7. Trial

Sections 7.1 - 7.5

Hon. Samuel A. Thumma

7.1 Introduction

This portion of the Bench Book, addressing admissibility, consists of three parts:

7.2 The History of The Judicial Gatekeeper Function, tracing the evolution of the standards for admission of expert testimony (including *Frye*, *Daubert* and Federal Rule of Evidence 702) and concludes with a chart comparing key distinctions between *Frye* and *Daubert*.

7.3 Evaluating Admissibility of Expert Evidence and Scientific Evidence, including a corresponding flowchart which, based on the Federal Rules of Evidence, addresses important: (1) legal issues; (2) procedural issues; and, (3) specific factors to be considered by the trial judge in determining admissibility of such evidence.

A trial judge lacking time to review all three parts will best be served by turning directly to Section 7.2, and the corresponding flowchart, which provides guidance on specific concepts and tools to aid in resolving specific admissibility issues.

7.4 Admissibility vs. Weight, addressing the important differences between these two concepts.

A trial judge lacking time to review all three parts will best be served by turning directly to Section 7.3, and the corresponding flowchart, which provides guidance on specific concepts and tools to aid in resolving specific admissibility issues.

7.2 The History of The Judicial Gatekeeper Function

7.2.1 *Frye v. United States*

The Federal Rules of Evidence (FRE) were adopted effective July 1, 1975 and have now been in place for more than forty years. For two centuries preceding the adoption of the FRE, the admissibility of evidence in most courts in the United States was governed by case law, or at times statutory provisions, not by a set of rules. *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923) was a seminal case addressing the admissibility of expert testimony, decided more than fifty years before the adoption of the FRE. *Frye* was an appeal from a murder conviction where the defendant argued the trial court erred in excluding "an expert witness to testify to the result of a deception test made upon defendant" that indicated defendant's confession was false.[1] The brevity of *Frye* merits quoting significant portions here.

Frye first described in some detail the proffered basis of the "systolic blood pressure deception test" at issue, followed by an observation that:

> the theory seems to be that truth is spontaneous, and comes without conscious effort, while the utterance of a falsehood requires a conscious effort, which is reflected in the blood pressure. The rise thus produced is easily detected and distinguished from the rise produced by mere fear of the examination itself. In the former instance, the pressure rises higher than in the latter, and is more pronounced as the examination proceeds, while in the latter case, if the subject is telling the truth, the pressure registers highest at the beginning of the examination, and gradually diminishes as the examination proceeds.[2]

Before trial, defendant "was subjected to this deception test" by his expert, Dr. William Moulton Marston.[3] When defendant sought to have Dr. Marston testify at trial "to the results obtained," the government objected, and the trial court sustained that objection.[4] Defendant offered to have Dr. Marston "conduct a test in the presence of the jury. This also was denied."[5] After a guilty verdict, the defendant appealed from his murder conviction.

On appeal, *Frye* noted the admissibility issue was a "novel question" and "no cases directly in point have been found."[6] *Frye* next quoted defendant's brief on appeal for the following propositions:

> The rule is that the opinions of experts or skilled witnesses are admissible in evidence in those cases in which the matter of inquiry is such that inexperienced persons are unlikely to prove capable of forming a correct judgment upon it, for the reason that the subject-matter so far partakes of a science, art, or trade as to require a previous habit or experience or study in it, in order to acquire a knowledge of it. When the question involved does not lie within the range of common experience or common knowledge, but requires special experience or special knowledge, then the opinions of witnesses skilled in that particular science, art, or trade to which the question relates are admissible in evidence.[7]

The next paragraph from the opinion contains what became the standard for the admissibility of novel scientific evidence – the "*Frye* test" – in many courts for many decades to follow:

> Just when a scientific principle or 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 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.[8]

Stated differently, to be admissible under the *Frye* test, the proponent of novel scientific evidence was required to show:

1. general acceptance
2. in the relevant scientific community (and also, as with any evidence, relevance, proper foundation and that the novel scientific evidence was not otherwise excluded from evidence).

