigation. *Id.*

B. Revision of Rule 702

There have been a number of proposals to revise Rule 702 and codify *Daubert* and *Kumho*.¹⁷⁰ The proposed amendment to Rule 702 states:

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-*if*

(1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.¹⁷¹

Despite the significant debate spurred by this proposed revision, Congress may adopt it in the near future.¹⁷² Supporters believe the revision will strengthen judicial decision making because it will increase the reliability of expert testimony.¹⁷³ However, supporters fail to explain how the mere codification of existing principles will result in increased reliability. Critics, on the other hand, aptly point out that the revision does little to clarify the vague standards by which courts measure reliability. They also speculate that the revision may result in increased litigation costs due to more extensive fact and data gathering. Some see the language of subpart (1)—“based on reliable facts or data”—as an improper invasion into the province of

170. Report of the Advisory Committee on Evidence Rules, *available at* <http://www.uscourts.gov/archive/1999/repevid.pdf> (last visited May 11, 2001) (proposal of The Evidence Rules Committee, Rules App.B-53) [hereinafter Advisory Committee Report].

171. FED. R. EVID. 702 (Proposed Draft 1999), *available at* <http://www.law.umich.edu/Thayer/699proamend.htm#702text> (last visited May 11, 2001).

172. Advisory Committee Report, *supra* note 170.

173. *Id.* Some of the largest supporters of the revision include: the Chemical Manufacturers Association; the Federation of Insurance and Corporate Defense Counsel; the International Association of Defense Counsel; the National Association of Manufacturers; the Product Liability Advisory Council; and Nissan of North America, Inc. *Id.*

the jury because the role of the trial judge is to examine the methodology and its application to the facts, not to examine the facts themselves.¹⁷⁴

V. MODEL APPROACH

The following model provides district court judges with a practical guide to conducting a reliability inquiry into expert testimony. The model is clear, yet it encompasses sufficiently broad guidelines and familiar legal principles that balance the desire for greater uniformity and predictability with the need to maintain a flexible approach.¹⁷⁵

A. *Rebuttable Presumption in Favor of Admissibility*

The process of admitting expert testimony should start with a *Daubert* inquiry and a rebuttable presumption in favor of admissibility. This position comports with the spirit of *Daubert*, which suggests that scientific evidence should be presumed admissible.¹⁷⁶ Further, the favorable presumption promotes judicial economy because it eliminates needless reliability inquiries and minimizes litigation costs where applicable.

B. *Limit Experts to Their Specialized Fields*

The court should confine the expert's testimony to the expert's area of expertise.¹⁷⁷ This prevents genuine specialists from offering

174. *Id.* at 5.

175. The Model Approach assumes that either the party seeking to exclude the evidence (majority approach) or the court, *sua sponte*, has already initiated a *Daubert* inquiry.

176. See *Jarvis*, 1999 WL 461813, at *2 (citing *Borawick v. Shay*, 68 F.3d 597, 610 (2d Cir. 1996)).

177. *Smith v. Rasmussen*, 57 F. Supp. 2d 736, 766-67 (N.D. Iowa 1999). An expert qualified in one area of expertise may be precluded from offering opinions beyond that area of expertise. For example, one who is qualified in general psychiatry may not be qualified to testify on the diagnosis and treatment of gender identity disorder. *Id.* See also *United States v. Benson*, 941 F.2d 598, 603 (7th Cir. 1991) ("An expert's opinion is helpful only to the extent that . . . [it] is an opinion informed by the witness' expertise."); *Gray v. Briggs*, 45 F. Supp. 2d 316, 323-25 (S.D.N.Y. 1999) (limiting a securities expert from testifying on specific provisions of ERISA).

unscientific speculations and eliminates the risk of exposing the jury to an opinion that the expert is not qualified to give. Moreover, limiting the scope of the expert's testimony will make it easier for the court to distinguish reliability issues from issues that go to the weight of the evidence.

C. A Court Should Only Exclude Expert Testimony When the Methodology Contains a Material Flaw

A court should only exclude an expert's testimony when it contains a material flaw in the methodology. From the cases discussed herein, one may extrapolate a definition of a "material flaw" as a flaw that significantly undermines the information on which the methodology is based, or that significantly undermines the way in which the methodology can be applied to the facts.¹⁷⁸ A court may also exclude expert testimony if minor flaws are so numerous that, in the aggregate, they constitute a material flaw. It is improper, however, to exclude testimony solely because the methodology is susceptible to criticism. Furthermore, once the court qualifies the expert, issues relating to the witness's qualifications go to the weight of the evidence, not to its admissibility.

D. Strict Adherence to the Preponderance of the Evidence Standard

A district court should conduct the reliability inquiry with an eye toward the proponent's burden of proof. An expert's testimony achieves reliability when it is "more likely than not" that there are sufficient grounds for the expert's conclusion.¹⁷⁹ The court must remember that the preponderance of the evidence standard allows for significant doubt as well as contrary opinion. Therefore, it is improper for the judge to exclude testimony merely because he or she believes that better grounds exist for an alternative conclusion or the

178. See *supra* Part II.C. In *Oglesby*, the failure to determine the material composition of the item precluded the expert from testifying as to its physical properties. *Oglesby*, 190 F.3d at 248.

