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Toxic Torts - Evidence - Third Circuit Recognizes Medical Monitoring Tort and Makes Significant Rulings Concerning Expert Testimony in Toxic Tort Cases

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TOXIC TORTS—EVIDENCE—THIRD CIRCUIT RECOGNIZES MEDICAL MONITORING TORT AND MAKES SIGNIFICANT RULINGS CONCERNING EXPERT TESTIMONY IN TOXIC TORTS CASES

In re Paoli Railroad Yard PCB Litigation (1990)

I. INTRODUCTION

Today's toxic tort plaintiff confronts significant legal obstacles to recovery.[1] Some of these legal obstacles include the latency of toxin-induced injuries, the problems posed by statutes of limitations and repose, and the difficulty in proving causation.[2] As a result of these legal obstacles, toxic tort victims do not recover adequate compensation for their injuries.[3] Federal and state courts have responded to the problem

1. The term "toxic tort" refers to cases in which individuals allege physical injury or other harm as a result of exposure to a toxic substance. Jack L. Landau & W. Hugh O'Riordan, *Of Mice and Men: The Admissibility of Animal Studies to Prove Causation in Toxic Tort Litigation*, 25 IDAHO L. REV. 521, 521 n.1 (1988-1989). Generally, toxic tort cases involve "(1) exposure to a harmful substance; (2) which produces consequences that are not immediately apparent (for example, diseases with substantial latency periods); and (3) the connection between exposure and the injuries complained of is open to reasonable dispute." *Id.*

2. *See* Leslie S. Gara, *Medical Surveillance Damages: Using Common Sense and the Common Law to Mitigate the Dangers Posed by Environmental Hazards*, 12 HARV. ENVTL. L. REV. 265, 265-67 (1988) (discussing difficulty in proving causation); Colin H. Buckley, Note, *A Suggested Remedy for Toxic Injury: Class Actions, Epidemiology, and Economic Efficiency*, 26 WM. & MARY L. REV. 497, 509-22 (1985) (discussing failure of conventional tort law that render toxic tort recovery "impossible"); Allan T. Slagel, Note, *Medical Surveillance Damages: A Solution to the Inadequate Compensation of Toxic Tort Victims*, 63 IND. L.J. 849, 851-58 (1987-1988) (discussing legal and practical barriers to recovery in toxic tort litigation).

3. *See* Linda Elfenbein, Note, *Future Medical Surveillance: An Award for Toxic Tort Victims*, 38 RUTGERS L. REV. 795, 795 (1986) ("[T]oxic tort victims generally have not been successful in claims for damages. Plaintiffs face procedural, substantive, and evidentiary obstacles when they attempt to bring such suits." (footnote omitted)). Commentators note that courts and legislatures have responded to the inability of plaintiffs to receive adequate compensation by developing various means for recovery. *See, e.g.*, Slagel, Note, *supra* note 2, at 850 ("To remove . . . recovery barriers, solutions which include major changes in the tort system, alternative compensations systems, administrative programs, and legislative action have been proposed.").

Moreover, commentators generally recognize the inadequacy of the traditional tort system in the toxic tort context. *See* W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 30, at 168 (5th ed. 1984 & Supp. 1988) (noting that toxic substance litigation has set courts off in new directions" because threat of future harm not yet realized traditionally has not been enough to allow for recovery); *see also* Gara, *supra* note 2, at 265-66 ("The [tort] system's ability to protect individuals from chemical hazards . . . has been constrained by the scientific community's frequent inability to show that exposure to a particular hazardous substance has caused an individual injury."); Buckley, Note, *supra* note 2, at 509 ("[C]ommon law tort doctrines now make recovery for injuries

by recognizing a new cause of action, the medical monitoring tort.[4] The medical monitoring tort is one of a growing number of non-conventional torts which courts have developed to provide redress for victims who have been exposed to toxic substances.[5] In applying the medical monitoring tort, courts have awarded to prevailing plaintiffs the cost of periodic medical examinations in order to detect and monitor deleterious health problems caused by toxic exposure.[6] Most courts that have addressed the viability of the medical monitoring tort have generally recognized the cause of action.[7] These courts, however, have differed as

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caused by exposure to hazardous waste impossible. We must completely restructure the tort system for compensating hazardous waste injuries."); Slagel, Note, *supra* note 2, at 849 ("Under traditional tort law principles, an individual exposed to a toxic substance has suffered no legally recognized injury entitling her to compensation until she manifests a detectable disease."); Palma J. Strand, Note, *The Inapplicability of Traditional Tort Analysis to Environmental Risks: The Example of Toxic Waste Pollution Victim Compensation*, 35 STAN. L. REV. 575, 618 (1983) ("Because toxic waste pollution injuries do not fit into this common law tort mold, [of furthering goals of compensation, deterrence and corrective justice] victims are not compensated. The indeterminacy of causation and the long time lag between action and harm are special characteristics of the toxic waste problem.").

4. For a list of cases which have recognized the medical monitoring doctrine, see *infra* note 7.

5. *See In re* Paoli R.R. Yard PCB Litig., 916 F.2d 829, 849 (3d Cir. 1990), *cert. denied sub nom.* General Elec. Co. v. Knight, 111 S. Ct. 1584 (1991). *See generally* Gara, *supra* note 2, at 303 ("One of the failures of the tort system . . . has been the great obstacles placed between the victim . . . and her ability to obtain compensation through the courts . . . . The cause of action for medical surveillance damages is one means of remedying this failure."); Allan Kanner, *Medical Monitoring: State and Federal Perspectives*, 2 TUL. ENVTL. L.J., 1, 2 (1989) ("[C]ommon law courts and Congress have sanctioned the right of aggrieved individuals to pursue remedies for medical monitoring . . . . This remedy is used to compensate invasions of an individual's body, to deter the underlying wrongful conduct, and to obtain the information needed to prosecute such medical monitoring cases." (footnote omitted)); Slagel, Note, *supra* note 2, at 850 ("The judicial solution is to award toxic tort victims the cost of medical testing . . . . Early detection enhances the prospects for cure and treatment of toxic-substance-exposure illnesses, as well as enhancing the victim's chances for a prolonged life and minimized pain and suffering." (footnote omitted)).

6. *Paoli*, 916 F.2d at 849. Recognition of the medical monitoring claim fulfills the tort system's objective of compensating the plaintiff for his or her injury. Slagel, Note, *supra* note 2, at 850. Moreover, the tort system's goal of deterrence is satisfied by obligating the toxic substance manufacturer and disposer to be responsible for their actions. *Id.*

7. *See* Ball v. Joy Technologies, Inc., 958 F.2d 36, 39 (4th Cir. 1991) (recognizing the existence of medical monitoring claim under Virginia and West Virginia law), *cert. denied*, 112 S. Ct. 876 (1992); *Paoli*, 916 F.2d at 849-52 (predicting that Pennsylvania Supreme Court would recognize cause of action for medical monitoring); Hagerty v. L & L Marine Servs., Inc., 788 F.2d 315, 319 (5th Cir. 1986) (holding that plaintiff ordinarily may recover reasonable medical expenses, past and future, which he incurs as a result of a demonstrated injury); Herber v. Johns-Manville Corp., 785 F.2d 79, 83 (3d Cir. 1986) (acknowledging New Jersey's recognition of cost of preventative monitoring due to tort as independent element of damages); Hendrix v. Raybestos-Manhattan, Inc., 776

to the proof required to support the medical monitoring tort.[8]

