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The Future of the Medical Examiner System

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Twenty-five years ago a group of experienced forensic pathologists, members of the Pathology-Biology Section of the American Academy of Forensic Sciences, created the National Association of Medical Examiners (NAME). There was trepidation in the Executive Committee of the Academy that pathologists might leave the Academy as was the case with firearms and tool mark examiners. This was not to be the case. The prime motive for the creation of NAME was to enhance the political prestige of medical examiners, a function not conducive to an academy some of whose diverse membership could oppose political or economic issues favorable to pathologists. At that time it was "understood" that the scientific sessions of the Pathology-Biology Section of the Academy were to be concerned with science, while NAME programs, and journals, were for political and scientific aspects not of paramount interest to the readers of the *Journal of Forensic Sciences.*

Thus were our beginnings—hopeful, humble, and correspondingly inexpensive (dues $15 per year). Today we are at the quarter-century mark. We now espouse standards, concerned mostly with structure and numbers of personnel, and extensive functional problem analysis, the latter being addressed on an ad hoc basis by the External Audit Committee.

We have seen a nationwide improvement in medical examiner structures. Many areas, particularly in states with an expanding populace and economy, have developed morgue and autopsy facilities that meet or exceed NAME standards. More are coming on-line, although there are many zones of suboptimal status quo. Sooner or later the higher-quality facilities stimulate emulation on the part of the substandard areas.

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But what of function? Many a business has gone bankrupt following a major building and expansion program. Fancy buildings and short-term profits do not warrant business success. Only continued and innovative service counts in the long run. These same business principles apply to us medical examiners.

How may we, as forensic pathologist medical examiners, be certain that our agencies shall function successfully? If I could warrant a proper answer for each of you, I should embark upon a new career as a consultant. It is not easy to assure success when universal standards cannot address local political, economic, and personality variables, as well as public comfort with the medical examiner. For example, a local problem, in some circumstances, may be solved only when an obstructive bureaucrat or politician is separated from office by career advancement, indictment, or a fatal heart attack. This type of problem in Miami has been solved with patience and a nonconfrontational stance by the medical examiner. However, the major element of assured success is to elevate service beyond budgeted means by hard work and personal sacrifice. Likewise one must react rapidly and appropriately when problems arise.

To minimize problems, that is the question. First, we must assume that problems shall arise. The best approach is consciously to prevent their occurrence by attending to detail. Many problems are of case investigative origin and may result in adverse publicity. There is ample room in the court arena for an honest difference of interpretation of the same set of data. But what if one data set is diminutive or irrelevant and the other is expansive and relevant? Psychologists who study the difference between success and failure in medical diagnosis point out that the most common mistake is overreliance upon noncontributory data (1). How may we proceed to acquire dependable diagnostic data? When do relevant data become irrelevant? How many data are enough to fulfill our statutory duty? Do the expectations of our professional colleagues and the public exceed our statutory duty? If so, must we be guided by such expectations?

Our statutory duty is to determine "the cause of death," best defined by Adelson as "the injury, disease or the combination of the two responsible for initiating the train of physiological disturbances, brief or prolonged, which produced the fatal termination" (2). I submit that statutory duty is not enough! Our expected role goes beyond the "what" and extends into the "why." Should we help explain "why" we are truly serving the community that pays for our service? It is not enough to say "drowning" and ignore why it occurred or to opine "blunt head injury" and not question why the automobile driver lost control.

Certainly it is a police function to determine law violations but it is the medical examiner's responsibility to determine if alcohol, drugs, natural disease, or psychological factors were significant in the analysis of the event. This may appear elementary to the reader of today but when NAME was created, only a handful of death investigative agencies collected pertinent motor vehicle alcohol data (3).

Our cases fall into two categories, those in which we play little role in the "why" and more of a role in the "what," and vice versa. "What" is common to most homicides, where police determine motives. When faced with a nonhomicide "why," case we must be prepared to expend more resources in the collection of data. For example, an uncomplicated homicidal gunshot wound, entry into the precordium with the bullet lodged posterior to the perforated heart, is simple and concerns itself medically with questions of range, directionality, and post-fatal injury activity. Alternatively a body found in water, a berserk individual who dies while being subdued or transported by the police, a burned body from a conflagration, many natural deaths, and some suicides are extremely complex as to cause, mechanisms, and manner of death. The medical aspects of uncomplicated gunshot wounds are, for practical purposes, autopsy dependent. Circumstantial data are of little core necessity to the cause of death.

The complex case is circumstance dependent. Unlike the aforementioned gunshot, whose autopsy pattern is unique to cause of death, the reactions of human organs and tissues in complex cases are not unique. The relevance of autopsy findings to cause and manner may be coincidental rather than indicative. An autopsy characterized by pulmonary edema is not solved by histologic study of lung tissue. Human tissues react in a limited way to an almost-infinite number of stimuli. A 5-min-old subcutaneous contusion may be histologically indistinguishable from one of 5 days' duration (4). Tissue reactions, both gross and microscopic, may antedate the event in question, may coincide, or may occur after the fact. It is a given that modern emergency medical care from the scene into and including the emergency department should be expected to alter or add to lesions associated with the fatal event.

