

INDIANA TRIAL EVIDENCE MANUAL  
2005 J. Alexander Tanford

Chapter 35  
EXPERT TESTIMONY

§ 35.01. Rule

An expert is a person who has acquired specialized knowledge of a particular subject through training, education, or practical experience. Experts may give a wide variety of opinions on matters within their fields of specialty whenever “scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue,” Evid. R. 702; even if those opinions embrace the ultimate issues for the jury. Evid. R. 704. Personal knowledge of the underlying facts is not required, but experts may not speculate. Their opinions must be based on facts either observed or learned from others. Evid. R. 703. The law of experts testimony is thoroughly discussed in *Hannan v. Pest Control Serv.*, 734 N.E.2d 674 (Ind. App. 2000).

§ 35.02. Overview

The admissibility of expert testimony turns not on one rule, but on several intertwined rules:

- (1) *Procedural requirements.* Expert testimony must follow several procedural rules, discussed *infra* in §§ 35.04 et seq.
- (2) *Appropriate issue.* Expert testimony is only admissible if there is an issue at trial that lies in a field of scientific, technical or other specialized (as opposed to common) knowledge. See §§ 35.06 et seq.
- (3) *Qualifications of witness.* A witness must be qualified as an expert by knowledge, skill, experience, training or education. See §§ 35.08 et seq.
- (4) *Adequate factual basis.* The expert must be familiar with the facts and circumstances of the present case, either from personal knowledge or from having reviewed the file, and must base opinions on those facts. The underlying facts do not have to be independently admissible. See §§
- (5) *Scientific reliability.* The expert must have been arrived at by reliable methods and procedures and be based on reliable scientific theory. See §§
- (6) *Testimony confined to area of expertise.* Experts may testify and give opinions only within their fields of expertise. See §§

§ 35.03. Scientific Evidence Discussed in Next Chapter

This chapter covers the admissibility of expert testimony and opinions. However, such testimony will often be accompanied by the introduction of specific items of scientific evidence. For example, a physician who testifies to background information on *contrecoup* brain injuries and gives an opinion that the plaintiff suffered such an injury, might want to illustrate her testimony with a scale model of a head and a series of CAT scan pictures. The model and

pictures constitute scientific evidence, the admissibility of which is covered in Chapter 36. These two topics are closely intertwined because of the rule that most kinds of expert opinions must be based on reliable scientific evidence.

#### § 35.04. Procedural Rules for Offering and Objecting to Expert Testimony

(A) *Pretrial*. Most issues concerning the qualifications of an expert and the scope of expert testimony are worked out pretrial. However, objections made before trial are not generally preserved for the record, and the attorney must renew the objection at trial when the expert testifies.

(B) *Establishing qualifications*. The qualifications of an expert 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. *Harrison v. State*, 644 N.E.2d 1243 (Ind. 1994). 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.”

(C) *No requirement that witness be formally tendered as expert*. There is no requirement that the witness be formally tendered as an expert in a particular field following the hearing on qualifications. Indeed, the court of appeals has disapproved of the practice of having the trial judge announce that a witness is qualified as an expert, because it could be seen as a judicial endorsement of that witness’s credibility, but did not prohibit it. *Campbell v. Shelton*, 727 N.E.2d 495 (Ind. App. 2000).

(D) *Either data or opinion may be first*. An expert may describe the facts first and then state conclusions, or may state conclusions first and then describe their factual basis. Either order is permitted by Rule 705.

(E) *Hypothetical question not required*. No hypothetical question is required. The expert may be asked to base an opinion upon facts contained in a file reviewed before the trial. Evid. R. 703. Hypothetical questions are permitted, however, if the attorney so desires. *Fleener v. State*, 648 N.E.2d 652 (Ind. App. 1995). A hypothetical question must be based on facts in evidence and reasonable inferences therefrom, but need not include all potentially relevant facts, only sufficient facts to form a reliable basis for an opinion. *Henson v. State*, 535 N.E.2d 1189 (Ind. 1989). If the opponent objects that the facts in the hypothetical are incomplete, the question may still be asked. The remedy is for the opponent to ask a question on cross-examination that contains what he or she feels to be the complete facts. *City of Indianapolis v. Robinson*, 427 N.E.2d 902 (Ind. App. 1981).

(F) *Certainty not required*. No rule of evidence limits an expert to opinions that can be stated with "reasonable certainty." Many field of expertise like medicine are not exact sciences. *Biehl v. State*, 738 N.E.2d 337, 338 n.1 (Ind. App. 2000). See *Turner v. State*, 720 N.E.2d 440 (Ind. App. 1999) (opinion that child’s injuries “could have” been caused in a certain way admissible).

(G) *Time for objection*. In general, the proper time for an objection is when the opponent asks the witness for an opinion or seeks to elicit testimony on a particular subject. Pretrial

objections or general objections made when the witness is tendered as an expert are not sufficient.

#### § 35.05. Procedure for Cross-Examining Experts

(A) *In general.* The scope of cross-examination of experts is broader than for other witnesses. See *Southlake Limo. & Coach v. Brock*, 578 N.E.2d 677 (Ind. App. 1991). The expert may be asked detailed questions about the facts or data underlying an opinion, may be asked hypothetical questions, may be confronted with contrary passages in treatises, and may be impeached like any lay witness.

(B) *Impeachment.* Experts may be impeached for untruthfulness, criminal convictions, and bias to the same extent as lay witnesses. E.g., *Simon v. Clark*, 660 N.E.2d 634 (Ind. App. 1996) (paid by a party or regularly represent a class of persons, e.g., insurance companies). The case law on whether you can impeach an expert by proving his or her bad reputation as an expert reaches different results.

