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Causation in Death After Trauma With Pre-Existing Cardiac Disease

S. R. Gerber*

A MAN WHO HAD BEEN UNDER treatment for a cardiac disease over a period of several years was injured and was admitted to a hospital where he died several days later. The medicolegal officer certified that the death resulted from the injuries.

A man who was not known to have displayed any symptoms of cardiac disease was injured and was admitted to a hospital where he died a few hours later. The medicolegal officer certified that this death resulted from cardiac disease.

How did the medicolegal officers reach these decisions? What evidence did they consider? Would a judge, jury or other triers of the facts be likely to reach the same conclusions?

Cases such as these illustrate an area where the schism between the medical and legal professions becomes most apparent when they are confronted with the need to collaborate in solving a medicolegal problem. Frequently the approach is indicative of diverging viewpoints directed to independent medical and legal problems rather than comprehension of medical and legal aspects of a single problem. Such an approach fails to effect a solution mutually satisfactory to both professions. For example, in the specific situations under discussion here physicians and attorneys might express seemingly opposing views of the cause and manner of death.

Adoption of commonly used words as synonyms for more precise terminology accepted for use within a profession leads to confusion when two or more professions employ the same word with different connotations. Thus, *cause of death* implies to the physician the etiology of the condition responsible for the terminal morbid process. In this respect, the physician considers the cause of death as the ultimate result of interaction of several conditions rather than a single entity.

The physicians' view of this enigma was expressed in an

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editorial on death certification published in the *New England Journal of Medicine*:¹

Of course, beyond mid-life a person usually dies fractionally anyway. One need look only at a complete autopsy report to wonder . . . why this man continued to live, and not why he died.

An editorial in the *Journal of the American Medical Association* further illustrates the pathologists' and clinicians' perplexities when they seek a single definitive answer to the question *Why, Oh Why, Did He Die?*²

Clinicians seem to prefer derangements of functions to anatomic alterations as explanations for causes of death. Their patient has been suffering from severe heart failure or metastatic cancer for years, but yesterday he seemed to be fine. Suddenly without apparent reason, the patient collapses and dies. In such circumstances, the doctor wants to know very understandably why he keeled over at that particular moment. It is not much good trying to tell him that even cancer and a failing heart must come to an end sometime. . . .

Let us hope our continuous quest for new knowledge will one day make it possible to provide exact answers to the inevitable clinical question, "Why did he die?" . . .

The ultimate answer to his question may have to await solution of the primordial question "What generates life?"

Fortunately, there is an intermediary agent which brings pressure to bear upon the physician to reach a decision as to the cause of death for purposes of official certification. The National Office of Vital Statistics delineates the following instructions for proper certification of the cause of death in accordance with international classification recommendations for selection of the main causes of death:

A cause of death is the morbid condition or disease process, abnormality, injury, or poisoning leading directly, or indirectly, to death. A death often results from the combined effect of two or more causes. These causes may be completely unrelated, arising independently of each other; or they may be causally related to each other, that is, one cause may lead to another which in turn leads to a third cause, etc. The medical certification of the Standard Certificate of

¹ Editorial: The Convenient Coronary, 262 *New Eng. J. Med.* 149, 150 (Jan. 21, 1960).

² Wilens, Sigmund L.: *Why, Oh Why, Did He Die?*, 187 *J. A. M. A.* 1020 (March 28, 1964).

Death (1956 revision) . . . is designed to elicit the opinion of the certifying physician as to the relationship to each other and to the death of the causes which he reports.³

A review of the Standard Certificate of Death in anticipation of the Eighth decennial revision revealed certain deficiencies for optimal use of the official certification of medicolegal cases. Accordingly, a Sub-committee on Medical Certification of Medicolegal Cases, after a comprehensive study of the peculiar requirements recommended a separate certificate for these cases. Such a form would afford the "opportunity of determining how a certifier reached his decision as to the cause of death, whether by inquest, autopsy, investigation, etc. Similarly, additional items of information of value for statistical and legal purposes could be obtained about the circumstances surrounding accidents, suicides, and homicides."⁴ Other advantages of the separate medicolegal death certificate include closer coordination between vital statistics registration and medicolegal officers. Items for accidents, suicides and homicides would not appear on the certificate forms supplied to physicians not associated with medicolegal offices if this proposal is adopted.

