Ann L Bucholtz. History of death investigation. FORENSIC SCI SEM, 2015, 5(1): 15–19. FORENSIC SCI SEM
Received 30 September 2014
Received in revised form 12 January 2015
Accepted 12 January 2015
Available online 18 April 2015
Peer Reviewed
2157118X.5.1.R2

History of Death Investigation

Ann L. Bucholtz [*, a]

a Qualified adopters and instructors need to register at the this link for access: http://textbooks.elsevier.com/web/manuals.aspx?isbn=9781455774371.

* Corresponding Author.

1 Introduction

Forensics, derived from the word "forum," refers to the application of various fields of science and medicine in the resolution of legal proceedings. The beginnings of forensic science were crude and rudimentary but formed the basis of areas of research and progress to modern-day use of lasers, sophisticated laboratory equipment to identify particles and drug identification, and computerization to improve response time to locate the answers to questions asked by investigators, some in near real time. This chapter reviews the historical beginnings of forensic medicine and its parallel in criminalistics, contrasts the coroner and medical examiner investigation systems, as well as provides insight into governing for accreditation, certification, and licensure.

2 Mandates, Jurisdiction and Laws

Forensic science has its origins in early China and was documented in an early transcript of text, Washing Away of Wrongs by Sung Tz'u written in 1248. He was a criminal affairs officer who wrote the book based on personal experiences. Within the text he described a scenario of a local village murder by a sickle used to harvest grain. The murderer was unknown and the investigator had each farmer bring their tools to the village to be examined. It was noted that flies were attracted to one particular sickle. This was apparently due to adherent tissue and blood on the tool and ended with the farmer admitting to the crime. The story has roots for the basis of forensic entomology with its observation of the relevance of insects and their relationship to the cycle of death. He described handling of male corpses by local men of low social standing and the female corpses were managed by local midwives.

The early Greeks performed anatomical dissections in an attempt to understand the workings of the body and organ relationships. However, it wasn't until the late 18th century when a book written by Giovanni Morgagni that described autopsy dissections with descriptions of disease processes that they gained acceptance in the West. This served as a framework in the late 19th century for Dr. William Osler, the acclaimed physician and educator, supporting the autopsy as a great teaching method for physicians to learn about their patient's disease and to see for oneself the disease process. His work and influence served as the basis for medical training that still is in existence today. The period after World War II showed extensive interest in autopsies, and most were done in the hospital setting to gain knowledge about the effectiveness of new treatments, as well as learn about the disease itself. Hospital autopsies were done for approximately 50% of deaths.

In 1954 the United States passed the Model PostMortem Act, which outlined general classes of deaths that need to be further investigated and certified by a government body rather than a hospital pathologist or treating physician. This act was used as a framework for each state to develop its own particular laws regarding death investigation. The act outlines reporting of all violent deaths; unusual, unnatural, or suspicious deaths; all prison deaths; and any death thought to represent a public health hazard. Over the years, each state has modified their laws to adapt to advances in the medicolegal

system, but for the most part they read as they were originally written and reflect these guidelines.

Today, it is estimated that hospital autopsies are done in less than 10% of hospital deaths. The decline is related to multiple influences, including the deleted requirement by the Joint Commission of American Hospitals (their accrediting

body) for a minimum autopsy rate and reimbursement to the hospital for this service, as well as improved radiologic methods for patient evaluation [1]. The interesting finding, however, is autopsies discover 22–33% findings that were not previously known even with the current technology [1]. They provide answers to families and further understanding to medical science, but unfortunately continue to decline in the hospital community.

Caseloads for medical examiners and coroner offices continue to increase as the population increases. With shortages of forensic pathologists and limited tax-based funds, death investigation offices must limit autopsies performed to those mandated by law. This creates a void for hospitals and families wishing for answers. Hospital pathologists rarely perform them, and in modern hospitals, morgues are no longer included as an essential area of the laboratory department. Those autopsies not falling under jurisdiction of the state's death investigation laws require signed family permission to proceed. State laws even outline the family members who may give this permission, usually following the order of spouse, adult children, parents of the deceased, adult siblings, a legal guardian, and then the individual charged with the disposition of the remains.