Another legal obstacle faced by plaintiffs in toxic tort cases is the

F.2d 1492, 1507 (11th Cir. 1985) (applying Georgia law and finding that medical monitoring claim is cognizable cause of action); Friends for All Children, Inc. v. Lockheed Aircraft Corp., 746 F.2d 816, 824-26 (D.C. Cir. 1984) (recognizing cause of action for periodic diagnostic examinations/medical monitoring); Merry v. Westinghouse Elec. Corp., 684 F. Supp. 847, 847-52 (M.D. Pa. 1988) (same); Villari v. Terminix Int'l, Inc., 677 F. Supp. 330, 338 (E.D. Pa. 1987) (same); DeStories v. City of Phoenix, 744 P.2d 705, 711 (Ariz. Ct. App. 1987) (same); Devlin v. Johns-Manville Corp., 495 A.2d 495, 503 (N.J. Super. Ct. Law Div. 1985) (same); Ayers v. Township of Jackson, 461 A.2d 184, 190 (N.J. Super. Ct. Law Div. 1983) (same), *vacated on other grounds*, 493 A.2d 1314 (N.J. Super. Ct. App. Div. 1985), *aff'd in part, rev'd in part*, 525 A.2d 287 (N.J. 1987); Askey v. Occidental Chem. Corp., 477 N.Y.S.2d 242, 247 (App. Div. 1984) (same); Habitants Against Landfill Toxicants v. City of York, No. 84-S-3820, 15 Envtl. L. Rep. (Envtl. L. Inst.) 20937, 20938-39 (Pa. Ct. of C.P. of York County, May 20, 1985) (same). *But see* Carroll v. Litton Sys., Inc., No. B-C-88-253, 1990 WL 312969, at *51 (W.D.N.C. Oct. 29, 1990) (stating that this court should not recognize a common law claim for the costs of medical monitoring in the absence of clear direction from the North Carolina courts or legislature and predicting that North Carolina courts would refuse claim in absence of legislative directives); Rheingold v. E.R. Squibb & Sons, No. 74 Civ. 3420, Memorandum Op. at 10 (S.D.N.Y. Oct. 14, 1975) ("Plaintiff . . . has no legal remedy in the absence of injury . . . ."); Potter v. Firestone Tire and Rubber Co., 274 Cal. Rptr. 885, 896 (Ct. App. 1990) ("Although we are sympathetic to [the toxic tort victim] . . . , we are presently unwilling to create a new cause of action for medical monitoring costs."), *appeal granted*, 806 P.2d 308 (Cal. 1990); Morrissy v. Eli Lilly & Co., 394 N.E.2d 1369, 1376 (Ill. App. Ct. 1979) ("In Illinois, possible future damages in a personal injury action are not compensable unless reasonably certain to occur.").

8. *See Ball*, 958 F.2d at 39 (court required plaintiff to demonstrate that present physical injury had manifested itself); *Paoli*, 916 F.2d at 852 (court set forth four-prong test); *Hagerty*, 788 F.2d at 319 (plaintiff may recover reasonable medical monitoring costs which are medically advisable and result of demonstrated injury); *Herber*, 785 F.2d at 83 (plaintiff permitted to present evidence that he possessed increased risk of contracting cancer but court must find that evidence is so probative that it could not be properly excluded because of prejudice); *Hendrix*, 776 F.2d at 1507 (plaintiff required to prove with reasonable certainty not only that he or she will sustain future medical expenses, but also amount of surveillance costs); *Carroll*, 1990 WL 312969, at *51 (plaintiff must demonstrate that physical injury or future injury were "reasonably certain"); Mateer v. U.S. Aluminum, No. 88-2147, 1989 WL 60442, at *7 (E.D. Pa. June 6, 1989) (plaintiff must demonstrate actual or potential injury); *Merry*, 684 F. Supp. at 850 (court set forth three-prong test for recovery); *Villari*, 677 F. Supp. at 338 (court required showing of present physical injury); *Ayers*, 493 A.2d at 1323 (requiring evidence that "defendant has so significantly increased the 'reasonable probability' that any of plaintiffs will develop cancer" (citation omitted)); *Ayers*, 461 A.2d at 190 (issue is not whether it is reasonably probable that plaintiff will suffer in future, rather relevant question is whether "it is necessary, based on medical judgment, that a plaintiff . . . should undergo . . . medical testing in order to properly diagnose the warning signs of the development of the disease"); *Askey*, 477 N.Y.S.2d at 247 (plaintiff must establish "with a reasonable degree of medical certainty that such expenditures are 'reasonably anticipated' to be incurred by reason of their exposure"); *Habitants*, 15 Envtl. L. Rep. at 20938 (plaintiff must show "the potential for severe and latent injuries, and the need for early detection and treatment").

difficulty they encounter when they attempt to present scientific evidence via expert witness testimony.[9] Such expert testimony is crucial to a plaintiff's establishment of causation and damages. To introduce expert witness testimony in federal court, plaintiffs must meet the requirements of Federal Rules of Evidence 702, 703 and 403, the goals of which are to facilitate the admission of reliable evidence.[10]

Expert witness testimony first must meet the threshold requirement of Rule 702, which permits the admission of expert testimony if scientific knowledge will assist the trier of fact.[11] Further, under Rule 702, for the witness to be permitted to testify as an expert, he or she must be qualified as an expert through knowledge, skill, experience, training, or edu-

9. *See* Kenneth R. Kreiling, *Scientific Evidence: Toward Providing the Lay Trier with the Comprehensible and Reliable Evidence Necessary to Meet the Goals of the Rules of Evidence*, 32 ARIZ. L. REV. 915, 915 (1990) ("As cases become more complex and technical, the trier of fact increasingly needs science-based assistance to understand the facts presented and to reach an informed determination—assistance in the form of 'scientific evidence' that is normally presented through supposed 'experts' in the field."); *see also* Anne S. Toker, Note, *Admitting Scientific Evidence in Toxic Tort Litigation*, 15 HARV. ENVTL. L. REV. 165, 165 (1991) (noting that often the outcome of the trial may depend largely, if not wholly, on scientific evidence).

The plaintiffs' need to present expert testimony is juxtaposed against the courts' general suspicion towards admitting the scientific evidence. The danger which contributes to the courts' reluctance to admit the scientific testimony is the aura of infallibility that envelops the evidence. *See* Paul C. Gianelli, *The Admissibility of Novel Scientific Evidence:* Frye v. United States, *A Half-Century Later*, 80 COLUM. L. REV. 1197, 1237 (1980). Moreover, the danger includes the potential that the scientific evidence will mislead the jury. *Id.*

10. *See* FED. R. EVID. 403, 702, 703; Kreiling, *supra* note 9, at 939 ("[T]he Federal Rules, when viewed in light of the purpose of the Rules, do suggest an approach which facilitates admission of reliable, comprehensible scientific evidence."); Vicki Christian, Comment, *Admissibility of Scientific Expert Testimony: Is Bad Science Making Law?*, 18 N. KY. L. REV. 21, 35 (1990) ("The goal in seeking a distinct rule on the admissibility of scientific testimony is to find a rule promoting the admission of only reliable evidence grounded in a proven scientific theory.").

Rule 403 states: "Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." FED. R. EVID. 403.

Rule 702 provides: "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.

Rule 703 states:

> The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

FED. R. EVID. 703.

11. FED. R. EVID. 702. For the text of Rule 702, see *supra* note 10.

cation.[12] Second, expert witness testimony must satisfy the requirements of Rule 703, which requires a court to examine the reliability of the evidentiary bases for the expert opinion evidence before such evidence is admissible.[13] Finally, expert witness testimony must conform to the mandates of Rule 403.[14] Rule 403 permits courts to exclude evidence otherwise admissible under Rules 702 and 703 if the court determines that the probative value of the evidence is substantially outweighed by the likelihood of unfairly prejudicial evidence, confusion or deception of the jury, or unnecessary expenditure of time.[15]

In *In re Paoli Railroad Yard PCB Litigation*,[16] the United States Court of Appeals for the Third Circuit attempted to mitigate the legal impediments that toxic tort victims face.[17] First, the *Paoli* court acknowledged that toxic tort plaintiffs receive inadequate compensation for their injuries.[18] The *Paoli* court predicted that the Pennsylvania Supreme Court would recognize a new cause of action—the medical monitoring tort.[19] Thus, in *Paoli*, the Third Circuit held for the first time that a cause of action for medical monitoring is a cognizable claim in Pennsylvania.[20] The *Paoli* court also adopted a standard that it believed the Pennsylvania Supreme Court would apply in granting medical monitoring damages.[21]

Second, realizing that judicial suspicion towards the admissibility of expert witness testimony has impeded toxic tort plaintiffs in proving causation and damages, the *Paoli* court broadened the admissibility of

12. FED. R. EVID. 702. For the specific language of Rule 702, see *supra* note 10.

13. FED. R. EVID. 703. For the specific language of Rule 703, see *supra* note 10. *See also* Christian, Comment, *supra* note 10, at 25-26.

14. FED. R. EVID. 403. For the specific language of Rule 403, see *supra* note 10.

15. FED. R. EVID. 403. The rationale behind Rule 403 is to exclude evidence that may cause the trier of fact to decide the case on an unfair or emotional basis. Note, *Expert Testimony Based on Novel Scientific Techniques: Admissibility Under the Federal Rules of Evidence*, 48 GEO. WASH. L. REV. 774, 784 (1980) (citing United States v. McRea, 593 F.2d 700, 707 (5th Cir.), *cert. denied*, 444 U.S. 862 (1979)).

16. 916 F.2d 829 (3d Cir. 1990), *cert. denied sub nom.* General Elec. Co. v. Knight, 111 S. Ct. 1584 (1991).

17. For a discussion of the laudable responsiveness of the Third Circuit to the needs of the toxic tort plaintiff, see *infra* notes 112-22 and accompanying text.

