



National Association of Medical Examiners

Abstracts of the 60th Annual Meeting

October 16 – 20, 2026

Sheraton Kansas City Hotel at Crown Center

Kansas City, Missouri

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1.1 Dead Accurate: Purpose-Built Artificial Intelligence for Forensic Documentation, Report Integrity, and Public Health Data Quality

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Forensic pathology occupies a critical interface between medicolegal documentation and population-level mortality surveillance. The accuracy and completeness of cause-of-death reporting directly influence vital statistics infrastructure, shaping epidemiological trend detection, resource allocation, and public health policy. Deficiencies in forensic documentation, including nonspecific cause-of-death language, transcription error, and incomplete required elements, represent recognized sources of mortality data distortion with measurable consequences for the surveillance systems that public health depends on.

This 18-month, multi-site pilot evaluated an Artificial Intelligence (AI)-assisted documentation platform across approximately 400 autopsies in two independent forensic pathology practices. The platform was designed around three priorities with direct public health relevance: usability through voice-driven, augmented reality (AR)-integrated capture that reduces documentation lag and transcription error; accuracy through National Association of Medical Examiners (NAME)-standard-aligned outputs and automated quality assurance review; and trust through preservation of forensic pathologist authority over all final determinations. Findings indicate that each design priority contributed to improvements in report consistency, documentation completeness, and the reliability of cause-of-death data entering the public health pipeline.

Commonly cited barriers to AI adoption in forensic pathology, including medicolegal liability, workflow disruption, and erosion of forensic pathologist authority, were addressed through platform design. Hands-free, real-time documentation reduced the interval between observation and documentation. Automated flagging of internal inconsistencies functioned as a structured quality layer without displacing pathologist judgment, directly targeting the documentation failures most likely to produce unreliable mortality records at the population level.

These findings support the feasibility of standards-aligned AI integration as a public health intervention within operational forensic pathology practice. Improving the fidelity of death investigation documentation strengthens the mortality data infrastructure that epidemiologists, policymakers, and public health agencies rely on to identify emerging threats, allocate resources, and evaluate outcomes. Further investigation across larger case volumes and varied jurisdictions will be necessary to assess the generalizability of these findings, but this study establishes a viable framework for advancing documentation quality as a public health priority.

1.2 Military Trauma Mortality Review: Actionable Postmortem Data to Increase Warfighter Survivability

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In response to the National Academies of Sciences, Engineering, and Medicine report on achieving the goal of zero preventable deaths after injury (1), the Defense Health Agency's Armed Forces Medical Examiner System and Joint Trauma System established an enduring Military Trauma Mortality (MTMR) process. This process is based on a standardized lexicon and a comprehensive forensic pathology investigation, including advanced radiographic techniques and a "complete" autopsy examination. Data from the investigation include emergency medical treatment delivered and/or observed at time of autopsy examination, delineation of all injuries sustained, and cause of death. A panel consisting of subject matter experts specializing in forensic pathology, trauma surgery, emergency medicine and prehospital care

determines each individual's mechanism of death, injury survivability, death preventability, and opportunities for improvement. A survivable injury is defined as an injury that the individual should have survived if all required medical resources were available and appropriate medical care was optimally administered throughout the continuum of care. A potentially survivable injury is defined as an injury the individual might have survived if all required medical resources were available and appropriate medical care was optimally administered throughout the continuum of care. A preventable death is defined as death that occurred from a survivable injury when the tactical situation did not limit prompt or optimal medical care. Opportunities for improvement include prehospital and hospital medical intervention, medical intervention placement, and time to medical intervention.

To date, the MTMR process has been completed on over 550 Service Members who died during combat operations (2,3,4). Most of the individuals had nonsurvivable injuries (76%), and by definition, these deaths were nonpreventable. Reduction of these deaths requires primary prevention and changes to tactics, techniques and procedures. For those individuals with potentially survivable (23%) and survivable injuries (1%), each of the injured structures were detailed and the required medical interventions for survival were defined, resulting in opportunities for improvement. The defined opportunities for improvement from these reviews continue to drive process improvement and medical solutions to improve combat casualty care and increase Warfighter survivability.

1. A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury. Berwick D et al eds. National Academy Press: Washington DC, 2016.
2. PMID: 32039975
3. PMID: 34397956
4. PMID: 35544336

1.3 An Autopsy-Based Analysis of the Relationship of Injury Patterns and Crash Characteristics in Fatal Motor Vehicle Accidents

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Motor vehicle collisions are a common cause of fatalities, especially among young individuals, and remain a public health concern. Retrospective, autopsy-based studies analyzing the relationship of injuries with certain crash characteristics are sparse. This study aims to analyze injuries based on crash characteristics and vehicle type in accidental, fatal motor vehicle collisions. All accidental motor vehicle fatalities reported to the Bexar County Medical Examiner's Office from 1/1/2011-12/31/2024 were reviewed. Each case underwent full autopsy examination and a scene investigation was conducted for all deaths that occurred at the scene. Markedly delayed deaths resulting from complications of injuries (e.g. pulmonary thromboembolism) and deaths that did not occur as a result of the collision (e.g. acute intoxications) were excluded. Demographic information, crash details, and causes of death were extracted, and autopsy reports were reviewed. Statistical analysis was performed utilizing the Pearson's Chi-square test and statistical significance was set at $p \leq 0.05$. There were 1,111 motor vehicle fatalities that met the inclusion criteria. Decedent vehicles included: 485 sedans, 224 pickup trucks, 256 sport utility vehicles (SUVs), 17 vans, 55 sports cars, and 32 commercial trucks. The cause of death included blunt force injuries in 885 cases (80%) and craniocerebral injuries in 119 cases (11%). There were 40 cases (4%) with a possible traumatic/mechanical or positional asphyxia, 8 cases (1%) involving drowning, and 86 cases (8%) with conflagration injuries. A significantly greater proportion of commercial truck deaths had a component of asphyxia or conflagration. There were 1,030 decedents (93%) with head injuries including intracranial hemorrhage, skull fractures, and brain injuries; 634 cases (57%) with cervical injuries including atlantoaxial dislocations; 911 (82%) cases with thoracoabdominal injuries; and 1,028 (93%) with extremity injuries. A significantly lower proportion of seat-belted decedents had cranial skull fractures or brain injuries, corresponding to ejection status, while a higher proportion had fractures of the ribs, pelvis, or extremity bones. The presence of pelvic and extremity fractures was correspondingly more frequent when decedents were not ejected. Other differences along with the potential implications of these findings will be further discussed during the presentation.

1.4 “One-Punch Manslaughter” Deaths: A UK Phenomenon

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In the UK, the term “one-punch manslaughter” (OPM) refers to a unique category of cases in which a single assaultive blow delivered by a punch with a clenched fist results in fatal blunt force head or neck injury almost exclusively in an ethanol-intoxicated male. The “one punch” precipitates a fall-associated spectrum of blunt force head injury with/without immediate unconsciousness and death. The usual causes of death are contrecoup traumatic brain injury (cTBI), vertebral artery injury-associated traumatic basal subarachnoid hemorrhage (TBSAH), commotio medullaris (CM), and neck injury.

Case assessment requires special procedures/dissections to demonstrate the pathological findings and permit correlation of the clinical presentation, pathological and toxicological findings to establish the correct cause and mechanism(s) of death. The pathological findings are heterogeneous with respect to the presence/absence of discernible primary impact blunt force injury (face/head/neck), secondary impact blunt force injury, skull fracture, and causes of death.

An analysis of all OPM cases autopsied for 2004-2016 inclusive in two forensic pathology group practice areas in England was performed. 49 cases were identified; age range: 18-78 years (mean = 39 yrs); M:F ratio = 47:2. The incidents occurred at a wide range of locations with pubs/nightclubs having the greatest frequency (20/49). A single punch was involved in the majority of cases (43/49) whereas a single push was responsible in 5/49 of cases.

45/49 cases immediately became unconscious. 4/49 exhibited a primary lucid interval). 9/45 of the cases that immediately become unconscious subsequently regained consciousness to have a secondary lucid interval before dying. In all, 12/49 cases died after lucid intervals.

For the one-punch category, 41/43 had a discernible facial impact site (27/43 external; 14/43 internal). No impact site was evident in 2/43 cases. 39/49 cases had evidence of blunt force impact injury from contact with the ground. SKs were identified (30/32 cases) and included a single depressed fracture at the site of primary impact.

The fatal pathology was cTBI (32/43), EDH (1/43), TBSAH (9/43), CM (3/43), depressed skull fracture (1/43), traumatic meningitis (1/43), neck injury (2/43) and commotio cordis (1/43). Femoral blood ethanol concentrations ranged 0 - 304 mg/100 mL (mean: 237 mg/100 mL). Illicit drugs were present in 9 of 43 cases.

This series reviews an important cohort of cases where death results from a single, assaultive blunt force impact in the setting of ethanol intoxication, and is only prevalent in jurisdictions with an entrenched drinking culture.

1.5 Where You Die Shouldn't Matter: A Constitutional Framework for Reform of the Medicolegal Death Investigation System in the United States

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The medicolegal death investigation system in the United States operates under significant structural variation. In approximately 1,600 counties across the country, the authority to conduct death investigations rests with elected coroners who are not required to possess any medical or forensic training — a geographic disparity that this presentation argues constitutes a violation of the Fourteenth Amendment's equal protection and due process guarantees.

This presentation employs doctrinal constitutional analysis, comparing existing Fourteenth Amendment precedent against the structural variation in medicolegal death investigation systems across jurisdictions.

Autopsy rate data from the Centers for Disease Control and Prevention and the Bureau of Justice Statistics are used to illustrate the geographic disparity between coroner and medical examiner jurisdictions and its consequences for the criminal justice system, the integrity of public health data, and the ability of families to find accurate information as to how their loved one died. The authors bring complementary expertise and perspectives from the fields of law and forensic pathology. Clinical observations from active forensic pathology practice are paired with constitutional analysis to identify reform pathways grounded in both legal doctrine and logistical reality.

Currently, where a person dies — not how they died — seems to determine whether or not their death is allocated the appropriate resources that it deserves. In jurisdictions where autopsies are systematically underperformed, deaths are simultaneously investigated and uninvestigated, leaving families, courts, and public health systems without the answers that only a competent forensic investigation performed by a qualified professional can provide. We argue that this geographic inequity is unconstitutional and needs to be addressed and corrected through system reform.

This presentation concludes with a proposed federal regulatory framework modeled on existing environmental and occupational safety law, establishing minimum standards for medicolegal death investigation while preserving each state's flexibility in its implementation. Realizing this framework requires the clinical data, professional expertise, and institutional credibility of the forensic community. The authors invite members of the National Association of Medical Examiners to contribute to this ongoing discussion, provide case documentation from their jurisdictions, participate in research efforts, and engage in legislative reform efforts.

2.1 Beyond Cause of Death: Forensic Pathology and Social Determinants of Death in New Mexico

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Introduction:

Forensic pathology centers on determining cause and manner of death; however, the upstream social and structural conditions contributing to mortality are not routinely integrated into medicolegal analysis. The concept of Social Determinants of Death (SDoD) extends the Social Determinants of Health framework by emphasizing how socioeconomic instability, environmental exposure, limited healthcare access, and structural inequities shape mortality patterns. National data demonstrate strong associations between cumulative social disadvantage and premature mortality. New Mexico, with its large rural population and diverse underserved communities, including substantial Indigenous populations, provides a unique setting to examine these dynamics within medicolegal death investigation.

Objective:

To illustrate how forensic casework can identify and characterize Social Determinants of Death and to demonstrate the role of forensic pathology as a bridge between medicolegal investigation and actionable public health intervention.

Methods:

A case-based series was derived from medicolegal autopsies performed at a statewide medical examiner system. Cases were selected to represent key domains of SDoD, including housing instability, substance use, rural healthcare access, interpersonal violence, environmental exposure, and structural vulnerability. Scene investigation findings, autopsy results, toxicology data, decedent demographics, and available social context were integrated to construct comprehensive mortality profiles. Patterns across cases were analyzed to identify recurrent systemic contributors to death.

Results:

Across cases, recurrent patterns demonstrate that mortality frequently arises from the convergence of multiple SDoD. Fatal outcomes followed identifiable trajectories, including untreated or poorly managed disease in rural settings, polysubstance use in the context of poverty and housing insecurity, and delayed intervention in interpersonal violence. Pediatric deaths reflected unsafe environments, limited caregiver resources, and culturally specific caregiving practices. One case involving cradleboard use and an unsafe

sleep environment highlighted the opportunity to systematically identify similar deaths and better characterize risk patterns within culturally specific practices. These findings indicate that many deaths classified under traditional manners, including natural and accidental, are deeply rooted in modifiable social conditions not captured by conventional death certification.

Discussion:

Forensic pathology provides a uniquely data-rich, population-level perspective on mortality that can inform public health strategies. Incorporating Social Determinants of Death into medicolegal investigations reframes death certification from a purely diagnostic exercise to a tool for surveillance and prevention. These findings support efforts to identify culturally specific risk patterns, including cradleboard-associated deaths, and to partner with Indigenous communities to develop culturally informed, community-driven education aimed at reducing preventable deaths while preserving traditional practices.

2.2 Beyond the Hype: Leveraging and Limiting Artificial Intelligence in Medicolegal Death Investigation to Protect Public Health

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Artificial intelligence (AI) is rapidly and inevitably entering society, including medicolegal death investigation systems. No forensic pathology organizations have produced comprehensive guidance on how to effectively and ethically use these tools to advance public health while avoiding serious pitfalls. The newly formed Artificial Intelligence Subcommittee of the National Association of Medical Examiners (NAME) Strategic Planning Committee was created in early 2026 to fill this gap by developing an AI position paper, educational materials, and practical implementation resources. This platform presentation will provide NAME members with an interim update on the subcommittee's work, highlight AI's current and near-term applications in forensic pathology and public health, and critically examine AI's hazards and limitations across diverse practice settings.

We will summarize key opportunities for AI to enhance public health impact in medicolegal death investigation, including workforce augmentation in chronically understaffed offices, more efficient analysis of large volumes of medical records and scene documentation, improved detection of emerging mortality trends, and better linkage of forensic data with public health surveillance systems at multiple jurisdictional levels. Examples include AI-assisted synthesis of complex medical and social histories in overdose deaths to identify modifiable risk factors and trend detection in violent deaths that may inform community-level prevention strategies. At the same time, we will highlight critical risks that threaten both case integrity and downstream public health action: privacy and HIPAA concerns, use of non-compliant or opaque platforms, bias and insufficient validation of AI tools in diverse populations, over-reliance on autogenerated narrative text, and unclear accountability when AI influences cause and manner of death determinations. Throughout, we will emphasize the principle that the forensic pathologist remains fully responsible for all work products, regardless of the degree of AI assistance.

Updates from the developing AI position paper will be presented along with practical, stage-appropriate best-practice recommendations for medical examiner offices seeking to implement AI tools in ways that are ethical, useful, defensible, and truly supportive of public health. These recommendations will address implementation governance and procurement, encryption and data-handling expectations, minimum validation and pilot-testing steps, staff training and competency assessment, and quality-assurance strategies that preserve evidentiary reliability, scientific integrity, and public trust. Finally, we will describe how the subcommittee's deliverables are intended to translate AI from speculative technology into concrete public health action through more timely surveillance, better-targeted prevention efforts, and informed policy development.

2.3 Legal Epidemiology Assessment of United States Medical Examiner and Coroner Systems

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Introduction: Medical examiners, coroners, and state officials play a central role in mortality surveillance. Death investigations can include scene investigation, autopsy, and toxicology. Information from these investigations is used to determine the cause and manner of death. State laws governing medicolegal death investigation (MDI) and certification vary widely, including component requirements, scope of authority, and qualifications. Unlike many forensic disciplines that operate under relatively standardized laboratory accreditation structures, MDI in the United States (U.S.) is governed at the state and local level.

Objective: Describe variability in state statutes and regulations governing U.S. MDI systems.

Methods: In 2022, CDC's Public Health Law Program, in collaboration with CDC's Division of Vital Statistics, conducted a legal epidemiology assessment of statutes and regulations from U.S. data sources including state constitutions and state statutes and regulations containing key terms related to MDIs. Researchers systematically identified, coded, and validated laws related to medicolegal system structure, professional authority, education and training requirements, circumstances requiring investigation or autopsy, and access to and retention of records. A total of 3,700 laws covering 3,100 U.S. counties and 2,040 separate MDI offices in 51 U.S. jurisdictions were analyzed.

Results: Nine distinct types of MDI systems were identified, most commonly statewide medical examiner systems (31%), county-based mixed medical examiner and coroner systems (25%), and county-based coroner systems (18%). Fifty-two percent of jurisdictions legally designated a state medical examiner, although fewer than half of jurisdictions operated fully centralized statewide systems. Most jurisdictions specified qualifications for medicolegal authorities (94%), while only 4% mandated accreditation for MDI offices. Autopsy authority frequently included multiple professional categories. Nearly all jurisdictions (94%) specified deaths requiring investigation, and 75% had legal requirements specifying when to conduct an autopsy. MDI record access was commonly addressed in state laws (88%), but retention periods were infrequently specified (20%).

Discussion: U.S. laws governing MDI and certification are highly heterogeneous. Variation in system structure, authority, qualifications, and investigative mandates may contribute to inconsistency in forensic practices and certification of these deaths. Understanding legal variability provides essential context for interpreting differences in MDI practice and mortality data. These findings establish a legal baseline against which future research may examine associations between legal frameworks and measurable forensic outcomes, including autopsy rates, toxicology utilization, diagnostic consistency, and mortality classification reliability. Future research should evaluate how laws influence autopsy utilization, toxicology practices, and cause-of-death accuracy.

3.1 Innovations in Community Outreach: The Cuyahoga County Medical Examiner's Citizens Academy, Where Forensics Meets Community

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The concept of the "Citizens Academy" (CA) began as a law enforcement outreach effort to enhance community relations and promote a better understanding of police department practices. These efforts were well-received and succeeded in fostering better understanding in the community. Medical Examiner Offices (MEOs) are another public agency whose workings are often misunderstood by the public. The MEO is also not readily accessible to a typical resident within a jurisdiction until a tragedy occurs. The Cuyahoga County Medical Examiner's Office (CCMEO) has a long tradition of community outreach, dating back to the 1930's, when it began publishing an annual statistical report. A CA seemed like a natural extension of this commitment and commenced in 2019 with the hopes of educating the public and clarifying some of these misconceptions.

CCMEO is a death investigation system in northeast Ohio centered around the city of Cleveland, which also oversees the county crime laboratory. We have created a program for the citizens of our county who

are interested in all the facets of forensic science that we, as a Medical Examiner's office and a forensic laboratory, provide. The CA includes ten weekly sessions and exposes participants to both functions of the agency, including scene investigation, pathology, toxicology, DNA, fingerprints, trace evidence, drug chemistry, and firearms. Staff in various areas volunteer to share expertise. An optional demonstration autopsy is also included for interested participants. Space is limited to 40 participants who must be residents of our jurisdiction, with five spots reserved for county employees.

In the inaugural year there were 100 applicants, but since the pandemic's end, this has grown to almost 650. The majority are female and the average age is 47. The CA has received a universally positive response from both participants and CCME staff. This presentation will discuss our CA experience and offer guidance and suggestions on how other death investigation agencies might approach this valuable form of community outreach.

3.2 Detecting Phytotoxins: Adaptation of a Comprehensive Toxicology Assay for Use in Complex Forensic Investigations

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Phytotoxins present unique and persistent challenges in death investigations. Unlike traditional drugs or pharmaceuticals, plant-based toxins are not included in standard forensic toxicology panels, and most laboratories do not have the capabilities to test for these substances. Symptoms of fatal ingestion can mimic natural disease or other toxidromes, leaving medical examiners and coroners with ambiguous autopsy findings, sometimes in the presence of notable scene investigations. Consequently, determining the role one of these toxins plays in death relies heavily on the laboratory testing capabilities and willingness to adapt toxicology protocols outside of the standard drug testing panel.

This presentation will showcase how adaptation of routine comprehensive toxicology testing methodologies, particularly through advanced high resolution mass spectrometry, can bridge the gap between investigation, pathology, and analytical chemistry to successfully identify toxins in complex forensic cases.

Our laboratory employs a non-targeted testing approach via liquid chromatography quadrupole time-of-flight mass spectrometry (LC-QTOF-MS). Biological specimens are prepared by an array of analyte isolation techniques to allow for capturing a range of chemical properties, and analytical reference standards are analyzed alongside case samples. Upon request from a forensic pathologist, a toxicologist reviews the toxin(s) of interest and determines whether detection is feasible based on chemistry, case circumstances and analytical setpoints. Generally, toxins with lower molecular mass and simpler structure are easier to detect, while larger substances (i.e., peptide or protein-like) may be less amenable to available techniques. Reference standards are required for testing and reporting, which factors into the toxicologist's determination of feasibility.

To date, our laboratory has fielded requests for, and investigated the detection of, several phytotoxins, including the yew tree (3,5-dimethoxyphenol), poison hemlock (coniine), the pong-pong or suicide tree (cerberin), and kava (kavain), among others. Most cases are submitted with history of poisonous plant ingestion. Biological specimens submitted for testing vary; however, blood remains the preferred specimen for most cases. In a case involving attempted suicide, stomach contents (containing suspected seeds) and bile tested positive for cerberin. This case involved a woman who ingested pong-pong seeds, presented to the hospital, and suffered cardiac arrest. In another case, blood was submitted after suspected poison hemlock ingestion and our testing found coniine present in blood and tissue.

By adapting advanced mass spectrometry workflows and fostering close collaboration between the forensic toxicologist and pathologist, medicolegal death investigation can effectively resolve complex, atypical poisoning cases that might otherwise remain undetermined.

3.3 4-ANPP: Investigating the Utility of a Quantitative Concentration Cutoff to Differentiate Between Pharmaceutically Derived and Illicitly Manufactured Fentanyl

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Fentanyl is an opioid that can be pharmaceutically or illicitly manufactured. Differentiating between these two sources has been increasingly important when fentanyl is detected on postmortem toxicology testing. One proposed mechanism is to more closely examine N-phenyl-1-(2-phenylethyl)-4-piperidinamine (or 4-ANPP) concentrations, which is both a minor inactive metabolite of fentanyl and a precursor in the synthesis of illicitly manufactured fentanyl. Studies have proposed that a quantitative cutoff for 4-ANPP may currently be the most informative differentiator between pharmaceutical (<0.5 ng/mL) and illicit (>0.5 ng/mL) fentanyl.

We applied this criterion to the fentanyl data at our institution which conducts both forensic and medical autopsies. We searched “4-ANPP” as inclusion criteria and eliminated cases with only qualitative 4-ANPP results. This produced 93 cases between 2022 (when quantitative results for 4-ANPP were first reported) through 2025 that had a median 4-ANPP concentration of 1.6 ng/mL (mean $\pm$ SD: 1.85 $\pm$ 8.03 ng/mL, range: 0.30–34 ng/mL).

When applying this quantitative cutoff to our dataset, 78 of cases had 4-ANPP levels >0.5 ng/mL while 15 cases had levels <0.5 ng/mL. When retrospectively reviewing the circumstances of these deaths, 92 of the 93 scenes had evidence of illicit drug paraphernalia and all but 20 cases were certified as mixed drug toxicities due to the detection of other illicit substances. Therefore, when blinded to investigative circumstances and additional postmortem toxicology results, using this cutoff alone had a sensitivity of 83.7% for identifying illicitly derived fentanyl. It also classified the one case of pharmaceutically derived fentanyl as having been illicit given its fentanyl level of 10 ng/mL and 4-ANPP level of 0.51 ng/mL.

When looking closer at the 20 cases where no illicit substances were co-reported on the toxicology results (arguably the situation in which this criterion may be the most helpful), the median 4-ANPP concentration was 1.5 ng/mL (mean $\pm$ SD: 1.78 $\pm$ 7.66 ng/mL, range: 0.21–51 ng/mL). When applying the quantitative cutoff to this subset of cases, 17 had 4-ANPP levels >0.5 ng/mL while 3 cases had 4-ANPP levels <0.5 ng/mL. The sensitivity was 84.2% and the one clinically derived fentanyl case was again misidentified.

While a potentially useful screening tool if additional information is unavailable, at our institution a thorough scene investigation still remains the gold standard for differentiating between pharmaceutically derived and illicitly manufactured fentanyl when investigating suspected overdose deaths.

3.4 Examining Discrepancies in Reporting Washington State’s Unexpected Carceral Fatalities (2021-2024)

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Introduction:

Washington State jails have some of the highest rates of deaths in the country. In 2021, the Washington State Legislature passed RCW 72.09.770, requiring fatality reviews for all unexpected deaths of incarcerated persons to identify opportunities for policy change and practice to prevent future deaths.

This study investigates these deaths and their review to identify systemic gaps in reporting practices and to highlight demographic, chronological, and institutional patterns, providing insight into transparency, accountability, and equity in correctional health reporting.

Methods:

A retrospective review was conducted of publicized Department of Health (DOH) and Corrections (DOC) reports on Washington State carceral fatalities between 2021 and 2024, with the following variables collected: decedent demographics (age, sex, race, ethnicity), facility characteristics, location of death,

medical and substance use history, cause of death, manner of death, preceding symptoms/signs, medical care received, and dates of incarceration, death, review meeting, and final panel report publication. Additionally, review recommendations were summarized to highlight opportunities for improvement within the state's carceral system.

Results:

Over the first four reporting years, the DOC reported 86 unexpected deaths, while the DOH reported 78. Consistent with national data, most deaths were attributed to natural and accidental causes and occurred predominantly in men (DOC = 83, DOH = 60). Race/ethnicity, unlike sex (DOC = 0.02%, DOH = 3.8%), was largely unreported by both (DOC = 96%, DOH = 83%). There was a lack of standardized reporting between the two and within each institution, and it was often unclear whether someone truly lacked a significant medical history or if such information was simply omitted.

Discussion:

To the authors' knowledge, Washington is the first state to establish this type of review panel. While helpful information has been gathered, there are several opportunities for improvement. The observed lack of granular data on race and ethnicity precludes assessment of whether certain groups were disproportionately represented among these fatalities and consequently limits the implementation of prevention strategies and targeted interventions. Comprehensive and standardized reporting requirements are needed to improve the quality of data from these reviews. Notably, these review committees consisted of facility employees and DOH/DOC staff, introducing potential bias in reporting. As compared to other fatality review panels, such as the DOH's Maternal Mortality Review Panel, autopsy reports were not reviewed by a subject matter expert in forensic pathology for accuracy, nor were these experts included in the review teams.

3.5 Pyogenic Ventriculitis without Bacterial Meningitis: A Case Report and Review of the Literature

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Pyogenic ventriculitis (PV) is a rare, potentially fatal, bacterial infection of the ependymal lining of the lateral ventricles of the brain that is characterized by the accumulation of pus within them. PV typically occurs secondarily to insertion of intraventricular drains/devices or other intracranial surgery more commonly (>80% of cases) with rupture of a brain abscess or bacterial meningitis (BM) being rarer causes. Less than 10 cases of community-acquired pyogenic ventriculitis (CAPV) have been reported. PV in the absence of bacterial meningitis has been reported.

Clinical presentation can consist of fever with signs of meningeal irritation, altered mental status or neurological deficit. Diagnosis is made on radiological imaging of the head (CT, MRI) and bacterial culture of the cerebrospinal fluid (CSF). *Staphylococcus* species, gram-negative bacilli, and *Streptococcus pneumoniae* are the common bacterial pathogens.

We present the case of a 47 year-old man with a history of illicit drug abuse and mental illness whose body was discovered laid on the floor at home, covered with feces, two days after he was last known to be alive. His state of health in the lead up to his death was unknown.

Postmortem examination yielded abundant luminal pus within the left lateral ventricle of the brain, associated with a thickened irregular appearance of its ependymal lining, in the absence of an intraventricular drain or evidence of recent neurosurgery. There was no purulent exudate within the subarachnoid space or intraparenchymal abscess of the brain. *Klebsiella pneumoniae* and *Proteus mirabilis* (gram-negative bacteria) were isolated from the pus. The lungs, kidneys and urinary bladder were devoid of suppurative inflammation and the other organs were unremarkable.

The glycated hemoglobin concentration was elevated (7.6%) and diagnostic of diabetes mellitus (DM). Biochemical analysis of the vitreous humor produced elevated concentrations of beta hydroxybutyrate

(4.79 mmol/L) and glucose (2.1 mmol/L) which were diagnostic of diabetic ketoacidosis (DKA). Toxicological analysis of the femoral blood found no finding of drug toxicity as a contributing factor to death. Death was ascribed to DKA in the setting of *Klebsiella pneumoniae* and *Proteus mirabilis* PV. This case exemplifies the extremely rare entity of CAPV that can develop in the absence of BM and **adds to the low number of similarly reported cases**. Previously undiagnosed (untreated) DM and the history of drug abuse were significant risk factors for the development of PV. It is reasonable to conclude that the DKA became superimposed on the PV.

3.6 Does the Use of Ex-officio Coroners Influence the Reporting of Non-natural Deaths?

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Introduction:

In the United States, coroners can be elected, appointed, or ex-officio. In select counties across six states, the position of coroner is held ex-officio by a prosecuting attorney, a justice of the peace, or a law enforcement official (sheriff or chief of police). Training requirements for coroners varies substantially by state, but in some jurisdictions, ex-officio coroners may be exempt from formal medicolegal death investigation training. Such differences in training and statutory oversight may contribute to variability in the certification of manner of death, particularly in cases of non-natural deaths.

Methods:

We extracted mortality data from all elected and ex-officio coroner counties across the United States from the CDC WONDER database between the years 1999 and 2020. This data was matched with the type of medicolegal death investigation system as reported by the Collaborating Office for Medical Examiners and Coroners, categorized as 1) elected coroner with and without a state medical examiner and 2) ex-officio coroner with and without a state medical examiner. Non-natural deaths per capita were compared across 1,319 elected coroner counties and 453 ex-officio coroner counties using a generalized linear model.

Results:

Over the study period, ex-officio coroner counties reported significantly lower rates of non-natural deaths per capita compared to elected coroner counties ($p < 0.0001$). Among ex-officio coroners, counties in which the role was held by attorneys had significantly lower rates of non-natural deaths compared to counties led by law enforcement officials and justices of the peace ($p < 0.0001$). The presence of state medical examiners was associated with increased reporting of non-natural deaths in both ex-officio coroner counties ($p < 0.0001$) and elected coroner counties ($p < 0.0001$), rendering the differences between these two groups insignificant ($p = 0.078$).

Discussion:

Non-natural deaths may be under-identified or underreported in ex-officio coroner counties, especially when the ex-officio coroner is an attorney, potentially reflecting differences in investigative training or practices. The availability of a state medical examiner office mitigates differences between elected and ex-officio coroners, suggesting that centralized guidance, training, and resources may improve the accuracy of death certification.

3.7 Association of Meconium Toxicology with Patterns of Placental Injury

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Introduction:

Maternal drug use during pregnancy is associated with adverse perinatal outcomes, including intrauterine fetal demise, although the mechanisms underlying these outcomes remain incompletely understood. While urine and blood matrices are essential for identifying acute maternal drug use, meconium reflects subacute to chronic intrauterine exposure due to its extended detection window. Because of this, we evaluated whether positive meconium toxicology is associated with specific patterns of placental injury,

including acute to chronic lesions, in liveborn infants to help inform potential mechanisms relevant to fetal demise.

Methods:

We retrospectively reviewed perinatal cases (2022–2026) with both placental examination and confirmatory meconium toxicology. Cases were classified as exposed (positive) or unexposed (negative) and further stratified by drug type. Placental findings were grouped into maternal vascular malperfusion (MVM), fetal vascular malperfusion (FVM), acute inflammatory lesions (AIL), chronic inflammatory lesions (CIL), and placental abruption and/or uterine rupture. Maternal variables included age, smoking, medical comorbidities, inadequate prenatal care, and sexually transmitted infections. Associations were assessed using chi-square or Fisher–Freeman–Halton exact tests and multivariable logistic regression.

Results:

A total of 104 liveborn cases were included; 65 (62.5%) had positive meconium toxicology. Common exposures included THC (59%), cocaine (35%), methamphetamine (17%), and methadone (17%); 26% had polysubstance exposure.

On univariable analysis, positive toxicology was associated with AIL ($p = 0.018$), but not with other placental lesions. Higher stage/grade AIL was more frequent in exposed cases (21.5% vs. 7.7%), though this did not reach statistical significance ($p = 0.065$).

In multivariable analysis adjusting for maternal factors, positive toxicology remained associated with AIL (aOR 3.47; 95% CI 1.17–10.27; $p = 0.025$). Cocaine and/or methamphetamine was associated with increased odds of AIL, whereas THC-only exposure was not. However, confidence intervals were wide and overall model performance was poor.

Discussion:

Positive meconium toxicology was associated with acute inflammatory lesions of the placenta, particularly in cases involving cocaine and/or methamphetamine. However, AIL is a nonspecific finding commonly encountered in the absence of drug exposure, and the model demonstrated limited predictive performance, indicating that toxicologic exposure alone does not account for these findings. Accordingly, toxicology results should be interpreted in conjunction with placental and autopsy findings and relevant clinical and investigative information.

3.8 Beyond the Inner Ear: Autopsy Skull Base Dissection Techniques to Evaluate Vascular Compromise and Infection

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Skull base dissections are uncommon but important autopsy procedures. Eye removal, auditory canal evaluation, and sphenoid sinus examination are standard forensic techniques. Forensic pathologists may need to examine other intracranial spaces for infection, vascular injury/compromise, or other findings pertinent to cause and manner determination. Herein, we provide a case-based review of skull base dissection procedures encompassing standard approaches for more commonly accessed base of skull structures, as well as recommended approaches for dissecting less commonly accessed skull base structures.

Case 1:

A 71-year-old man with acute myeloid leukemia on consolidation therapy developed septic arthritis requiring hospitalization. Left eye pain, redness, and proptosis with periorbital swelling were noted and rapidly progressed to bilateral symptoms and vision loss. Computed tomography showed concern for orbital cellulitis and chronic-appearing ethmoid, maxillary, and sphenoid sinusitis. Endoscopic paranasal sinus exploration was negative for fungus. He rapidly deteriorated and died, and a limited head-only autopsy was performed. Orbits were unroofed using a standard approach and an orbital exenteration including tarsus/levator aponeurosis was performed. To examine the paranasal sinuses, en bloc removal of the ethmoid sinuses, sphenoid sinus, and nasal turbinates was performed using the cribriform plate,

anterior clinoid process, and sella as the anterior, lateral, and posterior borders, respectively. The middle ears were accessed in the usual way.

Case 2:

A 4-month-old infant with multiple congenital anomalies had a perinatal course complicated by middle cerebral artery infarct attributed to hypoplastic left-sided cerebral arteries. Neuropathology showed microcephaly and left hemispheric encephalomalacia. To access the petrous and cavernous portions of the internal carotid arteries, en bloc removal of the arteries within the surrounding portion of skull base was performed and the carotid arteries were examined following decalcification. Evaluation for intracranial carotid artery dissection could be performed using this same method.

Case 3:

A 51-year-old woman with prior skull base tumor resection presented with acute bacterial meningitis complicated by cerebral infarcts. Care was withdrawn and autopsy was requested to clarify the relationship between the prior surgery and development of fatal meningitis. To assess current tumor burden and examine the inner ear and paranasal sinuses for infection, a rectangular portion of skull base was resected extending from the caudal anterior cranial fossa to the foramen magnum, laterally including the temporal bone and auditory canal and inferiorly including the maxillary sinuses.

3.9 Sepsis-Associated Axonal Injury (SAAXI): A 10-Year Review of Single Institution Autopsy Neuropathology

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Introduction:

Sepsis is a severe, life-threatening condition accounting for over 30% of total global deaths. Its pathogenesis is driven by excessive activation of the innate immune system, which promotes uncontrolled cytokine production and inflammatory cell death, leading to multiorgan failure. The brain is frequently affected, leading to cognitive impairment clinically and white matter signal abnormalities on neuroimaging studies, but underlying mechanisms are poorly understood. Small, published case series and our own experience suggest that these white matter abnormalities may be due to axonal injury, which we have termed sepsis-associated axonal injury (SAAXI). We present the histopathologic characterization of this novel entity and, in a large autopsy cohort, assess the association of SAAXI with demographic and clinical variables, concurrent hypoxic-ischemic brain injury, and regional vulnerability.

Methods:

A retrospective study was conducted on 125 adult patients (age: 34-90 years, 55% male, 45% female) from 2016-2025 who died from sepsis or septic shock, defined by the Sepsis-3 criteria. Each case was evaluated for acute axonal injury by applying amyloid precursor protein (APP) immunohistochemistry to five standardized brain sections (midfrontal cortex, cingulate gyrus with corpus callosum and caudate, thalamus with internal capsule, hippocampus with mesial temporal cortex, and pons). The pattern, extent, and severity of injury were assessed using a semi-quantitative rating scale. After slide digitization, computational pathology approaches were utilized for further characterization of lesions.

Results:

APP positive lesions were found in 45.6% of septic patients with no difference in age at death or frequency of positive cultures between SAAXI positive and negative cases. The most commonly affected region was the deep and periventricular frontal white matter, whereas the internal capsule and basis pontis showed the highest severity scores if positive. 61.4% of positive cases had lesions in at least 2 sections and 21% were positive in all sections examined. Evidence of concurrent hypoxic-ischemic injury was found in only a small subset of cases with no statistical difference between SAAXI positive (14.0%) and SAAXI negative cases (13.2%). Most lesions consisted of clusters of APP-positive axons with axonal swellings/bulbs. Rare cases showed an ischemic-type, rim-like APP staining pattern.

Discussion:

Acute axonal injury occurs frequently in septic patients but is likely underrecognized in routine autopsies. No association of SAAXI presence with clinical variables was found in preliminary analyses. The low frequency of classic hypoxic-ischemic injury patterns suggests that other injury mechanisms are the main drivers of the axonal injury seen in sepsis.

3.10 Closing the Gap: A Workflow-Based Analysis of Post-Consent Failure to Restore Hospital Autopsy Utilization

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Introduction:

Hospital autopsy rates have declined globally despite their well-established role in diagnostic quality assurance, patient safety, and medical education. While U.S. academic centers report autopsy rates of approximately 5%, our institution observed a marked decline to <1%. Prior studies have largely focused on barriers to obtaining consent; however, fewer have examined failures occurring after consent is obtained. We hypothesized that this reduction reflects inefficiencies within the autopsy workflow rather than solely limitations in consent acquisition. The aim of this study was to evaluate the consent-to-autopsy conversion ratio as a measure of workflow performance and to identify modifiable system-level gaps contributing to autopsy underutilization.

Methods: We performed a retrospective analysis of 4,229 inpatient deaths from 2019 to 2025. A detailed audit of 140 consent-related cases assessed documentation completeness, accuracy, and pathology involvement in the consent process. Resident physicians, who are primarily responsible for obtaining autopsy consent, were evaluated using a six-item scenario-based survey assessing recognition of autopsy indications (n=40). These data were integrated into a workflow-based predictive model to estimate the potential impact of targeted interventions on autopsy utilization.

Results: Autopsy utilization declined from 3.9% to 0.57% over the study period. Although consent initiation remained consistently low (4.3–9.1%), the consent-to-autopsy conversion rate decreased substantially from 52% to 8%, indicating significant attrition after consent had already been obtained. Consent audit findings demonstrated that 40% of forms were incomplete or inaccurate, and pathology involvement was minimal (1.4%). Resident survey results revealed inconsistent recognition of autopsy indications and infrequent consideration of autopsy in clinical practice, highlighting missed opportunities for appropriate case identification. Predictive modeling showed that combined improvements in consent quality, documentation accuracy, and clinician education could increase autopsy utilization up to 4.4-fold.

Discussion: Hospital autopsy underutilization is primarily driven by system-level inefficiencies within the consent and documentation workflow rather than consent acquisition alone. A substantial proportion of potentially recoverable cases are lost after consent has been obtained. This study introduces a reproducible, workflow-based framework that identifies actionable points of failure and supports targeted interventions to restore autopsy utilization as a measurable component of diagnostic quality assurance and patient safety in academic medical centers.

3.11 Improving Postmortem Documentation of Gender Identity and Sexual Orientation in Medicolegal Death Investigations

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Introduction:

Deaths among LGBTQ+ (lesbian, gay, bisexual, transgender, queer) individuals, particularly due to suicide or homicide, remain a significant public health concern. Accurate postmortem documentation on gender identity and sexual orientation is essential for valid surveillance, trend analysis, and development of targeted prevention strategies for preventable diseases. Despite growing societal

awareness, medicolegal death investigation systems inconsistently and incompletely capture these data, resulting in substantial information gaps that limit clinical and public health efforts.

Objective:

To improve the completeness and usability of postmortem sexual orientation and gender identity (SOGI) reporting in medical examiner cases without significantly increasing report time.

Methods:

A multidisciplinary quality improvement team evaluated medical examiner cases recorded for a single institution in a national medicolegal database (MDI Log). Baseline performance was assessed via text search of 3,243 cases (January 2021 through May 2024), revealing a completion rate of 0.31% for usable social history documentation of gender identity and/or sexual orientation. Key contributors to the quality gap were identified, resulting in the development of several different interventions. These included targeted educational sessions, updated documentation guidelines, and development of mandatory database fields for gender identity and sexual orientation. Altering and adding reportable fields to MDILog required support and cooperation from the National Association of Medical Examiners (NAME) and Occupational Research and Assessment, Inc. (ORA Inc.).

Results:

Following implementation, completeness of sexual orientation and gender identity (SOGI) documentation increased to 24.26% in the first post-intervention assessment encompassing May-July 2025 (n = 143) and reached 100% in a subsequent reassessment in September of 2025 (n = 19). The project exceeded its aim of a 50% increase in reporting by September 30, 2025. Additionally, the balancing measure (average report completion time) did not see a negative impact, remaining stable at 32 minutes pre- and post-intervention. As an added benefit, new fields were developed in MDILog for use by any office using this system for death investigation.

Discussion:

Standardized data fields, focused education, and clear documentation guidelines significantly improved postmortem reporting to SOGI information in medicolegal death investigations without increasing workload. This increases the accuracy of death investigation data, supports identification of vulnerable populations, and provides a scalable model for promoting equity and public health utility across medicolegal systems.

4.1 Undetermined due to insufficient data

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Sudden unexpected infant and child deaths are some of the most complex and difficult forensic investigations. In recent years, the technical difficulty of the examination and post-examination testing has increased. In addition to the challenges associated with the autopsy, these deaths often rely heavily on the death scene investigation in order to determine the cause and manner of death. Despite or perhaps because of this, it is not uncommon for unexpected pediatric deaths to have no definite cause of death identified, causing them to be certified as unexplained deaths.

The recommended nomenclature for certifying these unexplained deaths was spelled out by the National Association of Medical Examiners in the publication *Unexplained Pediatric Deaths: Investigation, Certification, and Family Needs* in 2019. The popularity of this terminology has grown in recent years, including terms like, "sudden unexplained death" and, "intrinsic" and "extrinsic" factors. One such recommended certification is, "undetermined (insufficient data)" or undetermined due to insufficient data. A sudden unexplained infant or child death may be certified as undetermined due to insufficient data when "a cause of death cannot be determined because investigation, death scene examination, or autopsy were substantially limited, incomplete, or insufficient."

The Sudden Unexplained Death in Childhood Registry and Research Collaborative (SUDCRR) performs in depth reviews of referred child deaths from around the world. At the time of this writing, over 300 cases

have been reviewed, undergoing a rigorous process involving multiple experts for each case including forensic pathologists, neuropathologists, cardiovascular pathologists, and geneticists. After review, a recommended cause and manner of death is ascribed to each case. In 20% of cases there was at least one element of the investigation that was felt to be insufficient. The most common missing or deficient elements included the death scene investigation, microbiology testing, microscopic examination of organs, and gross autopsy examination of the brain and heart. In 20 cases, this missing information led to the cause of death being certified as undetermined due to insufficient data.

The goal of this paper is to discuss what data was missing from these cases that caused the experts to opine that the cause of death could not be determined. The paper will highlight necessary elements in pediatric death investigation and potential pitfalls that affect determination of the cause of death.

4.2 Between Actionable and Ignored: The Problem of Variants of Undetermined Significance (VUS) in Molecular Autopsy

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Variants of uncertain significance (VUS) are the most common outcome of molecular autopsy in sudden cardiac death (SCD), yet current guidelines are explicit: VUS should not be used to alter medical management, and cascade genetic testing of at-risk relatives is not recommended. This binary framework—actionable versus non-actionable—appropriately limits overtreatment and unnecessary anxiety. However, it creates a persistent and consequential paradox for the medical examiner. When a previously healthy individual dies suddenly and the only findings are VUS in genes strongly associated with channelopathies or cardiomyopathies, the recommendation not to act may conflict with the obligation to protect surviving family members.

This presentation examines the lifecycle of a VUS, from initial identification to potential reclassification, and highlights systemic gaps that may leave families without meaningful follow-up. We review how VUS are classified, including variability and discordance across laboratories, and consider what typically occurs after a VUS is reported in the postmortem setting. Particular attention is given to the mechanisms driving reclassification over time, as well as the practical limitations of current systems in ensuring that updated interpretations reach affected families. We also address the role of cascade and segregation testing in this context, not as immediate clinical directives, but as potential tools for clarifying variant significance when appropriately coordinated.

Central to this discussion is the “recontact problem,” which presents a unique challenge for medical examiners. Unlike traditional clinical relationships, there is often no established infrastructure to support longitudinal follow-up, re-engagement of families, or communication of evolving genetic knowledge. As a result, families may remain unaware of clinically significant reclassifications that could alter risk assessment and management.

The binary recommendation framework for VUS, while necessary, is insufficient within the medicolegal context. The medical examiner may be the only physician to identify a potentially heritable risk and to initiate connection with genetic expertise. Bridging the gap between the directive not to act and the responsibility to ensure families are not lost to follow-up represents a critical and underrecognized function of forensic practice. In cases where certainty is unattainable, the obligation shifts from definitive answers to responsible stewardship of uncertainty—ensuring that ambiguity does not preclude vigilance, communication, and the opportunity for future clinical clarity.