As noted decades later, *Frye* is "one of the bigger mysteries in American legal history. The appeals court's opinion, only 641 words long, contains not a single reference to case law or precedent, nor any references to any scientific literature."[9] *Frye,* however, "is a landmark in the law of evidence and one of the most cited cases in the history of American law."[10]

7.2.2 Federal Rule of Evidence 702 (1975-2000)

Many years in the making, in January 1975, President Gerald Ford signed the Federal Rules of Evidence (FRE) into law effective July 1, 1975.[11] The FRE contain six rules addressing opinion and expert testimony (Rules 701-706), with Rule 702 governing the admissibility of expert evidence. As originally promulgated in 1975, that rule contained a single sentence and read as follows:

> 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.[12]

Although not expressly mentioning "general acceptance" or *Frye*, for nearly two decades after the adoption of Rule 702, *Frye* "continue[d] to be followed by a majority of courts."[13] The United States Supreme Court would change that in its 1993 *Daubert* decision.

7.2.3 The *Daubert* Trilogy.

Plaintiffs in *Daubert* were minor children born with serious birth defects who sued Merrell Dow Pharmaceuticals claiming that their mothers' use of Bendectin, an anti-nausea drug, caused their birth defects.[14] The issue addressed by the United States Supreme Court in *Daubert* arose out of the admissibility, under Rule 702 as it read at the time, of testimony from plaintiffs' experts that Bendectin can cause birth defects.[15] Plaintiffs argued "that the *Frye* test was superseded by the adoption of the Federal Rules of Evidence."[16] In *Daubert*, the United States Supreme Court agreed that the adoption of Rule 702, 18 years earlier, superseded *Frye*, at least in part.[17]

Daubert first noted Rule 702 did not "establish 'general acceptance' as an absolute prerequisite to admissibility," adding that Merrell Dow did not "present any clear indication that Rule 702 or the Rules as a whole were intended to incorporate a 'general acceptance' standard."[18] "*Frye* made 'general acceptance' the exclusive test for admitting expert scientific testimony. That austere standard, absent from, and incompatible with, the Federal Rules of Evidence, should not be applied in federal trials."[19]

If not *Frye*, what standard did apply? *Daubert* noted that under the Federal Rules of Evidence, "the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable," adding that "the requirement that an expert's testimony pertain to 'scientific knowledge' establishes a standard of evidentiary reliability."[20] "Rule 702's 'helpfulness' standard [also] requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility."[21] This, *Daubert* found, means:

> Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. We are confident that federal judges possess the capacity to undertake this review. Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test. But some general observations are appropriate.[22]

Daubert then set forth **non-exclusive** factors to determine the admissibility of expert evidence:

- **Testing:** "Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested."[23]

- **Peer Review and Publication:** "Another pertinent consideration is whether the theory or technique has been subjected to peer review and publication . . . . The fact of publication (or lack thereof) in a peer reviewed journal thus will be a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised."[24]
- **Error Rate:** "[I]n the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error."[25]
- **Standards and Controls:** "[I]n the case of a particular scientific technique, the court [also] ordinarily should consider . . . the existence and maintenance of standards controlling the technique's operation."[26]
- **General Acceptance:** "Finally, 'general acceptance' can yet have a bearing on the inquiry. A 'reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community.' Widespread acceptance can be an important factor in ruling particular evidence admissible, and 'a known technique which has been able to attract only minimal support within the community,' may properly be viewed with skepticism."[27]

In setting forth these non-exclusive factors, *Daubert* emphasized that the Rule 702 inquiry is "a flexible one," adding that the "overarching subject is the scientific validity of—and thus the relevance and reliability—of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions they generate."[28] The judge also must perform the Rule 403 balancing analysis[29] when faced with an objection.[30]

Daubert also offered other guidance in the admissibility of expert testimony, including:

