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## CHAPTER 7

# Certification of Deaths From Narcotism and Other Psychoactive Drugs of Abuse

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The complexity of the problem of death certification is well illustrated in the present large number of deaths from narcotism and other psychoactive drugs in the United States. These deaths, when their cause is correctly determined, are an important indicator of any overall increase or decrease of narcotic and other types of drug use and abuse, and provide important evidence of changes in prevalence and pattern of drug abuse in our population.

### THE CORONER AND MEDICAL EXAMINER SYSTEMS

In most areas of the country the investigation and certification of these deaths are the responsibility of official medicolegal agencies—either the office of coroner or that of medical examiner. The coroner's system is considerably older and was brought from England when the colonies were established. Coroners in this country are officials elected by the county and, with the exception of the States of Ohio and Louisiana, are not required to be physicians. Medical examiners are appointed officials of a county, municipality, or State. In jurisdictions that have adopted a medical examiner's system since 1915, medical examiners, in addition to meeting a medical requirement, must also be qualified pathologists able to perform autopsies and direct other related work. This last and important requirement varies considerably in actual practice in different places. In an effort to improve this unsatisfactory situation, the National Board of Medical Examiners has issued a guide to standards of performance for official medicolegal investigative agencies to provide a basis

for their accreditation (National Association of Medical Examiners, 1974).

Coroners and medical examiners have the same authority with regard to the investigation of deaths that are reported to them, but the lay coroner or nonpathologist coroner, in order to do his work effectively, may call on a physician to assist and advise him about the medical aspects of a death and may employ the services of a pathologist if an autopsy is indicated. But neither of the latter has primary responsibility in evaluating the death. Also, there may not be the necessary rapport between a lay coroner or physician coroner and the pathologist available to him. Furthermore, the coroner may not even call upon the available pathologist, and hence the pathologist may not provide the necessary interpretation and evaluation of the findings. The coroner may also omit data that are suggested by an onsite investigation (which may be carried out) or omit a careful perusal of a medical history of a death in a hospital many days after admission to the hospital.

The careful and meaningful certification of the cause of death is a responsibility which may be carried out by any physician who has been in medical attendance on a deceased person. But in many jurisdictions, the physician can exercise this function only when death has resulted entirely from natural causes, that is, from disease, and one for which the physician was in attendance long enough to make such a diagnosis. If the circumstances preceding or surrounding a death suggest possible violence or are otherwise unusual, or if the death has been sudden and unexpected or without medical attention, or was in whole or part the result of traumatic injury or poisoning, or has occurred during

official custody, a physician, even if he has been in attendance, cannot certify the death himself but must report it to the medical examiner or coroner for official investigation and certification. Unfortunately, not all deaths without medical attention or obvious suspicion with respect to cause are reported or accepted for investigation. What should be a mandatory requirement is too often optional in practice, and not much is done to compel compliance with the law in many jurisdictions.

### THE AUTOPSY AND CERTIFICATION OF CAUSE OF DEATH

Whether or not the postmortem investigation will include an autopsy and other possible examinations is at the discretion of the medical examiner or coroner to whom the death has been referred. The fact that an autopsy is included does not imply that the determination and certification of the cause of death can always be based on its findings exclusively, although such an impression exists in the minds of many physicians and most laymen.

It is very comforting for the medical examiner and forensic pathologist to encounter such clear-cut causes of death as a spontaneous rupture of a fresh myocardial infarction into the pericardial sac with massive hemo-pericardium, or of a ruptured aneurysm in various parts of the body, or stab or gunshot wounds, or other gross traumatic injuries involving vital organs.

But in many postmortem investigations the autopsy, although essential for what it does reveal, does not provide the complete answer. The neglect of chance information from an available source may result in failure to discover, for instance, a subtle traumatic injury without which the nature of an evident homicide would be obscured and gross findings of brain hemorrhage and meningitis misinterpreted as natural. The autopsy may also be incomplete on a toxicologic basis, or because it has to be done after the body has been embalmed, exhumed, or decomposed after a variable postmortem interval, or is inexpertly done by an inexperienced pathologist. Or the autopsy may be done completely by a pathologist who uncovers all the findings but misinterprets them. In such instances the autopsy

may lead to an erroneous conclusion or no conclusion at all as to the cause and manner of death.

