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30

The Warning Expert

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30.1 Introduction

In recent years, human factors and ergonomics specialists have increasingly filled the role of a warning expert in civil litigation. Such litigation usually involves personal injury and product liability cases. Questions typically addressed by the warning expert are:

- Is a warning needed?
- Is an existing warning or warning system adequate?
- What would an adequate warning system be?
- Would an adequate warning system make a difference (effectiveness)?

In this chapter, we will review a few of the rules that govern product liability as it pertains to warnings. We will then address several topics regarding the warning expert, including the expert's role, the definition of a warning expert, typical activities of the warning expert, and problems or issues associated with being a warning expert.

30.2 Some Rules Related to Warnings

In this section, we will comment on some of the rules that govern product liability as it pertains to warnings. For more complete coverage of the law relating to warnings, see Madden (1999).

The manufacturer is generally considered to have the greatest expertise regarding risks associated with its products. Conversely, a consumer or user is considered less informed about the risks of product use than the manufacturer or seller. The manufacturer is held to be expert on how the product is used and

to be knowledgeable of developments and the state of the art of the industry at the time the product was manufactured. This "should know" standard carries the burden of determining product dangers and providing warnings about foreseeable dangers from foreseeable uses as well as foreseeable misuses. Thus, this standard requires a manufacturer to anticipate how the product will be used and misused (uses incidental to those intended). Reciprocal logic dictates that when injury results from unforeseeable uses or misuses, the manufacturer is generally not held responsible.

Under common court rules of product liability, product manufacturers have an obligation to provide warnings sufficient to permit a product to be used safely or for an informed decision to be made not to use the product. Over the past several decades, this duty has developed on the basis of a large number of decisions brought in state and federal courts, which in turn have been developed into a collection of rules and doctrines called The Restatement (Second) of Torts and the Restatement (Third) of Torts. The claim that a manufacturer has failed to provide adequate warnings has been increasingly common in product liability litigation.

The restatements contain several warnings doctrines. A product can be found defective because of defective warnings or instructions when the foreseeable risks of harm could have been reduced or avoided by the manufacturer or seller providing reasonable instructions or warnings. Omission of necessary warnings and instructions renders the product not reasonably safe (or, similarly, unreasonably dangerous). A warning must be communicated so as to permit ordinary users to use a product safely or to avoid the risk. It is not always the case that the injured party needs to be warned directly. A bystander hit by debris from a lawnmower would typically not be warned directly by the manufacturer. Rather, the warning needed to be directed to the product user who, in turn, should have taken measures to avoid injury to others. Similarly, the doctrine of the learned intermediary has been used in cases such as those involving prescription drugs, in which, under many circumstances, the manufacturer's obligation traditionally has been to communicate risks to prescribing doctors, who in turn decide how the risks are controlled.

Generally, common law courts have ruled that there is no duty to warn of obviously hazardous conditions. The concept of "open and obvious" typically refers to circumstances in which the appearance or function of a product communicates the necessary hazard information. Similarly, hazards that are common knowledge such as knives and darts may not be deemed defective without a warning. An exception to these open-and-obvious and common-knowledge circumstances may be situations in which a warning is needed as a reminder; that is, the purpose of the warning is to direct the product user's attention to the hazard at the critical point in time. The visual and auditory seat belt signals in automobiles are intended as reminders.

Usually, there is no duty to warn members of a trade or profession against dangers generally known to that group. This professional user doctrine follows from the "no duty to warn" doctrine about known or obvious dangers because of training or experience. Presumptive familiarity with the hazards associated with a job depends on whether pertinent product safety information has reached the individual using or exposed to the product. This presumption relates to the manufacturer knowing how the product is used and whether warnings are provided to the end user or those exposed.

It is not simply whether or not a warning is given that decides the fate of a product liability claim. A warning that is given must be considered adequate; otherwise, the warning is defective and thus the product is defective. For a warning to be adequate in the legal sense, it must render the product reasonably safe for its intended and foreseeable uses and misuses. The adequacy of a warning considers the product's form and its content.

As mentioned earlier, manufacturers are held to the state of the art concerning their products when the product was manufactured. Tort law has said that defective warnings make a product defective. This would indicate the importance of manufacturers considering the state of the art of warnings. Many companies do not make use of current standards, guidelines, and scientific research on warnings. Many use warnings based on industry custom (copycats) without considering the warning literature or subjecting warnings to testing to evaluate their effectiveness. The guiding inquiry is whether the warning design is effective in providing persons in the target audience with informed consent about risks and

how to avoid them. Warnings can be evaluated to determine whether they are effective or whether alternatives might be better.