The potential for misinterpretation is great when we rely mainly upon the standard tool associated with the practice of pathology—the autopsy. Au-

topsy findings are expressed in terms of structural abnormality, coronary atherosclerosis, myocardial infarction, rupture, hemorrhage, ulcer, consolidation, etc. Often these autopsy findings coincide with the terminology of the International Causes of Disease (ICD). Myocardial infarction, coronary thrombosis, and coronary atherosclerosis found at autopsy are equally appropriate to the death certificate. Perusal of the ICD reveals a strong bias in favor of structural aberrations as "causes" of death for coding purposes.

But the ICD also notes that many codable "causes" are not visible at autopsy. Life is function and death is absent function. Most structural causes of death are not really a cause unless we take into consideration the circumstances. The coronary atherosclerosis of the autopsy is of little primary relevance to the death of the golfer struck by lightning or the home mechanic electrocuted by poorly maintained equipment. The golf ball-sized meningioma that distorted the left occipital lobe of the Eastern Airlines pilot whose Lockheed 1011 crashed in the Florida Everglades on the night of December 29, 1972, had absolutely nothing to do with the causative factors of the crash. Hemorrhages found in neck viscera may or may not be relevant to a charge of murder by strangulation. They may be occasioned by mucosal prodding and rubbing by endotracheal tubes administered by rescuers. Neutrophilic and platelet responses may indicate a nonrelated episode of neck trauma from a prior altercation or fall. Only a careful review of *all* circumstances enables one to interpret such autopsy findings.

It is tempting to interpret autopsy patterns in advance of full disclosure of circumstances. This arises from our pathology training exercise of "guess what is on the slide." It is abetted by a competitive spirit to "call the shot" before someone else does. It may also be a manifestation of poor integration of police and medical examiner investigations. The days of "do an autopsy, tell us the cause, and then we will investigate" are yet extant. This may work in some simple cases but has great potential for error in complex cases.

Errors of interpretation usually result from two factors, personality traits and/or complacency based upon continued success in the correct diagnosis of uncomplicated cases. Physicians are no different from other human beings and reflect the entire spectrum of human personality. Some are more adept at cognition than others. Some act more impulsively than others. Some learn more rapidly by experience than others.

Medical examiner opinions are correct in the majority of cases. They are because most cases are self-solving: auto crashes, homicides, suicides, and so forth. The pathologist's role is more perfunctory than critical. If we passively accept what is proffered by investigators plus what is revealed by autopsy, continued success with simple cases may lull us into a lack of recognition of diagnostic traps in complex situations.

Insurance against case diagnostic problems is to create an investigative system adaptable to case needs.

1. *The simple or "self-solving" case*:
   Issue a death certificate based upon initially derived circumstantial and autopsy evidence, but as a matter of routine continue to acquire reasonably available supportive data.

   For example, a man drops dead in a public place. Autopsy reveals a poor set of coronary arteries. The odds of this combination being anything other than death from natural coronary atherosclerotic heart disease are minuscule. However, subsequent acquisition of rescue paramedic records, including the initial electrocardiogram, plus prior hospital and medical treatment summaries is good practice. It reinforces the initial correct opinion. More importantly it creates an office policy that favors a proper response to the complex exceptional case. Alternatively it is good practice to enlarge upon the circumstantial diagnostic database by performing autopsies in the obvious cause of death "sign-out" case. Our office policy is to autopsy all genuine medical examiner cases, accidents, suicides, and apparent naturals, whenever possible. There is no such thing as too much relevant diagnostic data.
2. *The exceptional complex case*
   One should recognize the complexities, issue a pending certificate, and instigate a rapid data acquisition process whose procedures have been facilitated by daily usage. This demands a close working relationship with police, medical records librarians, and professional colleagues. The proper parlance is "networking" on a personal basis. When sufficient data are derived, issue the final death certificate but continue to acquire more data. Also, one must always be willing to modify a preliminary opinion in the light of new evidence.

Networking requires that the medical examiner not be insular but interact in community affairs and with individuals in government and the private sec-

tor. It also necessitates that other office staff members develop networks of advantage to the agency. For example, the records custodian should be on a first-name basis with local hospital records librarians. Medical examiner autopsy reports should automatically be sent to the hospital from whence the body was received. Key operational or investigative staff should develop their own networks. Often a newly hired physician, investigator, toxicologist, or other staff person will bring a prior network with him/her. This should be encouraged. An open, free exchange of information with a lack of confrontational attitudes creates a balance in favor of the office. One should maintain friendly and respectful relationships with religious leaders, particularly those whose religious beliefs decry what they perceive as unnecessary autopsies. In Florida the Medical Examiners Commission (the statewide oversight body for the medical examiner system) created an Ethical Advisory Committee. This serves to keep adverse legislative onslaughts to a minimum.