4.3 Navigating the Intersection of Pediatric Death Investigation and Organ Donation

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Pediatric deaths that fall under medicolegal jurisdiction present complex challenges at the intersection of death investigation and organ and tissue donation. In cases involving suspected abuse, homicide, or other forensic concerns, medical examiners and coroners must balance the preservation of forensic evidence with the potential to save lives through transplantation. These complexities contribute to significantly higher rates of donation restriction in pediatric cases compared with adult donors.

This multidisciplinary session brings together expertise from donation professionals, pediatric critical care, and forensic pathology to examine the clinical, legal, and investigative factors that influence medical examiner and coroner donation permission. Speakers will review national trends in donation restriction, scenarios requiring forensic oversight, and explore the roles and responsibilities of clinicians, organ procurement organizations, and death investigators.

Through this presentation, we will address common misconceptions surrounding donation in homicide and abusive trauma cases, examine how donation can affect forensic autopsy and legal proceedings. Attendees will gain a deeper understanding of the operational, legal, and ethical considerations involved in pediatric donation cases under medicolegal jurisdiction, as well as practical tools to improve communication and coordination between clinicians, donation professionals, and death investigation authorities.

Learning Objectives:

1. Summarize national trends in donation restriction in pediatric medicolegal cases and discuss the implications for children awaiting transplantation.
2. Define the roles and responsibilities of clinicians, organ procurement organizations, and death investigators in pediatric donation cases under forensic jurisdiction.
3. Discuss common challenges, concerns, and misconceptions surrounding organ and tissue donation in cases involving suspected abuse or homicide.
4. Explain how organ recovery procedures may intersect with forensic autopsy and legal proceedings.
5. Identify practical strategies and best practices for preserving forensic evidence during clinical care and organ recovery in potential donation cases.

4.4 Crib Camera Recordings Identify High Rate of Perimortem Convulsive Events in Sleep-Related Sudden Death in Toddlers

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Introduction: Crib camera recordings offer a novel opportunity to examine terminal events in sudden unexplained death in childhood (SUDC). We analyzed SUDCRRC cases with recordings of sleep-related deaths and compared SUDC videos with videos from living children with sleep-related febrile seizures (FS).

Methods: Forensic pathologists, epileptologists and a sleep medicine specialist independently reviewed recordings and performed descriptive analyses, documenting visual evidence of convulsive activity, audio evidence of abnormal respiratory patterns, body position, temporal relationships of events, and video/audio quality. High-quality videos capturing 8 convulsive events in SUDC were compared with 7 videos from living FS controls.

Results: Of 409 enrolled cases, 17 had terminal video recordings; 16/17 (94%) were sleep-related. Thirteen (81%) were male; one child had a history of epilepsy. Among the 15 sleep-related cases without prior epilepsy, ages ranged from 13.2 to 33.4 months. Four had a history of FS, four had a first-degree family history of FS or epilepsy, and eight had fever within 72 hours before death. Ten recordings were

continuous, and five were triggered by motion or sound. Eleven cases (73%) had a terminal convulsive event, and 11 (73%) were found face down. Genetic studies were unrevealing. Motion analysis showed distinct differences between SUDC convulsive events and seizures in living FS controls.

Discussion: Growing crib camera use has created a new window of investigation into sleep-related sudden death in toddlers. The high frequency of perimortem convulsive events — most in children without a seizure history — would have remained unrecognized without video evidence. These findings support a seizure-related mechanism in many sudden sleep-related deaths of toddlers and also possible differences to potentially differentiate lethal versus benign FS during sleep. Notably, most SUDC cases, including those in our series, were found prone faced down.

4.5 Collaboration with Medical Examiners to Diagnose Missed Kawasaki Disease

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Introduction:

We collaborated with the San Diego County Medical Examiner's Office (SDCMEO) to determine if children and young adults (<35 yrs) with known or missed Kawasaki disease (KD) were among those with sudden, unexpected death from cardiovascular causes. Histologic study of autopsy tissues contributes to our understanding of the pathology of KD that is now the most common cause of acquired heart disease in children.

Methods:

From 2013 to 2022, there were 188 cases age 0-35 yrs with a cardiovascular (CV) cause of death who were autopsied at the SDCMEO. We excluded 69 cases due to the following diagnoses: cancer, drug/alcohol abuse, congenital heart disease, morbid obesity, spontaneous coronary artery dissection, collagen vascular disease, and diabetes. The remaining causes of CV death were: arrhythmia, atherosclerosis, cardiomyopathy, hypertensive CV disease, myocardial infarction, and myocarditis. We excluded a further 30 cases attributed to arrhythmia who had no pathologic findings in the heart. Autopsy reports were screened for gross and histologic findings suggestive of KD vascular damage including calcification, recanalized thrombus, and thrombosed coronary artery aneurysms (CAA) with minimal atherosclerosis. Next of kin consent was obtained for research studies on the tissues (UCSD IRB # 180587).

Results:

We identified 89 cases who met the inclusion and exclusion criteria. Autopsy reports were reviewed and 2 cases were selected for gross and histologic review for suspicion of missed KD. We identified one KD-compatible decedent, a 33-year-old white male who suffered sudden cardiac death due to thrombotic occlusion of the LAD. Histology revealed intramyocardial and epicardial arterial recanalization in areas of fibrosis, both of which are consistent with antecedent KD. Additional findings included diffuse interstitial myocardial fibrosis and evidence of both acute and chronic ischemic changes. Interviewing the decedent's parents revealed a KD-compatible illness at age 8-9 years for which the child underwent a lymph node aspiration with no definitive diagnosis.

Discussion:

The clinical and histologic review met criteria for KD. The diagnosis of KD continues to be missed and individuals suffering from the complications of CAA may only be diagnosed at autopsy. Antecedent KD should be considered in cases of acute coronary thrombosis in young adults with minimal atherosclerosis and recanalization of thrombosed arteries. We welcome collaboration with medical examiners to support our IRB-approved study of the pathology of KD.

4.6 Implementation of Diagnostic Genetic Testing in Forensic Pathology

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Understanding how and why infants, children, and young adults die suddenly and unexpectedly is the goal of the Sudden Unexpected Infant Death (SUID) and Sudden Death in the Young (SDY) Case Registry. Since 2015, the Case Registry has compiled information about young people (0-20 years) who die suddenly and unexpectedly. In addition, the Case Registry has a variety of resources available for participating jurisdictions to implement diagnostic genetic testing, a helpful tool in understanding the cause of some of these deaths. In this presentation, we will review protocols for case identification, sample collection, results reporting, and genetic counseling based on the experiences of SUID and SDY sites as well as others incorporating systematic testing. Clark County, NV, Washoe, NV, Philadelphia County, PA, Franklin County, OH, and Military Cardiac Arrest Program (MiCAP) have all incorporated diagnostic genetic testing into the autopsy of sudden unexplained deaths. A variety of approaches and types of testing have been implemented, from commercial panels to whole exome sequencing. This information can help other offices implement diagnostic genetic testing for SUID and SDY cases at the time of autopsy.

5.1 Small Hearts, Big Problems: the Role of the Forensic Pathologist in Evaluating Cardiovascular Disease in Pediatric Decedents

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A wide range of cardiovascular diseases may be encountered in pediatric autopsy, including congenital malformations, cardiomyopathies, cardiac manifestations of systemic diseases, and inflammatory or infectious conditions. This workshop will review the more common diagnostic challenges faced by forensic pathologists, and will begin with a 90-minute didactic session, followed by a hands-on wet laboratory session (60 minutes). For the lab session, the audience will be split into staggered groups and rotate around two tables where they will examine 10-15 hearts which illustrate the concepts discussed during the didactics. Each table will be staffed by a cardiovascular pathologist to guide the learning. The didactic session is divided into three high-yield topics, presented by the following speakers:

Congenital Heart Disease in the Child and the Adult (Dr. Stanley Radio)

Long-term mortality for children with congenital heart disease (CHD) has improved significantly, with an increased range of surgical and non-surgical treatments. Therefore, it is increasingly likely that forensic pathologists will encounter CHD at autopsy, whether the death is natural or unnatural. The nomenclature of congenital heart disease can be confusingly heterogeneous, and surgical alteration of the anatomy may prove confounding when medical records are not available. This presentation will provide a framework for the assessment of CHD at autopsy.

Myocarditis (Dr. Alison Krywanczyk)

Diagnosing myocarditis at autopsy presents a twofold challenge for the pathologist. First, they must accurately identify and classify the type of myocarditis; second, they must determine the significance of the myocarditis to the cause of death. These tasks are often complicated by inconsistent application of diagnostic criteria and by the potential phenotypic overlap between myocarditis subtypes, cardiomyopathies, and resuscitative/iatrogenic changes. This presentation will review subtypes of myocarditis, updated diagnostic criteria, and important differential diagnoses to consider.

Cardiovascular Updates from the Sudden Unexplained Death in Childhood Registry (Laura Gould):

The SUDC Registry and Research Collaborative at NYU Langone Health evaluates cases of sudden

unexpected child deaths from 1 month to 18 years. As part of the blinded multidisciplinary review process, cardiac pathologists review gross autopsy photos and histology. With more than 380 cardiac pathology reviews completed, we examine the heterogeneity of specimens retained, the cardiac pathology findings in cases deemed explained after study review as well as the mild cardiac pathology findings identified that were insufficient for cause of death.

6.1 Reconsidering the “Lucid Interval”: Compelling Evidence of Early Neurologic Collapse in Fatal Abusive Head Trauma

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Abusive head trauma (AHT), as defined by the American Academy of Pediatrics, refers to injury to the skull or intracranial contents of an infant or young child resulting from inflicted blunt impact and/or violent shaking. It remains one of the leading causes of fatal traumatic brain injury in early childhood. Despite extensive literature describing the clinical and neuropathologic findings of AHT, controversy persists regarding the timing of neurologic deterioration and the possibility of prolonged “lucid intervals” following injury.

The University of New Mexico Office of the Medical Investigator is a centralized, statewide medicolegal death investigation system that enables uniform evaluation of pediatric homicides through coordinated scene investigation, medical record review, and standardized forensic autopsy examination.

A retrospective review of homicide deaths in children younger than five years between 2000–2025 identified 31 cases in which death occurred at home or shortly after arrival to the emergency department. In the absence of prolonged hospitalization or life-sustaining interventions, autopsy findings in these cases are considered closely representative of injuries present at or near the time of collapse and death.

Preliminary analysis was completed in 13 cases (6 females, 7 males; mean age 14 months, range 1 month–2 years). All children were unresponsive at presentation, and death was considered obvious in 54%. Emergency medical services were contacted in 84% of cases, including two with documented delays in seeking care. Reported histories commonly involved low-height falls or caregiver-related events. Antemortem behavioral changes, including lethargy, vomiting, or decreased responsiveness, were documented in 62%. Prior involvement with the New Mexico Children, Youth and Families Department was identified in 31%.

All cases demonstrated evidence of blunt head impact. External injuries were present in every case, most commonly facial and scalp contusions or abrasions. Subgaleal hemorrhage was identified in 85%, skull fractures in 54%, and subdural hemorrhage in 92%. All subdural hemorrhages contained an acute component estimated to have occurred within 24 hours of death; 50% contained an organizing component with an average age estimation of 15–18 days.

A “last-known well” interval was ascertainable in 10 cases (mean 5.2 hours; range <1–12 hours). Confessed or witnessed mechanisms of injury were identified in three cases, and seven cases resulted in conviction or guilty plea for child abuse resulting in death. Collectively, these findings support the conclusion that fatal AHT is associated with immediate or rapidly progressive neurologic deterioration without a prolonged lucid interval prior to collapse.

6.2 A Matter of Mind: Does Brain Region Influence Drug Detection?

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When blood is unavailable, limited, or unsuitable, brain tissue may serve as an alternative matrix for postmortem toxicology testing; however, no consensus has been established on the specific area from which the brain sample should be obtained. Studies examining drugs across different brain regions within

the same decedent are limited, and the specific brain region sampled is often not provided. The objective of this study was to characterize the presence of drugs across multiple specified postmortem brain regions and to compare these findings to contemporaneously collected postmortem blood samples. This study involved the collection of brain tissue, specifically the frontal cortex, thalamus, medulla, and pons, and postmortem blood. Brain tissues and postmortem blood samples from 23 decedents were submitted as part of a drug surveillance program, i.e., Swift Toxicology of Overdose-Related Mortalities (STORM). STORM analysis was conducted at Western Michigan University Homer Stryker M.D. School of Medicine, including 50 opioids and 24 non-opioid drugs. Samples from the specific brain regions were processed individually using a standardized method. Brain samples were rinsed, weighed, homogenized, centrifuged, and subjected to solid-phase extraction, then analyzed by liquid chromatography tandem mass spectrometry. Postmortem blood samples were extracted and analyzed by the same procedure. Opioids were identified in 16 of 23 decedents; non-opioids were identified in 18 of 23 decedents, and both opioids and non-opioids were identified in 12 decedents. Examples of discordant findings were observed; for example, analytes were detected in postmortem blood but absent in brain tissue, analytes were present in some brain regions but absent in other regions, and in one decedent, an analyte was present in brain tissue but not in blood. For 7 of 23 (30%) cases with analytes positive in the blood, there were inconsistencies in the presence of that analyte across each brain region. The detection of some analytes was not exhibited across all regions of the brain; however, fentanyl (n=8), norfentanyl (n=6), 4ANPP (n=6), benzoylcegonine (n=10), and alprazolam (n=3) were consistently detected across all brain regions. Regarding the detection of some analytes, our study suggests that there should be some consideration given to which region of the brain is sampled. Further research involving the evaluation of regional variation of analytes throughout the brain may help foster a consensus opinion regarding a specific area of the brain to sample for toxicological testing.

6.3 Forensic Investigation of Fatal Pediatric Intracranial Hemorrhage Secondary to Arteriovenous Malformation

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Arteriovenous malformations (AVMs) are rare but critical causes of hemorrhagic stroke in the pediatric population, accounting for 30–50% of such cases. While most pediatric AVMs are intracranial, spinal vascular shunts represent approximately 3–4% of intradural spinal lesions. These malformations often remain asymptomatic until a catastrophic rupture occurs, with roughly 50% of pediatric cases presenting acutely. In the forensic setting, undiagnosed AVMs present a significant challenge as symptoms may overlap with other conditions or result in sudden, unexplained death.

The Washoe County Regional Medical Examiner's Office investigated the death of a 4-year-old girl with no significant past medical history who experienced a witnessed collapse. Upon arrival at a regional medical center, CT imaging revealed subarachnoid and intracerebral ventricular hemorrhages. Notably, a CT angiogram of the head was unremarkable, with no identified intracranial vascular abnormalities. The patient developed progressive bradycardia and, despite resuscitative efforts with five doses of epinephrine including amiodarone, progressed to pulseless electrical activity and was pronounced deceased.

Internal examination revealed a 1247 gram brain with congested meningeal vasculature and subarachnoid hemorrhage overlying the brainstem, cerebellum, and temporal lobes. Serial sections confirmed intraventricular hemorrhage. Significantly, diffuse subarachnoid hemorrhage was identified along the length of the spinal cord. A 3cm x 2cm x 0.7 cm vascular malformation was discovered overlying the dorsal cervical spinal cord, extending from the C3 to C7 level. Microscopic examination revealed tortuous vascular channels with varying mural thickness and focal hyalinization. Elastic stains showed prominent internal elastic lamina in some vessels and focal absence in others. The underlying spinal cord exhibited dorsal flattening and parenchymal gliosis, but no hemosiderin deposits were found, suggesting the absence of prior bleeding episodes.

This case highlights the diagnostic complexity of spinal AVMs, which are located in the cervical spine or conus medullaris in 90% of pediatric cases. Because the initial clinical presentation and head imaging focused on intracranial hemorrhage, the spinal source remained undiagnosed antemortem. For the

forensic pathologist, this case underscores the necessity of a thorough spinal cord examination in pediatric deaths involving unexplained basal subarachnoid hemorrhage, particularly when cranial imaging fails to identify a vascular source. Identifying these rare malformations is essential for accurately determining the cause of death and providing closure for families in cases of sudden pediatric mortality.

6.4 Cerebral Palsy: Forensic, Pediatric, and Neuropathologic Considerations in a Medically Complex and Vulnerable Population

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Individuals with cerebral palsy represent a medically complex and vulnerable population commonly encountered in forensic practice. Cerebral palsy is a clinically diagnosed disorder of movement and posture arising from a variety of causes, including perinatal insults, traumatic brain injury, or abnormal brain development. Affected individuals may experience lifelong complications, including seizure disorders, dysphagia with aspiration risk, chronic immobility, musculoskeletal deformities, nutritional compromise, and dependence on caregivers and medical devices. In addition to medical considerations, these cases may be complicated by allegations of neglect. Together, these factors complicate scene investigation, postmortem evaluation, and death certification.

We present a case-based review of decedents with cerebral palsy investigated in a medical examiner system, with emphasis on autopsy, postmortem computed tomography, neuropathologic findings, and forensic pitfalls relevant to cause and manner of death certification. Across these cases, recurrent neuropathologic themes include remote hypoxic-ischemic brain injury with chronic white matter loss, ventriculomegaly, deep gray injury, and seizure-related alterations. These findings are often accompanied by systemic complications such as aspiration pneumonia, nutritional issues, and sequelae of long-term disability. By focusing on practical examples, we aim to provide medical examiners with a useful framework for determining jurisdiction and approaching death certification in this vulnerable population.

6.5 A Collaborative Approach to SUDEP: Integrating Forensic Science, Advocacy, and Lived Experience

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Sudden unexpected death in epilepsy (SUDEP) is defined as the sudden, unexpected, non-traumatic death of an individual with epilepsy, in whom postmortem examination reveals no structural or toxicological cause of death. Estimates indicate that SUDEP occurs in approximately 1 in 1,000 individuals with epilepsy annually, with substantially higher rates (approximately 1 in 150) among those with poorly controlled or refractory seizures. It is now recognized as the most common cause of epilepsy-related mortality and ranks second only to stroke in terms of potential years of life lost among neurological conditions. Forensic pathologists play a critical role in identifying these deaths, as they frequently occur suddenly and fall within the jurisdiction of medical examiner and coroner systems. Improved recognition is essential not only for accurate determination of cause and manner of death, but also for strengthening surveillance, informing families, and guiding prevention efforts.

In recent years, substantial work has been undertaken to improve recognition and standardization of SUDEP classification, including the development of a joint position paper outlining recommendations for the certification of SUDEP-related deaths. This collaborative effort, involving the National Association of Medical Examiners (NAME) and other key stakeholders, sought to promote more consistent death certification practices and enhance surveillance. However, the extent to which these initiatives have translated into measurable improvements in SUDEP detection and reporting remains uncertain.

In this presentation, we will review major collaborative efforts aimed at increasing awareness and standardizing approaches to SUDEP identification, with particular attention to their impact on forensic practice and mortality surveillance. We will also highlight recent state and federal legislative initiatives

aimed at improving SUDEP recognition, reporting, and research support, emphasizing effective collaboration grounded in clear communication and respect for physician autonomy.

Finally, the discussion will be framed through the lived experience of a family member of an individual who died of SUDEP, underscoring the critical role of the medical examiner system in accurately identifying and certifying these deaths. This perspective highlights how improved recognition and consistent certification practices can contribute not only to more reliable surveillance data and a better understanding of the mechanisms of death, but also to more meaningful communication with families and the advancement of prevention efforts.

7.1 Lessons and Recommendations from the Washington State Missing and Murdered Indigenous Women and People Task Force

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Despite being a recognized crisis, only three presentations have been given at NAME's Annual Meeting over the past decade centered on missing and murdered individuals within the Indigenous communities of North America. This collaborative presentation between the King County Medical Examiner's Office (KCMEO) and the Washington State Missing and Murdered Indigenous Women and People (WA MMIWP) Task Force seeks to expand the scope of understanding of this crisis and provide practical insight into opportunities for improvement within the medicolegal death investigation and criminal justice systems, as well as provide best practices related to these sensitive deaths, including guidance on the ascertainment of race and ethnicity.

Often associated with rural areas and reservations, MMIWP is an urban issue as well, with Seattle ranked as the city in the United States with the highest known number of murdered Indigenous women and girls. It also has the highest number of MMIWP cases overall, while Washington ranks second highest among states. Established by the Washington State Legislature in 2021, the WA MMIWP Task Force exists to understand and address the systemic causes of violence against Indigenous people. KCMEO, located in Seattle, is a key partner and collaborator, with an in-house forensic anthropology section that serves the entire state.

Voices in this presentation include Indigenous women from the WA MMIWP Task Force, including a Senior Deputy Prosecuting Attorney, the Director of the Urban Indian Health Institute, and the Executive Vice President and Chief Research Officer of the Seattle Indian Health Board, who will share their experiences. Select cases will highlight the vital roles medicolegal death investigation professionals play in bringing closure and justice to families and communities. These cases range from the importance of appropriate specimen collection even in extreme circumstances to compassionate and respectful notification of the family. Attention will be given to the Task Force's biggest obstacles, including reliance on incomplete data from law enforcement and inaccurate data from racial misclassification based on phenotype and lack of recognition of tribal nations. Forensic pathology and anthropology contributions include a descriptive analysis of the causes, manners, and physical distributions of these deaths, as well as sharing challenges in identification and genealogy results, respectively.

7.2 Women with a History of Intimate Partner Violence: A Population at Risk for Homicides Hidden Among Deaths Initially Reported as Suicide or Accident

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The CDC has estimated that around 5 million episodes of intimate partner violence (IPV) occur in the US yearly and has classified IPV as a key preventable public health problem. Studies have observed that about half of women homicide victims were killed by intimate partners (IP); that between 67% and 80% of women killed by their male IP were victims of prior IPV by that partner; that in particular, non-fatal strangulation (NFS) of a woman by her IP increases the odds of her being killed by him by approximately 7.5 times; and that 43% of IP homicides in the US were preceded by NFS.

Intimate partner homicide scenes are especially susceptible to crime scene staging, research showing that male IPs are responsible for most staged death scenes, and between approximately 20% and 40% of IPV death scenes involve staging. "Hidden homicides" is a term describing such deaths, when an IPV homicide goes undetected, classified as another manner of death.

We report examples of two staged, hidden homicides; one, a woman whose husband reported that she choked on food; and the other, a woman whose husband reported finding her unresponsive in the shower after an apparent fall. In each case the IP that reported the death as an accident was later convicted of the killing.

California's Joanna's Law (SB989) highlights that an apparent suicide of someone with a history of IPV should be treated as a suspicious death and undergo a full investigation, mandates that investigators interview family members (not just the IP reporting the death), authorizes law enforcement to request a complete autopsy, and highlights that a coroner is authorized to consult a board certified forensic pathologist in such cases. It lists 10 factors of suspicious deaths in IPV, gives families access to case information and the right to ask for independent case review, and mandates training on IPV for peace officers.

Medical examiners are in a position to look at sudden deaths of those with a history IPV more closely, recognizing the increased risk of an IPV victim to have been killed by their partner. We should remain willing to review our cause and manner of death determinations when we subsequently learn that a decedent had a history of IPV, especially of NFS. We should be part of developing local death investigation protocols to identify hidden homicides among sudden deaths of those with a history of IPV.

7.3 Response to El Paso's 2019 Mass Shooting

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On August 3rd 2019, the deadliest anti-latino attack in recent US history took place in El Paso, TX, resulting in 23 deaths and 22 injuries. The multidisciplinary approach that took place in the following days including multiple law enforcement agencies (Police Department, Sheriff's office, Federal Bureau of Investigation, US Customs and Border Protection), activation of the Texas Mass Fatality Operations Response Team (TMORT), coordination with local government and community institutions helped optimizing results aimed at definitive victim identification, expediting postmortem examinations, and keeping open channels of communication with the agencies involved, all while operating at the highest industry standards for securing evidence and keeping open communication with the victim's next of kin. The sociocultural aftermath of the event, as well as the collective efforts from the city and its constituents to heal from the attack are also shared.

7.4 Sculpted to Death: The High Cost of Vanity

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Elective cosmetic procedures, including abdominoplasty, liposuction, and gluteal fat transfer, have surged in popularity and are often marketed as routine, low-risk interventions. South Florida, particularly Miami-Dade County, has become a modern epicenter of cosmetic surgery, with hundreds of procedures performed daily, where demand ranges from minor focal refinements to extensive body contouring procedures, including large-volume liposuction, extended abdominoplasty, and Brazilian butt lift (BBL). Beneath this culture of transformation, however, lies a spectrum of potentially catastrophic, often underrecognized complications, where the ultimate 'high cost of vanity' may be death.

We present a series of six fatal cases associated with cosmetic surgical procedures, which underwent autopsy or record review at the Miami-Dade Medical Examiner's Office, illustrating the multifactorial nature of mortality in this setting. Death may occur intraoperatively or during the postoperative period and may result from direct surgical and procedural complications, incompetent postoperative care, or pre-existing medical conditions exacerbated by the physiologic stress of surgery. In all cases, the manner of death was certified as accident in the setting of elective procedures. These cases underline the diverse mechanisms of death associated with cosmetic procedures and highlight how even carefully selected patients undergoing elective interventions may rapidly deteriorate intraoperatively, within hours or even months after an initially routine and uneventful procedure.

This series emphasizes the critical importance of rigorous patient evaluation, adherence to evolving surgical safety standards, and vigilant postoperative care. It further underscores the indispensable role of the medical examiner and forensic investigation in elucidating mechanisms of death, identifying preventable factors, and informing public health efforts in an industry where the pursuit of cosmetic enhancement may carry life-threatening consequences.

8.1 Cross-Reactivity Matters: When a Positive Isn't Positive and a Negative Isn't Negative

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Immunoassay-based drug screens are widely used in forensic toxicology due to their speed, sensitivity, and ability to detect broad classes of compounds. A defining characteristic of these assays is cross-reactivity, wherein antibodies bind compounds with structural similarity to the target analyte. This interaction is governed by antibody affinity and epitope recognition rather than strict molecular specificity, resulting in variable assay responses to related compounds. Cross-reactivity is typically characterized in manufacturer validation studies as a percentage relative to the target analyte at a defined cutoff concentration; however, these values are concentration-dependent and may not translate linearly across all casework scenarios.

Because immunoassays are calibrated against a single target compound, structurally similar drugs, metabolites, degradation products, or exogenous substances may produce signal responses that meet or exceed the reporting threshold. This produces presumptive positive results in the absence of the target analyte, underscoring the need for confirmation using techniques such as GC/MS or LC-MS/MS for definitive identification and differentiation of compounds. Conversely, compounds with poor antibody affinity, or those outside the assay's validated cross-reactivity profile, may fail to trigger a positive result despite being present at pharmacologically or forensically relevant concentrations. Additional complexity arises from stereoselectivity, as some assays preferentially detect one enantiomer over another, further influencing interpretive accuracy.

This presentation explores the practical implications of cross-reactivity through case-based examples, including:

- ☐ An apparent amphetamine positive without confirmatory identification due to decomposition
- ☐ A false fentanyl-positive urine dipstick result caused by diphenhydramine
- ☐ Detection of a designer benzodiazepine not included in a standard confirmation panel

- ☐ Misinterpretation when a benzodiazepine falls outside an assay's cross-reactivity profile
- ☐ Preferential detection of the d-methamphetamine enantiomer over the l-methamphetamine enantiomer
- ☐ Positive tricyclic antidepressant finding caused by cyclobenzaprine

A central theme is the critical importance of understanding the immunoassay in use, particularly the data provided in the manufacturer's product insert. Cross-reactivity profiles are essential for accurate interpretation yet are frequently underutilized in practice thus underscoring the importance of proper confirmation testing.

Attendees will leave with a practical framework for evaluating immunoassay results, interpreting cross-reactivity in a concentration-dependent context, and applying product insert data to avoid common pitfalls in forensic toxicology.

8.2 The Orphine Family: Cyclophrine, Chlorphine, Spirochlorphine, & 2,5-Dichloro Desmethylchlorphine – The Latest Installment in the Novel Synthetic Opioid Saga

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Novel Synthetic Opioids (NSO) are a challenge in medicolegal death investigation due to their toxicity and respiratory depressant effects. This class continues to evolve in response to regulatory actions, with displacement rather than eradication driving successive waves of emerging compounds. Since the July 2025 implementation of generic controls on nitazene analogues in China, nitazene positivity in North America has declined and a new class of synthetic opioids, the "orphine" analogues, has appeared. The orphines were developed as potential therapeutic agents in the 1960's but never approved for human use. N-Propionitrile chlorphine (cyclophrine) was first identified in late 2024 and has since proliferated, followed by the appearance of related analogues including spirochlorphine (R-6890), 5,6-dichloro desmethylchlorphine (SR-17018), and 5,6-dichloro bromphine (SR-14968), among other variants. Recent international public health alerts have highlighted increasing orphine appearances globally.

We describe temporal, geographic, and toxicological trends and drug concentration data for emerging orphine analogues and evaluate their relationship to case outcomes and declining nitazene analogue prevalence.

Postmortem toxicology samples from 2025 through Q1 2026 were screened using a high-resolution mass spectrometry surveillance library encompassing 23 nitazene and orphine compounds and metabolites at NMS Labs. Confirmatory testing was performed at the Center for Forensic Science Research and Education. Positive cases were evaluated for prevalence, geographic distribution, and co-occurrence patterns.

Nitazene-positive cases declined substantially following international control measures, decreasing from 350 cases in 2024 to 176 in 2025 (-49%). In contrast, cyclophrine emerged rapidly, with 17 confirmed cases in late 2025 and 93 additional cases in Q1 and Q2 2026. Expanded testing identified multiple related analogues, including chlorphine (metabolite) and spirochlorphine, usually present in combination. Orphine analogues were detected across at least 16 U.S. states consistent with data from recent public health alerts issued by CFSRE describing widespread distribution and admixture with other potent opioids. Co-occurrence of multiple orphine analogues and residual nitazenes was observed, suggesting overlapping supply chains and transitional drug markets.

The emergence of orphines represents a clear example of market adaptation following regulatory action, mirroring prior transitions from fentanyl analogues to nitazenes. High potency, low concentrations, and frequent co-occurrence create significant analytical challenges, particularly for laboratories without high-resolution screening capabilities. The presence of multiple structurally related analogues within single cases further complicates interpretation and risk assessment. As evidenced by recent international alerts, orphines are likely to represent the next dominant class of novel synthetic opioids in the United States.

8.3 MDMB-4en-PINACA in the Criminal Justice System

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Synthetic cannabinoids are novel psychoactive substances that are agonists of the cannabinoid receptors. Many novel psychoactive substances, including synthetic cannabinoids, are not detected on initial drug screening tests making them more difficult to identify in the population. These substances are on the rise and their emergence in the prison population is an area of growing public health concern. Synthetic cannabinoids are designed to mimic the effects of tetrahydrocannabinol (THC) but are often more potent and are associated with enhanced toxicity and more severe adverse effects. Examples include agitation, respiratory depression, cardiac symptoms including tachycardia and cardiac dysrhythmias, and seizures. Since it has become available, MDMB-4en-PINACA, a synthetic cannabinoid, has been implicated in fatalities both in the United States and abroad. We present two cases of fatal MDMB-4en-PINACA toxicity in inmates in the Missouri prison system.

Case 1 involves a 31-year-old man who got into a minor physical altercation with his cellmate. The guards intervened, separated the individuals and placed the decedent into a restraint chair. He can be seen on surveillance video to be writhing with seizure-like activity before becoming unresponsive.

Case 2 involves a 32-year-old man who can be seen on video surveillance exiting his cell and collapsing suddenly. He experiences seizure-like activity before becoming unresponsive.

In both cases, despite medical interventions, the inmates were unable to be resuscitated. Full autopsies were performed including external exam, internal exam and toxicology. In case 2, histology, comprehensive metabolic panel and genetic testing were also performed.

MDMB-4en-PINACA was detected in both cases in a synthetic cannabinoid screen add-on test from NMS labs after the initial drug testing came back negative for illicit substances.

Synthetic cannabinoids, including MDMB-4en-PINACA are a growing concern in the prison population. One of the illustrated cases is from St. Louis City and one is from a rural county in central Missouri, demonstrating the widespread nature of the issue. Synthetic cannabinoids are easy to obtain and can be transported into prisons after infusion onto paper products which can then be mailed. In inmate deaths where overdose is suspected, SCs must be on the differential or they may be overlooked. These cases demonstrate a growing health threat to a vulnerable population.

8.4 Drug-Involved Mortality of Incarcerated Individuals and the Need for Comprehensive and Current Toxicology Testing to Include Novel Psychoactive Substances as a Standard Practice

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In-custody deaths, described as those occurring between physical arrest through incarceration, are a category of deaths in which the medical examiner/coroner community establishes jurisdiction per national standards. Recommendations include a scene investigation, review of available video footage, medical record review, an autopsy in all non-natural deaths, and comprehensive toxicology testing on appropriate specimens (e.g. femoral blood, urine), inclusive of common illicit and therapeutic drugs. Although each death requires its own investigation, the increasing frequency of novel psychoactive substances (NPS) being reported in custodial deaths warrants the specific inclusion of emerging drugs in toxicology panels used by this population.

Many jurisdictions may rely on limited or targeted toxicology panels, which are likely insufficient for the detection of emerging substances, including novel synthetic opioids (NSOs), synthetic stimulants, toxic

adulterants, and synthetic cannabinoids. Illicit drugs are surreptitiously smuggled into prison through inventive means like impregnated papers and clothing. NPS may have gained a foothold due to lower costs, higher potency of psychoactive substances that can be formulated for easy concealment and trafficking into prisons, difficulty in detection due to variable testing protocols and biotransformation factors including metabolism and chemical instability, and a shifting chemical landscape.

This case series reports various NPS from the deaths of incarcerated individuals in the past few years. The true toll is difficult to determine due to variable investigation, classification, and testing protocols. Synthetic cannabinoids MDMB-4en-PINACA and 5F-ADB continue to be the two most popular substances detected in fatal overdoses of incarcerated individuals. At least 16 states across the country, including Florida, Texas, Illinois, South Carolina, and California, have reported at least one in-custody death involving synthetic cannabinoids; many states monitoring for these cases report more than one fatality. Protonitazene, an NSO, has also been reported in this population.

Although ideally correctional settings would be insulated from illicit drug use, emerging evidence shows that illicit drug exposure is a risk for incarcerated individuals, both in acute and long-term settings. Gaps in toxicology testing may lead to under-recognition of drug involvement, misclassification of cause and manner of death, and missed opportunities to understand patterns of substance use and trafficking within facilities. Comprehensive, standardized toxicology testing, inclusive of synthetic cannabinoids and potentially additional NPS subclasses, would allow death investigation professionals to more accurately characterize drug-related morbidity and mortality of incarcerated populations and implement public health and safety solutions.

8.5 Dying With or Dying From? Characteristics of Confiscated Drugs on Scene and Whether the Presence of Drugs on Scene Correlate to the Cause of Death: A Retrospective Review in the County of Santa Clara

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Drug overdose deaths claim many lives every year in the state of California and in the United States. In addition, the County of Santa Clara, California, has experienced rising levels of homelessness with an increase of 114% in the past decade. As homelessness rose, the County of Santa Clara also experienced the fentanyl epidemic, closely followed by the fourth wave of the opioid epidemic involving illicit stimulants combined with synthetic opioids. In Santa Clara County, CA, this fourth wave was characterized by combined methamphetamine and fentanyl fatalities. Drug overdose deaths remain among the leading causes of death in unhoused (homeless) people, a vulnerable population. More broadly, among drug-related deaths, the relationship between drugs discovered on scene compared to cause of death has not been adequately explored in prior literature. We reviewed medical examiner reports from 2018 to 2022 for the County of Santa Clara, where drugs were discovered on the scene. There were 96 cases during this period. In terms of manner of death, 84 were classified as accident, 6 as suicide, 5 as natural, and 1 as undetermined. The demographic breakdown of decedents included 43 White/Caucasian, 41 Hispanic, 2 Black, with the remaining decedents characterized as Pacific Islander, Other, or Unknown (1 each). Additionally, unhoused decedents comprised approximately 23% of deaths in this sample, while only 21% of unhoused individuals surveyed in 2025 in Santa Clara County report substance use disorders.

This study has three main objectives. First, we will examine the relationship between confiscated drugs and how these correlate to the postmortem drug profile and ultimately, the cause of death. Second, we will also examine the autopsy findings, specifically the presence of pulmonary edema, frothy foam, and cerebral edema, to determine if there is a correlation between these and levels of postmortem opioid blood concentrations. Our hypothesis is that higher postmortem opioid blood concentration is more deadly, and decedents would not have as much pulmonary edema or congestion, due to the increased lethality of a higher dose.

Lastly, given the overrepresentation of unhoused individuals in our study, we will explore the types of seized drugs, causes of death, and postmortem blood concentrations among unhoused decedents, in contrast to decedents who were not homeless, in this cohort.

8.6 Drugs Pathologists Love to Hate: Contextual Interpretation of Methadone, Gabapentin, and Kratom

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Some drug results can be relatively straightforward to interpret, when armed with appropriate references, whereas others present greater challenges and require more nuanced evaluation. Methadone and gabapentin are commonly identified in casework, yet these substances are often difficult to interpret with respect to toxicity and contribution to death. Kratom alkaloids, in contrast to traditional drugs of misuse, are relatively recent additions to the toxicologic landscape, and their concentrations remain challenging to assess. This workshop will provide practical, case-based interpretive guidance for these “high-frustration” drugs.

Methadone, a long-acting synthetic opioid used in pain management and opioid use disorder treatment, presents unique challenges due to its variable half-life, risk of accumulation, and delayed toxicity. Postmortem concentrations may not correlate well with impairment or lethality, particularly in tolerant individuals. Cardiac effects, including QT prolongation and arrhythmia, further complicate cause-of-death determinations. This session will review methadone pharmacokinetics, therapeutic versus toxic ranges, and key considerations before attributing death to this drug.

Gabapentin, primarily approved for the treatment of partial seizures and postherpetic neuralgia, is increasingly being incorporated into proactive, multimodal pain-management plans aimed at reducing opioid use. As prescribing has expanded, its presence in polydrug toxicity cases has risen. Although rarely fatal on its own, gabapentin can potentiate central nervous system and respiratory depression when combined with opioids or other sedatives. Interpretation is often challenging due to its widespread prescribing, broad therapeutic range, and limited concentration-effect data. This presentation will help attendees distinguish when gabapentin is incidental versus when it is a meaningful contributor to toxicity, highlighting the critical role that concentration and context play in final interpretation.

Kratom alkaloids are emerging substances of interest with opioid-like and stimulant properties. Their legal status, variability in product composition, and limited pharmacokinetic data create significant interpretive uncertainty. Metabolite patterns, and common co-exposure make evaluation more complex. This workshop will address current knowledge gaps and provide a framework for evaluating kratom-related findings in forensic cases.

Through selected case examples, the goal of this session is to provide forensic practitioners with practical guidance for interpreting these substances in medicolegal casework. Emphasis will be placed on integrating analytical findings with drug-specific pharmacology, polysubstance effects, and postmortem considerations to support accurate cause and manner of death determinations. Participants will learn strategies to distinguish incidental from contributory findings and to recognize potential synergistic effects, ultimately enhancing confidence and consistency in complex toxicologic interpretation.

8.7 Statistical Analysis of the Use of Postmortem Toxicology Positivity Rates to Predict Drug Overdose Death Trends

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Introduction:

Monitoring changes in overdose deaths is an important public health initiative. CDC overdose mortality data is the primary national surveillance mechanism but has a 6–12-month reporting lag that limits real-time trend detection making it difficult to identify concurrent changes in drug supply or policy. Postmortem toxicology data from a large national reference laboratory may provide a faster alternative.

Objective:

To validate postmortem toxicology positivity rates as a proxy for CDC fentanyl and methamphetamine overdose mortality trends and evaluate their predictive value.

Methods:

Data were extracted from the NMS Labs information management system for all cases with blood screened by liquid chromatography/time-of-flight/Mass-Spectrometry (January 2016-March 2026). Monthly positivity rates for fentanyl and methamphetamine were calculated. Overdose (OD) death rates were extracted from the OD Pulse dashboard (Northwestern University, accessed May 2026); January 2026-April 2024). National and US census region-level data from NMS Labs and the CDC were compared using Pearson correlation and cross-correlation. AIC-based segmented regression identified concurrent trend changes and the Granger causality test assessed whether NMS trends predict CDC trends. All statistics were performed in R 4.5.1.

Results:

National NMS positivity and CDC OD rates were strongly correlated for fentanyl ($r=0.976$, $p<0.001$) and methamphetamine ($r=0.973$, $p<0.001$), with no temporal lag. Regional correlations ranged from $r = 0.864$ – 0.974 across all four US census regions for both analytes. Independent AIC-based segmented regression identified three fentanyl breakpoints in both series with identical timing and concordant slope directions across all phases. Methamphetamine breakpoint analysis showed generale concordance, but the number and timing of breakpoints varied slightly (NMS: 4; CDC: 5 with timing differences ranging from 2-7 months. Granger causality testing confirmed unidirectional predictive information flow from NMS to CDC for fentanyl while methamphetamine showed bidirectional feedback.

Discussion:

Postmortem toxicology positivity rates from NMS Labs closely mirror CDC overdose mortality trends for fentanyl and methamphetamine at both national and regional levels. The lack of statistical lag in the fentanyl data demonstrates that the faster availability of laboratory data can function as an early warning system for drug OD death trend changes. The more varied results for methamphetamine data may be due to multiple factors including the role of methamphetamine in drug OD deaths, the wider range of tolerated doses, the longer detection window for methamphetamine and the more varied supply sources. These findings support the use of postmortem toxicology data as a complementary near-real-time surveillance tool for drug overdose deaths.

9.1 Imaging the Unseen: Forensic Investigation of Injury in Vulnerable Populations

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Forensic pathologists frequently investigate deaths occurring among vulnerable populations, including children, older adults, victims of domestic or intimate partner violence, incarcerated or in-custody individuals, and persons experiencing homelessness or other forms of social marginalization. These individuals are often unseen or unheard during life, and the circumstances surrounding their injuries or deaths may be poorly documented, misunderstood, or contested. In such cases, forensic investigation plays a critical role in reconstructing events and ensuring that injuries—and the stories they tell—are accurately recognized and documented. Medical imaging—particularly radiography and computed tomography (CT) can provide essential additional information that complements autopsy and enhances interpretation of complex injury patterns.

This three-hour workshop will focus on the added value of imaging in the forensic evaluation of at-risk populations and highlight the importance of collaboration between forensic pathologists, forensic radiologists, and other professionals who routinely work with vulnerable individuals. Rather than focusing solely on basic injury recognition, the workshop will explore how imaging findings can strengthen

investigative conclusions, improve documentation, and help contextualize trauma within broader medicolegal and social frameworks.

The session will begin with a discussion of background concepts and current standards of practice relevant to both clinical and postmortem imaging of vulnerable populations. Parallels will be drawn between clinical forensic imaging and postmortem investigation, demonstrating how imaging in both contexts serves to document injury, identify patterns of trauma, and support multidisciplinary evaluation.

Case-based examples will illustrate how imaging can reveal occult fractures and internal injuries. Topics will include imaging approaches in suspected child abuse, injury assessment in older adults where fragility must be distinguished from neglect or abuse, documentation of trauma in intimate partner violence, evaluation of or use-of-force–related injuries in incarcerated or in-custody individuals, and imaging findings related to environmental exposure or untreated disease in socially marginalized populations.

The workshop will also include a hands-on imaging component, allowing participants to review and interact with imaging datasets. Attendees who bring their own Windows-compatible laptop computers (without institutional firewalls) will have the opportunity to explore cases directly using dedicated viewing software. This session is designed as a collaborative educational experience, bringing together multidisciplinary subject-matter experts who routinely evaluate vulnerable populations. By integrating imaging with traditional medicolegal investigation, participants will gain practical insight into how multidisciplinary collaboration can improve injury detection, strengthen documentation, and help ensure that individuals whose experiences were often unseen in life are more fully understood in death.

9.2 Do Self-Inflicted, Accidental Firearm Injuries of Younger Pediatric Decedents Demonstrate Characteristic Features? A Review of 19 Cases from Three Medical Examiner Offices

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Allegedly self-inflicted firearm injuries pose significant investigative and death certification challenges. Relative to adults and the older pediatric/adolescent population, a higher proportion of self-inflicted firearm deaths in the younger pediatric population receive an accidental manner of death classification. Such a classification indicates that both investigative information and autopsy examination support the conclusion that an injury was self-inflicted. However, many studies of pediatric firearm deaths encompass all manners of death, are not necessarily limited to self-inflicted injuries, include older pediatric/adolescent decedents, and focus primarily on epidemiological features rather than on the physical findings of wounds observed at autopsy.

Accordingly, to establish whether self-inflicted, accidental firearm wounds in younger pediatric decedents demonstrate characteristic autopsy findings, the case management system databases of three large medical examiner offices (Bexar County, TX; Harris County, TX; Miami-Dade County, FL) were queried for firearm-related fatalities in decedents aged less than 10 years, occurring between January 1, 2000 and December 31, 2025. This yielded a total of 183 cases, including 152 homicidal, 22 accidental, 2 suicidal, and 7 undetermined deaths. Of the accidental deaths, 19 involved self-inflicted firearm wounds; 3 were not specified as self-inflicted. For each self-inflicted accidental or suicidal firearm wound death, autopsy report descriptions and photographs of injuries were reviewed in detail, and diagrams of the wounds were created. Subsequently, the wounds in cases with undetermined manner of death classification, or characterized as accidental but not specified as self-inflicted, were reviewed to identify any correspondence with self-inflicted accidental or suicidal injury patterns.

The most characteristic pattern of self-inflicted accidental firearm injuries consisted of an entrance wound in the face, often at or near one eye, with powder tattooing indicative of intermediate-range firing; occasional entrance wounds in the anterior torso were also seen. The suicidal gunshot wounds involved the head, demonstrated typical features of contact-range firing, and were limited to older individuals among the study population (ages 8 or 9 years). Some injuries in cases which received undetermined manner classifications demonstrated features characteristic of accidental wounds, but were matched with unclear or concerning investigative information, or the physical examination of the wound was limited in

some way. Although not absolutely dispositive in the absence of supporting investigative information, many accidental, self-inflicted firearm wounds in the younger pediatric population do demonstrate characteristic features, which should be considered when classifying manner of death.