- "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence."[31]

- "[I]n the event the trial court concludes that the scintilla of evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment, and likewise to grant summary judgment. These conventional devices, rather than wholesale exclusion under an uncompromising 'general acceptance' test, are the appropriate safeguards where the basis of scientific testimony meets the standards of Rule 702."[32]

- "We recognize that, in practice, a gatekeeping role for the judge, no matter how flexible, inevitably on occasion will prevent the jury from learning of authentic insights and innovations. That, nevertheless, is the balance that is struck by Rules of Evidence designed not for the exhaustive search for cosmic understanding but for the particularized resolution of legal disputes."[33]

Although resolving some key issues, *Daubert* left open several others, including the appropriate standard of review on appeal for the decision on the admissibility of expert testimony and whether the standards in *Daubert* applied to all expert evidence offered under Rule 702 or only novel scientific evidence. A few years later, the United States Supreme Court held "that abuse of discretion is the appropriate standard" for an appellate court to use in reviewing a trial court's decision regarding admissibility under *Daubert*.[34] Two years after that, the United States Supreme Court held, in *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999), "that *Daubert*`s general holding—setting forth the trial judge's general 'gatekeeping' obligation—applies not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge."[35]

7.2.4 Federal Rule of Evidence 702 (2000-Present)

As a result of this "*Daubert* Trilogy" – *Daubert*, *Joiner* and *Kumho Tire* – Rule 702 was amended in 2000, and then restyled in 2011, so that the current version reads as follows:

> A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
>
> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
>
> (b) the testimony is based on sufficient facts or data;
>
> (c) the testimony is the product of reliable principles and methods; and,
>
> (d) the expert has reliably applied the principles and methods to the facts of the case.[36]

The Committee Notes on Rules – 2000 Amendment for Rule 702 are lengthy, rich with citations and, although not repeated here, merit reference based on the needs of the specific case.

7.2.5 *Frye* vs. *Daubert*: A Summary Comparison

Stated briefly, and without accounting for jurisdiction-specific differences that may exist, the comparisons between *Frye* and *Daubert* on several important issues can be summarized as follows:

Frye vs. *Daubert* Summary Comparison Table

Topic	*Frye*	*Daubert*
Applicability	Limited to "novel scientific evidence"	All expert evidence subject to Fed. R. Evid. 702.
Standard for admissibility	"Generally accepted in the relevant scientific community."	Text of the rule plus non-exclusive factors.
Standard of review on appeal	De novo	Abuse of discretion
Applicability to other/ subsequent cases	When admissibility resolved by binding appellate decision, resolved for all future cases (provided proper foundation is shown and evidence is otherwise admissible)	Case-by-case decision

Table 7.1

7.3 Evaluating Admissibility of Expert Evidence and Scientific Evidence

The admissibility of expert evidence and scientific evidence can involve (1) legal issues; (2) procedural issues; and, (3) specific factors to be considered. Although the separateness of these categories is not pristine, these categories help in identifying the applicable legal rules and in addressing issues involved in determining admissibility. The following Subsections address these three categories separately, recognizing they are interrelated and build on each other.

7.3.1 Legal Issues.[37]

7.3.1.1 Is the Proffered Evidence Opinion Evidence?

The first legal issue to consider is whether the proffered evidence is opinion evidence. If the evidence is opinion evidence, various Federal Rules of Evidence in the 700 series may be helpful in deciding admissibility.[38] If the evidence is not opinion evidence, the evidence may (or may not) be admissible, but unless an expert seeks to testify "otherwise" than in the form of an opinion, the rules regarding the admission of such evidence are found outside of the 700 series of the Federal Rules of Evidence.

7.3.1.2 Is the Proffered Opinion Evidence By An Expert (As Opposed To Opinion By A Lay) Witness?

Admissibility of opinion evidence by a lay witness is governed by Fed. R. Evid. 701, while admissibility of opinion evidence by an expert witness is governed by Fed. R. Evid. 702. Accordingly, an important legal issue is whether the proffered opinion evidence is from a lay witness or an expert witness.