In the situation of religious objections and deaths falling under the jurisdiction of the death investigator, an autopsy may proceed without family permission. However, it is best for public relations to work with the family and try to abide by their wishes or perform the autopsy within their religious constraints if at all possible. This may require a rabbi to be present during the procedure, collection of all body fluids to return with the body, or particular religious practices to be performed before or after the procedure. Muslim and Jewish religions request burials prior to sundown of the day of death if at all possible. Some religions forbid embalming. Some families request no autopsy because they wish to have an open casket and viewing of the decedent. With education about the procedure, they can be reassured that the incisions will be done in locations that will not preclude viewing, embalming, and open-casket funerals if the body was not damaged extensively by trauma prior to the autopsy. Objections can be overcome with meaningful conversations between the family and the death investigator or pathologist.

There is no universal body governing the death investigation system at a national level, and each state performs death investigations differently from its neighboring state. Many deaths reported to a death investigation office involve sudden death due to unknown mechanism. They represent natural diseases not previously or well documented prior to death, or the treating physician may be unavailable to sign for a patient with a well-documented history. Generally, there is a time limit in which a death certificate needs to be filed with a local health department after death. For this reason, the medical examiner serves as a resource to fill these gaps. The pathologist can issue meaningful causes of death based on medical records and external examination of the body without the need for an internal examination and full autopsy.

The local health department is the governing body that filters all death certificates to the National Bureau of Vital Statistics. They review and numerically code the causes of death into categories so that trends in causes may be recognized to adjust surveillance, prevention, and treatment practices. The local health department also issues burial or cremation permits to funeral homes after a valid death certificate is filed. They supply copies of death certificates, which are usually public record and can be obtained by anyone. The 1992 Model State Vital Statistics Act and Regulations serves as a template for each state to model their vital records practices and can serve as a reference to answer unusual questions when completing a death certificate [2].

The coroner system has been in existence since organized colonization began in 1492 when the concept was imported with the settlers from England. The first medical examiner office was established in New York

City in 1918, and it was the first government division of its kind in the United States [3]. They were also responsible for the first toxicology laboratory in 1918 [3]. The first chief medical examiner in the New York office was Dr. Charles Norris. This was followed by New York University establishing the first department of forensic medicine in 1933.

The Center for Disease Control maintains a list of the medical examiner and coroner jurisdictions within the United States [4].

3 History of Criminalistics

Parallel to the development of forensic medicine and autopsies, the world of criminalistics was also developing and spurring forward the science of evaluating evidence and tracking criminals. Alphonse Bertillon was a French law enforcement officer in the late 19th century who performed research in anthropometry, which is a study of physical characteristics of a person that make him or her unique. His study involved recording measurements of various body regions, such as forearms, trunks, ears, fingers, and faces, to differentiate one person from another. This had applications for differentiating criminals from each other, because the usual method had been for station police officers at the entrance to the jail to make visual identifications, which were sometimes inaccurate. The main purpose was to separate repeat-offender prisoners from first offenders. At the time, it was a huge scientific advancement and was thought to be reliable until the early 20th century when it failed to differentiate a case of twins. Although these particular measurements were eventually found to be unreliable, they formed the basis for the science of biometrics that utilizes a similar idea of individualizing characteristics but includes more detailed, patterned relationships, such as iris scans, fingerprints, and facial-recognition software used in security programs.

Another notable hallmark in criminalistics was the work of Edmond Locard in the early 20th century. He too was a Frenchman but with a background in medicine and law. He became interested in forensics during his studies and eventually formed the first criminalistics laboratory in Lyon, France, in 1910. He is best known for Locard's exchange principle, which states that whenever two items come into contact they exchange material between them. This is the principle used to recover evidence and particular trace evidence on the body or other items in a crime scene and link it to the individual who left it. The importance of this principle is that no scene is without trace evidence; it is the job of the investigator to locate it and collect it. Locard was also extremely interested in fingerprints, and through his work in microscopy, he detailed characteristics of them that are used today in fingerprint identification. He is generally considered the first criminalist.

In 1923, August Vollmer, chief of the Los Angeles, CA, Police Department, established the first American crime laboratory. The second crime laboratory was established in 1929 by Calvin Goddard (well known for his work in ballistics) at Northwestern University in Chicago, IL.