The medicolegal officer, by intimate association and experience with both the medical and legal implications of the deaths under his jurisdiction, accords equal importance to the medical and nonmedical evidence, i.e., to the pathology and to the circumstances. He is charged with the duty to determine

³ Vital Statistics Instruction Manual, Part II Coding and Punching, Section D, Cause-of-Death Coding for 1960, p. 13 (U. S. Government publication). "The medical certification form may be considered as consisting of two parts (I and II) which are designed for convenience as:

- I. (a) Immediate cause
(due to)
 - (b) Intervening antecedent cause
(due to)
 - (c) Underlying antecedent cause
 - II. Other significant conditions contributing to the death but not related to the immediate cause of death.
- In Part I is reported the immediate cause of death stated on line (a), and also the antecedent conditions on lines (b) and (c) which gave rise to the cause reported on line (a), the underlying cause being stated lowest in the sequence of events. * * *
- In Part II is entered any other significant condition which unfavorably influenced the course of the morbid process, and thus contributed to the fatal outcome, but which was not related to the immediate cause of death."

⁴ Medical Certification of Medicolegal Cases: U. S. National Committee on Vital and Health Statistics: see 10 Curr. Med. for Attorney, p. 27 (September, 1963).

the cause, mode and manner of death for purposes of official certification and fully realizes the ramifications of the uses of death certificates. He correlates evidence elicited from examination of the body with the circumstances and associated evidence without assuming that evidence from any one of these sources is of such overwhelming significance as to nullify the importance of evidence from any of the other sources. He cannot ignore discrepancies but must find the solution which is compatible with all of the relevant evidence. Evidence elicited from the body will establish the anatomic cause of death in most cases, but in relatively few of those in which injury has been incurred will the examination of the body alone suffice to determine how those injuries were incurred. Thus at the Cuyahoga County (Cleveland, Ohio) Coroner's Office each year 0.2% to 0.4% of the cases admitted are ruled *Violence of Undetermined Origin*, indicating that the anatomic cause of death was determined from the examination of the body but that investigation into the circumstances failed to demonstrate conclusively how the fatal injuries were incurred.

What significance does medicolegal certification have in relation to the legal concept of causation? Translation of *cause of death* into legal terminology denotes causation in respect to legal responsibility such as the extent of involvement of external influences. While attorneys acknowledge that somatic death results from physiologic processes, their direct concern focuses attention on the extent to which external factors launched or aggravated these processes. Accustomed as they are to the adversary system, some attorneys tend to present medical etiology and legal responsibility as two opponents engaged in conflict rather than two aspects of a single problem inextricably bound together and collaborating to produce the fatal result. From this viewpoint they want the medical expert to express his evaluation of causal relationship of external influences and physiologic processes on a basis of degree of *medical certainty*. When the medical evidence is not sufficient to establish clearly such absolute certainty the physician hesitates to state explicitly the extent to which various factors contributed to the fatal outcome. His hesitancy is due to a lack of scientific measures applicable to these evaluations. Unfortunately, here another source of misunderstanding arises from use of ordinary words to convey specific meaning within a profession.

Distinctions in connotations of such words as *probably*, *likely*, *liable*, *could*, *might*, or *possibly* when used in testimony in personal injury litigation were the subject of an exhaustive survey presented by Harley J. McNeal in an article entitled *The Medical Expert Witness—Positive—Negative—Maybe*.⁵ These words are defined as to acceptance in legal usage and listed as to admissibility in various states. A comprehensive survey of the same subject by Richard M. Markus appeared in this Law Review under the title: *Semantics of Traumatic Causation*.⁶

The Ohio courts have acknowledged the need for expert opinion.⁷

However, the restriction that the medical expert must define his opinion concerning causal relationships in terms of "medical certainty" fosters honest divergence of such definitions. The Supreme Court of the United States expressed the opinions that "the jury's power to draw inference (as to) aggravation . . . (and) . . . causation" cannot be impaired by "lack of medical unanimity as to the respective likelihood of the potential causes"; and further, that "the matter does not turn on the use of a particular form of words by the physicians in giving their testimony."⁸

⁵ McNeal, Harley J., *The Medical Expert Witness—Positive-Negative-Maybe*, 2 J. Forensic Sci. 135 (1957).