It is surprising how often during an autopsy the pathologist is content to take a body apart quite thoroughly, and after cataloguing his findings arrive at a definite conclusion as to the cause of death despite the fact that his findings are incomplete, or if complete, subject to several interpretations dependent in part on a knowledge of prior circumstances which he fails to determine or take into consideration.

### THE IMPORTANCE OF THE CIRCUMSTANCES PRECEDING DEATH IN ESTABLISHING CAUSE OF DEATH

Many examples are available of how serious errors in the determination and certification and classification of the cause of death can be committed in connection with cases in which an autopsy has been included as part of the postmortem investigation, but where the circumstances preceding death were disregarded. Errors in establishing cause of death may occur with addiction deaths, deaths following episodes of acute psychosis with exhaustion in which tranquilizing drugs have been administered therapeutically, and deaths during surgery, anesthesia, diagnostic and therapeutic procedures. The investigation of the cause of such deaths is difficult and often handicapped because in most instances the autopsy findings in themselves do not provide the answer, which depends in large part on accurate knowledge of the circumstances preceding the death and information available at the scene of death. Autopsy can demonstrate overt findings, such as the effects of the explosion of an anesthetic, gross inadvertent injury to a large blood vessel during a difficult surgical procedure, perforation of the esophagus during esophagoscopy followed by fulminating suppurative mediastinitis, air embolism during uterine insufflation, and perforation of the pericardium and right ventricle with hemo-pericardium during diagnostic sternal puncture. But such cases are relatively rare, and in most deaths during surgery and anesthesia, the pathologist does not find an anatomical cause of death.

In some cases the prior condition for which surgery and anesthesia were heroically undertaken may be so obvious as to explain the death, so that the surgery and anesthesia are only a circumstance during which death occurred and not a cause of death. Examples would be the cases in which the victim of a shooting or stabbing is operated upon for profusely bleeding perforated wounds and dies during the procedure, or when a person who is already exsanguinated from a bleeding ulcer, carcinoma, or esophageal varix dies during surgery and anesthesia carried out in an attempt to repair or correct what is an imminently dangerous condition, for example, congenital or acquired valvular disease of the heart or great vessels.

A bedridden patient with advanced carcinomatosis and clinical evidence of painful hydrothorax may have a thoracentesis performed as a palliative measure, during which there is inadvertent and clinically unsuspected perforation of the enlarged elevated adherent liver largely replaced by metastatic cancer; this puncture causes a large hemorrhage into the peritoneal cavity, so that the dying patient is speeded on his way. The certification of the latter type of case can be done in such a way as to convey the impression that the neoplastic disease was not immediately dangerous to the life and that the thoracentesis caused death by puncturing the liver just as a stab wound of a normal liver might do. The improper certification of the cause of death after autopsy in such a case might very well convey the impression of malpractice. The language used on death certificates must be considered very carefully. It must not conceal and prejudice anyone's rights if a surgical or anesthetic, diagnostic or therapeutic misadventure has occurred, but neither should it be casual or suggest a negligence that never occurred. The conscientiousness of the forensic pathologist, the medical examiner, and coroner in certifying the cause of death is extremely important in such situations.

A history of prior illness and medical care, no matter how well documented, does not establish that a death was natural. The issue as to where the death occurred and the circumstances under which the body was found are as important in a medically unattended and unwitnessed death as the fact that there

was a prior medical history. If the death is considered likely to be a natural one, the required investigation should include a complete autopsy to confirm and establish this. The autopsy must be more than perfunctory, for obviously, if the history of heart disease is reliable but misleading, the evidence of prior occlusive coronary artery disease and myocardial infarction would be found at autopsy but would not rule out the possibility of concealed fatal violence like choking on a bolus of food, strangulation, electrocution, a fractured upper cervical spine, or poisoning.