3.1 Coroners

Coroners are elected officials and in most jurisdictions the only credentials required for being placed on the ballot are a high school diploma and a voter registration card. Medical, science, or law enforcement background is not required. In some jurisdictions, the position has been combined with the sheriff position to decrease administrative overheads. In this case, sworn law enforcement deputies may rotate through the positions of death investigator and not be specifically trained in death-scene evaluations. There can be a public question of conflict of interest when investigations cross into departmental operations. Other jurisdictions utilize a separate department with a chief coroner and deputy coroners. Coroner positions may also be linked to local funeral homes as experienced personnel in dealing with the dead.

The history of the word "coroner" originates in England from the word "crowner," a tax collector for the dead. In old England, coroners were given the task of investigating any local event that might result in revenue for the Crown. Death was a potential source of money, and suicides, fires, shipwrecks, and others all were levied taxes or goods were confiscated by the Crown as fines. After the conquest of the Normans, the countryside continued to kill Normans. To discourage this, a heavy fine was levied against a community in which a Norman was found dead. It became

the job of the coroner to determine the origin of the dead person, and they largely assumed the person was a Norman and levied the tax unless someone could prove the decedent was English. This tax levy was known as "murdrum'" and became the origin of the word "murder" [5]. The concept of coroners and sheriffs was brought to the United States with the colonists when it was initially settled. It spread throughout the United States as colonies developed and the need for investigation and management of the dead became a necessity.

The United States varies from state to state in a mixture of medical examiner and coroner jurisdictions and combinations thereof [4]. Because coroners are not physicians, they are unable to perform autopsies. This is contracted to forensic pathologists who supply a cause of death to the coroner. The coroner then has the legal ability to certify the cause and manner of death on the death certificate. Most times, the coroner will agree with the cause of death, but if not, he or she may place any cause on the certificate or rule the manner as he or she wishes. Being a political position can have some bearing on this decision and is a potential downfall of the coroner system. Most times the job is performed justly and accurately in conjunction with the science of the autopsy in mind. In some jurisdictions, mainly ones where the position is combined with the sheriff department, the coroner is also a law enforcement officer with the ability to carry a weapon. Strict coroner office personnel are generally unarmed.

The chief coroner serves as an administrator and leader of the office for death investigations. Most times, he or she hires additional lay persons, many with a medical or law enforcement background, as deputy coroners who are responsible for day-to-day investigations. Because these positions are based on the county divisions of a community, a coroner's office can be a small operation. The deputy coroner may have a varied job description, including crime scene investigation, preparation of death certificates, body transport, and autopsy assistance.

3.2 Medical examiners

Medical examiners are forensic pathologists with education as a medical doctor (either an M.D. or D.O.), completion of at least 4 years of anatomic pathology (5 years if also trained as a clinical pathologist), and at least 1–2 years of subspecialty training in forensic medicine. In total, approximately 13–15 years of training after high school is needed to become a forensic pathologist.

Medical school includes the study of basic medical science, including pharmacology, pathology, biochemistry, human physiology, and anatomy, as well as patient care and skills necessary for the practice of medicine. Following medical school, medical students enter a residency program where they specialize in an area of interest. The residency begins with a general year that previously was known and perceived by the public as an internship with continued responsibility and in-depth learning of the specialty over at least 3 years (family medicine, internal medicine) to surgery and pathology (5 years). Because the study of medicine has become so complicated, large branches of medicine have subspecialized into even smaller groups, such as cardiology (internal medicine), head and neck (surgery), and forensic medicine (pathology).

There are a couple of clinical forensic medicine programs in the United States that are areas of subspecialization within emergency medicine but these are not common. Currently in the United States, there are approximately 500–600 board-certified forensic pathologists and 30–40 in training each year [6]. Unfortunately, the number training is less than the greater number of pathologists who are retiring, and there is a projected severe shortage as the number of pathologists continues to age and retire. Even though the number of hospital pathologists performing autopsies has greatly declined, the number of medicolegal autopsies continues to increase as the population increases.

