



Guide to Medical Examiner and Coroner Cases

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Background and Objective

Many potential donors of organs, tissues, and eyes are under medicolegal jurisdiction and require release before donation can occur. Although many death investigators support donation, much is at stake when evaluating a medicolegal case for release. Victims, their families, alleged perpetrators, prosecution and defense attorneys, and law enforcement agencies are all seeking the truth in the assessment of cause and manner of death. Death investigators are committed to performing the very best investigation possible to find the cause and manner of death. If the death investigators do not have a positive relationship with those in the donation community, it can affect their willingness to allow donation on medicolegal cases. If the opportunity to donate organs, tissues, or eyes are lost, this can affect the lives of many of those waiting for life-enhancing or life-saving donations and deny a potential donor family the opportunity to heal through donation. Education, communication, and consistency are necessary to ensure the best possible outcome for all involved. Information and education are powerful; however, if they cannot be properly communicated, then the knowledge is lost.

Despite the essential role death investigator relationships have on donation, national guidance or training material has not been developed for the donation community. While much emphasis has been placed on death investigators' support of donation, there has been little focus given to how the donation community may support the death investigation process. A lack of standard procedures, training, or practices promoting the preservation of evidence can all be contributing factors to the death investigator declining donation.

The American Association of Tissue Banks (AATB), the Eye Bank Association of America (EBAA), the Association of Organ Procurement Organizations (AOPO), and the International Association of Coroners & Medical Examiners (IACME) recognize the critical role that death investigators play in donation. This document has been developed to provide examples of beneficial practices and case studies that illustrate how such practices have been successfully utilized in tissue and eye donation cases under death investigator jurisdiction.

These practices are not requirements or standards but were developed to inform the donation community about practices that may beneficially serve the donor, donor family, and recipient by establishing measures to improve interactions on cases shared by death investigators and recovery organizations. Practices, policies, and procedures should be developed by each individual recovery organization in collaboration with the death investigation offices in their service area.

Defining Donation Stakeholders

Throughout this document organ, tissue, and eye organizations will be referred to generally as **recovery organization(s)**. These organizations may handle all areas of organ, tissue, and eye recovery and donation or may handle specific roles in their designated areas of donation.

What is Death Investigation?

A death investigation is a formal inquiry into the circumstances surrounding the death of a human being where investigative information is considered with autopsy findings and adjunctive studies (if performed) to determine the cause and manner of death (OSAC). The four primary sources of information used during a death investigation include information from: the body, any associated scene(s), a review of medical history, and information provided by family members and/or other witnesses. Death investigators may obtain information about the death directly, through verbal or written reports, or through review of photographs/ videos.

US Death Investigation Systems

US death investigation system structures and practices are highly variable. Titles, qualifications, authority, and responsibilities vary by state and county. State laws/statutes determine the roles of death investigators in your service area. Throughout this document we will describe common participants in the death investigation process (e.g., coroners, medical examiners, forensic pathologists, medicolegal death investigators, justices of the peace) will be referred to uniformly as **Death Investigators**.

A **coroner** (C) is generally an elected or appointed official whose duty is to oversee medicolegal death investigations, usually for a single county, and ensure certification of cause and manner of death. Coroner training and experience varies widely by jurisdiction and duties can vary based on local enabling statutes.

A **forensic pathologist** (FP) is a physician who is certified in forensic pathology by the American Board of Pathology (ABP) or who, prior to 2006, has completed a training program in forensic pathology that is accredited by the Accreditation Council on Graduate Medical Education or its international equivalent or has been officially “qualified for examination” in forensic pathology by the ABP. May be employed as a medical examiner or as a consultant to a coroner or Justice of the Peace.

A **medical examiner** (ME) is most often an appointed forensic pathologist whose duty is to oversee medicolegal death investigations, perform postmortem examinations, and certify cause and manner of death.

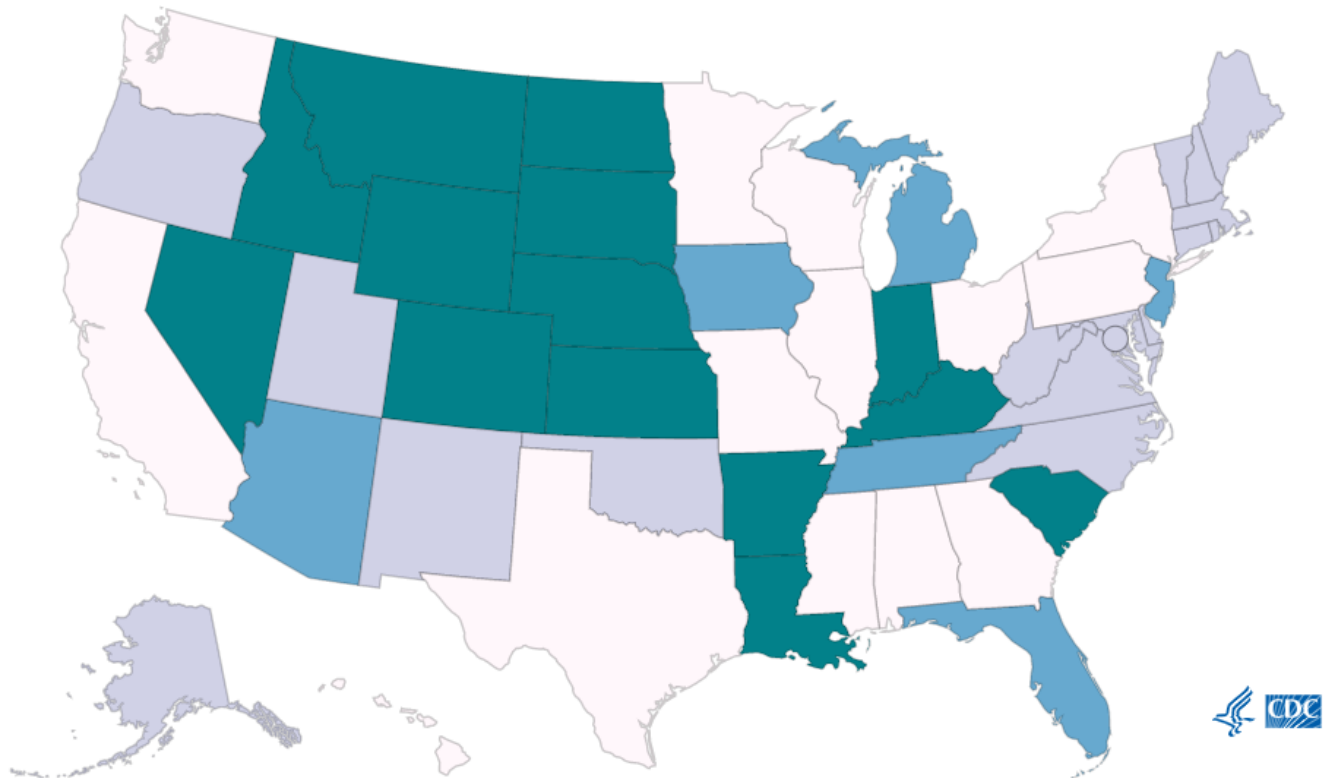
A **medicolegal death investigator** (MDI) is an individual who performs medicolegal death investigations. In practice, this title is often used to distinguish death investigators who gather information from outside of the autopsy suite from the forensic pathologist conducting the autopsy.

Some jurisdictions, particularly those which include outlying or remote populations, manage the death investigations locally, but transport the body to a regional center for autopsy.

There is currently no minimum national requirement for MDI training or experience, but a voluntary national certification process has been in place since 2005. Whether certified as a Diplomate (D-ABMDI) or a Fellow (F-ABMDI), certification demonstrates that a death investigator meets minimum competence in the investigation of deaths according to commonly accepted standards.

State and Regional Death Investigation Systems

Attempts to broadly categorize the US death investigation systems fail to adequately describe death investigation on a local level. For this reason, it is critical that recovery organizations establish policies, practices, and procedures within and include guidance from their local death investigation authorities. Though useful, efforts to define US death investigation, refer to **Figure 1**, tend to oversimplify the systems, when there are a variety of combinations. In some medical examiner systems, county-level investigation of death is administered by the county prosecutor/District Attorney while in other systems a Sheriff Coroner or Justice of the Peace may oversee death investigation. The map shows that while this model seems simple at first glance, there are a variety of combinations of the medical examiner/coroner system throughout the country which can make certain jurisdictions appear more complicated. For example, it is possible that in a jurisdiction with an elected coroner or justice of the peace, a board-certified forensic pathologist may be hired to conduct autopsies under the supervision of the coroner. It is also possible that a forensic pathologist may choose to run for elected coroner in another jurisdiction, thereby ensuring that the coroner position is staffed by an individual with extensive training in forensic pathology and death investigation.



Death Investigation Systems

- County-based mixture of medical examiner and coroner offices
- County/district-based medical examiner offices
- Centralized state medical examiner office
- County/district-based coroner offices

Figure 1. Death investigation systems, by state. Image: Centers for Disease Control and Prevention.

Communication and Relationship Management

Clear communication and proactive relationship management is at the heart of effective coordination of donation cases. This section describes best practices implemented in many different areas in the United States where the death investigators and local recovery organization work together successfully. Communication, as described in this section, encompasses both case-by-case communication as well as structured communication pathways developed to support timely and efficient problem-solving in complicated situations.

Relationship management cannot be discussed without mentioning the topic of trust. Death investigation offices and recovery organizations both have critical responsibilities with implications for public health, criminal justice, public policy, medical research, and community caretaking. Each office needs to be able to trust the other office to perform their role responsibly. The following guidelines outline ways in which roles and responsibilities can be proactively created, thus building trust through the establishment of clear and concise performance practices.

Contracts and Agreements

Business relationships that require timely and effective communication between offices are often best managed by establishing a shared written process for collaboration and communication. Although the

◆◆◆ Case Study ◆◆◆

A 37-year-old male with a history of alcohol dependency was found dead at the bottom of the stairs leading to his garden level apartment. The weather was cold, snow was on the ground, and there was some question as to the cause and manner of death. At the time of screening, it was unclear whether the decedent fell and died as a result of a head injury, foul-play, or hypothermia. Given the circumstances, the chief medical examiner was consulted. The death investigators agreed to release the body for the recovery of skin grafts and other specific tissue prior to autopsy (also called a *post* or *post-mortem*), but after an external examination was conducted and photographs obtained. As agreed upon in the interoffice MOU, the death investigator completed the release form and sent it to the established fax line at the recovery organization. The release form documented which tissues were released and, more importantly, which tissues could not be recovered prior to autopsy (e.g., heart for valves, lower leg blood vessels). The form also documented the number and color of blood vacutainers requested by the death investigator to be left with the decedent for toxicological analysis. The next day, the death investigator called their point of contact at the recovery organization and asked why only grey-top vacutainers were left with the decedent. The recovery organization manager opened the case and reviewed the release document faxed over by the death investigator and saw that red-top vacutainers were also requested.

It was determined that the recovery organization staff on the case assumed that this office only wanted grey-top vacutainers and did not reference the agreed upon release document. Corrective action and recovery organization staff training was conducted. The death investigator was informed of these corrective measures in an effort to rebuild trust in the donation process.

methods for documenting such agreements vary greatly on a national level, there are some typical best practices that have been employed successfully. These include interoffice *memoranda of understanding* (MOU), *letters of agreement* (LOA), or contracts that support the statutory requirements of the local city and/or county for both death investigation and donation.

A *memorandum of understanding* may be the simplest and most effective way to generate a document that meets the needs of both offices. While not an official contract, an MOU can succinctly outline mutually agreed upon practices. In addition, an MOU is easier to update when needed improvements come to light during the management of cases and decedent-related situations over time.

Letters of agreement are similar to MOU documents, but they are formatted to be closer to the structure of a contract and are commonplace in business agreements. They can be structured in a way to outline agreed upon practices.