9.3 NAME Involvement in Standards Development Activities in Medicolegal Death Investigation and Forensic Pathology

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Members of the National Association of Medical Examiners (NAME) are involved in many aspects of standards development for the fields of medicolegal death investigation and forensic pathology. These include both documentary standards and professional practice standards.

The Organization of Scientific Area Committees for Forensic Science (OSAC) was created to “strengthen the nation’s use of forensic science by facilitating the development of technically sound standards and guidelines and encouraging their use throughout the forensic science community.” OSAC has many discipline-specific subcommittees that conceive of and draft proposed standards that would be useful to the forensic science community. NAME is a charter member of OSAC, has a seat on its governing body, the Forensic Science Standards Board (FSSB), and has endorsed its standards development activities. OSAC, however, is not a standards development organization (SDO) and therefore cannot publish documentary standards on its own. Thus, OSAC-proposed standards are submitted to appropriate SDOs that put them through defined, consensus-based processes to vet, write, and publish them. One such SDO is the Academy Standards Board (ASB), a wholly owned subsidiary of the American Academy of Forensic Sciences, established and accredited by the American National Standards Institute (ANSI). The ASB develops consensus-based forensic science standards and provides training to support those standards. Similar to the subcommittees of OSAC, ASB has several consensus bodies that focus on the various specialties within forensic science. OSAC and ASB work closely together, and in fact, many members participate in both organizations to promote cross-talk and facilitate standards development. Once a standard has been published by an SDO such as ASB, it can be submitted to OSAC for evaluation to be placed on the OSAC Registry, which is a centralized repository for high-quality, technically sound standards.

This process has been used extensively in the field of medicolegal death investigation. However, standards development in the field of forensic pathology is unique in that it is the practice of medicine and thus, consensus-based, documentary standards are not appropriate. The history of how OSAC and ASB have navigated this issue when writing documentary standards will be discussed in terms of how standards are conceived, drafted, and developed.

NAME developed its own professional practice standards for autopsy performance in 2005, which are reapproved by the membership every five years, and can be amended annually. These standards are written and owned by NAME’s board certified, forensic pathologist members.

9.4 Scurvy: Scene Investigation and Autopsy Findings of this Emerging Public Health Threat

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A 35-year-old man with a history of schizophrenia, opioid dependence, and gingivitis had recent pain and swelling in his right leg before being found dead in his residence. Investigators found the scene lacked fresh fruits and vegetables, but contained plenty of fast food, frozen pizzas, and canned goods. External examination was significant for widespread petechiae, dry flaky skin, corkscrew hairs, and right leg edema. Internal examination revealed pallor of subcutaneous and visceral adipose tissue along with bilateral pulmonary thromboemboli. Dissection of the bilateral lower extremities showed the deep veins of the legs to be patent, however fascial hemorrhages were present. The decedent tested negative for Factor V Leiden and Prothrombin mutations. Histologic examination showed abnormal hair shafts which, in the context of the above scene and autopsy findings, was consistent with hypovitaminosis C (scurvy).

The often subtle and non-specific physical manifestations of scurvy may include hyperkeratosis, dry skin, edema, poor wound healing, hair shaft abnormalities, gingival bleeding, ecchymoses, and petechial hemorrhages. The medical literature reports cases of scurvy presenting as a coagulation disorder with deep vein thrombosis, hematomas, pulmonary thromboembolism, easy bruising, and abnormal complete blood count values. Given the relationship between vitamin C deficiency, defective collagen synthesis, endothelial vulnerability, and increased risk of thromboembolism along with his lack of other underlying risk factors, scurvy may have been a contributing factor in this decedent's death.

Although scurvy is often thought of as a historical maritime disease, it may be relatively easy to develop given our modern diet that is high in processed foods. Vitamin C is highly volatile and rapidly degrades through cooking, heat processing, and shelf-stabilization methods. Additionally, many barriers exist in today's society that may preclude adequate dietary intake of fresh produce, therefore greatly increasing an individual's likelihood of developing scurvy: psychiatric and eating disorders, poverty, medical conditions leading to impaired nutrient intake or absorption, excess alcohol consumption, certain prescription medications, use of GLP-1 agonists, tobacco use, and limited access to fresh produce. Because ascorbic acid is water soluble, scurvy can become symptomatic in a relatively short period of time (1-3 months).

It is estimated that approximately 8.4% of adults in the United States have some degree of vitamin C deficiency, and the incidence may only continue to increase. While the contributions of scurvy to morbidity and mortality are likely underrecognized, its diagnosis is of critical importance for the rapid implementation of treatment strategies and public health interventions.

10.1 Incarceration and Post-Release Deaths in New Mexico: A 10-Year Review

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Introduction:

The United States is a world leader in incarceration, with 2.3 million confined annually and 1.9 million in confinement on a given day. Yet, there is a paucity of published studies involving these deaths in the forensic pathology literature. The Office of the Medical Investigator (OMI) in Albuquerque, NM, has jurisdiction over deaths occurring throughout the state, and occasionally in neighboring states for some tribal deaths. New Mexico has numerous carceral facilities, including juvenile correctional facilities, state-operated adult prisons, county-based jails, and Immigration and Customs Enforcement (ICE) detention centers, and has an incarceration rate above that of the national average for both adults and juveniles.

Methods:

A retrospective analysis was conducted in OMI's case management system for decedents with an incarceration history. Data was gathered on the decedents and their correctional facilities, including basic demographics, location of death, and death certification. The study period was set as January 1, 2015, through December 31, 2024, and all ages were included.

Results:

Preliminary results reveal decedents to be overwhelmingly adult, with only a handful of cases representing fetal demise or juvenile deaths. Deaths most commonly occurred in people residing in jails, followed by prison and then ICE facilities, and in government- more than private- or tribal-owned facilities. The most frequent length of incarceration was 1 day. Homicides were relatively rare, and the methods used were varied. Overwhelmingly, suicides occurred via hanging, with many noted to be on suicide watch at the time of death. Video surveillance was generally lacking. Most deaths occurring in the post-release period occurred within the first 48 hours of release. Over half of deaths in this population were attributed to acute intoxications, and methamphetamine was the most commonly detected substance over fentanyl and ethanol.

Discussion:

This review represents the largest cohort of deaths occurring during incarceration in recent years and is the most inclusive across carceral facility types. Consistent with national data, men represented the

majority of deaths, and illnesses, suicides, and acute intoxications were the leading causes of death. Unlike deaths occurring in other vulnerable populations, such as pregnant individuals, children, and infants, there is an overall lack of fatality review panels in the United States centered on the deaths of those within our carceral system. Given this, descriptive studies like this are needed to highlight opportunities to improve the health and safety of those residing behind bars across our country.

10.2 GLP-1 Receptor Agonists: Friends or Foes?

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GLP-1 is an incretin hormone released following glucose consumption that stimulates insulin secretion, thereby supporting glycemic control. GLP-1 receptor agonists (GLP-1 RAs) were developed for the treatment of type 2 diabetes. Engineered to resist degradation by dipeptidyl peptidase-4 (DPP-4), they achieve prolonged activity, bypassing the insulin resistance characteristic of the disease. GLP-1 receptors are expressed in numerous organs, including the hypothalamus and stomach, where GLP-1 signaling promotes satiety and facilitates weight loss. Effectively, GLP-1 RAs have been adopted for medication-induced weight management and have become among the most widely prescribed pharmacologic treatments for obesity.

Despite the benefits, the rapid rise in GLP-1 RA use has been accompanied by an increase in adverse effects. Gastrointestinal (GI) complications are by far the most frequently reported, ranging from abdominal discomfort and nausea to pancreatitis and cholelithiasis. While GI adverse effects from GLP-1 RA use have not been directly linked to patient mortality, growing utilization warrants heightened awareness of the potential for lethality from a public health perspective.

We present the case of a 66-year-old woman found unresponsive at her residence, after reported nausea and vomiting. Her medical history was significant for obesity with recent rapid weight loss on semaglutide (a GLP-1 RA), cholelithiasis, hypertension, and active tobacco and alcohol use.

Postmortem full-body CT imaging demonstrated free peritoneal fluid surrounding the liver and spleen, pneumoperitoneum, and a gallbladder containing numerous stones. External examination revealed an overweight body habitus (body mass index of 29 kg/m²) and a protuberant abdomen. Internal examination revealed frank peritonitis with free bilious fluid throughout the abdominal cavity, the source of which was traced to an obstructing stone in the common bile duct, with resultant perforation. Although the root cause of gallstone development in this decedent was likely multifactorial, her history of GLP-1 RA use and rapid weight loss raised clinical concern for the medication's contribution to the fatal outcome. The cause of death was ultimately certified as complications of extrahepatic obstructive cholelithiasis. Obesity with recent rapid weight loss and atherosclerotic hypertensive cardiovascular disease were significant contributing factors in death. The manner of death was natural.

This case underscores the importance of identifying GLP-1 use history in fatal abdominal disease processes, and recognizing GLP-1 RA-associated biliary complications as potentially fatal. As these medications continue to see widespread use, forensic pathologists and clinicians alike should maintain a high index of suspicion for biliary pathology in patients with relevant exposure.

10.3 Hypothermia-Related Mortality in Cook County, Illinois and Santa Clara County, California: An Important Comparative Retrospective Analysis of Two Jurisdictions with Notable Climate Differences

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Deaths due to environmental cold exposure often involve a complex interplay of exposure, underlying natural disease, and substance use, and are variably supported by autopsy and scene findings.

Postmortem findings may include Wischnewsky ulcers, pancreatic hemorrhage, and red discoloration of pressure points, while scene investigation often reveals supportive evidence, such as inadequate environmental protection. Hypothermia-related mortality represents a significant yet understudied public health concern, particularly among vulnerable populations.

This retrospective study examines cold-related deaths in Cook County, Illinois and Santa Clara County, California, from 2015 through 2025, leveraging two jurisdictions with distinct climatic profiles. The study aims to characterize temporal trends in hypothermia mortality, identify populations at increased risk, and evaluate the contribution of underlying medical conditions and substance use. In addition, the study assesses the role of housing status and proxies of energy insecurity and examines the frequency and distribution of selected autopsy and scene findings in deaths attributed to cold exposure as commonalities between these two jurisdictions.

All cases containing hypothermia- or cold exposure- related terminology in the cause of death or other significant conditions will be identified in the Offices' digital databases spanning 2015 to 2025. Cases of carbon monoxide poisoning classified as accidental manner will be captured to assess indirect cold-related deaths from alternative heating methods. Data extraction will encompass comprehensive autopsy findings including age, sex, race, presence of Wischnewsky ulcers, knee erythema, pancreatic hemorrhage, toxicology results, cause and manner of death, significant medical conditions, and examination type. Scene investigation variables include, when available, ambient temperature data, housing status, death location, heating source availability, clothing adequacy, frost erythema, paradoxical undressing, burrowing behavior, weather conditions, and evidence of incapacitation. Comparative analysis between jurisdictions will account for baseline climatic differences using average low temperatures during death investigation periods.

By integrating autopsy findings with scene and contextual factors, this study aims to identify patterns associated with increased risk and clarify the relative contribution of environmental exposure, natural disease, and substance use. Given potentially increasing cold-related mortality despite warming trends, findings may reveal whether socioeconomic factors, including rising energy costs and housing insecurity, drive temporal changes. Results will inform targeted public health and harm reduction strategies for at-risk populations and will be presented to attendees upon study completion.

10.4 Blast Injuries Outside the Battlefield: Forensic Findings and Rural Health Implications

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Introduction:

An explosion is a rapid expansion of volume accompanied by an outward release of energy. Explosions create Blast Injuries (BI) that carry a high rate of morbidity and mortality. The pathogenesis of BI is generally stratified into five different categories: Primary, Secondary, Tertiary, Quaternary, and Quinary. An explosion of liquefied petroleum gas (LPG) is a rare phenomenon that has the ability to highlight the divergence of rural communities, their dependence on LPG, and access to healthcare. We present a case of blast injuries (BI) in the setting of an explosion of LPG in the rural Midwest.

Case:

A 63-year-old female was found deceased at the scene of a rural residential area following a large LPG explosion. The body was brought to the coroner's office, and a full examination was performed. The decedent sustained primary (aortic and pulmonary vein lacerations, bilateral hemothoraces), tertiary (comminuted skull and rib fractures, extremity fractures), and quaternary (extensive burns over >75% of body surface area) blast injuries.

Report:

Discussion:

The existing forensic literature on BI deaths is overwhelmingly drawn from military and terrorist contexts. Among civilian case reports, only a small number of reports document accidental gas or LPG explosion fatalities. Beyond the forensic findings, this case highlights important public health concerns. According to the United States Energy Information Administration, approximately 83% of households that use LPG for

heating are located in rural areas, and this figure jumps to over 90% in the Midwest. The increased rural dependency on LPG relative to urban areas is further exacerbated by the well-documented disparities in access to trauma care, with nearly 30 million Americans lacking access to a Level I or II trauma center within 60 minutes.

Discussion:

Rural populations are most likely to be dependent on LPG and are at a greater risk of LPG-related injury and death. This case underscores the need for targeted public health and safety interventions in rural communities.

10.5 Mind Your Manners - 30 Years Later: An Update to the Guide for Manner of Death Classification

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Manner of death certification was added to the U.S. Standard Certificate of Death in 1910 to support public health data collection. Initially focused on traumatic deaths, it has since been applied to natural deaths as well. While most cases are straightforward, some present significant challenges.

In 1995, the “Mind Your Manners” survey of NAME members informed the development of the *Guide for Manner of Death Classification*, approved in 2002. The Guide aimed to promote consistency by offering general principles and decision-making support, recognizing variation across offices.

Twenty years later, shifts in certification practices were observed—some influenced by the Guide, others by evolving knowledge—but persistent differences were deemed not significant enough to update the Guide at that time. In 2025, a NAME committee of forensic pathologists and coroners from diverse backgrounds, locations and jurisdiction sizes, revised the Guide, adding scenarios to reflect current challenges.

This presentation outlines the updated recommendations, their rationale, and selected complex cases. Because certification is circumstance-dependent, the Guide serves as a reference rather than a prescriptive standard, and variability is expected.

11.1 Integration of Forensic Pathologists' Assistants in a Medical Examiner's Office: A Novel Approach by the New Mexico Office of the Medical Investigator

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Introduction:

Physician extenders/advanced practice providers (APP's) have been incorporated in essentially all medical specialties for the last half century. Pathologists' Assistants (PAs) have been effectively used in surgical pathology and hospital autopsy pathology for an equal amount of time. Use of PAs in the forensic setting has not been generally endorsed/accepted thus far, despite the apparent, long-term workforce shortage in forensic pathology.

Discussion:

Considering the current shortage of forensic pathologists, lack of new graduating forensic pathologists, and current NAME autopsy equivalent limitations, there is no way for the current state of forensic pathology to continue as is. Pathologists' Assistants, specially trained in recognizing disease processes and injury patterns, seem to be the next logical progression for ME/C offices willing to incorporate physician extenders into their practice.

Pathologists' Assistants at the Office of the Medical Investigator (OMI) in New Mexico have been successfully utilized and incorporated into daily practice for the past 3 years. Preliminary unsolicited feedback from the attending forensic pathologists has been positive and a structured survey will be sent

out to assess the time saving aspect and efficiency of utilizing PAs in daily practice, with results to follow. PAs at OMI have not only been used for postmortem examinations, but also: interpretation of postmortem computed tomography (CT) scans, production of final draft of autopsy reports, review and interpretation of medical records and ancillary test results, supervision/instruction of rotating medical students, pathology residents, paramedic students, and forensic pathology fellows, and miscellaneous office administrative support.

The International Association of Coroners and Medical Examiners (IACME) have published a position paper on utilization of Pathologists' Assistants in forensic pathology, including recommendations on use and limitations in practice. If formally endorsed by NAME, the organization can produce its own guidelines on PA usage, allow for possible credentialing and/or supplemental training, and ultimately sharing autopsy equivalent credit with the attending pathologist. Additionally, NAME endorsement would prohibit abuse and/or misuse of Pathologists' Assistants in NAME accredited offices.

11.2 Communication as Infrastructure: Advancing Equity in Autopsy Consent and Public Health Data

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Medicolegal death investigation is essential to public health surveillance, particularly for vulnerable populations disproportionately affected by health disparities. Hesitation or objection to autopsy exams poses a complication to the collection of comprehensive public health surveillance data and can arise from many intersecting sources, including religious beliefs, mistrust in medical or legal systems, or heightened stress in the face of grief. While medical examiners retain legal authority to proceed with examinations without considering family preference, in practice, many offices seek to minimize conflict through communication and, when feasible, accommodation.

Conducting these conversations with a decedent's loved ones is a skill in itself, and there are few available resources for trainees and OCME personnel to learn the intricacies of fostering culturally competent, efficient, and compassionate communication within this context. Furthermore, research consent procedures differ across jurisdictions and institutions, adding complexity to communication strategies. Variability in autopsy consent communication may disproportionately impact vulnerable populations, limiting both equitable death investigation and inclusion in public health data.

To assess these challenges, we conducted a multi-jurisdictional survey of medical examiner offices to learn the current practices in autopsy consent discussions, available examination modalities, and operational constraints. This was supplemented by literature review of available scholarship on culturally competent patient communication, survey of pathology residents and fellows regarding their communication education, and information about current forensic pathology fellowship curricula.

Based on these findings, we propose a structured, decision-support framework designed to assist multi-disciplinary OCME personnel in navigating consent conversations, and supplement all levels of medical education. Structured communication tools and training resources provide a practical, scalable strategy to bridge forensic and public health goals without adding to the workload of pathologists. By adapting best-practices for culturally congruent care to the specific resources, approaches, and laws of OCMEs, we intend to strengthen communication and trust between the forensic pathology community and grieving families while maintaining the rigor and integrity of medicolegal investigation work.

11.3 Submersions in Swimming Pools: They Are Not All Drownings

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Decedents found submerged in swimming pools may be the result of natural or unnatural causes resulting in different manners of death. We examined a cohort of accidental and natural submersion deaths to

identify criteria for when to implicate drowning as the cause of death. Understanding the physiology of the body's oxygen cycle provides an important consideration when investigating these deaths.

A retrospective study for all fatalities in Connecticut found submerged in swimming pools between 2016 and 2025 was done. The cases were identified by text word searches of the report of death for "swimming," "pool," "submersion," and "drowning." There were 39 accidents and 23 natural deaths. The accidents were all due to drowning. The natural deaths were due to heart disease. The age ranges (mean) for accidents was 2-91 years (34 years) and for naturals was 26-95 years (74 years). There were 18/39 accidents under the age of 19 years and 0/23 for naturals. The sex for accidents was 27 male, 12 female, and for naturals 14 male, and 9 female. The race/ethnicity for accidents was 21 White, 15 Black, and 3 Asian and was 22 White and 1 Asian for naturals.

Not all causes of death of people found submerged in swimming pools are drownings. In these deaths, disease may be the sole cause of death, help explain why a person drowned, or be an incidental finding. These distinctions affect the cause and manner of death determinations. Various investigative factors help with these determinations including witness statements, swimming ability, dress (e.g., bathing suit vs. clothing), natural disease (type, extent), toxicology, and scene findings.

Understanding the pathophysiological differences in deaths due to cardiac disease and those due to drowning can help clarify death certification. If a person becomes unresponsive in a swimming pool due to heart disease, the loss of consciousness is because the brain is not being adequately perfused and the person submerges because they have lost consciousness. The cardiac mechanism results in the body's inability to maintain an adequate blood pressure (and oxygen delivery) to the brain. This breakdown in the body's oxygen cycle due to a cardiac mechanism, is downstream to the pulmonary oxygen supply, and therefore, the presence or absence of a sufficient pulmonary oxygen supply is immaterial because there is inadequate blood circulation to transport it.

Misclassifying these deaths as accidents may undervalue the need for public health strategies for cardiac screening among swimmers.

11.4 Characteristics of NAME-Accredited Medicolegal Offices in the United States in 2025

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We analyzed year-end 2025 data from 108 medical examiner and coroner offices accredited by the National Association of Medical Examiners (NAME), updating a prior 2011 national assessment. Six offices were excluded due to outlier status or incomplete reporting.

Since 2011, the number of accredited offices has nearly doubled, now covering more than half of the U.S. population, reflecting substantial growth in accreditation despite increasing system demands.

Operational scale varied markedly across jurisdictions. The median office served approximately 1 million persons and operated with an annual budget of about \$5 million, although both population served and budget spanned nearly two orders of magnitude. Mean per capita funding was \$4.75, from \$3.02 (equivalent to \$4.35 in 2025 dollars).

Workload analysis demonstrated that approximately 34% of all deaths were reported to medicolegal offices, with 20% formally investigated and certified. Among investigated deaths, roughly 45% underwent autopsy, though rates ranged widely (approximately 10–90%) across jurisdictions, reflecting differences in statutory requirements, investigative thresholds, and resource availability. Overall, offices performed approximately 500–700 autopsies per million population annually. Case mix included 39% natural deaths, 45% accidents, 9% suicides, 5% homicides, and 3% undetermined.

Across the 108 offices, 565 forensic pathologists (11% of total staff) were employed, with 98 vacant positions (~15% vacancy rate), confirming a persistent national workforce shortage. Staffing averaged 2–4 forensic pathologists per million population but declined in larger jurisdictions, suggesting economies of scale or resource constraints. Individual forensic pathologists performed approximately 240–280

autopsies annually, approaching accreditation thresholds; but offices with greater workloads should not be accredited. Investigator staffing correlated with both population served and geographic area.

In summary, accredited medicolegal death investigation systems remain highly heterogeneous, but overall appear to have generally lost resources since 2011, although some offices faring better or worse than others.

11.5 Distributive Injustice: Cause of Death and Demographics of Deceased Organ Donors at a Large Urban Academic Center (2021-2025)

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Introduction:

Deceased organ donation saves thousands of lives annually, yet donor organ distribution remains inequitable: stringent listing criteria disproportionately exclude individuals of lower socioeconomic status, perpetuating distributive injustice. No existing literature has directly examined the demographic and socioeconomic characteristics of deceased organ donors.

Methods:

A SlicerDicer (Epic Systems) query identified patients who died at hospitals within a large urban academic medical system and subsequently underwent organ procurement between 2021 and 2025. Demographic and socioeconomic characteristics, toxicology reports, cause of death (COD) and manner of death (MOD) were obtained from medical records. Data were analyzed using R. Cases will be paired with corresponding autopsy reports from the local medical examiner's office for corroboration of COD/MOD and additional analysis.

Results:

The final cohort included 301 decedents with a mean age of 44.6 years (range 6–78) and an average BMI of 27.8 kg/m² (range: 15.1-67.7). The majority were male (200, 66.5%), followed by female (95, 31.5%) and non-binary (6, 2%). By race, 208 (69.1%) were White, 20 Black or African American, 19 Asian, 17 multiracial, 4 American Indian/Alaska Native, and 2 Native Hawaiian/Pacific Islander; race was unknown in 21 cases. Of those reporting ethnicity, 239 (79%) identified as non-Hispanic and 35 (12%) as Hispanic; ethnicity was unreported in 27 (9%) cases.

The majority (55.8%) had a history of substance and/or alcohol use disorder. Hospital admission drug and alcohol testing was positive in 56.8% of cases, after controlling for drugs administered by medical personnel, and 25% were positive for cannabinoids. A history of incarceration was present in 80 decedents (33.1% of those with known status). Of those with a known employment status, 45.8% were unemployed. For insurance, 48.2% had Medicaid and 15.3% were uninsured. At the time of death, 75 (24.9%) were unhoused.

Additional analysis is pending including COD/MOD and correlation of data from the local ME's office's autopsy and toxicology reports.

Discussion:

The demographics of this cohort demonstrate marked differences from the general population. While race and ethnicity distribution were fairly congruent between our cohort and the regional population, most deceased donors have at least one factor that would prohibit them from receiving an organ, namely lack of a support system, insurance, and/or active substance use. These findings highlight a profound paradox at the heart of the deceased organ donation system: those who are most likely to donate are among those groups least likely to benefit.

11.6 Unraveling the Vortex: Distinguishing Crush Injuries vs Airborne Polytrauma in a Case Series of Tornado Related Fatalities

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Tornado-related fatalities are most commonly attributed to blunt force and crush injuries resulting from structural collapse and debris impact; however, high-intensity tornadoes may produce distinct injury patterns associated with extreme wind forces and victim displacement. This case series evaluates four tornado-related decedents, comparing injury patterns observed in traditional blunt force and crush injuries to those from two unique fatalities associated with a recent EF5 tornado in North Dakota. The earlier case and one decedent from the recent EF5 tornado, demonstrate findings consistent with established literature, including localized crush injuries, compressive asphyxia, and trauma patterns corresponding to structural failure. In contrast, the EF5-associated cases exhibited diffuse polytrauma, widespread skeletal fractures, and multisystem injuries not confined to a single vector, suggesting high-energy mechanisms beyond structural collapse. These findings raise suspicion for airborne displacement within the tornadic wind field, supported by the absence of focal compressive injury patterns and the presence of extensive internal organ damage. Additionally, we discuss key autopsy considerations in tornado fatalities, including the importance of correlating injury patterns with scene context and storm intensity to better characterize mechanisms of death. This series highlights the potential for distinct forensic injury profiles in extreme-intensity tornadoes and underscores the value of comprehensive autopsy evaluation in improving understanding of tornado-related mortality.

P1 Stercoral Ulceration of the Rectum with Secondary Multiorgan Injury: A Postmortem Case Study

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Stercoral ulceration is an uncommon but potentially fatal complication of chronic constipation and fecal impaction. The condition results from pressure necrosis of the colonic wall caused by impacted fecal material, most commonly affecting the rectosigmoid colon. Clinical presentation is often nonspecific and may mimic other causes of gastrointestinal bleeding or acute abdominal pathology, creating diagnostic challenges. We report the autopsy findings of an 82-year-old woman with a complex medical history who presented with generalized weakness and decreased oral intake. Imaging demonstrated a markedly distended rectum with stool burden and findings suspicious for stercoral proctitis. During hospitalization, the patient developed worsening abdominal pain, melena, progressive anemia, and severe lactic acidosis, raising clinical concern for mesenteric ischemia. Despite supportive management, the patient deteriorated and died. Autopsy revealed marked rectal dilation with multiple well-circumscribed mucosal ulcers measuring up to 6 cm in greatest dimension in the setting of severe fecal impaction. Histologic examination demonstrated mucosal ulceration with acute and chronic transmural inflammatory infiltrates consistent with stercoral ulceration. Additional findings included acute tubular necrosis, focal bronchopneumonia, and biventricular acute myocyte injury consistent with multiorgan dysfunction. No evidence of mesenteric vascular occlusion was identified at autopsy. This case highlights stercoral ulceration as an underrecognized cause of gastrointestinal bleeding and systemic deterioration in elderly patients with chronic constipation. The findings emphasize the importance of early recognition of fecal impaction and illustrate the critical role of autopsy in clarifying complex clinical presentations.

P2 Overdose Deaths in Northeast Ohio, 2022-2024: Impact of Declining Opioid Fatalities

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Introduction: Opioid-related overdose deaths have declined in recent years, raising questions about emerging drivers of overdose mortality. Local variation may be obscured in national analyses and underscore the need for region-specific investigation. This study analyzes drug-related overdose deaths from 2022 to 2024 in Cuyahoga (urban) and Ashtabula (rural) counties in Northeast Ohio to compare patterns of overdose mortality by urban and rural jurisdictions and demographic variations within regions.

Methods: A retrospective analysis of accidental drug-related overdose deaths between 2022 and 2024 in two Northeast Ohio counties: Cuyahoga County (urban) and Ashtabula County (rural). Data for Cuyahoga County were obtained from the Cuyahoga County Medical Examiner's Office, while Ashtabula County data were obtained from publicly available quarterly coroner reports. Age, sex, race, and substance(s) identified on postmortem toxicology reports contributing to the overdose death were recorded. Substance involvement was compared both between and within counties.

Results: A total of 727 accidental drug-related overdose deaths were recorded in Cuyahoga County and 89 in Ashtabula County during the study period. Fentanyl was the most frequently identified substance, present in 84% (n=609) of deaths in Cuyahoga County and 73% (n=65) in Ashtabula County.

In Cuyahoga County, cocaine was the second most commonly detected substance (56%), followed by methamphetamine (16%). Cocaine without fentanyl present in 11% of cases. In Ashtabula County, methamphetamine was the second most commonly detected substance (48%), followed by cocaine (20%). Methamphetamine without fentanyl present in 15% of cases. Xylazine was detected exclusively in combination with fentanyl, and nitazene compounds were co-involved with fentanyl in 81% of cases. Significant racial differences were observed between counties ($p < 0.001$). In Cuyahoga County, 65% of decedents were White and 34% were Black. In Ashtabula County, 98% of decedents were White and 2% were Black, largely reflecting the underlying general population racial makeup. Within Cuyahoga County, cocaine involvement had significantly higher odds in Black decedents (OR 2.61 (1.88-3.63), $p < 0.001$). In contrast, Black decedents had significantly lower odds of methamphetamine involvement (OR 0.39 (0.24-0.65), $p < 0.001$).

Discussion: Overdose patterns in Northeast Ohio suggest a shift toward a more stimulant-dominated landscape amid declining opioid deaths, with notable variation across geographic and demographic groups. Cocaine predominated in the urban county and methamphetamine in the rural county. Underlying demographic differences may contribute, at least in part, to observed rural and urban differences. These findings can inform public health intervention and programming planning.

P3 Death from Atraumatic Rupture of a Ductus Diverticulum Presenting with Massive Hematemesis in an Adult with a History of Patent Ductus Arteriosus Previously Repaired in Childhood

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The ductus arteriosus is a normal fetal vascular structure that connects the aorta and pulmonary artery, allowing oxygenated blood from the placenta to bypass the nonfunctional fetal lungs. Following birth, this vessel undergoes closure, enabling blood to circulate through the lungs for oxygenation. Failure of this closure results in a defect known as patent ductus arteriosus (PDA). Long term physiologic and clinical complications of a patent ductus arteriosus include poor growth, heart failure, pulmonary hypertension, and endocarditis.

Historically, PDA was treated with surgical ligation, in which the vessel is mechanically closed using sutures or clips. With advances in medical technology, transcatheter occlusion using coils or plugs has become the preferred method due to its minimally invasive nature and high success rate. Patients who undergo PDA closure generally experience excellent outcomes, with low rates of long-term complications and a normal life expectancy.

Fatal outcomes related to PDA repair are exceedingly uncommon, particularly given the overall safety and effectiveness of both historical and modern treatment approaches. However, this report describes a case in which a PDA that was surgically ligated in childhood, developed a ductus diverticulum aneurysm (DDA), and in adulthood, subsequently ruptured into the left lung parenchyma leading to massive fatal hematemesis. This case highlights an extremely rare decades delayed, abruptly fatal complication of a PDA that was surgically ligated in childhood.

P4 Nontraumatic Bilateral Cerebellar Hemorrhage in the Context of Recent Fentanyl Use

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Bilateral symmetric cerebellar hemorrhage is extremely rare and most commonly due to uncontrolled long-term hypertension. Its occurrence in the setting of acute opioid exposure has been described only rarely in the literature, and the underlying pathophysiology remains incompletely understood. This report describes a case of bilateral symmetric cerebellar hemorrhage in a decedent with recent fentanyl use and a history of illicit drug use.

A 53-year-old White man with no history of natural conditions and a history of illicit drug use was found deceased on his couch while on house arrest. According to police, his ankle monitor showed no movements for approximately 16 hours. Drug paraphernalia, including two small pouches containing white powder, white powder residue, and a straw, were recovered at the scene. At autopsy, the body was that of a well-developed male with no evidence of significant antemortem trauma. Internal examination revealed nontraumatic bilateral symmetric hemorrhage of the cerebellar hemispheres with surrounding edema and local compression of the brainstem. There was no evidence of atherosclerotic or hypertensive-like changes of the internal organs. The bladder was distended. Postmortem toxicology identified fentanyl at 1.8 ng/mL and norfentanyl at 1.4 ng/mL in peripheral blood. The cause of death was certified as nontraumatic bilateral cerebellar hemorrhage with the recent fentanyl use and chronic substance use considered as contributing factors. The manner of death was certified as accident.

A literature review identified prior reports of bilateral cerebellar hemorrhages in the setting of opioid toxicity, including cases described as toxic encephalopathy with hemorrhagic or necrotic components known as Cerebellar Hemorrhage and Necrosis Following Toxic Exposure (CHANTER) syndrome, an emerging entity associated with opioid use. The findings in the presented case show overlap with reported features of CHANTER. The mechanism is not fully understood but may involve hypoxic injury, mitochondrial dysfunction, and direct neurotoxicity.

While nontraumatic bilateral cerebellar hemorrhage remains rare, its presence in the context of recent drug exposure and in the absence of other potential causes should be recognized as potentially correlated with recent drug use, thereby supporting an accidental manner of death.

P5 Trends in Pediatric Mortality in Jefferson County, Alabama: An Eleven-Year Retrospective Analysis

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Pediatric mortality trends are an important indicator of population health, reflecting both medical and societal risk factors. Over 1.5 million pediatric deaths occur worldwide each year, with injury-related deaths remaining as the leading cause of death. In the United States, overall adolescent mortality has increased from 2018-2022, with motor vehicle-related deaths representing the most common mechanism. Understanding and comparing local trends in pediatric mortality is critical for developing targeted prevention strategies. The purpose of this study is to examine trends among pediatric deaths (<21 years old) within Jefferson County, Alabama from 2015-2025, with emphasis on demographics, cause and manner of death, and toxicology.

A retrospective analysis of 838 pediatric deaths was conducted. Cases were categorized by age, sex, cause and manner of death, means of death, and contributing factors. The majority of deaths occurred in older adolescents (18.0-20.99 years) and were significantly more common in males. Homicide was the leading manner of death, followed by accidents, with firearms representing the most common mechanism. Over time, homicides and undetermined deaths increased, while accidental deaths decreased; suicides and natural deaths demonstrated slight upward trends. Firearm-related deaths increased, while automobile- and co-sleeping-related deaths declined. Positive toxicology was identified in 211/838 cases,

and was most commonly detected in firearm-related deaths, followed by drug overdose and automobile-related deaths; the mean age of these cases with positive toxicology was 15.53 years. Pediatric mortality patterns in Jefferson County differs from nationwide trends, with the leading mechanism of death being firearm-related rather than motor vehicle-related. Homicide remains the leading manner of death in this cohort and continues to increase. These findings underscore opportunities for targeted public health interventions focused on injury prevention, gun safety, and risky behavior modification in this population.

P6 Forensic Pathology as a Platform for Microplastic Research: Advancing Exposure Surveillance and Health Disparities

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Introduction:

Micro- and nanoplastics (MNPs) are widespread environmental contaminants, now confirmed in human brain, cardiovascular, pulmonary, and reproductive tissues. Autopsy studies reveal systemic bioaccumulation, raising concerns about neurotoxicity, cardiovascular disease, and reproductive harm. Vulnerable populations, including those with lower socioeconomic status or high occupational/environmental exposure, may be disproportionately experiencing health disparities due to elevated concentration of toxicants, such as MNPs. Forensic pathology offers a unique opportunity to further our understanding of exposures and health risks by systematically collecting postmortem tissues from diverse populations experiencing adverse social determinants of health and disproportionately exposed to toxicants.

Objective:

To define the role of forensic and autopsy pathology in microplastic research and propose a framework for integrating postmortem tissue sampling into population-level exposure surveillance.

Methods:

We outline a forensic pathology framework using standardized tissue procurement across multiple organs. Samples are analyzed for polymer content via techniques such as pyrolysis-gas chromatography/mass spectrometry (Py-GC/MS), Polarization Wave Microscopy (PWM), and Scanning Electron Microscopy-Energy Dispersive Spectroscopy (SEM-EDS). Demographic and geographic data are integrated to reveal exposure patterns and disparities. Emphasis is placed on contamination control, reproducibility, and workflow integration into routine autopsies.

Results:

Autopsy-derived tissues provide a scalable, underutilized resource for characterizing MNPs bioaccumulation. Techniques can be readily adopted to minimize potential contamination of environmental plastics. Synthetic polymers have been detected across organs. Some show tissue-specific accumulation with links to various disease processes. Expanding forensic sampling networks enables mapping of organ-level distribution, correlation with health outcomes, and identification of socioeconomic, occupational, and environmental disparities. Routine tissue procurement establishes a practical model for longitudinal, population-level surveillance.

Discussion:

Forensic pathology bridges environmental exposure science and public health. Correlating tissue burden with demographic and clinical data can pinpoint at-risk populations and guide targeted interventions. Forensic pathology functions as a sentinel system for environmental health, revealing lifetime exposures, occupational impacts, and geographic health disparity.

Key considerations include consent, secondary use of specimens, privacy protections, and careful interpretation given contamination risks and methodological variability.

Forensic pathology provides a practical infrastructure for advancing microplastic research, supporting exposure surveillance, and informing equitable public health policy. The autopsy emerges as a uniquely

comprehensive environmental surveillance tool. This approach integrates forensic pathology, toxicology, environmental exposure science, and epidemiology to reveal how postmortem tissues can inform public health in the era of global plastic pollution.

P7 Suicide via Bang Stick: Readily Available Unconventional Firearms Represent a Risk for Vulnerable Suicidal Individuals

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Firearms are the most common method used in suicides, accounting for 55% of all suicide deaths in the U.S. In veteran suicide, firearms account for 70% of male and 42% of female deaths. Despite growing initiatives to prevent firearm injury and death, there remain many objects of equivalent lethality that are not legally considered “conventional firearms” and may be easily obtained by suicidal persons. Here, we present the case of a suicide using a “bangstick,” a non-conventional ballistic implement intended for fending off sharks and alligators. A bangstick involves a “powerhead” device, a short, non-rifled barrel able to house and discharge cartridges of similar caliber to handguns (.44 Magnum), shotguns (.410), and rifles (.223). By itself, a powerhead is officially considered a firearm by U.S. federal law; however, if permanently affixed to a metal shaft, the entire implement is called a “bangstick” and is no longer considered a firearm.

A 50-year-old man was found lying in a wooded area, with a bangstick, a projectile casing, and suicide notes at the scene. At autopsy, an entrance gunshot wound was observed on the upper forehead, with an underlying skull defect with internal beveling and associated soot deposition. A projectile pathway angled downward through the brain, from the entry wound to the posterior skull. A deformed projectile was recovered. The cause of death was a gunshot wound of the head. The manner of death was suicide.

Of note in this case was the fact that the decedent had multiple past suicide attempts, substance use disorder, and post-traumatic stress disorder secondary to military service. Although the decedent had participated in a suicide safety plan that included removal of available firearms, the possession of the bangstick was either not mentioned during visits, was not considered as a risk, or was obtained after the fact. In combination with evasion from the regulations against conventional firearm purchase/possession, the ready availability of bangsticks from online platforms adds to the ease of procurement, even for individuals at risk of harming themselves or others. In addition to bangsticks, the unregulated procurement or creation of improvised weaponry, through online shopping or other means, represents an unrecognized potential danger for vulnerable populations considering suicide. There must be greater awareness of these atypical, yet lethal means of suicide amongst medical, social, law enforcement and mental health professionals, as well as friends, families and support groups who engage with suicidal individuals.

P8 Predation in the City: Fatal Alligator Attack in an Urban Bayou

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Introduction: The incidence of alligator attacks in the United States has increased in recent years, particularly in Southern regions like Texas. Reported attacks often involve upper extremity injury, suggesting provoked or defensive encounters. Mortality is often associated with animal size, with mechanisms of death being hemorrhage or drowning. Although rare, fatal attacks still occur in alligator-dense states such as Florida. This case demonstrates that deadly attacks can occur in Texas, including large urban environments.

Case:

We present the case of a 63-year-old female with a petite body habitus (53 inches and 94 pounds) whose body was recovered from a bayou with an alligator that had partially consumed her. The deceased was found partially submerged with torn clothing. The alligator measured approximately 11.5 feet in length.

The decedent's medical and social history includes anxiety, depression, heavy alcohol use, and a prior suicide attempt by drowning.

External examination revealed a partially intact body, with absent upper extremities and portions of the torso. Necropsy performed by an external agency identified the missing upper extremities and portions of the torso inside the alligator. There was extensive tissue disruption with exposure and trauma of the skull and visceral organs. Additional findings included traumatic amputation of the mandible, fractures and partial absence of the bilateral ribs, and fracture of the second lumbar vertebra. Numerous punctures, lacerations, contusions, and abrasions were present on upper and lower extremities. The airway was open to water, with foreign particulates in the airway and lungs. Toxicology of brain tissue was positive for cocaine.

Discussion:

The blue-to-red pattern of bruising surrounding the bite marks found on the decedent's lower extremities demonstrates a vital reaction, supporting antemortem trauma. The 'death roll' is a rotational movement of the alligator along its long axis to shear its prey after latching. This mechanism is used by alligators when prey is too large to instantly kill. The traumatic amputation of the upper extremities, foreign substance in the airway, and the victim's petite size suggest an attack by the alligator resulting in drowning and traumatic hemorrhage. The presence of alligators in human-modified waterways such as bayous can lead to increased human-alligator interactions. Recognition of characteristic injuries and limitations of findings from considerable damage are therefore important for forensic pathologists to consider. Public education and awareness of the presence of alligators via safety protocols or signage may help reduce the incidence of occurrence.

P9 Methicillin-Resistant *Staphylococcus aureus* Pericarditis in an Elderly Female with Recent Aortic Valve Surgery and New Septic Arthritis: Unraveling A Complex Cardiac Autopsy Case

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Introduction:

Isolation of methicillin-resistant *Staphylococcus aureus* (MRSA) organisms from pericardial fluid is uncommon, with approximately 40 cases reported in the literature. In reported adult cases, it often presents with sepsis and cardiac tamponade (over 80% of cases), with ~20% mortality. Autopsy findings in MRSA pericarditis are rarely described; herein, we report a case to help address this gap in the literature.

Case:

A 70–80-year-old woman with a history of remote right knee arthroplasty and recent transcatheter aortic valve replacement (TAVR) for severe aortic stenosis presented with acute right knee pain, fever, tachycardia, leukocytosis, elevated lactate, and acute kidney injury. Knee aspiration revealed a purulent effusion with >40,000 WBCs (92% neutrophils), and positive MRSA cultures. Blood cultures were also MRSA-positive, indicating likely post-procedural bacteremia complicated by septic arthritis. She underwent urgent irrigation, debridement, and implant retention, and was started on intravenous antibiotics. Despite treatment, her condition deteriorated over ten days. Imaging revealed mitral valve endocarditis, suspected TAVR infection, and a moderate pericardial effusion. She underwent repeat surgery including removal of the infected aortic valve prosthesis (replaced with a graft), debridement of vegetations on the native mitral valve (replaced with a prosthesis), resection of a necrotic aorta segment, and drainage of pericardial fluid. Postoperatively, she developed uncontrollable aortic root hemorrhage and profound right ventricular failure, leading to her death.

The heart was markedly enlarged (500 g) with left ventricular hypertrophy. Grossly, there was moderate-to-severe atherosclerotic disease of the native coronary arteries, pericardial adhesions, and diffuse fibrinous epicardial debris with ~10 mL hemorrhagic pericardial fluid (MRSA-positive). Multiple transmural and non-transmural areas of red-to-black myocardial discoloration involved both ventricles and the proximal interventricular septum. The aortic graft and mitral valve prosthesis were intact without

vegetations or disruption. Microscopic examination confirmed acute, subacute, and old infarcts involving multiple myocardial territories, along with contraction band necrosis suggesting reperfusion injury. Acute inflammatory infiltrates and fibrinoid material were also present throughout the epicardial surface. Overall, the findings reflected severe multivessel coronary artery disease with superimposed widespread acute myocardial infarction and MRSA-associated pericarditis.

Discussion:

MRSA pericarditis may develop rapidly in patients with bacteremia (particularly in the setting of recent surgery or post-surgical complications), suggesting hematogenous seeding of the pericardium as the likely pathophysiologic mechanism. At autopsy, pathologists must be diligent in correlating cardiac findings to patient history and disease presentation as these cases may be complex to unravel.

P10 Sudden Childhood Death Unveiled by Molecular Autopsy: A Case of Confirmed Biallelic S Mutation with Diffuse Myocardial Fibrosis

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The *PPA2* gene encodes inorganic pyrophosphatase 2, a mitochondrial-located pyrophosphatase essential for cellular phosphate metabolism. Homozygous and compound heterozygous variants in the *PPA2* gene are a rare cause of sudden cardiac death in children. Affected individuals may be clinically silent until onset of acute heart failure and sudden cardiac arrest, often triggered by physiologic stressors such as viral illness, alcohol exposure, or certain medications. Furthermore, pathogenic variants are inherited in an autosomal recessive fashion, with multiple children in a family often affected. Reported cases remain limited worldwide.

We present a case of a 5-year-old girl with a history of recent sudden death of a sibling, who died following several days of upper respiratory and gastrointestinal symptoms. Autopsy was significant for findings including diffuse myocardial fibrosis and acute lobar pneumonia. Postmortem select viral respiratory pathogen testing confirmed human metapneumovirus and postmortem lung culture demonstrated scant *Streptococcus dysgalactiae*. Whole genome sequencing analysis detected biallelic (compound heterozygous) pathogenic and likely pathogenic variants of the *PPA2* gene.

This case report expands the number of reported individuals and families with confirmed pathogenic *PPA2* gene mutations. Additionally, it highlights the importance of integrating molecular testing into forensic practice, especially in the pediatric population, as it can reveal information relevant to cause of death determination as well as provide surviving family with information that may be critical to early detection and death prevention in other at-risk members.

P11 Hidden in Plain Sight: Gas Station Heroin at the Forensic–Public Health Frontier

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Tianeptine, popularly known as “gas station heroin” in some media reports, has emerged as a substance of abuse associated with serious toxicity, dependence, and death. Individuals who have medical and socioeconomic barriers and who may be seeking relief outside traditional care systems are particularly vulnerable to tianeptine abuse.

Tianeptine is an atypical tricyclic antidepressant approved for use in some countries, but it is not approved by the FDA in the United States. It enhances serotonin uptake and acts as a μ -opioid receptor agonist, leading to recreational use, inducing euphoria despite its risks of dependence, withdrawal, and toxicity. Therapeutic doses range from 25–50 mg/day. Tianeptine abuse involves gram-level daily intake, often obtained via online or retail powder purchases. At these doses, it can mimic symptoms of opioid toxicity such as nausea, tachycardia, seizures, and respiratory depression.