A medical examiner office is typically under the direction of a chief medical examiner who reports to a board of supervisors, state legislature, or the department head of the public health department. Under the chief may be an additional forensic pathologist. Current recommendations are the performance of 250 autopsies per year and no more than 350 per year per forensic pathologist. In large population cities, more than 7,000 deaths are reported to a medical examiner office with at least 4,000–4,500 cases accepted for jurisdiction. Not all cases accepted are necessarily

autopsied and may be certified by history or external examination. The autopsy rate is generally at least 60% and more commonly greater than 70–75% depending on staffing and workload. At 4,000 cases, more than 10 pathologists are needed to comply with the accreditation standards. It is clear that even by present-day availability there is a shortage of forensic pathologists and current training will be inadequate to meet future society's needs.

3.3 Notable forensic pathologists

Milton Helpern was the second chief medical examiner of the New York City medical examiner office. His support of research and teaching led to many forensic pathologists to later become chief forensic pathologists in other locations, spreading the concept of forensic medicine throughout the United States.

Dr. Thomas Noguchi is a modern-day pathologist who is best known as the "coroner of the stars" and formed the basis of the TV show "Quincy." This notoriety and positive portrayal of death investigations improved the public's perception of the science of forensic medicine. Present-day TV shows similarly dramatize the work of crime scene investigators (CSIs), criminalistics, autopsies, and courtrooms. These shows are not totally realistic but have raised an awareness of the science to most households. The negative side is the "CSI effect," in which juries expect similar results on cases presented to them even though the real forensic science does not support many of the concepts dramatized nor operate under the same time and money constraints as TV laboratories.

3.4 Medicolegal death investigators

Medicolegal death investigators serve as observation personnel and key assistants to the forensic pathologist at scenes. It is not possible for the forensic pathologist to visit all scenes and observe the body as it was found. It would be ideal, but just not possible. Death investigators are trained personnel with skills in observation, photography, and social skills to deal with the public during difficult situations. Their backgrounds are diverse and a cross-section of skills is helpful in any office. Some investigators have a funeral home background as funeral directors, others are emergency medical personnel, nurses, retired law enforcement officers, or physician assistants.

The ability to speak to physicians and understand medical terminology is an essential skill. Rudimentary photography skills are also very useful, as well as basics in evidence recovery and management. The ability to explain medical findings to families in lay language and serve as an intermediary between the pathologist and family is essential. Report writing skills, including grammar, are also necessary. Formal education can vary from a high school education to graduate school. Most offices now will not hire an investigator without a college degree. They are also not eligible for board certification via the American Board of Medicolegal Death Investigators (ABMDI) without at least an associate's degree. The ability to become a good death investigator resides more on the personality of the person than a particular degree or level of education. Many of the skills are learned on the job or through various continuing-education and certification courses. They generally work on a shift basis and are available to receive death calls 24 hours a day. In some offices, the death investigator also serves as a body transport team. In others, removals from the scene are contracted to local removal services or funeral homes. Typically, medicolegal death investigators are unarmed and do not serve as law enforcement officers unless they are part of a sheriff–coroner system.

References

1. Rosenbaum G, et al. Autopsy Consent Practice at US Teaching Hospitals: Results of a National Survey. Arch Intern Med 2000;160(3):374–80. Retrieved from http://archinte.jamanetwork.com/article.aspx?articleid=485226. [July 2013].
2. Taylor P (chairperson). Model State Vital Statiscs act and Regulations; 1992. US Dept of Health and Human Services. Retrieved from www.cdc.gov/nchs/data/misc/mvsact92b.pdf. [October 2013].
3. History of the Office of Chief Medical Examiner. New York City Office of the Chief Medical Examiner; 2013. Retrieved from http://www.nyc.gov/html/ocme/html/about/about.shtml. [July 2013].
4. Hickman M, et al. Medical Examiner and Coroners' Offices, 2004. US Dept of Justice, NCJ 216756. Retrieved from http://www.bjs.gov/content/pub/pdf/meco04.pdf. [July 2013].
5. History. The Coroners' Society of England & Wales. Retrieved from http://www.coronersociety.org.uk/history. [July 2013].
6. Examination Information. The American Board of Pathology; 2013. Retrieved from http://www.abpath.org/. [July 2013]. ■