The proffered evidence is from an expert witness if such a person is qualified as such "by knowledge, skill, experience, training, or education" and testifies based on "scientific, technical, or other specialized knowledge."[39] Admissibility of expert opinion evidence is governed by Rule 702, which is discussed in detail below. By

contrast, the proffered opinion evidence is from a lay witness if the witness "is not testifying as an expert" and "not based on scientific, technical, or other specialized knowledge within the scope of Rule 702."[40] Stated differently, lay witness opinion evidence is defined as what is not expert witness opinion evidence and its admissibility is governed by Rule 701. Using these definitions to determine whether the proffered opinion evidence is from a lay witness or an expert witness is essential in knowing which of these two different standards to apply.

7.3.1.3 Is the Proffered Expert Evidence Relevant?

To be admissible, all proffered evidence must be relevant to prove or disprove a disputed fact of consequence,[41] given that "[i]rrelevant evidence is not admissible."[42] This same standard applies with full force to expert evidence. As discussed more fully below, along with this general relevance standard, the proffered expert opinion evidence also must "help the trier of fact to understand the evidence or to determine a fact in evidence,"[43] and be reliable.[44, 45, 46]

7.3.2 Procedural Issues

As with most evidentiary issues, the trial judge has discretion in determining whether proffered expert opinion evidence is admissible.[47] This also typically includes discretion in identifying appropriate procedures to determine the admissibility of proffered expert opinion evidence.[48] The scope of that discretion, however, may turn on local law that is applicable in a given jurisdiction, which is beyond the scope of this Bench Book. In general, however, those procedural issues may include the following:

7.3.2.1 Is an Evidentiary Hearing Required To Determine Admissibility?

Although a trial judge has the discretion to hold an evidentiary hearing before determining the admissibility of proffered expert evidence, in most situations, such a hearing is not required. What situations may require such a hearing, or strongly suggest that such a hearing be held, typically will be an issue of local law.[49] The need for such a hearing also is significantly diminished, if not eliminated, for

bench trials.[50] In addition, if proffered expert evidence is admitted by the trial judge and that expert testifies at trial, the trial transcript will provide a further record in scrutinizing whether the admissibility determination was proper. It should be remembered, however, that "[i]t is always within the trial court's discretion to hold an evidentiary hearing to determine the reliability of proffered expert testimony."[51]

7.3.2.2 What Findings Must the Trial Court Make In Ruling On Admissibility of Proffered Expert Evidence?

Typically, a trial court is not required to make findings when ruling on the admissibility of evidence. This rule is less true for decisions on the admissibility of proffered expert evidence, where local law may require at least some findings.[52] The better practice is to make at least some findings setting forth the rationale used in deciding the admissibility of proffered expert evidence that is challenged, particularly if the evidence is precluded. This helps ensure that a proper record is made in resolving the issue (including whether an evidentiary hearing was requested or held); requires the trial judge to refine the analysis used in setting forth that rationale; and, provides a clearer record for the parties, counsel and others (including on appeal) for the rationale applied. Providing such rationale also avoids uncertainty for all, particularly on appeal:

The better practice is to make at least some findings setting forth the rationale used in deciding the admissibility of proffered expert opinion evidence that is challenged, particularly if the trial judge decides to preclude the admission of the evidence.

> When trial courts fail to make an explicit record of their findings regarding the reliability of the proposed expert witness's testimony, some appellate courts have exhibited a willingness to review the materials the trial court had before it to ascertain whether the trial court abused its discretion in admitting or excluding the testimony. Other appellate courts have extended their reviews to all of the materials in the trial record, including the testimony presented at the trial.