Official contracts are sometimes used to manage interoffice business relationships and are the most formal way to capture agreed upon guidelines. A contract is advantageous since it will capture the signatures of key leadership professionals in each office to ensure that guidelines outlined in the document are mutually beneficial. Contracts are also typically used in situations where there is fiduciary responsibility of one or both of the parties in the contract. For example, the local statutes for coroner may require that the office have a contract with local recovery organizations and require that a recovery organization pay a specified fee for the case-by-case or monthly use of a dedicated recovery room within the ME/C autopsy facility. Since the

environmental requirements for successful tissue recovery are key to an aseptic recovery, a contract can also specify which party in the contract is responsible for the repair and upkeep of the recovery room used by the recovery organization. The contract may specify when and how often payment is rendered to the county and under what conditions. While all three examples given so far can include a *sunset clause*, thus allowing a document to get reviewed and reevaluated within a specified time period (e.g., every 1–3 years), a contract is most likely to contain such a clause.

Donation Related Expenses

It is the responsibility of the donation organization to ensure every avenue to preserve the opportunity for donation is exhausted. Additional evidence, such as tests and diagnostics, may enable the death investigator to make an informed decision concerning the release of organs and tissues for donation.

Expenses associated with the donation process are the responsibility of the donation organization. Such expenses include but are not limited to donor transportation, tests, and diagnostics such as radiography, and clinical consultations. The donation organization may establish protocol with individual death investigation offices determining the need for such practices or may elect to handle specific requests on a case-by-case basis.

Standard Operating Procedures

The use of standard operating procedures (SOPs) is not new to the functioning of a successful recovery organization and the use of such resources should not be overlooked when working with a death investigation office. As you will see in this guide, there are many details that must be attended to on each donor case and having procedures to outline these requirements is key. While there will be similar content that could apply to procedures written by different recovery organizations (e.g., handling of decedent personal belongings, handling of potential evidence, when to contact the death investigator on call), each death investigation office and recovery organization may prefer to handle these situations in a customized manner according to business needs as well as local and national statutes and regulations.

Effective Collaboration

One of the most important and effective best practices that your recovery organization can implement is one that Dr. Charles V. Wetli used during his tenure at the Suffolk County Medical Examiner's Office in New York. In a mutual agreement between the recovery organizations and death investigation office, a single point of contact at each organization was established for situations where problems were identified. A single point of contact may effectively remove any confusion on the part of the death investigation office regarding whom to contact and how to communicate the issue.

Unusual and/or suspicious findings are often identified during the physical assessment performed by the recovery organization. This is especially problematic if there is any possibility the finding may be related to the cause and/or manner of death. The commonly accepted protocol is to stop the donation process and contact the death investigator.

Blood sample acquisition provides an excellent opportunity to communicate and cooperate with a death investigator on a shared case. Routine cases are typically not an issue, as blood can be drawn either intravascularly by the recovery organization prior to autopsy or by the pathologist if the autopsy precedes the recovery. Problems arise in situations where a potential donor is plasma diluted and a pre-mortem hospital sample must be acquired for testing. As the death investigator has jurisdiction, the recovery organization will need to collaborate with them to potentially share or split pre-mortem samples to proceed

with donation. This is ideal as it allows both agencies to meet their separate needs, the death investigator to run toxicological testing and the recovery organization to run serological testing.

Interoffice communication can take place at any point during the management of a case and should not be limited to the time of the referral. The death investigation office can provide information that may be critical in determining donor eligibility, which can ultimately lead to the discard or release of the recovered tissues. While it may seem as though recovery organizations are more likely to consume information provided by the death investigation office, recovery organizations can also share critical information that can assist a death investigator.

Routine Communication

Once agreements, protocols, and customer service tools have been implemented, there are still opportunities to engage in communication. Regularly scheduled meetings may be mutually beneficial. In these scheduled meetings, outcomes, statistics, and overarching feedback can be provided and discussed by the recovery organization and death investigation office. Routine communication can also be related to the request and receipt of completed or preliminary autopsy reports, which are needed to finalize donor eligibility determination and release for tissue processing and distribution.

Donor Referral Systems

Many deaths take place outside of the hospital setting and may not be referred to the recovery organizations through standard channels. Developing a death referral agreement between the recovery organization and death investigation office may promote the opportunity for donation in the case of deaths which otherwise may have not been reported to the recovery organization.

Several recovery organizations and death investigation offices have established automated electronic referral programs to streamline this process and reduce the risk of human error. Automated referral systems may reduce staff time from both the donation organization and death investigator and enable expeditors information sharing through real-time case updates and the distribution of relevant records. Exploration of these referral programs may be beneficial.

Educational Opportunities

Educational opportunities for both death investigators and recovery organization staff can be placed in two categories: initial training and ongoing training. Initial training can involve the onboarding of both death

◆◆◆ Case Study ◆◆◆

A 54-year-old woman was found dead in bed by family members in the morning. The death investigator arrived onsite to conduct the investigation and the family members left the residence shortly after being interviewed by the death investigator. The death investigator contacted the recovery organization to refer the case. Due to training conducted in his office, he followed the checklist in his investigative folder and remembered to document the whereabouts of the family after they left the residence. The recovery organization called the telephone number provided by the death investigator and the recovery organization was able to successfully complete a donor authorization and Donor Risk Assessment Interview (DRAI). The recovery was successfully completed on the same day, between the external examination and post-mortem examination of the decedent.

investigators and recovery organization staff by their respective offices about procedures, forms, and guidelines. Ongoing training can take place in many different situations. Monthly or quarterly meetings and office sponsored skills days provide opportunities for learning. It may be helpful to give the death investigation office the opportunity to interface with critical recovery organization staff on a regular basis. Examples of orientation and training may include but are not limited to the items listed below.

Donation Organization Training Opportunities

- Recovery organization staff observing post-mortem examinations.
- Recovery organization staff learning how to take photos of the donor for investigative purposes from death investigators.
- Recovery organization staff obtaining continuing education credits by participating in local or regional death investigation courses, a practice supported by AATB, EBAA, and AOPO.
- Recovery organization staff participating in *ride along* investigations with death investigators for that office.
- Recovery organization staff attending a local or regional death investigator's association meeting to network and learn about common issues associated with donation.
- Recovery organization hiring a full-time employee to work as a liaison in the death investigation office.
- Recovery organization taking a tour of the death investigation office in order to understand the different aspects of death investigation including; toxicology, autopsy document release, family viewing areas, and decedent arrival/departure storage protocols.

Death Investigator Training Opportunities

- Death investigation staff witnessing the donor screening, authorization, and Donor Risk Assessment Interviews (DRAI).
- Death investigation staff being introduced to current clinical applications of organs, tissues, and eyes. Presentations may even be coordinated in cooperation with all local recovery organizations to cover all clinical applications in one presentation.
- Death investigation staff attending a recovery case with an experienced and knowledgeable team/person. It is commonly recommended that anyone who views a recovery procedure be required to see the entire process, to ensure that the viewer sees the level of care and attention given to proper anatomical reconstruction/restoration.
- Death investigation staff receiving training on the impact of donation on the family of the decedent.
- Death investigation staff receiving training on how other recovery organization and partner agency collaboration efforts are resulting in mutually beneficial working relationships.

Requesting Approval for Donation

State and local statutes grant the death investigation office legal custody over a decedent as evidence. In many instances, the death investigator is the only party that may permit or deny authorized donation from moving forward. As a result, donation organizations often request permission from the death investigator to proceed with donation. In most states, if the death investigator feels that the removal of specific organs, tissues, or eyes would jeopardize the medical and legal determination of the cause and/or manner of death, they have the right to restrict donation either entirely or partially.

It is imperative that all relevant information and case details be shared so that accurate decisions can be made. Effective communication and information sharing helps ensure that the death investigator can make an accurate and informed decision concerning the approval of organ, tissue, or eye donation. The clear and direct communication of circumstances of death, medical and social history, and other relevant factors fosters a more trusting relationship and may increase the rate of approval of organs and tissues.

When the circumstances surrounding a death are unknown or puzzling, the death investigator may be hesitant to approve donation prior to the investigation. The death investigator may also have concern that physical evidence, such as trauma or abnormalities, may be lost or go unnoticed by the recovery organization. The potential of missing something vital to the determination of cause and manner of death may lead a death investigator to deny donation or to restrict specific organs or tissues.

The decision to approve organ, tissue, or eye donation can be based on their potential application. A death investigation office may be less likely to approve donation of organs, tissues, and eyes which are only acceptable for medical research or education, as they are not utilized directly in patient care or therapy. Donation organizations should establish practices ensuring the intended use for transplant or non-transplant of organs, tissues, or eyes is communicated to the death investigator.

Record Sharing with Death Investigators

Information obtained during or because of the donation process may be of value to the death investigation. Medical records may be considered evidence and should be provided to the death investigator for the sake of a comprehensive death investigation. Some state statutes require the sharing and documentation of all physical findings and medical records. Statutes, agreements, and practices for distributing records should be developed by the individual recovery organization and the death investigator. As the death investigation and surrounding information is time-sensitive, practices should be developed which promote an expeditious release of information.

What Information May Be Beneficial to the Death Investigator?

Examples of relevant beneficial information may include, hospital culture results, final diagnostic radiographic dictations, serology/NAT and other infectious disease testing results, funeral home information, tissue processing culture results, the Donor Risk Assessment Interview (DRAI), the donor chart and physical assessment forms, emergency services reports, and progress notes.

The physical assessment performed prior to recovery and autopsy may provide much needed information to the death investigation. The physical assessment can also aid in confirming the identification of the donor. Estimated or reported information about the donor's weight, height, sex, race, the hospital ID band with a medical record number (MRN), and reported tattoos or piercings, can be cross-referenced with the DRAI and other medical records. Accurate pre-recovery height and weight are of tremendous importance to the death investigation; in particular, an accurate assessment of heart weight by the examining death investigator depends heavily on body size.

Recovery notes documented before, during, and after the recovery may contain detailed information of physical findings and chain of custody of collected evidence. These may include blood samples, vitreous fluid, medication patches, IV medication, clothing, bagged hands for gunshot residue testing, subdermal or intramuscular bruising noted during recovery, and noted internal trauma within recovery sites (e.g., extremities, chest, abdomen).

Cardiac pathology reports and histology slides are essential for a death investigation. After valve recovery, the post-valve recovery heart remnant is usually examined by a pathologist and a cardiac pathology report is issued. Copies of slides and/or the heart remnant may be returned at the request of the agency investigating the death. These reports can provide information that may be helpful in determining manner or cause of death, such as valvular heart disease, cardiomyopathies, endocarditis, congenital heart malformations, ischemic heart diseases, or benign or malignant tumors. Procurement and processing notes are of great importance to the pathologists investigating the death and examining the heart.

Ocular images and documentation of ocular abnormalities can be useful in gathering information surrounding the death of an individual. Certain findings, such as conjunctival hemorrhage or petechiae, can indicate trauma that may not be apparent during the body inspection.



Donor Risk Assessment Interview (DRAI)

A donor risk assessment interview, or DRAI, is a documented dialogue conducted in person or by telephone with an individual or individuals knowledgeable of the donor's relevant medical history and social behavior. The relevant social history is elicited by asking questions regarding certain activities or behaviors that are considered to place such an individual at increased risk for a relevant communicable agent or disease.

Thorough risk assessment is performed by asking questions that are answered by the individual completing the DRAI, providing a vital tool to screen for eligibility. These answers are recorded as part of the donor chart and offer a detailed description of the donor's history. Information obtained from the interviewee on the DRAI by the recovery organization may be critical to the investigation and may include, but is not limited to alcohol use, prescription drug use, recreational drug use, over-the-counter drug use, mental illness, incarceration, chronic and acute medical history, surgical history, primary care physicians and specialists visited by the decedent, and travel history. This interview may provide critical information and details surrounding the donor's history that connect or contribute to the cause and manner of death. For example, the sudden, unexpected death of a middle-aged individual while walking on the street may be simply and easily explained if a chronic history of untreated cardiac disease is revealed in the DRAI. This information may even rule the case a natural death, therefore transitioning the death certification to the primary care physician or clinician instead of the death investigator.

