Opioid Drug Death Investigations

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ABSTRACT

Opioid-related deaths have transitioned over the past 15 years, beginning with a steady increase in the incidence of fatal prescription overdoses, followed by a dramatic increase in deaths caused by illicit opioids, namely heroin and fentanyl. These trends in drug-related deaths are identified by medical examiners and coroners who serve an important role in public health surveillance. Medicolegal death investigators, being first responders, often recognize spates of drug-related deaths in real time. While few jurisdictions are unaffected by the epidemic, some medicolegal death investigators may have less experience detecting fatal opioid overdoses. This review will outline many of the medical, behavioral, and physical indicators of a deadly prescription or illicit opioid overdose. All aspects of a thorough medicolegal death investigation will be discussed, including the proper documentation of the scene and evidence handling. Investigative questions and follow-up procedures will also be reviewed. *Acad Forensic Pathol.* 2017 7(1): 50-59

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INTRODUCTION

Beginning with a steady increase in the incidence of fatal prescription overdoses, there has been a dramatic increase in deaths caused by illicit opioids, namely heroin and fentanyl (1). These trends in drug-related deaths are identified by medical examiners and coroners who serve an important role in public health surveillance (2). In the early 2000s, medicolegal death investigators observed a spike in prescription drug overdoses with little foresight of the impending problem (3). As fatal overdoses consistently increased from year to year, medical examiners, coroners, and public health officials sounded the alarm of an epidemic. The law enforcement and regulatory response to the crisis was to crack down on pill mills, doctor shopping, and drug diversion. Addicts adjusted as well. Instead of swallowing prescription pills, abusers crushed and snorted them for a quicker sense of euphoria. Users also discovered methods to misuse fentanyl transdermal patches (4). As pills became more expensive and difficult to obtain, heroin filled the gap as a cheaper and more potent option. Beginning around 2010, the author began to see more syringes and drug paraphernalia at death scenes. The author also observed a shift in the demographics of the typical opioid abuser with the onset of the heroin epidemic. While adults over 40 made up the majority of prescription overdoses, more young adults between the ages of 20 and 40 began to die from heroin. Older adults also began to die from heroin. Illicitly manufactured fentanyl entered the scene soon after heroin (5). However, deaths from acute intoxication by all types of opioids continues to increase the caseloads of most medicolegal offices in the United States. Despite this increase, there are some regions of the country with limited experience investigating opioid fatalities. Medicolegal death investigators everywhere must be able to recognize potential opioid deaths to accurately determine jurisdiction. The need to thoroughly document the death scene and maintain proper chain of custody of evidence is critical as prosecutions of drug dealers for manslaughter are likely to increase (6).

DISCUSSION

Initial Report of Death

Medicolegal death investigators are tasked with detecting potential causes of death through direct observation of the death scene and by eliciting pertinent information from first responders during the initial report of a death. In some opioid overdoses, the cause of death seems immediately obvious to officials, requiring minimal exchange with the medicolegal death investigator during the first phone call. Other overdoses are more subtle and necessitate the investigator to inquire further when witnesses mention key words or medical conditions. Particular scene findings also require additional investigative effort to include or exclude intoxication as the probable cause of death. For instance, the complaint of “chronic back pain” prompts the investigator to explore the underlying disease or condition causing the pain. If the history includes back surgery, the decedent was probably prescribed an opioid at some point during treatment. Investigators should have a lower threshold for accepting cases in which controlled prescription drugs are present at the scene, especially if there are pill discrepancies noted. Another fine detail that introduces the possibility of an overdose often emerges during the witness’s recounting of the terminal circumstances. It is commonly reported that decedents were last known alive because they were snoring deeply and loudly, an indication of potential respiratory distress (7). A scene investigation should be conducted on every potential opioid overdose.

Scene Safety

Exercising scene safety is one of the primary tasks in every death investigation (8). In a drug-related case, the greatest threat or perceived threat to personal safety is a needle stick. Investigators and transport personnel are at highest risk for a needle stick while moving or manipulating the body. It is not uncommon for a syringe with a needle to be found underneath the body as the body is being turned over. Occasionally, the syringe is clutched in the decedent’s hand. Investigators must be hypervigilant when assessing the body

of a suspected intravenous drug abuser as a syringe is sometimes found in the decedent's pocket(s). A pat-down of the outer pockets will help identify a syringe. To avoid further risk of needle sticks, investigators should refrain from blindly reaching into trashcans or sweeping through the contents of open trash bags. Lastly, great care must be exercised at the time of needle collection.