As an example of the bridge between forensic pathology and public health practice and prevention, we present a case of a decedent with a history of spinal stenosis, chronic back pain, fibromyalgia, and migraines who is believed to have self-medicated with tianeptine. The strategies employed by the medical-legal death investigation system aim to raise awareness and drive legislative change. The autopsy revealed toxicology results significant for blood levels of tianeptine at 18 mg/L and diphenhydramine at 1.9 mg/L, an absence of alternative causes of death, and classic opioid toxicity findings (including cerebral and pulmonary edema). This case underscores tianeptine's forensic risks in pain management and its potential for misuse. It illustrates how fragmented pain care, limited access to safer/alternative therapies, and aggressive marketing of quasi-legal psychoactive products can intersect to endanger vulnerable patients.

Forensic literature documents rare fatalities, typically polysubstance in nature, with postmortem blood tianeptine concentrations of approximately 2.0–8.4 mg/L, and higher levels (up to 12.5–18 mg/L) in select cases. These reports often included findings of pulmonary edema and no alternative causes of death. Patient tolerance can complicate the interpretation of these levels.

We will discuss opportunities for a more proactive, public health-oriented model of medicolegal death investigation, including options for the inclusion of tianeptine in targeted and expanded toxicology testing, as well as real-time data sharing among medical examiner/coroner offices, poison centers, and public health surveillance systems. The use of information from these deaths will serve as sentinel events to identify and mitigate emerging retail drug hazards, ultimately preventing deaths in vulnerable populations.

P12 Traumatic Tracheal Transection in an Adolescent: From Suspected Homicide to Suicide in a Vulnerable Population

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Spontaneous adolescent mortality represents a significant public health concern. As a result, accurate characterization of cause and manner of death requires integration of forensic investigation with broader public health awareness. We present the case of a 16-year-old male found unresponsive at a campsite under initially suspicious circumstances.

Emergency medical services arrived to find the decedent pulseless and apneic, with ongoing bystander cardiopulmonary resuscitation. Significant facial trauma, neck swelling, and copious blood and emesis from the airway complicated resuscitative efforts, and the patient remained in asystole despite advanced interventions. Early scene findings raised concern for possible inflicted trauma. The decedent had a history of recent interpersonal conflict, including reported domestic issues, and had been observed interacting with unfamiliar individuals prior to the event. The body was discovered at a location separate from key personal belongings, further contributing to suspicion for homicide.

Postmortem examination revealed extensive circumferential ligature injuries with deep soft tissue hemorrhage and a complete transection of the proximal trachea just inferior to the larynx, along with laceration of the anterior esophageal wall. The airway and lungs contained abundant blood, consistent with fatal upper airway hemorrhage and aspiration. These findings were highly suggestive of a ligature-related mechanism. Investigators returned to the scene, ultimately identifying a ligature attached to a tree limb at an elevated location. The ligature appeared to have broken during a hanging attempt, with scene evidence supporting a subsequent fall and movement prior to collapse. Toxicologic analysis detected a fentanyl metabolite in urine, while confirmatory blood testing was negative, indicating no evidence of acute intoxication contributing to death.

The cause of death was determined to be upper airway hemorrhage with blood aspiration due to traumatic tracheal transection from ligature hanging, and the manner of death was ruled suicide. Ligature hanging is a common mechanism of suicide; however, complete transection of the trachea is a rare and catastrophic injury. This case underscores the importance of forensic pathology in resolving diagnostic uncertainty, particularly in vulnerable youth, where social context may confound initial interpretation. Suicide ranks among the leading causes of death in pediatric populations. These deaths often occur in

the setting of complex psychosocial stressors, including family conflict, trauma, and limited access to mental health resources, and may initially present with unclear or suspicious circumstances. Bridging forensic investigation with public health awareness of suicide is essential to accurately characterize such deaths and inform prevention strategies targeting at-risk populations.

P13 Non-Down Syndrome Acute Myeloid Leukemia with Megakaryocytic Differentiation, Complex Karyotype, and *RUNX1* Copy Gain in an 11-Month-Old Male: A Unique Case with Discussion of Autopsy Findings

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Acute myeloid leukemia with megakaryocytic differentiation (AMkL) is a rare subtype of acute myeloid leukemia (AML) representing a small fraction of childhood leukemias, which themselves account for roughly one-third of pediatric malignancies. Most childhood leukemias are acute lymphoblastic leukemia, while AML comprises 15–20%. AMkL is strongly associated with trisomy 21 and *GATA1* mutations (so-called “myeloid leukemia associated with Down syndrome”, MS-DL), occurring 500 times more frequently in children with Down syndrome. In contrast, non-Down syndrome associated AMkL (non-DS-AMkL) is exceedingly rare (<1% of AMkL cases), genetically heterogeneous, and typically carries a poorer prognosis. Treatment generally involves intensive chemotherapy and may include hematopoietic stem cell transplantation, yet overall survival is approximately 18-40 weeks.

We report a case of an 11-month-old male who first presented at 9 months of age with nonspecific viral-like symptoms, decreased oral intake, dehydration, and irritability. Initial infectious workup was negative. Peripheral blood smear with flow cytometry demonstrated 7–10% CD34-positive blasts with aberrant myeloid and megakaryocytic markers (CD13/dim, CD33, CD41, CD56), raising suspicion for AMkL. MRI of the cervicothoracic spine revealed a 2 × 2 cm enhancing paraspinal soft-tissue mass; bone marrow biopsy subsequently confirmed AML with 80% blasts. Cytogenetic analysis identified multiple chromosomal abnormalities, including gains involving chromosomes 8, 15, and 21; FISH demonstrated copy gain of *RUNX1*. Constitutional karyotype was normal (46, XY). A Mediport was placed and intensive chemoradiotherapy was initiated.

The clinical course was complicated by enlargement of the paraspinal mass leading to spinal cord compression, requiring surgical debridement that showed necrotic tumor cells consistent with treatment effect. Despite therapy, the patient ultimately developed acute pneumonia and died from hypoxic respiratory failure. Autopsy revealed congested lungs with marked intra-alveolar neutrophilic infiltrates and markedly hypocellular bone marrow (<5%) with fibrinoid material and severely decreased trilineage hematopoiesis. Focal clusters of atypical mononuclear cells (focally up to 10–20% cellularity) with CD34 and partial CD56 expression were present, consistent with residual AMkL.

This case highlights the diagnostic and prognostic challenges of non-DS-AMkL, particularly in infants. Awareness of such entities is essential, as leukemia may be the underlying cause of death in complex pediatric cases such as this.

P14 The Role of Forensic Investigation in Deaths Due to Psychogenic Polydipsia

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Adults with schizophrenia have a 15–20-year reduced life expectancy and a 3.5-fold increase in all-cause mortality. Common causes of mortality include cardiovascular disease, pulmonary disease, accidental drug overdoses suicide and hyponatremia induced by psychogenic polydipsia (PPD). The incidence of PPD among schizophrenic patients is not well-established; however, evidence demonstrates that ~20%

of chronically institutionalized psychiatric patients experience PPD, ~80% of whom have a schizophrenia diagnosis. PPD should be considered when determining the cause of death in patients with schizophrenia. History, scene investigation, and vitreous chemistry tests are essential for accurate determination of the cause of death. We present 3 cases of PPD related to schizophrenia.

Case 1:

A 47-year-old schizophrenia male was found deceased in his bed. Autopsy disclosed cardiomegaly (heart weight – 640 g), and a vitreous sodium concentration of 85 mmol/L. The cause of death was hyponatremia due to PPD with contributing causes of cardiomegaly and atherosclerotic cardiovascular disease. The manner of death was ruled natural.

Case 2:

A 45-year-old schizophrenic male with a history of seizure disorder was found in cardiac arrest on his living room floor and was pronounced dead at the hospital. Autopsy revealed pulmonary emphysema, cardiac dilation, coronary artery atherosclerosis, and a vitreous sodium concentration of 78 mmol/L. The cause of death was seizure disorder and PPD due to schizophrenia. The manner of death was ruled natural.

Case 3: A 34-year-old schizophrenic male was found deceased in his apartment with water dripping from his mouth. Earlier in the day, he was witnessed consuming large quantities of water. The autopsy disclosed coronary arteries disease and a vitreous sodium concentration of 123 mmol/L. The cause of death was PPD due to schizophrenia and the manner of death was considered accidental.

Cause of death determination may be difficult in patients with schizophrenia. Autopsy may reveal natural disease that might otherwise be sufficient to explain death; however, given the risk of electrolyte disturbances, vitreous chemistry is essential when evaluating these cases. History and scene investigation are also of paramount importance. Manner of death classification varies, with arguments for natural manner of death, emphasizing underlying psychiatric disorder, and accidental, emphasizing acute exogenous water intoxication.

PPD is an under-recognized, potentially fatal complication of psychiatric disorders that may results in severe hyponatremia induced mortality. Recognizing PPD as a contributor to mortality in schizophrenic individuals may improve monitoring and fatality prevention in this high-risk population.

P15 How Every US President Died: A Medical Examiner Perspective and Insights into Vital Records Access

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Just as the lives of United States (U.S.) presidents fascinate the general public, so too do their deaths. Popular online articles, videos, and websites have discussed the deaths of the presidents. However, the medical examiner perspective, salient in opining on cause and manner of death and death certification, has been noticeably absent from such popular or academic conversation.

The deaths of U.S. presidents span more than two hundred years, a period marked by major changes in medical understanding and systems for investigating death. Many occurred before death certification was standardized, leading to heterogeneous records regarding causes and manners. This retrospective evaluation using a modern forensic pathology lens aims to reassess these deaths in light of contemporary medical examiner standards, examine areas of historical and medical controversy, and comment on variability in access to death certificates across U.S. jurisdictions.

A historical review was conducted of all U.S. president deaths using publicly available information including peer-reviewed articles, biographies, transcripts of material held in presidential libraries, monographs, autopsy reports, and death certificates. Each case was evaluated using current U.S. death certification practices and given a cause and manner where appropriate. Additionally, state-specific regulation governing access to death records was reviewed to characterize differences across jurisdictions.

To date, presidential deaths have mostly been due to natural causes (36 of 40). Eight of 40 cases underwent autopsy or other postmortem examination. Approximately 50% had an official or publicly reported cause which was not etiologically specific. The historical and scientific literature has extensively examined the pathophysiology of several cases, including George Washington's acute epiglottitis, William Henry Harrison's enteric fever, and Herbert Hoover's acute gastrointestinal bleeding. Four presidents - Abraham Lincoln, James A. Garfield, William McKinley, and John F. Kennedy – died due to gunshot wounds or related complications, with some cases accompanied by discussion regarding medical management and autopsy procedures.

A national registration area for deaths was established in 1880, with individual states joining over time. Access to presidential death certificates varies across jurisdictions, reflecting differences in regulations concerning public availability, eligibility requirements, confidentiality, and fees. For few presidents, reassessment was limited by availability of source material, including death certificates. In these instances, no classification of cause or manner was given, to avoid undue speculation. Applying sound, modern principles of death certification to the presidents addresses public and historical interest.

P16 A Series of N-Propionitrile Chlorphine (Cychlorphine) Deaths in Southeast Texas

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Efforts to monitor the prevalence of illicit opioid use and opioid related deaths are challenged in part by the rapid emergence of new synthetic opioids. N-Propionitrile chlorphine, also known as cychlorphine, is a novel synthetic opioid that belongs to a class referred to as "orphine analogues" or "orphines". Structurally similar to other benzimidazolones such as brophine and chlorphine, they represent an increasing variety of non-fentanyl synthetic opioids in the recreational drug market. Cychlorphine was originally detected in 2024 and although still uncommon, has been increasingly identified in forensic casework. Although the pharmacological properties of cychlorphine have not yet been comprehensively studied, it is reported to be approximately ten times more potent than fentanyl, which may impact the effectiveness of standard opioid reversal protocols. Given its potency and rising detection frequency, comprehensive investigation into the toxicological profiles and case studies involving cychlorphine is critical for public safety, clinical intervention, and accurate determination of the cause of death.

Between November and December 2025, 80 accidental drug deaths were examined and sent for toxicology testing at the Fort Bend County Medical Examiner's Office and Harris County Institute of Forensic Sciences in Texas. Five cases were positive for cychlorphine on postmortem blood analysis from a reference laboratory. These cases involved male decedents aged 17 to 41 years, discovered across a 683-square-mile area including Houston, Humble, and Richmond. All decedents were males and received autopsies. Two of the cases from Fort Bend County arrived at the office with drug paraphernalia. All cases had a cause of death of mixed drug toxicity and the manner of death was accident. Alprazolam was detected in four cases, and bromazepam was detected in two cases. Significant autopsy findings included cerebral edema, pulmonary edema, and urinary retention.

Opioid use and associated deaths remain a significant threat to public health, requiring the forensic community to maintain vigilance and stay informed of current and emerging drug trends of non-fentanyl related novel synthetic opioids. The rising detection of cychlorphine requires a high index of suspicion from forensic pathologists, particularly in suspected toxicological deaths where routine screening is negative or insufficient to explain the cause of death. Future research is essential to characterize the pharmacological potency and toxicological profile of cychlorphine, including postmortem concentration ranges. These findings are critical to assist the forensic community for the accurate interpretation of toxicological findings, guiding laboratory protocols, determining the cause of death, and supporting public health strategies.

P17 Medetomidine Adulteration in Illicit Substance Overdose: A Report of Two Cases

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Synthetic opioid formulations are evolving at a rapid rate, and the rising presence of poly-substances and novel adulterants complicate both diagnosis and overdose management. A recent addition to illicit opioid mixtures is medetomidine (MED). The dextrorotatory isomer of MED is dexmedetomidine (DXMED). Both MED AND DXMED are α_2 -adrenergic receptor agonists. MED is commonly used as a veterinary sedative and analgesic, and DXMED is used in humans for sedation. Like xylazine, naloxone cannot fully reverse their sedative effects. MED was first identified in the illicit drug supply in 2022 in Maryland and found to be mixed with fentanyl, xylazine, and other substances. By 2024, reports of MED in relation to suspected opioid overdoses had sharply increased and its presence had become prevalent in drug samples and biospecimens across North America. Its widespread availability as a veterinary sedative may contribute to its rapid expansion in the illicit drug supply. Herein, we report two companion cases of MED adulteration in illicit substance overdose.

Two individuals were discovered deceased simultaneously at their shared residence. They were reported to have purchased illicit substances from the same source. Drug paraphernalia identified at the scene consisted of a glass pipe, an off-white powdery substance, and a yellow powdery substance. Decedent #1 was a 62-year-old male with a reported past medical history of lupus erythematosus, chronic obstructive pulmonary disease, unspecified cardiac disease, and chronic alcohol and illicit substance use. Decedent #2 was a 57-year-old male with a reported past medical history of unspecific circulatory disease and illicit substance use.

At autopsy, no significant traumatic injury was identified for either decedent. Decedent #1 had pulmonary edema, hypertensive and atherosclerotic cardiovascular disease, and a 0.5 cm long segment of myocardial bridging. Decedent #2 had pulmonary edema, atherosclerotic cardiovascular disease, hepatic cirrhosis, and stasis dermatitis with cutaneous ulceration. Decedent #1's postmortem femoral blood was positive for amphetamine, methamphetamine, fentanyl, and MED. His postmortem urine was positive for amphetamine, methamphetamine, benzoylecgonine, fentanyl, norfentanyl, and morphine. Decedent #2's postmortem femoral blood was positive for amphetamine, methamphetamine, cocaine, cocaethylene, fentanyl, hydrocodone, and MED. Both deaths were certified as accidents.

The combined sedative effects of MED and its isomers in combination with other opioids are an emerging threat. As exposure to MED in the illicit drug supply continues to increase, continued surveillance, improved testing resources, and targeted public health education are important for accurate detection and improved harm reduction.

P18 From Sting to Spine: Hymenoptera Envenomation Precipitating Atlanto-Occipital Dislocation

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Atlanto-occipital dislocation is a rare and commonly fatal injury that results in complete separation of C1 from the occiput due to disruption of the tectorial membrane and alar ligaments. This mechanism is most common in motor vehicle crashes or high impact trauma that result from excessive head motion relative to decreased upper cervical spine motion. It is commonly fatal due to brainstem injury that leads to respiratory arrest.

Hymenoptera envenomation typically causes swelling, pruritis, and erythema. Severe reactions can include pyrexia, seizures, or anaphylaxis. Serum sickness-like reaction could also occur about 1-2 weeks after. This is a presentation in which a Hymenoptera envenomation led to a traumatic atlanto-occipital dislocation due to blunt force trauma of the head and neck.

A 79-year-old male was found deceased at the base of a deer stand in front of the tractor he was using and the ladder to the stand lying on top of him. Present in the deer stand was an

active large “bald faced hornet’s” nest which are known as yellowjackets. His reported past medical history was pertinent for vertigo and hypercholesterolemia, with no reported allergies to hornets, bees, or wasps.

Autopsy examination was remarkable for blunt force trauma causing atlanto-occipital dislocation, several complete transverse rib fractures, and a complete transverse fracture through the sternum. The right and left lungs had significant global parenchymal contusions. A significant parietal subgaleal contusion and a subdural hematoma encircling the brainstem and cerebellum were found. Vast areas of the torso, arms, neck, and head were found to be covered with sparse pinpoint petechiae, consistent with puncture defects of a Hymenoptera sting. Bald faced hornets do not leave a stinger and can sting repeatedly. On internal examination, there was found to be significant atherosclerotic and hypertensive cardiovascular disease. Toxicologic analysis reported elevated serum tryptase levels consistent with Hymenoptera envenomation. Considering the autopsy and toxicologic findings, the death was deemed due to atlanto-occipital dislocation due to blunt force trauma complicated by envenomation by Hymenoptera and longstanding vertigo.

This case highlights a rare but catastrophic cascade in which Hymenoptera envenomation precipitated a traumatic fall resulting in atlanto-occipital dislocation, otherwise known as “internal decapitation”. This underscores the need for heightened awareness of envenomation-associated trauma and thorough investigation of precipitating factors leading to accidental injury and death.

P19 Autopsy-confirmed Type 2 Autoimmune Pancreatitis Presenting as Pancreatic Malignancy: The Medicolegal Role of Forensic Diagnosis in a Clinically Misidentified Disease

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Type 2 autoimmune pancreatitis (AIP) is a rare, IgG4-seronegative fibro-inflammatory disorder producing chronic pancreatic fibrosis, periductal lymphoplasmacytic infiltration, and granulocytic epithelial lesions. Progressive fibrosis can compress the splenic vein, causing segmental portal hypertension and spontaneous splenic rupture, a complication rarely recognized antemortem. Inflammatory fibrosis of other tissues can occur in this condition. Type 2 AIP poses a diagnostic challenge because it mimics pancreatic ductal adenocarcinoma and serum IgG4 is characteristically normal. Forensic pathologists are uniquely positioned to establish the true cause of death and generate population-level data on this underreported condition.

A 61-year-old male with type 2 diabetes mellitus, COPD, and hypertensive atherosclerotic cardiovascular disease presented with obstructive jaundice, upper abdominal pain, and hypothermia. Imaging demonstrated an enlarged heterogeneous pancreatic head with biliary dilation; the clinical diagnosis was pancreatic carcinoma. CT revealed a large subcapsular splenic hematoma with active hemorrhage and large hemoperitoneum. Two days prior, the patient had undergone a failed endoscopic retrograde cholangiopancreatography and subsequent percutaneous transhepatic cholangiography drain placement. The patient expired following refractory hemorrhagic shock. Due to the recent medical intervention, a medicolegal autopsy was performed. Autopsy identified no malignancy or any complications related to the previous procedures. The pancreas demonstrated diffuse fibrosis, near-total acinar destruction, periductal lymphoplasmacytic infiltration, granulocytic epithelial lesions, and obliterative phlebitis. Similar infiltrative changes were present in the heart, lungs, liver, kidneys, and trachea. The 230-gram spleen was ruptured, with 2000 cc of hemoperitoneal blood. Serum IgG4 was normal at 27 mg/dL. The cause of death was complications related to type 2 autoimmune pancreatitis, including massive hemoperitoneum due to a ruptured spleen. Hypertensive and atherosclerotic cardiovascular disease was considered a contributory cause of death. The manner of death was natural.

This case involved fibrosing pancreatic inflammation compressing the splenic vein, producing outflow obstruction and subsequent fatal capsular rupture. The systemic eosinophilic infiltrate, detectable only at autopsy, indicates disease extent well beyond the pancreas. Type 2 AIP is steroid-responsive and potentially reversible; death from its complications without a correct diagnosis represents a preventable outcome.

Fatal splenic rupture from splenic vein compression by type 2 AIP is anatomically predictable yet consistently underdiagnosed. Forensic autopsy is the definitive diagnostic instrument in such deaths and a critical public health tool for identifying preventable mortality. Accurate postmortem classification is crucial to advancing diagnostic criteria and epidemiological understanding of this disease

P20 Infant Deaths, State Laws, and Elected Coroners: A Call for Reform in Post-Dobbs Alabama

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Introduction:

Mortality data statistics are crucial for evaluating population health and guiding health policy. Alabama consistently ranks among the lowest-performing states in maternal and infant mortality outcomes. Recent research investigating the public health implications of the 2022 Supreme Court decision *Dobbs v. Jackson Women's Health Organization* has shown that infant mortality has risen more than anticipated in states with restrictive abortion bans and is most prevalent in the Southeast. Alabama restricts abortion in every circumstance except when the life of the mother is threatened. In this study, we examine limitations of the Alabama medicolegal death investigation system to identify sources of error regarding the accuracy of reported data.

Methods: Most recent state and county-level infant mortality data were obtained from the Alabama Department of Public Health. We examined funding for sixty-two Alabama coroner's offices to identify trends based on population size and rural/urban designation. Alabama coroner laws were analyzed and compared to those of Louisiana, South Carolina, and Virginia, where our college has campuses.

Results: Alabama had an infant mortality rate (IMR) of 7.1 during 2024, the most recently published data. Wilcox, Conecuh, and Butler counties, all classified as rural and with significant non-Hispanic Black populations, had the highest IMRs at 31.3, 30.3, and 29.9, respectively. Urban counties, on average, have higher coroner salaries and budgets, while rural counties often have zero budget with annual salaries as low as \$2,400. Eleven rural coroner's offices in Alabama reported having inadequate supplies, six counties expressed difficulties with transportation to Medical Examiner facilities, and twenty still use paper documentation. Elected coroners are only required to have a high school education to run for office. Conversely, Louisiana expects the coroner to be a physician, and Virginia has a state Medical Examiner system. In contrast to these states, Alabama state legislation does not mandate autopsies in cases of infant death.

Discussion: The Alabama coroner system is hindered by insufficient state and county funding and limited education requirements. These limitations are most impactful on rural areas, which have the poorest health outcomes and are projected to worsen following the *Dobbs* decision. To ensure thorough and accurate death investigations, Alabama must make several changes. Establishing minimum medical training requirements for coroners, mandating autopsies in infant deaths, and increasing state-level investment in rural death investigation systems are critical steps Alabama can make towards improving the accuracy of infant mortality data and guiding evidence-based policy post-*Dobbs*.

P21 Accidental Ligature Asphyxia from Electric Drain Cleaner

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Asphyxia is a condition characterized by the body not receiving sufficient oxygen. It has been described as an impairment of three components: respiratory, vascular, or nervous. There are many classifications of asphyxia, including strangulation, suffocation, mechanical, drowning, and other special types. Strangulation is defined as asphyxia due to external compression of the neck from an exterior force. Ligature strangulation can be suicidal, accidental, or homicidal in nature. Cases of fatal ligature strangulation have been referred to as "Isadora Duncan Syndrome," after a dancer whose scarf caught in

the wheel of a motor vehicle in 1929. We present a case of accidental ligature strangulation in which the death of an individual resulted from neck compression due to pressure applied by the cable of a commercial electric drain cleaner.

A 76-year-old man was found unresponsive outside of a residential building where he served as the landlord. Beside him was an auto-feed, motor-powered drain cleaner used to clear drain clogs. The scarf he was wearing was wrapped tightly around his neck and a cleaning cable. After the cable was cut from the machine, the body was brought to the Medical Examiner's Office, and a full autopsy with toxicology was performed. The external examination revealed ligature marks, abrasions, petechiae, and bruising consistent with ligature asphyxia. Pattern impressions on the right cheek and chin matched the machine cord. After removal of the cord and scarf, parallel hemorrhagic areas in the right neck's soft tissue matched the ligature's diameter. The left lateral neck showed intramuscular hemorrhage; scattered hemorrhage was also present. Both lateral and anterior-posterior views are negative for fractures. The toxicology findings were noncontributory towards death.

A thorough scene investigation, alongside a comprehensive autopsy that examines ligature marks, their direction, and associated tissue changes, is a key feature in differentiating causes of asphyxia. By ruling out anything suspicious with no signs of foul play, the findings were consistent with accidental ligature strangulation. The presence of petechiae and soft tissue neck hemorrhage indicated significant compression. As the ligature tightened, the jugular veins were compressed, and the carotid arteries were also likely eventually occluded. Compression of the carotid sinus likely triggered a vasovagal reflex. Accidental ligature strangulation is an uncommon cause of death. Safety measures and precautions, including wearing loose clothing, should always be considered when operating machinery.

P22 When the Barn isn't to Blame: Invasive Mucinous Adenocarcinoma Mimicking Farmer's Lung
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Farmer's lung (FL) is a form of hypersensitivity pneumonitis caused by repeated inhalation of thermophilic actinomycetes and fungal spores found in moldy hay, grain, straw, and other organic material. This non-IgE-mediated hypersensitivity reaction affects peripheral airways and interstitial tissue and can cause granulomatous inflammation that may progress to pulmonary fibrosis. FL risk is highest when cleaning barns, handling grain, or feeding animals with stored hay, especially in enclosed or high-humidity (>65%) areas. Hypersensitivity pneumonitis (HP) has an estimated incidence of 0.3 to 0.9 per 100,000, but is much higher in occupationally exposed groups, such as farmers. Incidence estimates range from 0.4% to nearly 6%.

Chronic FL and diffuse pulmonary malignancy can present highly overlapping and nonspecific clinical features, including progressive dyspnea, nonproductive cough, and weight loss, making distinction particularly difficult in the absence of medical history. Imaging findings further complicate differentiation, as both conditions may demonstrate diffuse bilateral interstitial patterns with ground-glass opacities and reticular changes. Mucinous adenocarcinoma in particular often presents with pneumonic-type or diffuse ground-glass and consolidative opacities due to aerogenous spread, mimicking inflammatory or interstitial lung disease.

We present an autopsy case in which invasive mucinous adenocarcinoma presented as farmer's lung. An 86-year-old female underwent a lung-only autopsy per family request for additional information and further evaluation specific to the decedent's prior diagnosis of "Farmer's Lung". The decedent's history is notable for lifelong farm exposure.

Microscopic examination of the lung revealed tall columnar mucinous epithelial cells growing in a lepidic fashion across pre-existing alveolar septal walls in a discontinuous fashion. Additional lung fields showed architectural complexity, invasive acinar growth, stromal desmoplasia, and scarring. Cytologically, the cells were bland for a suspected tumor. These findings were remarkable for mucinous adenocarcinoma diffusely spreading through the air spaces and involving all lobes bilaterally, eventually leading to

respiratory failure. There was no evidence of any other significant acute or chronic lung disease processes, including chronic hypersensitivity pneumonitis.

In individuals with significant agricultural exposure, clinicians are reasonably inclined to diagnose FL given the strong occupational risk factors. However, cognitive anchoring to exposure history combined with overlap in presentation can influence recognition of malignancy. Mucinous adenocarcinoma may be especially prone to misclassification as farmer's lung due to its tendency to present with imaging patterns that resemble benign inflammatory lung disease. This case illustrates the importance of forensic pathologists being aware of the differential diagnosis for reported lung disease from occupational exposure.

P23 Fatal Complications of Abdominoplasty and Liposuction in Connecticut: A 10-Year Review

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Cosmetic surgical procedures performed in office-based or ambulatory settings carry a risk of serious subsequent complications, including pulmonary thromboembolism, fat embolism, lidocaine toxicity, sepsis, and hemorrhage. As demand for abdominoplasty, liposuction, and combined procedures continues to rise, concerns regarding variability in regulatory oversight and postoperative monitoring have emerged. Although mortality for each procedure is relatively low relative to procedural volume, risk appears to increase when they are performed together. Despite extensive literature on cosmetic surgery safety, few studies directly characterize fatal therapeutic complications associated with abdominal plastic surgery within a statewide medicolegal system. A retrospective case review was performed for deaths occurring during an 11-year interval (2015 – 2025) where the primary cause of death included the terms “abdominoplasty” and/or “liposuction.” Deaths with a full autopsy were included. Cases were excluded if documentation was incomplete, including absence of medical records or histopathologic data, or if surgery occurred outside the 30-day postoperative period. Eight female decedents met inclusion criteria, with a median age of 51 years. Six decedents had obesity (BMI: >30kg/m²). Three were Non-Hispanic Black, three were Hispanic White, one was Non-Hispanic White, and one had unknown ethnicity. Six underwent abdominoplasty, three underwent liposuction, and three had combined procedures including panniculectomy or breast augmentation. The median interval from surgery/procedure to death was 9.5 days. Only one procedure occurred outside of Connecticut in South America. Pulmonary thromboembolism was the immediate cause of death in six cases. One death was attributed to complications of cosmetic surgery as the immediate cause, with lidocaine toxicity listed as contributory. One death was due to sepsis from a perforated large bowel obtained during cosmetic abdominal liposuction and was ruled an accident; the remaining deaths were ruled therapeutic complications. Autopsy findings included deep venous thromboses with pulmonary thromboemboli, procedure-related inflammatory changes, and bacterial peritonitis. All Connecticut procedures were performed by board-certified physicians, with variability in clinic type, postoperative monitoring, and medication management. This study details the types and onset of complications following abdominoplasty and liposuction. Although these fatal complications are rare relative to procedural volume, they remain an important patient safety concern, particularly when procedures are performed in combination. Given the limited number of cases in our geographic jurisdiction, future studies may be better powered in regions with higher plastic surgery volume or greater cosmetic surgery tourism. These results underscore the value of continued perioperative vigilance, monitoring, and oversight.

P24 Application of Femicide Classification Criteria in Female Homicides: A Review of Cases from the Jefferson County Coroner/Medical Examiner's Office

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Homicide patterns differ by sex, with women more frequently killed in domestic settings and by known offenders. Approximately 60% of female homicide victims are killed by an intimate partner or family member, compared to 11% of male victims. Femicide, defined as the gender-related killing of women and

girls, has established classification criteria, but application in U.S. death investigation systems is inconsistent.

A retrospective review of 308 female homicides (2012–2024) from the Jefferson County Coroner/Medical Examiner's Office was conducted. Cases were evaluated for perpetrator identification, victim–offender relationship, and contextual factors. Each case was classified using criteria from the UN Office on Drugs and Crime and compared to broader, assumption-based classifications.

Approximately 36% of cases (n=111) met strict criteria. Cases with unidentified perpetrators or unknown victim–offender relationships were categorized as indeterminate and analyzed separately and were not included in the calculation of cases meeting strict femicide criteria. A subset (n=72) lacked sufficient information for definitive classification due to unidentified perpetrators or unknown victim–offender relationships, but met other contextual criteria, supporting classification as probable femicide cases. Additional limitations included incomplete investigative reporting at the time of death certification, absence of documented motive, and cases remaining open or unsolved during initial reporting periods.

Application of femicide classification criteria is constrained by incomplete investigative data at the time of death certification, particularly in cases with unidentified perpetrators or unresolved investigative outcomes. While standardized criteria may improve consistency in medico-legal reporting and epidemiologic accuracy, death investigation systems are primarily structured to determine cause and manner of death rather than sociological classification. Given operational constraints and jurisdictional variability, femicide classification may be considered within a standardized secondary analytic framework applied post-certification, supporting consistent epidemiologic reporting without altering core medicolegal responsibilities.

P25 Death Due to Necrotizing Fasciitis of the Head and Neck: A Case Series of Three Elderly Men

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Necrotizing fasciitis is a subset of aggressive skin and soft tissue infections that cause muscle fascia and subcutaneous tissue necrosis. Necrotizing fasciitis most frequently arises in the lower extremities or abdominal wall; cervicofacial manifestations account for fewer than 5% of cases. Necrotizing fasciitis of the head and neck is a rare but rapidly progressive and life-threatening soft tissue infection that constitutes a true surgical emergency. Due to the complex anatomy of the cervicofacial region and the proximity to the upper airway, early diagnosis and management are particularly challenging, and delayed recognition is associated with high morbidity and mortality.

Necrotizing fasciitis affects about 0.4 per 100,000 people annually in the United States. In approximately 80% of cases, it is a direct sequela of bacterial infection introduced through a break in the skin's integrity. Gram-positive cocci, specifically strains of *Staphylococcus aureus* and *Streptococci* are responsible for most of these single-site source infections. The majority of necrotizing fasciitis patients have diabetes and a history of alcoholism. Patients with liver cirrhosis and immune suppression are also prone to necrotizing fasciitis.

Literature and case reports related to death due to necrotizing fasciitis of the head and neck are limited. We are presenting three cases of men with death due to necrotizing fasciitis of the head and neck to highlight the overlapping circumstances, postmortem findings, and report on novel use of postmortem computed tomography (PMCT) to diagnose necrotizing soft tissue infections.

P26 Incidence of Foreign Particulates in Pulmonary Vasculature of TPN-Dependent Decedents

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Total parenteral nutrition (TPN) is used in adult and pediatric patients who are unable to meet nutritional requirements through the gastrointestinal tract, including patients with intestinal failure, complex post-operative conditions, and prolonged critical illness. TPN has been shown to improve survival and clinical

outcomes; however, long-term use is associated with many well recognized complications. One less studied adverse effect includes the introduction of exogenous material, willfully or otherwise, embolizing to pulmonary circulation. Pulmonary embolism of foreign material has been described in other clinical settings, such as in individuals who inject crushed oral medications, where insoluble excipients such as talc, microcrystalline cellulose, and starch embolize to the pulmonary microvasculature. However, there is limited case-based literature addressing pulmonary vascular deposits in patients receiving TPN.

We retrospectively identified autopsy cases from a single academic institution over a 24-year period in which TPN administration was documented. Pulmonary sections were reviewed with hematoxylin-eosin staining and polarized light microscopy, with additional special stains performed when needed to distinguish foreign material from artifact. Cases without retrievable archived slides were excluded. Cases were classified as positive when material consistent with an intravascularly introduced excipient or contaminant was identified within a pulmonary artery lumen or wall. Cases were classified as negative if they had no significant findings, airway-centered material only, non-excipient pigments, or had findings attributable to other iatrogenic sources, such as talc pleurodesis.

Seventy-seven cases were evaluable, including pediatric and adult decedents ranging from 2 days to 88 years old. Thirteen cases demonstrated pulmonary vascular foreign material, corresponding to a prevalence of 16.7%. Materials including microcrystalline cellulose, calcium and calcium-phosphate deposits, adhesive-pad material, and a hair follicle fragment were identified. Six cases contained polarizable material that could not be further characterized on routine histology. Findings were frequently multifocal, involved multiple pulmonary lobes, and were present across the full age range of the cohort. Overall, one in six decedents with documented TPN exposure was found to have foreign material in the pulmonary vasculature. This result shows that iatrogenic complication is more common than the existing literature implies. Therefore, forensic pathologists should be aware of these potential histologic findings in pulmonary sections of TPN-exposed decedents.

P27 Fatal Endometrioma Emboli via Autologous Blood Transfusion

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The first modern, automated blood salvage and self-transfusion device was introduced in 1974, commonly known as a cell saver. Such devices filter, wash, and reinfuse a patient's own blood that is suctioned from the operative field. This allows for decreased use of allogeneic red blood cells, which carry a risk of infection and transfusion reactions. Although this intraoperative blood-saving method has many benefits for patients, as with any medical intervention, its use is not without risk. We present the case of a 39-year-old woman who suffered fatal pulmonary emboli of ruptured endometrioma contents that were reinfused through a cell saver device during elective surgery.

The 39-year-old woman was diagnosed with bilateral ovarian masses and uterine leiomyomata after experiencing pelvic pain and was admitted to a community hospital for an elective abdominal myomectomy, ovarian cystectomy, and possible oophorectomy. The surgery revealed bilateral endometriotic cysts, leiomyomata, uterine wall adhesions, and left hydrosalpinx. One of the endometriomas ruptured into the abdomen during removal, releasing a copious amount of old, dark blood, or "chocolate cyst" contents. After an estimated 600 mL of blood loss, she was autotransfused twice, 15 minutes apart, with 125 mL each time. She subsequently became progressively hypotensive and bradycardic, deteriorating into pulseless electrical activity (PEA), and advanced cardiac life support was initiated. It appeared to the surgical team and the autologous blood resources representative that the endometrioma contents were inadvertently suctioned into the cell saver reservoir and transfused into the patient. The surgery was promptly aborted. Despite this, the patient continued to experience oxygen desaturations, hemodynamic instability, and multiple episodes of PEA. She expired a few hours later following extensive resuscitative efforts.

Autopsy revealed congested lungs, weighing 1170 g combined. Microscopic evaluation of the bilateral lungs showed alveolar capillaries occluded with non-thrombotic microemboli, composed of pale brown microaggregates of degenerated anuclear material. This material was consistent with the excised

endometriotic cyst contents. Additional findings included morbid obesity (BMI 42.7 kg/m²), left ventricular hypertrophy, and approximately 1000 mL of dark, thin, sanguineous intra-abdominal fluid. The cause of death was non-thrombotic pulmonary emboli due to endometrioma rupture during elective surgery for uterine leiomyoma and ovarian cysts, and the manner of death was certified as accident. This case highlights a rare but catastrophic complication of intraoperative autologous blood salvage and underscores the need for strict exclusion of non-blood contaminants, particularly cyst contents and other pathological fluids, from cell saver circuits during surgery.

P28 A Postmortem Case of Metastatic Breast Carcinoma in Pregnancy: Placental Metastasis, Fetal Compromise, and Utility as an Internal Immunohistochemical Control

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Breast cancer is the most common malignancy diagnosed in women worldwide and is the most frequently diagnosed malignancy during pregnancy. Bone is the most common site of breast cancer metastasis, but rarely, it can metastasize to the placenta in pregnant patients. There are less than 20 such cases reported in medical literature. When placental metastasis occurs, it commonly involves the intervillous space and can impact maternal-fetal blood flow. Many treatment options for breast cancer during pregnancy simultaneously require consideration for maternal survival and fetal safety, as many systemic therapies are contraindicated due to potential harm to the fetus.

We present a case of a 30-year-old woman with metastatic invasive ductal carcinoma (estrogen receptor (ER)/ progesterone receptor (PR) positive, Human Epidermal Growth Factor Receptor 2 negative) involving the brain, liver, and lungs. She was treated with bilateral mastectomy, chemotherapy, radiation, anti-hormonal therapy, and cerebellar metastasis resection. Two years following her initial diagnosis, the patient discovered she was pregnant. Anti-hormonal therapy was discontinued, and her primary goal was for term delivery. At 23 weeks gestation, she was admitted to the hospital for altered mental status and transaminitis. Imaging revealed innumerable liver metastases and an epidural tumor causing cervicomedullary compression. The fetus, at 24 weeks gestation, developed grade III fetal heart tracings consistent with uteroplacental insufficiency, requiring an emergent cesarean section. Following delivery, the patient experienced progressive hemodynamic instability, and she died later that day.

At autopsy widespread metastatic disease was confirmed with an incidental finding of bilateral ovarian teratomas. Immunohistochemical (IHC) staining for ER and GATA3 was performed on the metastatic deposits in the placenta, liver, and lungs. The hepatic metastases were negative for ER and GATA3, while the pulmonary metastases were ER negative with faint GATA3 positivity. In contrast, the placenta, which was quickly fixed in formalin following delivery, demonstrated metastatic deposits that were positive for ER and GATA3.

This unique case demonstrates metastatic involvement of the placenta and its contribution to uteroplacental insufficiency and preterm delivery. It further highlights the therapeutic limitations involving pregnant patients and the ethical dilemmas that arise when balancing maternal and fetal outcomes. The variation in IHC staining between autopsy metastases and promptly formalin-fixed placenta shows the limitations of antigen veracity in autopsy specimens, possibly limiting interpretations.

P29 Influenza A-Associated Acute Necrotizing Encephalopathy: A Rare But Deadly Complication

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Acute necrotizing encephalitis (ANE) is a rare but fatal consequence of influenza infection. Given its increasing recognition in the pediatric population and its severe clinical consequences, further data collection is necessary to better define its clinicopathologic features and to enhance diagnostic awareness in both clinical and forensic settings.

Thus far, ANE is mostly described in patients with a median age of 5 years, though rare adult cases have been reported. Patients are often previously healthy, and many are unvaccinated. It is most associated with influenza A and may be influenced by genetic susceptibility, including RANBP2 mutations. The typical presentation includes fever with respiratory or gastrointestinal symptoms followed by rapid onset of altered mental status. Mortality is high with cerebral herniation as the most frequent cause of death. On autopsy, ANE frequently presents with bilateral thalamic involvement, with lesions also reported in the basal ganglia, cerebral white matter, cerebellum, and brainstem.

We present a case of a 22-year-old previously healthy female who was found deceased in her dorm room after reporting feeling unwell. On autopsy, she was found to have cerebral edema and intracranial hemorrhages, including bilateral hemorrhages of the basal ganglia. On microscopy, sections of the brain showed vasculitis of cerebral blood vessels with fibrinoid and endothelial necrosis, perivascular inflammation, and karyorrhexis. Postmortem testing for Influenza A (H3) infection was positive, and the decedent's death was attributed to ANE due to Influenza A infection.

We present this case study as an example of a rare deadly consequence of influenza infection that requires increased recognition in both the antemortem and postmortem settings and underscores the need for postmortem viral testing and neuropathologic examination.

P30 Cosmetic Surgery-Related Mortality in Cook County, IL: A 10-Year Forensic Retrospective Review

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Cosmetic surgeries represent 2-3% of all surgical procedures performed in the United States. Of these, breast augmentation and liposuction are among the top two most performed procedures, with approximately 300,000-313,000 breast augmentation procedures and 250,000-300,000 liposuction procedures carried out annually. Despite widespread use, cosmetic surgery like all surgical procedures carries inherent risk.

Although the epidemiology and reported incidence of cosmetic surgery-related mortality have previously been addressed in the historical clinical literature, corresponding contributions from the forensic pathology field remain limited. Fatal surgical complications may manifest suddenly and without warning days after the procedure, outside the confines of the hospital. Consequently, such fatalities may be underrepresented or absent in hospital-based datasets. However, these same fatalities fall under the deaths investigated under Medical Examiner or Coroner jurisdiction. Medicolegal autopsy databases thus represent an important and underutilized resource for identifying high-risk patient populations and elucidating mechanisms of procedure-related death. The intent of this study is to examine cosmetic surgery-associated fatalities utilizing postmortem data from a large Medical Examiner's Office to identify common complications, causative mechanisms, and recurring patterns leading to death.

A retrospective review of case files from the Cook County Medical Examiner's Office over a 10-year period from January 2015 to December 2025 was conducted. The electronic database of the office was searched for the following categories: "aesthetic", "augmentation", "contouring", "cosmetic", "lipoplasty", "liposculpture", "liposuction", "mastoplasty", "mastopexy", and "plastic surgery". Data collected included autopsy findings, histopathological results, toxicological analyses, and demographic information, all of which were systematically assessed. Fourteen subjects met the study criteria and were all female (100%). Ages ranged from 28 – 63 with a mean of 45.0 years. Notably, the vast majority of subjects had complications of liposuction listed in the cause of death. The manners of death included natural, accident, or undetermined, but it must be noted that 'Therapeutic Complication' is not an option in the state where the manner was certified.

In this case series, the overwhelming majority of fatal cases is associated with complications of liposuction procedures. A comprehensive discussion of the autopsy findings and results of the study will be presented to the audience with the objective of enhancing understanding of liposuction-related causes of death, the

risk factors and mechanisms contributing to these fatalities, and key considerations during the autopsy examination of these relatively uncommon cases.

P31 Sudden Death and Non-bacterial Thrombotic Endocarditis: A Patient Without Identifiable Risk Factors

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Non-bacterial thrombotic endocarditis (NBTE) is characterized by the formation of sterile vegetations, composed of platelets and fibrin, on heart valves. Previously called "marantic endocarditis" for a potential associated pathology, NBTE is linked with malignancy and autoimmune disease. Malignancies most frequently associated include adenocarcinomas, particularly mucinous variants. Autoimmune pathologies most frequently associated include antiphospholipid antibody syndrome (APS) and systemic lupus erythematosus (SLE), though new associations with COVID-19 have also been reported. Systematic reviews have found that as few as 5% of cases have no known etiology on presentation.

First described as fibrin deposition on cadaveric heart valves, the exact pathogenesis is still unknown. However, factors that increase the risk of thrombosis in general have been proposed, including endothelial damage, hypercoagulability, the presence of immune complexes, hypoxia, and carcinomatosis. NBTE typically affects previously healthy aortic and mitral valves.

Older sources suggest NBTE may exist in up to ~1% of postmortem examinations and up to ~4% of patients with malignancy. Pre-mortem diagnosis of NBTE has also been increasing since the early 2000s. It is observed in all age groups, though particularly with patients in their 40s-80s. NBTE has a wide range of presentations, from asymptomatic and incidentally identified to chest pain, heart failure symptoms, and stroke.

We present the case of a 42-year-old woman with no prior medical history who collapsed suddenly at home. Upon autopsy, she was found to have a 320 g heart, with small vegetations on the mitral and aortic valves. A small embolism was noted in the PDA at the same level as a subendocardial infarct. No evidence of malignancy, thrombophilia, or autoimmune disease was noted. On microscopic evaluation, a bland organizing vegetation without significant acute inflammation was identified. The cause of death was non-thrombotic bacterial endocarditis of unconfirmed etiology, and the manner of death was natural.

Our case is unusual due to the lack of association with malignancy or autoimmune disease. As many patients present to the hospital with sequelae of embolic events and given that NBTE may be present in up to 1% of postmortem examinations, it is important to consider that these patients may similarly present to the medical examiner. Careful examination of the cardiac valves will help to rule out the possibility of NBTE even in the absence of a readily identifiable associated condition.