(C) *Alternative hypotheticals.* New hypothetical questions may be asked on cross-examination to present alternative theories, test the expert's degree of certainty, and use facts omitted on direct. *Terre Haute First Nat. Bank v. Stewart*, 455 N.E.2d 362 (Ind. App. 1983); *Ramsey v. Complete Auto Transit*, 393 F.2d 41 (7th Cir. 1968).

(D) *Contrary learned treatises.* It is proper to impeach the reliability of the opinion given on direct by introducing passages in authoritative books or articles that give a contrary view. If the expert claims to have relied on a particular treatise, or admits on cross-examination that a treatise is a reliable authority, passages from that work may be read into the record which contradict the opinion given. If the expert denies that a treatise is reliable, its reliability may be established through other experts or judicial notice. The treatise itself is not admissible as an exhibit. Evid. R. 803(18).

(E) *Court's witnesses.* If the expert is called by the court, both parties should be allowed to cross-examine. Evid. R. 614(a). See IC 35-36-2-2 (disinterested experts in insanity defense cases).

#### § 35.06. Issues on Which Expert Testimony Admissible

(A) *General rule of liberal admissibility.* Expert testimony is admissible whenever scientific, technical, or other specialized knowledge will assist the jury to understand the evidence or decide an issue. Evid. R. 702(a). The old rule requiring the subject matter to be beyond the knowledge of the average juror has been abrogated, and expert testimony is admissible whenever the judge thinks it will be helpful to the jury, even if the field is partly within common experience. *Sears Roebuck & Co. v. Manuilov*, 742 N.E.2d 453 (Ind. 2001) (expert testimony should be liberally admitted); *Hanson v. State*, 704 N.E.2d 152 (Ind. 1999) (firearms expert gave opinion that serial numbers had been filed down).

(B) *Must be relevant.* Expert testimony must be relevant and not unduly prejudicial. *Indiana Michigan Power Co. v. Runge*, 717 N.E.2d 216 (Ind. App 1999); *Howerton v. Red Ribbon, Inc.*, 715 N.E.2d 963 (Ind. App. 1999). There is no special rule for balancing the

helpfulness of expert testimony against its tendency to prejudice, overwhelm or mislead the jury. If relevant, expert testimony is admissible unless the relevance of evidence is substantially outweighed by its prejudicial effect. *See Harrison v. State*, 644 N.E.2d 1243 (Ind. 1994) (Rule 403 applies).

(B) *Standard of care.* Expert medical testimony is admissible (and usually required) to establish that a physician's conduct fell below the applicable standard of care because of the technical and complicated nature of medical treatment. *Boston v. Gyn, Ltd.*, 785 N.E.2d 1187, 1191 (Ind. App. 2003). It is not absolutely required if the issue is within ordinary experience. *Bader v. Johnson*, 732 N.E.2d 1212, 1217-18 (Ind. 2000) (doctor forgot to tell parents of fetus's abnormalities; no expert required).

(C) *Cause of an injury.* Expert opinions on causation are admissible if scientifically reliable. *Sears Roebuck & Co. v. Manuilov*, 742 N.E.2d 453 (Ind. 2001). To establish causation of a medical injury, expert testimony is necessary unless the issue is very simple. *Ford Motor Co v. Reed*, 689 N.E.2d 751 (Ind. App. 1997).

(D) *Sanity of defendant.* When a defendant gives notice of an insanity defense, the court must appoint 2 or 3 psychologists or psychiatrists to examine the defendant and testify at trial. They are required by statute to testify after the close of the State's case. IC § 35-36-2-2.

(E) *Background information.* Expert testimony is also admissible when its only relevance is to provide background information that will help the jury understand other aspects of the case. *See Cook v. State*, 734 N.E.2d 563, 570 (Ind. 2000) (testimony on general unreliability of eyewitness identifications admissible in mistaken identification case); *Isaacs v. State*, 659 N.E.2d 1036 (Ind. 1995) (testimony on battered woman syndrome admissible to explain why victim did not leave); *Callis v. State*, 684 N.E.2d 233 (Ind. App. 1997) (testimony on police interrogation techniques admissible when defendant claimed confession obtained involuntarily); *Ross v. State*, 665 N.E.2d 599 (Ind. App. 1996) (information on DNA testing admissible to "render other evidence comprehensible to the trier of fact").

#### § 35.07. Field of Expertise Must Be Beyond Knowledge of Lay Persons

Although the issues on which an expert may testify need not be completely beyond the knowledge of the average juror, the expert's field must be one that involves scientific, technical, or other specialized knowledge that is beyond the education and experience of average lay persons. *Bacher v. State*, 686 N.E.2d 791 (Ind. 1997); *Hannan v. Pest Control Serv.*, 734 N.E.2d 674, 679 (Ind. App. 2000).

#### § 35.08. Experts Compared to Skilled Lay Witnesses

Under Evidence Rule 702, there can be no such thing as an "expert" on a matter of common knowledge. Experts are connected to fields of specialized knowledge beyond the understanding of the average juror. However, the supreme court has held that lay witnesses who have acquired expertise in matters of common knowledge by *personal experience* (not training) will often be able to give helpful opinions to the jury that look a lot like expert opinions. *See Angleton v. State*, 686 N.E.2d 803 (Ind. 1997) (police officer gave opinion that defendant's home had not

been burglarized); *Mariscal v. State*, 687 N.E.2d 378 (Ind. App. 1997) (martial arts teacher gave opinion that defendant had wounded himself during knife fight). The major difference is that an expert may rely on hearsay and second-hand knowledge; Evid. R. 703; while a skilled lay witness must rely solely on his or her own perceptions and personal knowledge. Evid. R. 701. See § 34.04, *supra*.