Another danger to personal safety is inadvertent inhalation or absorption of illicit opioid powder. Illicit fentanyl can be so potent that miniscule amounts could cause death. While there are no reported cases of fatal exposure of law enforcement or forensics personnel in current literature, a number of medicolegal offices have purchased naloxone in the event of an accidental exposure (9). The frequency of these cases coupled with the potency of the drugs requires investigators to

use caution when evaluating the scene. Personal protective equipment is essential especially where multiple drug fatalities are suspected.

Scene Evaluation

After identifying the lead law enforcement officer, the investigator should request a guided tour of the scene. This "walk through" provides an opportunity for the officer to point out items he or she believes are significant and for the medicolegal death investigator to inquire about the integrity of those items. When initially viewing the decedent, his or her body position may reveal the first indication of an opioid overdose. In cases of acute intoxication, it is the author's experience that decedents are commonly found face down on their knees, suggesting sudden loss of consciousness (**Image 1**). When a body is discovered

Image 1: This man collapsed moments after injecting heroin into his arm. A wash cloth is clutched in his hand, which was likely used to wipe away blood from the injection site.

in this position, carefully inspect the immediate area for paraphernalia as a syringe or straw is likely underneath the body. Another immediately identifiable sign of an opioid overdose is the foam cone. This frothy buildup around the nose or mouth should be photographed at the time of the scene walk through as it is easily obliterated when the body is moved. While not pathognomonic of an overdose, overdose should be considered any time the decedent has a foam cone.

Investigating a Prescription Opioid Overdose

Prescription opioid overdoses are sometimes difficult to detect, most notably because there are legitimate medical conditions for which pain relief is needed. To further complicate the determination of jurisdiction, older adults may have a number of diseases that are equally as likely to have caused death as an overdose. As a result, the medicolegal death investigator must dig deeper into the decedent's medical, psychological, social, and behavioral histories to support or refute the investigative differential diagnosis of death by intoxication.

Several key words and findings also raise suspicions of prescription drug abuse. The most concerning is "pain management." Until recently, pain management patients were routinely prescribed a "cocktail" of medications including an opioid, benzodiazepine, and muscle relaxant. Whenever this combination of medications is present at the scene, jurisdiction should be considered. Prescription bottles with missing or obliterated labels can be a strong indication of misuse. Furthermore, possession of a prescription bottle belonging to someone else could be a sign of abuse. Another concerning finding is "doctor shopping" when the decedent has the same controlled substance from multiple prescribers (10). Doctor shopping may be detected by a prescription drug inventory at the scene or through a search of a state prescription drug monitoring program (PDMP).

A complete death scene investigation includes an inventory of prescription information and pill counts (11). In cooperation with law enforcement, the medicolegal death investigator should conduct a thorough

search of the residence for prescription bottles including medicine cabinets, kitchen cabinets, purses, refrigerators, nightstands, dresser drawers, and trashcans. Pill bottles, patches, and liquid (morphine) containers should be photographed so that all information on the front and back is legible. An overhead photo of the contents of the bottle(s) is also recommended. The following information should be recorded prior to securing the prescriptions in a bag: medication name, quantity prescribed, dosage directions, date filled, number remaining, and full name of the prescribing physician. If there is a pill discrepancy, the pathologist should be notified prior to the beginning of the autopsy.

Investigating an Illicit Opioid Death

Illicit opioid deaths are easily detected by investigators when the route of administration is intravenous injection; however, cases of powder insufflation (snorting) are more difficult to identify. In order to properly investigate these deaths, investigators must be familiar with the physical items associated with the preparation and administration of illicit opioids. Heroin and illicit fentanyl are generally encountered in powder form, though there have been recent reports of fentanyl pressed into tablets or filled in capsules (12). Heroin powder ranges in color from white to brown (**Image 2**) while illicit fentanyl is usually white. Intravenous drug abuse (IVDA) requires the user to carry or improvise a number of materials to prepare the illicit substance for injection. This IVDA kit is commonly referred to as "the works" (**Image 3**). The works includes a syringe with needle (used to aspirate and inject the illicit drug preparation), a "cooker" (a metal object, usually a spoon, bottle cap, or foil used to hold the powder and water mixture during heating), a heat source (lighter or candle used to heat the cooker in order to help dissolve the powder into the water), a filter (a small piece of cotton placed inside the cooker to capture solid debris as the liquid drug is drawn through the needle into the syringe), and a tourniquet (e.g., belt or shoelace used to increase the size of the vein for easier injection). Any time a metal spoon is found outside the kitchen, investigators should check the bottom of the spoon for soot and charring.