P32 When Life-Sustaining Interventions Turn Lethal: Accidental Strangulation by Feeding Tube in a Three-Year-Old with Epilepsy

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We present a case involving a 3-year-old male with a history of epilepsy and encephalopathy discovered actively seizing by his parents in a pack n' play. The child's percutaneous endoscopic gastrostomy (PEG) tube was found to be encircling the head and neck. The tube was removed, emergency personnel dispatched, and resuscitative efforts attempted before being pronounced deceased at the hospital. Findings at autopsy included a ligature furrow across the neck which canted upwards at the posterior neck, consistent with the PEG tube. There were diffuse petechial hemorrhages across the forehead, eyelids, and cheeks, as well as bilateral palpebral conjunctival hemorrhages.

Deaths due to ligature strangulation occur in both the adult and pediatric populations, and can be accidental, homicidal, or suicidal in manner. Accidental ligature strangulations occur more commonly in

children, specifically those under 4 years of age. A study conducted by the US Consumer Product Safety Commission examined 2178 deaths between 1980 and 1997 with different patterns of unintentional infant suffocation. "Entanglement" resulting in strangulation accounted for 14.3% of those cases. Current research suggests young children with physical or mental disabilities are especially at risk due to an inability to self-rescue.

A literature review reveals four reports of medically necessary therapeutic devices leading to strangulation in children. Three of the four resulted in death. Two of the four children had documented cognitive and/or physical limitations. All cases described children under the age of two years old.

PEG tubes are utilized to deliver long-term feeding for patients with various diseases that preclude swallowing or oral intake. A variety of documented risks include mechanical, infectious, and metabolic challenges. Mechanical complications may include positioning issues, accidental tube kinking, leakage, or dislodgment, and damage to the gastrointestinal tract.

The Food and Drug Administration (FDA) has recognized strangulation as a rare risk and issued a warning after the death of two children under the age of two in 2021. Manufacturers have been encouraged to voluntarily collaborate with the FDA to minimize the risks. Additional interventions, modifications, healthcare provider/caregiver education may be necessary to further reduce the risk of accidental strangulation in this vulnerable population.

P33 Fatal Anemia From Chronic Uterine Bleeding: Two Exceptional Autopsy Cases

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Uterine leiomyomas and adenomyosis are very common gynecologic pathologies associated with heavy menstrual bleeding, abdominal discomfort, subfertility and a reduced quality of life. Although they are considered benign conditions, they can lead to severe life-threatening anemia.

Case 1:

A 43-year-old Black woman was found unresponsive in bed. Her medical history included anemia, with progressive weakness and abdominal pain for two months. At autopsy, there was diffuse organ pallor and faint lividity. Heart examination revealed a faint yellow-brown alternating stripes pattern; histology revealed multiple areas of intracellular fatty deposits, most pronounced in the papillary muscles and along the endocardium, with pallor and associated loss of defined cardiomyocyte striations. The uterus was enlarged with a thickened endometrium and extensive adenomyosis, with clotted blood in the endometrial cavity. Postmortem lab testing showed severe microcytic, hypochromic anemia (hemoglobin 1.2 g/dL, RBC 0.87 million/ng, hematocrit 6.6%) with cellular bone marrow. Toxicology was negative for drugs and ethanol. The cause of death was certified as anemia due to chronic blood loss due to adenomyosis; the manner of death was natural.

Case 2:

A 41-year-old Black woman was found unresponsive in her residence. Her medical history was notable for menorrhagia due to uterine fibroids requiring prior blood transfusion. At autopsy, no lividity was appreciated and marked organ pallor was noted. The heart showed dilated cardiomyopathy with diffuse yellow, vaguely striped left ventricular endocardium; histology revealed patchy myocardial pallor and cytoplasmic vacuolization with droplet-like endocardial inclusions suggestive of lipid deposition. The uterus was enlarged with multiple leiomyomas (up to 14 cm) and hemorrhagic endometrium. Additional findings included chronic lymphocytic thyroiditis. Toxicology was negative for drugs and ethanol and showed only mild ketonemia. The cause of death was certified as complications of anemia due to chronic menorrhagia due to uterine leiomyomata; the manner of death was natural.

Both cases revealed alternating myocardial lesions, variously described in the literature as "thrush breast heart," "tabby cat heart," and "tiger heart".

A literature review revealed case reports and small case series of near-fatal anemia, both chronic and acute hemorrhagic, caused by underlying benign uterine pathology including adenomyosis and/or

leiomyomata. However, to the best of the authors knowledge, no autopsy-proven cases of chronic uterine bleeding as a main cause of death were reported.

Benign uterine pathology is an underrecognized cause of life-threatening anemia, particularly in vulnerable and medically underserved populations, and pathologists must be aware of these potentially fatal conditions.

P34 Overlapping (Concurrent) Lupus CNS Vasculitis and Cerebritis: A Case Report Highlighting the Neuropathological Spectrum of Neuropsychiatric Systemic Lupus Erythematosus

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Introduction:

Neuropsychiatric systemic lupus erythematosus (NPSLE) refers to neurological and psychiatric manifestations of SLE caused by CNS involvement from lupus-related autoimmunity. Lupus cerebritis is a severe complication of SLE characterized by inflammatory cell infiltration in brain parenchyma. The exact prevalence of SLE-associated cerebritis is unclear with estimates ranging from 12% to 95%. SLE-associated CNS vasculitis, while rare, is another severe immune-mediated inflammatory process involving thrombosis and necrosis of blood vessel walls. Both disorders represent distinct but occasionally overlapping neuropathological processes within the spectrum of NPSLE. We present a case of NPSLE with autopsy-confirmed concurrent CNS vasculitis, cerebritis, and meningitis.

Case:

A 39-year-old woman with a history of SLE, prior aseptic meningitis, lupus nephritis, and incidental intracranial calcifications presented with fever, headache, and fatigue. CT Brain demonstrated diffuse cerebral edema without evidence of herniation and marked calcification involving bilateral basal ganglia. Infectious work-up was negative. Over 24 hours, she deteriorated neurologically, progressing from worsening confusion to decerebrate/decorticate posturing, then to fixed, dilated pupils and herniation despite aggressive management. MRI brain demonstrated tonsillar herniation and anoxic brain injury. CT angiography confirmed absence of cerebral blood flow and brain death was declared.

Gross brain examination revealed severe diffuse cerebral edema, subfalcine herniation with right-to-left shift, and diffuse loss of gray-white differentiation. Microscopic examination of cerebral cortex, basal ganglia, and hippocampus demonstrated severe diffuse hypoxic-ischemic changes, vessel wall degeneration, perivascular lymphocytic infiltrates, and severe dystrophic calcifications of small and medium-sized vessels. In the brainstem (midbrain and pons), there was a prominent acute inflammatory infiltrate involving leptomeningeal and parenchymal vessels with fibrinoid necrosis, consistent with acute vasculitis, along with focal meningitis, cerebritis/encephalitis, vascular microthrombi, and hemorrhage. The cerebellum showed prominent vascular calcifications.

Discussion:

This case highlights the histologic diversity of severe CNS complications in patients with SLE and illustrates the neuropathological overlap between lupus CNS vasculitis and cerebritis. Neuropathologic findings include acute vasculitis, cerebritis and meningitis, as well as chronic vasculopathy with dystrophic calcifications, microthrombi, and perivascular inflammation. These findings support the concept that NPSLE pathology exists along a physiologic and chronologic continuum with ischemic-vascular and inflammatory-neurotoxic mechanisms occurring concurrently. Severe dystrophic calcifications, likely sequelae of prior microinfarctions from vascular injury, suggest longstanding CNS involvement predating the terminal event. This report underscores the importance of recognizing the overlap of severe complications in NPSLE and their existence on a spectrum, as they may impact therapeutic strategies that combine immunosuppression and anticoagulation.

P35 Venous Air Embolism: An Underrecognized Complication of Gunshot Wounds of the Head

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Air embolism is a potentially fatal consequence of the entry of air through a compromised venous system. While venous air embolism is a well-recognized complication of penetrating neck wounds, neurosurgical interventions, and vascular procedures, it has only rarely been described as a complication of traumatic head injury. Existing literature regarding air embolism at forensic autopsy is largely limited to case reports, and the incidence of air embolism associated with fatal traumatic head injury has not been previously reported. At the Cuyahoga County Medical Examiner's Office, incidental detection of intracardiac air on radiographs of decedents with gunshot wounds of the head and subsequent confirmation of air embolism at autopsy prompted investigation into whether air embolism is an under-recognized finding in these cases.

Electronic records from 2023 to 2025 revealed 248 cases of suicide by gunshot wound of the head, of which 212 cases had radiographs available for retrospective review. Each radiograph was independently reviewed by two board certified forensic pathologists for evidence of intracardiac air embolism and data regarding decedent demographics, resuscitation, therapeutic intervention, decomposition, entrance wound, firearm, and ammunition was recorded.

Sixty-nine cases (33%) were positive, 121 (57%) were negative, and 14 (7%) were equivocal for intracardiac air embolism. The remaining 8 cases (4%) were interpreted discordantly by the two reviewers (6 positive vs equivocal and 2 equivocal vs negative). There were no significant differences in age (40.38 vs 45.26 years), sex (83% vs 90% male), presence of decomposition changes (3% vs 7%), or receipt of resuscitative and/or therapeutic intervention (16% vs 21%) between positive and negative cases. In positive cases, entrance wounds were most commonly temporal (71%), followed by temporal-parietal (7%), frontal (6%), and intraoral (6%). In negative cases, entrance wounds were most commonly temporal (63%), frontal (10%), and parietal (8%). In both groups, pistols were the most frequently used firearms (70% vs 69%), followed by revolvers (17% vs 19%), rifles (4% vs 3%), and shotguns (2% vs 1%). The most common ammunition types were 9 mm (51% vs 43%) and .38 special (7% vs 10%). Radiographic patterns of decomposition gases were distinguishable from those of air embolism.

This study identifies venous air embolism as an under-recognized complication of gunshot wounds of the head and highlights the importance of careful postmortem radiographic review. Improved recognition of this finding provides valuable insight into the pathophysiology underlying fatal penetrating head wounds and may enhance forensic interpretation of these cases.

P36 Illuminating a silent killer: Utilizing Postmortem Contrast Angiography for Visualization of a Ruptured Intracranial Saccular Aneurysm

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Intracranial saccular ("berry") aneurysms are focal dilations of intracranial arteries that most commonly arise at bifurcation points within the circle of Willis. Rupture results in subarachnoid hemorrhage and is a well-recognized cause of sudden, unexpected death. Identification of the rupture site at autopsy may be challenging due to clot burden, vessel collapse, and postmortem artifact, particularly in the absence of antecedent medical history.

We report the case of a 32-year-old man with no known medical history who was found unresponsive and pronounced deceased by first responders. External examination was unremarkable aside from morbid obesity, with no evidence of trauma. Postmortem imaging including radiographs and computed tomography revealed intracranial hemorrhage and no skeletal injuries. Internal examination revealed marked cerebral edema (brain weight 1,590 g) and acute subarachnoid hemorrhage involving the base of the brain and cerebral convexities.

Given concern for aneurysmal rupture, a targeted contrast-enhanced postmortem computed tomography (PMCT) angiographic approach was performed. The brain was removed prior to contrast administration, and the vertebral arteries and internal carotid arteries were isolated and ligated to limit contrast extravasation. Contrast material was then directly injected into the basilar artery, followed by CT imaging of the intracranial vasculature. This technique allowed clear delineation of the circle of Willis and demonstrated focal contrast extravasation from a ruptured saccular aneurysm arising from the proximal segment of the right middle cerebral artery. Subsequent gross examination of the cerebral vasculature confirmed the site of rupture.

This case highlights the value of contrast-enhanced PMCT angiography as an adjunct to traditional autopsy in cases of suspected aneurysmal subarachnoid hemorrhage. Selective vascular isolation and direct arterial contrast injection can significantly improve visualization of intracranial vessels and facilitate identification of rupture sites. Incorporation of targeted postmortem angiographic techniques may enhance diagnostic accuracy in sudden, nontraumatic deaths due to intracranial vascular catastrophes.

P37 Maternal Mortality in Klippel-Trenaunay Syndrome: Challenges in Pregnancy Management

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Maternal mortality remains a critical public health crisis that is further compounded by undiagnosed or poorly recognized underlying medical conditions. Klippel-Trenaunay Syndrome (KTS) is a rare congenital disorder characterized by lymphatic and venous malformations that can result in soft-tissue overgrowth, cutaneous vascular lesions (cutaneous hemangiomas, venous varicosities), limb hypertrophy, and -most concerning during pregnancy or surgical intervention- life-threatening hemorrhagic and thrombotic complications. The rarity and variable presentation of KTS contribute to delayed diagnosis and heightened risk, particularly in reproductive-aged women.

We present the case of a parturient female with undiagnosed KTS complicated by chronic disseminated intravascular coagulation who presented for a planned caesarian section. Although the patient had requested her medical records months before delivery, these records were not available until the postmortem interval, highlighting a critical systems-level failure. The initial cesarean section proceeded without complication, resulting in the delivery of a healthy term infant. However, during routine inspection of the surgical field, a brisk hemorrhage was identified that could not be localized. The patient subsequently suffered cardiac arrest and could not be resuscitated despite aggressive intervention.

Postmortem examination revealed unilateral lower-extremity hypertrophy and labial soft-tissue hypertrophy, findings documented in the medical record prior to pregnancy. Internal examination demonstrated extensive retroperitoneal vascular malformations involving the soft tissues. Intravascular injection of opaque fluid identified a small tear within an atypical vascular bundle adjacent to the pouch of Douglas, consistent with catastrophic hemorrhage in the setting of underlying vascular malformation and coagulopathy.

This case underscores the lifelong morbidity and eventual maternal mortality associated with undiagnosed KTS and illustrates how medicolegal investigation can elucidate hidden contributors to maternal death. Beyond individual diagnosis, such cases highlight opportunities for improved surveillance, interdisciplinary communication, and integration of forensic findings into maternal health initiatives. Strengthening collaboration between postmortem clinical evaluation and public health is essential for identifying preventable deaths among vulnerable populations and informing strategies to reduce maternal mortality.

P38 Move over Coxsackievirus Family, there is a New Kid on the Block: a Case Report of Human Parvovirus B19 Fulminant Myocarditis in a Young Adult Male

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Fulminant myocarditis in immunocompetent adults is a rare but catastrophic complication of various viral infections. Previously, Coxsackieviruses A/B were the dominant viral agents implicated in viral myocarditis; however, human parvovirus B19 has emerged as the leading viral infection associated with this disease.

A male in his thirties without significant past medical history presented to the emergency department (ED) with a 1-week history of cough, fever, chest pain and shortness of breath. Two days prior, he was evaluated and tested negative for influenza, COVID-19, and respiratory syncytial virus infections. In the ED, he suffered a cardiac arrest with return of spontaneous circulation. Radiologic studies demonstrated bilateral pleural effusions, an enlarged cardiac silhouette, and no focal lung consolidations or pulmonary embolism. Laboratory studies corroborated severe lactic acid/metabolic acidosis, acute renal/liver injury, and new-onset heart failure with a NT-proBNP level of 53,519 pg/mL. Despite aggressive resuscitation efforts, the patient expired shortly after admission.

An autopsy performed at the New Mexico Office of the Medical Investigator was notable for 1000 mL of brown-yellow cloudy fluid within the right pleural cavity, 450 mL of serosanguinous fluid within the left pleural cavity, and 50 mL of serous pericardial fluid. Cardiovascular examination showed a right-dominant heart weighing 325 grams with mild coronary atherosclerosis, unremarkable heart valves, and dark red-brown, firm myocardium free of fibrosis. Histology of the cardiac muscle showed a myocardial interstitial lymphocytic inflammatory infiltrate with multifocal areas of myocyte necrosis. Negative ancillary tests included immunostaining for toxoplasma, cardiac tissue Giemsa stain, pulmonary tissue Gram stain, viral nasopharyngeal swab submitted to the CDC, pulmonary cultures, and Hantavirus IgM serology. Human Parvovirus B19 infection was detected via polymerase chain reaction (PCR) testing performed on formalin-fixed paraffin embedded tissue with negative results for adenovirus, enteroviruses, influenza A/B, human parainfluenza (1-4) virus, and SARS-CoV-2 virus. The cause of death was human parvovirus B19 fulminant myocarditis with a natural manner of death.

Adult human parvovirus B19 infection presents with nonspecific symptoms of an upper respiratory infection and may go undetected with conventional viral testing. Rarely, patients deteriorate rapidly and expire after developing acute decompensated heart failure and cardiogenic shock with multiorgan failure, leaving clinicians and families without a clear cause of death. Postmortem examination of suspected myocarditis should include molecular testing for Human Parvovirus B19 in addition to standard viral ancillary testing given its etiological role in fulminant myocarditis.

P39 Sudden Cardiac Death in Ehlers-Danlos Syndrome: Conduction System Pathology Beyond Vascular Rupture

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Ehlers-Danlos Syndrome (EDS) is a heterogeneous group of heritable connective tissue disorders caused by defects in collagen synthesis. The vast majority of deaths in EDS are attributable to spontaneous arterial rupture, vascular dissection, or hollow organ perforation. Fatal cardiac pathology outside of these mechanisms has received virtually no attention in the literature. A comprehensive literature search fails to identify any published reports documenting myocardial or conduction system histopathology in EDS decedents dying without rupture.

We present a 21-year-old female with EDS, postural orthostatic tachycardia syndrome (POTS), mast cell activation syndrome, small fiber neuropathy, Hashimoto's thyroiditis, and gastroparesis who collapsed suddenly while at work. She was transported to the hospital with CPR in progress and achieved return of spontaneous circulation. Serial EKGs showed progressive atrioventricular block. She arrested a second time and could not be resuscitated.

At autopsy she was a 71-inch, 153-pound female with a heart weight of 380 grams. The aorta was normal caliber with only subcritical coronary atherosclerosis. Histology revealed abnormal ground substance deposition within vessel walls of the lungs, kidneys, coronary arteries, aorta, and notably the cardiac conduction system. An accessory pathway was identified skirting the AV node. The conduction tissue in the interatrial septum was infiltrated by adipose tissue, and the anterior right ventricular free wall had near full-thickness adipose infiltration.

Taken together, these findings including the accessory AV pathway, ground substance infiltration of the conduction system, and adipose replacement of both conduction tissue and RV myocardium represent a potentially fatal arrhythmogenic substrate. This appears to be the first reported case of fatal conduction system and myocardial histopathology in an EDS decedent without vascular or organ rupture, and may represent an underrecognized mechanism of sudden cardiac death in this population.

P40 Fatal Hemophagocytic Lymphohistiocytosis (Hemophagocytosis Syndrome) in Pregnancy: A Review

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Hemophagocytic Lymphohistiocytosis (aka Hemophagocytosis Syndrome) is a rare hyperinflammatory syndrome (excessive immune system activation) characterized by fever, pancytopenia, splenomegaly and multiorgan failure with features of phagocytosis of erythrocytes, leukocytes, platelets and their precursors by macrophages (hemophagocytosis) in the bone marrow, liver, lymph nodes and elsewhere. It is classified as primary (inherited mutations) or secondary to infections (viruses, bacteria, fungi and parasites), malignancies (esp. T-cell lymphomas), and autoimmune diseases. It can mimic an infectious illness such as bacterial sepsis. Hypertriglyceridemia, markedly elevated serum ferritin, low serum fibrinogen (typically) and DIC are common. Untreated EBV-associated HLH is almost universally fatal. Age >30 yrs, elevated FDPs and elevated serum ferritin are associated with an increased risk of death. HLH can manifest during or shortly after pregnancy with a high fatality risk to both mother and fetus/neonate (maternal: 18–31%; fetal/neonatal: 40–60%). The immunological stress or "cytokine storm" of pregnancy may trigger HLH. Sixty-six case reports and seven case series (104 patients) have been reported on.

The case of a pregnant 40-year-old woman (29/40 weeks' POG) who died after unsuccessful resuscitation attempts and emergency C-section following cardiac arrest, is presented to provide an overview of this entity. There was a one-month history of PUO, headache, and lethargy, with hepatomegaly, raised LFTs, pancytopenia, features of DIC (positive d-dimer test), and significantly elevated serum ferritin and D-Dimer found on investigation. Serological testing was negative for acute infection with evidence of previous exposure to EBV (IgG positive).

Postmortem examination yielded the body of a middle-aged woman with stigmata of recent medical/surgical intervention, small volume bilateral serous effusions and blood-stained fluid in abdomen. The uterus displayed post-C-section status. Placental examination was unremarkable. The spleen displayed small white lesions of foci of avital necrosis with negative histochemical stains. The intra-abdominal lymph nodes were prominent with abundant hemophagocytosis. The bone marrow was devoid of any infiltrative or infective process, with a left shift. The liver was enlarged and heavier than expected with peliosis hepatis. The heart, lungs, kidneys and brain were devoid of any significant pathology. Death was due to HLH.

The underlying cause could not be established but infection and malignancy were excluded. The splenic lesions raised the possibility of an underlying collagen vascular disorder as the trigger, but the decedent's autoimmune antibody status was unknown. To the exclusion of identification of a demonstrable known underlying causes of HLH, pregnancy is the most plausible explanation.

P41 They Came Back Worse: A Five-Year Autopsy Study of Dismissed Symptoms and Subsequent Death

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Introduction:

Patients may present with symptoms that are underrecognized or unattributed to serious underlying conditions, potentially contributing to delayed diagnoses and adverse outcomes. Autopsy provides a unique opportunity to retrospectively examine these patterns and their effects on different populations. While misdiagnoses have been studied in autopsy series, scant attention has been given to the consequences of dismissed symptoms resulting in death, despite common knowledge that many populations are less likely to have serious symptoms taken seriously.

Methods:

A retrospective review of autopsies performed over a five-year period at a single medical institution was conducted. Cases were included if documentation demonstrated (1) a healthcare encounter with reported symptoms and (2) subsequent clinical deterioration leading to death related to these symptoms and their dismissal. Excluded were cases where symptoms were inadvertently misdiagnosed. Clinical records were reviewed to identify presenting symptoms, the interval between symptom onset and death, and final autopsy diagnoses. Variables collected related to vulnerability included age, sex, race, ethnicity, sexual orientation and gender identity (SOGI), relationship status, body mass index, primary language spoken, substance use and mental illness history, and veteran and housing status.

Results:

A total of 18 cases met the inclusion criteria. Every decedent belonged to one (n = 8) or multiple (n = 10) vulnerable populations within the healthcare system, whether that be of female sex (n = 12), a racial/ethnic minority (n = 8), unhoused (n = 2), a non-native English speaking immigrant (n = 1), a SOGI minority (n = 1) and/or those with documented substance use (n = 7) or psychiatric (n = 2) history. The most common presenting symptoms included dyspnea (n = 4), headache (n = 4), and back pain (n = 3), and the most frequent underlying causes of death were infection (n = 8) and malignancy (n = 6). The median interval between initial presentation and death was 23.3 days. A subset of cases (n = 6) demonstrated repeat presentations prior to death.

Discussion:

This study demonstrates that patients who experienced fatal outcomes after having healthcare encounters that dismissed their symptoms were part of one or multiple vulnerable groups, including female sex, housing instability, substance use disorder, and psychiatric comorbidities. This is in stark contrast to the average decedent profile seen on this service. These findings support that social factors impact how patients receive healthcare and highlights the importance of autopsies in understanding flaws in our healthcare system.

P42 Not Just Carbon Monoxide: Bilateral Globus Pallidus Injury in Drug and Toxic Alcohol Exposure

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Bilateral globus pallidus infarcts at autopsy are a well-known gross finding in severe carbon monoxide (CO) toxicity. There are multiple pathophysiologic explanations for selective toxicity of CO to the globus pallidus. The globus pallidus contains the highest iron content in the brain, and CO has a high affinity for heme iron to form carboxyhemoglobin. The formation of carboxyhemoglobin leads to tissue hypoxia by reducing the oxygen-carrying capacity of blood. The globus pallidus also has high metabolic activity and oxygen consumption as part of the basal ganglia. CO inhibits the cytochrome C oxidase in the mitochondrial electron transport chain that further results in intracellular hypoxia and subsequent cell death. Anatomically, the globus pallidus has poor collateral circulation. The lenticulostriate and anterior choroidal arteries are long, thin perforating arteries that branch from the middle cerebral and internal carotid arteries, respectively, forming a watershed zone. This makes it extremely sensitive to reduced oxygen delivery. Studies have also suggested that an influx of catecholamines during acute CO poisoning

may contribute to these bilateral infarcts as well. Dopamine excess in the synaptic cleft of the mesolimbic system following CO exposure causes neuronal injury and can last weeks after withdrawal. Yet, bilateral globus pallidus infarcts have been associated with other insults. Rhabdomyolysis due to vascular insufficiency and muscle compression from prolonged immobility can complicate protracted overdose cases and has been associated with bilateral globus pallidus infarctions. Both ethylene glycol and diethylene glycol have been reported to cause delayed bilateral basal ganglion hemorrhage after ingestion. Bilateral hemorrhage and cystic lesions are also documented in patients who survive longer than 24 hours after acute methanol intoxication. Here, we present a series of five forensic autopsy cases with evidence of selective bilateral globus pallidus insults with no history of carbon monoxide exposure. The cause of death included mixed drug toxicity/overdose and acute ethylene glycol toxicity. At autopsy, four cases demonstrated bilateral yellow-brown indurations with increased macrophages, vascular siderocalcinosis, and tissue loss, consistent with a remote infarct. One case demonstrated bilateral parenchyma softening with tissue loss as well as increased macrophages, vascular siderocalcinosis, and reactive astrocytes, consistent with a subacute infarct. This series highlights the non-specificity of bilateral globus pallidus infarction to CO poisoning. Mixed drug overdose and ethylene glycol toxicity has been shown to produce these bilateral infarcts. Forensic pathologists should not dismiss bilateral globus pallidus infarctions as prior carbon monoxide exposure.

P43 Parvovirus B19 Discovered within Autolyzed Fetal and Placental Tissues after Prolonged Intrauterine Retention: A Case of Intrauterine Fetal Demise

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Introduction:

Parvovirus B19 is a clinically important cause of maternal-fetal infection and is included among the TORCH infections group, significant for their ability to cross the placenta and infect the fetus. Parvovirus B19 primarily infects erythroid precursor cells, which can lead to fetal complications including anemia, high-output cardiac failure, hydrops, and fetal death. Following fetal demise, prolonged intrauterine retention can lead to progressive autolysis causing breakdown of cellular and tissue architecture. When severe, tissue degenerative changes can impede pathology diagnosis by obscuring classical histologic features or hallmarks. Here we present a case that made a diagnosis of Parvovirus B19 despite severe autolysis.

Case Presentation:

Our autopsy case examined an intrauterine fetal demise delivered at 25+4 weeks gestational age. Fetal weights and measurements, on clinical ultrasound and at autopsy, were most consistent with approximately 20 weeks gestational age. Severe maceration changes and autolysis of tissues further supported a prolonged intrauterine retention time of greater than one week. Placental tissues showed severe degenerative change with no evidence of acute or chronic inflammation. Within the autolyzed fetal tissues, diffuse hemosiderin deposition was identified in the liver, confirmed by special stain, which prompted additional immunohistochemical stain work-up for CMV and Parvovirus B19. Parvovirus B19 immunostain positively highlighted red blood cell lineage cells within hepatic tissue and a myriad of fetal tissues and placental tissue as well.

Moreover, this led to a more careful histologic review of fetal tissues. Amazingly, the classic viral cytopathic effect of Parvovirus B19 could be observed within renal glomeruli, as these structures are relatively resilient against postmortem autolysis and also contain numerous capillaries with red blood cells.

Discussion:

In the setting of advanced fetal and placental autolysis, classical features of Parvovirus B19 may be difficult to identify, including cytopathic effects and typical inflammatory patterns, including placental chronic villitis. This case illustrates the importance of recognizing diffuse hepatic hemosiderosis as a clue to Parvovirus B19 infection and also highlights the resilience of renal glomeruli, which may demonstrate red blood cell viral cytopathic effect within an autolyzed fetus.

P44 Assessing Discrepancies Between Clinical Cause of Death and Hospital Autopsy Findings in Out-of-Hospital Deaths

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Introduction:

In deaths that occur outside of an inpatient hospital, the medical examiner or coroner may decide to issue a death certificate without assuming custody of the decedent or entirely decline the case, with the death certificate filled out by the patient's primary care physician. Despite the clinical cause of death being listed, families of these decedents may still have unanswered questions about how their loved ones died. At our institution, patients who have previously received care within our medical system may request a hospital autopsy even if the death occurred outside of our hospital or affiliates. This results in a significant number of autopsies performed on patients who died at home, in long-term care facilities, rehabilitation facilities, or hospitals outside our system. The cause of death identified at autopsy sometimes differs from that entered on the death certificate. We investigated in this project the frequency and nature of these differences.

Methods:

We analyzed autopsies performed between 2020 and 2025 on decedents who died outside our hospital system to determine the value added by performing a hospital autopsy. Eligible cases were identified, and the autopsy cause of death was compared to the death certificate cause of death or, when the death certificate was unavailable, the clinical cause of death listed on the autopsy request form. Each case was classified as having a "major discrepancy," "minor discrepancy," or "no discrepancy" by each of the three authors independently. Interrater reliability was moderate (Krippendorff's $\alpha = 0.706$). Consensus ratings for further analysis were developed through discussion and agreement among all three authors.

Results: Out of 47 cases, 16 (34%) were found to have major discrepancies between the clinical and autopsy causes of death. 13 (28%) cases had minor discrepancies, and 18 (38%) had no significant discrepancy. Additional analysis will address the types of discrepancies attested, sources of death certificates, and decedent demographics.

Discussion:

Autopsy frequently revealed significant medical conditions not previously recognized as contributing to the patient's death. Our review of death certificates also underscored inaccuracies in the completion of the cause of death that may lead to incorrect diagnoses, errors in public health statistics, and delayed family closure. This study reinforces the valuable role of an autopsy in the investigation of a unique subset of out-of-hospital deaths which otherwise would not meet criteria for a traditional hospital or medicolegal autopsy.

P45 A Novel Iatrogenic Mechanism Leading to Hemorrhagic Complications Following Transoral Robotic Surgery (TORS): A Case Study

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Transoral robotic surgery (TORS) is a minimally invasive approach approved in 2009 by the FDA for resection of T1-T2 tumors of the oropharynx. The most severe reported complication is post-operative hemorrhage, with an estimated incidence of 5.4-13.2%. Of those, fatal outcomes are rare, with less than 100 such cases reported in the literature.

We report an otherwise healthy 72-year-old man who was diagnosed with metastatic squamous cell carcinoma of the tongue who underwent TORS with a concomitant right external carotid artery (ECA) ligation. On post-operative day 3, with no antecedent symptoms, he precipitously bled from his mouth, leading to a rapid respiratory death despite resuscitative efforts. At autopsy, there was extensive pulmonary hemoaspiration, but a high cervical, intra-oral, and lower facial vascular dissection revealed an intact ECA ligation site and no grossly discernible vascular breaches. The right lingual artery (just distal to the ECA ligation) was dusky, thin, and grossly surrounded by soft tissue hemorrhage in contrast to the superior thyroid artery (arising just proximal to the ECA ligation), which appeared normal. Microscopically,

the surrounding soft tissues supplied by the right lingual artery had coagulative necrosis with associated acute and subacute necrotizing inflammation, but no bacteria. In contrast, viable tissue surrounded the other branches of the ECA.

Hemorrhagic complications following TORS are associated with known risk factors, including radiation therapy, advanced patient age (>70 years), large tumor size, and coagulopathies. To mitigate risk, many surgeons choose prophylactic ligation of the ECA or its branches, which is thought to decrease the severity of post-operative hemorrhage. Paradoxically, in this patient, it appears that the ligation itself caused rather than prevented the hemorrhage through an apparent vascular ischemic mechanism, one not described in the preventive ligation literature. Conventional wisdom and experience had previously dictated that collateral circulation is adequate to supply the tissue territory normally perfused by the ligated ECA, but individual and apparently inadequate vascular variations may preclude this protection. Other mechanistic theories for bleeding, with or without ECA ligation, include retrograde blood flow, pseudoaneurysm development, enzymatic degradation due to salivary pooling, and infection. For this patient, the specific histopathology was temporally consistent with an inflammatory response to necrosis over the course of the three post-operative days. This case report describes a therapeutic complication from hemoaspiration as a result of ischemic complications from a previously undescribed TORS-related ECA ligation, a surgical technique specifically designed to mitigate hemorrhagic complications.

P47 Benchmarking Convolutional Neural Networks, Vision Transformers, and Contrastive Language-Image Pre-training for Objective Classification of Gunshot Entrance and Exit Wounds

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Accurate differentiation between entrance and exit gunshot wounds (GSWs) is essential for forensic investigations and trajectory reconstruction. Currently, only a small number of studies have explored deep learning for this task in human forensic images: Oura et al. demonstrated feasibility using porcine models, Cheng et al. achieved 87.99% accuracy using 2,418 real-case images, and Queiroz et al. recently published the first multi-purpose model using 2,551 images with 86.9% accuracy for hole classification. However, these pioneering works are exclusively based on Convolutional Neural Networks (CNNs). Despite these advancements, to the best of the authors' knowledge no study has yet evaluated the efficacy of Vision Transformers (ViTs) or Contrastive Language-Image Pre-training (CLIP) in a forensic context. ViTs capture long-range spatial dependencies, while CLIP offers a multimodally pretrained reference architecture that may better represent subtle visual patterns in wound morphology than standard image-only CNNs. This research addresses this gap by performing the first comprehensive benchmark of local feature-based CNNs against global context-aware ViTs and multimodal CLIP architectures.

This research uses a specialized forensic dataset curated at the Cook County Medical Examiner's Office. Six architectures are evaluated: CNNs (ResNet50, EfficientNet-B0, ConvNeXt-Tiny), ViTs (ViT-Small, Swin-Tiny), and CLIP. To preserve diagnostic detail while focusing on wound morphology, a "Center-Focus" preprocessing strategy is applied to standardize image input and isolate morphological markers. Because the dataset is class imbalanced, with entrance wounds more frequent than exit wounds, class weights are derived from inverse class frequencies and incorporated into a weighted cross-entropy loss to reduce bias toward the majority class. Model interpretability is evaluated through Grad-CAM and Attention Rollout to ensure alignment with forensic diagnostic criteria.

The aim of this study is to determine whether Transformer-based models and CLIP provide new insights into global morphological patterns that traditional CNNs may overlook. The study quantifies performance through Accuracy, F1-Score, and AUC-ROC metrics. This research intends to provide forensic pathologists with a reliable, reproducible, explainable decision-support tool, supporting standardized training, and reducing inter-observer variability in high-stakes forensic investigations.

The study is currently ongoing. A detailed discussion of the results will be presented to the attendees.

P48 The Language of Suicide: Understanding How Younger Generations Communicate

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From 2015 to 2025, there were 2,545 successful suicides in Palm Beach County, FL. Of these, 69 were completed by individuals aged 18 and younger ('Youths'). Individuals within this age group grew up in an era defined by digital media. The pervasiveness of online culture has contributed to rapid shifts in language usage amongst the youth in our society. It is important to understand the euphemisms used by this subgroup of the population to describe suicidal acts and ideations so as to improve accuracy in death certification.

Presented here is a collection of common euphemisms used by Youths to describe suicidal acts and ideations. These include 'familiar' phrases such as 'Play in traffic' and 'Long walk off a short pier' and more novel euphemisms including 'Commit Sudoku' and 'Keep Yourself Safe'. Also presented will be insights into the websites, apps, and communications methods used by this subgroup. Familiarization with these topics will help better investigation strategies for law enforcement, medical examiner personnel, and families when confronted with suicidal ideations, attempts, and/or completions in individuals age 18 and younger.

P49 Medicolegal Death Investigation, Toxicology Collaboration, and Forensic Pathology Leadership in Emerging Drug Threat Identification and Dissemination

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Novel synthetic opioids continue to pose a significant and evolving public health threat due to their extreme potency and frequent absence from routine toxicology testing. N-propionitrile chlorphine (cychlorphine) is a relatively new synthetic opioid estimated to be approximately ten times more potent than fentanyl. Failure to recognize emerging substances such as cychlorphine can lead to missed or delayed cause of death determinations, hinder accurate mortality surveillance, and impede subsequent investigative efforts.

A young adult male was found unresponsive after reportedly making "gurgling" sounds while in bed. At the scene, frothy fluid was noted around his mouth, and three tablets labeled "RP" and "10 325", markings commonly associated with oxycodone hydrochloride tablets, were recovered nearby. Autopsy findings were most notable for frothy fluid within the airway and cerebral edema, findings suggestive of an opioid-related respiratory depression. Initial peripheral blood toxicology testing identified only cannabinoids, a result that was discordant with both the investigative findings and the anatomic features observed at autopsy. Given the medicolegal death investigation and autopsy findings, additional toxicology testing was pursued in direct collaboration with the toxicology laboratory. Expanded toxicology analysis ultimately identified cychlorphine in peripheral blood. Concurrently, drug chemistry analysis identified cychlorphine in the recovered tablets.

This death underscores three key lessons. First, the autopsy begins at the death scene. Accurate cause of death determination requires thoughtful integration of a thorough medicolegal death scene investigation, autopsy findings, and toxicology, with critical reassessment when results do not align. Second, emerging synthetic opioids may not be detected even with expanded screening, underscoring the importance of proactive communication between forensic pathologists and toxicologists to guide targeted testing. Third, forensic pathologists play a vital role in public health and safety surveillance by partnering with stakeholders, including public health and public safety departments, as well as media organizations, to rapidly disseminate information about novel and potentially lethal substances. This dissemination may occur through mechanisms such as Health Alert Network (HAN) notifications, media interviews, and op-ed publications in newspapers.

P50 Postmortem Pregnancy Testing: A Simple Screen, a Complex Interpretation

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Reducing maternal mortality is a foundational goal of the Utah Department of Health and Human Services (DHHS). In addition to the risks inherent to childbirth, pregnancy itself is a known risk factor for various conditions including depression, psychosis, and eclampsia, as well as domestic and interpersonal violence. As part of a statewide public health system, the Utah Office of the Medical Examiner (OME) plays a key role in monitoring causes of death among the population. Despite the potential significance of pregnancy in death investigation, postmortem pregnancy testing is not routinely performed at the OME.

This study aimed to investigate the utility of such testing in a forensic setting. The first objective was to estimate the prevalence of unrecognized pregnancy in decedents who are examined at the Utah OME. During the initial phase, 200 female decedents aged 10-50 years were tested for pregnancy using commercially available test strips that detect human chorionic gonadotropin (beta-hCG). Urine samples were preferentially tested. Blood samples were used if urine was unavailable.

The overall test positivity rate was 11% (22/200). Interestingly, all positive results came from blood samples (22/101). Urine positivity was 0% (0/99). Given the discordance between urine and blood results, a second phase of testing was carried out on 100 decedents where both urine and blood samples were available. The overall test positivity rate for blood was 20% (20/100). Of the 20 cases with positive blood tests, 3 had concordant positive urine tests. No decedents had positive urine with negative blood results. The overall positivity rates of the two phases are both higher than anticipated. The obvious difference between positivity rates of blood and urine was likewise not expected. There are multiple possible explanations for the results that are not mutually exclusive, including differential concentrations of beta-hCG in blood vs. urine, non-viable pregnancies, recent miscarriages, and false positives. Overall, this study suggests caution when trying to ascertain postmortem pregnancy status with qualitative test strips. The unexpected findings in this study warrant further research. Future work will use a quantitative confirmatory assay for beta-hCG to clarify the results of bedside pregnancy testing and improve their interpretation.

P51 Postmortem Toxicology Patterns in Suicide Compared With Other Traumatic Deaths: A Retrospective Case-Control Study

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Suicide remains a leading cause of death in the United States, with rates rising over the past two decades and consistently exceeding national averages in Arizona. Despite extensive prevention efforts, actionable markers of acute suicide risk remain incompletely defined. Impairing substances such as alcohol, cannabinoids, stimulants, benzodiazepines, and opioids are known to alter judgment, increase impulsivity, and reduce behavioral inhibition, yet their prevalence in suicide decedents relative to other traumatic deaths is not well characterized in forensic populations. Variability in toxicological testing practices in apparent suicides may further limit the integration of substance exposure data into public health surveillance.

We conducted a retrospective case-control study within a county medical examiner system in Arizona. Suicide decedents by non-poisoning mechanisms (n = 26) were compared with decedents of motor vehicle accidents (MVA) and homicide. Cases and controls were matched on sex and frequency-matched by age group, with partial matching on race and ethnicity. This study represents an ongoing surveillance project in partnership between PCMEO and the Arizona Suicide Mortality Review Team, and additional cases are being prospectively incorporated as they become available. Postmortem blood toxicology results were analyzed for the presence of impairing substances. Fisher exact tests were used for comparisons.

Suicide decedents demonstrated a significantly higher frequency of detection of impairing substances compared with MVA decedents (P = .014). Comparison with homicide decedents did not reach statistical significance (P = .086), though a non-significant trend toward higher prevalence in suicide decedents was

observed. Overall, impairing substances were detected more frequently in suicide decedents compared with at least one external traumatic control group.

These findings suggest that acute substance exposure is differentially represented across manners of death and may serve as a measurable correlate of suicide risk in forensic populations. From a public health perspective, systematic toxicological evaluation in suicide deaths may enhance surveillance accuracy, improve identification of high-risk populations, and inform targeted prevention strategies addressing substance use.

P52 Fatal Neurologic Injury After General Anesthesia in a Decedent of Venezuelan Ancestry: Bilateral Basal Ganglia Hemorrhage and Autopsy Findings

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Recent communications from anesthesiology societies have described rare cases of severe neurologic complications and death following routine general anesthesia in patients of Venezuelan maternal ancestry. A mitochondrial DNA point variant in the NADH dehydrogenase 4 gene (MT ND4 m.11232T>C) has been identified in some cases. It has been hypothesized to be associated with increased susceptibility to volatile anesthetics, particularly sevoflurane. However, autopsy findings in these cases have not been well characterized in the literature, and the full genetic spectrum remains incompletely defined.

A 30-year-old female of Venezuelan ancestry with a history of prediabetes underwent elective abdominoplasty with fat transfer at an outpatient surgical center. General anesthesia was induced with volatile anesthetic maintenance and intravenous induction and adjunct agents, including Sevoflurane, Fentanyl, Lidocaine, and Propofol. The procedure was reportedly uneventful; however, the subject failed to regain consciousness following anesthesia. Neuroimaging performed after surgery demonstrated multiple areas of restricted diffusion in the supratentorial and infratentorial brain, including the bilateral basal ganglia, thalami, subcortical white matter, cerebellar peduncles pons medulla and cerebellum, findings suggestive of severe hypoxic ischemic brain injury. The subject remained hospitalized and was transitioned to comfort care prior to death ten days later. A forensic autopsy was performed. The abdomen showed uncomplicated postoperative changes. Lung frozen sections stained with Oil Red O showed no evidence of fat embolism. Examination of the brain revealed scattered hemorrhages in the bilateral frontal lobes and bilateral basal ganglia, measuring up to 1.6 cm in greatest dimension. Microscopic examination of the involved areas and surrounding parenchyma demonstrated global hypoxic ischemia with multifocal ischemic infarcts and hemorrhagic transformation. No significant natural disease or alternative anatomic cause of death was identified. Given the prolonged hospitalization, there were no concerns for acute drug or ethanol toxicity. After the postmortem examination, a sample of blood in a EDTA (Ethylenediaminetetraacetic acid) tube was submitted for mitochondrial DNA sequencing for MT ND4 m.11232T>C, with results pending at the time of submission.

To the best of authors knowledge, this case represents the first postmortem pathologic characterization of bilateral basal ganglia hemorrhage following general anesthesia in a decedent of Venezuelan ancestry. ND4 mutation is currently considered a variant of uncertain significance, and its clinical and pathogenic implications remain unknown. Accordingly, whether detected or absent, the genetic result does not by itself establish or exclude a causal relationship.

P53 Comparative Forensic Death Investigation Models: Structure, Workforce, and Surveillance Implications Across High- and Low-Income Settings

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Forensic death investigation models define how jurisdictions determine cause and manner of death for unnatural, unexpected, or unwitnessed deaths. Their structure affects criminal justice outcomes, public health surveillance, overdose and maternal mortality tracking, and the accuracy of death records. No international standard governs how forensic death investigation should be organized, and comparisons across countries remain limited.

We conducted a comparative analysis of forensic death investigation systems in five high-income countries (United States, Scotland, Finland, Sweden, Norway) and reviewed emerging approaches in sub-Saharan Africa and South Asia. Data sources included peer-reviewed literature (2000–2026), national professional body reports, WHO guidance, and government policy documents. Systems were evaluated across four domains: legal authority and jurisdiction, workforce qualifications and capacity, laboratory infrastructure, and linkage to national death registration.

In the United States, death investigation operates across approximately 2,000 medicolegal offices in 2,300 autonomous jurisdictions through either elected coroners, who in many states require no medical training, or appointed medical examiners, who must be physicians. The forensic pathology workforce falls 30–40% below NAME-defined adequacy, with greatest shortfalls in rural areas. Laboratory and toxicology capacity vary widely, and cause-of-death data linkage to national vital registration is inconsistent, producing surveillance gaps in overdose, maternal mortality, and injury deaths.

Scotland's procurator fiscal system centralizes investigation under legally qualified crown officers who instruct accredited forensic pathologists for approximately 14,000 deaths annually, with standardized national jurisdiction and systematic vital registration linkage. Finland and Sweden employ forensic pathologists through national authorities, achieving autopsy rates of 22–24% overall and 87–99% for injury deaths, with consistent civil registration integration. Norway's police-directed model produces lower autopsy rates (5–10%) despite similar legal infrastructure.

In sub-Saharan Africa and South Asia, forensic pathology workforce capacity is severely limited and laboratory infrastructure minimal. Most deaths occur outside health facilities and are documented through clinician certification, police inquiry, or verbal autopsy. Minimally invasive tissue sampling (MITS), with diagnostic accuracy above 80%, is being piloted in Rwanda, Zambia, and Nepal, though formal integration into medicolegal systems remains early-stage.

