

13. EXPERT WITNESSES

A. Introduction

1. The topic of expert witnesses and the scientific and technical evidence they bring into the trial, is a complicated one. In many law schools, this topic is the subject of an entire advanced evidence class. There are whole casebooks devoted to experts, and the leading reference book (Faigman, Kaye, Saks & Sanders) is 4 volumes. We will give it only cursory coverage here. There is not time to do more in an introductory evidence class.

2. Rules 702-706 govern expert testimony.

3. Analyzing the admissibility of expert testimony consists of asking four questions:

A) Is there an appropriate issue for expert testimony? This is mostly determined by the parties, because experts are expensive. Rule 702 says that experts may testify whenever their specialized knowledge will assist the jury, which is pretty much all the time.

B) Does the proposed witness have the qualifications to be an expert? Rule 702 says that the witness must be "qualified as an expert by knowledge, skill, experience, training or education." As with other foundations, only minimal qualifications are required. It is rare for an attorney to go to the trouble of recruiting, paying and summoning a totally unqualified expert, so a more common issue is whether an expert is qualified to testify about a particular issue. A physician is qualified to testify about medical issues, but might not have the qualifications to testify on some specialty like laser neurosurgery.

C) Is the expert basing opinions on adequate information? Rule 702 requires the testimony to be "based on sufficient facts or data." The expert must base his or her opinion on enough information, observations, tests, experiments, and other data to make them reliable. However, experts do not need personal knowledge. They may review files and records and offer opinions as consultants. The problem is that the judge is not an expert, so how can the judge determine how much data is "enough?"

D) Is the expert's opinion rational? Rule 702 requires an expert's testimony to be "based on reliable principles and methods ... applied reliably to the facts of this case." This is a much more promising basis for a potential objection (or, more likely, a pretrial motion in limine).

To meet this requirement, the expert testimony must:

- be confined to the expert's area of expertise
- be rationally related to data
- not contradict basic scientific principles
- be derived by following accepted procedures, practices and protocols in the field
- if scientific, be "scientifically reliable" as defined by the *Daubert* test.

4. The concept of "scientific reliability" (also known as the "Daubert" test) derives from Daubert v. Merrell-Dow. Basically, the Supreme Court said that opinions that are scientifically reliable will be more helpful to the jury than opinions based on advertising, quackery, abstract philosophy, or outright fraud, and punted to overworked district court judges to make that determination based on evidence presented by the opposing parties. This is a difficult task -- they must distinguish "true" scientific knowledge from "false" science. Is this really a good idea? I doubt most judges have extensive scientific backgrounds. They were more likely to be business, finance, or political science majors as undergraduates and not have taken a science course since high school biology -- which (if it was anything like my experience in North Carolina) was devoted entirely to dissecting frogs and growing mold because school officials were afraid to anger evangelical Christians who objected to everything else in the science curriculum.

5. The Supreme Court tried to help these poor judges in the Daubert case by giving them suggestions on what to look for. They didn't think these up themselves, but took them from amicus briefs filed by scientific organizations. To be reliable, matters of science must:

- A) Be derived from scientific methodology -- that is, theories tested by neutral scientists through controlled studies.
- B) Be subjected to peer review and publication -- no "private" or proprietary data;
- C) Have a small rate of error in results (no statistical significance of results unless $p < .05$).
- D) Have achieved widespread acceptance if it has been around for awhile (Among educated elite -- not among general public -- e.g., evolution).

6. The courts have been mixed on whether to extend the "reliability" concept to non-scientific fields. The majority view is that testimony in quasi-scientific fields like engineering and medicine must be scientifically reliable, but opinions in non-scientific fields like handwriting analysis, accident reconstruction, or plumbing do not -- although courts have generally held that nonscientific experts cannot actually contradict scientific principles. Thus, an experienced plumber can testify as to whether the plumbing in a building meets code or was installed improperly, but cannot say that water in the waste line flows uphill.