Infectious Disease Screening Results: Reasonable Disclosure of Information

The Department of Health and Human Services 45 CFR 164.512(b)(1)(iv) permits the disclosure and sharing of protected health information by covered parties when there is the potential for contraction and/or spreading of communicable diseases. All relevant medical records are discoverable as physical evidence and relevant to the death investigation by death investigator.

Serological, nucleic acid testing (NAT) (AATB Standards for Tissue Banking D4.230), or infectious disease screening results (e.g., Ebola, Zika, SARS-CoV-2) may be provided in accordance with the established practices and procedures as agreed upon by the individual recovery organization and the death investigator. Agencies involved in donation and death investigation share responsibility regarding testing for infectious diseases. Death investigators and donation agencies need to establish procedures to notify each other of testing being performed. Agencies will share testing results to reduce incidence of discordant test results that render donors ineligible and confound outcomes.

Documentation

Documentation of relevant physical findings, medical record findings, case-related communication with the death investigator, a decedent's personal effects, and disposition may be considered evidence and be beneficial to the death investigator. Findings should be described, but not interpreted, as diagnosing injuries or findings may be inaccurate and/or contradict the diagnosis of the death investigator.

Documentation of critical communication between the death investigator and the recovery organization is not only required to maintain real-time donor record management but may be discoverable in a court of law or subpoenaed. Details that are documented surrounding death investigator's release for donation, such as restrictions and requests, should be uniform and standard practices should be developed for individual offices in collaboration with appropriate death investigators. Information documented should include the first and last names of the persons contacted, as well as their title. The dates and times of these conversations should also be captured. Documenting method of contact can also be helpful (e.g., phone, text, email).

Identification

Documentation of decedent identification is essential in retaining the integrity of the chain of custody. As the decedent is under death investigator jurisdiction, granting approval to recover prior to the viewing/external examination/autopsy places the responsibility of maintaining the chain of custody on the recovery organization. This includes ensuring the traceability and location of the decedent and all associated potential evidence.

Establishing the Chain of Custody

The Organization of Scientific Area Committees for Forensic Science (OSAC) defines chain of custody as, “The order in which a piece of evidence should be handled by persons investigating a case, specifically the unbroken trail of accountability that ensures the physical security of samples, data, and records in an investigation.” Chain of custody should be established upon receipt of the donor, with the date and time recorded. Documentation of observations, physical evidence, belongings, witnesses, specimens for testing, and the location of recovery are a few examples of things that may be considered when documenting chain of custody.

When establishing custody, it may be beneficial to document any present parties. This includes recovery staff, transporters, mortuary service staff, hospital staff, death investigators, or funeral home staff. Documentation of witnesses is beneficial when itemizing belongings or specimens, establishing chain of custody, collecting specimens, and releasing custody. A detailed inventory of belongings and specimens, and their condition at the time of receipt, may aid in cases in which liability is in question or the viability of evidence is under scrutiny.

Documentation should be descriptive, but not definitive. For example, “yellow metal ring with clear stone” should be documented instead of “gold diamond ring”. In the unfortunate event that belongings are lost or misplaced, documentation of decedent effects may be utilized in assessing property values.

Clothing or other items should not be physically altered, cut, or torn. These belongings may also hold value in the investigative process. Damage to clothing or belongings may be used to match decedent injuries and provide more detail concerning how the injury took place. For injuries such as blunt force or sharp force trauma (e.g., gunshot wounds or injuries from a pedestrian vs. car), preservation of belongings (e.g., clothing, damaged items found in pockets) is critical to identifying the point of impact or the trajectory of a projectile.

Documentation of transportation may also be beneficial and relevant in efforts to maintain a positive working relationship between the recovery organization and death investigation office to provide reference or arrival and departure times when the investigation, autopsy, or funeral services may be time sensitive or delayed due to the donation process.

Specimens collected for the death investigator are critical to the investigation and are considered physical evidence. Assuring the integrity and viability of this evidence is another critical element in maintaining the chain of custody. Just like patient belongings, transferred specimens should be documented when custody is obtained, at the time of collection, and when custody is relinquished.

The chain of custody of specimens is established when a representative of a recovery organization takes custody of a specimen or item. An example of this would be a recovery organization staff member picking up a pre-mortem blood sample from a hospital laboratory. Custody is then relinquished when custody is established by any other person(s). For example, after the recovery is completed, that same recovery staff member gives a portion of the pre-mortem sample to the death investigation office.

Establishing a chain of custody enables the ability to identify breaches in custody. For example, following recovery, a secure seal or lock placed on a body bag may provide confidence that the integrity of evidence enclosed within the bag is maintained. A seal or lock may be single-use or reusable, (e.g., tag, wire lock, zip tie) which must be actively removed or damaged to open the body bag. Documenting when locks and seals are applied to evidence helps to provide a timeline of when a breach in the chain of custody may have taken place and can help identify the location of lost evidence or decedent belongings.

Cooling

Documentation of cooling times is not only essential for completing the donor record but may also be relevant to the death investigation. A lack of cooling can result in expedited decomposition and may impact findings. Therefore, detailed records of cooling timelines may be beneficial in diagnosing the onset of injury or identifying various post-mortem changes.

Eye and tissue banks also must document cooling times per AATB and EBAA Medical Standards. These cooling times help in determining the safety and eligibility of tissue. For eye donors, cooling time may be defined as the time the body is refrigerated or the time ice or cooling packs are placed on the closed eyes.

◆◆◆ Case Study ◆◆◆

An 18-year-old male died secondary to blunt force trauma from a motor vehicle collision. During treatment in the field, medics cut the decedent's clothing and inadvertently also cut through a metal necklace that was noted to be silver in color. Death was pronounced at the scene and all belongings, including the necklace, were enclosed in the body bag and transported to the local hospital morgue. The legal next-of-kin authorized donation and upon receipt of the decedent, the recovery technician noted a "broken silver-colored metal necklace and a cut black shirt" in the decedent's belongings. The family called, seemingly distraught, on the following day stating the recovery technician had destroyed the decedent's belongings. Documentation upon establishing custody permitted concise, positive follow-up to the grieving family members, as the damage occurred during life-saving efforts by paramedics.

Save

Discard Changes

Annotation List

- 1 - Abrasion
- 2 - Autopsy Incision
- 3 - Body piercing - requires description
- 4 - BP Cuff
- 5 - Bruise/Contusion/Hematoma
- 6 - Cast/Ortho Device
- 7 - Central Line
- 8 - Chest Tube
- 9 - Dressing/Bandage
- 10 - EKG Leads
- 11 - ETT/NG/OG Tube
- 12 - Fracture/Dislocation
- 13 - ICP Line
- 14 - ID Band/Tag
- 15 - IV/IO/Arterial Line
- 16 - Laceration/Wound

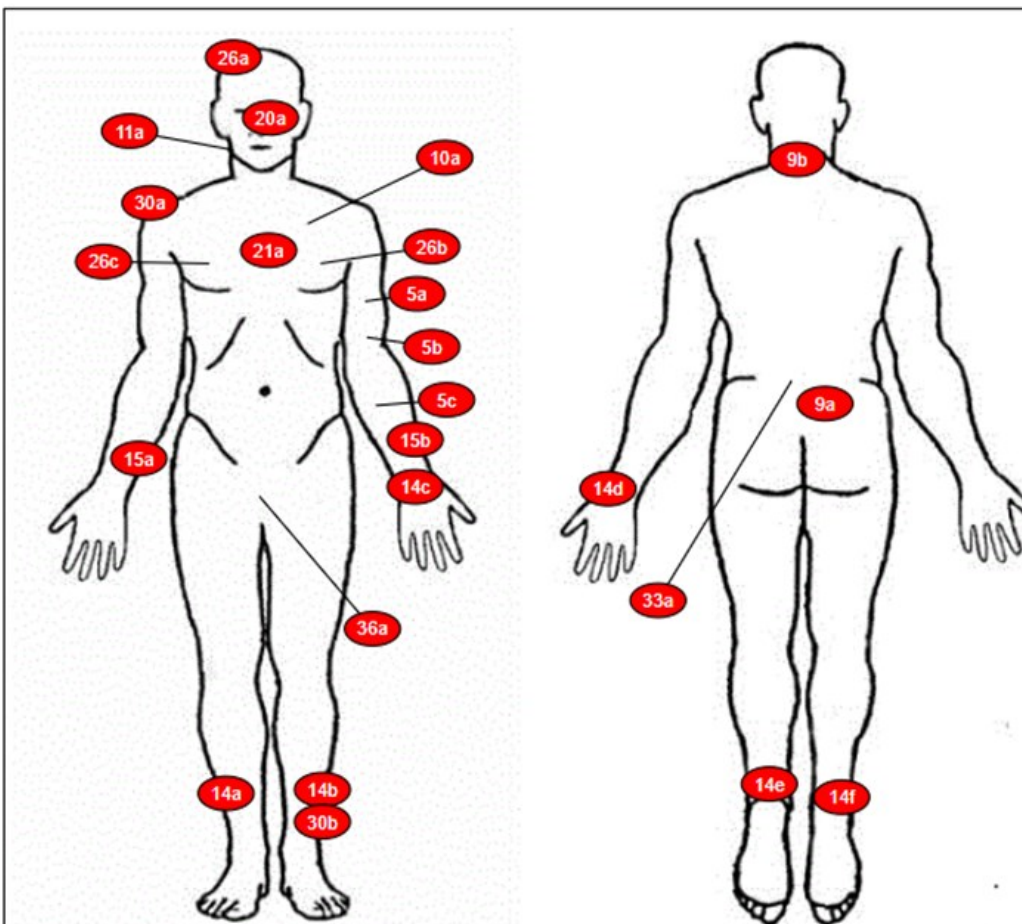


Figure 2. The image above illustrates how physical assessment findings may be documented in a donor record.



Medical Findings

Any new medical findings or potential diagnoses should be treated as though they are equally as important as the physical findings. Abnormal findings, diagnostic outcomes, and suspicion of active viral infections or communicable diseases should be relayed to the death investigator expeditiously. Signs of chronic comorbidities or diagnosis by a clinician directly related to the cause of death, or contributing to the cause of death, should also be relayed in an urgent manner.

Physical Assessment Findings

All physical assessment findings should be documented in detail to ensure that there is a record of relevant or discoverable findings, refer to **Figure 2**. This may include the identification of injuries, abnormalities, or *pertinent negatives* (the absence of outstanding or expected findings). This practice is essential to the proper completion of donor records and may also impact the death investigation. Detailed record keeping also provides historical reference points if an inquiry is made later.

Documentation should remain descriptive, with no interpretation offered. Identification of injuries and/or lesions (e.g., abrasions, contusions, lacerations, blood clots) should include the location of the finding and the estimated size.

◆◆◆ Case Study ◆◆◆

A 36-year-old male was admitted to the emergency room after suffering an apparent cardiac event with no prior medical history and no visible injuries or other concerning scene findings. He died in the cardiac intensive care unit (ICU) several days after admission. Due to the sudden nature of the death in combination with the decedent's young age, the case was under death investigator jurisdiction. Although the family gave authorization for donation and completed a DRAI, the death investigator was hesitant to release for donation. Upon further evaluation of the medical records, diagnoses of cardiomegaly, hypertension, and severe cardiopulmonary insufficiency were noted. This information was relayed to the death investigator, who then declined further death investigation, as the case was now considered a natural death. This case serves as an example of how recovery may confirm medical suspicions and strengthen relationships between donation organizations and death investigators.