179. It is proper to look at the conclusion because it is virtually impossible to determine "fit" without doing so. See *Gen. Elec. v. Joiner*, 522 U.S. 136, 146 (1997).

discovery of some flaws in the methodology.¹⁸⁰ The overarching principle of the *Daubert* and *Kumho* inquiry is reliability. For a court to require more constitutes an abuse of discretion.

E. When in Doubt, Admit Expert Testimony

To give meaningful precedential value to *Daubert* and *Kumho*, district court interpretations must comport not only with the language of the opinions, but also with their spirit.

1. Historical Analysis and Courts' Language Supports Liberalized Admission

An examination of the reliability inquiry's evolution uncovers a trend that moves consistently toward a more liberalized approach. Under *Frye*, a judge had to "count the scientific votes" to determine the accepted theory in the field and compare it to the proffered testimony.¹⁸¹ A judge deemed testimony inadmissible if the expert's theory was not in accord with the rest of the relevant scientific community. This effectively excluded all novel or emerging sciences regardless of the principles involved.

Daubert replaced *Frye* with Rule 702, a rule the Court described as having a "liberal thrust" in favor of letting the jury hear "all" the evidence.¹⁸² *Daubert* recognized that the universe of science constantly expands and that today's novel science may become tomorrow's generally accepted science.

Kumho extended *Daubert's* liberalized standard to all expert testimony. The *Kumho* Court went to great lengths to emphasize the flexibility of the reliability inquiry, an inquiry that courts fashion to fit the facts of the individual case. The Court expressly cautioned against the mandatory and mechanical application of the *Daubert* factors. Instead, the *Daubert* factors serve as a starting point, to be applied whenever they can reasonably indicate reliability. *Kumho* emphasized that courts should admit expert testimony where it

180. *Heller v. Shaw*, 167 F.3d 146, 152-53 (3d Cir. 1999).

181. *Frye*, 293 F. at 1013.

182. *Daubert*, 509 U.S. at 579.

“assists” the trier of fact. As such, *Kumho* clearly intended to open the door to the admission of theories that challenge existing orthodoxies.

2. Gaining Admission is Only the First of Many Hurdles

Opponents to liberal admission misplace concerns that liberalized admission will allow “junk scientists” to hijack the fact-finding process. Our legal system traditionally advocates the use of cross-examination to uncover inaccuracies in lay witness testimony. No reason exists to believe that cross-examination suddenly becomes inadequate when applied to expert witnesses. No hard empirical evidence supports the argument that a lay juror is incapable of critically evaluating the reliability of expert testimony.¹⁸³ In fact, these claims prove as speculative and baseless as the “junk science” the opponents so desperately fear.¹⁸⁴

Notably, clearing the *Daubert/Kumho* hurdle and gaining the admission of expert testimony does not grant the proponent instant victory. It merely marks the first step down a long, pitfall-laden road. First, the proponent may find his case dismissed or his opponent granted summary judgment if the admitted evidence does not “fit” or is insufficient to show causation.¹⁸⁵ Second, the district court judge may so severely limit the testimony or direct the jury in such a manner as to render the testimony meaningless. Third, the judge may exclude the testimony under Rule 403.¹⁸⁶ Fourth, vigorous cross-examination will likely expose “junk science” or other questionable testimony. Finally, assuming the proponent overcomes all of these obstacles and the judge allows the expert testimony, the possibility of

183. Emanuel Imwinkelreid, *The Standard for Admitting Scientific Evidence: A Critique from the Perspective of Juror Psychology*, 100 *MIL. L. REV.* 99, 114-16 (1983).

184. Claimant’s contentions cannot be supported by factual data and as such, would themselves be unreliable and inadmissible under a *Daubert/Kumho* inquiry.

185. *E.g.*, *Deiner v. Cincinnati Sub-Zero Prods., Inc.*, 58 F.3d 341 (7th Cir. 1995) (granting summary judgment because expert was sole proof of causation and opinion was not reliable); *Pomella v. Regency Coach Lines, Ltd.*, 899 F. Supp. 335 (E.D. Mich. 1995) (granting summary judgment because expert’s testimony did not “fit” facts of the case).

186. *FED. R. EVID.* 403. Judges may exclude evidence if the danger of unfair prejudice, confusion of the issues, or misleading the jury substantially outweighs the probative value of the evidence.

directed verdict and judgment notwithstanding the verdict still may spell defeat.¹⁸⁷ Thus, opponents misplace concerns that a liberalized policy of admission would impede the efficient administration of justice or that juries will blindly follow expert witnesses wherever they may lead.

VI. CONCLUSION

While the district court judge's instincts urge him to seek certainty, science and experience provide only probability. Reliability, however, lies somewhere between certainty and probability. This tension, coupled with a lack of substantive direction from the Supreme Court, results in inconsistency and uncertainty for litigants. The clear and sufficiently broad guidelines and legal principles of the proposed model allow the district court judge to fulfill the gatekeeping function, while at the same time ensure the preservation of the role of the jury and the adversary system. In the end, any solution must be one that properly balances the desire for greater uniformity and predictability with the need to maintain a flexible approach.

187. *Daubert*, 509 U.S. at 596 (stating expressly that these conventional devices, rather than wholesale exclusion, represent the appropriate safeguards).