Image 2: Multiple resealable baggies containing heroin powder found in a decedent's pocket.

Image 3: Most of the supplies of a “works kit” including a cooker (ice cream scoop), syringe with needle, and filters (cotton swabs).

In addition to recognizing paraphernalia, it is important for investigators to document drug packaging as this information can be proactively communicated to the police or public during a spate of overdose deaths. Heroin packaging comes in various forms, but the most common are small plastic zip-top baggies, glassine envelopes, plastic bag corners (“tear offs”), cut/crimped plastic drinking straws, aluminum foil, and paper bindles (**Image 4**). The zip-top baggies and glassine envelopes are often stamped with an image or slogan. These images are useful to law enforcement tracking drug distribution networks.

Snorting opioid powder leaves behind little to no sign on the body. Most abusers will use a straw, so there may be no visible residue around the nares. That being said, there is paraphernalia associated with snorting drugs. Most commonly, cut straws, empty pen barrels,

or rolled bills are used and are frequently found in the decedent’s pockets. If one of these items is found, investigators need to conduct a more thorough search of the scene for the remnants of drug packaging.

Documentation and Collection of Evidence

In a number of jurisdictions, the legal system has begun to approach overdose deaths with a focus on prosecution of drug dealers (5). Scenes are being managed more like homicides with a regard to evidence collection. This further underscores the importance of the scene briefing and walk through to discuss what items will be collected and by whom. If DNA collection is a consideration, then all persons entering the scene should consider increased personal protective equipment, including a facemask. Cell phones on the body have traditionally been treated as personal effects;

Image 4: Examples of common opioid powder packaging. Note that the plastic baggies are branded with an “eight ball” graphic.

however, cell phones contain critical information for the law enforcement investigation. If a phone is recovered from the pockets, it should be photographed and turned over to the police following proper chain of custody procedures.

After photographing prescription bottles, all controlled prescription drugs should be counted in the presence of a witness. The bottles are then placed in a tamper resistant evidence bag, marked with the case number, date collected, and signed or initialed by both parties. A chain of custody form should also be completed and accompany the bag of medications to the laboratory or other secure storage. In some jurisdictions, the medical examiner or coroner has legal authority to collect any item related to the cause and manner of death. In overdoses, this could include paraphernalia. If a syringe is to be collected, the investigator should place the needle and syringe in a sharps container, seal with evidence tape, and place the sharps container in a secondary container, usually a plastic evidence bag. Keep in mind that some crime laboratories will not accept a

syringe with a needle. In these cases, the investigator should contact the laboratory for proper evidence collection and submission techniques.

Evaluation and Documentation of the Body

Of course, a critical piece of evidence at any death scene is the body. There may be few external signs of an opioid overdose with the exception of intravenous injection cases. In these deaths, the investigator may observe acute venipuncture marks with or without contusion or blood around the injection site. The most common location for intravenous drug injection is the antecubital (AC) fossa. Veins in this location are easily accessible and easily hidden with clothing. After years of injections in the AC, chronic users may use alternate injection sites on the body. Other common locations are the groin and lower legs (**Image 5**). Investigators should use good judgment when searching the body for injection sites. If the body is in public view, it may not be advisable to pull down the decedent's pants to check for puncture marks in the

Image 5: Fresh needle injection of the lower leg. The decedent was unconscious before wiping away the blood.

groin. However, an investigator can easily remove a decedent's shoes and check between toes or slide their pant legs up to check the ankles and lower legs. Any time a decedent is wearing long sleeves and the cause of death is not clear, always slide the sleeves past the elbows to check for puncture marks.

Fentanyl transdermal patches are sometimes the source of the overdose. During examination of the body, investigators may encounter square or rectangular areas of adhesive residue on the skin. These patches are recommended to be placed on the upper arm, chest or back. Any time a decedent is found dead with a heating pad applied to the body, the investigator would be well served to check the area closely for a fentanyl patch. The application of heat to a fentanyl patch has been shown to increase the rapidity of absorption through the skin, which may result in injury or death (13).