> Such reviews by the appellate courts, of course, amount to their conducting their own reliability analyses. Trial courts, however, have a much broader "array of tools which can be brought to bear on the evaluation of expert testimony" than do appellate courts. There should be few cases "in which an appellate court should venture to superimpose a *Daubert* ruling on a cold, poorly developed record."[53]

7.3.3 Specific Factors for The Trial Judge To Consider

In some respects, in determining admissibility of proffered expert evidence, there are as many specific factors for the trial judge to consider as there are cases that apply Rule 702. Even when not legally complicated, each case is factually rich and no two cases present the identical details or facts. The focus in all of this is admissibility, not correctness or weight, a distinction that can create confusion given the focus on reliability. With this preface, the following discussion highlights specific factors identified in 4 JACK B. WEINSTEIN & MARGARET A. BERGER, WEINSTEIN'S FEDERAL EVIDENCE CHAPTER § 702 ("Testimony by Expert Witnesses") (2nd ed. 2018), perhaps the leading treatise in the area.

7.3.3.1 Expert Qualifications (Including Helpfulness to The Trier of Fact).

Rule 702 requires that an expert have sufficient qualifications to testify, looking at the person's "knowledge, skill, experience, training, or education" and requires that the proffered "expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue."[54] "The standard for qualifying expert witnesses is liberal," meaning a trial judge may abuse his or her discretion by excluding expert testimony "because the witness lacks a certain educational or other experiential background," or where the witness "lacks expertise in specialized areas" when the witness has general educational and "experiential qualifications in a general field."[55] Moreover, the qualification required by the rule are disjunctive, meaning "any one or more of these bases should be sufficient to qualify a witness as an expert."[56]

The following factors may be relevant to whether the proffered expert's qualifications will be helpful to the trier of fact:

1. Do the individual's qualifications relate to an issue the trier of fact will resolve?
2. Do the individual's qualifications turn on the person's "knowledge, skill, experience, training, or education," or some combination (and, depending upon which, is an adequate showing made of those qualifications)?
3. Does the relevant legal issue require an expert to have specific expertise (and, if so, does the proffered expert have such expertise)?
4. Does the relevant legal issue require an expert to have local expertise (and, if so, does the proffered expert have such expertise)?
5. Does the relevant legal issue require an expert to have expertise for a specific time period (and, if so, does the proffered expert have such expertise)?[57]

7.3.3.2 Sufficient Facts or Data.

Expert evidence must be "based on sufficient facts or data."[58] Although case-dependent, factors relevant to this inquiry include:

1. Is the proffered expert evidence "based on suppositions rather than facts?"
2. Is the proffered expert evidence a logical extension of research done independently of the litigation or is it developed solely for the purpose of the specific case?
3. Did the proffered expert rely "unduly on anecdotal evidence in arriving at an opinion?"[59]

7.3.3.3 Reliable Principles and Methods.

Expert evidence must be "the product of reliable principles and methods."[60] Factors relevant to this inquiry may include:

1. Can the theory or technique be tested and, if so, has it been tested?
2. Has the theory or technique "been published and subjected to peer review?"
3. What is the known or potential error rate in the application of the theory or technique?
4. Are there standards and controls for the application of the theory or technique (and, if so, has the proffered expert applied those standards and controls)?
5. Is the theory or technique generally accepted in the relevant scientific community?[61]

7.3.3.4 Reliable Application of the Principles and Methods to the Facts.

The final Rule 702 requirement is that the proffered expert "has reliably applied the principles and methods to the facts of the case."[62] This inquiry requires the most from the trial judge, as it is only after the trial judge has some appreciation for the qualifications required, the facts and data necessary and the relevant principles and methods that the trial judge can determine whether those principles and methods have been reliably applied to the facts of the case. Factors relevant to this inquiry may include:

1. Does the proffered expert evidence represent an "unfounded extrapolation from the underlying data?"
2. Has the proffered expert "used a subjective methodology?"
3. Has the proffered expert properly connected the proposed expert evidence with the facts of the case?
4. Has the proffered expert adequately addressed alternative explanations?
5. Did the proffered expert rely "unduly on the temporal proximity between the occurrence of an event and the onset of illness or injury?"[63]

As noted in *Daubert*, "[t]he focus, of course, must be solely on principles and methodology, not on the conclusions they generate."[64] In addition, for some narrow categories of expert evidence, it may be that the requirements of Rule 702(d) are not applicable.[65] Reference to local law is essential to determining whether a specific jurisdiction has recognized any exceptions to the Rule 702(d) requirements in such comparatively unique situations.