When consulted about the work of one's colleagues or other investigators, it is essential to adopt a cautious attitude and not leap to denigrate or support the prior opinion. Develop the attitude of active review of *all* evidence prior to the rendering of opinion in finality. An attorney proffered the autopsy plus autopsy photographs to a pathologist. Only after that pathologist asked for, and received, all police reports, scene photographs, medical examiner investigative reports, and microscopic slides was a correct report issued. Contrast that with two other pathologist consultants, who accepted only the proffered autopsy report and photographs and whose questionable opinions were rendered within a few minutes.

Over three and one-half decades ago Alan Moritz, in his classical paper discussed, what he characterized as one of "the most dangerous mistakes in forensic pathology" (5). The mistakes are

> particularly prevalent among experienced forensic pathologists who, for one reason or another, acquire a propensity for what might be called "categorical intuitive deduction." This Sherlock Holmes type of expert may see certain bruises in the skin of the neck and conclude without doubt that they were produced by the thumb and forefinger of the right hand of the strangler. . . . He ignores the essential component of proof of the correctness of any such scientific deduction . . . the nonoccurrence of such lesions or changes in control cases. . . . It is difficult to estimate how much harm is done by these people. I know of a man who was hanged largely on the weight of such uncritical evidence. . . . The stakes are too high to play hunches in forensic pathology.

Should we wish not to be the subjects of what Mortiz discussed, we must broaden our investigative techniques and enlarge our "simple case" files with relevant redundant supporting data. This depends upon the development of a data source network. It instills into our office investigative procedures and mechanisms to assure that we will rise to the level of investigative competence needed for complex cases and will be able to profit from our mistakes. This is the best method for developing and retaining community respect.

Of what concern is this to the future of forensic pathology in the United States? Our future depends upon exemplary performance of service. Those who pay the expense expect results. Results lead to additional fiscal support, not vice versa. However, political and economic reality dictates the degree of additional support. Communities with a shrinking population and decreased tax base will not be able to support to the degree that occurs with an expanding population and economy. In Dade County, Florida, we had experienced two major, but inadequate, building programs for the Medical Examiner Department, the initial building constructed in 1957 and an enlargement in 1968. Each was due to population growth and a corresponding increase in caseload. In 1980–1981 additional factors, riot, transfer of the Cuban prison population to Miami, and drug massacres, resulted in great public outcry and, finally, a criminal justice bond issue. One result was a totally new medical examiner facility, state of the art and designed for a half-century of growth.

Already this building complex has attracted interest on the part of governments whose existing medical examiner facilities are due for expansion. It can serve only to improve the lot of medical examiners who need better facilities. In time, future medical examiner buildings will serve to set facility standards for our profession.

More importantly, it is for us, the organized medical examiners of the United States and Canada, to improve currently good standards of performance by example and to disseminate these via organized well-structured activities of the NAME. We can achieve this only if we study the perceived successes and failures within our member component agencies.

Administrative procedures that work well for a large urban jurisdiction such as Los Angeles or New York should be monitored and incorporated into our thinking for the future of similar agencies. What works well for a large state, such as Florida, should be likewise studied with regard to other large area states. Administrative problems should

be carefully studied from a management theory aspect. Certainly problems and solutions studied by the External Audit Committee can be developed into excellent case management reviews.

I see for the future a stronger role for the NAME, becoming a resource for management studies of medical examiner practice. We already have members who, through experience and/or special study, possess organizational study skills suitable for such purposes. This approach, not the union mentality of individual member protection at all costs, will do much to assure orderly growth, maturity, and respect for medical examiners and their agencies.

We have come a long way since the NAME was founded. We have come a much longer way since Mr. Richard Child, Milton Helpern, and others championed the medical examiner system almost 40 years ago, when the National Municipal League authored model legislation to create medical examiner systems. Back then most medical examiner service areas in North American did not yet exist.

The future is upward—with patience and without complacency—as we respond to the political, economic, and demographic forces that impact upon the role of the forensic sciences in our society.

REFERENCES

1. Jason H. In: Elstein AS, Shulman LS, Sprafka SA, ed. *Medical problem solving, an analysis of clinical reasoning.* Cambridge, MA: Harvard University Press, 1978:x.
2. Adelson L. *The pathology of homicide, a vade mecum for pathologist, prosecutor and defense counsel.* Springfield, IL: Charles C Thomas, 1974:15.
3. Committee on Public Works. *1968 alcohol and highway safety report,* 90th Congress 2d Session Committee Report. Washington, DC: U.S. Government Printing Office, August 1968.
4. Robertson I, Mansfield RA. Ante-mortem and post-mortem bruises of the Skin. Their differentiation. *J Forens Med* 1957;4:2–10.
5. Moritz AR. Classical mistakes in forensic pathology, 1956. *Am J Clin Pathol* 1956;26:1383–97.