Any reasonable possibility of violence must be explored by the forensic pathologist, who should be skilled and experienced in his work. Too often such autopsies, if they are undertaken at all, have been delegated to the least experienced pathologist on the staff who has only just begun his training. It is not possible for the inexperienced to review such autopsies satisfactorily. An autopsy is not a simple technical procedure, but is one that requires experience and skill for a correct interpretation and an awareness of indications for additional studies including necessary toxicologic, histologic, microbiologic, and serologic examinations. X-ray facilities should be available when needed. Good photography of significant findings should be carried out at the autopsy table and, when indicated, at the scene. A poorly performed, incomplete autopsy by an inexperienced, unsupervised pathologist in a sense is worse than none at all, for, when no autopsy is performed, the limitations of the investigation are recognized; whereas the performance of an autopsy provides the erroneous impression that the cause of death has been determined, which may be far from the fact, especially if the autopsy was inexpertly performed.

Deaths from narcotism and drug abuse are easily overlooked. Corroborative autopsies, to be such, must be thoroughly performed and subtle competitive causes considered and looked for. A recent fatal acute amphetamine poisoning of a middle-aged man would have been overlooked if a spurious history of rheumatic heart disease had been believed by a medical examiner, and autopsy not performed. The death led to investigation of the physician's practice and revocation of his medical license.

Another need for the meaningful investigation of deaths is a better understanding of what is the cause of death in a given case. Obviously with gunshot wounds and other penetrating or blunt force injuries or with unequivocal poisoning or natural death, the cause of death can be pinpointed. This type of case offers no problems with respect to the determination of the cause of death.

But there are many deaths in which the cause cannot be designated in such a simple manner. This is especially true when an unexpected death occurs and the history reveals an illness best illustrated by the acutely disturbed maniacal patient who is already confined in a psychiatric hospital or was just admitted there for treatment or is resisting arrest and custody without hospitalization ever taking place. Before the days of medicinal tranquilizers, such disturbed catatonic patients were treated palliatively with restraints and hydrotherapy consisting of prolonged immersion in a tub of cool water. After a period of such treatment most of these patients improved and their symptoms subsided. Some, however, died after a period of persistent fever and hyperactivity. Some died unexpectedly or were found dead after a period of prolonged excitement and hyperactivity. A complete autopsy would disclose no anatomical cause of death. Toxicologic studies were also negative. The cause of such deaths was certified as "acute psychosis with exhaustion" or "exhaustive psychosis." Death was physiologic and the mechanism was not clear and not evident in the autopsy. Without knowledge of the clinical history, the cause of death would have to be designated as undetermined. But the fact remains that such unexpected deaths of acutely disturbed and maniacal patients did occur, and the cause of death could not be pinpointed. The difficulties of certifying the cause of such deaths were appreciated by everyone who encountered them.

#### "PINPOINT" AND "FRAMEWORK" ANALYSES

In a critical review of a group of autopsy-negative deaths of mentally ill patients attributed to the phenothiazines during the 15-year period prior to 1973, when these

drugs were used extensively as tranquilizing agents, Peele and Von Loetzen (1973) pointed out that these unexpected deaths attributed to phenothiazines were similar to a group of deaths reported to the Association of Medical Superintendents of American Institutions for the Insane as long ago as 1849 by Dr. Luther Bell of the McLean Asylum in Massachusetts. Bell's paper (1849) concerned 10 patients who died suddenly, in whom autopsies failed to reveal an adequate explanation for their deaths. His report gave rise to the term "Bell's Mania," to describe this entity which later was more commonly designated as "lethal catatonia." It was also called "exhaustive death" and "deadly catatonia," or "exhaustive psychosis." The authors pointed out that after 1956 such unexpected deaths were designated as "phenothiazine deaths" and not "lethal catatonia." They questioned attributing these deaths to phenothiazines, and suggested that these mentally ill patients who died unexpectedly after a period of agitation, disturbed behavior, and fever, with negative autopsy findings, were dying from the "lethal catatonia" described by Bell rather than from the effects of medication with phenothiazines. *The administration of a tranquilizer and its recovery in the body during life or after death do not establish it as a cause of death.*

