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The "Undetermined" Ruling: A Medicolegal Dilemma

For many years it has been the duty of coroners and medical examiners not only to investigate deaths of medicolegal interest but also to render an opinion as to the cause and manner of death. "Cause of death" is understood to be the primary disease, injury, or physiologic disturbance that brings about a person's death. "Manner of death" is ruled "natural" when death results solely from a disease process and "unnatural" when death results from unavoidable injury ("accident"), conscious intent of the decedent ("suicide"), or the act of another ("homicide").

These opinions, usually called "rulings," are useful and often essential in the disposition of the estate and of insurance and other financial matters; in both civil and criminal litigation; and for sociologic, demographic, and epidemiologic studies. The origins of these rulings and questions regarding their current validity and utility have been discussed at length in the medicolegal literature and will not be considered here [*1-3*].

In the great majority of cases, after authorizing or conducting an investigation of the decedent's history and the circumstances of death, performing an autopsy and other examinations, and obtaining other information, the coroner or medical examiner is able to form reasonable opinions and make sound rulings regarding cause and manner of death. However, these rulings are not, and cannot be, based entirely on totally objective interpretations of morphologic changes in body tissues and on results of laboratory determinations. Rather, rulings of cause of death often must be in part subjective, and those of manner of death often must be based in part on the examiner's assessment of the psychological make-up, the motivation, and the intent of the decedent and others in a given case.

Thus there is a small number of cases in which either manner of death or cause and manner of death cannot be determined with reasonable medical certainty even after all indicated examinations have been completed. In these cases the coroner or medical examiner must in honesty make a ruling of manner of death or of cause and manner of death as "undetermined." The degree of certainty with which the examiner must believe he has established and can defend a given ruling of cause and manner of death in order to justify rendering that ruling rather than one of undetermined is difficult to define, and herein lies much of the difficulty and controversy regarding the appropriateness and frequency of undetermined rulings.

The exact number and percentage of medicolegal cases ruled undetermined is small and somewhat difficult to determine with certainty. It is difficult to recover such cases from the files of some medicolegal offices and bureaus of vital statistics, and studies of series of cases ruled undetermined could not be found in the recent medical or medicolegal literature.

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The late Dr. Milton Helpern, certainly one of the world's most experienced forensic pathologists, said, "There are approximately five percent or more, somewhere between five and seven percent of cases where we cannot determine the cause of death" [*4*]. Says Marshall Houts, a writer experienced in medicolegal matters, "Up to shortly after World War II, some pathologists estimated they could not find a clear-cut cause of death in perhaps 5 percent of the cases they autopsied. I am told that now the more accurate figure may be 2 percent" [*4*].

Whatever the exact figure, it is common knowledge among forensic pathologists and medical examiners that many of them, and many coroners, are for various reasons very reluctant, or even refuse, to render a ruling of undetermined, even when such a ruling is clearly the proper one based on the evidence at hand.

Rulings of undetermined should not be made casually or in an attempt to avoid responsibility in difficult cases, for an unsupported ruling of undetermined may well cause more difficulties than a justifiable one. Rather, it is thought by the author and others that such a ruling is not only entirely appropriate but mandatory in the few cases that are sufficiently difficult, incomplete, or open to various interpretations as to make definitive rulings impossible.

In view of the importance of the undetermined ruling and the lack of formal study of this subject in the literature, this study was undertaken in a metropolitan coroner's office. Its purposes include determination of the incidence of undetermined rulings and the types of cases so ruled, the influence of the physician's training and experience on his making such rulings, the rapidity and means by which such cases are ruled, and ways in which undetermined rulings may be kept to a reasonably small number within the context of sound medicolegal practice.

Procedure

The Officer of Coroner, Montgomery County, Ohio in Dayton, Ohio serves populations estimated in 1976 as Montgomery County, 602 600 and City of Dayton, 204 000 [*5*]. During the past ten years a yearly average of about 2000 deaths has been reported to the office, and a yearly average of 531 autopsies has been performed.

Lay investigators, each of whom must have had police force training and experience prior to being hired by the office, take all death calls and conduct investigations, interviews, and scene investigations when indicated. Autopsies are performed by physicians and by pathologist's assistants working under their direct supervision. As a rule, the physician responsible for each case makes the rulings of cause and manner of death, with assistance from the chief pathologist and coroner when necessary.

