

## SO YOU WANT TO BE A MEDICAL DETECTIVE

A medical detective can be considered a "death investigator". There are a variety of professionals beside the police who may be involved in death investigation, including coroners, medical examiners, pathologists and forensic pathologists. Below is a description of each of these death investigators.

### What is a coroner?

A coroner is a public official, appointed or elected, in a particular geographic jurisdiction, whose official duty is to make inquiry into deaths in certain categories. The office of coroner or "crownor" dates back to medieval days when the crownor was responsible for looking into deaths to be sure death duties were paid to the King. The coroner's primary duty in contemporary times is to make inquiry into the death and complete the certificate of death. The coroner assigns a cause and manner of death and lists them on the certificate of death. The cause of death refers to the disease, injury or poison that caused the death. The coroner also decides if a death occurred under natural circumstances or was due to accident, homicide, suicide or undetermined means or circumstances. Coroners are called upon to decide if a death was due to foul play. Depending upon the jurisdiction and the law defining the coroner's duties, the coroner may or may not be trained in the medical sciences. The coroner may employ physicians, pathologists, or forensic pathologists to perform autopsies when there appears to be a question of cause or manner of death that autopsy can elucidate. In some jurisdictions, the coroner is a physician, but in many localities, the coroner is not required to be a physician nor be trained in medicine. In the absence of medical expertise, the non-physician coroner may have difficulty in sorting out subtle non-violent and violent causes of death. **TEN STATES USE CORONERS AS THEIR ONLY OFFICIAL DEATH INVESTIGATION PROFESSIONAL.**

### What is a medical examiner?

A medical examiner is a physician, hence, the title medical examiner. When acting in an official capacity, the physician medical examiner is charged, within a particular jurisdiction, with the investigation and examination of persons dying a sudden, unexpected or violent death **AND WITH DETERMINING THE CAUSE AND MANNER OF THE DEATH. THE MANNER OF DEATH IS: HOMICIDE, SUICIDE, ACCIDENTAL, NATURAL OR UNDETERMINED.** The role of a medical examiner differs from that of the non-physician coroner in that the medical examiner is expected to bring medical expertise to the evaluation of the medical history and physical examination of the deceased. The physician medical examiner usually is not required to be a specialist in death investigation or pathology and may practice any branch of medicine. Most systems employing physicians as part time medical examiners encourage them to take advantage of medical training for medical examiners to increase their level of medical expertise as applied to death investigation. The National Association of Medical Examiners and the American Academy of Forensic Sciences are two organizations that offer specialized training. **TWENTY-THREE STATES HAVE MEDICAL EXAMINER SYSTEMS, AND 18 HAVE MIXED SYSTEMS, THAT IS MEDICAL EXAMINER AND CORONER.**

### What is a pathologist?

A pathologist is a physician trained in the medical specialty of pathology. Pathology is the branch of medicine that deals with the diagnosis of disease and causes of death by means of laboratory examination of body fluids (clinical pathology) cell samples, (cytology) and tissues (anatomic pathology). The autopsy is the procedure utilized to study the dead. It is primarily a systematic external and internal examination for the purposes of diagnosing disease and determining the presence or absence of injury.

### What is a forensic pathologist?

The forensic pathologist is a subspecialist in pathology whose area of special competence is

the examination of persons who die suddenly, unexpectedly or violently. The forensic pathologist is an expert in determining cause and manner of death. The forensic pathologist is specially trained: to perform autopsies to determine the presence or absence of disease, injury or poisoning; to evaluate historical and law-enforcement investigative information relating to manner of death; to collect medical evidence, such as trace evidence and secretions, to document sexual assault; and to reconstruct how a person received injuries. Forensic pathologists are trained in multiple forensic sciences as well as traditional medicine. Other areas of science that the forensic pathologist must have a working knowledge of toxicology, firearms examination (wound ballistics), trace evidence, forensic serology and DNA technology. The forensic pathologist acts as the case coordinator for the medical and forensic scientific assessment of a given death, making sure that the appropriate procedures and evidence collection techniques are applied to the body. When forensic pathologists are employed as death investigators they bring their expertise to bear upon the interpretation of the scene of death, in the assessment of the time of death, of the consistency of witnesses' statements with injuries, and the interpretation of injury patterns or patterned injuries. In jurisdictions where there are medical examiner systems, forensic pathologists are usually employed to perform autopsies to determine cause and manner of death.

### **Specifically what does a Forensic Pathologist do?**

As a physician who specializes in the investigation of sudden, unexpected and violent deaths the forensic pathologist attempts to determine the identification of the deceased, the time of death, the manner of death (natural, accident, suicide or homicide) the cause of death and if the death was by injury, the nature of the instrument used to cause the death.

First, the forensic pathologist gathers a history as to how the death occurred and often obtains the past medical history of the deceased as well. Next, the forensic pathologist examines the body externally and then internally taking small samples of tissues to examine under the microscope for abnormal changes not visible to the naked eye. This postmortem examination is known as an autopsy.

During the course of the autopsy, various laboratory tests may be undertaken, including x-rays, retention of body fluids such as blood and urine and small samples of tissues such as liver or brain for toxicological analysis and cultures of body fluids and organs for evidence of infection.

When all of the information including the history, the results of the autopsy and the laboratory tests are completed, the forensic pathologist correlates all the information and draws conclusions as to the cause and manner of death. A report is then prepared summarizing these findings. The forensic pathologist can expect to be subpoenaed to testify before courts and other tribunals about the pathologic findings and conclusions. Coroners, medical examiners and pathologists provide copies of their official reports to parties, such as insurers or public agencies, having a legitimate interest in the cause and manner of death of citizens.