Increasingly, the plaintiff and defense sides of product liability cases are using human factors experts in evaluating the warning obligation and the adequacy of warnings given. It would seem imprudent in the current litigation environment for a manufacturer not to evaluate the effectiveness of its warnings, not only for the primary purpose of enhancing safety but also for the purpose of knowing how its product might be judged with respect to future injury claims. The next section considers the role of a human factors expert in warning cases.

30.3 The Warning Expert's Role

The role of the warning expert can be characterized along two dimensions: the formal and informal. The formal role is essentially defined by the law or by the courts. The informal role refers to the activities or tasks actually carried out by the expert.

The Formal Role

There are three Federal Rules of Evidence to be noted regarding the expert's role:

Rule 702. 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.

Rule 703. The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

Rule 403 (the "balancing" rule). Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice; confusion of the issues; misleading the jury; or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.

Thus, the expert's role is to educate the trier of fact (the judge and/or jury) with regard to information that is beyond his "common sense" or personal experience. The expert must be impartial and must not demonstrate an interest in the outcome of the case. Although the expert is employed by one side in a case (plaintiff or defense) and may form attitudes or opinions about the distribution of fault or blame, the role calls for neutrality.

The Informal Role

Generally, the expert in a case does not simply examine facts and express opinions. Many other types of activities are carried out in working on a case. The informal role may include serving as a consultant, analyst, investigator, researcher, and/or report writer.

Often when contacting a warning expert for possible work on a case, an attorney will not have a clear understanding of what the expert has to offer regarding the warnings issues. In such instances, the expert may function as a consultant regarding the nature of such expertise and what he or she can and cannot do. For example, for a given set of circumstances, it may be possible to determine that a warning was needed when none was provided or that a given warning was inadequate. However, it may not be possible to develop an exemplar of an adequate warning given the available information. The inhalation hazard associated with a chemical solvent may not be adequately addressed in a warning, but the development of a complete warning system for such a product might require other information such as ingestion and skin contact hazards.

The warning expert is frequently an advisor, analyst, investigator, and/or researcher (data collector). Often the warnings issues in a case are not as simple as whether or not a warning on a product label or a sign is adequate. Rather, the various media through which such information was, could have been, or should have been communicated must be determined and assessed. Furthermore, the knowledge the target audience already had is relevant. This target knowledge is an example of when an expert may collect such data, thus functioning as a kind of researcher.

Frequently, experts are asked for or required to submit a written report. In such reports, experts indicate their opinions and the basis of those opinions. Given the adversarial context of litigation, one can expect that such reports will receive extensive examination and critique, including scrutiny by others with similar expertise.

30.4 Defining the Warning Expert

What qualifies a person to be a warning expert? Many people give expert testimony on warnings; not all are qualified. In the following subsections, we discuss what constitutes a warning expert and who is not a warning expert.

Who Is a Warning Expert?

Rule 702 states that a person may qualify as an expert on the basis of knowledge, skill, experience, training, or education. Advanced academic degrees or specific kinds of experience are not necessarily required. An experienced auto mechanic with limited formal education might be accepted as an expert witness on some subject of auto repair. A university professor in mechanical engineering may have never designed an internal combustion engine (or any other engine), but he or she may be qualified on the basis of education and knowledge. Ultimately, the issue of whether a person is qualified to testify as an expert is decided by the court.

What education, knowledge, experience, etc. should a warning expert have? A degree in warnings obviously is not a criterion because such degrees do not exist. Some answers may be gleaned from noting what a warning is. It is a communication. It has the purpose of attracting attention and providing information about hazards, consequences, and instructions. It is also intended to influence people's behavior appropriately. Warnings are also displays. From this perspective, developing or evaluating a warning requires information about hazards, consequences, and appropriate forms of behavior as well as knowledge about how such information should be communicated or displayed in order to influence behavior.

This set of requirements may seem substantial (and it is), but a closer look reveals a workable definition of the warning expert. First, information about hazards, consequences, and appropriate behaviors is generally not the bailiwick of the warnings person; instead, these are matters about which warning experts make assumptions based on information from engineers, toxicologists, safety professionals, etc. The warnings person does not have expertise in the physiological reactions to breathing the vapors of a chemical solvent or the center of gravity and handling dynamics of an off-road vehicle. Such information is typically gleaned from other experts or technical literature. The relevant expertise for the warning expert is communications, displays, and human behavior. Thus, psychologists, human factors specialists and ergonomists, and people in the field of communications represent the most likely pool of people with such expertise.