#### § 35.09. Qualifications as an Expert

(A) *In general*. A witness may be qualified as an expert based on knowledge, skill, experience, training, or education. Evid. R. 702. The standard is a minimal one. The witness need not be the best available expert or have extensive training. *Bacher v. State*, 686 N.E.2d 791 (Ind. 1997) (paramedic qualified to state opinion on time of death); *Grinstead v. State*, 684 N.E.2d 482 (Ind. 1997) (police officer with only a few hours' training qualified as expert on blood splatter).

(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 is an expert. See *Creasy v. Rusk*, 730 N.E.2d 659 (Ind. 2000) (nurse in nursing home qualified to give opinion on symptoms of Alzheimer's disease by virtue of experience); *McIntosh v. Cummins*, 759 N.E.2d 1180, 1184 (Ind. App. 2001) (family practitioner qualified to give opinion on standard of care for orthopedic surgeon).

(C) *Either education or experience will suffice*. An expert does not need both educational and experiential credentials. Either standing alone will suffice. See *Koziol v. Vojvoda*, 662 N.E.2d 985 (Ind. App. 1996) (accident investigator with 20 years of experience but no formal training qualified as an expert); *Gambill v. State*, 479 N.E.2d 523 (Ind. 1985) (pathologist with medical education but no previous experience qualified as expert).

(D) *State license irrelevant*. An expert need not be licensed to practice in Indiana. *Hartford Steam Boiler Insp. & Ins. v. White*, 775 N.E.2d 1128, 1131 (Ind. App. 2002).

(E) *Expertise in underlying fields not required*. Experts must understand and know how to interpret data underlying their opinions, but need not be an expert in gathering that underlying data. *Hegerfeld v. Hegerfeld*, 555 N.E.2d 853 (Ind.App. 1990). For example, a physician does not have to be qualified as an expert in radiology to rely on X-rays. Any lack of knowledge of scientific principles of underlying fields goes to the weight of the evidence, but does not render an otherwise competent expert unqualified. See *Martin v. Roberts*, 464 N.E.2d 896 (Ind. 1984) (police officer may calculate speed from physical evidence despite lack of expertise in underlying mathematical formula).

#### § 35.10. Opinions Must Be Based on Facts of Present Case.

(A) *Familiarity with case required*. 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. Evid. R. 703; *Clark v. Sporre*, 777 N.E.2d 1166, 1170-71 (Ind. App. 2002).

(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.* Personal knowledge is not necessary. Experts may also base opinions on information gathered from other sources, such as depositions, reports and photographs supplied by an attorney. *Vaughn v. Daniels Co., Inc.*, 777 N.E.2d 1110, 1120-21 (Ind. App. 2002).

(3) *Opinions based on hearsay.* The fact that some items in the file may be inadmissible hearsay is irrelevant. Experts may base opinions on inadmissible evidence provided:

- (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 the type customarily relied upon by the expert in the practice of his or her profession.

*Vaughn v. Daniels Co., Inc.*, *supra* at 1121-22. *See, e.g., Fleener v. State*, 648 N.E.2d 652 (Ind. App. 1995) (psychologist may rely on Diagnostic and Statistical Manual).

(4) *Speculative opinions.* The expert must base an opinion on concrete information of some sort, whether personally observed or learned from reliable sources. Experts may not speculate in the absence of information. *See Indiana Michigan Power Co. v. Runge*, 717 N.E.2d 216 (Ind. App 1999) (opinion that electro-magnetic field from power lines caused health problems lacked factual basis and was speculative; not admissible).

#### § 35.11. Admissibility of Underlying Facts

Experts may base opinions on hearsay or other inadmissible evidence, but that 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. Evid. R. 705. Pre-Rules cases holding that hearsay documents relied on by the expert could be admitted for the limited purpose of showing the basis of the expert's opinion on direct examination are no longer good law. *E.g., Miller v. State*, 575 N.E.2d 272 (Ind. 1991).

#### § 35.12. 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 or laboratory scales, the proponent must prove the equipment was properly set up, calibrated and tested. *Robinson v. State*, 634 N.E.2d 1367 (Ind. App. 1994). Any potential problems that such tests may have been unreliable goes only to the weight to be given the expert's testimony. *See Lockhart v. State*, 609 N.E.2d 1093 (Ind. 1993) (DNA tests). Tests and experiments designed to show causation, feasibility, or dangerousness must have been conducted under substantially the same conditions as the original events. *Null v. State*, 690 N.E.2d 758 (Ind. App. 1998).

(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. It is covered in Chapter 36, 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. *Charley v. State*, 651 N.E.2d 300 (Ind. App. 1995).

### § 35.13. Testimony Must Have Reliable Scientific Basis

(A) *General rule.* Expert testimony is admissible only if the court is satisfied that the scientific, technical, psychological or other principles upon which it rests are reliable. Evid. R. 702(b); *Kubsch v. State*, 784 N.E.2d 905, 921-22 (Ind. 2003). 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 testimony based on "my experience" that electric power lines caused health problems not admissible; no scientific procedure used). The reliability of the expert's conclusions are a matter for the jury to evaluate in light of cross-examination and the presentation of contrary evidence. *Sears Roebuck & Co. v. Manuilov*, 742 N.E.2d 453, 460-61 (Ind. 2001); *Hannan v. Pest Control Serv.*, 734 N.E.2d 674 (Ind. App. 2000).