It should be noted that there are differing perspectives on whether a recovery organization should document exact measurements of physical findings. While it is considered more accurate to measure a wound, scar, or other finding, there is a possibility that the death investigator will also measure the same findings, refer to



Figure 3. Apparent small laceration, roughly 2" superolateral to the right tibial tuberosity. Photo: Craig Nelson, MD.

Figure 3. If the physical assessment and autopsy measurements contradict one another, it may call into question which measurement is correct. It is most likely the measurement on the autopsy report will stand as a death investigator has more experience and training in the proper measurement of physical findings. This can be avoided by providing approximate measurements of physical findings, such as comparing the size to another well-known object (e.g., round lesion approximately the size of a quarter). Such documentation should also be maintained throughout the tissue recovery. The location, description, and size of abnormal intraoperative findings should be detailed in the same manner.

Significant Ocular Exam Findings

Ocular examination, refer to **Figure 4**, performed by the eye bank may yield information pertinent to the examination and/or eye donor eligibility. Once the eye bank performs a procedure (e.g., in situ excision or enucleation), the condition of the eyes will change. Observations noted during the pre-recovery ocular examination may include systemic (e.g., jaundice, sarcoidosis), local (e.g., petechial hemorrhages, pterygium, infiltrates, melanoma), surgical (e.g., previous cornea transplant, LASIK or other cornea re-shaping procedures, glaucoma tube shunt, iridectomy), traumatic (e.g., laceration, abrasion), or circumstantial (e.g., dirt, glass, debris) findings. The significance of observations to each involved party varies by case. For instance, an observation of a corneal transplant or prosthetic eye has relatively obvious implications for the



Figure 4. An ocular speculum placed to perform an ocular examination.



Figure 5. Icterus, also known as scleral jaundice.

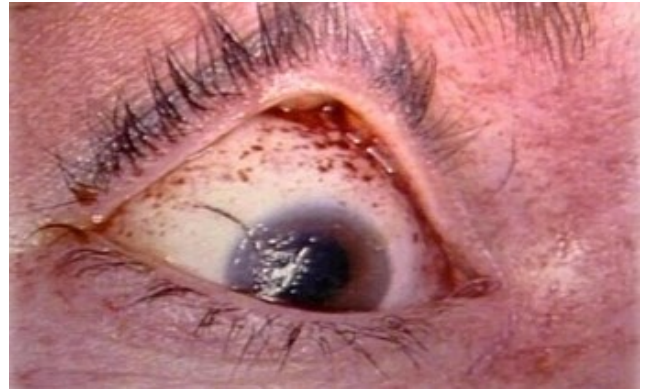


Figure 6. Petechiae due to strangulation.

eye bank, but may also be useful to the death investigator to assist in the identification process or in the investigation of case circumstances (e.g. the deceased is identified as having poor vision which may be relevant in the investigation). It is important for the eye bank recovery technician to note if contact lenses were present in the donor's eyes from an investigative, identification, and chain of custody perspective.

Jaundice, refer to **Figure 5**, is usually an indicator that there is an issue with a person's liver, gallbladder, or pancreas. This can be attributed to a variety of factors, which include cirrhosis, heart failure, hepatitis, sickle-cell anemia, acute pancreatitis, and carcinomas. Because it is possible to see jaundice in the ocular tissue only, it is important to document as a finding for the death investigator.

Petechial hemorrhages, refer to **Figure 6**, are small red or purple pinprick size dots of blood that appear under the skin or mucous membranes. Two of the main causes are trauma and excessive pressure (e.g., vomiting, strangulation, violent coughing). Asphyxiation, accidental or intentional, may result in the presence of petechial hemorrhaging of the face or conjunctiva, which is significant to the death investigation.

Preservation of Evidence

In cases where recovery takes place prior to the death investigation, critical pieces of physical evidence may be obtained or moved from their original location due to the nature of the recovery process. Removal of clothing, belongings, therapeutic medical devices/portals of entry (e.g., central lines, endotracheal tubes [ET], intravenous lines [IV], intraosseous catheters, gunpowder residue on the hands, and/or dirt or debris surrounding an area of injury or wound prior to evaluation and documentation by the death investigator would be considered an alteration of evidence. Removal or alteration of any items or evidence should not occur without the expressed permission of the death investigator.

◆◆◆ Case Study ◆◆◆

A 35-year-old woman was found dead as a result of head and neck injuries. The death investigator suspected that the injuries and cause of death were due to a fall taken by the decedent. The death investigator released for eye donation prior to autopsy. During the recovery, the technician noted petechiae on both eyes that were overlooked by hospital staff. The technician notified the death investigator of this finding and additional medicolegal investigation was performed. The death was determined to be a domestic violence homicide resulting from strangulation. Physical exam findings can be difficult to detect even in fatal strangulation cases. This technician's attention to detail allowed for identification of a dangerous criminal and protection of potential future victims. As the death investigator collected information surrounding the case, there was suspicion of domestic abuse. The petechiae that was noted by the technician led the death investigator to look at the injuries more closely. Because of this information, it was discovered that the fall was secondary to strangulation. NOTE: Based on the agreed upon protocol with the death investigation office, photographic evidence may be sufficient, or it may require an additional phone call prior to recovery.

The establishment of defined practices and procedures to ensure the integrity of findings and chain of custody, such as decedent belongings and physical evidence, will strengthen the relationship between a death investigation office and a recovery organization. Clear and specific documentation (chain of custody) regarding movement of the body (e.g., hospitals, death investigation offices, funeral homes) may locate items or evidence that may go missing when and if the chain of custody has been broken.

Recovery and Evidence Preservation

Efforts should be made to limit manipulation or alteration of anatomical findings during recovery, as the body may contain clues that can help confirm or clarify the circumstances around the manner and/or cause of death. For example, the recovery of pelvic tissue may cause disruption of abdominal findings or breach the peritoneum. The rupture of the bladder during recovery eliminates the option for post-mortem urine collection, which may be essential for toxicological testing by the death investigator.

◆◆◆ Case Study ◆◆◆

A family of four and delivery truck driver for a furniture company were involved in a motor vehicle accident. A member of the family of four and the delivery truck driver were killed in the accident, and both became eye and tissue donors. During the recovery process, the eye bank removed contact lenses from the delivery truck driver. The presence of the contact lenses was noted on the physical assessment under the ocular findings. The contact lenses were placed into a red top vacutainer with saline and logged in as decedent belongings. Subsequently, the surviving family members attempted to bring a wrongful death lawsuit against the furniture company. The family claimed that the driver was at fault because he was not wearing his glasses at the time of the accident. However, due to the eye bank documentation of the contact lenses found in the decedent's eyes upon recovery, this claim was accurately disputed.



Figure 7. Debris and medical artifact. Photo: Craig Nelson, MD.



Photography

Recovery may cause alteration to the donor's physical appearance. The death investigator may request images to preserve evidence or the chain of custody. Images should be captured in a manner which enables the death investigator to clearly identify the anatomical or physical location of the photographed area. Photography should follow protocol established by the death investigation office and the individual recovery organization.

Photographs should provide a clear reference with respect to specific points in time in the recovery process including 1) the receipt of the donor body, 2) prior to the removal of any medical/therapeutic artifacts and belongings/clothing, 3) after the removal of these items but before donor preparation, and 4) after the donor preparation, but before recovery.

Figure 7 demonstrates capturing images after the removal of clothing but prior to the removal of medical artifacts such as IV lines and chest tubes. This image also demonstrates the critical role photographs may play in capturing artifact, such as debris or blood, prior to the completion of donor preparation.

Items (e.g., chest tubes, central lines) in an area of injury that do not prevent a proper donor preparation or recovery should remain in place and not disturbed whenever possible. For example, an endotracheal tube will not prevent the proper preparation or recovery of tissue from the lower extremities and may be relevant to the death investigation. This would be considered a medical/therapeutic artifact which should be left in place. The death investigator should be consulted if artifacts or belongings overlaying an area of injury may preclude a proper donor preparation or surgical recovery.

Editing Images

Images taken for the purpose of evaluation by a death investigator should not be altered or manipulated in any way prior to delivery to the death investigator.

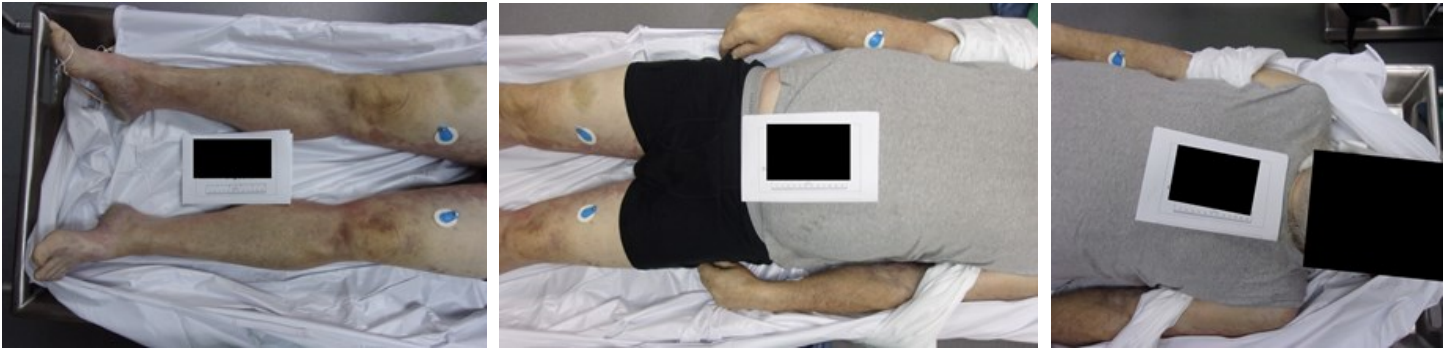


Figure 8. Full body photographs. Photo: Craig Nelson, MD.

Full Body Images

Images for investigative purposes should not exclude any detail. This is contrary to most recovery photography protocol, which seeks to exclude identifying traits or characteristics of a decedent. Full body or overall images should include all aspects of the body, utilizing a technique which provides an accurate perspective and a range which provides sufficient detail for review and identification of all findings for investigative purposes. For example, capturing images of each plane of the body (anterior, posterior, left, and right) and in thirds (head to mid-torso, mid-torso to mid-thigh, and mid-thigh to foot). **Figure 8** provides examples of images captured within a single plane, the anterior view, in thirds, with a photo scale prior to the removal or alteration of any effects.

The camera should always be held perpendicular to the subject being photographed. Some death investigation offices require that images of the decedent show the entire body, from head to toe, in a single photograph. Anatomical orientation should be provided to reduce or eliminate confusion or assumptions. While this may be possible in an autopsy suite, as most are equipped with platforms for photographers to stand on above the patient, this may not be possible for a recovery staff in a standard operating room or other recovery environment. This should be discussed with the death investigation office in advance.

Photo Scale and Donor Identifier

A scale, a measuring tool (e.g., ruler, placard), and a patient identifier (e.g., donor number), should be used when images are captured for screening/eligibility and forensic or investigative purposes. Death investigators typically use an American Board of Forensic Odontology (ABFO) No. 2 Photomacrographic scale, refer to **Figure 9**. This scale provides an accurate source of reference for visualization and the ability to scale measure



Figure 9. These images demonstrate scaling and capturing the location of a physical finding.

the size of elements in the image in a scientific manner. The scale should be placed near the area being captured to provide an accurate point of reference and at 90 degrees of the area being photographed. Pre-printed Avery labels with scales can be used, as these are cheap, disposable, and can be attached to other items.

Belongings and Chain of Custody

Photographs may be used to document the chain of custody of donor personal belongings, the condition of belongings, and specimens being moved or transported with the body. Images of belongings or specimens received with the body should be captured at receipt of the donor, prior to the alteration or removal of any items from the initial state of the body. Images of belongings or samples to be transported or moved with the body following recovery should be captured in the manner in which they are left by recovery staff. These images may be used to establish the organization's appropriate handling and transfer of the belongings and specimens.