Future research should evaluate existing models for their comparative strengths and limitations, assess whether centralized jurisdiction and standardized referral criteria demonstrably improve mortality data quality, and examine pathways for integrating minimally invasive tissue sampling into civil registration systems in low-income settings.

P55 A Novel Federal Grant Strategy to Achieve Accreditation Council for Graduate Medical Education Accreditation and Establish a Forensic Pathology Fellowship

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The persistent national shortage of forensic pathologists continues to challenge medicolegal death investigation systems, contributing to increased caseloads, delayed reporting, and downstream public health impacts. Although expansion of forensic pathology fellowship training is widely recognized as a critical solution, financial and infrastructural barriers limit the development of new Accreditation Council for Graduate Medical Education (ACGME)-accredited programs, particularly within medical examiner-coroner offices. We outline a novel and, to our knowledge, first-of-its-kind approach utilizing the Bureau of Justice Assistance Strengthening the Medical Examiner-Coroner System Program (Purpose Area 2: Accreditation) grant to directly support ACGME accreditation and the creation of a forensic pathology fellowship at the DeKalb County Medical Examiner's Office (DCMEO). This innovative alignment of federal grant funding with graduate medical education development represents a replicable model for addressing workforce shortages in forensic pathology. Considering a significant proportion of physicians practice in proximity to their training centers, the establishment of a fellowship program in an underserved, heavily populated district has the potential to profoundly improve the regional and national forensic workforce.

P56 Kratom Alkaloid Distribution in Postmortem Matrices After Suspected Use of a Synthetically Enhanced Product

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A thriving commercial market has emerged for kratom-derived products. Although “kratom” refers to products derived from the leaves of the Southeast Asian plant, *Mitragyna speciosa*, not all kratom-products are created equal. Mitragynine is the predominant alkaloid of the plant and is a weak partial mu opioid receptor agonist that also interacts with the adrenergic and serotonergic systems, which potentially explains the dose dependent stimulant and opioid-like effects. 7-Hydroxy mitragynine (7-OH) and mitragynine pseudoindoxyl (MP) are known metabolites of mitragynine; 7-OH being a minor constituent of natural kratom. Both 7-OH and MP are mu opioid receptor agonists with higher activity and affinity compared to mitragynine. Due to their enhanced activity, companies have exploited these compounds to synthetically enhance products, altering the alkaloid profile. Toxicological analysis and interpretation of kratom exposure has evolved over time in response to these changes.

This case study reports the analytical findings from multiple postmortem matrices for kratom alkaloids collected from an individual who died following consumption of a 7-OH product. Mitragynine was reported in femoral blood at 100 ng/mL, which is not considered a significant concentration in death investigation casework. Further testing was pursued at the CFSRE where 7-OH was reported at 53 ng/mL and MP at 650 ng/mL. Postmortem urine reported mitragynine, 7-OH, and MP at 440, >10,000 ng/mL and 1700 ng/mL, respectively. Vitreous and gastric contents also contained all three alkaloids, with 7-OH concentrations most prevalent.

Toxicological confirmation of kratom alkaloids has expanded to 7-OH and MP. Stability of these alkaloids is also a significant pre-analytical variable. 7-OH is unstable in biological matrices, particularly in blood and serum/plasma, as it enzymatically transforms to MP. 7-OH stability studies demonstrated 24% and 91% decreases in fortified refrigerated blood and serum, respectively, within 14 days; while 7-OH in urine demonstrated greater stability. Therefore, the assessment of kratom alkaloid distribution is dependent on elapsed time, matrix tested, and ratios of kratom alkaloids. The case presented was a suspected 7-OH exposure, with MP found at the highest concentration in blood. The corresponding urine reports a very high concentration of 7-OH, with lower mitragynine and MP concentrations. These results demonstrate the toxicological representation of alkaloids in different matrices after 7-OH exposure. Medical examiners, coroners, and toxicologists should be aware of the expanded scope of kratom alkaloid analytes needed to confirm these enhanced products, as well as the pre-analytical variables that may impact the results.

P57 Bis[2,2,6,6-tetramethyl-4-piperidyl] sebacate (BTMPS) in Biological Samples in the Absence of Illicit Drugs

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BTMPS testing in forensic toxicology casework began after it was discovered that it was being cut into illicit drugs. BTMPS, (Bis[2,2,6,6-tetramethyl-4-piperidyl] sebacate), or Tinuvin®770, is commonly used in the manufacture of both food and medical grade plastics as a UV-stabilizing additive. While BTMPS is often found in samples alongside fentanyl, synthetic opioids, and stimulants, it can also be found in the absence of illicit drugs. Two positive cases with BTMPS without the presence of illicit drugs, and four cases with the presence of illicit drugs have been identified to date. The cases without illicit drugs were an oxycodone overdose, and an amphetamine overdose. Both decedents had empty prescription bottles found at the scene. A third case was identified involving an individual that was subject to urine testing due to pain management therapy. The urine test results matched the prescriptions the individual was taking and no illicit drugs present, therefore he was considered compliant. However BTMPS was also detected in the urine sample. How does BTMPS enter the licit drug supply? It is possible that the BTMPS was a contaminant on the pills from the plastic medication bottle(s) in which they were stored since manufacture, and because so many of them were ingested at one time, the BTMPS accumulated to a

detectable concentration. For the individual in pain management therapy, he was on multiple medications most of which were stored in plastic bottles, including an opioid. University of Washington drug detection data showed that BTMPS was detected in licit drug samples. In 311 prescription opioid samples (excluding fentanyl), 3.5% were positive for BTMPS, thus supporting the BTMPS leaching out of the plastic pill containers. In addition, BTMPS is a potent calcium channel blocker and nicotinic receptor antagonist. For this reason, it has been used in nicotinic receptor studies. Papke et.al, 1994, discovered that the control and the BTMPS treated nicotinic receptors both produced receptor blockade. It was determined that BTMPS was leaching out of the plastic syringes that were being used. When the plastic syringes were removed from use, the control and BTMPS groups no longer produced the same results. Because BTMPS has been found in biological specimens from postmortem and antemortem samples without the presence of illicit drugs, in prescription opioid pills, and found to leach out of plastic syringes, there can be no assumption made that the individual used illicit drugs if BTMPS is detected.

P58 A Bee or Not a Bee? A Case Report of Pituitary Apoplexy Presenting as Anaphylaxis

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Edema of the face and tongue prompts concern for trauma, anaphylaxis, angioedema, infection, and endocrine dysfunction. The death of a person with a history of localized bee sting reactions found dead with facial edema in the context of recent outdoor activity would be highly concerning for anaphylaxis. In this case, autopsy, toxicology, and histology confirmed pituitary apoplexy as the cause of facial edema and excluded other more common causes.

P60 Organ Weight Reference Ranges in Adolescents Aged 13–17 Years: A Retrospective Forensic Autopsy Study

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Assessment of organ weight is a core component of forensic pathology and may provide important insight into underlying disease or physiologic variation. However, reference data for adolescents remain limited despite the need to interpret organ weights across the transition from pediatric to adult life. The present study addresses this gap by generating age-specific organ weight reference ranges for individuals aged 13 to 17 years using forensic autopsy data.

A retrospective review of forensic autopsies from three large Medical Examiner's Offices was performed to identify decedents aged 13 to 17 years over a 10-year period. Cases were excluded for significant natural disease, decomposition, prolonged medical intervention, organ procurement procedures, extensive trauma, or substantial disruption of the organ of interest. Organs with gross or histologic abnormalities were excluded individually. In traumatic deaths, uninvolved organs were included. Collected variables included cause of death, manner of death, age, sex, height, weight, body mass index, and weights of the brain, heart, lungs, liver, spleen, and kidneys.

Descriptive statistics were used to establish percentile-based reference ranges stratified by age and height. Regression analyses evaluated associations between organ weights and anthropometric variables to identify independent predictors and improve estimation of expected organ weights.

The present study leverages a forensic autopsy-based design to characterize an underrepresented adolescent population and to evaluate multiple major organs in relation to body size. By defining adolescent-specific reference ranges and identifying predictors of normal variation, it may improve the interpretation of organ weights in forensic practice and assist in distinguishing physiologic variation from underlying pathology.

P61 Reported Toxicology Testing in US Violent Deaths and Suicides: National Violent Death Reporting System, 2023

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Toxicology testing in death investigations can inform the understanding and prevention of violent deaths and suicides, particularly when substance use may be a contributing factor. However, testing may vary by manner of death and jurisdiction. This study examined the frequency of toxicology testing among violent death and suicide decedents in the United States using the most recent data year available (2023) from the Centers for Disease Control and Prevention's (CDC) National Violent Death Reporting System (NVDRS).

NVDRS is a state-based active surveillance system that links death certificates, law enforcement reports, and coroner/medical examiner records to capture detailed information on homicides, suicides (including homicide-suicide incidents), unintentional firearm injury deaths, legal intervention deaths, and deaths of undetermined intent that may be due to violence or suicide. A decedent was classified as having toxicology testing if any substance or substance class was documented as tested in NVDRS source records. The prevalence of any toxicology testing conducted overall, by manner of death, and by jurisdiction were assessed. For homicides in which the perpetrator also died, including mass shootings (defined as incidents involving four or more people shot, excluding the shooter), toxicology testing among both victims and perpetrators was examined.

Among 79,613 violent death and suicide decedents in 2023, 58.7% had documentation of any toxicology testing. Testing occurred most frequently among deaths of undetermined intent (75.8%) and legal intervention deaths (74.8%), and least frequently among unintentional firearm injury deaths (51.5%). In homicides where the perpetrator also died, toxicology testing was conducted for 71.7% of victims and 72.9% of perpetrators. In mass shootings where the perpetrator died, testing occurred for 84.8% of victims and 81.4% of perpetrators. Geographic variation in toxicology testing across violent deaths and suicides was also observed, ranging from 15.1% in Idaho and 99.0% in Utah.

These findings highlight substantial variation in toxicology testing across manners of death while demonstrating comparable testing frequencies for homicide victims and perpetrators. Geographic differences in toxicology testing support the need for future analyses using NVDRS data to examine reported testing availability by additional factors, such as type of medicolegal death investigation system type and specific substances. These analyses, along with more years of data, can better describe patterns in toxicology practices over time. Standardizing testing and improving the availability of toxicology data in violent death and suicide investigations across jurisdictions and decedent types could strengthen substance-related mortality surveillance and inform targeted prevention strategies.

P62 Low-specimen Volume Toxicology Testing: A Partnership Model with Washington State Patrol (WSP) for Postmortem Cases

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Introduction:

Forensic toxicology plays a critical role in medicolegal death investigations, providing analytical results that assist with the determination of cause of death and contribute to accurate public health surveillance data. Situations in which toxicology testing cannot be performed create significant gaps in our understanding of drug-related mortality trends, ultimately limiting the quality of epidemiological data available to public health agencies and policymakers. Each year, testing for a number of cases submitted to NMS Labs is cancelled due to insufficient specimen volume, as the submitted volume does not meet the minimum requirement for testing by NMS. This presents a pervasive operational challenge in forensic toxicology and its partnering agencies.

Methods:

In collaboration with the WSP Toxicology Laboratory, NMS Labs implemented a low-specimen volume testing model designed to maximize analytical output from otherwise untested samples. Between January 1, 2025 and May 1, 2026, 155 postmortem cases (representing 1.9% of all submissions) underwent this protocol which would have been cancelled due to insufficient blood volumes. The protocol incorporated two key operational parameters:

1. Client notification that sample volume may be fully exhausted prior to completion of all confirmation analyses; testing is prioritized accordingly with full transparency.
2. Manual reviews of each case to determine confirmation priorities by a board-certified toxicologist. Drug priorities indicated by WSP are integrated into the analytical workflow. A standardized confirmation priority chart governs the order of testing unless case-specific factors or requisition instructions require modification.

Results:

Implementation of the low-volume protocol enabled toxicological testing on 155 cases that would otherwise have been cancelled and yielded no results. Collaboration between NMS Labs and WSP facilitated efficient resource allocation while ensuring that the highest-priority analytes were confirmed. Preliminary data demonstrate that clinically significant findings were identified in a majority of these cases.

Discussion:

This partnership demonstrates that low-specimen volume toxicology testing is operationally feasible when supported by a structured workflow and inter-laboratory collaboration. This risk-management evaluation centers on prioritizing analytes of interest in postmortem toxicology testing, thereby providing the results necessary to support medicolegal death investigations. This is done with the understanding that testing for less relevant or significant analytes may not be completed, which is a less consequential outcome than failing to identify suspected drug-related fatalities. Alternatively, if these low volume samples were tested in the absence of toxicological intervention and prioritization, they could be consumed following testing that has little relevance and value to the case.

P63 Exceptionally High Postmortem LSD Concentration: A Medicolegal Interpretation Challenge

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We report a case in which an exceptionally high lysergic acid diethylamide (LSD) concentration posed a major challenge in medico-legal interpretation.

A 47-year-old woman was found dead following reported use of LSD and alcohol. The partner stated that he had mixed LSD, reportedly in powder form, with alcohol prior to ingestion.

Forensic autopsy and toxicological analysis revealed a blood alcohol concentration of 4.2‰ and an LSD level of 97.7 ng/mL, which is, to our knowledge, among the highest ever reported in a forensic context. The partner's LSD concentration was only 5.4 ng/mL in the absence of alcohol. Several factors may account for this marked discrepancy in LSD concentrations. First, the presence of (histologically confirmed) liver cirrhosis in the deceased may have reduced the first-pass metabolism of LSD, potentially resulting in higher systemic concentrations. Second, the uncommon presentation of LSD in powder form, rather than on impregnated blotter paper, may have complicated accurate dosing. Third, the possibility of differential or intentional administration was raised.

Despite the unusually high LSD concentration, its contribution to death remained unclear. Very limited recent literature is available. LSD is generally considered to have low toxicity, and no consensus exists regarding lethal concentrations. This has even led to suggestions that LSD challenges the classical toxicological principle of Paracelsus that the dose makes the poison. Typical postmortem LSD concentrations reported in the literature are low, often below 1–3 ng/mL, while even "high" reported values rarely exceed 10–20 ng/mL. Notably, the literature reports non-fatal outcomes following both intranasal ingestion of approximately 550 times a typical recreational dose and cases involving LSD powder

mistaken for cocaine, with blood concentrations up to 60 ng/mL. Fatal cases invariably involve confounding factors, with no documented instances of fatal LSD monointoxication to date.

In this case, the markedly elevated blood alcohol level represented a plausible cause of death. Given the scarcity of data, we considered it important to report this exceptionally high LSD concentration to contribute to the existing literature. In addition, there is a lack of robust data on the interaction between LSD, alcohol and underlying liver pathology, further complicating interpretation in this case. Due to the lack of clear evidence supporting a causal role of LSD, its contribution was considered indeterminate, leading to reasonable doubt and subsequent acquittal. This case illustrates the challenges in interpreting extreme LSD concentrations in forensic toxicology.

P64 Translating Results of SUDC Death Investigations into Practice; Where Data Lost to Families Can Help Transform the Field of Pediatrics and Help Inform Best Practice in Rare and Sudden Deaths

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The sudden and unexpected death of a young child, classified as a category of death by the acronym SUDC, can be a cataclysmic event for a mother. However, instead of my journey ending where my daughter's life did, I, that mother of sweet Billie Hoffman, began a process of wanting to make impactful change in her memory. We learned that Billie's death was caused by viral meningoencephalitis. The light was shed on the severity of her symptoms only following the death investigation and neuropathology report were complete, though several questions remained unanswered. She experienced a febrile seizure three days prior to her death and was treated at home by the family pediatrician. There are several key issues that remain at the forefront of my mind following the response to the death of our child by professionals. It should be noted, I am not a physician, nor did my daughter's death did not get re-classified to represent her appropriate cause of death following the death investigation. If the data gained by the aforementioned studies gets lost in the hands of families, how does the medical community change and grow? How can we use the invaluable information gained from death investigations to close the gap between what is known about common practice for viral illness in children, febrile seizure, and sudden death?

P65 A Retrospective Study of Suicides during Pre-COVID and Post-COVID in the State of Maryland

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Introduction: Globally, a significant rise in the prevalence of mental health conditions was triggered by the COVID-19 pandemic. The epidemiology patterns of suicide in different demographic groups were likely altered by this change. The diversity within Maryland establishes a primary setting for assessing these clinical risks.

Objective: The purpose of this study is to compare Maryland's suicide rate by demographics, cause/method of death, alcohol and toxicology, pre- and post-COVID 19. Findings will guide focused prevention education and improve resource allocation for vulnerable populations by identifying high-risk groups.

Methods: A retrospective analysis was conducted using de-identified records from the Office of Chief Medical Examiner of Maryland. 753 confirmed suicide cases were analyzed in the study. Age, gender, ethnicity, cause/method of death were among the characteristics analyzed. Additionally, clinical indicators such as presence of alcohol, toxicological results, and previous mental health diagnosis were analyzed. Differences between the cohorts were found using Pearson's chi-squared test. Small cell counts were addressed by Monte Carlo simulations. Multivariable logistic regression assessed factors specifically associated with the post-COVID period.

Results: Our data showed 406 pre-COVID suicide cases and 347 post-COVID suicide cases. The cases declined in 2020 before increasing marginally in the subsequent year. Age and gender distribution did not alter significantly between the two intervals, across the bivariate comparisons. However, age was a significant factor within the multivariable analysis. Firearm-related deaths were more prevalent in the post-COVID period compared to hanging or asphyxiation (OR = 2.03, 95% CI: 1.39 – 2.99, $p < 0.01$). African or Native American and Hispanic individuals showed a higher odd of suicide during the post-COVID period (African or Native American: OR = 1.48, 95% CI: 1.03 – 2.15, $p = 0.04$; Hispanic: OR = 2.13, 95% CI: 1.04 – 4.47, $p = 0.04$). Additionally, recorded mental health diagnoses increased from 68% prior to COVID-19 to 94% following the pandemic ($p < 0.01$). Multivariable analysis indicates that individuals with documented mental health diagnosis faced significantly higher odds of suicide during the post-COVID period. This group showed an odds ratio of 11.1 (95% CI: 6.62 – 19.5, $p < 0.01$) compared to those without a diagnosis. No other analyzed factors reached statistical significance.

Discussion: The study found variations in the characteristics of suicide cases before and after COVID-19 pandemic. These disparities were especially noticeable in terms of mental health diagnosis, cause/method of death and ethnicity. These findings may support the implementation of more focused suicide prevention strategies.

P66 Relevance of Routine Back Dissection in Forensic Autopsies

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At the Forensic Medicine Department of the Antwerp University Hospital (UZA), Belgium, a full back dissection is routinely performed in all autopsies, regardless of case context or external injuries. In contrast, observations from other jurisdictions, including the United States, suggest that back dissection is often reserved for selected cases rather than incorporated into standard practice. Higher caseloads may partly explain this difference. Notably, the Forensic Autopsy Performance Standards of the National Association of Medical Examiners (NAME) do not include back dissection as a minimum requirement; however, they emphasize thorough external examination and documentation and correlation of external and internal injuries.

We retrospectively analyzed all forensic autopsies performed at our institution in 2025 ($n = 248$) to assess the added value of routine back dissection, specifically the detection of internal findings not evident on external examination.

In 147 cases (59.3%), no external or internal injuries were identified. External injuries without internal injuries were present in 24 cases (9.7%); predominantly superficial lesions ($n = 14$), followed by contusions ($n = 7$) and combined superficial lesions and contusions ($n = 3$). Both external and internal injuries were observed in 40 cases (16.1%).

Importantly, in 37 cases (14.9%), no external injuries were documented, while internal back dissection revealed hemorrhages and, in 4 of these cases, spinal fractures* - findings that would otherwise have been missed. In some instances, the hemorrhages were extensive despite an unremarkable external examination. These cases comprised a heterogeneous group: 20 trauma-related deaths (predominantly blunt force, $n = 15$), 9 intoxications, and 8 natural deaths (including infections, cardiovascular disease, and hypothermia).

Of these 37 cases, the internal findings were included in the autopsy report summary in 19 instances; however, this may be attributable to individual reporting practices, as the autopsies were performed by different forensic doctors. While such hemorrhages are often non-specific, they may support scenarios involving restraint, compression, collapse, seizure activity, or positional asphyxia; although they rarely appear decisive in determining the cause of death. However, given the importance of accurate injury documentation, and considering that in approximately 15% of cases no external injuries were visible despite the presence of internal hemorrhages and occasional spinal fractures, routine back dissection may be worth considering, as it adds only limited additional time.

*Only fractures of the spine or scapulae were documented in this study, as relevant posterior rib fractures can, in most cases, also be identified anteriorly.

P67 Cadaveric Evaluation of TASER Conducted Electrical Weapon Dart Ballistics

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Introduction:

TASER Conducted Electrical Weapons (CEWs) are used by public safety authorities around the world during violent encounters. Modern CEWs launch 11 mm (0.43 in) electrode darts into human tissue to deliver electrical current to incapacitate skeletal muscle. They travel at 67.1 m/sec +/- 9.1 m/sec (220 ft/sec +/- 30 ft/sec). Darts are commonly tested for impact effect on live humans by firing them at areas without internal organs (e.g., legs, buttocks).

In the field, darts may unintentionally impact areas containing internal organs. There are limited methods of testing these areas for ballistic injury. We describe a proof-of-concept, cadaveric model that provides information aimed at design safety and injury reduction.

Methods:

This cadaveric study was exempt from institutional review board oversight. Fresh cadaveric torsos (BMIs 16.95-24.2 kg/m²) were suspended vertically 30.5 cm (12 in) from the muzzle of a compressed air cannon. The cannon launched standard CEW darts aimed at the torsos at standard muzzle velocities with impact angles between 60°-90°. Post-impact, the torso underwent a gross autopsy by a qualified forensic medical examiner to evaluate for internal cavity penetration and organ damage.

Results:

20 darts were fired at cadaver torso surfaces. Target locations were areas backstopped by internal organs (lungs, heart, liver, GI tract). Three dart housings showed some evidence of laceration to the outer epidermal layer but did not penetrate any internal torso cavities. No internal organ injury was detected at autopsy. All darts were easily externally retrieved prior to the autopsy.

Discussion:

This study describes a novel cadaveric model to evaluate CEW dart injury risk to sensitive areas. Forensic physicians would benefit from better understanding the ballistics of CEWs used in their communities. This testing model has utility for assessing CEW dart ballistics. We recommend this testing process be part of future CEW dart safety studies.

P68 Fentanyl-Related Fatalities and Proximity to Free Naloxone Resources: Utilizing Geospatial Analysis to Identify Community Access Needs

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Introduction:

In 2025, 19.8% of total deaths under Pierce County Medical Examiner (PCME) jurisdiction involved fentanyl. The Tacoma Needle Exchange, a community-based program, the Tacoma Department of Public Health, and other organizations offer free naloxone throughout Pierce County. Providing naloxone through community-based programs over provider-prescribed access points is more effective in leading to naloxone use during overdoses. Leveraging community access to naloxone through community-based programs reduces opiate-related overdose deaths.

This study aims to understand if Pierce County has free naloxone resources located near or in the zip codes that contained relatively high fentanyl-related overdose deaths in 2025.

Methods:

The query function in Pierce County Medical Examiner Office's case management system, MEDIS, was used to search for cases in which death occurred in 2025 and fentanyl was listed in either the "cause of death" or "other significant conditions contributing to death" fields. The query output incident location, including street address, city, state, and zip code. Free naloxone resources were aggregated from Washington State's "Naloxone Finder" website tool and Tacoma Needle Exchange's map of naloxone resources. These addresses were converted to coordinates via Google Maps and coordinates were mapped onto OpenStreetMap using QGIS software. Query data from MEDIS were transformed into a zip code-based heat map and overlaid to the individual coordinates of free naloxone resources. Similar maps were used to estimate the percent of fentanyl-related deaths occurring outside of a set radius from a free naloxone resource. Free naloxone resources and deaths per free naloxone resource were compared for inside versus outside the city of Tacoma.

Results:

Among zip codes with greater than 20 fentanyl-related deaths, all but one had at least a single free naloxone resource. Six Tacoma zip codes had relatively high fentanyl-related deaths and contained only one resource. The zip code with the highest number of fentanyl-related deaths had a single resource. There are two zip codes that collectively have 19 fentanyl-related deaths but share a single resource. Over 70% of fentanyl-related deaths occurred outside a 1-mile radius from a free naloxone resource. Three zip codes contained regions falling outside a 10-mile radius of any resource; a single zip code provides the sole resource serving the southeastern region of Pierce County.

Discussion:

Fentanyl continues to be a significant cause of death in Pierce County.

This data will be shared with local health departments and used to identify additional locations for free naloxone resources to reduce fentanyl-related fatalities.

P69 Modifiable Risk Factors in Motor Vehicle Fatalities in Individuals under 21: An Eleven-Year Review in Jefferson County, Alabama

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Motor vehicle collisions are a leading cause of death in children and adolescents in the United States. Studies suggest that modifiable risk factors such as improper restraint and substance use contribute to motor vehicle fatalities in this age group. However, these factors may not be emphasized in death certifications, limiting the ability to guide prevention efforts. This study aims to characterize and quantify the prevalence and distribution of motor vehicle fatalities among individuals ages 1-21 years in Jefferson County, Alabama over an eleven year period.

All deaths in individuals 0-21 years of age from 2015 through 2025 were queried using the Jefferson County Coroner/Medical Examiner's Office Case Management Database (n=838). Motor vehicle-related deaths in those ages 1-21 years were isolated for analysis (n=115). Supplementary data was recorded from case narratives, including seatbelt use, child restraint use, toxicology results, helmet use, and driver vs. passenger vs. pedestrian status. Decedents were stratified into age groups (1-9.99, 10-17.99, and 18-20.99 years), and comparisons were analyzed with chi-square tests.

Overall, 78 out of 115 (68%) motor vehicle deaths involved at least one modifiable risk factor (lack of restraint, positive toxicology, or lack of helmet use, as applicable). The prevalence of modifiable risk factors increased markedly with age, from 40% (10/25) in ages 1-9.99 to 45% (15/33) in ages 10-17.99 to 93% (53/57) in ages 18-20.99 (p<0.001). Individuals aged 18-20.99 were significantly less likely to use seatbelts compared to younger decedents (p=0.03). Positive toxicology was identified in 36 out of 117 cases, predominantly among older adolescents, which included 19 drivers. Twelve of these 36 cases had toxicology results included on the death certificate (Part II). Among children aged 1-6 years, improper or

absent child restraint use was common (9/11 cases, $p < 0.01$). Helmet use did not differ significantly by age, though lack of helmet use was present in 3 out of 8 bike-related deaths.

Modifiable risk factors are present in the majority of motor vehicle deaths in the 1-21 age group in Jefferson County. The presence of modifiable risk factors in these deaths increases significantly with age, affecting nearly all deaths in the 18-21 age group. These results suggest that targeted public health interventions addressing seatbelt use and substance use in this population may reduce mortality.

P70 Trends in Epilepsy-related Deaths with Cannabis Legalization

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Introduction:

Epilepsy remains a significant cause of mortality in the United States, and cannabis derivatives are increasingly utilized for seizure management. Rapidly evolving cannabis legislation necessitates improved understanding of its epidemiological impact on epilepsy-related mortality. This study evaluates state-level trends in epilepsy-related deaths across stages of increasing cannabis legalization.

Methods:

State-level epilepsy death rates from 1979 to 2023 were extracted from CDC WONDER. A dataset was compiled tracking the years that the following state cannabis policies were implemented: Medical legalization, medical identification card availability, first dispensary opening, recreational legalization, home cultivation of medical marijuana, and home cultivation of recreational marijuana. Epilepsy-related deaths were modeled using negative binomial regression with a log link and population offset to estimate incidence rate ratios with 95% confidence intervals (CI). Robust standard errors accounted for clustering within states. Subsequent models were fit for each binary policy predictor. Each model included state and year fixed effects to account for time-invariant differences between states and temporal trends. Analyses were performed using IBM SPSS Statistics (Version 31).

Results:

Significant associations were observed exclusively with novel, early-stage medical cannabis access policies. States with medical marijuana laws demonstrated a 14% increase in epilepsy mortality rates compared to those without (95% CI: 8%–21%, $p < 0.001$). Implementation of medical identification card registries and the opening of initial dispensaries were associated with an 8% (95% CI: 2%–14%, $p = 0.009$) and 7% (95% CI: 1%–13%, $p = 0.018$) increase in mortality rates, respectively. Variables indicating broader access, such as recreational legalization and home cultivation, yielded no statistically significant impact on mortality rates.

Discussion:

The observed increase in epilepsy-related mortality correlates with the establishment of restrictive medical cannabis milestones, but not with broader recreational legalization. This highlights a potential vulnerability in states where access remains tightly restricted compared to fully legalized environments. Rather than direct pharmacological harm from cannabis, this trend may reflect increased diagnostic awareness and more accurate cause-of-death reporting by medical examiners and coroners in states adopting novel medical therapies. Further investigation is required to delineate death certification biases from true policy-related mortality shifts.

P71 Is That a Heart Tumor? Novel Case of Disseminated *Curvularia* sp. Infection in a Newborn

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Fungal infections result in over 7000 reported deaths per year in the United States, roughly the same number as traffic-related pedestrian deaths. While many of these are due to more common pathogens, such as *Aspergillus* and *Candida*, the wide variety of possible fungal pathogens makes proper workup and treatment crucial.

Curvularia, a genus of dematiaceous fungus, is known to cause mycetomas, sinusitis, and keratitis. It rarely involves other sites and has been reported doing so in only three pediatric cases in the literature. There has not, however, been a published report of systemic, multiorgan involvement by *Curvularia* sp. in a pediatric patient.

This report examines a case of an extremely premature infant, delivered at 22 weeks 3 days gestation, who was then admitted to the neonatal intensive care unit (NICU) due to respiratory distress. During her tenuous clinical course, blood cultures grew *Enterobacter cloacae* complex. Despite receiving broad coverage with cefepime and fluconazole, the patient declined and passed away at an age of 25 days. During autopsy, a tan-white nodule measuring 0.4 cm in the greatest dimension was noted within the left ventricle of the heart. At the time, it was thought to be a benign tumor. Microscopic sections revealed diffuse involvement by fungal elements. Examination of routine lung sections, as well as a section of a groin wound, also demonstrated widespread fungal elements. Due to the critical need for infectious monitoring and control in the NICU, a tissue block was sent for broad range fungal polymerase chain reaction (PCR) testing, which identified the fungal agent as *Curvularia* sp. There was no clinical suspicion for disseminated fungal infection prior to the autopsy.

This case underscores the importance of avoiding premature closure, detailed gross examination, appropriate histologic examination, and appropriate test ordering to identify and report accurate autopsy findings and causes of death.

P72 Errors in Natural Death Certification Completed Outside of the Medical Examiner's Office

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The Coconino County Office of the Medical Examiner (CCOME) receives notification of approximately 3/4ths of the deaths in the county, including many natural deaths outside the jurisdiction of the ME's Office. Because they are reported to the office, each case includes an investigative report containing the summary of the death circumstances. Typically, the case is released for the death certificate to be completed by the attending or primary care physician or other health care provider (nurse practitioner, nurse midwife, physician assistant). These non-pathology trained individuals may have little training on the completion of a death certificate. Without training in death certification, it can be difficult to write this document without errors. The goal of this project is to assess the frequency and types of errors made in natural death certification outside the medical examiner's office in Coconino County. This was done by comparing the investigative report and death certificate of the first 100 natural cases reported to CCOME in 2024 that were then signed out by a clinician in the county. The death certificate cause of death and other significant condition statements were scored with a grading system to determine the kind of error made as well as the severity of that error regarding the ability to accurately interpret the death certificate. Additional data collected were the specialties of the certifier and the location of the death to determine if these contributed to differences in error frequency. 77% of death certificates reviewed contained one or more errors, with 43% having major errors affecting the accuracy of the cause of death. The specialty of the certifier did not cause a large variation in error rate, but it was noted that most deaths were certified by critical care physicians, hospitalists, and primary care providers (physicians and advanced practice providers were nearly equal). Location may affect the rate of errors with 93% of deaths occurring at home having death certificate errors while in-hospital and ER deaths had around 76%. These results highlight the large amount of death certificates with errors that may be causing misrepresentation within vital statistics.

Considering the lack of training in this area for the clinicians tasked with completing death certificates, it seems reasonable to begin to address these areas with training on death certificate completion for physicians and advanced practice providers, particularly those in critical care, general hospital medicine, and primary care fields.

P73 Interdisciplinary Collaboration between a Pathology Unit and a University Engineering Program: A Model for Operational Innovation

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Introduction:

Pathology units face increasing operational demands yet have historically been isolated from the engineering and systems-design disciplines that routinely drive process innovation in other settings. As case volumes doubled within five years, a regional pathology unit partnered with the University of Toronto Institute for Multidisciplinary Design and Innovation to systematically improve operational efficiency. Structured collaboration with engineering faculty and students proved to be a practical, low-cost model for sustained operational innovation in forensic pathology. Process, findings and outcomes of this collaboration are demonstrated.

Methods:

Two Master of Engineering students applied DMAIC (define, measure, analyze, improve, control) methodology across three operational subsystems: pre-analytical (intake and storage), analytical (scheduling, imaging, gross and microscopic analysis, ancillary investigations, diagnosis and conclusions), and post-analytical (release and documentation). Three data collection methods were deployed: a prospective case-timing form, in-person time studies, and an anonymous staff survey — capturing 89 consecutive cases over two weeks. Analytical outputs included Pareto charts, lead-time classification of value-added versus non-value-added tasks, and fishbone root-cause analysis. A weighted evaluation matrix ranked three candidate solutions against defined specifications.

Results:

Mean total case processing time was 282 minutes (median 200 minutes). Gross examination was the dominant bottleneck, accounting for 52 % of cycle time (median 105 minutes), with manual data entry and paperwork alone consuming approximately 22 % of examination duration. Case intake accounted for 8 % of cycle time, with the majority of that interval spent on database entry and documentation. Complex cases required approximately 30 % more processing time than standard cases. Staff survey respondents (n=10) most frequently identified inefficient data entry, fragmented information sharing, and excessive idle waiting time as operational barriers, each endorsed by a majority of respondents. Three solutions were evaluated — automated data-entry simplification, an integrated radio-frequency identification (RFID) based real-time case-tracking system, and a mechanical body-handling device. Of these, the RFID-based tracking system was projected to yield the greatest improvement in operational efficiency.

Discussion:

This initial project catalyzed sustained annual collaboration, yielding subsequent engineering designs for RFID decedent-tracking, gurney-to-table transfer systems, automated body-repositioning systems, and sensor-guided calvarial saw systems — an ongoing innovation pipeline was seeded by a single structured engineering-medical engagement. The model offers dual benefit: pathology units gain iterative, structured innovation at low cost; engineering students gain authentic experience in a demanding, unfamiliar client domain. Pathology services seeking to address operational inefficiency are encouraged to consider formal partnerships with university engineering programs as a practical and sustainable model for innovation.

P74 Undiagnosed Placenta Accreta Spectrum Resulting in Maternal Death: A Case Report

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Placenta accreta spectrum (PAS) is a life-threatening obstetric condition where the placenta directly attaches to or invades the myometrium due to defective or absent decidua basalis. We present a case of fatal PAS in which the diagnosis was missed despite multiple prenatal ultrasounds and significant clinical risk factors, including multiple cesarean sections.

A 32-year-old Black woman (G5P0223) at 38w4d gestation died from extensive hemorrhagic shock due to a ruptured uterine wall. The decedent experienced one month of intermittent abdominal pain worsening over three days before presenting with convulsions, altered mental status, and cardiac arrest, which is collectively consistent with hemorrhagic shock from PAS. She was pronounced dead in the emergency department. The fetus was subsequently delivered via emergency cesarean section, but unfortunately had succumbed as well while in utero.

A forensic postmortem examination revealed an area of retained and adherent placenta within the uterus along the anterior aspect of the lower uterine segment, consistent with invasion at the site of prior cesarean scar tissue. Gross pathology and cross-sectional myometrial examination demonstrated marked thinning of the uterine wall, loss of normal myometrial layering, and extensive placental infiltration and organized fibrous tissue, without an identifiable plane of demarcation. The decedent had significant risk factors for PAS, including two prior cesarean deliveries, multiparity, two prior induced abortions, preeclampsia with a previous pregnancy, and Graves' disease, although no placenta previa or preeclampsia was identified during the current pregnancy.

This case highlights a critical diagnostic failure: frequent surveillance without a targeted protocol. Color Doppler ultrasonography identifies abnormal uteroplacental vascularity, including turbulent lacunar blood flow, loss of the retroplacental clear zone, and bridging vessels, findings detectable prior to catastrophic hemorrhage. The absence of color Doppler and MRI, despite well-established risk factors, represents a failure to incorporate the latest recommendations from ACOG and SMFM screening guidelines. Black women in the United States experience maternal mortality at nearly three times the rate of white women, driven in part by inadequate risk assessment and delayed diagnosis. This case underscores the urgent need for systematic PAS risk stratification, standardized color Doppler protocols targeting the lower uterine segment in patients with prior cesarean deliveries, and a lower threshold for MRI referral in high-risk pregnancies.

P75 Demonstration of Tension Pneumothorax at Autopsy by Removal of Only One-Half of the Anterior Chest Plate

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Tension pneumothorax is notoriously difficult to document objectively using traditional autopsy techniques. Once the plural cavities are breached during removal of the anterior chest plate, the intrathoracic pressure relationships required to confirm pneumothorax are lost. Although postmortem imaging - particularly postmortem CT - is superior to autopsy for documenting pneumothorax, it is not available in all autopsy settings. This study introduces a novel autopsy technique that enables direct demonstration of tension pneumothorax by performing a midline sternotomy followed by selective removal of only one half of the anterior chest plate. By preserving the integrity of the pleural cavity suspected of harboring a tension pneumothorax, this approach allows visualization of a bulging pleura and shifted mediastinal structures for better gross documentation. The presented case of a 21-year-old male who died in a motorcycle crash illustrates how this method permits clear photographic documentation of pneumothorax and mediastinal shift at autopsy. This approach may enhance diagnostic confidence in cases where tension pneumothorax is suspected but postmortem imaging is either not available or is equivocal.

P76 Recurrent Respiratory Papillomatosis with Fatal Outcome in a Child

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Recurrent respiratory papillomatosis (RRP) is a rare, benign disease caused by human papilloma virus (HPV). RRP exists as two subtypes – juvenile onset and adult onset. Vertical transmission occurring during delivery through an infected birth canal is considered the major mode of acquiring the juvenile form, which is considered more aggressive than the adult form. Although RRP lesions are histologically benign, they may result in progressive hoarseness, stridor, respiratory distress, and airway obstruction, making RRP a serious and potentially fatal disease.

We report a 5-year-old male with history of asthma and RRP (status post multiple debridements) who completed a breathing treatment at home, ate candy, and began having breathing difficulties. Caregivers feared he was choking on the candy and attempted to dislodge the candy. Emergency medical services were called, and the child was bradycardic and unable to breathe upon their arrival. Cardiopulmonary resuscitation was started, and he was immediately transported to the hospital and then intubated. Mild difficulty was noted when passing the endotracheal tube through the vocal cords, but this was overcome with mild pressure, raising concern for a foreign body in the airway. Despite resuscitation attempts, he was shortly pronounced dead. Postmortem examination did not reveal any food or foreign objects within the airways. A large squamous papilloma of the larynx (at the vocal cords) was identified that was nearly occlusive. Histologic examination demonstrated an exophytic lesion with branching fibrovascular cores and squamous epithelium with focal koilocytic changes. There was no marked atypia or invasion. Other autopsy findings included inflammatory changes in the lungs and anoxic/hypoxic changes in the brain.

Cases of fatal RRP have been reported in adults, secondary to rapid airway obstruction or malignant transformation. However, our case shows that special attention is still needed for children. The child in our case had both asthma and RRP, and the symptoms for both conditions overlap. While breathing difficulties secondary to asthma exacerbations may be more common, an occlusive neoplasm must be ruled out especially in someone with history of RRP. Despite debridements, recurrence is common. As lesions grow larger, they can lead to choking events or sensations of choking. If such events occur while eating, there can be confusion about the exact cause of the choking. Our case highlights the severity of RRP in children and how complications can be confused with other conditions and events, so extra vigilance and awareness is necessary to prevent fatal outcomes.

P77 Postmortem Toxicology Findings in Motor Vehicle Accidents: A Retrospective Forensic Autopsy Study in Maryland (2022-2024)

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In the United States, motor vehicle accidents (MVAs) remain a leading cause of death, and the state of Maryland is no exception. MVA fatalities are overwhelmingly caused by driver error but become even more likely in cases of intoxicated/impaired drivers. Although DUI/DWI is most associated with alcohol, the rise of synthetic opioids and other illicit psychoactive substances may suggest a need for more proactive measures against substance use and abuse. Current data tracking the co-occurrence of multiple impairing substances in MVA fatalities remains limited. This study aims to identify patterns of polysubstance detection in MVA fatalities, which may inform prevention strategies, public safety initiatives, and policies that reduce traffic-related injury and death.

A retrospective review was conducted of autopsy, investigative, and postmortem toxicology records collected from the Maryland Office of the Chief Medical Examiner, focusing on decedents involved in motor vehicle crashes from 2022 to 2024. Subjects included in the study population were limited to deaths occurring within Maryland jurisdictions and included motor vehicle operators, pedestrians, and passengers. Of the 1055 cases, drivers accounted for 636 cases (60.3%), passengers 221 (20.9%), and pedestrians 198 (18.8%). Among drivers, 27.8% of cases were positive for alcohol only, 5.3% cases

positive for illicit drug(s), and 5.9% cases positive for alcohol and illicit drugs. In addition, 72 drivers were positive for prescription drug(s).

Across all case types, polysubstance was identified in 15.7% of cases, while prescription drug-only use accounted for 9.9%. Cocaine and Fentanyl were the major illicit drugs detected in drivers, whereas cocaine was the main illicit drug detected in pedestrians. Of drivers who tested positive for alcohol, 9.3% cases had blood alcohol concentration < 0.08, 90.7% with blood alcohol concentration (BAC) > 0.08; 75.6 % with BAC > 0.15, and 59.4 % BAC > 0.20; (> ~ greater than or equal to).

Demographically, males aged 26-35 displayed the highest rates of both alcohol impairment and fatality, consistent with national averages. Substance type also varied with age: alcohol impairment was most found in drivers aged 25-34 (55%), illicit drug involvement peaked in ages 35-44 (28.1%), and prescription drug detection peaked at the 55-64 age group (40.2%).

These findings highlight the multidimensional and complex nature of substance involved MVA fatalities in Maryland. The rise of fentanyl and cocaine in toxicology findings reflects the upward trend of illicit psychoactive drug use in motor vehicle accidents and suggests an increased need for involvement of impaired driving surveillance and intervention.

P78 A Rare Case of Pancreatic Alpha Cell Hyperplasia Found on Autopsy

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Pancreatic alpha cell hyperplasia (ACH) is a rare histologic finding, distinct from glucagonomas or microadenomas. It has been proposed that three distinct clinical types of ACH exist (reactive, functional, and non-functional ACH), all with differing clinical presentations but identical histologic findings, that with the right clinical suspicion, can be found at autopsy. We present a case of a 13-year-old female with a history of poorly controlled type 2 diabetes and chronic hyperglycemia that displayed histologic findings consistent with ACH. The night prior to her death, she received her normal dose of long-acting insulin. In the early morning, she was found to have a blood glucose level of 495, so was given 9 units of rapid-acting insulin to correct it. Four hours later she was found unresponsive. CPR was initiated and she was transported to the nearest pediatric facility, however she did not respond to resuscitative efforts and died at the hospital. On autopsy, the decedent's only gross finding was a tan, lobulated mass in the left lobe of the liver, which histologically was consistent with a benign hepatic adenoma. The pancreas was grossly unremarkable, without any distinct nodules, however microscopically showed diffusely hyperplastic islet cells that on immunohistochemical staining with glucagon had abundant alpha cells, indicative of ACH. While non-specific focal endocrine hyperplasia is uncommonly seen, with up to 10% of autopsy cases having this finding, alpha cell specific hyperplasia is incredibly rare, with less than twenty reported cases in the literature. It is proposed that based on this histologic finding, in conjunction with her diabetic history, the decedent had a functional type of ACH. Due to its rarity, ACH can be easily missed, but its identification is profound due to its potential to be a familial syndrome and pre-malignant finding of pancreatic neuroendocrine tumors.

P79 Last Call: Genetic Cardiomyopathy Associated Myocardial Infarction and Sudden Death in Young New Drinkers

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Inorganic Pyrophosphatase 2 (PPA2) is a mitochondrial enzyme that hydrolyzes pyrophosphate into phosphate, which plays a critical role in converting inorganic phosphate into two orthophosphates, utilized for ATP production. Depending on mutation severity, patients can present early in life with sudden cardiac arrhythmic death or acute heart failure at varying ages from prenatal to late adulthood due to underlying stressors including infection and alcohol use. Individual case reports highlight pediatric patients as young as five weeks suffering from cardiac arrest with unknown stressors and children as young as thirteen months old presenting with cardiac arrest following viral infection. Additionally, there are case reports of

otherwise healthy teenagers and young adults presenting with myocardial infarction and sudden cardiac death triggered by alcohol ingestion as low as one to two beers. Even the ingestion of vinegar has been attributed to the onset of myalgia in some patients. Forensic assessment of sudden death in previously healthy children and young adults with a clinical history of otherwise benign infection or mild alcohol use should trigger concern for mutations affecting this gene.