### **How does the forensic pathologist use the history, external physical examination, autopsy and laboratory studies to determine the cause and manner of death?**

The history is the beginning of the investigation and is of utmost importance in making the determination of cause of death. The scene investigation may disclose drugs or toxins which may be related to the cause of death. Some poisonous agents are not detected on a routine drug screens therefore the pathologist must have knowledge of medications and toxins in order to request the specific analytical tests needed to detect them. An example would include the "sniffing" of aerosol propellants, a risky activity which has been frequently reported in teenagers. Sniffing of propellant substances can cause sudden death by precipitating lethal cardiac arrhythmias. A special analysis (gas chromatography by head space analysis) is required to detect the chemicals in the blood. In other cases there may

be sufficient natural disease to account for death but the individual may in fact have died of a drug overdose or other subtle cause. In the case of drowning and suffocation the autopsy findings may not be specific and police investigation may be critical to the understanding of the death. Data developed by coroners, medical examiners and pathologists is studied by medical epidemiologists and health and safety agencies to develop strategies to prevent disease and injury, thereby saving lives. The data developed about injuries and fire deaths led to legislation requiring seat belts in vehicles and smoke detectors in building construction.

In the examination of skeletal or severely decomposed remains, the forensic pathologist needs a working knowledge of multiple methods of identification including forensic anthropology in order to establish identity. If sufficient skeletal parts remain, the pathologist may be able to determine the age, race and sex of the individual and sometimes estimate the length of time since death. Occasionally, specific markings on the bones may enable the pathologist to come to a conclusion as to the cause of death.

**What is the importance of performing an autopsy in someone in whom the cause of death is "obvious".**

The importance of examining people in whom the cause of death appears obvious is several fold. In the case of shootings or other fatal assaults the forensic pathologist, during the course of the examination, may recover bullets or other important trace evidence. In the case of motor vehicle occupants, it is important to determine who was driving and to assess driver factors, vehicle factors or environmental factors that might have caused or contributed to the crash. Forensic autopsies may identify inherited diseases that constitute a risk for next of kin. Examples include certain types of heart disease (premature atherosclerosis, hypertrophic cardiomyopathy) and certain kinds of kidney disease (adult polycystic kidney disease). Notifying the family would be an important service to the living. In individuals who have undergone medical treatment after collapse or injury it is important to share the findings with the treating physicians for educational purposes.

**How does an autopsy authorized by the next-of-kin on a patient dying in the hospital of a natural disease differ from an autopsy authorized by law as part of a medicolegal investigation.**

The hospital autopsy is often performed on individuals in whom the disease causing death is known. The purpose of the autopsy is to determine the extent of the disease and/or the effects of therapy and the presence of any undiagnosed disease of interest or that might have contributed to death. The next-of-kin must give permission for the autopsy and may limit the extent of the dissection (for example the chest and abdomen only, excluding the head).

A medicolegal (forensic) autopsy is ordered by the coroner or medical examiner as authorized by law with the statutory purpose of establishing the cause of death and answer other medicolegal questions. The next-of-kin do not authorize and may not limit the extent of the autopsy. Common questions include the identity of the deceased person, the time of injury and death and the presence of medical evidence (for example bullets, hair, fibers, semen). Observations made at autopsy elucidate how and by what weapon lethal injury was inflicted. During the course of the forensic autopsy, blood and other body fluids are routinely obtained in order to check for alcohol and other drugs. The forensic autopsy should be complete (including the head, chest, abdomen and other parts of the body as indicated).

### What is clinical forensic pathology?

Because of their expertise in interpreting methods of injury, many forensic pathologists also examine, upon request, living patients including individuals who have been sexually assaulted (rape) and children who have been injured to assist in determining if child abuse or neglect has occurred. The forensic pathologist also examines patients to determine whether the pattern of injuries is consistent with accidental or intentionally inflicted injuries. During these examinations a forensic pathologist may collect evidence for analysis. Examination of living patients is customarily performed on behalf of law-enforcement agencies needing the same information on the living as required on dead victims of injury.

### Where do forensic pathologists work?

Forensic pathologists are employed by states, counties, groups of counties, or cities, as well as by medical schools, the military services, and the federal government. In some settings such as medium sized and smaller counties the forensic pathologist may work for a private group or hospital which contracts with the county to perform forensic autopsies.

### How does one become a forensic pathologist?

- 1) After high school the future forensic pathologist attends college for 4 years and receives a bachelors degree.
- 2) After undergraduate school the aspiring forensic pathologist spends 4 years in medical school, earning an M.D. or D.O. degree.
- 3) After medical school there are several routes by which one may become a forensic pathologist. One may spend **THREE YEARS IN ANATOMIC PATHOLOGY (HOSPITAL PATHOLOGY) FOLLOWED BY ONE YEAR OF TRAINING IN FORENSIC PATHOLOGY. ALTERNATIVELY THE PROGRAM MIGHT CONSIST OF ANATOMIC PATHOLOGY, CLINICAL PATHOLOGY (LABORATORY MEDICINE) AND FORENSIC PATHOLOGY (5 YEARS) OR ANATOMIC PATHOLOGY (2 YEARS), FORENSIC PATHOLOGY (ONE YEAR) AND ONE YEAR OF NEUROPATHOLOGY, TOXICOLOGY OR A RELATED FIELD.** The residency training in forensic pathology involves practical (on-the-job) experience supervised by trained forensic pathologists. The forensic pathology resident actually performs autopsies and participates in death investigation. To become certified, one then must pass an examination given by the American Board of Pathology certifying special competence in forensic pathology.

Forensic pathologists practice medicine in the finest tradition of preventive medicine and public health by making the study of the dead benefit the living.