18. *Paoli*, 916 F.2d at 849. For a discussion of the reasons that toxic tort victims receive insufficient compensation, see *supra* note 3 and accompanying text.

19. *Paoli*, 916 F.2d at 849. For a discussion of the Third Circuit's recognition of the medical monitoring tort, see *infra* notes 53-73 and accompanying text.

20. *Paoli*, 916 F.2d at 852. For a discussion of the specific conclusion of *Paoli* court regarding the medical monitoring claim, see *infra* notes 71-73 and accompanying text.

21. *Paoli*, 916 F.2d at 852. For a discussion of the standard that the *Paoli* court adopted, see *infra* note 73 and accompanying text.

expert witness testimony under Rules 702, 703, and 403, thereby giving plaintiffs a greater opportunity to present evidence.[22] Concerning the admissibility of novel scientific evidence under Rule 702, the *Paoli* court adopted the analysis it developed in *United States v. Downing*.[23] Regarding the reliability of evidence under Rule 703, the *Paoli* court reaffirmed the approach it adopted in *In re Japanese Electronic Products*.[24] Finally, with respect to weighing the value of evidence under Rule 403, the *Paoli* court held that Rule 403 exclusions should be utilized sparingly to avoid the exclusion of probative evidence.[25]

II. FACTS AND PROCEDURAL HISTORY

In *Paoli*, thirty-eight persons who worked or lived near the Paoli railyard brought a diversity action in April of 1986 against six defendants, including Amtrak, Conrail and General Electric.[26] The plaintiffs brought the action in the United States District Court for the Eastern District of Pennsylvania, claiming that due to the negligence of the defendants, they suffered a variety of illnesses as a result of exposure to polychlorinated biphenyls (PCBs).[27] PCBs are toxic substances that were used as fluid in Paoli railcar transformers and could be found in

22. For a discussion of the liberal evidentiary position taken by the *Paoli* court, see *infra* notes 74-111 and accompanying text.

23. 753 F.2d 1224 (3d Cir. 1985). For a discussion of the facts and holding of the *Downing* court, see *infra* notes 98-100 and accompanying text. For the Third Circuit's treatment of the admissibility of meta-analysis, a novel scientific technique, see *infra* notes 97-105 and accompanying text.

24. 723 F.2d 238, 276-79 (3d Cir. 1983), *cert. granted in part sub nom.* Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 471 U.S. 1002 (1985), *rev'd on other grounds sub nom.* Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574 (1986). For a discussion of the facts and holding of the *Japanese Electronics* case, see *infra* notes 79-84 and accompanying text. For a discussion of the *Paoli* court's treatment of *Japanese Electronics*, see *infra* notes 85-88 and accompanying text.

25. *See Paoli*, 916 F.2d at 859-60; *see also* DeLuca v. Merrell Dow Pharmaceuticals, Inc., 911 F.2d 941, 957 (3d Cir. 1990) ("[I]f . . . testimony survives the rigors of Rule 702 and 703 . . . Rule 403 is an unlikely basis for exclusion."); Note, *supra* note 15, at 784 (courts have warned that Rule 403 should be applied sparingly to avoid the exclusion of probative evidence (citing United States v. McRea, 593 F.2d 700, 707 (5th Cir.), *cert. denied*, 444 U.S. 862 (1979))).

26. *Paoli*, 916 F.2d at 835. The defendants in *Paoli* were: Amtrak, which owned the railyard since 1976; Conrail, operator of the railyard between 1976 and 1983; the Southeastern Pennsylvania Transit Authority (SEPTA), which has operated the facility since 1983; Monsanto Corporation, the largest manufacturer of PCBs in the United States; General Electric Company, manufacturer and supplier of the electrical transformers that contained the PCBs; and the City of Philadelphia, owner of some of the railroad cars. *Id.*

27. *Id.* The Paoli railyard is a twenty-three acre electric railcar maintenance facility which is the terminus for the Paoli Local, a rail line which serves the Philadelphia Main Line. *In re* Paoli R.R. Yard PCB Litig., 706 F. Supp. 358, 361 (E.D. Pa. 1988), *rev'd*, 916 F.2d 829 (3d Cir. 1990), *cert. denied sub nom.* General Elec. Co. v. Knight, 111 S. Ct. 1584 (1991).

high concentrations in the air and soil surrounding the Paoli facility.[28]

The plaintiffs asserted several theories of recovery based on common law tort and the medical monitoring doctrine.[29] The plaintiffs sought to establish that they were exposed to PCBs and that this exposure caused them harm.[30] In order to meet their burden of proof under the tort theory, the plaintiffs relied on expert witness testimony.[31] The district court, however, refused to admit a substantial portion of the plaintiffs' evidence and declined to conduct *in limine* hearings regarding its admissibility.[32] Accordingly, the defendants filed a joint motion for summary judgment, which the district court subsequently granted in favor of the defendants on the personal injury claims.[33] All plaintiffs filed an appeal to the Third Circuit from the district court's grant of summary judgment.[34]

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28. *Paoli*, 706 F. Supp. at 361.

29. *Paoli*, 916 F.2d at 836. The plaintiffs sought damages under state law for their personal injury claims and "response costs" under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 42 U.S.C. § 9607(a) (1988). *See Paoli*, 706 F. Supp. at 361. The scope of the issues before the Third Circuit, however, was confined to common law tort and the medical monitoring doctrine. *Paoli*, 916 F.2d at 835-36. For a discussion of the medical monitoring tort, see *supra* notes 4-8 and accompanying text. For a discussion of the Third Circuit's approach to the medical monitoring tort, see *infra* notes 53-73 and accompanying text.

30. *Paoli*, 916 F.2d at 838.

31. *Id.* at 835. For a discussion of the Third Circuit's analysis regarding the expert testimony, see *infra* notes 74-111 and accompanying text.

32. *Paoli*, 916 F.2d at 854. The Third Circuit pointed out that the district court opinion was unclear in many places as to whether it was formally excluding or merely describing the testimony. *Id.* at 853. However, the Third Circuit stated that "[i]n view of the [district] court's 'bottom line,' we will assume that the court excluded the challenged evidence." *Id.*

33. *Paoli*, 706 F. Supp. at 376. Subsequent to the plaintiffs' answer of the summary judgment motion, attorneys for all parties requested oral argument. *Paoli*, 916 F.2d at 836-37. The district court judge refused the request. *Id.* at 837.

The Third Circuit dedicated a significant portion of its opinion to a description and analysis of the plaintiffs' expert testimony. *Id.* at 838-49, 852-60. The court's assessment regarding the admissibility of plaintiffs' evidence was crucial to its evaluation of whether the district court's granting of the summary judgment motion was proper. The *Paoli* court stated that "[b]ecause the grant of summary judgment inexorably flowed from these evidentiary rulings, if they are set aside, so must be the summary judgment." *Id.* at 835.

34. *Paoli*, 916 F.2d at 836-37. The *Paoli* court's opinion based on this appeal not only dealt with the medical monitoring claim and the evidentiary issues, but it also concerned three other issues which are not within the scope of this casebrief. First, the *Paoli* court rejected the defendants' attacks on the court's appellate jurisdiction. *Id.* at 837-38. Second, the *Paoli* court considered and granted the Butler plaintiffs' motion to amend. *Id.* at 863. Finally, the *Paoli* court found that the plaintiffs had not complied with a statute requiring notice of injury to SEPTA. *Id.* at 863-65. However, the *Paoli* court further stated that such non-compliance could be excused if SEPTA failed to show prejudice. *Id.* at 865.

III. ANALYSIS

A. *Review of the Record*

Before beginning its legal analysis, the *Paoli* court reviewed the record on which the district court based its grant of summary judgment.[35] The *Paoli* court summarized the district court's analysis of the plaintiffs' expert witnesses and evidence, and its examination of the plaintiffs' prima facie case.[36] In order to prove abnormal exposure and causation, the plaintiffs primarily relied upon nine experts.[37] The *Paoli* court exhaustively discussed each of the experts' qualifications, the facts upon which the experts based their opinions, and the testimony of each witness. The testimony of Dr. Deborah A. Barsotti, Dr. Arthur C. Zahalsky and Dr. Ian C.T. Nisbet was the crucial testimony for the *Paoli* court's legal analysis.[38]

In its review of the record, the Third Circuit also discussed and noted the importance of the meta-analysis technique advanced by plaintiffs' expert, Dr. Nicholson.[39] Dr. Nicholson employed this technique in order to prove that current epidemiologic studies support a conclusion

35. *Id.* at 838-49.

36. *Id.* at 838-45.