B. THE RULES

1. Qualifications

(A) In general. A witness may be qualified as an expert based on knowledge, skill, experience, training, or education. The standard is a minimal one. The witness need not be the best available expert or have extensive training. The expert's qualifications must be established on the record before the witness is asked to give opinions. If there is a genuine possibility that the witness will not be found qualified, a hearing on qualifications should be conducted out of the presence of the jury. The opponent has the right to cross-examine the expert on the issue of qualifications prior to the expert giving opinion testimony, and to object that the witness is not qualified. This is also called a "voir dire."

(B) Judicial discretion. Whether a proposed expert witness has been sufficiently qualified is for the trial judge's determination based on the witness' testimony. There is no fixed standard; rather, the trial court must be satisfied that the witness has sufficient expertise to assist the jury. For example, a nurse at a nursing home may be qualified to give opinion on symptoms of Alzheimer's disease by virtue of experience, even though not an M.D.

(C) Either education or experience will suffice. An witness may qualify as an expert based on either experience or training; both are not required.. *Compare McCutchan v. Blanck*, 846 N.E.2d 256, 261 (Ind. Ct. App 2006) (witness with 23 years experience in septic systems qualified as expert) *with Gambill v. State*, 479 N.E.2d 523 (Ind. 1985) (pathologist with medical education but no previous experience qualified as expert).

(D) Weaknesses in a witness's qualifications go to the weight, not the admissibility, of the testimony.

2. Opinions Must Be Based on Facts

(A) *Familiarity with case*. An expert opinion must rest upon detailed knowledge of the facts of the present case. Those facts may come from the expert's personal knowledge, from a file containing pertinent records prepared by others, or from a combination of these two sources.

(B) *Opinions based on personal knowledge*. An expert may testify to an opinion based solely on personal knowledge of the facts, as in the case of an examining physician. It ordinarily makes no difference whether the expert observed these underlying facts in the normal course of practice or as a result of being specifically hired for the litigation.

(C) *Opinions based on second-hand knowledge*. Experts do not need personal knowledge. They may base opinions on information gathered from other sources, such as depositions, reports and photographs supplied by an attorney. An expert may incorporate facts from the expert's own knowledge or obtained from sources outside the record evidence.

(D) *Opinions based on hearsay or other inadmissible evidence*. The fact that some items in the file may be inadmissible hearsay is irrelevant. Experts may base opinions on inadmissible evidence, such as standard references in their field that would otherwise be hearsay, provided a foundation is laid that:

- (1) The expert has sufficient expertise to evaluate the accuracy and reliability of the information,
- (2) The report is of the type normally found reliable, and
- (3) The information is a type customarily relied upon by the expert in the practice of his or her profession.

(E) *Sufficiency of facts or data*. The question of whether the facts or data are sufficient to support the opinion goes to the weight, not the admissibility of the opinion.

3. Helpfulness

Expert testimony is admissible whenever scientific, technical, or other specialized knowledge will help the jury to understand the evidence or decide an issue. This is primarily a question of relevance. Experts may supply background, describe forensic tests, review the performance of doctors and engineers, and state a broad variety of opinions on the merits of the case. The subject matter does not have to be totally beyond the knowledge of the average juror.

4. Admissibility of Underlying Facts

The fact that experts may base opinions on hearsay or other inadmissible evidence does not make the underlying information admissible. Any inadmissible evidence used in formulating an opinion remains inadmissible on direct examination, but may be brought out on cross-examination.

5. Opinions May Be Based on Tests and Experiments

(A) *Opinions based on tests.* An expert may base an opinion in part on scientific testing procedures conducted at the expert's own lab or by an independent lab. If specialized equipment is used, such as radar guns or laboratory scales, the proponent must prove the equipment was properly set up and calibrated, although any potential problems with the accuracy of results goes only to the weight to be given the expert's testimony. Tests and experiments designed to show causation, feasibility, or dangerousness must have been conducted under substantially the same conditions as the original events.

(B) *Admissibility of the tests themselves.* The admissibility of the test results themselves is a separate issue from the admissibility of the expert's opinion, and is covered below in the discussion of scientific evidence.