The case files of the office for the ten-year period 1968 through 1977 were searched and all cases in which final rulings of cause of death, manner of death, or cause and manner of death were entered as undetermined were further studied. These cases were divided for purposes of study into six categories, each representing one of the most common general reasons for which one or more of the three types of undetermined rulings were made.

Results

A ruling of undetermined was made in 92 of 5308 autopsies, an incidence of 1.73% (Table 1). The number of cases ruled undetermined increased with one year's exception from 1968 through 1972, fell precipitously in 1973, then attained a new peak in 1974 from which it decreased steadily through 1977. These trends will be analyzed later. The interval in days between initially ruling most of these cases "deferred" and making a final ruling of undetermined shows a general downward trend throughout the study. In 40% of all undetermined cases there was during this interval consultation by the coroner's office

with, and sometimes at the request of, law enforcement agencies, the decedent's physician or attorney, or his family regarding the progress of the investigation.

It would have been expected by most forensic pathologists that the most common type of death ruled undetermined would be that, usually drug-related, in which the cause is known but it is difficult or impossible to decide whether the manner of death is suicide or accident. In this series, however, the largest category of undetermined rulings, 35% of the total, is that of persons dying of known injury, usually blunt force, but under circumstances in which the injury was not witnessed or there was no reliable eyewitness evidence (Table 2). Thus, 31 of these 32 cases were ruled "manner undetermined," even though 25 of the 32 (78%) were investigated by police prior to the final ruling being made.

In nine of these cases death resulted from blunt craniocerebral trauma. Four were probably battered child cases; in two cases the prime suspects each "passed" a polygraph examination and in the other two they refused this examination. In two cases death resulted from sepsis following instrumentation to produce abortion, but it could not be determined whether the decedent or another person had performed the attempt.

The second-largest category of undetermined deaths (25%) is that in which the cause or probable cause was drug-related, but in 65% of these cases the manner of death alone could not be determined. Only four of the decedents were admitted to and died in a hospital; 19 were found dead, most in a home. Multiple drugs were found in the decedents in some cases, and barbiturates were the most common.

In keeping with previous studies [*6, 7*] of this type of undetermined case, 7 of the 23 (30%) had a documented history of "depression," "mental illness," psychiatric treatment, or previous suicide attempt. In four cases a ruling of undetermined was made because toxicology studies were negative despite historical, scene, and autopsy findings consistent with death from intravenous narcotism. Siegel et al [*8*] would likely have little hesitation in making a definitive ruling of cause and manner of death in such cases, the negative toxicology notwithstanding. Curphey [*9*] and Farberow and Neuringer [*10*] are proponents of the involvement of the social scientist and of the "psychological autopsy" in determining manner of death in some of these undetermined drug-related autopsy cases; these measures were not formally employed in this series.

In the third category of 20 cases (22%) there was inadequate history, pathological evidence, or both on which to base definitive rulings, and in 75% of these cases both cause and manner of death were undetermined. Eight persons were admitted to and died in a hospital; of these, two were young adults who died unexpectedly, one during and one

TABLE 1—*Autopsies ruled undetermined, Montgomery County (Ohio) Coroner's Office, 1968-1977.*

Year	Total Autopsies	Undetermined		Deferred/Ruled Interval, Days
		n	%	
1968	483	7	1.45	120
1969	524	9	1.72	116
1970	495	6	1.21	72
1971	496	13	2.62	103
1972	544	13	2.39	52
1973	577	4	0.69	23
1974	517	16	3.09	30
1975	630	14	2.22	65
1976	513	8	1.56	17
1977	529	2	0.38	46
Totals	5308	92	...	...
Averages	...	...	1.73	64

TABLE 2—*Undetermined rulings, by reason.* [a]