Whatever the pool is from which a warning expert is drawn, the expert should have certain specifics in his bag of knowledge and methodological tools. The first arena of knowledge is a thorough familiarity with the substantial body of scientific, peer-reviewed research literature that has emerged over the past two decades. For a review, see Wogalter and Laughery (this volume). This literature provides a basis for understanding the issues associated with warnings design and effectiveness. Expertise should also include relevant methodologies such as hazard, fault-tree, and failure-modes analyses; task analysis; display design; and data collection and analysis techniques. Another important knowledge domain is human

cognition — that is, how people process information. The earlier work of Lehto and Miller (1986) has been important, in part, for its emphasis on the cognitive perspective.

Who Is Not a Warning Expert?

The preceding suggestions and criteria regarding warning expertise need to be supplemented with a few observations about who is not a warning expert. Examples would be:

- A mechanical engineer with expertise in vehicle design, vehicle dynamics, and the hazards associated with uses of vehicles may be an outstanding engineering expert, but that knowledge does not qualify him as an expert on warning about these hazards.
- A toxicologist or physician may have excellent knowledge about illnesses or diseases associated with exposure to chemicals and may qualify as an expert on these topics, but such knowledge does not qualify him to be a warning expert.
- A person who has produced warnings (perhaps many) in his career, which by most criteria are not very good, is not necessarily a warning expert.

These examples, of course, are not intended to be critical of mechanical engineers, toxicologists, or physicians. The intent is to help clarify what a warning expert is, or should be. Experience indicates that people with a wide variety of credentials and experiences have been permitted to give expert testimony about warnings in the courts. The qualifications of many could be seriously questioned.

The Court's Judgment on Warning Expertise

Courts (judges) must distinguish between legitimate warning experts and those who do not have such expertise. Such decisions are not simple, particularly when one considers that judges are not expert in the vast array of subject matter, including warnings, addressed by expert witnesses. It is beyond the scope of this chapter to address this decision-making issue. However, it is important for the potential warning expert to be aware that such decisions are made and that information may be sought as a basis for the decision. Some examples of information that may serve as a basis for such decisions include:

- Is the content area of the person's education and knowledge in an area such as psychology, human factors, ergonomics, or communications?
- What is the level of knowledge about or familiarity with the technical literature on warnings that the expert possesses?
- What is the record in carrying out and publishing research on the topic of warnings? Has the research been funded? By whom? Have the publications appeared in peer-reviewed journals, proceedings, and books?
- What is the expert's experience in designing warnings?
- Has the expert played a role in relevant national organizations, advising government agencies, consulting with and/or working for industry on relevant projects, serving as an editor or reviewer of scientific literature, etc.?

All of these factors or considerations need not be met to qualify as a warning expert. However, to be accepted and to function as an expert in this field, at least some of these credentials must be satisfied.

30.5 Activities and Functions of the Warning Expert

As already noted, the warning expert may engage in a variety of activities. Every case is different to some extent, and the expert's activities will vary from case to case. Figure 30.1 presents a general overview of the expert's activities. It shows a sequence of activities from initial contact to trial. Although the timeline of activities is shown as a linear sequence, in some cases the order may be different and steps may be

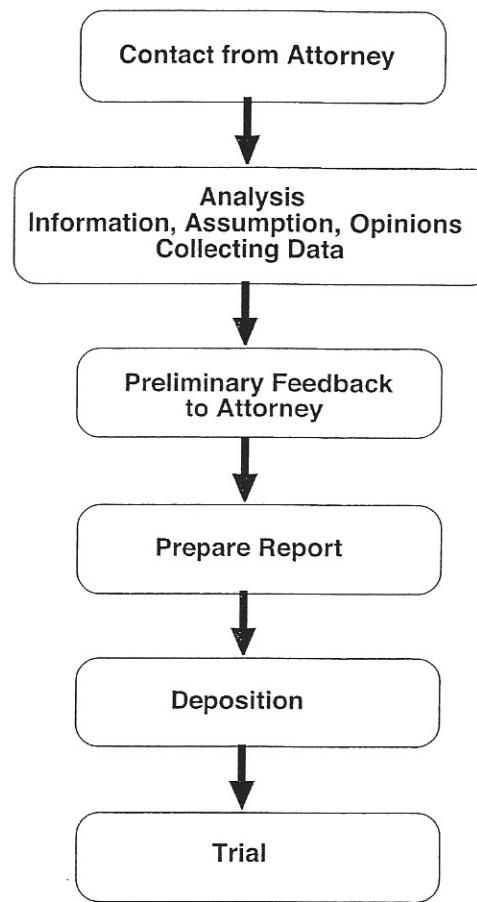


FIGURE 30.1 A generalized sequence of activities of a warning expert involved in litigation.