(C) *Foundation.* When offering technical or mechanical evidence, such as measurements from scales and tape measures, no expert is needed to explain how such devices work. Any person familiar with their operation may testify to the results of a measurement if a foundation can be laid that the measuring device was properly operated and regularly tested or calibrated.

7. Foundation of Scientific Reliability

(A) *General rule.* Expert testimony on scientific, engineering and medical issues is admissible only if the court is satisfied that the scientific principles upon which it rests are reliable. This standard looks at procedure, not results. The court must determine that the general methodology, theories, and procedures used by the expert are reliable. *See Indiana Michigan Power Co v. Runge*, 717 N.E.2d 216 (Ind. App 1999) (expert who testified based on "my experience" that electric power lines caused health problems was not admissible because no scientific procedure was used). However, the reliability of the ultimate conclusions are a matter

for the jury in light of cross-examination and the presentation of contrary evidence, and as long as an expert applied reliable principles and methods, the fact that other experts, studies or treatises contradict the expert's conclusion goes to weight, not admissibility.

(B) *New science*. The reliability standard is a liberal one and does not mean the science must be old and well established. Experts may base opinions on new theories, minority views, and cutting-edge techniques, as long as the judge makes a determination that there is a reliable body of scientific evidence that supports the expert's use of that procedure. Dr. Frankenstein's theory of reanimation would not qualify.

(C) *Foundation*. Reliability may be established by testimony of the expert, testimony of other experts, scientific journals and texts, or judicial notice if the science has been around a long time. The court may also look to whether other courts have found it reliable. As with any foundation, the proponent bears the burden of proving the science is reliable for the purpose offered. Factors to consider in evaluating reliability include:

- (1) Whether the scientific theory, fact or procedure can be or has been empirically tested.
- (2) Whether the science has been subjected to peer review publication in scientific journals.
- (3) In the case of a particular technique or application, whether the potential error rate is too high to produce reliable results.
- (4) In the case of a particular test or procedure, whether there are standards controlling how it is applied.
- (5) Whether the science has achieved widespread acceptance, although the absence of widespread acceptance does not disqualify the expert. Every theory was once new.

(D) *Social Science is Science*. Rule 702 does not distinguish physical and biomedical science from social science, so social scientific testimony must also be shown to be reliable.

8. Scientific-Reliability Foundation Not Required in Nonscientific Fields

Rule 702(a) authorizes expert opinions in three areas: scientific, technical and specialized knowledge. It requires a foundation of scientific reliability if the expert is a scientist, but it is not clear what kind of foundation is needed if the expert is an electrician who testifies that a miswired branch circuit could have overheated and started a fire.

If a field is not scientific, the courts are divided on whether some alternate form of reliability is required. Most hold that it is, which seems the better rule. Some minimal foundation should be required that the expert is using reliable and commonly used principles of the field, i.e., that the testimony is reliable from the perspective of others in the field.. For example:

- Evidence that a civil engineer's opinions are arrived at by using reliable engineering principles.

- A business economics expert's opinion about the value of a business should be based on reliable principles of economics and accounting.
- An accident reconstructionist's opinion is based on accepted theories, not crackpot stuff like "faked left syndrome." See *Smith v. Yang*, 829 N.E.2d 624, 629 (Ind. Ct. App 2005).

Some apply only the minimal standard that experts in nonscientific field cannot rely on principles that contradict basic science. Sorry, Ghostbusters. A third approach is to not require any special foundation, but leave the question of reliability of nonscientific testimony to cross-examination and the jury.

9. Opinions Must Be Confined to Area of Expertise

An expert's opinions should be confined to the witness's areas of proven expertise. A chiropractor is not qualified to give opinions or evaluate hospital records involving medical doctors' reports. However, area of expertise is defined by training and experience, not just by the exact specialty in which the expert currently works. For example, family practitioners may give opinions on a broad range of medical issues based on their general training in medical school.