Category	Reason for Undetermined Ruling	Cases, *n*	Undetermined		
			COD	MOD	C + MOD
1	fatal injury, but undetermined MOD	32	0	31	1
	i—blunt trauma	18	...	18	...
	ii—fire	4	...	4	...
	iii—found in water (apparent drowning)	5	...	4	1
	iv—sharp force injury (abortion)	2	...	2	...
	v—gunshot wound	2	...	2	...
	vi—"neglect" (malnutrition, dehydration)	1	...	1	...
2	probably drug-related; undetermined MOD	23	0	15	8
	i—"lethal" drug level found	17	...	14	3
	ii—consistent with intravenous narcotism; no drugs detected	4	...	1	3
	iii—probably drug-related; no "lethal" level	2	...	...	2
3	inadequate historical or pathological evidence	20	1	4	15
4	decomposition and incomplete history	9	0	1	8
5	premature birth and death; circumstances unknown	6	0	0	6
6	known or competing COD; MOD unknown	2	0	1	1
Totals		92	1	52	39
Percentage		...	1	56.5	42.5

[a] COD = Cause of death; MOD = manner of death.

shortly after tonsillectomy. At least the intraoperative death could well have been ruled a "therapeutic misadventure."

Three persons were chronic alcoholics, and in each a large fatty liver was the only significant autopsy finding. In each case, despite some opinion to the contrary [*11*], it was decided that fatty liver was not in itself an adequate cause of death. In one case an invalid ruling of "cause ... rheumatic heart disease," "manner undetermined" was made. In this case, after all of the findings have been studied, it is thought that the manner can only have been "natural."

In the fourth category of nine cases (10%) the decedent's body was so decomposed and the history sufficiently incomplete that cause and manner of death could not be determined, though in one case the cause was presumed to be drowning and was so ruled. Three of the bodies were found lying in warm rooms, and two each lying outdoors, in a river, and buried. The fact and manner of burial in the latter two cases strongly suggested homicide, but in neither case could cause of death be determined with reasonable certainty. Hirsch and Adelson [*12*] have reported a very similar case in which cause and manner of death were ruled nonetheless.

In two of our cases an inhalant, in one case furniture polish and in the other spray paint, was felt to be the probable cause of death, though neither could be proved chemically.

Six premature infants, ranging from about twelve weeks' to about eight months' gestation, constitute the fifth category. In each of these cases the circumstances of the infant's birth and death were unknown, and thus cause and manner of death were both ruled undetermined. One infant was dead on arrival at a hospital after an unattended home delivery. The bodies of the three smallest infants were found by employees screening sludge at a sewage disposal plant, while one was found wrapped in a blanket in water along the shore of a lake, and one lying on a river bank.

Neither of the remaining two cases could be categorized. One was a 57-year-old man who died of multiple myeloma. He had been employed for 15 years in a dry-cleaning plant, and his attorney alleged that exposure to toxic solvent fumes there had caused the myeloma. This hypothesis was thought incapable of being proved or disproved, so the manner of death was ruled undetermined. In the other case, that of a 26-year-old man found hanged after a domestic quarrel, there were competing causes and manners of death. Significant amounts of morphine, methaqualone, and codeine were found in the decedent, and the circumstances of his hanging, or being hanged, could not be satisfactorily determined. The case was thus ruled undetermined.

It is widely recognized in medicolegal practices that since determination of cause of death and particularly of manner of death is often based at least in part on subjective as well as objective evaluations, different examiners given the same evidence may well return different rulings in a given case. Curvey [*13*] states that such rulings are "a reasoned judgement based on ... experience and training. The selection of manner of death ... is subject to personal interpretation. The reporting of the manner of death by medical examiners is not uniform."

In order to study the effect of individual physicians' training and experience on their undetermined rulings in this series, Table 3 was constructed to show the number of undetermined rulings made yearly by each physician throughout the study. Each of the seven physicians employed by the office was assigned a code letter for reference, the letters assigned successively in order of decreasing length of experience in forensic pathology. A designates the pathologist with the greatest experience in forensic pathology, the coroner. Physician B was a non-Board-certified forensic pathologist, and Physician C a Board-certified forensic pathologist. Physicians D and E were general practitioners, and Physicians F and G were pathologists not Board certified in forensic pathology, the latter

TABLE 3—*Undetermined rulings, by year.*

	Yearly Totals, Physicians							
Year	A	B	C	D	E	F	G	Yearly Total, Office
1968	0	7	...	0	...	...	0	7
1969	1	5	2	1	...	...	...	9
1970	1	2	3	0	...	...	...	6
1971	0	3	8	2	...	...	...	13
1972	2	3	4	4	...	...	...	13
1973	1	...	...	2	...	1	...	4
1974	2	...	11	3	...	...	...	16
1975	0	...	10	3	1	...	...	14
1976	0	...	6	1	1	...	...	8
1977	2	...	...	...	0	...	...	2
Totals	9	20	44	16	2	1	0	92
Percentages	9.8	21.7	48	17.4	2.17	1.08	0	...

two each being employed for only one year during the study. Physicians A through D were each responsible for approximately the same number of cases yearly from 1969 through 1972. Determination of the exact number of cases for which each physician was responsible was of questionable importance because of the free availability of consultation among physicians prior to ruling all cases.