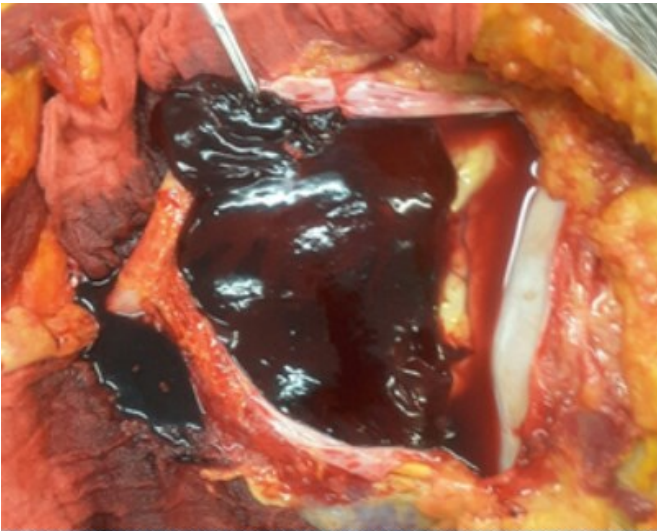


Figure 10. Coagulated blood noted after pericardial excision and prior to cardiectomy. Photo: Craig Nelson, MD.

Internal/Intraoperative Photography

Findings may be discovered during the recovery that require images of an area that are within a sterile field, refer to **Figure 10**. Care must be taken to avoid contamination of the surgical field. If a close-range image is essential, photography equipment should be utilized in a manner which maintains the integrity of the sterile field and sterile recovery staff. If available, a sterile ruler or sterile scalpel handle with a ruler may be included in the field to provide scale. Actions and movements should be in accordance with the Association of periOperative Registered Nurses' Standards and follow the guidelines set forth in the AATB Aseptic Technique Guide.

Ocular Images

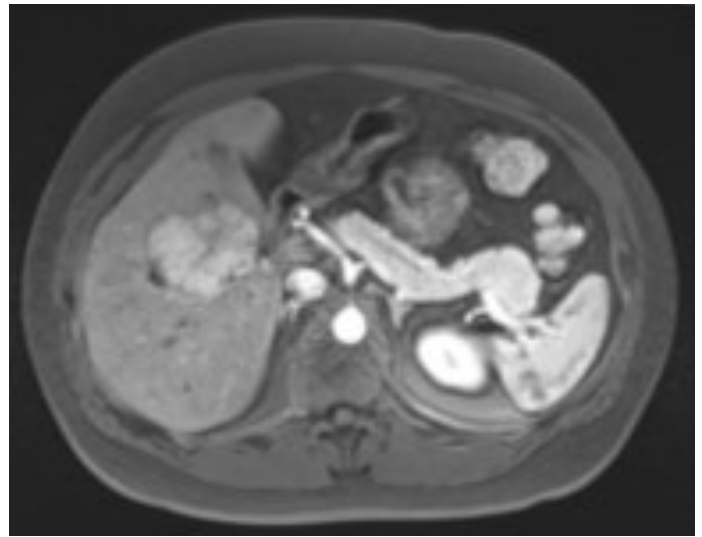
If required, ocular photographs should be taken prior to and after the recovery process. The intended purpose is to identify eye color, trauma (e.g., petechiae, subconjunctival hemorrhage), and the presence of contact lenses. Each of these can contribute to the determination of the cause of death. Care should be taken to follow the death investigation office's processes for taking photographs. Please refer to the individual eye bank's protocol with the death investigation office for exact imaging and file transmission preferences.

Reconstruction/Restoration

Organizational practices may require the capture of images for documentation of the donor prior to and/or following recovery. This may be done to provide a point of reference in circumstances in which the impact of the donation process or the integrity of restoration efforts is in question. If these efforts are in question, these images may help provide evidence that actions of the recovery organization did not cause any liability on their part. Images should include the entire surgical site prior to and following recovery.

Shared Organ Cases

In some circumstances images may be required on shared organ, tissue, and eye cases. This may include the capture of images of the patient on a hospital unit prior to organ recovery. In such situations, the patient may be unstable and altering the position of the body may have adverse effects, such as shifting medical devices critical to patient stability. Under such circumstances, it may be acceptable to complete partial image capture (e.g., anterior, left, right) to avoid excessive manipulation. In-situ images of organs prior to removal from the body during organ recovery may be requested as a condition for release from the death investigation office.



Figures 11 and 12. Examples of CT (left) and MRI (right) images. Photos: Angela Levy, MD.

Radiography

In many cases the existence, extent, location, or severity of injuries and/or trauma may not be apparent during an external examination. The concern of the death investigator may be the oversight of internal injuries with limited or no external trauma. Furthermore, there may be concern of alteration, loss, or misdiagnoses of internal injuries such a soft tissue trauma or bone fractures due to the recovery process. Pre-recovery radiography may enable the death investigator to differentiate trauma or resuscitative efforts from artifacts of the recovery process. For example, during resuscitative efforts ribs may be fractured. If a heart for valves is recovered it may be difficult for the death investigator to clearly confirm if the origin of fractures is trauma, resuscitative efforts, or transection of ribs during the heart recovery process.

Radiography – A technique of viewing structures of the body using electromagnetic radiation. Usually, radiographs are performed to view internal structures in situ but can also be used to analyze bones, tissues, and organs ex situ. X-rays, skeletal survey, CT, and MRI are commonly used radiography techniques.

◆◆◆ Case Study ◆◆◆

An 18-year-old male was involved in a hit-and-run motor vehicle collision. 911 was called. Upon their arrival, he was in respiratory distress and had to be emergently intubated. He was taken to the nearest emergency department where he became unconscious. A large bruise was noted on his forehead, but no other traumatic external findings. The CT scan showed marked cerebral edema, subarachnoid hemorrhage, and a right subdural hematoma. His condition deteriorated and he was pronounced brain dead 12 hours later. His mother consented to organ, tissue, and eye donation, but the death investigator was hesitant to release for donation because the investigation pointed toward a homicide. The death investigator needed to be confident that no other trauma was missed, or artifact created by recovery procedure. Therefore, a full body CT was ordered by the recovery organization. The study was negative for visceral and bony trauma. Due to these findings, the death investigator consented to organ, eye, and tissue recovery.



Skeletal Survey – A series of x-rays of all the bones in the body. A standard survey includes skull, spine, pelvis, ribs, and extremities. Skeletal surveys are used to assess entities such as bony trauma, non-accidental injuries in children, injury patterns, abnormal bone development, malnutrition, abnormal collections of air, and bone damage due to tumors. It is also used to detect foreign bodies such as bullets or medical devices.

Computed Tomography (CT) – An imaging scan that uses ionizing radiation to view both hard and soft tissues in slices as if the body were sliced like a loaf of bread. The word *tomo* means slice. CT scans are often used to view bony fractures, bone pathology, organ injury or disease, and fluid collections such as blood, refer to **Figure 11**. Three dimensional CT can also be performed.

Magnetic Resonance Imaging (MRI) – Body imaging that uses magnetic fields, radio waves, and field gradients to generate images of the body, refer to **Figure 12**. MRI is used to analyze soft tissues such as the brain, heart, liver, fat, cartilage, and tumors. It can also detect small hemorrhages. MRI has superior contrast resolution compared to CT.

Sudden Unexpected Infant Death

Sudden unexpected infant death (SUID) is the death of a seemingly healthy infant with no clear indication of trauma or acute onset of injury or illness. Investigations into SUID cases may be inconclusive due to the lack of physical findings or known contributing health issues. Some sudden unexpected infant deaths may be attributed to genetic disorders or mechanical asphyxiation, such as wedged between pillows or co-sleeping.

Infants may not exhibit many physical indicators of assault, abuse, or other trauma, such as defensive injuries, and cannot move themselves out of harmful or dangerous positions. Death investigators may complete additional investigative measures, such as doll reenactments, to understand the scene and circumstances surrounding SUID cases. Due to the potential to overlook physical findings at autopsy after donation, death investigators are often hesitant to permit the recovery of the heart for valves or ocular tissue.

Donation organizations must build relationships and discuss responses to these sensitive cases with death investigators. Every effort should be made to accommodate and support infant and child death investigation research by providing records and specimens when able.

◆◆◆ Case Study ◆◆◆

A six-month-old infant was found dead in her crib with no noted medical issues. The parents were approached for donation and authorized heart for valve donation. The death investigator was not going to permit recovery because the cause of death was unknown, and underlying trauma may have been present. The tissue recovery organization provided a skeletal survey and a full-body CT scan. The death investigator agreed to release to recovery if the skeletal survey and full-body CT scan were normal. They also required a cardiology report from the cardiac pathologist, provision of heart histology slides, and return of the residual remains of the heart after resection of the valves. The heart valves were successfully recovered, and all requests were fulfilled.

Toxicology

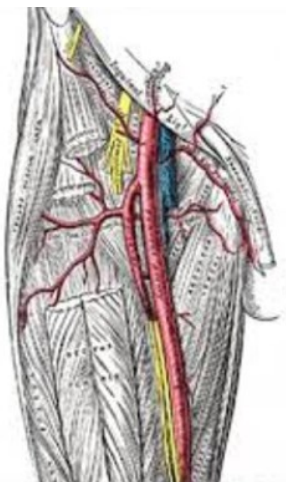
Toxicological testing, which oftentimes is performed in combination with an autopsy, looks for a variety of substances (analytes) present in the body. Examples of analytes include alcohols, illicit drugs, prescription drugs (taken as prescribed or abused), common poisons, and household and industrial chemicals. Toxicological screening may identify only one drug or substance, or it may highlight the presence of multiple substances.

Toxicological screening can provide qualitative information, such as identifying the presence of a substance or its metabolites. They can also provide quantitative information, which allows for the measuring of the quantity of the analyte present. It is important to note that chemicals, or analytes, can come to rest inside of a patient in a variety of ways. Absorption of a chemical or substance can occur through inhalation (e.g., lungs), ingestion (e.g., GI tract), injection (e.g., veins), or direct contact with the skin or mucous membranes (e.g., mouth, nose, dermal patches). This is why the DRAI (medical/social interview) specifically asks if the method of drug use is known, as the same substance can be snorted/smoked or injected.

When toxicological screening is performed and how comprehensive or focused the tests are varies with jurisdiction and on a case-by-case basis depending on the circumstances of death.

One of the challenges with assessing toxicology against donor eligibility criteria is the fact that toxicological results may take weeks to months to be finalized. This is partly due to the fact that in some jurisdictions, it may be a requirement that all toxicological screening is run by a government laboratory rather than a private toxicology firm. Some recovery organizations have sought creative approaches to this issue by offering death investigation offices the option of running toxicological screening through a private laboratory at the recovery organization's cost. This is often seen as a win-win situation since toxicological results can be completed quickly and the death investigator does not have to pay for the tests.

It can be helpful, when evaluating toxicological results, to compare them to the documented physical assessment findings of the recovery organization staff and the physical assessment documented on the autopsy report. This is because the review of relevant medical records should yield facts and information that align with one another to create a uniform clinical picture of the decedent. For example, if questionable marks on the decedent's lips appear like burn marks, receiving a toxicological result positive for methamphetamine is a confirmation that the patient was likely smoking the drug through a hot pipe during the time interval prior to death (days to weeks).



Specimens For Testing

The most common toxicological screens are performed on blood, but it is routine practice to analyze other specimens such as urine, gastric contents, liver, and vitreous humor. In some cases, toxicological evaluation of multiple body fluids is performed on the same patient.