(B) *Liberal standard.* The supreme court has held that the intent of the rule is to liberalize the use of reliable expert scientific testimony. *Sears Roebuck & Co. v. Manuilov*, 742 N.E.2d 453 (Ind. 2001). 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. *Hannan v. Pest Control Serv.*, 734 N.E.2d 674 (Ind. App. 2000).

(C) *Foundation.* In *McGrew v. State*, 682 N.E.2d 1289 (Ind. 1997), the supreme court clarified the foundation rules for expert scientific testimony. Before an expert may testify about a matter of science or draw conclusions based on scientific theories, tests or procedure, the proponent must establish the reliability of the science. Reliability may be established by judicial notice if there is no dispute about it, or by the testimony of expert witnesses at a hearing. As with any foundation, any credible testimony by the proponent's expert is sufficient if the opponent does not call contrary experts or introduce contrary learned treatises. There is no heightened burden of proof. If the reliability of scientific evidence is disputed, the trial judge must decide whether the proffered testimony is reasonably reliable for the purpose offered. *See Steward v. State*, 652 N.E.2d 490 (Ind. 1995) (science may be reliable for one purpose but not for another). Factors to consider include:

- (1) Whether the scientific theory, fact or procedure can be or has been empirically tested. *See Hannan v. Pest Control Serv.*, 734 N.E.2d 674 (Ind. App. 2000); *Hottinger v. Trugreen Corp.*, 665 N.E.2d 593 (Ind. App. 1996).
- (2) Whether the science has been subjected to peer review publication in scientific

- journals. *Hannan v. Pest Control Serv., supra.*
- (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. *See Wallace v. Meadow Acres Manufactured Hous.*, 730 N.E.2d 809 (Ind. App. 2000) (analysis concerning formaldehyde levels based on data collection method that did not meet HUD or other published guidelines for taking good measurements was not reliable and not admissible).
  - (5) Whether the science has achieved widespread acceptance. *Hannan v. Pest Control Serv., supra.* Widespread acceptance does *not* establish reliability unless it is so indisputably accepted that judicial notice may be taken of its reliability. *See Newhart v. State*, 669 N.E.2d 953 (Ind. 1996).

The recent decision of the United States Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993) is consistent with Rule 702(b) and will be helpful in understanding it, but is not controlling. *McGrew v. State, supra.*

(D) *Pre-1997 cases.* Appellate cases prior to *McGrew* were inconsistent in their foundation requirements and should be used carefully. *See Grinstead v. State*, 684 N.E.2d 482 (Ind. 1997) (holding blood spatter analysis admissible despite absence of proof of reliability); *Burkett v. State*, 691 N.E.2d 1241 (Ind. App. 1998) (citing pre-Rules cases for proposition that reliability is established if the evidence was admitted in other cases).

#### § 35.14. Medical Causation Testimony

To be reliable, a diagnosis of medical causation must involve both a personal examination of the patient and a series of tests to rule out other possible causes of the injury. *Indiana Michigan Power Co. v. Runge*, 717 N.E.2d 216 (Ind. App 1999) (opinion that electro-magnetic field from power lines caused health problems based on “personal experience” but no medical tests not reliable). *See Hannan v. Pest Control Serv.*, 734 N.E.2d 674, 681-83 (Ind. App. 2000) (temporal coincidence, i.e. exposure to toxic substance followed soon after by symptoms, is not scientifically reliable to establish causation without testing to rule out alternative causes of ailments).

#### § 35.15. Opinion Must Be Confined to Area of Expertise

An expert's opinions should be confined to the witness's areas of proven expertise. *See Brooks v. Friedman*, 769 N.E.2d 696, 702 (Ind. App. 2002) (chiropractor not qualified to give medical opinions or evaluate hospital records involving medical doctors' reports); *Indiana Michigan Power Co. v. Runge*, 717 N.E.2d 216 (Ind. App 1999) (an expert in elctro-magnetism not qualified to give opinion on health problems from power lines). However, area of expertise is defined by training and experience, not just by the exact specialty in which the expert currently works. *See McIntosh v. Cummins*, 759 N.E.2d 1180, 1184 (Ind. App. 2001) (family practitioner qualified to give opinion on standard of care for orthopedic surgeon).

§ 35.16. Opinions on Ultimate Issues vs. Legal Conclusions

(A) *Opinions on ultimate issues admissible.* 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. Evid. R. 704. See *Koziol v. Vojvoda*, 662 N.E.2d 985 (Ind. App. 1996) (accident investigator permitted to give opinion on who was at fault, because determining fault was within his field of expertise).

(B) *Legal conclusions prohibited.* Experts may not testify to purely legal conclusions. *Vaughn v. Daniels Co., Inc.*, 777 N.E.2d 1110, 1122-23 (Ind. App. 2002). Examples of prohibited legal opinions include:

- (1) Opinions concerning guilt, innocence, or intent in a criminal case. Evid. R. 704(b). See *Griffin v. State*, 692 N.E.2d 468 (Ind. App. 1998) (giving this rule an unusually broad interpretation and excluding all opinions about any aspect of defendant's mental state including "has problems functioning in everyday life," "shows poor judgment," and is "easily aggravated and impulsive").
- (2) Opinions on whether a witness has testified truthfully or falsely. This is a narrow rule prohibiting only testimony directly commenting on the truthfulness of a particular witness. *Miller v. State*, 770 N.E.2d 763, 773 (Ind. 2002) (psychologist could testify that coercive interrogation techniques were likely to produce unreliable confession); *Carter v. State*, 754 N.E.2d 877, 881-82 (Ind. 2001) (expert permitted to testify that autistic children like victim were generally incapable of lying).
- (3) Opinions on parties' legal rights and responsibilities. See *Merrill v. Knauf Fiber Glass GMBH*, 771 N.E.2d 1258, 1263 (Ind. App. 2002) (opinion that defendant owed plaintiff a duty).