Table 3 shows that the yearly number of undetermined rulings by Physician A was quite constant throughout the ten-year period. The undetermined rulings by Physician B were nearly equal for two years but decreased to a lower, constant yearly level as failing health resulted in diminution of his caseload and, finally, his leaving the office.

Physician C was employed by the office while he was a resident in general pathology from 1969 through 1972; he left the office during 1973 to complete a year of residency in forensic pathology. When he returned in 1974 his yearly undetermined rulings increased by a factor of about two, though in 1974 and the subsequent two years he was responsible for twice as many cases yearly as in 1969 through 1972. His total number of undetermined rulings was almost five times that of the other Board-certified forensic pathologist (Physician A).

The undetermined rulings of Physician D remained relatively constant throughout his employment, while those of the other three physicians were so few as to not allow meaningful interpretation.

Discussion

Preswalla [*1*] has succinctly stated both the reasons for which coroners and medical examiners must make rulings of cause and manner of death and the reasons for which a small number of these rulings must be undetermined: "The fundamental purpose of a medicolegal death investigative system is to examine and classify medicolegally important deaths both for recording vital statistics and for the administration of justice. In classifying deaths, the Medical Examiner/Coroner uses evidence other than only medical findings, and his decisions are therefore administrative and quasijudicial."

Mills [*14*] thinks that a judgment of cause or manner of death "does not require absolute certainty. Only 'reasonable medical certainty' is necessary." Statutes, however, give to these rulings a much more definitive interpretation, such as: "A statement in a coroner's record as to the ... 'probable cause of death' ... is a statement of fact, not the statement of an opinion, and is admissable as evidence" [*15*].

The relatively small and constant number of undetermined cases drawn both from the sources quoted above and from the present study are a reflection of at least two opposing factors daily in evidence in medicolegal practice: first, the considerable and slowly improving scientific skills of forensic pathologists and other medical and forensic scientists, skills which enable them to study, solve, and confidently make rulings in forensic cases, many of which are of considerable and increasing depth and complexity, and second, particularly evident in the highly trained scientist and the physician, the natural reluctance to admit that one is occasionally unable to arrive at a satisfactory, honest, and objective solution to a problem so that, instead, one makes an ambiguous or tenuous ruling. The latter category varies from "stretching" a minimal or borderline normal anatomic finding, such as interpreting a few lymphocytes in myocardium as fatal myocarditis, to rendering meaningless causes of death such as "heart ceases to function."

This constant interplay between the skills and knowledge of the forensic scientist and his desire to be of service, his reluctance to admit fallibility, and the increasing demands and importance placed on his efforts and rulings by society and the legal system produce in each case what yet appear to be relatively consistent performance and rulings for a given examiner and within a given office.

The percentage of cases ruled undetermined in this study is at the lower end of the

narrow spectrum of figures quoted by MacDonald [*4*] and has remained relatively constant during the ten years studied. The two years with the by-far two lowest figures, 1973 and 1977, were those in which Physician C was not employed in the office.

That the physician's training, judgment, and experience affect in different directions his perception of cases ruled undetermined is borne out by the finding that young Physician C, recently formally trained in forensic pathology, ruled nearly five times more cases undetermined than did his Board-certified, considerably more experienced colleague, Physician A. However, the undetermined rulings of each remained nearly constant from year to year relative to the total number of cases ruled by each. The approach of Physician C to his rulings appears to have been generally cautious and quite conservative and that of Physician A bolder, based on his greater experience.