37. *Id.* at 838-41.

38. *Id.* A number of the plaintiffs adduced the testimony of Deborah A. Barsotti, Ph.D., a toxicologist who received her doctorate in pathology and was serving, at the time of the testimony, as the Chief of the Research Analysis Branch of the Agency for Toxic Substance and Disease Registry of the United States. *Id.* at 839. Dr. Barsotti offered expert opinions as to both exposure and causation. *Id.* Dr. Barsotti stated that she traced the PCBs in the plaintiffs' bodies to the Paoli railyard by using gas chromatography. *Id.* Dr. Barsotti also opined with "reasonable scientific certainty," that the PCBs were the cause of many of the diseases that plaintiffs had contracted. *Paoli*, 706 F. Supp. at 369-70. As the Third Circuit noted, however, the district court seemed to have excluded Dr. Barsotti's testimony pursuant to Rule 702. *Paoli*, 916 F.2d at 855; *see also Paoli*, 706 F. Supp. at 369-70. The district court found that Dr. Barsotti was not qualified as a chemist to testify as to gas chromatography, nor was she qualified as a medical doctor to present evidence concerning the cause of plaintiffs' illnesses. *Id.* For the text of Rule 702, see *supra* note 10. For a discussion of Rule 702, see *supra* notes 11-12 and accompanying text.

Plaintiffs also proffered the testimony of Arthur C. Zahalsky, Ph.D., who had received his doctorate degree in microbiology. *Paoli*, 916 F.2d at 839. Dr. Zahalsky owned an immunological consulting firm and was a college professor of immunology and human diseases. *Id.* Dr. Zahalsky submitted that plaintiffs had suffered immune system injuries due to their exposure to PCBs at Paoli. *Id.* at 840. However, the district court refused to admit the testimony because he was "not trained in differential diagnosis." *Paoli*, 706 F. Supp. at 370; *Paoli*, 916 F.2d at 855.

Ian C.T. Nisbet, Ph.D., who received his doctorate degree in physics from Cambridge University, served as the president of a scientific consulting firm and published work in the environmental science area. *Paoli*, 916 F.2d at 840-41. The district court also rejected Dr. Nisbet's testimony because, *inter alia*, there is "nothing in . . . [his] curriculum vita that would qualify him to testify as an expert in this area." *Paoli*, 706 F. Supp. at 372; *see Paoli*, 916 F.2d at 855.

39. *Paoli*, 916 F.2d at 841, 856-59.

that PCBs are causally linked to deleterious health effects in humans.[40] The *Paoli* court explained that meta-analysis is a technique which combines the results of various epidemiological studies done by other scientists, and re-analyzes the combined data to evaluate whether the data renders different results than individual studies conducted with a smaller data sample.[41] Finally, the Third Circuit noted three sources that the plaintiffs' experts relied upon for their testimony: animal studies purporting to demonstrate the harmful health effects of PCBs, studies utilizing data from the Yusho and Yu Cheng studies and the experts' own research and opinions.[42]

Although the *Paoli* court did not discuss the animal studies that the plaintiffs relied upon, it noted that the animal studies purported to demonstrate the deleterious health effects of PCBs.[43] The district court had excluded the animal studies based on Rule 703 because the court found the studies were irrelevant.[44]

The evidence based on the Yusho and Yu Cheng incidents was particularly relevant to the Third Circuit's opinion.[45] Some of the experts used the Yusho and Yu Cheng incidents as possible bases for their opinions regarding causation.[46] The Yusho and Yu Cheng incidents, which occurred in Japan and Taiwan in the 1960s, involved the contamination of rice oil with a Japanese brand of PCBs.[47] Persons who ingested food cooked with this rice oil contracted various diseases.[48] The district court, however, excluded from evidence any expert opinion based on studies of the Yusho and Yu Cheng incidents.[49]

The Third Circuit opinion also discussed the district court's definition of the plaintiffs' prima facie case.[50] The district court had stated that the plaintiffs would need to prove four elements: "1) that defendants released PCBs into the environment; 2) that plaintiffs somehow ingested these PCBs into their bodies; 3) that plaintiffs have an injury;

40. *Id.* at 841. Based on the meta-analysis, Dr. Nicholson concluded that exposure to PCBs can cause liver, gall bladder and biliary tract disorders. *Id.* Specifically, the Third Circuit pointed out that the plaintiffs must prove causation to survive a motion for summary judgment, and meta-analysis is one of the few pieces of direct evidence indicating that PCBs in fact cause disease. *Id.* at 856.

41. *Id.*

42. *Id.* at 845.

43. *Id.*

44. *Id.* at 846.

45. *See id.* at 854.

46. *Id.* at 846.

47. *Paoli*, 706 F. Supp. at 368.

48. *Id.* After reviewing the scientific community's opinions, the district court found that the incidents occurred due to the consumption of toxic PCDFs and that the incidents are not evidence of the effects of PCBs. *Id.*

49. *Id.*

50. *Paoli*, 916 F.2d at 848-49.

[and] 4) that PCBs are the cause of that injury."[51] Because the district court excluded almost all of the plaintiffs' evidence, the court concluded that the plaintiffs were unable to prove the four elements of their case.[52]

B. *Medical Monitoring Claim*

In its legal analysis, the *Paoli* court first evaluated the plaintiffs' medical monitoring claim.[53] Through this claim, the plaintiffs sought to recover the costs of future periodic medical examinations that they alleged were medically necessary to prevent the manifestation of latent diseases brought about by PCB exposure.[54] The *Paoli* court acknowledged that neither the Pennsylvania Supreme Court nor the Pennsylvania Superior Court had yet confronted the issue of whether a plaintiff's claim for the cost of preventative medical surveillance was a valid cause of action.[55] The *Paoli* court explained that because it was sitting in diversity, its task was to predict whether the Pennsylvania Supreme Court would recognize a claim for medical monitoring under the Pennsylvania substantive law and, if so, to define the elements of such a claim.[56]

After describing the medical monitoring tort, the *Paoli* court distinguished this tort from the similar claim of enhanced risk of harm, which the Pennsylvania Supreme Court previously had expressed caution in recognizing.[57] The *Paoli* court posited that the supreme court's cautious position towards recognizing enhanced risk claims would not extend to medical monitoring claims.[58] The *Paoli* court explained that the proper

51. *Paoli*, 706 F. Supp. at 375.

52. *Paoli*, 916 F.2d at 849.

53. *Id.* at 849-52. For an explanation of the medical monitoring tort, see *supra* notes 4-8 and accompanying text.

54. *Paoli*, 916 F.2d at 849.

55. *Id.*

56. *Id.* (citing Erie R.R. Co. v. Tomkins, 304 U.S. 64 (1938)).

57. *Id.* at 849-50; *see* Martin v. Johns-Manville Corp., 494 A.2d 1088, 1094 n.5 (Pa. 1985) (stating that plaintiff, in asserting enhanced risk of harm claim, must present evidence from which jury can reasonably determine degree to which future consequences of present injury are *probable*, not just possible) (emphasis in original)), *rev'd on other grounds sub nom.* Martin v. Owens-Corning Fiberglas Corp., 528 A.2d 947 (Pa. 1987). The *Paoli* court discussed various nontraditional torts that recently have been adopted by courts to allow plaintiffs recovery without present manifestations of physical injury. *Paoli*, 916 F.2d at 849-50. The *Paoli* court provided examples in the toxic tort context, such as recovery for emotional distress resulting from fear of contracting a future disease and the enhanced risk of future harm. *Id.*

The *Paoli* court defined medical monitoring claims as actions seeking to recover only the costs of periodic medical examinations that are needed to discover the manifestation of disease. *Id.* at 850. In contrast, the *Paoli* court characterized enhanced risk claims as those claims seeking compensation for the expected injury, proportionately reduced to reflect the probability that it will not appear. *Id.*

58. *Paoli*, 916 F.2d at 849-52. More importantly, the *Paoli* court opined that

inquiry in a medical monitoring claim is not whether it is reasonably probable that plaintiffs will suffer injury in the future, as is the case in enhanced risk claims.[59] Rather, the *Paoli* court stated that the appropriate inquiry is whether medical monitoring is, to a reasonable degree of medical certainty, necessary to properly detect the manifestation of disease.[60]

After determining that the Pennsylvania Supreme Court would be likely to recognize the tort of medical monitoring, the *Paoli* court then determined the analysis the supreme court would apply.[61] To accomplish this task, the *Paoli* court examined and compared approaches taken by two Pennsylvania federal courts that had considered the appropriate standard for a medical monitoring claim under Pennsylvania law.[62] The first case examined by the *Paoli* court was *Villari v. Terminix International, Inc.*,[63] which was decided by the United States District Court for the Eastern District of Pennsylvania.[64] The *Villari* court allowed the plaintiffs' request for the costs of future medical monitoring.[65] However, the *Villari* court required that the plaintiffs demonstrate present physical injury in order to recover future monitoring costs.[66]