⁶ Markus, Richard M., *Semantics of Traumatic Causation*, 12 Clev.-Mar. L. Rev. 233 (1963).

Those who earnestly seek to understand these obstacles to satisfactory communications between members of the professions are urged to read these articles and *After All, Doctors Are Human* by Leonard S. Powers in the *Personal Injury Annual—1963*, p. 429 (Matthew Bender Co., N. Y.).

⁷ *Shepherd v. Midland Mut. L. Ins. Co.*, 152 Ohio St. 6, 87 N. E. 2d 156 (1949) (Syllabus 2):

"Where an ultimate fact to be determined by the jury is one depending upon the interpretation of certain scientific facts which are beyond the experience, knowledge, or comprehension of the jury, a witness qualified to speak as to the subject matter involved may express an opinion as to the probability or actuality of a fact pertinent to an issue in the case, and the admission of such opinion in evidence does not constitute an invasion or usurpation of the province or function of the jury, even though such opinion is on the ultimate fact which the jury must determine."

⁸ *Sentilles v. Inter-Caribbean Shipping Corp.*, 80 S. Ct. 173 (361 U. S. 107, 109, 1959): The jury's power to draw the inference that the aggravation of the petitioner's tubercular condition, evident so shortly after the accident, was in fact caused by that accident, was not impaired by the failure of any medical witness to testify that it was in fact the cause. Neither can it be impaired by the lack of medical unanimity as to the respective likelihood of the potential causes of the aggravation, or by the fact that other potential causes of the aggravation existed and were not conclusively negated

(Continued on next page)

The concept of the inviolable right of the jury to determine the legal aspects of causation was implicit in rulings of courts in Cuyahoga⁹ and Hamilton Counties¹⁰ relative to GC 2855-16 (ORC 313.19): *Coroner's verdict the legally accepted cause of death*. However, the court has recognized that the medical certification of the death including the manner of death is appropriately in the province of the coroner.¹¹

If triers of the facts are to have the responsibility of determining whether or not the evidence of legal responsibility is compatible with the medical testimony it would be desirable to provide some guides for evaluation and correlation of evidence offered by medical experts and other witnesses.

It is not possible to state dogmatically that certain evidence independently will establish proof of cause of death. The relative responsibility of pre-existing cardiac disease and subsequent injury must be assessed for each individual case by equating the various factors intimately concerned. Neither law nor medicine can be an exact science in which certain rules operate inexorably and consistently to produce the same result every time. Too many variables of the human mind and body intervene. Since no two individuals are exactly alike, their reactions cannot be predicted or interpreted with absolute reliability using merely knowledge of how others reacted in similar situations or circumstances. Thus, it must be understood that this paper was never intended to provide a do-it-yourself guide to permit either attorneys or physicians to independently

(Continued from preceding page)

by the proofs. The matter does not turn on the use of a particular form of words by the physicians in giving their testimony. The members of the jury, not the medical witnesses, were sworn to make a legal determination of the question of causation. They were entitled to take all the circumstances, including the medical testimony into consideration. See, Small, Gaffing at a Thing Called Cause: Medico-Legal Conflicts in the Concept of Causation, 31 Tex. L. Rev. 630 (1953).

⁹ State ex rel. Dana v. Gerber, 79 Ohio App. 1, 70 N. E. 2d 111 (1946). G. C. § 2855-16 as enacted is invalid and void because it deprives party of fundamental rights and is violative of Ohio Const. Art. I, §§ 1 and 16 and Ohio Const. Art. IV, § 1, also being contrary to due process clause of 14th amendment to U. S. Constitution.

¹⁰ Roark v. Lyle, 68 Ohio L. Abs. 177, 116 N. E. 2d 817 (1952). G. C. § 2855-16 is unconstitutional and does not give the Court of Common Pleas authority to review the findings of the coroner.