7.3.3.5 Is the Proffered Expert Evidence Otherwise Inadmissible?

Even relevant proffered expert evidence otherwise admissible under Rule 702 may be excluded "if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence."[66] This standard for exclusion applies with full force to proffered expert evidence.[67] Similarly, expert evidence may be inadmissible for other reasons apart from Rule 403.[68]

Even relevant proffered expert evidence otherwise admissible under Rule 702 may be excluded "if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence."

Expert Evidence Flowchart

Federal Rules of Evidence (2018)

Science Bench Book for Judges

7.4 Admissibility vs. Weight

As with any evidence, the admissibility determination is separate from the weight to be given evidence that is admitted. Admissibility is for the court alone to decide, recognizing that determination dictates whether the finder of fact can even consider proffered evidence. As with fact evidence, even expert evidence that does not seem worthy of much weight may be admissible, with the finder of fact alone determining the weight it should be given. Moreover, the fact that competing experts disagree on analysis or conclusions does not mean one or the other is inadmissible.

> Experts often disagree. A trial court's determination that the proffered testimony of one expert witness is reliable and helpful does not necessarily mean that the contradictory testimony of another witness, concerning the same subject matter but using different methodology, is not also reliable and helpful. This flows from two basic principles underlying the court's gatekeeping role.
>
> First, the subject matter of expert testimony is almost never known to a certainty. Thus, expert witnesses need not be completely knowledgeable concerning their field of expertise and need not be totally convinced that their opinions are correct to be qualified to testify to those opinions. Second, the court's limited objective is to assess whether the proffered evidence is admissible because it is sufficiently reliable to be helpful to the trier of fact. The court is not determining whether the proffered evidence is actually correct; this latter question is reserved for the trier of fact.[69]

When amending Rule 702 in light of the *Daubert* Trilogy, the Committee Notes on Rules to the 2000 Amendments observed that, when a trial court "rules that an expert's testimony is reliable, this does not necessarily mean that contradictory expert testimony is unreliable. The amendment is broad enough to permit testimony that is the product of competing principles or methods in the same field of expertise …. As the court stated in *In re Paoli R.R. Yard PCB Litigation*, 35 F.3d 717, 744 (3d Cir. 1994), proponents "do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have

to demonstrate by a preponderance of evidence that their opinions are reliable . . . . The evidentiary requirement of reliability is lower than the merits standard of correctness."

As a final example, comments by one state supreme court in adopting Rule 702 as that state's standard merit repeating.

> The amendment recognizes that trial courts should serve as gatekeepers in assuring that proposed expert testimony is reliable and thus helpful to the jury's determination of facts at issue. The amendment is not intended to supplant traditional jury determinations of credibility and the weight to be afforded otherwise admissible testimony, nor is the amendment intended to permit a challenge to the testimony of every expert, preclude the testimony of experience-based experts, or prohibit testimony based on competing methodologies within a field of expertise. The trial court's gatekeeping function is not intended to replace the adversary system. Cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.
>
> A trial court's ruling finding an expert's testimony reliable does not necessarily mean that contradictory expert testimony is not reliable. The amendment is broad enough to permit testimony that is the product of competing principles or methods in the same field of expertise. Where there is contradictory, but reliable, expert testimony, it is the province of the jury to determine the weight and credibility of the testimony.[70]