This poster explores the clinical course and pathological findings of a 21-year-old female presenting with acute chest pain and myocardial infarction following reported ingestion of 2-3 alcoholic beverages. She survived a sudden death event but required cardiac transplantation. Directed family history revealed maternal early-onset heart failure and a sibling with unspecified mitochondrial myopathy but no family history of cardiac sudden death. Subsequent genetic work-up was positive for heterozygous PPA2 mutations and a heterozygous RYR2 mutation of unknown significance. Examination of her explanted native heart demonstrated extensive focally transmural myocardial fibrosis previously reported in PPA2 cardiomyopathy. Histological evaluation revealed a complex nonischemic pattern of myocardial infarction of varying ages, indicating recurrent silent myocardial necrosis was ongoing prior to her arrest. Changes in behavior and alcohol exposure likely contributed to an acceleration of myocardial injury leading to clinical infarction, heart failure, and transplantation. PPA2 mutation identification is important for surviving relatives. In family studies, biallelic pathogenic mutations in the PPA2 gene are associated with progressive neurological dysfunction and cardiac abnormalities with family members manifesting variable presentations, despite having the same mutations. Clinical onset, triggers, and adverse events vary greatly. A 58-year-old woman with a homozygous mutation reportedly tolerated alcohol consumption but developed acute heart failure from viral infection. Treatment often includes avoidance of triggers, implantable cardioverter-defibrillator, or heart transplantation with a favorable prognosis.

P80 Tessalon Gone Wrong: Cracking the Case of 4-butylamino benzoic acid

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Benzonatate (Tessalon®) is a non-narcotic, non-controlled antitussive widely prescribed for the symptomatic relief of cough associated with respiratory conditions such as bronchitis and pneumonia. Benzonatate exerts its therapeutic effect through peripheral mechanisms by anesthetizing stretch receptors located in the respiratory passages, lungs, and pleura, thereby suppressing the cough reflex at the source rather than acting centrally. Despite its clinical utility, benzonatate has been associated with significant safety concerns. The drug's narrow therapeutic margin is notable, with serious adverse effects including central nervous system depression, seizures, cardiac arrhythmias, and, in severe cases, death. From an analytical perspective, benzonatate presents unique challenges. The parent compound is rapidly hydrolyzed *in vivo* to its primary metabolite, 4-butylamino benzoic acid (4-BABA), complicating direct detection in biological specimens as it is often not detectable in its parent form. Analytical methods that do not target 4-BABA may fail to identify exposure altogether possibly leading to false-negative interpretations.

This presentation will present a case of a 15-year-old who died by suicide. Scene investigation and autopsy findings indicated a suspected overdose by benzonatate. The decedent left a recording along with text messages between her and a boyfriend with whom she was upset with. She advised she was going to kill herself and held up a bottle labeled benzonatate that was prescribed; the benzonatate pearls in the bottle were identified via the picture she took. The bottle was found empty at the scene along with a bottle of Tylenol®. Upon autopsy, there were no abnormal anatomical findings other than pulmonary edema and foam emanating from the mouth and nose. The decedent was found deceased in the bathroom next to her bedroom and had vomited. When found, she had been deceased for several hours.

Toxicology testing performed on the subclavian blood underwent comprehensive testing via LC/TOF-MS with the only positive finding being indications of caffeine. Benzonatate direct testing was performed via LC-MS/MS and yielded none detected results with a reporting limit of 0.10 mcg/mL. The sample was tested for 4-BABA while the test was undergoing validation, and yielded results greater than the upper limit of quantitation (>10 mcg/mL); assay analytical range = 0.10-10 mcg/mL.

This case enforces the importance of evaluating a case scene and testing for 4-BABA in suspected benzonatate overdose deaths.

P81 What Do Bereaved Families Need from Medicolegal Autopsy? A Systematic Review of Best Practices

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Introduction: Good forensic autopsy work is not just the examination itself. It also means making the examination understandable and useful to the people most affected by the death. Families need to know why an autopsy is being performed, what choices remain, how results will be shared, and when the body can be released. This is especially important after sudden or traumatic deaths involving children or other vulnerable populations, when families may have little control over what happens next. We undertook a systematic review of best practices for the benefit of the next of kin.

Methods: We searched Embase, PubMed, and Cochrane for papers published from 1956 through 2025, using terms related to autopsy, consent, bereavement, communication, report, next of kin/families, and medicolegal death investigation. We included papers with an actionable recommendation about family-centered autopsy care, rather than only attitudes or current practice. Recommendations were extracted, reworded as short practice statements, and organized by their place in the autopsy process (consent, autopsy performance, reporting, and post-report communication).

Results: 235 articles met the inclusion criteria. Most recommendations dealt with the consent stage (59%) or quality of communication (39%). Far fewer addressed post-report communication (20%) or written reports (~2%). Although the forensic papers came from widely varying legal systems, they pointed in the same direction. Bereaved families were often able to accept a medicolegal autopsy, even one they did not choose, when the process was explained clearly by someone knowledgeable, qualified, and empathic. Across the forensic literature, challenges for families were less about the performance of the autopsy and more about communication; for example, why the examination was performed, whether the body could be viewed or released, who would answer questions, and when results would be available. Follow-up contact after autopsy was described as welcome rather than harmful. Report writing stood out as an underexplored area in the literature, despite the general consensus that autopsy reports are challenging for next of kin to understand.

Discussion: Family-centered forensic autopsy practice does not change the legal purpose of the examination. Rather, it reframes a taboo and complex process as one that is mindful of the family's needs. Existing medicolegal communication guidance provides the field with a starting point, but more evidence is needed in areas where forensic pathologists have the most direct influence: notifying families before autopsy when possible, explaining results, following up after the report, and writing reports that families can understand.

P82 Postmortem Molecular Diagnosis of Fatal Ascending Aortic Rupture in a Young Traveler: Identification of an *FBN1* Likely Pathogenic Variant with Concurrent *THSD4* Variant

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Aortic aneurysm rupture in young adults is uncommon and should prompt consideration of inherited connective tissue or nonsyndromic aortopathy. The absence of a documented medical history or phenotypic features may obscure an underlying heritable aortic disorder and delay recognition of its familial implications. In this case, the autopsy, histopathology, and postmortem molecular testing established the cause of death and identified clinically significant implications for surviving relatives.

A 28-year-old male collapsed while stepping off an escalator at Chicago O'Hare International Airport after arriving from Brazil and while en route to Canada. A bystander initiated cardiopulmonary resuscitation maneuvers, followed by advanced resuscitative efforts by emergency personnel. He was pronounced shortly after hospital arrival. Initial clinical concern reportedly included pulmonary hemorrhage because blood was present in the endotracheal tube. Autopsy revealed hemopericardium (approximately 850 mL) due to full-thickness rupture of a markedly dilated ascending aorta measuring 7.0 cm in greatest diameter.

The aneurysmal segment involved the aortic root/valve region and contained a separate healed remote intimal tear, indicating prior clinically silent aortic injury. Additional findings included aortic valve annular dilatation, left ventricular dilatation, pulmonary edema, and cardiomegaly (heart weight 461 g). No significant coronary artery disease or traumatic injuries were identified. Microscopic examination demonstrated translamellar mucoid extracellular matrix accumulation, frequent elastic lamellar disruption, and multifocal smooth muscle cell disorganization within the aortic wall, findings supportive of genetic aortopathy. Postmortem whole exome sequencing identified a heterozygous likely pathogenic FBN1 splice-region variant (c.4460-8G>A) and a heterozygous THSD4 variant of uncertain significance (c.1412G>A; p.Arg471Gln). FBN1 is associated with Marfan spectrum disorders and isolated thoracic aortic aneurysm/dissection; THSD4 has been linked to familial thoracic aortic aneurysm. Postmortem toxicology was noncontributory.

This case exemplifies the value of integrating forensic autopsy pathology with modern molecular diagnostics in sudden unexpected deaths of young individuals. Recognition of occult hereditary aortopathy can clarify cause and manner of death, explain prior silent vascular injury, and generate actionable diagnostic and therapeutic recommendations for relatives. In this case, after communication of the cause of death and molecular findings to the deceased's family, it was reported to the Office that the decedent's brother had the same condition and had undergone open heart surgery for repair of the aortic valve and proximal aorta. Forensic pathologists should maintain a low threshold for molecular investigation when encountering thoracic aortic catastrophe at an early age, even in the absence of classic syndromic features.

P83 A Matter of Time: Sudden Death Due to Primary Melanoma of the Dura

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Primary melanocytic tumors of the central nervous system are rare neoplasms derived from leptomeningeal melanocytes, spanning a spectrum from benign to malignant entities. They are categorized into diffuse forms, including meningeal melanocytosis and melanomatosis, and circumscribed forms, including melanocytoma and melanoma. Despite this classification, their clinical behavior remains poorly defined, and sudden death attributable to primary leptomeningeal neoplasms is exceedingly uncommon.

We report the case of a 27-year-old male without established primary care who experienced sudden onset headache and ear pain upon awakening from sleep. His history was notable for chronic vape pen and daily marijuana use since adolescence, without other known medical conditions. He subsequently developed emesis and acute distress, and emergency medical services found him with pinpoint pupils and agonal respirations. Despite naloxone administration and resuscitative efforts, he was pronounced dead shortly after hospital arrival.

Autopsy revealed hepatosplenomegaly and changes consistent with resuscitation. Toxicology was presumptively positive for cannabinoids. Neuropathologic examination demonstrated an acute subarachnoid hemorrhage involving the inferior right cerebellar hemisphere, with an additional subdural hemorrhage over the left cerebellar hemisphere. Notably, there was dense pigmentation and focal thickening of the dura mater. Histologic evaluation identified malignant melanoma arising from the dura at the foramen magnum, with leptomeningeal dissemination and vascular invasion. Molecular studies could not be performed due to extended postmortem interval and fixation. The cause of death was determined to be acute intracranial hemorrhage due to primary malignant melanoma of the dura.

This case illustrates a rare and catastrophic presentation of primary meningeal melanoma and underscores the importance of comprehensive forensic evaluation in sudden, unexpected deaths. A thorough autopsy, including detailed neuropathologic examination, is essential for accurate diagnosis, surveillance of rare entities, and improved characterization of their natural history. Distinguishing primary meningeal melanoma from metastatic disease is critical, as their behavior and prognosis differ. When available, molecular profiling can aid in this distinction, as primary meningeal melanoma is molecularly distinct from cutaneous melanoma, often lacking BRAF mutations and instead harboring GNAQ or GNA11

alterations. Overall, integration of gross, histopathologic, immunohistochemical, and ancillary findings is crucial in these cases.

P84 Identification and Implications of Vascular Anatomy Variants of the Great Vessels in the Perinatal Autopsy

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Congenital anomalies of the great vessels are important to recognize on autopsy as they can have genetic associations and may be implicated in the cause of death. However, detailed descriptions and gross photography of these anomalies are often difficult to find, especially those useful for autopsy and in the perinatal setting. This can make diagnosis and interpretation challenging, particularly without supportive clinical information or in those with less experience performing fetal/pediatric autopsies.

Using pictures from perinatal autopsies done at Seattle Children's Hospital, we discuss and demonstrate variations of the great vessels that are important to identify at the time of autopsy. These include anomalies that may be the cause of demise or are associated with other significant congenital, genetic, or extravascular abnormalities. A brief explanation of normal anatomy and dissection techniques of the thoracic cardiovascular system and the ductus venosus within the fetus is included. The gross findings for select aortic arch, pulmonary artery, pulmonary veins, ductus venosus, and portal vein anomalies are described with particular attention to identification during prosection. A summary of commonly associated anomalies, syndromes, or genetic findings based on select literature and textbook review is additionally included.

Great vessel anomalies that can directly cause demise in the perinatal period include absent ductus venosus (ADV), interrupted aortic arch, total anomalous pulmonary venous return (TAPVR), aortic coarctation (AoC), and hypoplastic aortic arch. ADV can cause demise in utero, whereas the others can cause demise in infancy without surgical treatment.

Anomalies that can cause chronic conditions leading to demise include absent portal vein, partial anomalous pulmonary venous return (PAPVR), unilateral absent pulmonary artery, hypoplastic aortic arch, AoC, and ADV. Such conditions include congestive heart failure (absent portal vein, absent pulmonary artery, and ADV), pulmonary hypertension with shunt reversal (PAPVR), and upper body hypertension with lower body hypoxia and renal failure (hypoplastic aortic arch and AoC). Absent portal vein can also lead to abnormal hepatic development.

Interrupted aortic arch, right-sided aortic arch, TAPVR, AoC, and ADV can be seen in a multitude of genetic conditions/syndromes. Important associations include interrupted aortic arch and right-sided aortic arch with 22q11.2 deletion, AoC with Turner, Shone, and PHACE, and ADV in Turner and Noonan syndrome. Many of the great vessel anomalies are also associated with other congenital anomalies, particularly congenital heart malformations.

P85 Reading Tea Leaves: Regulatory and Interpretive Challenges of Enhanced Mitragynine Products

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Introduction: In 2025, Colorado enacted the Daniel Bregger Act (SB25-072) to regulate "enhanced" kratom extracts exceeding a 2% 7-hydroxymitragynine (7-OH) threshold. However, state-level enforcement is challenged by a fragmented regional legal landscape and the ease of acquiring unregulated products via online retailers. We present a case that demonstrates how expanded metabolite quantitation can identify "silent" kratom toxicity when scene evidence is absent, while highlighting the significant interpretative gaps that remain in forensic toxicology.

Case:

A 32-year-old male with a history of chronic ethanol abuse and obstructive sleep apnea (OSA) was found unresponsive on his bedroom floor without drug paraphernalia or supplements present. Autopsy revealed an acute, full-thickness esophageal rupture and hypertensive cardiovascular disease. Initial toxicology identified ethanol (152 mg/dL), benzoylecgonine (320 ng/mL), phenazepam, and unsuspected high concentrations of mitragynine and its metabolites. Expanded research-tier quantitation was utilized to result the concentrations: mitragynine (470 ng/mL), mitragynine pseudoinoxyl (110 ng/mL), and 7-OH (73 ng/mL).

Discussion:

The hierarchy of alkaloids (mitragynine > pseudoinoxyl > 7-OH) suggests consumption of enhanced kratom product(s). While 7-OH is the focus of SB25-072, it is often found at lower postmortem concentrations due to its rapid conversion into mitragynine pseudoinoxyl, a more potent mu-opioid agonist. Mitragynine levels >1000 ng/mL are often cited in isolated deaths; however, no universally established "fatal range" exists for its metabolites. In this case, alkaloids may have acted as synergistic contributors to respiratory failure, exacerbated by the decedent's OSA and other depressant use. Additionally, the acute esophageal rupture suggests a terminal event involving forceful emesis; high-potency alkaloids can induce severe nausea and vomiting and could have precipitated this mechanical insult.

This case highlights the persistent challenges in certifying kratom-involved deaths despite the evolving toxicological landscape. The recent transition of these metabolites from research-only protocols to validated quantitative panels reflects a growing national interest and necessity for standardized data. However, as this case demonstrates, having the ability to quantify these compounds does not yet equate to a full understanding of their lethality. Furthermore, the "clean" scene highlights a critical enforcement gap: while states regulate local sales, the availability of unregulated extracts allows users to bypass state safeguards, leaving the laboratory as the sole line of detection. Even with advanced testing, the lack of human reference data, the ease of commerce, and nonspecific gross findings still leave the medical examiner with significant interpretive hurdles regarding mitragynine and its metabolites.

P86 Heyde Syndrome Resulting in Fatal Gastrointestinal Hemorrhage in a 27-Year-Old Male

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Heyde syndrome is a rare and likely underreported clinical syndrome of aortic stenosis and gastrointestinal angiodysplasia thought to be caused by an acquired von Willebrand factor deficiency. It is usually considered a disease of the elderly, typically occurring in the seventh decade or later, and diagnostic workup is usually initiated only after the detection of gastrointestinal bleeding. Here we present a case of fatal gastrointestinal bleeding secondary to Heyde syndrome in a 27-year-old male with a history of congenital aortic stenosis and insufficiency secondary to a bicuspid aortic valve. The decedent was found unresponsive in a gym weight room and ultimately pronounced deceased on scene. Postmortem assessment revealed copious amounts of blood within the small bowel lumen. Microscopic examination of the small bowel was remarkable for abnormally dilated blood vessels in the mucosa and submucosa of involved sections. Autopsy furthermore revealed a bicuspid aortic valve with thickened nonmobile leaflets leading to aortic stenosis. In the setting of aortic stenosis, the microscopic finding of gastrointestinal angiodysplasia indicates the diagnosis of Heyde syndrome. This case constitutes an uncommon presentation of fatal gastrointestinal bleeding secondary to Heyde syndrome in an individual well below the typical age range of this diagnostic entity. Thus, consideration of Heyde syndrome should be made regardless of age when presented with the proper clinical context and findings.

P87 Intrauterine Fetal Demise Associated with Chronic Histiocytic Intervillositis, Fetal Vascular Malperfusion, and Acute Chorioamnionitis; an Autopsy Case Report

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Chronic histiocytic intervillositis (CHI) is a rare placental entity associated with adverse perinatal outcomes, including intrauterine fetal demise, preterm delivery, and fetal growth restriction, with high risk of recurrence. It has been linked to maternal autoimmune disorders and thrombophilia, with occasional elevations in maternal serum alpha-fetoprotein and alkaline phosphatase (ALP). Histologically, CHI is characterized by a dense intervillous infiltrate of CD68-positive maternal histiocytes with a variable inflammatory component. Although most cases lack an identifiable etiology, infectious intervillositis with organisms such as SARS-CoV-2, cytomegalovirus, and *Listeria* have been reported as causes.

A primigravid woman at 38 weeks' gestation with an otherwise uncomplicated pregnancy presented with lower back pain and cramping. Ultrasound demonstrated a breech fetus without cardiac activity, and induction of labor resulted in a stillbirth. Placental cultures from the chorionic surface grew *Prevotella bivia*. Maternal evaluation was unremarkable aside from elevated ALP, with negative infectious and autoimmune serologies. At autopsy, external examination and anthropometric measurements were consistent with fetal growth restriction. The placenta was small, firm, and grossly notable for multiple white nodules. Histologic evaluation identified three overlapping patterns of injury: chronic histiocytic intervillositis (CHI), fetal vascular malperfusion, and acute chorioamnionitis. CHI was characterized by a dense intervillous infiltrate predominantly composed of CD68-positive histiocytes with a minor T-cell component, accompanied by perivillous fibrin deposition, fibrinoid villous necrosis, and multifocal chronic villitis. Infectious stains, including HSV-1, cytomegalovirus, and *Treponema pallidum*, were negative. Fetal vascular malperfusion was evidenced by multifocal thromboemboli and avascular villi. Acute chorioamnionitis was mild (maternal stage 1–2, grade 1; fetal stage 1, grade 1) and associated with focal fetal vasculitis and villous edema. Despite evidence of maternal and fetal inflammatory responses, the degree of fetal growth restriction and villous injury was disproportionate, supporting CHI as the primary pathologic process, with superimposed infection and acute inflammation likely incidental.

CHI is a rare but severe cause of placental insufficiency and stillbirth which may be complicated by concurrent patterns of placental injury. Recognition of CHI is crucial due to its strong association with adverse outcomes and high recurrence risk in subsequent pregnancies.

P88 Forensic Pathological Evaluation of Diffuse Alveolar Damage in a Fatal Case of Fat Embolism Syndrome Following Bilateral Tibial Fractures

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Objective:

Fat Embolism Syndrome (FES) is a serious clinical condition typically occurring after long-bone fractures when fat droplets from bone marrow enter the systemic circulation. While FES is frequently associated with femoral fractures, it is less commonly reported in cases involving isolated tibial fractures. We present a forensic autopsy case of fatal FES resulting from bilateral tibial fractures in an elderly patient, focusing on the pathological findings of diffuse alveolar damage (DAD) and the role of inflammatory cytokines.

Case Report:

An 80-year-old male with a history of atrial fibrillation and chronic respiratory disease sustained bilateral tibial fractures in a vehicle-related accident. He underwent open reduction and internal fixation on Day 0. His oxygenation levels began to decline on post-operative Day 3. On Day 6, his condition acutely deteriorated, with oxygen saturation dropping to the 40s followed by cardiopulmonary arrest. Despite intensive care, the patient died on post-operative Day 11.

Autopsy Findings: External examination revealed petechial hemorrhages in the eyelid and bulbar conjunctiva. Internal examination confirmed fixed bilateral fractures of the left distal tibia and right tibial shaft. The lungs exhibited significant emphysematous changes and bilateral pleural effusions. Histological

examination showed hyaline membrane formation, interstitial fibrosis, and inflammatory cell infiltration, consistent with DAD. Fat staining of the pulmonary microvasculature was positive. Additionally, postmortem biochemical analysis of the blood revealed a markedly elevated interleukin-6 (IL-6) level exceeding 10,000 pg/mL.

Discussion:

The cause of death was determined to be acute respiratory distress syndrome (ARDS) resulting from FES. While the incidence of FES for isolated tibial fractures is low (0.3%), the risk increases with bilateral fractures. Pathophysiology involves mechanical obstruction and a biochemical phase where free fatty acids and inflammatory cytokines like IL-6 induce endothelial damage. In this case, the extremely high IL-6 levels likely promoted the progression of DAD by increasing vascular permeability and damaging the alveolar-capillary membrane, as seen in severe systemic inflammatory responses. This underscores the significance of the biochemical mechanism in the fatal progression of FES in vulnerable elderly populations.

P89 Investigating Risk Factors and Causes of Death for Acute Esophageal Necrosis: A Case Series at the Pinal County Medical Examiner's Office

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Acute esophageal necrosis (AEN), or "black esophagus," is a rare condition characterized by circumferential necrosis of the distal esophagus. Its etiology remains unclear but is thought to be multifactorial, due to a combination of ischemia, impaired mucosal barrier, gastric outlet obstruction, and metabolic disruption. The epidemiology and associated clinical conditions remain poorly defined.

A retrospective autopsy case series with an exploratory unmatched case-control comparison was conducted. Cases consisted of decedents with acute esophageal necrosis identified on postmortem examination between January 2023 and December 2025. Controls (unmatched 3:1) were randomly selected from the same study period and autopsied by the same medical examiner's office without evidence of AEN on esophageal evaluation. Demographic, clinical, and pathologic variables included age, sex, race, body mass index (BMI), cause of death, presence of diabetes mellitus/diabetic ketoacidosis, cardiovascular disease, and other comorbidities, and gross pathologic findings. Analyses were primarily descriptive; categorical variables were summarized as counts/percentages, continuous variables as medians/ranges, and comparisons for select variables were performed using Fisher's exact test.

Five cases of acute esophageal necrosis were identified. The median age was 35 years (range 29–63), and 4/5 (80%) decedents were male. In all cases, the decedents were White, including two individuals of Hispanic ethnicity. The median BMI was 26.7 (range 21.1–41). Diabetes or diabetic ketoacidosis was present in 1/5 (20%) cases, and cardiovascular disease was present in 2/5 (40%). Mental health disorders were present in 4/5 (80%) cases, and substance or alcohol use disorders were present in 3/5 (60%). Gastrointestinal comorbidities (e.g. gastroesophageal reflux disease, inflammatory bowel disease, prior abdominal surgery) were present in 3/5 (60%) cases.

Gross examination demonstrated circumferential black discoloration, necrosis, and sloughing of the distal esophageal mucosa in all cases. Additional findings included Wischniewski spots of the gastric mucosa in 1/5 cases, chronically incarcerated intestines and omentum in 1/5, and cardiomegaly in 2/5 cases, including one with concentric left ventricular hypertrophy.

Compared with controls, decedents with AEN were younger and more frequently demonstrated mental health disorders and metabolic disease. Alcohol use occurred at similar rates in both groups, whereas cardiovascular disease was more prevalent among controls. None of these differences reached statistical significance.

In this autopsy case series, AEN presented in relatively young decedents with multiple medical and psychosocial comorbidities. Although comparisons with controls did not reach statistical significance, these findings suggest that AEN arises in diverse settings rather than a single consistent clinical profile.

P90 Hidden Granulomas, Visible Consequences: Autopsy as a Corrective Lens in a Clinically Vulnerable Population

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Cardiac sarcoidosis (CS) remains an important but often underrecognized cause of sudden cardiac death. Although advanced cardiac MRI and FDG-PET/CT can improve antemortem detection, the disease is still frequently first identified at autopsy, particularly in decedents previously diagnosed as having idiopathic cardiomyopathy or unexplained arrhythmia. We report a 48-year-old man with palpitations, exertional dyspnea, and newly diagnosed cardiomyopathy who collapsed and died while performing yardwork. Advanced cardiac imaging had been scheduled but was not completed before his death.

Complete autopsy performed two days postmortem revealed cardiomegaly, biventricular dilatation, patchy pale-tan to white areas involving the anterior wall of the left ventricle and interventricular septum, and moderate atherosclerotic coronary artery disease. Grossly, these findings could have supported a nonspecific dilated or ischemic cardiomyopathy. Histologically, however, there were well-formed, non-necrotizing epithelioid granulomas rimmed by lymphocytes with associated confluent replacement fibrosis. The granulomatous inflammation and fibrosis involved the interventricular septum and anterior and posterior walls of the left ventricle, a distribution typical of CS and one associated with conduction disturbance, ventricular arrhythmia, and sudden death. No extracardiac sarcoid was identified in representative organ sections. These findings supported CS as the cause of sudden cardiac death.

This case highlights two important forensic considerations. First, CS must be distinguished from giant cell myocarditis, a more fulminant autoimmune myocarditis with different clinicopathologic implications. Although multinucleated giant cells may occur in both, giant cell myocarditis typically shows diffuse destructive lymphohistiocytic inflammation with prominent myocyte necrosis, often with eosinophils, whereas CS is characterized by well-formed non-necrotizing granulomas, fibrosis, and limited myocyte necrosis. Second, because CS is patchy, extensive targeted sampling should include the interventricular septum, left and right ventricular walls, and, when feasible, the atrioventricular and sinoatrial nodes.

From a public health perspective, this case illustrates a diagnostically vulnerable population whose presenting symptoms of arrhythmia or cardiomyopathy are nonspecific and whose deaths are potentially preventable with timely therapy. Accurately diagnosing CS at autopsy becomes a public health tool that ensures accurate death certification, fills diagnostic gaps, and highlights avenues for improvement in the cardiomyopathy workup. This case also underscores the relevance of complete autopsies with comprehensive histologic sampling even when the available medical records suggest a more common natural cardiac death.

P91 Unusual Cerebellar Architecture in a 22-month-old with Menkes Disease

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This 22-month-old male child was found prone and unresponsive in his crib. The scene investigation and autopsy were subsequently conducted by the King County Medical Examiner's Office. Gestational history included term birth, average birth weight and height. Following birth, he began to experience recurrent seizures and was evaluated at Seattle Children's Hospital where workup was consistent with Menkes disease, a rare congenital disorder of copper malabsorption. Intravenous copper supplementation was subsequently initiated, and despite appropriate therapy, his epilepsy progressively worsened, exhibiting breakthrough seizures while on multi-agent therapy.

Autopsy revealed multiple diagnostic features of Menkes disease including height and head circumference <3rd percentile for age, low body weight (5-10th percentile), skin laxity, generalized bone under-mineralization with abnormal costochondral ossification, "kinked" hair-shafts, and microcephaly, among others. Multiple remote and subacute rib fractures were noted, without evidence of acute injury and without

clinical concerns for traumatic etiologies, typical of Menkes disease and a mimic for abuse-pattern injury. Neuropathologic examination revealed multiple features of Menkes disease including generalized cortical atrophy with overall foreshortening and small brain size for age (678 g, <5th percentile for 1 year). Focal chronic subdural hemorrhages were identified, another common Menkes disease finding that mimics abuse-pattern injuries. Interestingly, the cerebellum was markedly small (59 g, predicted weight 76.8 g), and cut sections revealed shrunken, atrophic, and firm folia. Microscopy revealed dysgenesis in the form of an attenuated external granule cell layer, usually as a thin ribbon throughout the superficial part of the molecular layer, but occasionally at the pial surface, more consistent with the cellularity typically seen at 1 month of age.

Descriptions of cerebellar architecture in Menkes disease are uncommon in recent literature and this case can both further our understanding of this rare disorder and encourage awareness to avoid misdiagnosis and medicolegal implications of suspected trauma.

P92 Heart and Mind Under Siege: A Fatal Case of Cardiac and Cerebral Toxoplasmosis

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Toxoplasma gondii (*T. gondii*) is an obligate intracellular protozoan infecting one-third of the world's human population, with marked geographic variation in seroprevalence ranging from approximately 60% in African countries to under 20% in the United States and Canada. Most infections are asymptomatic in immunocompetent people but can result in significant morbidity and mortality in immunocompromised patients, including those with human immunodeficiency virus (HIV). Among immunocompromised individuals, toxoplasmic encephalitis is the most common manifestation of *T. gondii* infection, while pulmonary, cardiac, and hepatic involvement may also occur. Although disseminated multi-organ disease is uncommon, it represents a significant cause of toxoplasmosis-related mortality. In the forensic setting, autopsy is critical for identifying opportunistic infections, especially in cases of previously undiagnosed immunosuppression. We present a fatal case of cerebral and cardiac toxoplasmosis in a 30-year-old Congolese female with no known past medical history who was found unresponsive in her home.

According to her roommates, the decedent had experienced headaches and fatigue for weeks, planned to seek medical care the day before death, and was found deceased in bed with foam exuding from her mouth. Autopsy revealed widespread patches of white-gray discoloration involving the left ventricle and interventricular septum with marked pulmonary edema and congestion. Gross examination of the brain after formalin fixation showed multiple cerebral cavitory lesions with diffuse cerebral edema and concomitant left uncus and cingulate gyrus herniation. Microscopic examination of the heart revealed rare ovoid collections of minute organisms histologically consistent with *Toxoplasma* in a background of florid mixed inflammatory infiltrate with numerous eosinophils and myocyte damage. Microscopic examination of the brain showed cavitory lesions consistent with abscesses containing degenerated *Toxoplasma* organisms, along with chronic diffuse leptomeningitis. *Toxoplasma* organisms in the heart and brain were confirmed by immunohistochemistry. Postmortem serologic testing was found to be positive for HIV, supporting an underlying immunocompromised state. Toxicology testing was noncontributory.

Concurrent cerebral and cardiac toxoplasmosis is uncommon and typically occurs in severely immunocompromised individuals. Cardiac involvement often presents with nonspecific constitutional symptoms, as in this case, and is most frequently confirmed on histologic examination at autopsy. This case highlights the nonspecific clinical presentation and underscores the importance of considering underlying immunosuppression and performing postmortem HIV testing in appropriate contexts, as well as the value of comprehensive histologic, immunohistochemical, and serologic evaluation in unexplained deaths. Identification of previously undiagnosed HIV infection has significant implications for accurate cause-of-death determination, public health reporting, and family counseling.

P93 A Retrospective Epidemiological Study of Suicide Trends in Allegheny County, Pennsylvania from 2000 to 2015

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Introduction:

Suicide rates in the United States have risen in the past decades, with a steady rise since 2000. Suicide remains a top ten leading cause of death nationwide, with Pennsylvania above average compared to the nation. Suicide constitutes a major public health issue with biological, socioeconomic, and psychological components.

Methods:

All cases classified as suicide in Allegheny County from 2000 through 2015 were collected. A total of 2,512 cases were reviewed, with ages ranging from 8-95 years. This cohort consisted of 1,992 males and 519 females, with 1 reported as unknown. Epidemiological data was collated to include gender, race, marital status and age. Race was classified as white, black, Asian, Hispanic and "other". Marital status was categorized as single, married, separated, divorced, widowed, or unknown. The month of the year and day of the death as well as documentation of suicide note was noted. The cause of death was classified as firearm/explosion, asphyxiation, drugs/poisoning, blunt force trauma, sharp force/incision, burns, exposure, electrocution and not specified. Statistical analysis was performed using IBM SPSS Statistics 31.0.1.0 (49) and Microsoft Excel.

Results:

Majority of the suicides in the 15-year period were male (79.3%) and white (90.6%) individuals. The most common marital status was single (43.2%). The most common age group was 40–49-year-olds (21.8%). The proportion of suicides that occur in each calendar month, revealed that August had the highest proportion and February had the lowest with Tuesday having the most. Suicides due to firearms/explosions (46.1%) and asphyxiations (34.4%) accounted for almost 80% of suicides in Allegheny County between 2000-2015. Among cases in which a suicide note was documented (33.5%), a statistically significant association was observed between race and between age group and the likelihood of leaving a note. Adjusted standardized residuals indicated that Black individuals were underrepresented among those who left a suicide note. Individuals aged 60–69 were more likely than expected to leave a note, accounting for 16.7% of all documented notes.

Discussion:

In comparison to the previous study (Omalu et al, 2005) in Allegheny County, there is a shift in the common age range for suicides as well as a change in month, with August having higher rates of suicide. Suicide represents a manner of death that is often challenging for communities to process. We report our findings in this retrospective study to provide evidence-based information for public health planning and targeted prevention strategies.

P94 Silent Giant: A Fatal Rupture of a Giant Coronary Artery Aneurysm

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Coronary artery aneurysms (CAA) are very uncommon entities, with giant coronary artery aneurysms (GCAA) having an occurrence of 0.02%. A CAA is characterized as dilation that is 1.5 times larger in diameter than the neighboring segments. A GCAA is defined as an aneurysm that is greater than 20 millimeters in diameter. We present a case of a ruptured GCAA discovered at autopsy.

A 64-year-old white man with no prior medical history was at his friend's residence. He was witnessed to clutch his chest and collapse. He was transported to the hospital and declared deceased 12 minutes after arrival. At autopsy, the decedent had 420 milliliters of clotted and liquid blood in the pericardial sac. The heart weighed 600 grams. The right coronary artery had a 6.2 x 3.6 x 4.0 centimeter GCAA with a 0.6 centimeter rupture site. An occluding red thrombus was immediately distal to the GCAA. The left anterior descending coronary artery and left circumflex coronary artery had 0.6

centimeter diameters with minimal atherosclerosis. Microscopic examination of the GCAA revealed an abnormal vessel wall with atherosclerotic changes including infiltration of lipid laden macrophages, fibrotic intimal thickening, and medial degeneration including fibrosis and loss of smooth muscle cells. Verhoeff van Gieson showed near complete loss of medial elastic fibers. The cause of death was classified as hemopericardium due to ruptured giant coronary artery aneurysm. Hypertensive and atherosclerotic cardiovascular disease was contributory. The manner of death was natural. Toxicological testing performed and was non-contributory.

CAA is defined as a segment of the coronary artery that is greater than the normal adjacent coronary artery segment by 1.5x and involves less than 50% of the total length. In contrast, ectasia is used when there is diffuse dilatation that exceeds 50% or more of the artery length. CAAs have a male predominance and most present in the seventh decade of life. Most aneurysms are clinically silent and are found incidentally at autopsy or during coronary angiography. In the pediatric population, CAAs are often multiple and associated with Kawasaki disease. In adults, CAAs are most often atherosclerotic CAAs. The right coronary artery is the most commonly affected artery, followed by the left anterior descending coronary artery. Multiple aneurysms can be found approximately one-half to two-thirds of hearts. Treatment for CAAs is not well defined given the rarity of the entity. Awareness of this entity is important given how rare GCAAs are.

P95 A Case of Fatal Intracranial Hemorrhage: An Uncommon Finding in Multiple Sclerosis

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Introduction:

Multiple sclerosis (MS) is a complex, chronic, and debilitating autoimmune disease of the central nervous system. In this condition, the body's immune system attacks and destroys the myelin sheaths that insulate nerve fibers in the brain and spinal cord. Demyelination disrupts normal nerve conduction and can lead to a range of neurological complications, including visual impairment, focal weakness, paresthesia, incontinence, and cognitive dysfunction.

Case:

We present the case of a 46-year-old woman with a history of relapsing-remitting multiple sclerosis. She presented to the hospital with persistent vomiting and hematemesis and subsequently developed acute respiratory failure requiring intubation. She was found to have multiple ischemic and hemorrhagic cerebrovascular infarcts, complicated by upper gastrointestinal hemorrhage, acute renal failure, sepsis, and ventilator-dependent respiratory failure.

At autopsy, the brain demonstrated multiple hemorrhagic infarcts involving the left temporal lobe, bilateral parietal lobes, and bilateral occipital lobes. A large cystic infarct measuring 6.0 × 4.0 cm was identified in the left thalamus, with extension into the adjacent brain parenchyma. Histologic examination revealed focal demyelinating plaques in the periventricular white matter, consistent with multiple sclerosis, along with a perivascular lymphocytic infiltrate. Examination of the heart showed moderate cardiac hypertrophy and mild atherosclerosis of the left anterior descending coronary artery and the abdominal aorta.

Discussion:

Although uncommon, patients with MS may have an increased risk of intracranial hemorrhage, with a prevalence of 0.19%. Autoimmune-mediated inflammation in MS contributes to breakdown of the blood-brain barrier, allowing infiltration of white blood cells into the central nervous system and triggering a sustained inflammatory response. Chronic inflammation may also promote angiogenesis, leading to the formation of fragile blood vessels, and may contribute to vasculitis. These processes can produce structural changes in cerebral vasculature, increasing susceptibility to vascular rupture and hemorrhage.

P96 Silent Aspiration in Pediatric Populations: A Case Report and Literature Review

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Pediatric aspiration is a common event, with approximately 10% of infants and toddlers experiencing aspiration in clinical studies. The prevalence is significantly higher in young children with risk factors such as prematurity or airway abnormalities, with one study detecting aspiration in 77% of premature infants. Infants and toddlers who aspirate can display symptoms such as coughing, increased swallowing, or (in extreme cases) difficulty breathing and cyanosis, but most pediatric aspiration occurs silently without any outward symptoms. Although the vast majority of children recover quickly from aspiration with no long-term issues, aspiration still causes approximately 200 pediatric deaths each year in the United States. Here we review the literature on silent aspiration in pediatric populations. We additionally present the case of a G-tube-dependent 22-month-old girl with congenital hypotonia, plagiocephaly, and an uncharacterized mitochondrial disorder. She had a history of dysphagia and prior aspiration, but parents reported no recent aspiration episodes and a swallow study three months prior to death showed no aspiration with thickened liquids. She was almost exclusively G-tube fed and only had thickened liquids by mouth occasionally for pleasure. She was found unresponsive by a caregiver after being put down for a nap following a G-tube feeding. Resuscitation efforts were unsuccessful. On medical autopsy, her lungs displayed extensive bilateral food aspiration with intra-alveolar hemorrhage and multifocal bronchopneumonia. Additionally, autopsy findings were significant for dysmorphic facies, liver fibrosis (Ishak level 2), and thymic stress involution. This case highlights the high risk and potentially devastating consequences of silent aspiration in young children with dysphasia, even in children who are fed by G-tube. These children can appear well and show no aspiration or infectious symptoms, even in the setting of extensive aspiration with multifocal pneumonia.

P97 When Familiar Becomes Dangerous: Pediatric Fatalities from Domestic Animal Exposures

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The risk of animal-related fatalities is under-recognized in comparison to the prevalence of household animals in the United States. Vulnerable populations, specifically children, are at increased risk for injuries due to their inability to defend themselves and commonly due to a false sense of safety by caretakers.

We present a case series highlighting several pediatric fatalities from household and domestic animal exposures to identify patterns and prevention opportunities. Three cases of pediatric deaths involving animal-related injuries were retrospectively reviewed. These cases came from across the state of North Dakota and involved children ranging from ages 5-months to 6-years old.

In the first case, a 6-year-old male was playing outside of his residence unattended. Two family members came outside to find that the child had been mauled by a neighborhood dog. The child succumbed to injuries spread diffusely throughout the body, with the most severe being on the buttocks and scalp.

In the second case, a 9-month-old was given a snack and was attacked by the family dog three separate times with a family member intervening each time before the child was rushed out of the house and to the hospital. The child was bitten on the face, ear, head, and neck with airway severed above the epiglottis. The child died after admittance to the hospital.

In the third case, a 6-month-old female infant was laid on a couch, unsupervised, for a nap. A household cat was found lying on the infant, covering the nose and mouth. The infant was found not conscious and not breathing and eventually died in the hospital after multiple attempts. Petechiae were present on the infant's face, neck, and chest and within the conjunctiva.

All cases occurred in familiar home environments and involved lapses in risk perception regarding domestic animals and vulnerable children. These cases illustrate that fatal injuries can occur even with familiar animals and perceived supervision. Increased caregiver education and anticipatory guidance are critical to preventing pediatric animal-related injuries.

P98 Clinically Overlooked EBV-associated Post-transplant Lymphoproliferative Disease in Transplant Liver Failure Discovered at Autopsy

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Introduction:

Post-transplant lymphoproliferative disease (PTLD) belongs to a spectrum of lymphomas arising in immune deficiency/dysregulation lymphomas (IDD-lymphomas). Clinically, it occurs within a year after transplant and is often associated with Epstein-Barr virus (EBV) or KSHV/HHV8. Here we report a case of EBV-associated PTLD diagnosed through autopsy in a liver transplant recipient.

Case:

The decedent is a 52-year-old female with past medical history of hypertension, rheumatic mitral stenosis with a history of mechanical valve replacement, and heart failure with reduced ejection fraction. She had received a liver transplant 6 weeks before death for fulminant liver failure secondary to hepatitis B reactivation from newly acquired HIV infection. The post-operative recovery was complicated by hematomas and cytomegalovirus and EBV viremia, and she was discharged. The patient was transferred back after 10 days for worsening renal function. During the hospital stay, she developed toxic/metabolic encephalopathy in the setting of acute liver failure and circulatory collapse requiring intubation. On day 10 of admission, the patient developed pulseless electrical activity and was ultimately pronounced dead. At autopsy, the allograft liver was soft, necrotic, and bile-tinged. The portal vein, inferior vena cava, and hepatic artery anastomoses were patent and without stenosis or thrombi; the bile duct anastomosis was patent and without stenosis or calculi. The heart showed cardiomegaly, mechanical mitral valve replacement, tricuspid valve annuloplasty, and 80% occlusion of the left anterior descending artery. The lungs were consolidated with multiple pleural nodules. The uterus contained a hemorrhagic endometrial mass.

On microscopic examination, lymphocytic infiltrates composed of small lymphocytes were found involving the liver, epicardial fat, lungs, endometrium, and retroperitoneal tissue. Necrotizing viral bronchopneumonia was present. The pituitary gland was completely replaced by lymphocytes and infarcted. The lymphocytes were positive for CD20, CD10, MUM-1, focally kappa-restricted, and diffusely EBER ISH positive. The cause of death was multiorgan failure from overwhelming EBV-associated post-transplant lymphoproliferative disease.

Discussion:

Evaluation of surgical anastomoses is essential in graft liver failure. The organs should be removed en bloc, then the aorta can be opened posteriorly to probe into the celiac trunk, while displacement of thrombi or calculi should be avoided. The liver should be adequately sampled.

Our patient had two mechanisms of immune dysregulation: immunosuppression and HIV infection, which may explain the early presentation and fatal systemic involvement. With increasing use of novel immunomodulatory agents, IDD-lymphomas may be more frequently encountered, and it is necessary to be aware of this entity.

P99 A Comparison of ChatGPT versus Human Responses on Published National Association of Medical Examiners Educational Activities Committee "Case of the Week" Multiple-Choice Questions

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The swift expansion of artificial intelligence (AI) in medicine requires critical evaluation. Large Language Models (LLMs) using Natural Language Processing (NLP) could address pathology workforce shortages and workflow demands. Research shows LLMs can assist pathologists by managing administrative duties, simplifying reports, and creating educational tools. However, significant risks exist, particularly "hallucinations," where the AI generates inaccurate or misleading information.

While the performance of chatbots in general anatomic (surgical) pathology has shown promise in the existing literature, their specific utility and accuracy within forensic pathology remain largely unexamined. To bridge this gap, the current study presents a direct comparison between ChatGPT's response accuracy and the collective performance of National Association of Medical Examiners (NAME) members. The evaluation utilizes previously published "Case of the Week" multiple-choice questions (MCQs), originally developed and curated by the Educational Activities Committee (EAC) of NAME.

The methodology involves the systematic input of forensic vignettes and associated imagery or other figures from published NAME EAC MCQs into the free version of ChatGPT. This data collection process, which commenced in August 2025, includes reviewing each AI-generated response for accuracy and classifying it by a specific forensic topic. To evaluate performance, ChatGPT's results are statistically measured against the aggregated correct user response rates for the identical question set. This comparative analysis utilizes a binary scale based on a predetermined threshold of human accuracy (set at 70% correctness for user responses).

As of April 2026, 97 MCQs were analyzed. Preliminary data shows that ChatGPT answered 56.70% of questions correctly, whereas users collectively answered only 20.62% correctly. Question type comparison analysis is underway. This research aims to foster discussion on integrating LLMs into forensic pathology practice and training while establishing a basis for future implementation and investigation within medical examiner offices or other medical education institutions.

Several limitations exist for this study. First, questions were entered retrospectively after NAME published the answer PDFs online; therefore, ChatGPT may have theoretically accessed these publicly available documents during its computation. Second, while the free version of ChatGPT was utilized throughout, rapid model updates (e.g., GPT-4o, GPT-4o mini, GPT-5.3) occurred over the study year. Lastly, human responses are deidentified, and thus, it is not possible to separate non-forensic pathologist responses from others. This may have granted later prompts more advanced interpretation capabilities than those processed earlier, complicated by daily limitations on image and figure file analysis inherent to the free version.

P100 No Warning: Accidental Fatal Hydrogen Sulfide Exposures in the Workplace

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Introduction:

Hydrogen sulfide (H₂S) is a toxic colorless gas that emits a "rotten egg" smell and is an important industrial byproduct. The typical industrial H₂S-related death is secondary to sewage lines. Here we present unique accidental H₂S deaths unrelated to sewage.

Cases 1-2:

Two males, 42-years-old and 74-years-old, were working on a truck mixing materials for hydromulching when they became overcome by fumes and fell into the truck's hopper. Extraction and decontamination were performed by the fire department due to the presence of ammonia gas and H₂S.

At autopsy, internal examinations were remarkable for hyper-inflated lungs, congested liver, acute gastritis, and cardiomegaly with myocyte hypertrophy. Toxicology testing was positive for elevated thiosulfate.

Cases 3-4:

Two males, 28-years-old and 33-years-old, were both working at an oil refinery during a scheduled shutdown and maintenance when H₂S was released at high pressure from an opened line. Extraction and decontamination were performed by a hazardous materials team.

At autopsy, external examinations showed blunt force injuries related to the pressure of the gas, and a fall, respectively. Internal examinations were remarkable for pulmonary edema and congestion, bilateral conjunctival hemorrhage, and oral (decendent 3) or laryngeal/tracheal (decendent 4) mucosal hemorrhage.

Decedent 4 had additional findings including blue-gray discoloration of the skin and brain and cardiomegaly with myocyte hypertrophy. Toxicology testing was positive for elevated thiosulfate.