repeated. The expert should remain flexible about the expectations of his activities in a case because different jurisdictions have different rules, and attorneys and judges try cases differently.

The Initial Contact

Usually the expert's involvement in a case begins when he is contacted by an attorney. This contact normally takes the form of a phone call, a letter, a fax, or an e-mail. Following introductions, the attorney will provide a brief description of the accident or exposure, the injuries or illness, and the issues or aspects of the case about which the attorney is seeking expert help. If the expert's credentials and the issues match, and if agreement is reached on procedures, fees, etc., the expert's role in the case will begin. Some experts require a formal agreement in the form of a contract, but others proceed on a less formal basis. Such contracts are normally two- to three-page documents that spell out the scope of the work and billing and payment procedures. Some experts require a retainer and others do not.

Another consideration that should be sorted out at this point is the time frame, that is, what the client expects from the expert and when. Will a report be required and, if so, by what date? Must a deposition be completed by a certain date? Has a trial date been set? Although not typical, it is not uncommon for an attorney to decide well into the development of a case that a warning expert is needed. For example, a defense attorney may have recently deposed the plaintiff's warning expert and decided that he also needs to employ such a person. The expert is well advised to take into account the time requirements in deciding whether to get involved.

Analysis

As indicated earlier, although Figure 30.1 implies a sequence of activities that occur serially, it is not entirely accurate. Actually, analysis may continue right up to the time of courtroom testimony. As new, relevant information becomes available in discovery, the expert may prepare supplemental reports or even be deposed more than once. Sometimes, with the help of the expert, attorneys will prepare an affidavit or a declaration before or after a deposition. Nevertheless, early work on a case focuses on analysis of information and the formulation of opinions.

Information

The information examined by a warning expert typically comes from two sources: the attorney and the expert. By the time the expert is employed, a great deal of information is often available. Such information may include:

- The complaint or petition
- Accident reports
- Information about the product (if a product was involved)
- Information about the job and work environment (if the injury/illness was job related)
- Statements and/or depositions of fact witnesses
- Reports and/or depositions of other experts
- Standards and guidelines

Sometimes the warning expert is involved early in a case and has an input to the kinds of information that will be useful in evaluating the warnings issues. The expert may assist the retaining attorney in formulating interrogatories and requests for production asking the opposing side for additional information. Such information may include:

- Hazard analyses results (failure mode, fault tree, etc.) that have been done
- Procedures and criteria involved in developing the existing warning system
- Relevant past safety behaviors of the plaintiff
- Safety history of the product or environment

The warning expert may also raise issues and assist in the formulation of questions for the retaining attorney to ask fact witnesses and other experts during deposition and trial testimony.

The expert may also gather information, including the relevant scientific literature. The expert may carry out tests, surveys, and other procedures (e.g., consumer interviews and focus groups) to gather relevant information if necessary. For the warning expert, relevant information might include:

- Are the hazards, consequences, and appropriate modes of behavior “open and obvious”? That is, do the appearance and/or function of a product or environment provide the warning information?
- What do people already know about the relevant hazards, consequences, and appropriate modes of behavior?
- How do people use a product?
- Do people notice, understand, and respond to the warning system?

Testing with relevant target populations may not be possible or practical in the context of litigation consulting. For example, many cases are on a short fuse, and sometimes resources to conduct warning effectiveness testing are not available. Also, formal testing in the litigation context may not be necessary, in cases in which there is a complete absence of a warning, or when many of the features known to benefit warning effectiveness (see Wogalter and Laughery, this volume) were not employed in the subject warning.

Problems can arise during the information-gathering phase. One potential problem occurs when the attorney does not provide relevant information. This omission could occur because the attorney did not realize the information was relevant or because he withheld it, thinking it was harmful to his case. The latter circumstance cannot be tolerated. An example would be a highway accident in which the driver

(plaintiff) was drunk and the blood alcohol content analysis was withheld from the expert. On the defense side, an example might be a letter or memorandum from the product manufacturer's file indicating that the warning system was deliberately downplayed so as not to have a negative impact on sales. Such withholding of information is rare, but it can be embarrassing to the warning expert. It can also change the expert's opinions.