(C) *Mixed professional/legal opinions allowed.* Only purely legal opinions are prohibited. Mixed opinions in which both the law and the expert's field of specialty use the same concept are permitted. See *Freed v. State*, 480 N.E.2d 929 (Ind. 1985) (psychiatrist could testify defendant was "legally sane;" mixed legal and expert opinion); *Major v. OEC-Diasonics, Inc.*, 743 N.E.2d 276, 285 (Ind. App. 2001) (expert on legal profession allowed to give opinion that attorney's conduct violated Rules of Professional Conduct); *Mundy v. Angelicchio*, 623 N.E.2d 456 (Ind. App. 1993) (in malpractice suit, expert could give opinion that surgeon was not negligent; mixed legal and medical opinion).

(D) *Opinions on credibility of witnesses.* Expert opinions by mental health professionals that a witness is being truthful are not allowed. *Head v. State*, 519 N.E.2d 151 (Ind. 1988) (witness stated she thought child's allegations were true). This is a narrow rule confined literally to testimony concerning the truthfulness of a particular witness. Testimony that casting doubt on the truthfulness of a witness's testimony is admissible. *Miller v. State*, 770 N.E.2d 763, 773 (Ind. 2002) (coerciveness of interrogation techniques were likely to produce unreliable confession); *Carter v. State*, 754 N.E.2d 877, 881-82 (Ind. 2001) (autistic children were generally incapable of lying); *Fleener v. State*, 648 N.E.2d 652 (Ind. App. 1995) (child not prone to exaggerate or fantasize). The court of appeals cautions that in many cases the line between impermissible

vouching for the child's credibility and giving an opinion that the child is not prone to exaggeration or fantasy is an extremely fine one and trial courts must be vigilant in making sure the witness does not vouch for the truth of the child's particular accusation. *Hook v. State*, 705 N.E.2d 219 (Ind. App. 1999).

## Chapter 36 SCIENTIFIC EVIDENCE

### § 36.01. Scientific Evidence Distinguished from Expert Testimony

Scientific evidence and expert testimony are closely related, but are not the same things for evidentiary purposes. Scientific evidence is the CAT scan, EKG, blood tests and other procedures performed on an unconscious patient. Expert testimony is the neurologist giving a diagnosis, prognosis, and opinion of causation based on the scientific evidence. The credibility of expert testimony is related to the credentials of the expert witness and the care he or she has taken. The credibility of the scientific evidence is independent of any particular witness, and is inherent in the nature of the scientific process itself.

### § 36.02. Admissibility Distinguished from Expert's Use as Basis of Opinion

Scientific evidence may arise at trial in two distinct ways. An expert may testify that he or she conducted tests or relied on scientific evidence as the basis of an opinion. The admissibility of this testimony is determined by the rules of expert witnesses, *supra* Chapter 35. Experts may base their opinions on all kinds of data and information, and it need not be independently admissible. Indeed, the fact that an expert relied on an item of scientific evidence tells us nothing about its admissibility. If an attorney wishes to introduce actual items of scientific evidence themselves, such as DNA tests or economic analysis of lost earning potential, a foundation must be laid showing that the scientific evidence is reliable. Other kinds of scientific evidence have additional foundation requirements discussed in the following sections.

### §36.03. Scientific Evidence Must Be Reliable to Be Admissible

Because the credibility of scientific evidence does not depend on a witness, it is hard for jurors to evaluate it. For that reason, the courts require a foundation of "scientific reliability" before scientific evidence is admissible. This foundation may be laid in either of two ways:

- (1) *Expert testimony*. An expert witness may testify that scientific procedures, tests, or other evidence is scientifically reliable. See *Harrison v. State*, 644 N.E. 2d 1243 (Ind. 1994) (DNA evidence).
- (2) *Judicial notice*. Scientific evidence that has been around for a long time may be well known to be either reliable or unreliable, in which case the court may take judicial notice of that fact based on "sources whose accuracy cannot reasonably be questioned," such as current encyclopedias. Evid. R. 201; *Orr v. State*, 472 N.E.2d 627 (Ind. App. 1984). Judicial notice may not be based on the fact that similar evidence has been admitted in previous cases, because science constantly

progresses.

In *Haycraft v. State*, 760 N.E.2d 203, 211 n.7 (Ind. App. 2001), the court of appeals says in a footnote that the reliability foundation is required only if the evidence is being introduced by an expert witness. The implication is that *unreliable* scientific evidence can be freely used as long as it is introduced by police officers and other skilled lay witnesses. This opinion is contrary to the usual rule, and should be viewed cautiously.

#### § 36.04. Scientific Equipment

Specialized scientific and technical equipment, such as police radar and laboratory scales, must be shown to be accurate before evidence of their measurements is admissible. 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. *Charley v. State*, 651 N.E.2d 300 (Ind. App. 1995); *Robinson v. State*, 634 N.E.2d 1367 (Ind. App. 1994).

#### § 36.05. Blood Tests

(A) Before a report of the results of a blood test is admissible, a chain of custody must be proved for the blood sample from the time it was drawn to the time it was tested. *Culver v. State*, 727 N.E.2d 1062 (Ind. 2000); *Fendley v. Ford*, 458 N.E.2d 1167 (Ind. App. 1984). A chain of custody of the blood sample may be established by documents because the hearsay rule does not apply when laying foundations. See § 1.05, *supra*. But see *Reeve v. Boyd & Sons*, 654 N.E.2d 864 (Ind. App. 1995) (strange dictum in footnote 4 denies existence of chain of custody requirement, not good law).