¹¹ State ex rel. Stark v. Zipf, 172 Ohio St. 462, 178 N. E. 2d 249 (1961); Carson v. Metropolitan Life Ins. Co., 156 Ohio St. 104, 100 N. E. 2d 197 (1951); State v. Woodards, 6 Ohio St. 2d 14, -- N. E. 2d --, reported in 39 Ohio Bar Rep. (decided March 30, 1966).

render a decision on any specific case. Rather, the purpose is to provide some insight into the complexity of the problems, some of the factors to be considered and the need for attorneys and physicians to recognize each other's problems, and to attempt to understand and approach them with mutual confidence and respect. Attorneys should not expect that any simple guide would enable them to analyze and diagnose complicated medical problems nor should physicians expect that simple statements of legal principles would enable them to analyze and adjudicate involved legal problems.

Thus, any attempt to outline standards which the person without medical training and practical experience could use for evaluation and correlation of evidence would tend to engender misunderstanding and miscarriage of justice rather than to aid the triers of facts in any specific case. Dr. Wilmer Smith warns against over-reliance on standards.¹²

Standards are merely an aid to the evaluation of disability. This aid is usually most helpful before experience has accumulated. Standards never indicate that the disability, even in an identical case, 'lies here'; they mean only that the evaluation of the disability lies somewhere near. Regardless of how many such standards one has, the true guide to the evaluation of scheduled disability lies always in the ratio between function present now and preinjury function. In this volume we have not been at pains to present a large number of standard disabilities. It is our feeling that too complete a list of these becomes imposing to an unwarranted degree and is too apt to engender a slavish servitude which is a poor substitute for medical knowledge and clinical discernment. These latter, when guided by proper principles, are really the *sine qua non* of disability evaluation.

A review of the types of evidence routinely considered by the medicolegal officer who has the statutory duty to officially certify the cause, mode and manner of death may provide an insight into the evaluation and correlation of the variety of information.

In cases in which death follows injury incurred by someone with pre-existing cardiac disease the fundamental question to be resolved is the relative severity of the injury and the disease as threats to the life of that specific individual. Although

¹² Smith, Wilmer Cauthorn, *Principles of Disability Evaluation*, 167-8 (J. B. Lippincott Co., 1959 ed.).

examination of the body may afford evidence of the extent of pathologic changes induced by disease and injury, in some cases their comparable roles in the fatal outcome must be based on the individual's medical history which reflects how his body reacted and how he responded to treatment. Thus, the pre-mortem signs and symptoms and the postmortem evidence of disease and injury are correlated and evaluated.

In the cases cited at the beginning of this paper it might be presumed that the first man displayed no symptoms of aggravation of the cardiac disease while he was hospitalized following the injuries and that the injuries were sufficiently severe to have caused death in another person of similar age whose heart was normal. By contrast, the second man might have displayed acute symptoms of cardiac disease during hospitalization and terminally, while the injuries incurred were such that they normally would present no serious threat to life. In either of these cases the autopsy findings might have affirmed the clinical diagnosis or vice versa, providing agreement between the post-mortem and pre-mortem evidence.

When there is considerable disparity between the severity of the disease and injury the conclusion is reached readily and can be explained usually to the satisfaction of all interested persons. Analyses of cases in which the extent of disease and severity of injury approach equal status as threats to life require more specialized knowledge to ascertain the distinction; therefore the rulings are more difficult to explain and afford more opportunity for disputes. Honest differences of opinions sincerely held arise from conflicting viewpoints and major interests. How then can the triers of facts discern the truth?

Here, it must be recognized, is another divergence in focus of the medical and legal viewpoints and goals. While the physician seeks scientific proof to lead to the ultimate truth, the attorney aims his efforts at the immediate goal of establishing liability to settle a dispute. The dead cannot be revived for evaluations by repetitive tests introducing variables according to accepted methods of scientific proof. Therefore, physicians and attorneys must rely on data to demonstrate the validity of their premises.

Statistical data can be found to support arguments both for and against the major premises concerning evaluation of the roles of cardiac disease and injury in causing death; i.e., whether injury activated or aggravated pre-existing cardiac disease, or

contrariwise, pre-existing cardiac disease adversely affected capability for combating the injury. The triers of facts ought to be indoctrinated in the critical approach to analysis of statistics, the methods of use and their applicability to the situation under consideration.