Drawing blood from a peripheral blood vessel (e.g., the femoral vein or artery) may result in a more accurate toxicological assessment than blood drawn from the thorax (e.g., subclavian blood vessels, inferior vena cava, heart). This is due the fact that different tissue types *take up*, or absorb, different levels of substances. Blood located in the chest, following cardiac cessation, can yield inaccurate toxicological results due to the redistribution of substances as they diffuse between the blood

◆◆◆ Case Study ◆◆◆

An obese male was discovered by his roommate laying supine on the floor between the sofa and living room table. He was last seen alive 3 hours ago. Upon discovery, his skin was cool to the touch and there was no pulse. He was cyanotic (blue skin) and had bubbly foam emanating from his mouth and nose. The death investigator was contacted and upon investigation, he was pronounced at the scene. On the coffee table was a closed metal box, a spilled bottle of soda, and several burn marks. The decedent was a smoker. On the floor was a leather belt laying next to a pile of dirty laundry. A small gauge insulin needle was found on the table, but this was associated with his 10-year history of insulin-dependent diabetes mellitus (IDDM). Although distraught, his family authorized donation and there was nothing in his medical history that contraindicated donation. His musculoskeletal tissue, skin, and eyes was recovered for donation. Six weeks later, the autopsy report with toxicological profile was released and the main abnormality was that the donor was positive for heroin and 6MAM-morphine. The manner of death was filed as *accident*. The cause of death was an acute overdose of heroin.



Foam cap present in some cases including drug overdose.

Photo: Kim A. Collins, MD.

You may have already noticed certain details in the scene investigation that were relevant but overlooked by (or not communicated to) the recovery organization before donation.

Although the patient was diabetic, this did not fully explain the presence of the needle on the table. It is known that heroin abusers often keep their *kit*, or drug paraphernalia, in containers that they store and bring out when they are ready to take another dose. Insulin-sized needles are often used for intravenous drug abuse since they are small and are less likely to cause track marks or show needle marks after injection. The presence of the belt

on the floor could have indicated that the patient did not keep a tidy home, or it may have been used to put pressure on his upper arm during the injection of drugs (it can be noted that a trained death investigator would inspect the belt for teeth marks, since this is how the belt is held tight during injection). The presence of a foam cone or foam cap over the mouth and nose can indicate an acute overdose of opiates due to acute pulmonary edema. Unfortunately, unless this is observed and documented immediately, this foam is transient and can be wiped away or vanish later when the decedent is placed in the body bag and moved to another location. A foam cone is rarely, if ever, noticed during a recovery organization's physical assessment at the time of recovery.

and surrounding organs (e.g., the heart and stomach). If a death investigator has requested that a recovery organization draw blood to conduct toxicological screening, extracting blood from the decedent's peripheral vessels is better than obtaining the blood from the heart or a more central vessel. The preferred sample site should be discussed with the partnering death investigation professionals and documented, along with the date and time of draw.

On the other hand, blood used for serological testing often has the best quality when drawn from the blood vessels of the thorax (e.g., subclavian vessels). This is due to the fact that blood in the legs may begin to form thromboemboli (clots) earlier than blood found in larger vessels near the heart. Blood that has begun to clot is difficult to draw and difficult to centrifuge when being prepared for antigen, antibody, and NAT (nucleic acid testing) to determine donor eligibility. Hemolysis (the rupturing of red blood cells) represents degraded specimen quality and may contribute to false positive serologic test results. Sometimes toxicological results are obtained from bile, gastric contents, solid organ samples, and even hair. The toxicological results from an inpatient hospital chart more frequently involve identification assays performed on urine and are not always reflective of the same substances found at time of death in the blood.

Vacutainers Used for Testing

Blood can be placed in various types of blood vacutainers depending on the type of testing to be performed. While blood for serological testing by the recovery agency is most often placed into red, tiger (black and red marble), or purple (lavender) top vacutainers, blood for toxicology may be placed into a grey top vacutainer which contains a preservative (sodium fluoride) and an anticoagulant (potassium oxalate). Once a grey or purple top tube is filled, it should be inverted several times in order to ensure that the additives in the vacutainer thoroughly mixes with the blood. Blood in a grey top tube is not acceptable for infectious disease testing.



Figure 13. Clean vitreous sample.

Vitreous Humor and Toxicological Screening

Vitreous humor is the transparent, colorless, gelatinous mass that fills the space between the lens of the eye and the retina lining the back of the eye, refer to **Figure 13**. It is produced by cells in the non-pigmented portion of the ciliary body. Unlike the fluid in the frontal parts of the eye (aqueous humor), which is continuously replenished, the gel in the vitreous chamber is stagnant. The metabolic exchange and equilibration between systemic circulation and vitreous is so slow that vitreous is sometimes the preferred choice as an “alternate bio-specimen” for post-mortem analysis. Additionally, vitreous is generally less susceptible to contamination due to the closed structure of the eye and is better preserved than blood after death.

Procurement of Vitreous

For eye donors it is preferred that the vitreous fluid be drawn post-corneal recovery. For many eye banks, vitreous draw prior to recovery precludes the tissue’s viability for transplant. Technicians are trained on proper vitreous sample collection, labeling, and chain of custody according to the death investigation office’s standards. Vitreous can be drawn after corneal recovery using a needle and syringe inserted into the globe of the eye, far from the clear cornea. The insertion is best at the lateral canthus, introducing the end of the needle to the center of the globe. The vitreous should be withdrawn slowly. A vacuum collection system should not be used thus rendering the specimen inadequate due to retinal contamination. The following things should be considered when drawing vitreous:

- The gauge of the vitreous needle. The larger the gauge, the increased likelihood for the introduction of contaminants.
- The size of the syringe. The larger the syringe, the greater increase in the pressure of the draw and likelihood for the introduction of contaminants.

- Consider including supplies to draw a vitreous sample from each eye. If a contaminated sample is recovered from the first eye, there is an opportunity to draw a clean sample from the second eye.
- Death investigators should be discouraged from using unsterile or reusable supplies to recover vitreous samples. Unsterile or reusable supplies may introduce artifacts from previous investigations into the current one, contaminating medicolegal specimens.
- Determine during penlight exam if vitreous has been drawn prior to ocular recovery. Vitreous that has been drawn prior to cornea recovery may compromise the cornea and render donor tissue ineligible for transplant. Before proceeding, ensure the cornea is uncompromised, sterile equipment was used, and the lot/manufacturer/expiry information for the sterile equipment is available to the eye bank.
- As required, the eye bank will draw vitreous specimens. Eye banks should be encouraged to draw vitreous through the iris after removal of a cornea (to prevent contamination).
- Cases in which the death investigation office is holding off on vitreous draw while recovery is pending could result in the death investigation office missing their opportunity to draw vitreous. Eye banks and death investigation offices should coordinate carefully together to ensure this opportunity is not missed.
- The eye bank's standard operating procedure (SOP) should be followed if vitreous has been drawn prior to ocular recovery. Depending on the how the vitreous was drawn (e.g., aseptically or not, through the clear cornea) and the resulting shape of the cornea, some eye banks will continue with the recovery. Others will choose not to recover the tissue regardless of how vitreous was drawn.

Approximately 2 mL of fluid can be aspirated from each eye. The vitreous should be placed in a sterile tube. Unless otherwise specified by the death investigator, the specimen should be collected in a red top with no additives. The specimen should be clear and colorless. If small flecks of black-brown retina appear in the sample, the sample may be deemed inadequate for evaluation.

Ensure that the proper protocol for handling and transporting samples is established and understood by all involved agencies. Once vitreous samples have been obtained it is important that they reach the designated destination for analysis. If the recovery of the sample takes place at the death investigator's office, there may be a designated location for storing the sample. Other circumstances may dictate that the sample be left with the decedent for transport to the death investigation office. Whatever protocol is implemented, it must be adhered to by all parties in order to facilitate the safe transport and chain of custody for the specimen.

Performable Post-Mortem Vitreous Analyses

Depending on the environment, vitreous fluid can be procured up to approximately 4 days after death. Vitreous is best stored in a refrigerated environment but can be frozen for the purpose of archiving. Testing of vitreous demonstrates chemical changes immediately or shortly after death and can be used to aid in determining the cause and or approximate time of death. Analyses that can be performed on vitreous fluid include chemistry for the following:

- Electrolytes: potassium, sodium, chloride, magnesium, calcium
- Physiological substances: glucose, ketones, urea, insulin, catecholamines, C-peptide
- Toxicology: drugs, ethanol
- Viral antibodies
- Acids
- Some trace metals

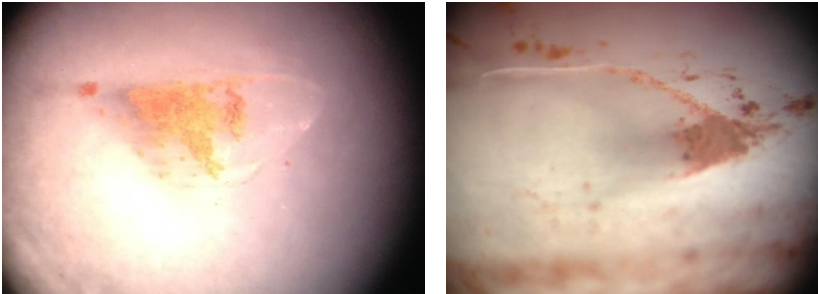
Contaminated Vitreous Samples

Care should be taken when vitreous samples are collected so as not to contaminate the sample with other substances. A contaminated vitreous specimen, refer to **Figure 14**, carries the risk of preventing proper identification of a potential cause and manner of death. Blood, povidone-iodine, uveal pigment, and bits of retinal material can all be considered contaminants to the sample that will affect the outcome of the testing or deem the sample unacceptable for analysis. The ramification for submitting a contaminated vitreous sample is, in part, a sample with particulates can physically clog the filtering mechanism. Secondly, if blood, povidone-iodine, ETOH, or some other non-vitreous component is in the tested sample, it can skew the results.



Figure 14. Contaminated vitreous sample.

Figures 15 and 16 demonstrate what a vitreous draw looks like if the needle penetrates the cornea. Note the beveled shape, indicative of the shape of an aspiration needle. The deposition of red blood cells at the exit



Figures 15 and 16. Slit lamp image of a cornea (endothelial side) after penetrated by a needle. Photos: Samantha Wetzler, MD.

suggests the needle had been previously used on a blood draw. Following the rationale that different tissues within the body absorb analytes at different rates, a death investigator may compare the vitreous toxicological results to the blood toxicological results in order to correlate the post-mortem findings with the given history.

Clots: Thrombus, Thromboembolus, and Post-Mortem Clot

There are many circumstances which may lead to sudden unexpected death which do not have any warning or contributory history. One such instance is pulmonary thromboembolism. Identifying clots during tissue recovery may be helpful in the death investigation process and establishing these practices in collaboration with the death investigator may preserve the opportunity for donation on sudden unexpected deaths.

A thrombus or pre-mortem clot that forms within an artery, vein, or heart chamber, is composed of blood elements (blood cells, platelets, and fibrin). A thrombus forms due to vessel injury, heart chamber injury, or blood stasis. There are several risk factors for thrombus formation including obesity, pregnancy, smoking, injury, recent surgery, and sedentary lifestyle. The blood components attach to the vessel wall as thin layers creating a striped appearance both grossly and microscopically (lines of Zahn). The layers are dark red (blood cells) and gray (fibrin and platelets). Usually, these form in the deep leg veins or pelvic veins; however, they can form in other areas of vessel injury. Although such findings would not be the defining cause of death, finding a thrombus in the deep veins of the lower extremities may point to additional thrombi or thromboemboli, refer to **Figure 17**.