7.5 Endnotes

1. Frye v. United States, 293 F. 1013 (D.C. Cir. 1923)
2. *Id*., 293 F. at 1014
3. *Id*.
4. *Id*.
5. *Id*.
6. *Id*.
7. *Frye*, 293 F. at 1014
8. *Id*.
9. Dr. Marston, whose name is not mentioned in the *Frye* opinion, later became a comic book writer and the creator of Wonder Woman. JILL LEPORE, THE SECRET HISTORY OF WONDER WOMAN at 73 (2015).
10. *Id*.
11. *See generally*, Eileen A. Scallen, *Analyzing the Politics of (Evidence) Rulemaking*, 53 HASTINGS L.J. 843 (2002). (citing authority and noting, given the lack of the Federal Rules of Evidence, the promulgation of the Model Code of Evidence in 1942 by the American Law Institute and the Uniform Rules of Evidence promulgated in 1953 by the National Conference of Commissioners on Uniform State Laws (often called the Uniform Law Commission).)
12. Fed. R. Evid. 702 (1975).
13. Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 586 (1993).
14. *Daubert*, 509 U.S. at 582.
15. *Daubert*, 509 U.S. at 583.
16. *Daubert*, 509 U.S. at 587.
17. *Id*.
18. *Daubert*, 509 U.S. at 588.
19. *Daubert*, 509 U.S. at 589.

20. *Daubert*, 509 U.S. at 589, 590.

21. *Daubert*, 509 U.S. at 591-592.

22. *Daubert*, 509 at 592-93 (footnotes omitted).

23. *Daubert*, 509 U.S. at 593.

24. *Daubert*, 509 U.S. at 593, 594.

25. *Daubert*, 509 U.S. at 594 (citation omitted).

26. *Id*.

27. *Id*.

28. *Daubert*, 509 U.S. at 594-95.

29. "The court may exclude relevant evidence if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence." Federal Rules of Evidence, (2018).

30. *Daubert*, 509 U.S. at 595.

31. *Daubert*, 509 at 596 (footnotes omitted).

32. *Id*.

33. *Daubert*, 509 U.S. at 597.

34. General Elec. Co. v. Joiner, 522 U.S. 136, 138-39 (1997).

35. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 141 (1999).

36. Fed. R. Evid. 702 (2018).

37. The corresponding flow chart addresses these same issues, in the same order, recognizing that relevance under Rule 401 and helpfulness to the trier of fact to understand the evidence or determine a fact in issue under Rule 702(a) often have substantial overlap.

38. *See, e.g.*, Ariz. R. Evid. 701 ("Opinion Testimony by Lay Witnesses"); 703 ("Bases of an Expert's Opinion Testimony"); 704 ("Opinion on Ultimate Issue"). See also Fed.R.Evid. 702 ("Testimony of Expert Witness," providing an expert may "testify in the form of an opinion or otherwise.")

39. Fed. R. Evid. 702.

40. Fed. R. Evid. 701.

41. Fed. R. Evid. 401.

42. Fed. R. Evid. 402.

43. Fed. R. Evid. 702(a).

44. Fed. R. Evid. 702(d); *See also Daubert*, 509 U.S. at 589 ("the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable")

45. *Daubert*, 509 U.S. at 591 (noting the requirement that evidence assist the trier of fact "goes primarily to relevance");

46. *Daubert*, 509 U.S. at 594-95 (noting Rule 702 inquiry is "a flexible one. Its overarching subject is the scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission").

47. *See Kumho Tire Co*., 526 U.S. at 152.

48. *Id*.

49. 4 WEINSTEIN'S FEDERAL EVIDENCE § 702.02[6][b] at 702-29 to 7-35 (2nd ed. 2013) (citing cases).

50. *Id*. at § 702.02[6][b] at 702-29 to 702-30 (2nd ed. 2013) ("When the gatekeeper and the trier of fact are the same, the court may admit evidence subject to the ability to exclude it or disregard it, if the evidence turns out not to meet the standard of reliability under Rule 702.").