It is encouraging to note in this study that the average interval between an initial ruling of deferred and a final ruling of undetermined showed a general downward trend, more obvious when it is seen that the average interval per case for the first five years was three months but that for the second five years was only slightly more than one month (36 days). Since prolonged waiting for a final ruling, even one of undetermined, may result in considerable mental anguish and financial uncertainty for survivors, as well as in holding legal proceedings in abeyance, it behooves the medicolegal office to complete its investigation as rapidly as possible commensurate with accurate reporting. That this is being done with increasing success in the Montgomery County Coroner's Office is indicated by the figures above.

One reason frequently advanced verbally by forensic pathologists and coroners against ruling cases undetermined is that such rulings will frequently, if not inevitably, bring accusations of dereliction of duty or legal entanglements from the survivors. That these fears are greatly exaggerated is shown by this study, in which in only 6 of the 92 undetermined cases (6.5%) was it documented that the decedent's family themselves or their attorney questioned or strongly challenged the final ruling.

In three of these cases the family alleged that the decedent had been the victim of foul play, but in none could their assertions be substantiated. Two families merely questioned procedures employed during the investigation. In one case, after an initial ruling of a drug-related death, manner undetermined, the family produced compelling evidence that drugs had not been involved. The reference to drugs was thus deleted after an interval of more than one year (440 days). A seventh case was ruled undetermined after the family successfully challenged an initial ruling of suicide from self-inflicted gunshot wound.

The reasons for which cases in this series were ruled undetermined have been discussed. Rulings of manner of death, whether definitive or undetermined, are binding on neither insurance companies for determination of amount of death benefits [*13*] nor on the prosecutor's office in questions of bringing criminal charges, though in this office the coroner's rulings are in general readily accepted in both regards.

The second category of cases raises perhaps the greatest controversy among the medicolegal office on one hand and families and insurance companies on the other. Because of the stigma generally attached to a ruling of suicide such a ruling may bring upon the examiner reproach from the family, while a ruling of accident may well incur opposition from the insurance company. Again, the examiner must not intentionally take refuge in a ruling of undetermined. He must make this ruling only if he believes that there is no preponderance of evidence for a ruling of either suicide or accident.

The medical examiner or coroner is obligated to employ every means at his disposal to thoroughly study and to satisfactorily conclude and rule each case. This often requires that he obtain consultation from experts, for example from the toxicologist in Categories 2 and 3 (Table 2), from the forensic dentist or anthropologist in examining decomposed remains as in Category 4, and in some cases from more experienced forensic pathologists for review of the case and his conclusions.

Finally, ruling a case undetermined need not be a final or irrevocable decision. Should new evidence subsequently come to light allowing a definitive ruling to be made, a Supplementary Certificate of Death can easily be filed.

There will always remain a number of undetermined rulings, if only because of the puzzling human factors inherent in many forensic cases. Undetermined rulings can be held to a reasonably small number by continued thorough and meticulous case investigation and review and by employing both scientific and intellectual honesty in ruling cases. A medicolegal office which boasts that it rules no cases undetermined deludes not only the public but itself.

Conclusions

The coroner or medical examiner must make rulings of cause and manner of death in each of his cases. Since these cases are frequently difficult or highly complex, the cause and manner of death may be difficult or impossible to determine because of inadequate pathological evidence and complex human factors, respectively. It is inevitable that some cases must finally be ruled undetermined, though for various reasons there is a general reluctance on the part of many coroners and forensic pathologists to do so.

In this study of 5308 autopsies performed during a ten-year period in a metropolitan coroner's office there were 92 (1.73%) cases in which a ruling of undetermined was made. This percentage is at the lower limits of the few other series quoted in the literature.

The type of case most often ruled undetermined was that of death resulting from known trauma but without sufficient reliable investigative evidence on which to base a ruling of manner of death. The second and third most common types were drug-related deaths with undetermined manner and cases without adequate evidence for a cause of death, respectively.

The experience and training of the coroner or his physician to some extent influenced the total number of undetermined rulings made by him, though for each the yearly number of such rulings per case handled remained relatively constant during his employment. During the second five years of the study there was marked improvement in the rapidity of finally ruling cases undetermined, apparently because of continuing emphasis on this problem from within the office itself.

The medical examiner or coroner must employ every means at his disposal to arrive at a definitive ruling in each case, neither employing rulings of undetermined to avoid responsibility in difficult cases nor making them more frequently than is justified by the evidence. In so doing he will occasionally incur disfavor from families or attorneys, but he will satisfactorily discharge his duties and be of considerable service to the community.

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