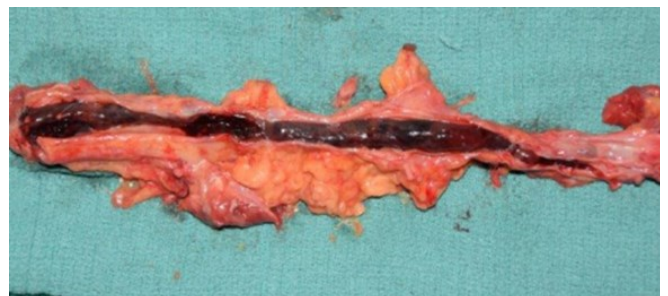


Figure 17. Deep vein thrombosis (femoral) found at autopsy. Photos: Daniel Schultz, MD.

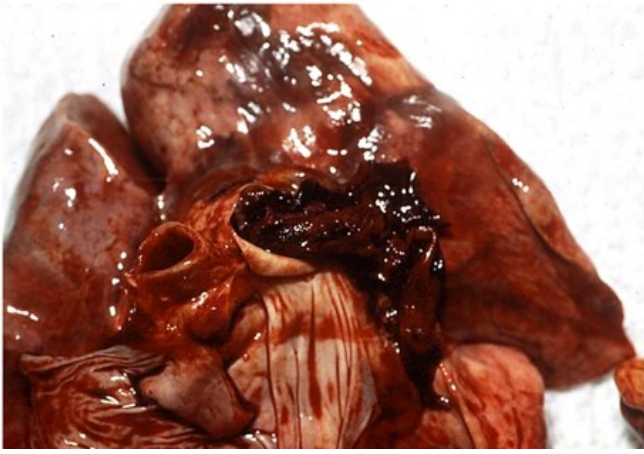


Figure 18. Pulmonary emboli. Photo: Kim A. Collins, MD

Blood Clots Discovered During Heart for Valve Recovery

The heart valve recovery is invasive and can potentially lead to the disruption, loss, or misdiagnosis of critical findings. The transection of the pulmonary veins and arteries during for valve recovery may preclude the death investigator from appropriately diagnosing these findings if effective practices are not in place.

Pulmonary thromboembolus, also called a pulmonary embolus (PE) — A thromboembolus within the

pulmonary artery or the more distal vessels of the lungs

which originally formed in a distant site (as a thrombus) and was dislodged to become an embolus, or thromboembolus, and traveled to the lung. The pulmonary thromboembolus is often the diameter of the deep leg vein, such as the popliteal vein, and is coiled upon itself, obstructing the left, right, or both pulmonary arteries, refer to **Figure 18**.

Thromboembolus — A thrombus that has become dislodged and travels to a different location in the body. The word *embolus* means *to throw*. A thromboembolus is often coiled upon itself and has the diameter of the vessel in which it originally formed. The cut surface can have a striped appearance due to the layering of the blood elements when it originally formed. It is slightly firm and friable and is usually in a right heart chamber, pulmonary artery, and/or vessel(s) of the lung. Much like thrombi found in the legs, these findings of thromboemboli are essential to the death investigation. Thromboemboli within the heart, lungs, or associated vasculature will likely either be or directly contribute to the cause of death.

Blood Clots Discovered During Lower Musculoskeletal or Vascular Recovery

Deep leg veins — The legs have superficial veins (near the body surface) and deep veins (deep within the leg). They are the iliac, femoral, popliteal, and tibial veins.

◆◆◆ Case Study ◆◆◆

A 65-year-old accountant was working overtime during tax season. She drove an hour to her condominium late one evening. Upon walking to the elevator, she became short of breath and collapsed. The doorman called 911. She was pronounced dead on the scene. Her past medical history included diabetes mellitus and obesity. The death investigator felt the cause of death was heart-related and allowed pre-autopsy tissue recovery. During recovery of the heart, the technician saw the finding depicted in **Figure 18**. The technician immediately halted the recovery procedure and photographed the pulmonary thromboembolus. She then called the death investigator to relay the finding. The death investigator was pleased with her detection and quick notification. The death investigator requested that the pulmonary thromboembolus be placed in a container of formalin if it became dislodged during recovery. This way the thromboembolus could be processed in the histology laboratory for microscopic examination if needed. The cause of death was certified as pulmonary thromboembolus, a finding that may have gone unnoticed if not for the technician's careful attention.

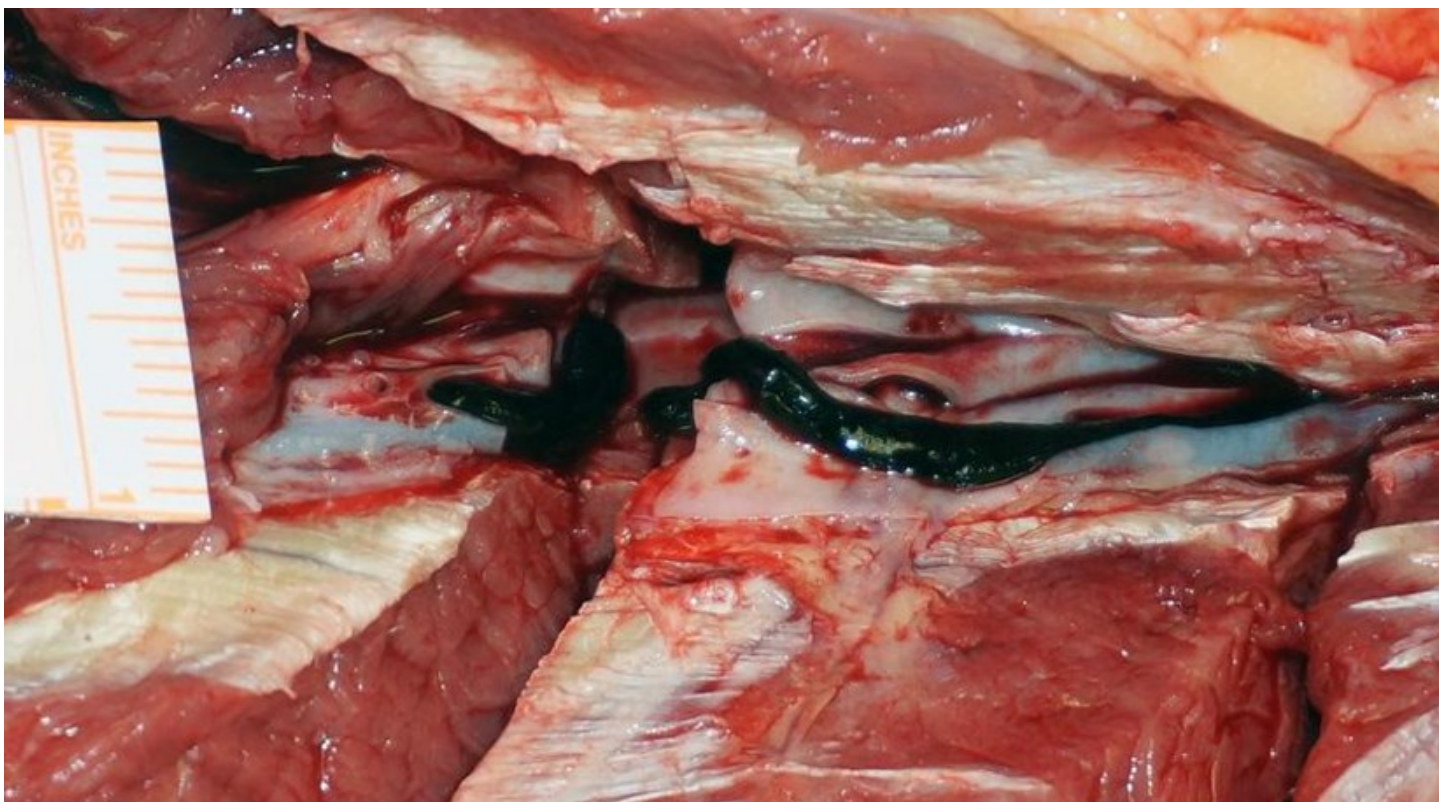


Figure 19. In situ deep vein thrombosis, lower extremity. Photo: Joseph Prahlow, MD.

Thrombus — As described above, a thrombus may be discovered in a deep leg vein, refer to **Figure 19**. A thrombus may be attached to the vein wall or unattached within the vein.

Post-mortem blood clot — A clot that forms within a blood vessel after death due to the settling and separation of blood components. The separation of the blood components leaves a two layer, dark red and yellow-tan, appearance but not the multiple striped lines of Zahn as in a thrombus. Many describe it as looking like chicken fat. The consistency is soft and slightly rubbery. This type of clot assumes the shape and diameter of the blood vessel in which it is found post-mortem.

Documentation and Preservation of Thrombi, Thromboemboli, and Post-Mortem Blood Clots

Documentation of the location and size of the clots may prove beneficial to the death investigator. Practices may be established by the recovery organization and the death investigator to document, photograph and collect such findings for further evaluation in the death investigation.

The death investigator should be consulted if any such findings are unexpectedly discovered during recovery. Documentation, photography, and collection practices of such clots should be established by each recovery organization and practices may be specific to individual death investigators depending on the circumstance and jurisdictions.

1. Photograph the clot in situ.
2. Gently place the specimen into a container and send with the decedent to the death investigator for evaluation.
3. Document on paperwork the location, size, appearance, and disposition of the clot specimen.

Conclusion

The American Association of Tissue Banks, the Eye Bank Association of America, the Association of Organ Procurement Organizations, and the International Association of Coroners & Medical Examiners recognize the essential role that death investigators play in the donation process and acknowledge the concerns of death investigation professionals with respect to potential loss of information and evidence during the donation process. We recognize that jurisdictions, roles, and expectations will differ greatly between regions, states, and counties. As such, we recommended that individual recovery organizations establish standard procedures and practices in collaboration with death investigators in their service areas.

To ensure the best possible outcome for individuals, families, recovery organizations, and our death investigation colleagues, it is imperative to proactively establish positive relationships and information sharing.

The practices illustrated throughout this guide may assist in the preservation of evidence and in some instances enable donation to take place in cases which would have not otherwise been possible. These practices are not requirements or standards but are intended to serve as a point of reference, education, and summary of possible solutions in order to further educate the donation community about the death investigation process.

◆◆◆ OSAC Glossary ◆◆◆

All definitions in this section and in **green** in the text can be found at <https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science/osac-lexicon>

Accidental Death — An unexpected or unforeseen death due to injury.

Algor Mortis — The change of body temperature to ambient temperature. A body will not cool if it is located in an environment greater than 98.6 degrees F.

Analyte — A chemical substance to be identified and/or measured.

Analysis — Analytical activity carried out during the forensic process to determine characteristics, specifications, or relevance of potential exhibits or conditions. The measurement of analyte and/or evaluation of data.

Analyze — To examine, measure, or test the properties of a material for evaluation purposes.

Antemortem — Before death.

Artifact — A by-product, artificial feature, or change resulting from human activity or a technical process.

Autopsy — A diagnostic medical procedure consisting of postmortem external and internal examination of a human body; conducted by a pathologist. It may be supplemented by ancillary tests and examination such as toxicology, histologic evaluation, and specialty consultation.

Best Practice — A system of processes, checks and testing that will deliver an outcome that has fewer problems and fewer unforeseen complications, and that combines the attributes of the most efficient and most effective ways of accomplishing a task based on proven and provable methods.

Blood — Blood is a body fluid in humans and other animals that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells.

Blood Clot — A gelatinous mass formed by a complex mechanism involving red blood cells, fibrinogen, platelets, and other clotting factors.

Blunt Force Trauma — An alteration to the skeleton produced by low-velocity impact from a blunt object (e.g., being struck by an object or concussive wave) or the low-velocity impact of a body with a blunt surface (e.g., motor vehicle accident or fall).

Capture — To record data, such as an image, video sequence, audio stream, or biometric sample to digital storage, often by means of a sensor.

Cause of Death (COD) — Medical opinion of the disease or injury that resulted in a person's death.