The absence of relevant information is another potential information problem. Information about whether the plaintiff noticed or understood the warnings or what the plaintiff knew or understood about the hazards, consequences, and correct modes of behavior is not available in a death case. Contradictory information is still another problem. Multiple witnesses to an accident often report different and contradictory accounts. These problems, among others, must be taken into account by the expert.

Assumptions vs. Opinions

The distinction between assumptions and opinions is important. En route to formulating opinions, the warning expert typically makes assumptions about a number of things, for example:

- Hazards and consequences associated with the product being used
- Hazards and consequences associated with the activity being carried out
- Warnings that were provided and how they were provided
- What relevant people knew about the hazard and consequences
- Where, when, and how the accident, injury, and/or illness occurred

These points refer to factual matters. The facts, or assumptions, may be associated with varying degrees of confidence, depending on the quality of available information, but they are still assumptions. Assumptions made by the warning expert may also be based on opinions of other experts. The hazards and potential consequences of handling some chemical solvent may be defined by the opinions of an expert toxicologist. To the warning expert, they are assumptions.

Formulating Assumptions

Two of the major difficulties in formulating assumptions are (1) missing information and (2) contradictory information. What a brain-damaged or deceased person knew about hazards is important to the warning expert, but it is not available. Assumptions regarding this knowledge may be based on testimony of co-workers and family members as well as records of training, experience, and past performance of the person. Information about a product warning system may not be available if the product was destroyed in an accident. Was the label legible? Was the manual available?

Contradictory information presents different but often equally difficult problems for the warning expert. Different perspectives and memories of fact witnesses is a problem noted earlier. Simple answers or solutions to these problems do not exist for the warning expert who is trying to decide the appropriate assumptions to make. The following are a few suggestions to use when carrying out the analysis:

1. Be clear about the information needed or the issues about which one needs to make assumptions.
2. Do not hesitate to ask questions or request information.
3. Be prepared to recommend that steps be taken to obtain information not currently available.
4. Be prepared to express opinions based on two or more different sets of assumptions.

The last point warrants an additional comment. Often, the plaintiff's attorney will be happy with one set of assumptions, but the defense attorney will prefer a different set of assumptions. During deposition or trial testimony, the expert may be asked his opinions given the different assumptions (e.g., whether a product manual was available or read). If different assumptions warrant different opinions, give the different opinions.

Formulating Opinions

There are several categories of issues about which the warning expert typically expresses opinions:

- Was a warning needed?
- Was the warning adequate?
- Would the warning have made a difference?

The expert can also expect to be asked about the basis of the opinions. It should be recognized that when the term "warning" is used here, it is referring to a warning system, perhaps consisting of several warning components.

Is a Warning System Needed?

Several considerations are relevant to this question. The first is whether or not a hazard exists. There is no need to warn about nonexistent hazards. Second, is the hazard open and obvious? In the law, it is generally not necessary to warn about a hazard that is open and obvious. Most would agree that a fire is an obvious burn hazard, but the inhalation hazards of solvent vapors are not open and obvious. Many hazards, however, are not so easily classified. For example, how an ignition source could start a fire may not be open or obvious. A third consideration is whether or not people already know about the hazard. If so, a warning may not be needed. A fourth consideration is whether a warning is needed as a reminder. Circumstances such as high task loading may necessitate a reminder warning.

Is the Warning System Adequate?

This question is central to the warning expert. An important consideration is the definition of adequacy. In the context of litigation, a warning is adequate or inadequate. However, the goodness or badness of a warning system is a continuum: it may be good or very good; it may be bad or very bad. The expert's task includes deciding where to draw the adequacy cutoff. Some rules of thumb for such a decision follow; they may be helpful, but not always applicable:

- The warning system must be considered as a whole. A poor warning in a manual, which may or may not be seen, may not render the warning system inadequate if a good warning is on the product. On the other hand, for many products an adequate on-product component is necessary for the system to be adequate. The point is that the different components of the system do not necessarily get equal weight in judging adequacy.
- Minor violations of criteria or guidelines may not be a basis for inadequacy. Using the signal word "caution" instead of "warning," when the latter is appropriate to the hazard, is probably not a valid reason alone for declaring a warning inadequate.
- An opinion that the warning system probably would not have changed the outcome is not a basis for declaring the system adequate. The issue of whether or not the warning is adequate from a design perspective is not the same question as whether it would have made a difference.