(B) In paternity actions, the results of blood or genetic tests are admissible in evidence without foundation unless the defendant objects 30 days in advance. Such evidence is conclusive if the tests exclude paternity. IC 31-14-6-2; *Humbert v. Smith*, 664 N.E.2d 356 (Ind. 1996).

(C) Blood tests (or blood serum tests) for alcohol are admissible in prosecutions for driving while intoxicated; IC 9-30-6-15; and operating a water craft while intoxicated. IC 14-15-8-17. It is not clear whether a foundation is required. See *Pollard v. State*, 439 N.E.2d 177 (Ind. App. 1982) (results admissible without foundation as long as test was conducted by certified hospital technician). If blood serum tests are used, an expert should normally be called to convert the blood serum alcohol level to blood alcohol by weight for whole blood. *Mehidal v. State*, 623 N.E.2d 428 (Ind. App. 1993). However, even without the expert, evidence of serum alcohol content is relevant as some evidence of blood alcohol level. *Blinn v. State*, 677 N.E.2d 51 (Ind. App. 1997).

(D) IC 9-30-6-15 provides that the trier of fact "shall" presume that if a person's blood alcohol level is above 0.08% when tested, then it also was above 0.08% when the person was driving. Cf. *State v. Stamm*, 616 N.E.2d 377 (Ind. App. 1993) (test must have been taken in compliance with Department of Toxicology guidelines). The courts have interpreted the word "shall" to mean "may", and held that a jury must be instructed that they may reject this presumption even if no evidence is offered by the defendant. The use of the word "shall" would

relieve the state of its burden of proof on an essential element of a crime and violate the rule against mandatory presumptions. See *Sandstrom v. Montana*, 442 U.S. 510 (1979); *Hall v. State*, 560 N.E.2d 561 (Ind. App. 1990). In *Finney v. State*, 686 N.E.2d 133 (Ind. App. 1997), the court of appeals held that this presumption is only valid if the prosecution establishes that the defendant was eliminating alcohol metabolically at the time of the test and not still absorbing recently consumed alcohol. The state can establish this by taking two blood samples at different times to see whether BAC is rising or falling.

#### § 36.06. DNA Analysis

The results of forensic DNA analysis are generally admissible in civil and criminal cases. Since DNA testing procedures are constantly changing and improving, a foundation is required that the particular test used is scientifically reliable and was properly conducted. Evid. R. 702(b); *Troxell v. State*, 778 N.E.2d 811, 815 (Ind. 2002). IC 35-37-4-13 purports to automatically admit DNA tests in criminal cases without laying the foundation, but the supreme court held that this statute conflicts with court precedent. DNA evidence is *not* automatically admissible, but subject to the usual rule that scientific reliability for the purpose for which it is offered must be proved in each case. *Harrison v. State*, 644 N.E. 2d 1243 (Ind. 1994). Another statute, IC 31-14-6-2, admits DNA test reports in paternity cases without foundation unless the defendant objects 30 days in advance. It has been approved by the supreme court. *Humbert v. Smith*, 664 N.E.2d 356 (Ind. 1996).

The leading case on DNA evidence is *Smith v. State*, 702 N.E.2d 668 (Ind. 1998), which thoroughly reviews the issue. It holds that “DQ Alpha,” “Polymarker,” and “D1S80” tests are reliable and admissible, rejecting the argument that the Polymerase Chain Reaction methodology employed in the Polymarker and D1S80 tests are scientifically unreliable. Irregularities or problems in testing go to weight, not admissibility unless they are so substantial that the reliability of the results is doubtful. See also *Troxell v. State*, 778 N.E.2d 811, 815 (Ind. 2002) (“Short Tandem Repeat” analysis admissible); *Patterson v. State*, 742 N.E.2d 4, 12 (Ind. App. 2000) (“match probabilities” evidence in DNA testing is admissible).

#### § 36.07. Forensic Techniques

(A) Hair comparison analysis is admissible. *McGrew v. State*, 682 N.E.2d 1289 (Ind. 1997).

(B) Shoeprint comparison analysis is admissible. *West v. State*, 755 N.E.2d 173, 181 (Ind. 2001). (C) Forensic pathology analysis reconstructing paths of bullets is admissible. *Morgan v. State*, 755 N.E.2d 1070, 1077-78 (Ind. 2001).

(D) Bite mark comparison evidence is admissible. *Carter v. State*, 766 N.E.2d 377, 381 (Ind. 2002).

#### § 36.08. Breathalyzer Tests

Breath tests conducted on a variety of equipment, including the Intoxilizer, are admissible. *Baran v. State*, 639 N.E.2d 642 (Ind. 1994). In order for the results of a breath test to be admissible under IC 9-30-6-5 (automobiles) or IC 14-15-8-17 (water craft); three foundation

elements must be proved. *State v. Johanson*, 695 N.E.2d 965 (Ind. App. 1998) (strict compliance required). The statutes provide that official certificates are prima facie evidence of those elements:

- (1) The test was administered by an operator certified within the last two years by the department of toxicology of the Indiana University School of Medicine. This may be proved by an official certificate or a letter from the department of toxicology stating that the operator had passed its course. *Oller v. State*, 469 N.E.2d 1227 (Ind. App. 1984). *Cf. Wray v. State*, 751 N.E.2d 679 (Ind. App. 2001) (certificate of training not admissible when officer testified he did not actually receive the training he was being certified for).
- (2) The equipment and chemicals used in the test were inspected and approved by the department of toxicology. Certification of the breath machine creates a rebuttable presumption that it is in good working order for 180 days. *Christian v. State*, 710 N.E.2d 582 (Ind. App. 1999).
- (3) The operator used techniques approved by that department. *Bowman v. State*, 564 N.E.2d 309 (Ind. App. 1990). The police officer's personal assertion that he followed approved procedures is insufficient. The state must offer a certified copy of the department document that sets out approved procedures; *Boothe v. State*, 439 N.E.2d 708 (Ind. App. 1982); offer a copy of the breathalyzer operational checklist; *Grogan v. State*, 482 N.E.2d 300 (Ind. App. 1985); or have a witness read the department guidelines into the record. *Sell v. State*, 496 N.E.2d 799 (Ind. App. 1986). Rules of the department of toxicology containing proper procedures for administering breath tests are described in administrative regulations and must be judicially noticed if requested. *See Mullins v. State*, 646 N.E.2d 40 (Ind. 1995).

There has been a recent flurry of cases concerning the evidentiary and legal differences between breath test results expressed as percent by weight of alcohol in 100 milliliters blood or as grams of alcohol per 210 liters of breath, based on an ambiguity in the motor vehicle laws concerning driving while intoxicated. They are summarized in *Sales v. State*, 723 N.E.2d 416 (Ind. 2000). The law has been amended to remove the ambiguity, so the issue should be moot. *See* IC 9-13-2-131 (evidence of alcohol concentration in the blood of 0.08 admissible and prima facie evidence of intoxication); IC 9-13-2-151 (blood alcohol level of 0.05 to 0.08 are relevant to showing intoxication).

#### § 36.09. Field Sobriety Tests

Field sobriety tests, including the horizontal gaze nystagmus test, are admissible and sufficiently reliable to satisfy Rule 702 as long as the officer is trained in their use. *Cooper v. State*, 761 N.E.2d 900, 903 (Ind. App. 2002) (gaze test); *Smith v. State*, 751 N.E.2d 280 (Ind. App. 2001) (standard field sobriety tests).

#### § 36.10. Portable Breath Tests

The court of appeals has held that the results of a portable breath test are not admissible

because they are not certified by the Department of Toxicology. *Sharber v. State*, 750 N.E.2d 796 (Ind. App. 2001). The opinion should be viewed cautiously, because the court did not consider whether these tests were scientifically reliable.

#### § 36.11. Radar

The Court of Appeals has held that the state must lay a foundation before introducing evidence of a speed reading obtained from radar. The state must prove that the radar unit was regularly tested and calibrated and that the particular police officer operated it properly. *Smith v. State*, 502 N.E.2d 122 (Ind. App. 1986). There is no requirement that the state prove the operator was certified or an expert. *Marlatt v. State*, 715 N.E.2d 1001 (Ind. App. 1999).

#### § 36.12. Polygraph Tests

(A) *Generally inadmissible*. Perhaps the only kind of testing procedures that generally are not admissible are the results of polygraph tests. They are unreliable and may unduly influence the jury. *Majors v. State*, 773 N.E.2d 231, 238 (Ind. 2002). Even the mention that a person took a polygraph test is prohibited. *Reese v. State*, 452 N.E.2d 936 (Ind. 1983).

(B) *Admissible if stipulated*. If the defendant, defense attorney and prosecutor sign an advance written stipulation that the defendant will take a test and the results will be admissible, then the results may be used. The court has some discretion to refuse to admit the results despite the stipulation if the results were inconclusive or the test poorly conducted. The opponent has the right to require that the examiner appear in court for cross-examination. *Davidson v. State*, 558 N.E.2d 1077 (Ind. 1990). Normally the judge should give a cautionary instruction to the jury on the limited usefulness of polygraph tests. *Sanchez v. State*, 650 N.E.2d 734 (Ind. App. 1995).

(C) *Opening door*. Despite the presumptive inadmissibility, a party may open the door to admission of polygraph evidence in some narrow circumstances. See *Willoughby v. State*, 552 N.E.2d 462, 469 (Ind. 1990) (defendant misled jury as to his truthfulness by implying he passed a polygraph); *Majors v. State*, 773 N.E.2d 231, 238-39 (Ind. 2002) (defendant implied that a state's witness had been granted immunity because of his involvement, when he was actually granted immunity as precondition to taking a polygraph).

(D) *Wording of stipulation*. The requirements of a proper stipulation are: (1) the prosecution, defendant, and defense counsel must all sign a written stipulation providing for the defendant's submission to the examination and for the subsequent admission at trial of the results; (2) notwithstanding that stipulation, the admissibility of the test results is at the trial court's discretion regarding the examiner's qualifications and the test conditions; (3) the opposing party shall have the right to cross-examine the examiner if his or her graphs and opinion are offered into evidence; (4) the jury must be instructed that, at most, the examiner's testimony tends only to show whether the defendant was being truthful at the time of the examination, and that it is for the jury to determine the weight and effect to be given to the examiner's testimony. The stipulation is a contract, so misrepresentation by the police constitutes fraud in the inducement, which voids the stipulation. *State v. Willey*, 712 N.E.2d 434 (Ind. 1999). The stipulation is not necessarily void if not signed by defense counsel if other evidence suggests defendant and

counsel agreed to it; *Hovenden v. State*, 721 N.E.2d 1267 (Ind. App. 1999); or if the defendant has waived his right to counsel. *Kochersperger v. State*, 725 N.E.2d 918 (Ind. App. 2000).