Chain of Custody — The process used to maintain and document the chronological history of an item of evidence. Documents the individual who collected the evidence and each person or agency that subsequently takes custody of it. This chain of custody verifies evidence integrity meaning that the evidence being analyzed is the same evidence that was found at the scene and that there was no opportunity for the evidence to be tampered or compromised. A chain of custody should be maintained for an item until it is released, disposed of or destroyed.

Confirmatory Test — A test that is specific for a biological material or substance of interest and that is used for the conclusive identification of a biological fluid; this usually refers to a serological or microscopic test for detection of a particular biological fluid (e.g., blood or semen).

Contamination — Unintended presence, or introduction, of particles, chemicals, and other substances.

Continuing Education — An educational activity (such as a class, lecture series, conference, seminar, or short course) that is offered by a recognized organization or individual that updates participants in their relevant area of knowledge.

Coroner — Generally an elected (sometimes appointed) official whose duty is to oversee medicolegal death investigations, usually for a single county, and certify cause and manner of death. An officer of a county or municipality whose chief function is to investigate by inquest as before a jury any death not clearly resulting from natural causes (see medical examiner).

Database — An authoritative repository of information used for storage, search and analysis.

Death Certificate — A formal vital statistics document certifying the identification, cause and manner of death of a particular individual.

Death Scene — The site where a person has died; the term may also refer to the location where the decedent was found.

Decedent — A deceased individual.

Documentation — Written notes, audio/videotapes, printed forms, sketches and/or photographs that form a detailed record of the scene, evidence recovered, and actions taken during the search of the crime scene.

Evidence — Objects or information which should be identified and collected for appropriate documentation and analysis to support conclusions in forensic scene investigations.

Forensic — The use or application of scientific knowledge to a point of law, especially as it applies to the investigation of crime.

Forensic Pathologist — A physician who is certified in forensic pathology by the American Board of Pathology (ABP) or who, prior to 2006, has completed a training program in forensic pathology that is accredited by the Accreditation Council on Graduate Medical Education or its international equivalent or has been officially “qualified for examination” in forensic pathology by the ABP. May be employed as a Medical Examiner or as a consultant to a coroner or Justice of the Peace.

Gross Examination — Assessment of materials with the naked eye.

Gunshot Residue — Sometimes defined as the total residues resulting from the discharge of a firearm. Constituted typically of nitrites and lead, as well as unburned and partially burned gunpowder particles, carbonaceous material plus metallic residues from projectiles, fouling, and any lubricant associated with the bullets. These are usually observed with the naked eye, or an optical microscope, and detected or visualized by the Griess test and sodium rhodizonate.

Homicide — Death as a result of a volitional act committed by another person (injury, poisoning, etc).

Image — Imitation or representation of a person or thing, drawn, painted, photographed, and so forth.

In situ — In the original place or position.

Ingestion — Taking of substances into the body by mouth.

Jurisdiction — A geographic area in which a medical examiner or coroner’s authority applies. Legal authority to make legal decisions and judgments regarding a death, including performance of autopsy, as well as investigation and certification of cause and manner of death.

Manner of Death (MOD) — Classification system based on the circumstances under which death occurred; includes accident, homicide, natural, suicide, and undetermined. Death occurs in one of four manners: natural, if caused solely by disease; accidental, if it occurs without apparent intent; suicide, if caused by the deceased; homicide, if someone other than the deceased caused it.

Measurement Scale — An object showing standard units of length (e.g., ruler) used in documentation of an item of evidence.

Medical Examiner — An appointed medically qualified officer whose duty is to investigate deaths and bodily injuries that occur under unusual or suspicious circumstances, to perform post-mortem examinations.

Medicolegal — Pertaining to medicine and law.

Medicolegal Death Investigation — A formal inquiry into the circumstances surrounding the death of a human being; investigative information is considered with autopsy findings and adjunctive studies (if performed) to determine the cause and manner of death.

Medicolegal Death Investigation System — Medicolegal death investigation office(s) within a state or district (usually a medical examiner or coroner office) that is a jurisdictional unit with a single chief medicolegal death investigation officer.

Medicolegal Death Investigator — The medicolegal investigation includes the collection of data, photographs, evidence, witness interviews, external examination of the body at the scene, and other forensic information and analysis that will contribute to the determination of cause and manner of death, reconstruction of the accident or crime scene, and support the provision of survivability factors. The medicolegal investigation falls within the exclusive purview of the medicolegal authority operating at the scene of an incident. A formal inquiry into the circumstances surrounding the death of a human being; the conclusions of the investigation are taken in concert with the autopsy findings and adjunctive studies in determining the cause and manner of death.

Natural Death — Death due solely to natural disease.

Next of Kin — Legally determined hierarchy of interested parties who have authority over the body.

Notes — The written documentation of procedures, standards, control and instruments used, observations made, results of tests performed, charts, graphs, photographs, sketches and other documents generated that are used to support the analyst's conclusions.

Nucleic Acid — An important class of macromolecules, which are polymers of nucleotides, found in all cells and viruses. DNA and RNA are the major types. The functions of nucleic acids have to do with the storage and expression of genetic information. Deoxyribonucleic acid (DNA) encodes the information the cell needs to make RNA and proteins. A related type of nucleic acid, called ribonucleic acid (RNA), comes in different molecular forms that participate in protein synthesis.

Pathology — The study and diagnosis of disease.

Personal Effects — This refers to property, including clothing, jewelry, wallets or other items found on a decedent's body. Personal effects are categorized as associated or non-associated directly with the remain, with regard to proximity to the decedent (i.e. a wallet in a pocket of a decedent's pants would be considered associated PE; however, the same wallet found in the body bag of a visually unidentifiable decedent would be considered unassociated).

Personal Protective Equipment (PPE) — Equipment such as safety glasses, goggles, face shields, gloves, chemical-resistant suits, and so on that are worn or used to protect individuals from the dangerous effects of materials that they are handling or exposed to.

Physical Evidence — Anything that may be found or associated with criminal activity at a crime scene.

Policy — A guiding principle, operating practice, or plan of action governing decisions made on behalf of an organization.

Post-mortem — After death.

Postmortem Examination — An examination of a dead body to determine cause of death.

Pre-mortem — Before death.

Protocol — A set of instructions that explain the correct conduct and procedures to be followed in a specified situation.

Radiography — Technique for generating and recording an x-ray pattern for the purpose of providing the user with a static image(s) after termination of the exposure.

Residue — Remnants of a target substance that can be recovered and quantified.

Rigor Mortis — Stiffening of the body after death; a time dependent change that helps determine time of death.

Sample — A group of items, test results or portions of material, taken from a large collection of items, test results or portions of material, that serves to provide information that may be used as a basis for making a decision concerning the larger collection.

Scene — Any environment in which human remains and associated materials may be recovered.

Serology — The detection, characterization, identification, and/or typing of body tissues and fluids, either in native form or as stains or residues left at a crime scene using physical methods (normal and enhanced lighting), biochemical assays and/or microscopy; This definition applies to current crime biology laboratory practices which may be followed by DNA testing.

Sharp Force Trauma — Skeletal trauma produced by a tool that is edge pointed or beveled.

Specimen — Samples of tissues (including blood or hair), secretions (breast milk, saliva, or sweat), excretion products (bile, exhaled air, or urine), and other material such as stomach contents or vomit derived from a patient.

Standard — An established or widely recognized model of authority or excellence as a reference point against which other things can be evaluated or the ideal in terms of which something can be judged.

Standard Operating Procedure — Written procedure that describes how to perform certain organization activities.

Suicide — Death resulting from intentional self-inflicted act.

Trauma — A physical injury or wound caused by an external force of violence, which may cause death or permanent disability. Trauma is also used to describe severe emotional or psychological shock or distress.

Toxicology — A scientific discipline concerned with the analysis of biological materials for the presence of potentially harmful substances.

◆◆◆ Donation Glossary ◆◆◆

Anatomical Gift – a donation of all or part of a human body to take effect after the donor's death for the purpose of transplantation, therapy, research, or education.

Authorizing Person – Upon the death of the donor, the person, other than the donor, authorized by law to make an anatomical gift. 14th Edition AATB Standards for Tissue.

Consent for Donation – Consent for donation, also referred to as consent or first-person authorization (FPA), is the act of an individual electing to be a donor upon their death. Organs, tissue, and eye may be recovered from a FPA donor without receiving authorization from any other authorizing person at the time of death. Example recordings of first-person authorization or consent include state and federal donor registries or the donor designation on a driver's license.

Document of Gift – a donor card or other record used to make an anatomical gift. The term includes a statement or symbol on a driver's license, identification card, or donor registry.

Donor Risk Assessment Interview (DRAI) – A documented dialogue in person or by telephone with an individual or individuals who would be knowledgeable of the donor's relevant medical history and social behavior. For example, this may be the donor, if living; the next of kin; the nearest available relative; a member of the donor's household; other individual with an affinity relationship (e.g., caretaker, friend, significant life partner); and/or the primary treating physician. Alternatively, a living donor may complete a written questionnaire. The relevant social history is elicited by questions regarding certain activities or behaviors that are considered to place such an individual at increased risk for a relevant communicable disease agent or disease (RCDAD). 14th Edition AATB Standards for Tissue Banking.

Donor Designation – the donor has made an autonomous decision via a document of gift to make an anatomical gift. This decision is to be honored and implemented and it not subject to change by others. Here is the exact language: *Section 8 of the UAGA is designed to state firmly the rule that a donor's autonomous decision regarding the making of an anatomical gift is to be honored and implemented and is not subject to change by others.*

Family History – An essential part of a patient's medical history in which he or she is asked about the health of members of the immediate family in a series of specific questions to discover any disorders to which the patient may be particularly vulnerable, such as "Has anyone in your family had tuberculosis? Diabetes mellitus? Breast cancer?" Hereditary and familial diseases are especially noted. The age and health of each person, age at death, and causes of death are charted. Often a genogram is developed for pictorial documentation. The family health history is obtained from the patient or family in the initial interview and becomes a part of the permanent record. Other questions, such as those concerning the age, sex, relationships of others in the household, and marital history of the patient, may also be asked if the information has not already been secured. Mosby's Medical Dictionary, 9th edition. © 2009, Elsevier.

Psychiatric History – A person's mental profile, which includes information about chief complaint, present illness, psychological adjustments made before onset of disease, individual and family history (Hx) of psychiatric or mental disorders, and an early developmental history (Hx). McGraw-Hill Concise Dictionary of Modern Medicine. © 2002, The McGraw-Hill Companies, Inc.

Physical Assessment (PA) – A recent ante-mortem or postmortem documented evaluation of a deceased donor's body that can identify evidence of: high-risk behavior and signs of HIV infection or hepatitis infection; other viral or bacterial infections; or, trauma to the potential recovery sites. 14th Edition AATB Standards for Tissue Banking.

Relevant Medical Records – A collection of documents including a current donor risk assessment interview, a physical assessment/physical examination, laboratory test results (in addition to results of testing for required relevant communicable disease agents), relevant donor records, existing coroner and autopsy reports, a certified copy or verified copy of the death certificate (when applicable), as well as information obtained from any source or records which may pertain to donor eligibility regarding high risk behaviors, and clinical signs and symptoms for any relevant communicable disease agent or disease (RCDAD), and/or treatments related to medical conditions suggestive of such risk. 14th Edition AATB Standards for Tissue Banking.

Relevant Recovery Documentation – Records generated before, during, and/or after the Recovery of donated tissues which includes a Physical Assessment, a list of tissues recovered, as well as findings of internal trauma/injuries and/or surgical sites. 14th Edition AATB Standards for Tissue Banking.

Uniform Anatomical Gift Act – The Uniform Anatomical Gift Act (UAGA) allows a decedent or surviving relatives to donate certain parts of the decedent's organs for certain purposes, such as giving to those in need or for medical research. The act was revised in 1987 and again in 2006. The revisions made in 2006 aimed to address shortages and encourage donation.