Would the Warning System Have Made a Difference?

This issue is also central to the work of the warning expert because it goes to the issue of causation. If a warning system was inadequate but had no bearing on the accident, injury, or illness in question, then its inadequacy is irrelevant. The effectiveness issue is often a difficult one for the warning expert. No one would argue that bad warnings will be effective, and most people would agree that good warnings are more likely to be effective than bad warnings. Furthermore, even the best warning system is not likely to be effective 100% of the time. The difficulty lies in formulating opinions about how effective the warning system would be or, in other words, in quantifying effectiveness. Categorical judgments may be made, such as "more likely than not," but they must be made with careful consideration of the best information available. Factors such as the design of the warning system, characteristics of the target audience, circumstances of the task or activities of the people involved, and the empirical scientific literature are relevant to the issue.

Sometimes questions arise in a case for which the existing technical literature contains no directly relevant information or data. Examples might be a specific risk perception issue (e.g., what do people know about this hazard or its consequences?) or a specific warnings issue (e.g., is the existing warning

understandable to this target audience?). Sometimes, straightforward inferences can be made from the technical literature. In other circumstances, relevant data may be collected through an experiment or a survey. An excellent example of this latter approach was reported by Senders (1994), in which a survey was carried out to determine how people would connect a gas heater.

Preliminary Feedback to Attorney

At some point, the expert will provide feedback to the attorney regarding preliminary opinions. This feedback may be more interactive than the sequence of steps reflected in Figure 30.1 might suggest. The attorney will want to know what the expert thinks in order to decide whether to continue to employ him in the case. If his opinions are not supportive of the case, the expert's work will be finished. This, of course, is a potential pitfall for the expert in that a job and a fee are lost. However, the alternative is filled with even greater pitfalls.

The feedback should be as frank and as complete as possible. It is also important that the attorney understand the assumptions of the expert that form the basis for his opinions. When questions about the validity of the assumptions or alternatives need to be considered, the attorney needs to know how the expert's opinions would be influenced by such alternatives.

Preparing Reports

Reports are essentially intended to provide the opposing attorney with information regarding who the expert is, what he has done, and what his opinions are. Reports are not required in all cases. Cases in federal courts require a report as well as a current curriculum vitae and a list of cases in which the expert has given testimony during the preceding 4 years. Report requirements for cases in state courts vary; commonly, no report is required.

Report requirements may vary in specificity. A report may be brief and very general, stating opinions in the broadest terms. Such a report might state only that the warning was inadequate and that, if a good warning had been provided, the accident or injury would have been prevented. In other instances, reports must be specific and complete. If a warning is judged to be inadequate, the specifics of its inadequacies must be spelled out as well as the basis for the opinion. In some circumstances, if an opinion is not provided in the report, the expert may not be permitted to express that opinion in trial. Thus, the warning expert must know the report requirements early in his work on a case because such requirements influence the level of analysis carried out before the report is prepared.

Typically, the opinions in the report of a warning expert will address the issues posed earlier: was a warning needed? Was the warning system adequate? Would the warning system have made a difference? A final point on reports: they should be prepared with great care. Odds are that they will be scrutinized extensively and every point subjected to questioning and, perhaps, challenged.

Deposition Testimony

The next step in most cases is a deposition. The procedure usually involves the attorney for the opposing side examining the expert in a question-answer format. There may be more than one questioning attorney, such as when an expert is working for the plaintiff and there are multiple defendants. The expert is under oath, the procedure is recorded, and the testimony is considered part of the formal record of the case. It can be used later during trial and possibly in future testimony in other cases. It is important for the expert to be well prepared and consistent. Contradictions between deposition testimony and trial testimony are likely to be noticed and can discredit the expert. The deposition is adversarial, and the opposing attorney will be attempting to establish such things as:

- Questions or shortcomings regarding the expert's credentials
- Flaws in the analyses carried out
- Contradictions in or concerns about the opinions

- The basis for the opinions (scientific data, theory, and experience)

The tone of depositions is generally professional. Attorneys come prepared and they get on with the business at hand. There are exceptions, and bad manners and hostile behaviors sometimes emerge. It is critical that the expert not get caught up in the argumentative or emotional aspects of the situation. The opposite of bad manners and hostility can also occur — overfriendliness. Watch out if the attorney starts a question with "Doctor, you will agree with me won't you, sir, that..."