During the past few years, mentally disturbed patients, including some narcotic addicts, continue to be admitted to psychiatric hospitals and, instead of cold-tub therapy, are given sedatives or tranquilizers such as glutethimide (Doriden) or the phenothiazines; more recently, if these substances are not effective in the instance of addicts, methadone has been prescribed for its tranquilizing effect. With no more indication than formerly with the unmedicated disturbed patient, unexpected death of such medicated disturbed patients may occur even after an initial apparent improvement in their condition.

Again, the autopsy findings in many such deaths are negative for an anatomical cause of death. Now the toxicologist is called in, and his sophisticated complete analysis reveals the drugs which had been used in treatment, any of which may have been taken prior to admission to a hospital.

Can the cause of such a death be pinpointed any more than it was in the former psychiatric patient who did not receive such tranquilizing medications? I believe not, and I believe that it is incorrect and an oversimplification to state the cause of death as, for instance, acute glutethimide or phenothiazine or methadone poisoning. Yet this is being done in many instances by forensic pathologists whose experience has mainly been with "pinpoint" causes of death, such as gunshot or stab wounds, which are easily found on and in the body and retained as evidence in a bag or jar until needed in court as an exhibit. The causes of such deaths are easy to certify, although there may be some difficulty in classifying the particular manner of death as to whether they were homicidal, suicidal, accidental, or in an undetermined category.

The determination and certification of deaths, as much as vital statistical divisions would like them stated unequivocally for ease of coding and classification, cannot always be documented so unequivocally. At times the cause of death must be outlined within a broad framework of circumstances utilizing both the clinical history and a complete autopsy, and not attributed to only one of several toxic chemical substances without consideration for the other findings and the clinical circumstances. This may be a time-consuming and arduous task for the medical examiner or coroner, and is more difficult than the certification of a death by gunshot wound or fractured skull.

The present volume will provide a basis for what is necessary for a meaningful and comprehensive certification of death of a person from psychoactive drugs. Many such deaths can only be described within a framework and should not be attributed arbitrarily to one drug.

When deaths from intravenous heroin addiction were rampant in New York City (Helpem and Rho 1966), the combination of circumstances, namely, crude drug injection devices, multiple needle punctures and their scars, coupled with almost characteristic post-mortem and chemical findings of heroin derivatives, made it easy to pinpoint the cause of death as an "acute reaction to an intravenous injection of heroin," or as an infectious complication of intravenous injections of

heroin with contaminated syringes and needles. It is important to recognize and trace cases of infectious endocarditis, generalized sepsis, and viral hepatitis as direct complications of intravenous narcotism in heroin addicts. Endocarditis is not primary but secondary to a primary site of thrombophlebitis that can be demonstrated in an infected injected vein. Tetanus, more common in females than in males, is a complication of subcutaneous narcotism (skin poppers). The gross appearance of the cutaneous addict with deep subcutaneous abscesses and phlegmons is usually characteristic when tetanus is a fatal complication.

There are also deaths of addicts from other causes, including homicide, suicide, accidental trauma, and death from natural causes. The routine autopsy of an apparent narcotic death not infrequently reveals an unsuspected death in these last-mentioned categories.

In recent years in New York City there has been a striking change in the pattern of narcotic addiction. This may be dated to the advent of methadone as a modality of treatment introduced by Dole and Nyswander (1965, 1967) using a group of hospitalized, carefully controlled intravenous heroin addicts, and later at larger methadone maintenance centers set up throughout this city and elsewhere.

Methadone, a synthetic substitute for morphine introduced during World War II, has been found to block the intense craving of addicts for heroin and maintain them when it is administered as a substitute. It is given orally, usually in orange juice, in gradually increasing doses starting with about 10 mg and increasing to 100 mg or 120 mg a day, after tolerance has been developed.

Carelessness has resulted in children finding and drinking the methadone solution left in a refrigerator by the addict and some fatalities have occurred in this manner, as well as when it was surreptitiously given in a large dosage to a nonaddict without tolerance.