The second case the *Paoli* court considered was *Merry v. Westinghouse*

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the Pennsylvania Supreme Court would not require a demonstration of reasonable probability of harm in medical monitoring claims. *Id.* The *Paoli* court reached its conclusion by distinguishing the facts in *Paoli* from the facts in *Martin*. *Id.* at 850-51; *see also Martin*, 494 A.2d at 1092-93. Primarily, the *Paoli* court stated that the injury in *Martin* was different from the injury in *Paoli*. *Paoli*, 916 F.2d at 850-51. The *Paoli* court explained that an injury involved in an enhanced risk claim is speculative because courts are compelled to predict the *probability* that the injury will manifest itself. *Id.* However, the *Paoli* court pointed out that the injury in a medical monitoring claim is much less speculative because the jury need only determine whether the plaintiff requires medical surveillance. *Id.*

The *Paoli* court also stated that if the supreme court was concerned with recognizing the medical monitoring claim, it could require that the jury determine that the requested medical monitoring "is *probably*, not just *possibly*, necessary." *Id.* at 851 (emphasis added).

59. *Paoli*, 916 F.2d at 851.

60. *Id.*

61. *Id.* at 852.

62. *Id.* at 851-52. For a discussion of the two district court opinions that the Third Circuit compared, see *infra* notes 63-70 and accompanying text.

63. 677 F. Supp. 330 (E.D. Pa. 1987).

64. *Paoli*, 916 F.2d at 852. In *Villari*, homeowners, individually and on behalf of their minor children, brought an action against Terminix, a pest control company. *Villari*, 677 F. Supp. at 331-32. Plaintiffs claimed that Terminix contaminated their home with a hazardous termiticide. *Id.* Plaintiffs alleged a variety of theories of recovery, one of which was for the costs of future medical monitoring. *Id.*

65. *Villari*, 677 F. Supp. at 338.

66. *Id.* The *Villari* court, however, explicitly stated that the plaintiffs were not required to have exhibited *symptoms* of the particular diseases for which they sought medical surveillance damages, but did need to show some physical injury. *Id.* (emphasis added). Thus, the *Paoli* court pointed out that because the plaintiffs in *Villari* had sufficiently demonstrated physical injury, the *Villari* court

Electric Corp.[67] In *Merry*, the United States District Court for the Middle District of Pennsylvania explicitly rejected the *Villari* court's putative physical injury requirement.[68] The *Merry* court agreed with the *Villari* court that plaintiffs need not exhibit symptoms of disease to recover for medical surveillance.[69] The *Merry* court held that in order to recover for medical monitoring costs, a plaintiff must prove three elements: exposure to hazardous substances, potential for injury and the need for early detection and treatment.[70]

In predicting the approach that the Pennsylvania Supreme Court would take, the Third Circuit in *Paoli* adopted the general standard utilized by the *Merry* court.[71] The *Paoli* court, however, established four elements that constitute a cause of action for medical monitoring in

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did not decide the issue of whether medical monitoring costs could be recoverable without such a showing. *Paoli*, 916 F.2d at 852.

By requiring a showing of present physical injury, the *Villari* court expressly refused to follow Ayers v. Township of Jackson, 461 A.2d 184 (N.J. Super. Ct. Law Div. 1983), *vacated on other grounds*, 493 A.2d 1314 (N.J. Super. Ct. App. Div.), *aff'd in part, rev'd in part*, 525 A.2d 287 (N.J. 1987). *See Villari*, 677 F. Supp. at 338, n.5. In *Ayers*, the New Jersey Superior Court enunciated the following standard for recovery based on a medical monitoring claim:

> It is not the reasonable probability of whether plaintiffs will suffer cancer in the future that should determine whether medical surveillance is necessary. Rather, it is whether it is necessary, based on medical judgment, that a plaintiff who has been exposed to known carcinogens at various levels should undergo annual medical testing in order to properly diagnose the warning signs of the development of the disease. If it is necessary, then the probability of the need for that medical surveillance is cognizable as part of plaintiffs' claim.

Ayers, 461 A.2d at 190. The plaintiffs in *Villari* did not adequately persuade the district court that the Pennsylvania Supreme Court would adopt this approach. *Villari*, 677 F. Supp. at 338 n.5.

67. 684 F. Supp. 847 (M.D. Pa. 1988).

68. *Id.* at 849. In *Merry*, property owners whose wells had been contaminated by toxic substances brought an action against Westinghouse for, *inter alia*, medical monitoring damages. *Id.* at 847-58.

69. *Id.* at 849.

70. *Id.* The three requirements articulated by the *Merry* court were extracted from Habitants Against Landfill Toxicants v. City of York, No. 84-S-3820, 15 Envtl. L. Rep. (Envtl. L. Inst.) 20937, 20938-39 (Pa. Ct. of C.P. of York County, May 20, 1985). *See Merry*, 684 F. Supp. at 850. The *Merry* court held:

> [T]he plaintiffs, through their experts' reports, have created an issue of fact as to the probability of contracting a serious illness as a result of exposure to the hazardous substances in their wells. It would be reasonable for a jury to conclude that the plaintiffs have a significantly but unquantifiably enhanced risk of serious disease, and that such enhanced risk of disease justifies periodic medical examinations.

Id. at 852. Consequently, the *Merry* court denied Westinghouse's motion for summary judgment on the plaintiffs' medical monitoring claim. *Id.*

The *Merry* court found that the approaches adopted by the courts in *Habitants* and *Ayers* were consistent with Pennsylvania public policy and tort law. *Merry*, 684 F. Supp. at 848-52.

71. *Paoli*, 916 F.2d at 852. For a discussion of the *Merry* standard, see *supra* notes 67-70 and accompanying text.

Pennsylvania.[72] In order to recover for medical monitoring costs, the *Paoli* court held that a plaintiff must demonstrate: 1) that the plaintiff was significantly exposed to a hazardous substance due to the negligent actions of the defendant; 2) that as a proximate result of the exposure, the plaintiff suffers a significantly increased risk of contracting a serious latent disease; 3) that the increased risk makes periodic diagnostic medical examinations reasonably necessary; and 4) that monitoring procedures exist which make the early detection and treatment of the disease possible and beneficial.[73]

C. *Evidentiary Issues in the Toxic Tort Setting*

After recognizing the availability of the medical monitoring tort in Pennsylvania, the Third Circuit in *Paoli* focused its attention on the evidentiary issues in the case.[74] The Third Circuit assumed that the district court had excluded the bulk of the plaintiffs' evidence as unreliable, and thus the Third Circuit considered whether the district court had done so properly.[75] The Third Circuit scrutinized the evidence presented at trial and evaluated the propriety of the district court's evidentiary rulings under Federal Rules of Evidence 703, 702 and 403.[76]

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72. *Paoli*, 916 F.2d at 852.

73. *Id.* In supporting its holding, the *Paoli* court stated that the policy reasons for recognizing a medical monitoring cause of action are supported by the conventional goals of the Pennsylvania tort system. *Id.* First, the *Paoli* court noted that medical monitoring claims, in this toxic age, recognize that an individual can be substantially injured, notwithstanding latent manifestation of that harm. *Id.* Second, the *Paoli* court pointed out that medical monitoring claims do not require a court to speculate about the probability of future injury. *Id.* Instead, the *Paoli* court stated that a medical monitoring claim merely requires the factfinder to determine the probability that the far less expensive remedy of medical surveillance is appropriate. *Id.* Finally, the *Paoli* court recognized that allowing recovery for this claim would deter the careless discharge of toxic substances by defendants and encourage plaintiffs to bring timely actions for the detection and treatment of their injuries. *Id.*

74. *Id.* at 852-60.

75. *Id.* at 852-53. The *Paoli* court stated:

> As we have explained . . . , the text of the district court opinion, which attacks many of plaintiffs' expert opinions without formally excluding them, suggests that the court was merely describing, not excluding, the testimony. However, at other times the court appears to have excluded most if not all of the testimony. In view of the court's "bottom line," we will assume that the court excluded the challenged evidence.

Id. at 853.

The *Paoli* court then explained that if the district court's exclusions were proper, summary judgment was appropriately granted. *Id.* However, the *Paoli* court acknowledged that it had to determine whether the evidence was properly excluded. *Id.*

76. *Id.* at 852-60. For a discussion of the evidence presented for the district court's consideration, see *supra* notes 38-40. For a discussion of the *Paoli* court's analysis of the propriety of the district court's evidentiary rulings, see *infra* notes 77-106 and accompanying text.