Also, if you have previously provided deposition and trial testimony, the opposing attorney may have researched your previous work, and questioning may focus on opinions in earlier cases. Such situations are one of the reasons to maintain consistency.

Trial Testimony

The final step in the activities of an expert is to testify in court. The attorneys representing both sides question the expert. Credentials are established and opinions are expressed. Three aspects of the warning expert's role in the courtroom are noted here. First, he is in the position of communicating the nature and results of an analysis that includes methodology and data, as well as opinions that may be technical in nature, to an audience of lay people — the jury. Metaphors, visual aids, and demonstrations can be exceptionally helpful and should be developed as part of the warning expert's communication tools. Charts listing criteria for warnings and examples of good and poor warnings can help the jury to understand the expert's opinions.

The second aspect of courtroom testimony is directed to the warning expert more than to other kinds of experts. The jury may have attitudes or information that must be overcome or changed. One point concerns information. By the time the warning expert begins testimony, the jury will usually have heard descriptions of the accident or illness and presentations about the hazards associated with the product. A role of the warnings person is often to provide an analysis in terms of how a product was used and, sometimes, to evaluate what the injured party knew or did not know about the hazards at the time of the accident. In short, the warning expert must help the jury analyze the issues in the proper context, not in terms of what everyone in the courtroom knows now. Another point concerns attitudes. People often have a predisposition to believe that if someone gets hurt, it is because he made a mistake. The warning expert needs to help the jury take a more systems-oriented view of systems involving people.

The third aspect of courtroom testimony regarding warnings is that juries do have experience with and knowledge about warnings. Correct or incorrect, complete or incomplete, this knowledge exists. It is appropriate to assume that most juries will have a limited understanding of the display design and communication principles relevant to warnings design, and they will not appreciate how warnings fit into the overall safety scheme. Thus, another role of the warning expert is to expand the jury's understanding of warnings and their role in safety so that the expert's opinions can be better appreciated and accepted.

30.6 Issues, Problems, and Temptations

Numerous issues, problems, and temptations are associated with expert witness role. A few examples will be discussed in this section. Anyone working as an expert is well advised to keep them in mind in carrying out such work. The adversarial context in which the expert functions is quick to capitalize on errors, usually at some cost to the expert.

Ethics

Codes of ethics generally define principles applicable to the role of the warning expert in litigation. The code promulgated by the Human Factors and Ergonomics Society is an example. The expert should be familiar with applicable ethics codes and follow them carefully.

Boundaries

One of the success rules of the expert game is for the expert to know what he knows and to know what he does not know. It is critical that the expert stay within the boundaries of his expertise. The warning expert should limit his analyses and opinions to warnings issues; he should not address matters associated with engineering design, child development, or a host of other potentially “nearby” topics. This rule is not as straightforward as it may seem — for various reasons:

- Boundaries are often fuzzy. The psychologist serving as a warning expert may (hopefully) know a great deal about human cognition. When testimony from different fact witnesses is contradictory as to the circumstances of some accident event, it may be tempting to offer opinions about that testimony based on knowledge of human memory. A good rule of thumb is for the expert not to do so unless he really is expert on memory and has specifically been asked to evaluate and form opinions about such issues.
- Boundaries are also violated because the expert gets questions in a deposition or in trial about peripheral issues such as a design feature of some piece of equipment. Although the warning expert may be tempted to provide an answer, this is a temptation to be avoided. Such questions may represent an effort to maneuver the expert out onto a limb that can then be sawed off from behind.
- The boundary rule can be difficult because an expert represents a cost in litigation, and the attorney who hired him may understandably want to keep costs under control. If the expert provides opinions on the other issues, the attorney may not need to hire other experts, thus cutting expenses. Avoid such “favors.”

Consistency

Given the boundaries of one's expertise, it is also important to be consistent within those boundaries. An opinion today that differs from an opinion tomorrow is not likely to go unnoticed — at least not for long. This also may seem like an easy rule to follow. For example, if one applies the criteria for warnings design and the factors that influence when warnings will and will not be effective, it would seem relatively easy to be consistent in formulating opinions, but this is not so:

- Situations or circumstances are seldom the same or different; rather, they vary as shades of gray. Accidents, injuries or illnesses, products, and people vary in numerous dimensions; this, in turn, makes the analyses and formulation of opinions complex.
- Being consistent can be difficult because, through artful questioning, the opposing attorney may attempt to get the expert to be contradictory.
- Consistency can be a challenge because the warning expert may have opportunities to work on the defense side in some cases and the plaintiff side in other cases. The attorneys representing the different sides are looking for different opinions. Warning experts who work only for defendants or for plaintiffs will have less difficulty being consistent, but they will face other challenges regarding integrity and impartiality. It is important to keep in mind that one is a warning expert, not a defense or plaintiff expert.