Statistics are compilations of specific aspects of similar cases and conditions. It must be recognized that such cases or conditions also had dissimilar aspects. Thus, although statistics may furnish valuable indices of influences, trends and factors, they do not afford an inflexible medium for diagnosis of an individual case. All influences must be evaluated from the viewpoint of their effect on the specific individual, not what effect they might be expected to exert on others in similar circumstances. It is this aspect of the art of medicine that makes it seem highly improbable that automation alone will provide entirely successful and satisfactory diagnoses. In order to utilize computers the human mind must participate in the evaluation of the relative significance of the information desired and set in motion the programming. The appended outline indicates some factors that might be fed into a computer to effect an evaluation of the extent of responsibility of pre-existing disease and subsequent injury in causing death.

Having listed these factors to be considered there must be a choice as to whether it is the medical interest or the legal interest which is to be served before the machine can provide the data. Neither physicians, nor attorneys, nor theologians can ultimately resolve the question "Why did he die?" to the satisfaction of everyone. Each profession should acknowledge that theirs is not the finite resolution of the question of causation but only the answer to the problem oriented to their specific interest. It has been recommended that both physicians and attorneys ought to avoid using the term *cause of death* and restrict themselves to the terminology more explicitly expressing their respective viewpoints: medical etiology or legal responsibility. This is consistent with Dean Prosser's view:¹³

To deal with the problem in terms of causation, or to talk of "proximateness," is merely to obscure the issue.

Physicians in general are not aware of the fact that the person who induces injury to another by a criminal or negligent

¹³ Prosser, *Law of Torts*, ch. 9, § 48, p. 258 (2d ed., 1955).

act is not excused from responsibility in the eyes of the law for the outcome that may have been affected adversely by pre-existing conditions. He must take existing circumstances as he finds them.¹⁴

It must be concluded that there can be no short cut to the goal of correlating medical etiology and legal responsibility. However, the pathways of interdisciplinary approach will be made smoother, broader and more pleasant if physicians and attorneys recognize and respect the basic reasons for their divergent viewpoints.

APPENDIX.

Evaluation and correlation of medical etiology and legal responsibility—Fundamental factors to be considered when death follows injury to a person who had pre-existing cardiac disease.

I. Pre-existing Cardiac Disease.

A. Anatomic Evidence demonstrates existence:

(Presence and degree as a factor in causing death determined by following means listed in order of generally diminishing specificity or reliability although exceptional circumstances may alter these qualities.)

1. Autopsy + recent clinical findings and medical history.
2. Autopsy + medical history without recent clinical evaluation employing diagnostic aids.
3. Autopsy + anamnestic history derived from nonmedical observers.
4. Autopsy alone.
 - a. Comprehensive, including gross and microscopic examination of brain and all major organs.
 - b. Limited to gross examination of brain and major organs.
 - c. Restricted to examination of heart.

Note: Extent of autopsy examination significant in evaluation of autopsy findings with or without medical history.

¹⁴ *Id.*, p. 260.

B. Anamnestic history as evidence of existence:

1. Medical history with recent clinical findings.
 - a. Extensive diagnostic aids employed.
 - b. Limited use of diagnostic aids.
2. Recent medical history with remote clinical "work up" (a & b as above).
3. Recent medical history, no diagnostic aids.
4. Remote medical history, no diagnostic aids.
5. History derived from nonmedical observers (may be more significant than 3 or 4 above).

C. Lack of evidence does not always exclude possibility which may be inferred from negative findings of previous sources of evidence with same order of relative significance summarized as follows from probable exclusion to possibility of inclusion:

1. No anatomic evidence, no clinical evidence, no history of symptoms.
2. No anatomic evidence, no clinical evidence, some history of symptoms (reliability dependent on experience and knowledge of reporter and opportunity to observe).
3. No anatomic evidence, remote clinical evidence and history.
4. No anatomic evidence, recent clinical evidence and history.
5. Minimal anatomic evidence, recent clinical history.

II. *Injury—Factors considered in evaluating contribution to cause of death.*

A. Anatomic evidence—Extent, site and type of injury.

1. Premortem and postmortem evaluation by medical records and autopsy examinations.