1. *Interpretation of Federal Rule of Evidence 703*

The Third Circuit in *Paoli* first considered the district court's analysis under Rule 703.[77] The district court had found that much of the plaintiffs' scientific evidence was unreliable and excludable under Rule 703.[78] The *Paoli* court, however, found that the district court's analysis fatally deviated from the Rule 703 protocols established in *In re Japanese Electronic Products*.[79] Thus, the *Paoli* court relied on the *Japanese Electronics* protocols in overturning the district court's exclusion of the plaintiffs' expert testimony evidence based on Rule 703.[80]

In *Japanese Electronics*, the Third Circuit set forth the standard for determining whether an expert's informational foundation is of the type reasonably relied upon by experts in the field, and thus admissible under Rule 703.[81] The *Japanese Electronics* court stated that the proper issue is not what courts determine to be reliable, but rather what experts in the relevant field deem reliable.[82] Moreover, the *Japanese Electronics* court demanded that, as a matter of law, the district court must make a factual determination as to the facts which the experts in the field deem to be reliable.[83]

The *Paoli* court concluded that the *Japanese Electronics* case mandated that the district court have a proper foundation for making its admissibility findings.[84] The *Paoli* court then applied the *Japanese Electronics* standard to the animal studies that several of the plaintiffs' witnesses utilized as a factual foundation for their opinions.[85] The *Paoli* court found that the district court had improperly excluded the opinions that were based on these animal studies.[86] The court suggested that the dis-

77. *Paoli*, 916 F.2d at 853-54; *see also* FED. R. EVID. 703. For the text of Rule 703, see *supra* note 10.

78. *Paoli*, 916 F.2d at 853. For a discussion of the evidence that was reviewed by the district court, see *supra* notes 35-52 and accompanying text.

79. *Paoli*, 916 F.2d at 853-54; *see also In re* Japanese Elec. Prods., 723 F.2d 238, 276-79 (3d Cir. 1983), *cert. granted in part sub nom.* Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 471 U.S. 1002 (1985), *and rev'd on other grounds*, 475 U.S. 574 (1986). In *Japanese Electronics*, American television manufacturers brought suit against Japanese manufacturers and others on the theories of antitrust, tariff and antidumping violations. *Id.* at 238. The district court had excluded expert testimony under both Rules 702 and 703, and granted summary judgment in favor of the defendants. *Id.* at 276-79. The Third Circuit reversed those rulings. *Id.* at 278.

80. *Paoli*, 916 F.2d at 853-54.

81. *Japanese Electronics*, 723 F.2d at 277.

82. *Id.* Thus, the Third Circuit in *Japanese Electronics* found that the trial court had erred in its interpretation of Rule 703 by substituting its own opinion as to what constituted reasonable reliance instead of determining what experts in the relevant fields deemed reliable. *Id.*

83. *Id.* Further, the *Japanese Electronics* court stated that "[t]here is no discretion to forbear from making this inquiry and finding." *Id.*

84. *Paoli*, 916 F.2d at 853.

85. *Id.* at 853-54.

86. *Id.* at 853. The *Paoli* court pointed out that the district court seemed to

trict court should have identified the theory upon which it rejected the opinions and should have indicated which opinions it intended to exclude.[87] Because the district court did not articulate the facts it relied upon in making its legal determination, the *Paoli* court set aside the district court's evidentiary exclusions.[88]

Similarly, the Third Circuit in *Paoli* found that the district court's treatment of the Yusho and Yu Cheng studies as a foundation for expert opinions was flawed.[89] The Third Circuit rejected the district court's finding to exclude expert opinions based on these two studies because the district court did not specify the scientific literature on which it based its determination.[90] Thus, the Third Circuit, based on Rule 703, abrogated the evidentiary exclusions the district court had made.[91]

2. *Interpretation of Federal Rule of Evidence 702*

The Third Circuit next considered the propriety of the district court's exclusions based on Rule 702.[92] First, the Third Circuit reviewed the district court's rejection of expert witnesses as unqualified to give testimony in a particular field.[93] The Third Circuit stated that the dis-

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have excluded the expert testimony based on the animal studies. *Id.* The district court had stated that it had "very convincing evidence on the record that says that these studies are irrelevant." *Paoli*, 706 F. Supp. at 368. However, the *Paoli* court emphasized that such an untenable statement is not sufficient without a specific discussion of the evidence that led the district court to its conclusion that the opinions were unreliable. *Paoli*, 916 F.2d at 853.

87. *Paoli*, 916 F.2d at 853. The *Paoli* court indicated that the district court should have disclosed "the evidence in the voluminous record it has chosen to credit." *Id.*

88. *Id.*

89. *Id.* at 854. The district court stated that it excluded the expert opinions based on the Yusho and Yu Cheng incidents because "the consensus conclusion from the scientific literature is that the diseases that occurred in the victims of these incidents were caused by the ingestion of highly toxic PCDFs with their food and is not evidence of the effects of PCBs." *Paoli*, 706 F. Supp. at 368. For a discussion of the Yusho and Yu Cheng studies, see *supra* notes 45-49 and accompanying text.

90. *Paoli*, 916 F.2d at 854. The *Paoli* court also concluded that the district court erred by not specifying which opinions it was excluding based on the Yusho and Yu Cheng incidents. *Id.*

91. *Id.* The *Paoli* court directed the district court, on remand, to reconsider, in light of the *Japanese Electronics* guidelines, the district court rulings that involved factual inquiry into the basis for expert opinions. *Id.* at 854-55.

In its analysis of the evidence excluded under Rule 703, the *Paoli* court also considered whether the district court afforded the plaintiffs adequate process for defending against the evidentiary exclusions. *Id.*

92. *Id.* at 855. The Third Circuit divided the district court's Rule 702 exclusions into two classes: "(1) rejection of the witness as unqualified to give expert testimony in the relevant field; and (2) rejection of the expert because, however qualified, he or she was relying on an unreliable scientific technique." *Id.* (footnote omitted). For the text of Rule 702, see *supra* note 10.

93. *Paoli*, 916 F.2d at 855-56. The *Paoli* court referred to the three witnesses that the district court seemed to have rejected as unqualified. *Id.* The

trict court had excluded some of the expert witness' testimony by determining that the expert did not possess appropriate degrees or training.[94] The Third Circuit noted that requiring an expert to have a particular background contradicts the jurisprudence in this area.[95] In addition, the Third Circuit looked to the liberal language of Rule 702 and concluded that the district court abused its discretion by excluding several of the plaintiffs' experts as unqualified.[96]

For example, the Third Circuit examined the district court's exclusion of Dr. Nicholson's meta-analysis technique.[97] The district court had examined the meta-analysis technique under the standard announced in

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Paoli court first looked to the district court's rejection of Dr. Barsotti. *Id.* Dr. Barsotti was rejected on the grounds that she was neither a chemist qualified to discuss gas chromatography, nor a medical doctor qualified to explain the cause of plaintiffs' injuries. *Id.*; *see also Paoli*, 706 F. Supp. at 369-70. In addition, the *Paoli* court noted that the district court rejected Dr. Zahalsky's opinion on the effect of PCBs on humans because Dr. Zahalsky was not trained in differential diagnosis. *Paoli*, 916 F.2d at 855; *see also Paoli*, 706 F. Supp. at 374. Similarly, the *Paoli* court indicated that the district court excluded Dr. Nesbet's [sic] testimony because his " 'curriculum vita [did not] qualify him to testify as an expert' " as to whether a specific study was accurate. *Paoli*, 916 F.2d at 855; *see also Paoli*, 706 F. Supp. at 371. For a discussion of the qualifications, the facts upon which these three experts based their opinions, and the testimony of each expert, see *supra* note 38 and accompanying text.

94. *Paoli*, 916 F.2d at 855.

95. *Id.* at 855. The *Paoli* court specified several cases which represented the liberal approach of the Third Circuit in finding a witness qualified to give testimony. *Id.*; *see* Habecker v. Copperloy Corp., 893 F.2d 49, 52-53 (3d Cir. 1990) (permitting safety specialist, although not an engineer, who had master's degree in safety education and doctorate in human factors and product safety design to testify as to whether forklift manufacturer's failure to install forklift seatbelts caused death of forklift operator); Hammond v. International Harvester Co., 691 F.2d 646, 653 (3d Cir. 1982) (authorizing expert to testify in tractor products liability case although his only qualifications were sales experience in agricultural equipment field and teaching automotive repair); Knight v. Otis Elevator Co., 596 F.2d 84, 88 (3d Cir. 1979) (allowing expert to testify in elevator design defect case although expert did not have specific background in elevator design and manufacture).