The real solution to the consistency challenge is to be true to the empirical and theoretical science of warnings.

Being Current

Related to the consistency issue is the challenge of staying current with the empirical and theoretical science in the area of warnings. This is not a minor challenge, given the increase in research activity during the past 20 years. There have also been significant efforts in the development of standards and guidelines for warnings. It is imperative that the warning expert be knowledgeable about the current state of the science. The growth and development of knowledge about the design and effectiveness of

warnings is probably the one legitimate basis for changing opinions about how warnings should be designed and how they function.

The Adversarial Setting

The warning expert functions in many aspects of the adversarial setting. Several such points have already been noted. A few general “rules of the game” are:

- The expert’s role is to advise or educate the jury. Although the expert is employed by one side, he must be impartial and unbiased. The expert does not win or lose.
- The plaintiff attorney’s role is to win the case for the plaintiff. He does win or lose.
- The defense attorney’s role is to win the case for the defendant. He does win or lose.
- The attorneys in a case will do whatever is necessary within the boundaries of the law and acceptable practice to win.
- The attorney for the other side will make every effort to discredit the expert and his testimony. This effort will include getting him to contradict himself, including researching his work in past cases to identify inconsistent opinions. It will also include employing other warning experts whose opinions differ from the expert’s.
- The attorney for the other side may attempt to discredit the entire domain of warning expertise (e.g., Hardie, 1994). This effort may include the argument that the issues of warnings design and effectiveness are within the province of the jury; that is, these are issues that jurors (lay people) are capable of evaluating without the help of experts. The effort may also include the argument that no “hard science” is associated with warnings. However, given the extensive research literature on warnings, an expert should be able to deal with scientific merit challenges.

The preceding examples of “rules” relevant to the adversarial litigation setting may at first seem excessively critical of attorneys and the system, but that is not the intent. Rather, these are characteristics of many or most of the circumstances associated with the context in which the warning expert functions, and potentially serious pitfalls await one who is not aware of them. Again, the expert’s best defense against the various challenges inherent in the role is to be true to the empirical and theoretical science of warnings.

Nothing Is Secret

The expert’s credentials, past experiences in other cases, and specific work on a case must be revealed on request when working on a case. This rule varies in different jurisdictions, but generally the expert should assume that everything he does in a case will be revealed to the other side. This information would include anything provided or revealed by the attorney who hired him. It includes all handwritten and typewritten notes, conversations, activities, publications reviewed, etc. related to the case. It can also include work in other past and present cases. Thus, the warning expert needs to be aware that “nothing is secret.”

30.7 Conclusions

The expert witness is in a potentially powerful position with regard to litigation. This influence is due primarily to two aspects of the role. First, the expert is generally interacting with people who know much less about his area of expertise. Thus, except for similar experts who may be employed by the opposite side of a case, no one is qualified to challenge or evaluate the opinions of the expert at a scientific or technical level. The second source of influence stems from the fact that the expert can give opinions. This aspect of the role differs from the fact witness, who provides information but is not permitted to render an opinion.

As the body of scientific literature in the field of warnings design and effectiveness has grown and developed (see Wogalter and Laughery, this volume), so apparently has the role of warnings issues in product liability and personal injury litigation. As these issues continue to be addressed in litigation, the

need for capable experts in the subject matter will continue. The role of the warning expert can be challenging, but it is also important — and it is important that it be done well.

In this chapter, some of the techniques, procedures, and challenges associated with the role of the warning expert have been presented and explored. Most of the topics presented could be addressed in much greater depth than the scope of this chapter permitted. It is increasingly common for each side of a case to have a warning expert and for these experts to disagree. Such circumstances are to be expected and are not a reason to abandon the role of the warning expert in litigation. Engineers, physicians, toxicologists, and economists also disagree and work on both sides of cases. The important point is that the people who serve as warning experts should be qualified and that they should do their best to provide high-quality expertise to the judicial system.

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