51. *Id*. at § 702.02[6][b] at 702-29 (2nd ed. 2013) (footnote omitted).

52. *See* Glazer v. Arizona, 234 Ariz. 305, 315-16 (Ariz. Ct. App. 2014) ("The federal circuits are split on whether such findings are required. *Compare* United States v. Mitchell, 365 F.3d 215, 233-34 (3d. Cir. 2004) (reviewing merits of ruling on admissibility of expert evidence 'adher[ing] to the usual precepts of abuse-of-discretion review,' where the trial court 'elected not to make findings of fact or conclusions of law (written or oral)') and Conwood Co. v. U.S. Tobacco Co., 290 F.3d 768, 791-95 (6th Cir. 2002) (similar) with United States v. Roach, 582 F.3d 1192, 1207 (10th Cir. 2009) (noting trial court 'is required to make specific, on-the-record findings that the testimony is reliable under *Daubert*'); *see also* Mukhtar v. Cal. State Univ., Hayward, 319 F.3d 1073, 1076-77 (9th Cir. 2003) (Reinhardt, J.,

dissenting from denial of rehearing en banc) (discussing various approaches).”), *vacated in part on other grounds*, 237 Ariz. 160 (Ariz. 2015).

53. Fed. R. Evid. 702(a).

54. 4 WEINSTEIN’S FEDERAL EVIDENCE § 702.02[7] at 702-37 (2nd ed. 2013) (citations omitted).

55. *Id*. at § 702.04[1][a] at 702-57-59 (2d ed. 2013) (footnotes and citations omitted).

56. *Id*. at § 702.04[1][c] at 702-64 (2d ed. 2013) (footnote and citations omitted).

57. *Id*. at § 702.04[1][c] at 702-61-87 (2d ed. 2013) (footnote and citations omitted).

58. Fed. R. Evid. 702(b).

59. 4 WEINSTEIN’S FEDERAL EVIDENCE § 702.04[2][b] at 702-102-104 (2d ed. 2013) (footnote and citations omitted).

60. Fed. R. Evid. 702(c).

61. Although set forth in a somewhat different form, this list is closely paraphrased from factors identified in 4 WEINSTEIN’S FEDERAL EVIDENCE § 702.04[2][c] at 702-105-113 (2d ed. 2013) (footnote and citations omitted).

62. Fed. R. Evid. 702(c).

63. Although set forth in a somewhat different form, this list is closely paraphrased from factors identified in 4 WEINSTEIN’S FEDERAL EVIDENCE § 702.04[2][d] at 702-116-118.8 (2d ed. 2013) (footnote and citations omitted).

64. *Daubert*, 509 U.S. at 595

65. *See generally* Arizona v. Salazar-Mercado, 234 Ariz. 590, 325 Ariz. 996 (Ariz. 2014) (in case addressing admissibility of evidence of Child Sexual Abuse Accommodation Syndrome, holding state-law version of Rule 702(d) did not “bar admission of ‘cold’ expert testimony that educates the fact-finder about general principles without considering the particular facts of the case.”)

66. Fed. R. Evid. 403.

67. *See Daubert*, 509 U.S. at 595 (cautioning trial judges, in assessing expert evidence, to “be mindful of other applicable rules,” including Fed. R. Evid. 403).

68. 4 WEINSTEIN’S FEDERAL EVIDENCE § 702.03 at 702-52-56 (2nd ed. 2013) (providing various examples of when proffered expert opinion evidence is inadmissible, including “if it does no more than tell the trier of fact what conclusion

to reach;" contract interpretation; witness credibility; state of mind; the law the jury should apply; and legal conclusions).

69. *Id*. at § 702.05[3] at 702-118.8 (2d ed. 2013) (footnote and citations omitted).

70. Ariz. R. Evid. 702, cmt. to 2012 Amendment