96. *Paoli*, 916 F.2d at 855-56. For the language of Rule 702, see *supra* note 10. In addition to the language of Rule 702, the *Paoli* court referred to the Rule 702 Advisory Committee notes which emphasize that various kinds of "knowledge, skill, experience, training or education" qualify an expert. FED. R. EVID. 702 advisory committee's note.

The *Paoli* court scrutinized the qualifications of the three witnesses that the district court had rejected. *Paoli*, 916 F.2d at 855-56. The *Paoli* court found that the district court abused its discretion in excluding the witnesses based on Rule 702. *Id.* For a discussion of the Third Circuit's analysis of the district court's findings regarding the qualifications of the witnesses, see *supra* notes 92-94 and accompanying text.

97. *Paoli*, 916 F.2d at 856-59. The exclusion of Dr. Nicholson's testimony is the second category of excluded evidence that the *Paoli* court discussed: the rejection of the witness because, however qualified, he or she was relying on an unreliable scientific technique. *Id.* at 855. The *Paoli* court noted that the district court used Rule 702 to exclude Dr. Nicholson's testimony because the court found that Dr. Nicholson's meta-analysis was an inadmissible scientific tech-

United States v. Downing[98] for evaluating expert testimony based on novel scientific techniques.[99] Although the *Downing* relevancy approach has been utilized in many jurisdictions, the circuit courts are divided as to the proper test for the admissibility of novel scientific evidence.[100]

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nique. *Id.* at 856. For a discussion of the significance of Dr. Nicholson's testimony, see *supra* note 39-41.

98. 753 F.2d 1224 (3d Cir. 1985).

99. *In re* Paoli R.R. Yard, 706 F. Supp. 358, 373 (E.D. Pa. 1988), *rev'd*, 916 F.2d 829 PCB Litig. (3d Cir. 1990), *cert. denied sub nom.* General Elec. Co. v. Knight, 111 S. Ct. 1584 (1991). In *Downing*, the defendant had been convicted of mail fraud solely on the basis of eyewitness testimony. *Downing*, 753 F.2d at 1226. The *Downing* court considered the issue of whether Rule 702 allowed a defendant to present testimony from an expert in the field of human perception and memory regarding the reliability of eyewitness identification. *Id.* The *Downing* court opined that the district court had excluded the evidence apparently because the court believed that the psychologist's testimony did not meet the Rule 702 "helpfulness" requirement. *Id.* The *Downing* court held that the district court erred in excluding the evidence and stated:

> The language of Fed.R.Evid. 702, the spirit of the Federal Rules of Evidence in general, and the experience with the *Frye* test suggest the appropriateness of a more flexible approach to the admissibility of novel scientific evidence. In our view, Rule 702 requires that a district court ruling upon the admission of [novel] scientific evidence . . . conduct a preliminary inquiry focusing on (1) the soundness and reliability of the process or technique used in generating the evidence, (2) the possibility that admitting the evidence would overwhelm, confuse, or mislead the jury, and (3) the proffered connection between the scientific research or test result to be presented, and particular disputed factual issues in the case.

Id. at 1237.

Other courts have followed the rationale of the *Downing* court. *See* Ellis v. International Playtex, Inc., 745 F.2d 292, 301-05 (4th Cir. 1984) (adoption of reliability approach); United States v. Smith, 869 F.2d 348, 353 (7th Cir. 1989) (same); United States v. Williams, 583 F.2d 1194, 1198-1200 (2d Cir. 1978) (adoption of reliability approach with court review focused on reliability of scientific evidence and its tendency to mislead), *cert. denied*, 439 U.S. 1117 (1979); United States v. Bennett, 539 F.2d 45, 53 (10th Cir.) (adoption of reliability approach), *cert. denied*, 429 U.S. 925 (1976).

The *Paoli* court noted that the reliability issue is critical because defendants alleged that meta-analysis is too unreliable to be accepted by the court. *Paoli*, 916 F.2d at 856.

100. Many jurisdictions continue to follow the test which was articulated in Frye v. United States, 293 F. 1013 (D.C. Cir. 1923). In *Frye*, the defendant had been convicted of second degree murder, and he appealed the judgment contending that the trial court erred in admitting certain evidence. *Id.* at 1013. The Court of Appeals for the District of Columbia considered the admissibility of the systolic blood pressure deception test. *Id.* The *Frye* court, in an oft-quoted passage, established the *Frye* "general acceptance" standard:

> Just when a scientific principle of discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while the courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, *the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.*

Id. at 1014 (emphasis added). The *Frye* court held that the systolic blood pres-

The *Paoli* court affirmed the district court's utilization of the *Downing* standard, but held that the district court's analysis under *Downing* was inherently flawed.[101] In its analysis, the *Paoli* court concentrated on the reliability prong of the *Downing* standard.[102] The *Paoli* court refused to designate the exact level of scrutiny at which a district court can exclude a technique as sufficiently unreliable.[103] However, the *Paoli* court found

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sure test had not gained the scientific recognition among authorities that would justify its admission. *Id.*

The current status of the *Frye* test is difficult to evaluate. Gianelli, *supra* note 9, at 1228. The status of the test has been widely debated and criticized. *See* CHARLES T. MCCORMICK, MCCORMICK ON EVIDENCE § 203, at 608 (Edward W. Cleary ed., 3d ed. 1984) (discussing criticisms of *Frye* approach and stating that most appealing method for evaluating admissibility of scientific evidence is that "[g]eneral scientific acceptance is a proper condition for taking judicial notice of scientific facts, but it is not a suitable criterion for the admissibility of scientific evidence"); Kreiling, *supra* note 9, at 921 (noting that most important objection to *Frye* is that test fails to even consider what is often crucial reliability issue: whether technique was properly used (citing Gianella, *supra* note 9, at 1226)); Gianelli, *supra* note 9, at 1250 ("The *Frye* test, which has cast its shadow over the admissibility of scientific evidence for more than a half-century, has proved unworkable.").

A significant issue in this area is whether the lack of reference to the *Frye* standard in the Federal Rules of Evidence indicates an abrogation of the test. *See Kreiling*, *supra* note 9, at 927. Some commentators argue, however, that the rules do not indicate an intent to abolish the *Frye* test. *See, e.g.*, *id.* ("There is, however, no indication in the legislative history that the Federal Rules supplant *Frye*.").

101. *Paoli*, 916 F.2d at 856. The *Paoli* court first affirmed the decision to analyze the meta-analysis technique under Rule 702 instead of Rule 703. *Id.* The Third Circuit stated:

> [T]he determination whether expert testimony depends on a reliable "scientific technique," to be analyzed under Rule 702, or whether the basis for testimony is "facts or data . . . of a type reasonably relied upon by experts in the particular field," to be analyzed under Rule 703 . . . is ofttimes subtle if not strained.

Id. The difference, the *Paoli* court pointed out, is whether the problem with the scientific evidence lies in the underlying data itself or the method used to analyze the data. *Id.* The *Paoli* court looked to the rule established in DeLuca v. Merrell Dow Pharmaceuticals, Inc., 911 F.2d 941, 952-57 (3d Cir. 1990). The *DeLuca* court stated that if a scientist's methodology is being attacked, but not the underlying data relied upon, the court must examine the reliability of the methodology under *Downing* and Rule 702. *Id.* at 954; *see also Paoli*, 916 F.2d at 856-57.

In discussing the reliability requirement of *Downing*, the *Paoli* court recognized that the balance is weighted towards admitting the testimony. *Id.* at 857; *Downing*, 753 F.2d at 1237. As the *DeLuca* court pointed out, there is "a strong and undeniable preference for admitting any evidence having some potential for assisting the trier of fact and for dealing with the risk of error through the adversary process." *DeLuca*, 911 F.2d at 956.

102. *Paoli*, 916 F.2d at 857. The *Paoli* court referred to the absence of evidence on the record that meta-analysis is an inaccurate mode of analysis. *Id.* Indeed, the *Paoli* court pointed out that defendants' own experts did not question the reliability of meta-analysis in general. *Id.* Instead, the experts questioned the way in which Dr. Nicholson applied the meta-analysis technique. *Id.*

103. *Id.* at 858. The *Paoli* court stated:

that in this case the district court did not make specific enough findings on the reliability of the meta-analysis to satisfy *Downing*.[104] Therefore, the *Paoli* court set aside the district court's exclusion of the meta-analysis technique.[105]

3. *Interpretation of Federal Rule 403*

The *Paoli* court's final consideration was the pre-trial exclusions of evidence by the district court based upon Rule 403.[106] The court stated that exclusions at the pre-trial stage based on Rule 403 are rarely necessary.[107] The *Paoli* court found that in order to exclude evidence under Rule 403 at the pre-trial stage, a court must have a complete record.[108] Because the record was deficient in this respect, the *Paoli* court set aside the district court's exclusions of evidence based on Rule 403.[109]

The *Paoli* court ultimately held that, contrary to the conclusion of the district court, the plaintiffs submitted sufficient evidence to survive a

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> Reliability indicia vary so much from case to case that any attempt to define such a level would most likely be pointless. *Downing* itself lays down a flexible rule. What is not flexible under *Downing* is the requirement that there be a developed record and specific findings on reliability issues.