Heroin addicts who have gone on a supervised program of methadone maintenance have been able to function and return to work without reverting to heroin. Some addicts who have not cooperated in the program have been found to use a variety of drugs, including methadone, obtained illicitly. This large

variety of illicit drugs available to addicts has enabled them to get along with an occasional indulgence in heroin but without the intense craving for it which formerly existed among all heroin addicts. With substitute drugs including methadone, former heroin addicts, even though not on a supervised methadone program, are no longer entirely dependent on heroin, the most addictive narcotic drug of all.

Deaths of addicts in New York City from intravenous injection of heroin mixtures have diminished by a factor of 10. Deaths of addicts in which methadone alone was found—according to complete toxicologic analysis—were 11 percent in the first half of 1973 and are now at a higher level. The remainder and majority of deaths of addicts reveal intakes of combinations of multiple drugs, including mixtures of methadone, heroin, alcohol, amitriptylene (Elavil), barbiturates, propoxyphene (Darvon), or benzodiazepines such as diazepam (Valium), chlordiazepoxide (Librium), oxazepam (Serax), etc. Other drugs are now encountered less frequently in fatal cases, and these include the phenothiazines such as chlorpromazine (Thorazine), glutethimide (Doriden), cocaine, and methaqualone (Quaalude). *The importance of a complete toxicologic analysis in all fatalities from known and suspected addiction is evident.* With the multiplicity of drugs encountered, it is no longer sufficient for the toxicologist to confirm the presence of a single drug considered as the most likely substance to have caused death. Use of alcohol is encountered more often in its effects on the liver than it is found by the toxicologist. In addicts surviving more than 24 hours after its ingestion, alcohol cannot be demonstrated chemically, and its presence must be determined from the autopsy and history.

The total number of deaths of narcotic and heroin addicts from addiction in New York City has diminished in recent years. The highest number occurred in 1971, and since then the total has diminished each year.

Narcotic deaths can no longer always be pinpointed and attributed to a single drug to the exclusion of others without regard for the clinical history and circumstances surrounding the death. The death of an addict who has

jumped off a subway platform to be killed by an oncoming train cannot reasonably be attributed to methadone poisoning or be designated as methadone-related because a trace of methadone is found in his body. Such a designation and inference that methadone had caused death would be an unjustified conclusion of a medical examiner's or coroner's office. The use of the "framework diagnoses" would prevent an impression of unfairness or bias by an official agency in addition to providing a meaningful explanation of the cause of death.

The value and need of the framework certification of the cause of death are shown in the following two cases. The first is somewhat similar to the unexpected death of an acutely disturbed person who has not received any tranquilizers; the second is a disturbed former heroin addict who was committed to a prison ward, treated with tranquilizers including methadone, and died unexpectedly.

The first case illustrates the complexity of certification of the cause of death and why it is not possible to provide a "pinpoint" cause. It did not involve the discovery or history of the use of drugs; there was no addiction factor but rather a sudden onset of maniacal and antisocial behavior.

**Case One:** The deceased was an 18-year-old athletic and strongly built black man who excelled in track and football and was the recipient of a college scholarship. He was apparently doing well but unexpectedly decided to give up his college career and return home, to the disappointment of his parents.

He then developed an acute personality disorder including an interest in voodooism, followed by unusual, aggressive, violent, antisocial criminal behavior manifested by the commission of assault and robbery necessitating forceful arrest, with violent resistance on his part; during which he received multiple contusions of the scalp, neck, shoulder, wrists, and an exposure to tear gas followed by his sudden death not explicable on the basis of traumatic injuries—which were minor at autopsy. There was no demonstrable evidence of tear gas exposure. It was concluded that death was caused by a combination of all the circumstances. This sudden death is somewhat analogous to death resulting from acute exhaustion following extreme hyperactivity of an acute mentally disturbed patient with or without minor physical injuries and with

an otherwise negative autopsy coupled with the absence of any narcotic drug.