(E) *Tests of witnesses other than defendant*. Although usually it will be the defendant who takes a polygraph test, a defendant and prosecutor also may stipulate to the admissibility of results of a test conducted on the victim of the crime or other key witness. *Albrecht v. State*, 737 N.E.2d 719, 725 (Ind. 2000) (alternative suspect). However, the same rules apply requiring a stipulation. The defendant has no constitutional right to introduce into evidence the fact that a possible alternative perpetrator failed a polygraph. *Hubbard v. State*, 742 N.E.2d 919, 922-24 (Ind. 2001).

(F) *Civil cases*. Parties to a civil action also may make polygraph test results admissible by stipulation. *Sauzer-Johnson v. Sauzer*, 544 N.E.2d 564 (Ind. App. 1989).

### § 36.13. Economic and Social Science Evidence

The court of appeals has held that economics and the social sciences are “sciences” within the meaning of Rule 702. Opinions, theories, tests and procedures used by experts in these fields are therefore admissible, subject to the requirement that they be shown to be scientifically reliable. *Ollis v. Knecht*, 751 N.E.2d 825, 828-29 (Ind. App. 2001) (economist estimating lost income must establish that particular method he uses is reliable).

### § 36.14. Syndromes, Disorders, and Other Psychological Evidence

(A) Post-traumatic stress disorder is probably admissible if relevant. *See Simmons v. State*, 504 N.E.2d 575 (Ind. 1987) (pre-Rules case). It is well accepted as reliable by psychologists.

(B) Rape-trauma syndrome is probably admissible. *See Simmons v. State*, 504 N.E.2d 575 (Ind. 1987) (pre-Rules case approving state's use of syndrome to show victim's conduct consistent with it); *Henson v. State*, 535 N.E.2d 1189 (Ind. 1989) (pre-Rules case approving defendant's use of syndrome to show victim's conduct was inconsistent with it). It should be admissible under the new reliability standard also; rape-trauma syndrome is accepted as reliable by psychologists.

(C) Battered woman syndrome is admissible in connection with a plea of insanity defense or a claim of self-defense, but not to negate mens rea. IC 35-41-1-3.3; 35-41-3-11; *Marley v. State*, 747 N.E.2d 1123 (Ind. 2001). Testimony about the syndrome is also admissible for other relevant purposes, notably to explain behavior that seems inconsistent with a victim's claim. *See Barrett v. State*, 675 N.E.2d 1112 (Ind. App. 1996) (to explain why victim stayed with abusive boyfriend); *Isaacs v. State*, 659 N.E.2d 1036 (Ind. App. 1995) (to rebut defendant's claim his relationship with ex-wife was “friendly”); *Dausch v. State*, 616 N.E.2d 13, 15 (Ind. 1993) (to explain victim's recanting accusation). Under the terms of the statutes, the person claiming to be a battering victim must have cohabited with the batterer, which the supreme court interprets to mean living together in a sexual relationship. *Marley, supra*. If Evidence Rule 702 were literally applied, this syndrome probably should not be admissible because its reliability has not been demonstrated. *See Faigman, Battered Woman Syndrome and Self-Defense*, 72 Va. L. Rev. 619 (1986).

(D) Child sexual abuse syndrome is not admissible. *Fleener v. State*, 656 N.E.2d 490 (Ind. 1995) (not proven scientifically reliable).

(E) Psychological testimony describing a so-called "pedophilia profile" is not admissible. *Buzzard v. State*, 669 N.E.2d 996 (Ind. App. 1996).

### § 36.15. Public Opinion Polls

If relevant, expert testimony concerning the results of scientifically conducted public opinion polls is admissible. The foundation requirements are:

- (1) The poll was conducted by an expert in the field of public opinion surveys;
- (2) A relevant population was used;
- (3) A representative sample of that population was selected;
- (4) The subjects were questioned according to an acceptable method;
- (5) The sampling technique, questionnaires and interviews were designed in accordance with generally accepted standards;
- (6) The data gathered were accurately reported; and
- (7) The data were analyzed in a statistically correct manner.

Poll results are not rendered inadmissible just because another expert suggests that it could have been conducted "better." *Saliba v. State*, 475 N.E.2d 1181 (Ind. App. 1984) (survey on community attitudes toward obscenity).

### § 36.16. Mathematical Probabilities

Many common kinds of scientific evidence, such as fingerprint and blood group evidence, are based on mathematical probabilities. Probability testimony based on empirical scientific data is admissible if relevant; not admissible if based on "unsubstantiated estimates." *Patterson v. State*, 729 N.E.2d 1035 (Ind. App. 2000). See *Davis v. State*, 476 N.E.2d 127 (Ind. App. 1985) (based on blood tests, 99% probability that the defendants were the parents of an abandoned baby; odds were 518,000 to one); *Jenkins v. State*, 485 N.E.2d 625 (Ind. 1985) (evidence that defendant's blood group placed him among 30% of population that could have committed rape admissible).

### § 36.17. Engineering Evidence

Engineering and product testing evidence is subject to Rule 702(b) and must be shown to be scientifically reliable before it is admissible. *Ford Motor Co v. Ammerman*, 705 N.E.2d 539 (Ind. App. 1999). This is consistent with the position taken by the United States Supreme Court in *Kumho Tire Co. v. Carmichael*, 119 S.Ct. 1167 (1999). Before an engineer may testify to an opinion that a product was defective or behaved in a certain way, the expert's method of analysis must be scientifically reliable. If the procedure used by the expert is a non-standard one, the proponent must prove that it produces results that neutral experts in the field would view as reliable.