Follow-up Investigation

Experienced investigators recognize that the scene examination is only the beginning of a comprehensive death investigation. In many fatal overdoses, there are no knowledgeable or reliable witnesses to confirm medical, psychological, and social histories. There-

fore, the medicolegal death investigator must contact family members and treating physicians after returning from the scene in order to determine whether or not the decedent abused illegal or prescriptions drugs. The following list of questions (**Figure 1**) will assist in obtaining a better understanding of the decedent's drug use history and potentially reveal additional sources of information (14).

When speaking with a treating physician, the investigator should specifically ask about known or suspected drug use. If the physician suspected drug use, what signs, symptoms, or behaviors did the decedent display during physical exam or history? Did the physician ever order a drug screen?

Medicolegal death investigators should also have access to prescription drug monitoring programs in their jurisdiction. These databases are useful in identifying patients who attempt to obtain the same narcotic prescriptions from different physicians without the physicians' knowledge of the other prescriptions. Prescription drug monitoring program databases may be helpful in cases where the cause of death is not clear after completion of the scene investigation. A search of the PDMP should be a standard procedure in most accepted and declined cases.

Has the decedent ever used illegal drugs or abused prescriptions?

- If yes, what kind? How often? When was the last use? How long has he or she been using?
- How do they use (route of administration)?
- Has he or she ever been hospitalized for an overdose? When? Where?
- Has he or she ever been in drug rehabilitation?

What precipitated initial use (it may be related to an injury)?

How long has the decedent been sober?

- Any recent life events that may have triggered relapse?
- Has the decedent been recently incarcerated or otherwise unable to use drugs?

Any indication this was an intentional overdose?

Who is the primary care physician? Are there any other treating physicians?

Figure 1: List of questions to assist in obtaining a better understanding of the decedent's drug use history.

An emergency medical services (EMS) incident report (“run sheet”) should be requested in all these cases as some acute venipunctures could be the result of resuscitative efforts rather than intravenous drug abuse. If the EMS record does not adequately document the treatment, then an interview may be necessary.

CONCLUSION

From the initial phone call through the completion of post-scene interviews, medicolegal death investigators need to be alert for explicit as well as subtle indications of a deadly overdose. The reporting party might mention details such as “heavy snoring” or “pain management” triggering the investigator to ask further questions and more than likely warranting a scene response. In the author’s experience, the position of the body may also yield the first clue of a fatal overdose. Even a history of opioid abuse unaccompanied by other supporting facts or findings could be sufficient to accept jurisdiction on a case. Once jurisdiction is accepted, a scene investigation should be conducted on all opioid drug deaths.

At the scene, investigators must document physical findings of an opioid drug death while exercising extreme caution when manipulating the body. Findings in a prescription drug death include multiple bottles of the same opioid from different prescribers, discrepancies in pill counts, or a heating pad applied to a transdermal patch. A pill inventory should be a standard practice in all suspected prescription drug overdoses. Common illicit opioid paraphernalia including cut straws, empty pen barrels, and “works kits” need to be photographed and collected in accordance with local laws and practices. After the scene has been documented, the investigator should examine the body with great care as syringes with needles are frequently discovered immediately underneath the body, in the pockets of clothing, or clutched in a decedent’s hand. Illicit fentanyl and fentanyl analogs present a serious threat to the health of investigators as minute amounts of the powder could be inhaled or absorbed. Personal protective equipment, including a properly fitted face mask and gloves, should be worn to reduce the risk of exposure and to protect against unintentional contam-

ination of the drug packaging with an investigator’s own DNA.

The medical examiner or coroner is uniquely positioned to deliver useful data to policy makers and law enforcement officials to inform prevention and response strategies. By conducting a thorough follow up investigation on every opioid drug death, the medical examiner or coroner’s office is able to provide the public health community with potential points of intervention to help reduce future deaths. Furthermore, scene photographs of drug packaging can be shared with local and regional law enforcement to aid in the identification of drug distribution networks. The medicolegal death investigator’s documentation of an opioid drug death not only assists in the determination of cause and manner of death, but also provides valuable information to support public health and safety initiatives.

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