**Case Two:** The clinical history in this death of a disturbed narcotic addict remanded to the prison ward of a large hospital by the court on complaint of his mother whom he attempted to stab, illustrates the importance and necessity of an inclusive "framework" certification of the cause of death with none of the significant facts omitted. An attempt to pinpoint the cause of death in such a case, selecting only one of the many findings, may inadvertently or deliberately attribute death erroneously to only one drug in complete disregard of the surrounding circumstances, namely, the mentally disturbed condition of the patient, a known intravenous heroin addict. The unsuccessful use of other tranquilizers, such as phenothiazine and glutethimide prior to the use of methadone, and the calming effect of methadone immediately after it was given, indicate that the situation was a complex one. When this death was first investigated, the medical examiner concluded that death was caused by acute methadone poisoning, an assignment of causes which did not take into consideration all the clinical facts. The certification suggested that the medication was routinely and carelessly given to the patient, and that the fatal poisoning was an immediate consequence.

When this patient was first admitted in a disturbed state he was given chlorpromazine at 12 o'clock noon, 3 p.m., and 9 p.m. Additionally, 40 mg of methadone was administered at 3:40 p.m. on the same day. The first two of the three doses of phenothiazine (chlorpromazine) did not control the patient's antagonistic and disturbed behavior. The methadone was administered in a 40 mg dose because the chlorpromazine had not had any calming effect on the patient's hostility, but after it was given the patient became more tractable and manifested a more cooperative relationship with those around him on the ward. At no time between 3:40 p.m., the time the methadone was administered, and 9 p.m., when he was given the third dose of chlorpromazine, was there any indication of an adverse reaction from any of the medications. The deceased was up and around and described as active and alert during his dinner meal and afterwards. He was observed entering his bed at 11:30 p.m., at which time his gait was steady and he was in no apparent distress.

In the 12 p.m. to 8 a.m. nurses' rounds he appeared to be asleep. At 6:45 a.m. the next day, he was found dead by the nurses, and at 7 a.m. was pronounced dead by a

physician. The death was reported to the medical examiner's office.

There was evidence, both clinically and in previous admissions, that the deceased had been a narcotic addict and had used heroin and cocaine. Old needle-track scars were noted in the hospital, and confirmed at autopsy.

Autopsy revealed pulmonary edema and acute bronchopneumonia and other evidences of drug addiction. Toxicologic examination of urine by thin-layer chromatography revealed evidence of methadone and thorazine. Toxicologic examination of the organs, urine, and bile in the medical examiner's office revealed a small amount of methadone in the liver and a faint amount in the brain, also a small amount of methadone in the urine, and a chlorpromazine derivative in small amount in the stomach with a trace amount in urine and bile. Opiates were absent in the bile and urine. Acidic drugs were absent in the stomach, brain, and urine.

In view of the clinical report, the long period of time after the administration of the methadone during which the deceased exhibited no evidence of an untoward reaction to any of the medications including the chlorpromazine (the ineffectiveness of which was followed by the single 40 mg dose of methadone), and the knowledge that the deceased had been an intravenous heroin addict and admittedly had taken cocaine on occasions, make the decision of the precise cause of death uncertain.

The death was unexpected and unusual. The autopsy findings of pulmonary edema, acute pneumonitis, and hyperplasia of lymph nodes corroborate the fact that the deceased was an addict with small amounts of methadone and thorazine found in the tissues. The previously disturbed condition of the patient must also be considered. There is no basis for an arbitrary conclusion that the death of this disturbed addict, sedated with methadone as well as other tranquilizers, resulted from an overdose of methadone and that the methadone was wrongly administered.

## SUMMARY

The problem of certification of the cause of death in narcotic addicts and other psychoactive drug-related deaths can be very complex. A valid cause of death must be described within a framework of circumstances, clinical history, and autopsy and related findings. The

more complete and accurate the information in a given case, the more meaningful the cause of death will be. Forensic pathologists, medical examiners, and coroners must become aware of their responsibility in this regard and resolve that the pinpoint type of cause of death cannot be used in such situations.

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