Id.

104. *Id.* The district court had excluded Dr. Nicholson's report because it had "not been peer-reviewed or accepted by anybody in particular." *Paoli*, 706 F. Supp. at 373. The district court based its exclusion on a defense expert's affidavit which stated that "the report has [n]ever been subjected to pre-publication review, and the report has never been published in the scientific literature." *Paoli*, 916 F.2d at 857-58. The Third Circuit held that these were insufficient grounds for excluding the testimony. *Id.* at 858. The *Paoli* court first stated that there is no requirement that an expert's testimony be based on peer-reviewed or published data. *Id.* (citing *DeLuca*, 911 F.2d at 954). Second, the *Paoli* court noted that Dr. Nicholson's own affidavit contradicted the defense expert's affidavit and stated that his report, in fact, had been peer-reviewed. *Id.* at 858.

105. *Paoli*, 916 F.2d at 858.

106. *Id.* at 859-60. Again, the *Paoli* court expressed its uncertainty that the district court actually excluded any evidence based on Rule 403. *Id.* at 859. The *Paoli* court assumed this because of a suggestion that the district court was excluding all of plaintiffs' evidence under Rules 403 and 703. *See Paoli*, 706 F. Supp. at 369. For the relevant text of Rule 403, see *supra* note 10.

107. *Paoli*, 916 F.2d at 859. The *Paoli* court reasoned that a finding that evidence was more prejudicial than probative was an extreme measure at the pre-trial stage because no harm is done by admitting the evidence. *Id.* Consequently, the *Paoli* court authoritatively found that "[p]recipitous Rule 403 determinations, before the challenging party has had an opportunity to develop the record, are therefore unfair and improper." *Id.* The *Paoli* court also found that the district court did not conduct the balancing that is required by Rule 403. *Id.*

108. *Id.* The *Paoli* court stated that "we hold that in order to exclude evidence under Rule 403 at the pretrial stage, a court must have a record complete enough on the point at issue to be considered a virtual surrogate for a trial record." *Id.* at 859-60. Further, the *Paoli* court suggested that in complex litigation involving numerous experts and intricate scientific testimony, an *in limine* hearing may be very useful. *Id.* at 859.

109. *Id.* at 860.

motion for summary judgment on each element of their prima facie case.[110] Therefore, the *Paoli* court reversed the district court's grant of summary judgment and remanded to the district court for further proceedings.[111]

III. CONCLUSION

In *Paoli*, the Third Circuit attempted to ameliorate some of the obstacles that impede the toxic tort victim's ability to recover. The *Paoli* court recognized a new cause of action in Pennsylvania, the medical monitoring tort.[112] In order to recover for the costs of periodic medical examinations under the medical monitoring tort, a plaintiff must establish that (1) the plaintiff was significantly exposed to the toxic substance because of the negligent acts of the defendant; (2) as a proximate result of the exposure, the plaintiff suffers a significantly increased risk of contracting a serious latent disease; (3) the increased risk makes periodic diagnostic medical exams reasonably necessary; and (4) monitoring procedures exist which make early detection and treatment reasonably necessary.[113] Moreover, by not requiring that a plaintiff actually manifest injury before he or she may recover for periodic medical examinations, the *Paoli* court adopted a liberal standard of proof for the tort.[114] Because toxic tort victims' injuries are most often latent, the *Paoli* court's liberal approach provides protection for such plaintiffs.

In addition, the *Paoli* court used a liberal approach regarding the admissibility of expert witness testimony in its interpretation of Federal Rules of Evidence 703, 702 and 403.[115] This approach reflects a sensitivity to the point that because a plaintiff cannot prove causation without expert witnesses, a trial court's exclusion of the testimony will preclude

110. *Id.* at 860-62. The *Paoli* court adopted the elements of plaintiffs' prima facie case that the district court had set forth. *Id.* at 860. The four elements that the district court stated the plaintiffs were required to prove were: "1) that defendants released PCBs into the environment; 2) that plaintiffs somehow ingested these PCBs into their bodies; 3) that plaintiffs have an injury; 4) that PCBs are the cause of that injury." *Id.*

111. *Id.* at 865.

112. For a further discussion of the *Paoli* court's approach to the medical monitoring tort, see *supra* notes 53-73 and accompanying text.

113. *Paoli*, 916 F.2d at 852.

114. *Id.* at 850-52. For a discussion of the requirements that the *Paoli* court imposed to sustain a cause of action for medical monitoring, see *supra* note 73 and accompanying text.

115. For a discussion of the liberal evidentiary approach of *Paoli* court, see *supra* notes 74-111 and accompanying text.

On remand, however, the district court again refused to allow certain expert testimony. *See In re* Paoli R.R. Yard PCB Litig., No.s 80-2229, 86-2229, 86-2235, 86-2669, 86-5277, 86-7414 to 86-7422, 86-7561, 87-0712, 87-2874, 87-5269, 87-5304, 1992 WL 315216, at *1-4 (E.D. Pa. Oct. 22, 1992) (noting exclusion of various experts' testimony and granting defendants' motion for summary judgment since "[p]laintiffs have no competent expert testimony on the crucial issues of exposure and causation").

any recovery for the plaintiff.[116] First, the *Paoli* court affirmed its intent to construe the requirements of Rule 702 liberally when a party seeks to establish the qualifications of an expert witness.[117] Furthermore, in considering the admissibility of novel scientific evidence under Rule 702, the *Paoli* court reaffirmed its resolve to utilize the *Downing* reliability approach.[118] Thus, before a district court admits novel scientific evidence, it must look to three factors: the reliability of the technique used in producing the evidence; the possibility that admitting the evidence will mislead the jury; and the connection between the research to be presented and the factual issues in the case.[119]

Finally, as part of its liberal evidentiary approach, the *Paoli* court strongly suggested that Rule 403 exclusions are impermissible at the pre-trial stage.[120] Such a liberal approach to the admissibility of expert witness testimony demonstrates the *Paoli* court's understanding of the significant evidentiary burdens involved in toxic tort cases.

The evidentiary rulings set forth in *Paoli* send a strong message to district courts faced with the issue of the admissibility of expert witness testimony. Through its repetitious criticisms of the district court for not indicating the testimony it excluded, the *Paoli* court instructed the district courts to articulate the specific facts and theories relied upon before excluding the testimony.[121] In addition, the *Paoli* court suggested that the district courts should provide some type of trial surrogate for the plaintiffs to defend their evidentiary submission before excluding the testimony.[122]

The toxic tort victim faces an uphill battle in attempting to recover for injury resulting from exposure to toxic substances. Toxic torts do not fit within the traditional tort context, causation is extremely difficult to prove in the area of toxic torts and judges are overly suspicious of scientific testimony. Courts are beginning to respond to these difficulties faced by plaintiffs. As a result of the *Paoli* decision, toxic tort plaintiffs

116. *Paoli*, 916 F.2d at 853. For a discussion of the necessity of expert witness testimony in proving a toxic tort case, see *supra* note 9 and accompanying text.

117. *Paoli*, 916 F.2d at 855-56. For a discussion of the *Paoli* court's liberal approach to the qualifications requirement of Rule 702, see *supra* notes 92-105 and accompanying text.

118. *Paoli*, 916 F.2d at 856. For a discussion of the *Downing* reliability approach, see *supra* notes 101-04 and accompanying text.

119. United States v. Downing, 753 F.2d 1224, 1237 (3d Cir. 1985). For a discussion of *Downing*, see *supra* notes 98-99 and accompanying text.

120. *Paoli*, 916 F.2d at 859-60. For a discussion of the *Paoli* court's Rule 403 analysis, see *supra* notes 106-11 and accompanying text.

121. *Paoli*, 916 F.2d at 852-60. For a discussion of the district court's failure to specify the expert testimony it excluded, see *supra* note 86.

122. *Paoli*, 916 F.2d at 859.

are given a greater opportunity to present their case in the face of seemingly overwhelming evidentiary obstacles.

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