10. Opinions on Ultimate Issues vs. Legal Conclusions

An expert opinion is admissible even though it embraces an ultimate fact in issue or invades the province of the jury, as long as it concerns a matter within the expert's field of speciality. Rule 704. An engineer can testify that the defendant's failed to use the reasonable care a product engineer should use, which produced a dangerous product and caused the injury because it is not a purely legal opinion. Legal conclusions are a narrow category, e.g.:

- (1) Opinions on the proper outcome of the trial, e.g., that the defendant is guilty.,
- (2) Opinions on specific elements of a cause of action, e.g., whether a beneficiary had exerted undue influence on a testator.
- (3) Opinions on parties' legal rights and responsibilities, e.g., that the landowner owed his guests a duty.

Mixed opinions in which both the law and the expert's field of speciality use the same concept are permitted. For example:

- A psychiatrist could testify that the defendant was sane.
- An expert on the legal profession could testify that an attorney's conduct violated the Rules of Professional Conduct.
- In a medical malpractice suit, an expert could give an opinion that the surgeon was not negligent.

C. SCIENTIFIC EVIDENCE

1. In General.

Expert testimony and scientific evidence are closely related, but not the same thing. A doctor's opinion may rest in part on X-rays and EKGs. A forensic chemist's testimony may be almost entirely based on DNA tests. In some cases, the witness is essentially superfluous, as when a police officer brings to court the results of a Breathalyzer test for alcohol and has no actual idea how the test works. Is the scientific evidence independently admissible? If an expert testifies that he conducted a DNA test and concluded that blood at the scene of a crime came from the defendant, there is nothing that requires the attorney to introduce the actual piece of paper with the test results on it. But what if he or she does?

The scientific evidence must be relevant and not merely cumulative. That usually means that an expert will incorporate it into his or her testimony, e.g., by pointing to the different bands in a print-out of a DNA test result and explaining how one matches two samples. In other cases, the test result is itself the primary "witness," as when a police officer describes the speed reading he saw on a radar gun. It must be reasonably clear to the jury and not confusing or misleading.

It does not matter in most cases whether the witness brings the actual print-out or merely describes what he or she saw. The officer who clocked the defendant going 95 miles an hour may bring to court the piece of paper printed out from the computer to which the radar gun was connected, or may just describe what the gun said. This is just a question of whether the original document is required, covered by Rules 1001-1008. We cover this in the next class. What matters is that scientific evidence from a scientific contraption is being delivered to the jury in both cases, and it requires some additional foundation:

- (1) The scientific evidence must be shown to be reliable -- i.e., the result of a test based on reliable scientific theory, properly conducted.
- (2) Equipment must have been calibrated and in good working order. No expert is needed to explain how such devices work. A technician who regularly operates the machine and has personal knowledge of when it was calibrated can lay this foundation.
- (3) If testing involves blood or tissue sample, guns, carpet fibers, or other objects, they must be shown to have been properly handled to minimize the risk of contamination. If the thing passed through several hands on its way to the lab, a chain of custody is required to account for safekeeping at each stage.

2. The Problem of Forensic Testing

Forensic evidence is developed by law enforcement to help convict the accused. It is not truly scientific, because science assumes some level of neutrality on the part of the investigator. Courts have long accepted forensic testimony, such as:

- Hair comparison analysis.
- Shoeprint comparison analysis.
- Forensic reconstruction of bullet trajectories.
- Bite mark comparison.

- Fingerprint identification.
- Firearms tool mark identification analysis.

Recently, many courts are reconsidering whether these techniques actually produce reliable results. Several have been shown to be unreliable, such as carpet fiber analysis. Expect more litigation on this issue in coming years.

3. Polygraph Tests

Perhaps the only kind of testing procedures that generally are not admissible are polygraph tests. They are unreliable and may unduly influence the jury. Even the mention that a person took a polygraph test is prohibited.

4. Syndromes, Disorders, and Other Psychological Evidence

The courts generally agree that some common types of psychological evidence is reliable enough to be put before the jury:

- (A) Post-traumatic stress disorder
- (B) Rape-trauma syndrome
- (C) Battered woman syndrome.