Discussion: H₂S is a naturally occurring substance, a major byproduct of many industries, and easily created by common household and industrial cleaners. As such, H₂S poisoning can easily occur accidentally, as exposure to the gas will result in olfactory paralysis and inability to smell the characteristic noxious odor. In a recent annual report, almost 98% of exposures to H₂S were unintentional, and it is the second highest cause of death via gas inhalation in the workplace. The characteristic autopsy finding of H₂S poisoning is a blue-gray/blue-green discoloration of the skin and/or internal organs; however, this finding is rare. The typical findings are non-specific and include pulmonary edema, congestion, petechial hemorrhages, and cardiac injury. Without scene investigation or targeted thiosulfate testing, H₂S poisoning may go undiagnosed or underreported. Greater awareness of the potential for H₂S poisoning and the need for systems to ensure detection are necessary for people in other lines of work where the risk may not be as apparent and especially for rescue teams and death investigators who may respond to sites with H₂S gas.

P101 A Descriptive Retrospective Study of Deaths Occurring within Edmonton Public Transit Infrastructure including Transit Vehicles

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Deaths occurring within transit infrastructure are poorly described within current literature. Edmonton, Alberta is a mid-sized city in Canada with a population of 1.2 million and a public transit system that includes both bus and train service. This study aims to identify cause and manner for deaths occurring in public transit infrastructure and relevant details from their death investigations to help identify preventable risk factors. 94 deaths occurring within public transit infrastructure between January 1, 2020 and December 31, 2024 were identified from the Office of the Chief Medical Examiner (OCME) case file database system.

Results indicate that most deaths were accidental (94%, n = 88), 95% of which were due to illicit drug use/overdose (OD), most commonly a combination of methamphetamine and fentanyl analogues (74%, n = 62), with the remaining due to blunt force traumatic injury. Remaining manners of death were determined to be natural, homicide (sharp force), and suicide (blunt force), in 3, 2, and 1 case, respectively. Most decedents were homeless (74%, n = 70) and 25-44 years old (63%, n = 59). Nearly all (96%, n = 81) decedents with cause of death reported as OD had history of drug misuse and 63% (n = 53) had history of mental health disorders. Most deaths occurred in highly visible locations (n = 86, 91%) and in train stations (41%, n = 39). Edmonton's northeast (44%, n = 41) and downtown (n = 30, 32%) saw the most deaths. The number of cases steadily increased nearly every year from 2020 to 2024 with highest number of cases in November and December (combined 32%, n = 30) and 47% (n = 44) from 21:00-05:59. EMS attempted resuscitation in 71/94 (76%) of cases and transported decedent to hospital in 35/94 (37%) cases. The first person to identify the decedent was most commonly a bystander (n = 40, 43%), with transit security being most likely to attempt resuscitation. Of 68 CPR-eligible cases, 34% received CPR before EMS arrival. Naloxone was reportedly given before EMS arrival in 44% (n = 37) of OD cases, and naloxone was not given by any individual in 19% (n = 13) of OD cases in which resuscitation was attempted. Collapse-to-discovery interval was unknown in 41% of cases (n = 39).

In summary, individual, situational, social, and systemic determinants of mortality must be considered to reduce avoidable deaths in public transit infrastructure.

P102 Spectrum of Fatal Retroperitoneal Pathology: A Clinicopathological Analysis of Eight Autopsy Cases

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This autopsy case series examines eight decedents with retroperitoneal pathology, predominantly presenting clinically with nonspecific symptoms, unexplained anemia, hemodynamic instability, or

abdominal/flank pain. Etiologies included metastatic renal osteosarcoma with fatal hemorrhage, extragonadal mixed germ cell tumor with suspected spontaneous tumor lysis syndrome, spontaneous retroperitoneal hemorrhage of unclear significance, ruptured abdominal aortic aneurysm, hemorrhage, angiography- and angioplasty-related vascular injury, and retroperitoneal lymphoma with third-spacing and compartment syndrome. In several cases, retroperitoneal hemorrhage was the primary cause of death; in others, it exacerbated advanced cardiac disease or contributed to multi-organ failure. All autopsies were performed using an anterior Ghon approach, which variably limited reconstruction of retroperitoneal relationships at the time of death.

These cases highlight the wide etiologic spectrum of retroperitoneal hemorrhage, especially treatment-related and neoplastic causes, and demonstrate how hemorrhage may be either the proximate cause of death or an important aggravating factor in complex patients. Systematic autopsy evaluation, including targeted dissection planning based on antemortem imaging and clinical findings, improves cause-of-death accuracy, identifies occult procedural complications, and refines clinicians' understanding of sudden decompensation.

Existing literature primarily links retroperitoneal hemorrhage to anticoagulation, renal/adrenal neoplasms, and ruptured aortic aneurysms, with rarer reports of IVC filter-related rupture. Prior work on treatment-related deaths emphasizes meticulous documentation of device position, catheter tracks, and vascular integrity. Classic autopsy techniques (Virchow, Rokitsansky, Letulle, Ghon) variably preserve retroperitoneal anatomy; a modified, clinically driven, hybrid approach—beginning with in situ assessment when retroperitoneal pathology is suspected and followed by en bloc removal—may optimize both anatomic preservation and diagnostic yield in these complex cases.

P103 Fulminant HSV Hepatitis with Concurrent CMV Duodenitis in an Immunocompromised, HIV-Negative Patient: A Case Report

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Herpes simplex virus (HSV) and cytomegalovirus (CMV) are common members of the *Herpesviridae* family and exhibit a high prevalence of seropositivity in the general population. While these viruses usually remain latent in immunocompetent individuals, primary infection or viral reactivation may cause severe, rapidly progressive disease with high mortality in immunocompromised patients.

We report a case of a 38-year-old woman with systemic lupus erythematosus on multiple immunosuppressive agents and chronic idiopathic thrombocytopenic purpura status post splenectomy who presented with coffee-ground emesis, fatigue, and diffuse abdominal pain. She was found to be hypotensive with an elevated lactate and admitted for sepsis. Computed tomography (CT) imaging of the abdomen demonstrated a proximal duodenal ulcer. Following endoscopic intervention, she stabilized and was discharged. Two days later, she was readmitted with hematemesis, melena, and acute blood loss anemia. Laboratory studies revealed a marked and acute elevation of liver enzymes. Despite aggressive supportive care, her condition deteriorated to multi-organ failure, and she died. Following her death, antemortem testing revealed a high CMV viral load by polymerase chain reaction (PCR). A hospital autopsy revealed an ischemic segment of duodenum with ulceration and intraluminal hemorrhage, as well as multifocal hepatic purpura and a soft intra-hepatic lesion. Histologic examination of the duodenum demonstrated classic CMV cytologic features, which were confirmed with immunohistochemical staining (IHC). Sections of the liver lesion revealed extensive hepatic necrosis with non-specific viral cytopathic changes. IHC for HSV was diffusely positive, and postmortem PCR of peripheral blood confirmed a disseminated HSV infection.

To our knowledge, this represents the first autopsy-confirmed case of concurrent fulminant HSV hepatitis and CMV duodenitis. This case underscores the diagnostic challenges of viral co-infection in immunocompromised individuals and highlights the critical role of autopsy in identifying unexpected infectious etiologies contributing to rapid clinical decline and death.

P104 Diagnosis by Exclusion in Forensic Pathology: Frequency and Categories in a 300-Case Autopsy Series of Adults (age > 18 years)

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Introduction:

In forensic pathology, several causes of death lack pathognomonic anatomical findings and are therefore established by exclusion, relying on circumstantial evidence and the absence of alternative diagnoses. The frequency and distribution of such “diagnoses by exclusion” remain poorly quantified.

Objective:

To assess the proportion and types of deaths certified by exclusion in a consecutive forensic autopsy series.

Methods:

A retrospective review of 300 consecutive autopsies was performed. Causes of death were classified into two categories:

- Direct diagnosis: based on clear anatomical, pathological or toxicological findings sufficient to explain death
- Diagnosis by exclusion: absence of specific pathological findings, with cause of death determined through systematic exclusion of alternatives and circumstantial information.

Cases classified as diagnosis by exclusion were further grouped into categories, including drowning, hypothermia, sudden cardiac death, intoxication without definitive toxicological confirmation, and others. Demographic data and manner of death were recorded.

Results:

A substantial proportion of cases were classified as diagnoses by exclusion. The most frequent categories included sudden cardiac death, drowning, and hypothermia. Diagnoses by exclusion were more common in natural deaths but also represented a relevant fraction of accidental deaths. Inter-case variability in the level of supporting circumstantial evidence was observed.

Discussion

A non-negligible proportion of forensic diagnoses rely on exclusion rather than direct demonstrable findings. This highlights the inherent epistemological limits of forensic pathology and underscores the importance of standardized criteria and thorough scene investigation in determining cause of death. Importantly, in cases where the cause of death is established by exclusion, diagnostic conclusions are inherently sensitive to the quality and interpretation of circumstantial information: changes or reinterpretations of the circumstances may lead not only to a different attributed cause of death (e.g., different types of asphyxia), but also to a different classification of the manner of death. Furthermore, in some cases—particularly those in which a hereditary condition may be suspected—additional diagnostic investigations (e.g., genetic testing) are not always performed. This is often due to the fact that such analyses are not considered relevant for judicial purposes by the Public Prosecutor and are therefore not funded. As a result, a degree of uncertainty may persist, and the possibility of an underlying genetic cause of death cannot always be definitively ruled out.

P105 Service Personnel Advancing Research on Chronic Traumatic Encephalopathy Through Brain Donation

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Prions are transmissible pathogens made of misfolded forms of abundant brain proteins, such as prion protein, alpha-synuclein, and tau. These misfolded proteins cause incurable neurodegenerative illnesses like chronic traumatic encephalopathy (CTE), which can result from repetitive traumatic brain injuries. CTE is marked by the deposition of abnormal tau forms and is believed to be caused by repetitive head trauma due to impact and blast encounters. It has been observed not only in military veterans exposed to

concussive injuries, but also in contact-sport athletes. In prior work, Dr. Stanley B. Prusiner's lab at the Institute for Neurodegenerative Diseases at the University of California San Francisco have shown that frozen brain samples from athletes with CTE contained tau prions that could be transmitted to cellular assays.

Cryo-electron microscopy (cryo-EM) studies of tau prions have uncovered a wide array of alternative conformations that tau polypeptides can adopt among the 16 known pathologically and/or clinically distinct group of diseases cause by misfolded tau, called tauopathies. The conformation of misfolded tau in the brains of athletes with CTE has recently been elucidated by cryo-EM and matches those observed in two other tauopathies. This data provides insights that assist drug discovery programs by characterizing the vast array of diverse conformers tau can adopt and identifying specific structural variants that therapies can target to stop or slow the spread of pathological tau. Unfortunately, the conformation(s) of tau prions from military veterans with CTE has yet to be elucidated. Given the structural diversity of tau prion conformers catalogued thus far, there is no guarantee that the tau-CTE fold observed in athletes is the same as that found in veterans with CTE. Understanding and characterizing the specific tau fold(s) that accumulate in the brains of military veterans with CTE is critical to the success of developing therapies for this devastating disease.

Therefore, the Service Personnel Advancing Research on CTE (SPARC) program was established to facilitate brain donation from individuals with history of military service and TBI. The SPARC team provides education and outreach to military-affiliated communities about brain donation. When an eligible decedent is available, the recovery team obtains consent for donation and recovers the brain. To preserve the tissue architecture and tau prion activity, a relatively short postmortem interval and proper storage conditions are required; therefore, relationships with medical examiners and coroners are essential to facilitate timely notification of eligible decedents.

P106 Vitreous Findings of Hyponatremic Dehydration in a Fatality of a Military Cadet

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Exertional fatalities can occur even when individuals with access to water experience extreme environmental stress. We present the case of an 18-year-old decedent who was a military academy student and, during a July training exercise conducted under heat wave conditions (96°F), was deployed alone for a four-hour land navigation task in a wooded area. The decedent, approximately 190 pounds and 74.5 inches in height, was equipped with a weight-bearing vest containing canteens, a first aid kit, empty AR-15 magazines, a helmet, and a CamelBak® hydration system. Hydration stations were available, but they provided only water, without electrolytes. When he failed to return at the designated time, a search was initiated, and he was located approximately two hours later. Paramedics did not attempt resuscitation at the scene.

External examination revealed abraded contusions of the back and left leg, contusions of the right hip and flank, and mild decomposition. Purge fluid was noted from the nose and mouth, with insect activity present in these areas. No other significant traumatic injuries were observed.

Vitreous electrolyte analysis revealed sodium (120 mmol/L), potassium (14 mmol/L), chloride (110 mmol/L), urea nitrogen (36 mg/dL), creatinine (0.80 mg/dL), and glucose (<35 mg/dL). The combination of low sodium, elevated urea nitrogen, and low creatinine indicates hyponatremia due to acute physiological stress from excessive fluid loss and consumption of plain water, with exertional heat exposure. These findings provide objective biochemical evidence supporting significant metabolic and electrolyte derangements preceding death. Autopsy also revealed moderate dysplasia of the atrioventricular nodal artery, and cerebral edema.

The cause of death was determined to be exertional heat injury, with atrioventricular nodal artery dysplasia as a contributory condition. The manner of death was certified as accident. This case underscores the utility of vitreous chemistry in exertional heat related fatalities, providing quantitative support for assessment of hydration status and physiological stress that complements autopsy and scene findings, even in individuals with access to water.

P107 Substance Use Disorder and/or Diffuse Midline Glioma?

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Diffuse midline glioma (DMG) is a WHO Grade 4, infiltrative astrocytic tumor arising in midline structures (e.g., thalamus, brainstem, spinal cord) and characterized by loss of H3K27me3 protein expression. It affects both children and adults and has a poor prognosis.

A 27-year-old Caucasian female with a history of hypertension and opiate/polysubstance use disorder was admitted with encephalopathy after two days of withdrawn behavior, darting gaze, and multiple falls. On arrival, she had twitching concerning for seizures and was unable to maintain wakefulness. Neurological examination showed forced right gaze deviation, right-sided Horner syndrome and right-sided weakness. Urine drug screen was positive for opiates and oxycodone; not supported with quantitative opioid concentrations. MRI showed right-sided T2/FLAIR hyperintensity in the pontomedullary junction. During admission, patient required mechanical ventilation and treatment for suspected pneumonia. Her mental status fluctuated, progressing to lethargy with agitation, tachycardia, and hypoxia. Repeat imaging showed global cerebral edema, anoxic brain injury, increased intracranial pressure, and herniation through craniotomy defect. The patient expired 23 days after admission.

Autopsy was limited by organ donation; absence of lungs precluded determination of pneumonia and sepsis as factors contributory to patient's demise. Of organs not removed, the brain showed severe cerebral edema with bilateral cerebellar tonsillar herniation.

Microscopic examination revealed diffuse anoxic-ischemic encephalopathy and focal infiltrating tumor in the medulla, with IHC and a molecular profile characteristic of diffuse midline glioma (DMG), H3 K27-altered (WHO Grade 4).

These tumors can occur at any age. Pediatric DMGs are preferentially located in the brainstem and pons; adolescent and adult DMGs predominantly involve the thalamus or spinal cord. Because these tumors involve vital structures, even minimal edema and intracranial pressure increase can cause significant neurologic impairment and be life-threatening.

In this case, interaction between acute opioid intoxication and the diffuse midline glioma is unclear, although each may have contributed to cerebral edema and herniation and the patient's subsequent demise. Acute opioid intoxication is known to cause cerebral edema. The tumor can trigger vasogenic edema, increased intracranial pressure and brain herniation. The immediate cause of death is tonsillar herniation secondary to severe cerebral edema.

Take-home points:

1. Consider CNS pathology in overdose/substance use disorder cases.
2. DMG can present with psychiatric/behavioral symptoms which are easily missed; especially in vulnerable populations such as young patients with substance use disorders.
3. DMG is an aggressive, often lethal tumor, and sometimes as in this case can be incidentally discovered.

P108 Seeing the In(Clues)ions: A Rare Case of Intrauterine Fetal Demise due to HSV Acute Chorioamnionitis

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Acute chorioamnionitis is a clinical and histological diagnosis of inflammation of the placenta, placental membranes, and/or umbilical cord typically due to an ascending infection from the maternal lower

genitourinary tract. While the vast majority of ascending infections are bacterial, very few viral associated acute chorioamnionitis cases have been reported.

Herpes Simplex Virus (HSV) is the most common cause of neonatal herpes and is associated with severe morbidity and mortality in neonates. Mother-to-infant transmission most commonly occurs during vaginal delivery or postnatal skin contact and rarely through in utero transmission (reportedly approximately 5% of cases). Prior cases in the literature describe intrauterine HSV infections as disseminated disease with a classic triad of severe skin, ophthalmologic, and central nervous system (CNS) manifestations or other severe systemic consequences. For these cases, diagnosis is typically made peri-/postpartum. Few prior cases of intrauterine HSV infections describe placental findings, and to our knowledge, no prior published cases describe intrauterine fetal demise (IUFD) due to HSV-associated acute chorioamnionitis.

We present a case of a 23-week gestational age female delivered via spontaneous vaginal delivery at home to a G1 17-year-old mother with limited prenatal care. At time of birth, there were reportedly breeched positioning of the fetus and no signs consistent with life. Autopsy revealed a normally developed female fetus, without overt signs of natural disease, infection, or trauma, and measurements appropriate for estimated gestational age. The placenta was also examined and was grossly unremarkable. Microscopic evaluation of fetal organs was largely unremarkable; however, evaluation of the placenta noted findings consistent with viral acute chorioamnionitis with an HSV etiology (confirmed by immunohistochemistry). A literature review is performed to correlate and discuss case findings with that of intrauterine HSV infection; HSV-related fetal demise; and acute chorioamnionitis and HSV, as well as highlight the importance of additional specimen examination, ancillary testing, and scene information beneficial to the certification of IUFD cases.

P110 Declining Hospital Autopsy Rates and System-Level Barriers: A 10-Year Institutional Review and Implications for Death Investigation

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Introduction: Hospital autopsy remains the gold standard for determining cause of death and identifying clinically missed diagnoses, yet utilization in the United States has declined to below 5%. This trend has implications not only for clinical care, but also for death certification accuracy, public health surveillance, and the forensic pathology workforce.

Objective: To evaluate institutional trends in hospital autopsy utilization and identify system-level barriers contributing to declining rates.

Methods: A retrospective review of hospital autopsies performed at an academic medical center from 2016–2025 was conducted. Variables included autopsy volume, age, sex, and cause of death. Trends were compared with state mortality data. In parallel, institutional workflows, including consent processes and results communication, were analyzed to identify operational gaps.

Results: Autopsy volume remained stable from 2016–2019, followed by a marked decline beginning in 2020 without return to baseline despite increased statewide mortality. The decline was driven primarily by reduced adult and male autopsies, while pediatric and perinatal cases remained stable. Comparison with state mortality data demonstrated an inverse relationship, with rising deaths and declining autopsy utilization. Workflow analysis identified key barriers, including fragmented and reactive consent processes, variable physician engagement, reduced educational exposure, and inconsistent communication of autopsy findings.

Discussion: Declining hospital autopsy rates reflect modifiable system level and cultural barriers rather than reduced clinical need. Reduced utilization limits detection of diagnostic discrepancies and may impact accuracy in cause-of-death certification and mortality data. These findings have downstream implications for both clinical quality and medicolegal death investigation systems. System-level interventions, including standardized consent processes, improved clinician engagement, and integration

of autopsy findings into quality and educational frameworks, may help restore autopsy as a critical tool in modern medical and forensic practice.

P111 Emerging Implanted Medical Devices

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Implanted medical devices are increasingly used to treat conditions such as heart disease, chronic pain, epilepsy, sleep apnea, and cancer, and are frequently encountered at autopsy. Interrogation of certain devices—particularly pacemakers and implantable cardioverter-defibrillators—can provide valuable information for cause of death determination and, in some cases, aid in identification. Active implantable devices, such as pacemakers and defibrillators, are assigned unique identifiers, while passive implants, such as orthopedic hardware, use either a unique serial or lot/batch numbers.

The growing use of postmortem radiography, including full-body imaging, has increased detection of medical hardware, even in cases limited to external examination. At the same time, newer and smaller devices present interpretive challenges. For example, leadless micropacemakers may resemble projectiles on radiographs. Like traditional pacemakers, these lithium battery-powered devices must be removed prior to cremation. Although they deliver lower-energy electrical signals, they can still produce shocks.

Despite their forensic relevance, guidelines for handling such devices during autopsy remain limited. These devices can be identified and interrogated by manufacturers when necessary. This presentation reviews commonly encountered and emerging implanted devices and highlights the information they provide for medical history, cause of death determination, and identification.

P112 Venous Bullet Embolism Following Gunshot Wound to the Thigh: Case Report and Literature Review

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Introduction: Bullet embolism, also referred to as a missile embolism, is a rare complication of ballistic trauma. This phenomenon occurs when a projectile enters an arterial or venous vessel and migrates anterograde, retrograde, or paradoxically within the circulatory system. In a review published by Michelassi et al. (1990), bullet embolism occurred more frequently following arterial injury. In contrast, a review published by Kuo et al. (2019) demonstrated that venous entry (56%) was more common, followed by arterial entry (27%), and cardiac injury (15%).

Case: We report the case of a 25-year-old male who was found unresponsive with labored breathing in the parking lot of his apartment complex. Witnesses reported hearing gunshots, followed by the decedent running into the parking lot, where he subsequently collapsed. Upon arrival, EMS personnel discovered gunshot wounds to the upper right thigh. He was transferred to the hospital where he was unable to be resuscitated. He was pronounced dead and transported to the Western District of Virginia Office of the Chief Medical Examiner in Roanoke, Virginia for autopsy.

At autopsy, the decedent was discovered to have three indeterminate-range gunshot wounds to the right thigh consisting of an entrance and exit of the anterior right thigh with re-entrance into the anterior right pelvis. The path through the right thigh involved skin and subcutaneous tissue only. Prior to internal examination, a full-body computed tomography (CT) scan without contrast was performed, which revealed hemorrhage in the pelvic/abdominal region and a foreign metallic object in the region of the left chest. 1,700 mL of blood was recovered from the peritoneum and a lacerating injury to the left external iliac vein was identified. There were no grossly identifiable defects of the abdominal organs, mesentery, or diaphragm. Upon dissection of the pulmonary arterial tree, a small-caliber projectile was recovered from the lower lobar branch of the left pulmonary artery without disruption of the pulmonary parenchyma. Due to the lack of injury in the abdominal and thoracic organs, the projectile was determined to have penetrated the left external iliac vein and embolized to the left pulmonary arterial branch.

Discussion: As firearm-related deaths increase, bullet embolism is a potential complication that could be seen more often in the forensic setting. While postmortem imaging and external examination are helpful in the diagnosis of missile emboli, autopsy with careful accounting of internal injuries remains the most accurate method to evaluate the bullet's trajectory.

P113 Nitrous Oxide: Nothing to Laugh At

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Case:

A 34-year-old male was found unresponsive seated on a couch in his residence. Numerous canisters of nitrous oxide surrounded him. Most had been used and others remained packaged in a box labeled Whip-lts. He was pronounced on scene. The decedent had a history of heroin abuse and was known to abuse nitrous oxide. Medical records revealed the decedent had previously presented to the emergency department with complaints of numbness and tingling in his hands and feet, and felt as though he could not ambulate.

Postmortem examination demonstrated a saddle pulmonary embolus within the pulmonary trunk extending to the vasculature of the right and left lungs. Firm adherent thrombus was also present within the deep veins of the right lower extremity. Testing of femoral blood by GC-MS analysis revealed an elevated nitrous oxide level (48 mcg/mL). No ethanol or other drugs were present. Vitamin B12 levels and hypercoagulability testing were unable to be performed.

Discussion:

Nitrous oxide is an anesthetic gas which also has analgesic (pain relieving) action. It is additionally sold as a compressed gas propellant in whipped-cream dispensers readily available at most supermarkets and online. They are abused by inhalation for their euphoric effects. Although considered safe, its toxic effects from exposure include confusion, acute psychosis, unconsciousness, and cardiovascular collapse. Medical sequela may also include signs and symptoms of emphysema and abnormal blood counts. The gas may also result in asphyxiation due to oxygen displacement.

Chronic nitrous oxide abuse is well-known to inactivate vitamin B12 which affects the metabolism of methionine and folate resulting in hyperhomocysteinemia, which then carries an increased risk of venous thromboembolism. The mechanism may be related to endothelial dysfunction, platelet and clotting activation, and impaired fibrinolysis. Case reports documenting chronic nitrous oxide abuse showed homocysteine levels decrease when nitrous oxide was stopped then increase upon reuse.

Long-term abuse also results in severe neurological complications, most commonly presenting as myeloneuropathy affecting the dorsal columns due to vitamin B12 inactivation and decreased myelin production. Nitrous oxide likely has independent neurologic toxicity seen as motor axonal degeneration.

Forensic pathologists should be aware of the serious adverse effects of nitrous oxide. Not only can acute toxicity result in death, natural disease processes such as venous thromboembolism and paraparesis may result from chronic abuse.

P114 Alligator Annihilation—Death Certification Challenges Presented by Extensive Postmortem Animal Activity

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The intersection of advanced decomposition, waterlogging, and postmortem animal activity creates a complex diagnostic barrier that complicates death certification. Postmortem animal activity presents unique challenges to autopsies, particularly when death occurs in unknown circumstances. Animal activity mimics injuries or obscures injuries pertinent to the cause and manner of death. Postmortem predation effaces parts of the body needed for proper identification of the decedent, such as distortion to facial features, fingerprints, or tattoos. We present an unidentified female found face down in a bayou with all four extremities partially to completely missing due to extensive alligator predation. Investigators found

her nude, with external genitalia entirely absent due to predation, limiting the ability to assess for sexual assault. While most organs remained intact, extensive predation and confounding waterlogging decomposition make certifying the cause and manner of death difficult. Distinguishing antemortem from postmortem injuries in the context of prolonged water submersion creates an additional hurdle in death investigation. In this case presentation, we explore how aquatic decomposition coupled with extensive postmortem animal activity—particularly alligator predation—challenges death investigation and certification.

P115 Autopsy Findings of Head Injury in Accidental Crash Deaths of Young Adults (2020-2025)

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Traumatic brain injury (TBI) deaths have increased annually from 2010 to 2020, highlighting a need for continued research into the frequency and recognizable patterns of these injuries. TBI refers to injury to the brain caused by an external force, such as a bump, blow, or jolt, resulting in a disruption to normal brain function. TBIs remain a significant public health concern, and this study aims to identify patterns in head injuries resulting from motor vehicle accidents (MVCs) to inform prevention strategies, improve public health policies, and enhance safety measures. Data was collected from autopsy and investigational reports from the Maryland Office of the Chief Medical Examiner (OCME) over the years 2020-2025, focusing on accidental deaths due to MVCs in young adults (18-25 years old). A total of 312 cases were examined in the study, including 219 drivers, 55 passengers, and 34 pedestrians. Men overwhelmingly accounted for 75% of the cases, 234 of 312. Drivers accounted for the highest proportion of injuries, with injuries most associated with these accidents being subdural and subarachnoid hemorrhages, skull fractures, and neck injuries, often accompanied by associated soft tissue injuries such as abrasions, contusions, and lacerations. Subdural and subarachnoid hemorrhages were the most common injury type, accounting for approximately 70% of all cases. Of 312 cases, 124 were positive for ethanol; 78 involved drivers, approximately 63%. Geographically, Prince George's County and Baltimore County contributed notable proportions, 25% and 10%, respectively, with their proximity to urban cities suggesting higher traffic and the need for targeted prevention efforts. Frontal collisions (37%) were identified as the most common direction of impact. Ejected occupants, 26 out of the 143 cases with confirmed safety device details, show much higher rates of major brain injuries (7.25%) than those who were not ejected (4.29%). Safety device use reduced ejection (3 out of 73) compared to no safety device use (23 out of 70), indicating a higher ejection risk without restraints. These findings demonstrate consistent patterns in injury type and crash dynamics, emphasizing the importance of targeted prevention, improved young adult driver safety education, and potential advancements in vehicle safety design to reduce the incidence and severity of traumatic head injury in MVCs. Improved safety education focusing on seat belt usage and the dangers of drunk driving could help prevent future deaths in this age range. Ultimately, this research emphasizes the need for improved vehicle safety measures in these communities.

P116 When Natural Isn't Natural: Hidden Suicide Among Older Adults and Public Health Implications

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Deaths involving older adults with significant chronic medical conditions are frequently presumed to be natural based on age, comorbidities, and initial scene information. While many such deaths are appropriately classified, this assumption may obscure suicide and other non-natural manners of death, leading to potential misclassification. Accurate recognition of these deaths is critical not only for medicolegal certification, but also for public health surveillance and a more complete understanding of mortality trends in vulnerable aging populations.

This presentation describes two cases involving older female decedents with extensive medical histories whose deaths were initially reported as natural. In both instances, preliminary information provided no immediate indication of suspicious circumstances. However, independent medicolegal scene investigation

revealed concerning findings, including loose prescription medications, multiple pill containers, conflicting collateral histories, and environmental indicators inconsistent with routine natural death. Further investigation, including postmortem examination and toxicological analysis, supported suicide determinations in both cases. These findings illustrate how reliance on age, medical history, and initial reporting may contribute to premature assumptions regarding manner of death and highlight the importance of thorough scene assessment.

Older adults represent a vulnerable population with unique and often underrecognized risk factors for suicide, including chronic pain, declining health, loss of independence, grief, and social isolation. Failure to accurately identify these deaths may compromise mortality data, limit recognition of suicide trends in this population, and hinder prevention efforts.

By bridging forensic investigation with public health awareness, medicolegal professionals play a critical role in improving classification accuracy and strengthening mortality surveillance. These cases emphasize the need for investigative objectivity and reinforce that significant medical history does not preclude intentional self-harm.

P117 Left in the Cold: A Case Series Analyzing Cold Exposure Deaths, Autopsy Findings, and Social Vulnerabilities

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From 1999-2022, approximately 40,000 deaths were recorded with cold exposure as an underlying or contributing cause of death in the United States. Specifically, in 2022, the mortality rate for cold as an underlying or contributing cause of death was 0.92 per 100,000 persons, yet cold as only the underlying cause of death was less than 0.4 per 100,000. These rates also saw statistically significant increases in the five to six years preceding 2022. This incongruity, alongside significant increases in mortality rates, underlines the importance of autopsy in defining the cause of death in cases where cold exposure may be overwhelmingly influential. Moreover, autopsy represents a focal point in death investigation to correlate nonspecific cold exposure gross and histological observances with scene findings and toxicology.

Herein we performed a retrospective review of seven cold exposure-related deaths in the Upper Midwest. With each case, we reviewed demographic, toxicology, scene findings, and autopsy results. In review, we noted key similarities that implicate cold exposure's role in cause of death, including paradoxical undressing, pulmonary congestion, gastric Wischnowsky ulcers, frozen state, and frost erythema. We also found vital differences, such as genetic testing and gross thromboembolism that precludes hypothermia as the underlying cause of death and negative toxicology results pointing away from carbon monoxide poisoning in a decedent found in an enclosed space next to a running car. Together, these cases demonstrate the juxtaposition between environmental exposure, intoxication, and social vulnerability and their contribution to cold exposure-related deaths, demonstrating the importance of public health to promote warming shelters, outreach, and awareness of exposure-related intoxication.

P118 Coexistence of Ganglioglioma and Intracranial Aneurysm Presenting as Sudden Death

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The coexistence of primary central nervous system (CNS) neoplasms and intracranial aneurysms (IA) is rare but well described, with reported incidence ranging from 0.7% to 8% (Abbas and Boutarbouch, 2024). In most cases, clinical presentation is driven by the tumor, and aneurysms are often incidental findings (Licata et al., 1986; Kamali et al., 2004). Sudden death due to aneurysmal rupture in this setting is uncommon and may be overlooked, particularly in patients with known epilepsy where death may be attributed to seizure-related causes.

We report the case of a 28-year-old man with a 10-year history of epilepsy secondary to an unresected brain tumor who was found deceased at home. His seizures occurred multiple times per week and were associated with medication nonadherence. At autopsy, a ruptured 0.5 cm saccular aneurysm of the right posterior communicating artery with associated subarachnoid hemorrhage was identified. Additionally, a 5.0 cm mass in the left temporal lobe was found and histologically confirmed as a low-grade ganglioglioma. The aneurysm was spatially and pathologically unrelated to the tumor. The cause of death was certified as saccular aneurysm of the right posterior communicating artery with rupture and associated subarachnoid hemorrhage, and the manner of death was natural.

This case highlights the diagnostic complexity of sudden death in patients with known neurologic disease and underscores the risk of premature diagnostic anchoring. While epilepsy and intracranial neoplasms are often presumed to explain sudden death, alternative causes such as vascular catastrophes must be considered. We propose that recurrent seizure activity may contribute to aneurysm formation through repeated hemodynamic fluctuations in cerebral blood flow, even in the absence of a direct spatial relationship to the tumor. Recognition of coexisting intracranial pathology is critical to avoid misclassification of cause of death, with important implications for clinical understanding, epidemiologic data, and public health.

P119 Fatal Immune Checkpoint Inhibitor-Associated Cardiotoxicity: An Autopsy Case Series with Clinicopathologic Correlation

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Introduction: Immune checkpoint inhibitor (ICI) associated myocarditis is a rare but frequently fatal adverse event. Occasionally, it occurs as part of an overlap syndrome characterized by myocarditis, myositis, and myasthenia gravis-like symptoms (triple M syndrome), but autopsy descriptions are limited.

Methods: We reviewed four autopsies performed at a single academic center with suspected fatal ICI associated myocarditis. We correlated the clinical presentation with autopsy findings, including gross examination, histologic examination, and ancillary studies.

Results: All four decedents developed severe cardiovascular toxicity after a recent ICI exposure. Three patients had features consistent with triple-M overlap syndrome, with progressive weakness, bulbar/ocular symptoms, and inflammatory skeletal muscle involvement at autopsy. The fourth patient had fulminant myocarditis. Cardiac pathology ranged from patchy lymphocytic myocarditis to diffuse biventricular injury. One case revealed multifocal patchy myocarditis with concomitant diaphragm, psoas, and thigh myositis. A second case revealed biventricular transmural necrosis with lymphohistiocytic inflammation and associated myositis involving multiple skeletal muscle groups. A third case showed patchy interstitial and subendocardial myocarditis with diffuse diaphragmatic myositis. The fourth case showed marked right ventricular-predominant subendocardial and interstitial lymphocytic myocarditis with myocyte injury, mild left ventricular myocarditis, and circumferential left ventricular subendocardial necrosis.

Discussion: We report four autopsies involving fatal ICI cardiotoxicity. Our findings show that the cardiac inflammatory pattern may be morphologically heterogeneous, but generally shows a T cell/histiocyte predominant inflammation. Autopsy can aid in this suspected diagnosis, and pathologists should comprehensively sample the myocardium and skeletal muscle when ICI toxicity is suspected at autopsy.

P120 The Enigma of Postpartum Preeclampsia: Case Report and Literature Review

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Introduction:

Preventable pregnancy-related deaths remain a high cause of mortality, and disproportionately affect black individuals in the US. Postpartum subdural hematoma (SDH) carries a broad differential. Accurate classification matters for both individual cases and disparity surveillance.

Between 2017–2019, hypertensive disorders of pregnancy (HDP) were documented in 31.6% of hospital delivery deaths. Studies persistently show racial/ethnic disparities in both prevalence and outcomes. The risk of HDP continues into the postpartum period. We describe a case of fatal atraumatic postpartum SDH which prompted literature review into the oft-overlooked potential diagnosis of lethal postpartum preeclampsia (PPPE).

Case: A 25-year-old black female with no documented history of hypertension or HDP underwent uncomplicated c-section. The day after surgery, she developed a severe headache and became unresponsive. Her blood pressure hours prior was normal; the next measurement, obtained after the event, was 149/78 mmHg, with systolic readings later surging to the 180s. CT revealed left SDH with herniation and midline shift. Despite emergent craniectomy, she was pronounced six days postpartum. The differential diagnosis discussed during multidisciplinary review included ruptured vascular anomaly, spinal anesthesia (SA), and PPPE, prompting a literature review to determine the diagnostic criteria and possible postmortem findings of this relatively unexplored entity.

Literature review revealed no cases of fatal SDH directly attributed to PPPE. Three cases of non-fatal SDH associated with postpartum HDP were found; however, there may have been exposure to SA intrapartum, and two cases had history of antepartum HDP. Several case reports/series of both fatal and non-fatal SDH due to HDP were identified but a large proportion were also exposed to SA. Two retrospective studies on PPPE reported one death each (neither due to SDH).

Discussion:

Definitions of PPPE vary. Proposed criteria is new-onset preeclampsia between 48 hours and 6 weeks postpartum. The results of a large retrospective study suggest that PPPE has worse outcomes and further study is needed to determine whether PPPE is on the same spectrum of other HDP, constitutes missed antepartum diagnoses, or is a separate entity entirely. There is a paucity of reported cases of fatal SDH due to PPPE. Further study is needed to determine the true prevalence, especially given overlapping risk factors and timing with SA-related SDH.

Accurate classification is necessary for surveillance of pregnancy-related mortality and disparities. Our case highlights the utility of multidisciplinary review and contributes to the literature on fatal postpartum SDH.

P121 A Unique Case and 25-Year Retrospective Review of Gastroduodenal Ulcers in Miami-Dade County

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Introduction:

Miami-Dade County is the most populous in Florida, with over 2.7 million residents of diverse backgrounds. Furthermore, Miami and South Florida are known for a robust tourism industry attracting individuals from around the globe. We herein report a unique case involving a tourist who suffered an unusual perforated gastric ulcer while on a cruise. A review of historical data on such fatalities in the county was subsequently conducted.

Methods:

A query of the Miami-Dade County Medical Examiner Department electronic database was performed. Search keywords included: “gastric, gastroduodenal, or peptic” and “ulcer” in either the primary or contributory cause of death. Identified cases were reviewed within their electronic files. Comparison of data primarily included: investigative information, autopsy findings, toxicology data, and death certification. Data was compiled and analyzed using Microsoft Excel.

Results:

A total of 82 cases over a 25 year period were identified, of which 9 were certified as Accident and the others as Natural. The decedent ages ranged 35 to 91 years (mean of 64 years). The majority (77%) of cases were autopsied, with apparent discovery of ulcer(s) via the exam. Five cases were certified upon record review only. 52% of the ulcers were designated as perforated, while 29% had associated

gastrointestinal hemorrhage. 30% of decedents had reported history of ethanol use, though only 12% featured chronic ethanolism included on the death certificate. Five Accident cases involved stress ulcers related to blunt force trauma (including three motor vehicle collisions and two elderly decedents who fell), while one involved complications of a remote sharp force wound, and two involved acute cocaine toxicity. One Accident case involved a perforated ulcer which occurred in a swimming pool such that water submersion was included on the death certificate. Only 10 cases featured histologic sampling of the ulcer(s), with highly variable documented microscopic detail; cases rarely featured a malignant process.

Discussion: The unique case in question involves a perforated gastric ulcer which communicated into the pericardial sac; no other case over a 25-year period had such findings. Limitations of this study include lack of consistently digitized records prior to 2005, not capturing ulcer cases which were certified simply as “Complications of ...” without further specification, as well as inconsistent documentation of social history in case files. Histologic sampling of ulcers is recommended (as well as description of the inflammation pattern).

P122 A Rising Need for Alternative Methods of Decedent Identification

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Decedent identification during a death investigation is of the utmost importance. The typical identification is visual confirmation by friends or family, assuming that features have not been distorted by decomposition or injury. Even if the decedent could be identified visually, some have nobody to identify them. Since the COVID-19 pandemic, there's been an increasing need for alternative methods of identification due to more decedents being found without the ability to directly identify them. This project's aim is to conduct an analysis of the usage of alternative forms of identification before and after the pandemic.

The Jefferson County Coroner/Medical Examiner's Office (JCCMEO) Case Management Database was used to identify cases from 2012-July 2025 that used alternative identification methods. The identification methods analyzed within this study are as follows: fingerprint comparison, DNA comparison, radiographic comparison, dental record comparison, medical record comparison, tattoo comparison, identification (ID) cards/Law Enforcement Tactical System (LETS), and circumstances. Cases were divided into three time periods: before the pandemic (2012-2019), during the pandemic (2020-2021) and after the pandemic (2022- July 2025). ANOVA tests were completed for each category of identification to compare the three time periods.

5,582 cases were identified. The most commonly used method for identification was LETS/ID Cards (n= 4214) and the least used method was DNA (n= 25). Using ANOVA for all categories, excluding LETS and medical record comparison, a significant p-value (p= <0.05) was found when comparing the pre-pandemic and post-pandemic time periods. Using t-tests with the Bonferroni adjustment to rule out false positives from paired t-tests, and the significant values held true.

There's a marked increase in decedents being identified through secondary methods since the pandemic, excluding medical record comparison and LETS. LETS is consistently utilized by law enforcement to confirm the identification of individuals without informants at the scene. Medical records are difficult to acquire due to access barriers and often require at least a tentative ID. Significant medical history, if available, can aid identification.

Unidentified decedents put significant stress on community resources. The responsible agency/jurisdiction must fund the personnel, investigation, storage, and disposition costs for each decedent. It could be suggested that a breakdown of family units and social isolation related to the pandemic has impacted this trend. Lack of support systems predisposes individuals to negative health outcomes in the long term. Initial analysis of this trend, utilization of alternative ID methods, warrants further research.

P123 Fetal Autopsy Revealing *Listeria monocytogenes* in a Case of Intrauterine Fetal Demise

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Listeriosis is a food borne illness caused by the bacterium *Listeria monocytogenes*, a gram-positive bacillus. Pregnant women are a vulnerable population at risk for Listeriosis, as infection can lead to preterm delivery, neonatal sepsis, and fetal demise. Fetal demise due to listeriosis is underreported in forensic literature, however, it remains an important differential for infectious cases of stillbirth. We report a case of a 20-week gestational age female infant of a 38-year-old mother, who presented with abdominal pain, fevers, and chills. She was found to have a septic abortion and subsequently delivered the infant. The mother reported traveling to Norway approximately a month prior to presentation. While she did not recall specific exposures, she did report consuming cheese on a goat farm. Autopsy of the infant revealed disseminated disease, with microabscesses containing gram-positive bacilli identified in the skin and lungs. The placental examination revealed necrotizing chorioamnionitis, necrotizing deciduitis, and acute intervillitis. Bacterial polymerase chain reaction testing of placental tissue detected *Listeria monocytogenes*. A search using artificial intelligence (ChatGPT) identified a reported outbreak of *Listeria* in Norway during that time. The outbreak was linked to smoked salmon from a specific producer. This case highlights the importance of fetal autopsy and placental examination in determining the cause of stillbirth, as well as identifying notifiable infectious diseases.

P124 An Unusual Cause of Fatal Subarachnoid Hemorrhage: Ruptured Giant Cerebral Artery Aneurysm Following Accidental Sibling “Roughhousing”

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Subarachnoid hemorrhage (SAH) is a life-threatening neurologic emergency characterized by sudden accumulation of blood within the subarachnoid space of the meninges, leading to increased intracranial pressure and cerebral compression. The most cited etiology of SAH is spontaneous rupture of a cerebral artery aneurysm, typically involving or adjacent to the Circle of Willis. Many factors contribute to rupture, with aneurysm size and location considered critical. Most aneurysms range from 0.5-2.5 cm and rupture during the fourth to sixth decades of life. Mortality is high, with acute case-fatality rates of 30-50%. Death frequently attracts medicolegal attention due the often-unexplained sudden timing with increased probability of non-natural manner of death.

A previously healthy 10-year-old female presented to a rural emergency department for evaluation of acute head trauma after failing to receive adequate care at two prior health facilities. The patient was reportedly “roughhousing” with her 11-year-old brother when she was pushed against a wall, hitting her head. She quickly developed lethargy and a headache, followed by an episode of emesis. Initial imaging demonstrated evidence of SAH with an associated basilar mass, and the patient was subsequently airlifted to a Level 1 pediatric trauma center. Upon arrival, she was conscious with photophobia, headache, ongoing emesis, and a Glasgow Coma Scale score of 14-15. Surgical intervention was deemed non-urgent by neurosurgery. Initial management consisted of standard-of-care support and a staged imaging workup. Shortly after admission, however, the patient acutely decompensated with need for aggressive pre-surgical stabilization. Despite multi-disciplinary efforts, the patient rapidly deteriorated and decision was made to withdraw further medical care. The patient passed approximately 32 hours after her initial traumatic event.

At autopsy, external examination was unremarkable aside from evidence of medical intervention and organ procurement. No signs of external head trauma were observed. Internal examination, limited to head only, demonstrated an edematous brain (1500 g), diffuse SAH, and a ruptured giant left middle cerebral artery aneurysm (3.4 cm) with associated blood clot extending to surrounding SAH. The cause of death was SAH due to ruptured cerebral artery aneurysm following blunt force head trauma. The manner of death was accidental.

We present a case of death due to subarachnoid hemorrhage occurring at an unusual age with unusual circumstances. This case emphasizes the challenges of managing neurological emergencies in settings with limited health care access, as well as the difficulty in determining appropriate manner of death where unintentional trauma exacerbates an undiagnosed health condition.

P125 Autodigestion of the Stomach After Death: Two Cases of Gastromalacia with Associated Diaphragmatic Perforation

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Gastromalacia is a postmortem phenomenon caused by autodigestion of the gastric wall by endogenous enzymes. Although it is a recognized artifact of decomposition, gastromalacia is relatively uncommon at autopsy. This process can mimic peptic ulcer perforation, potentially leading to diagnostic confusion, particularly in distinguishing postmortem change from true antemortem pathology. In some cases, enzymatic and acidic autodigestion may extend beyond the stomach to involve adjacent structures, further increasing diagnostic uncertainty. Reports of gastromalacia with diaphragmatic involvement are exceedingly rare. Herein, we describe two cases in which both decedents had gastromalacia with extension beyond the stomach into the diaphragm, resulting in diaphragmatic perforation.

Case 1:

A 27-year-old male was found deceased behind the wheel of his vehicle. Postmortem radiography demonstrated pneumoperitoneum and a left-sided pneumothorax. At autopsy, the mildly decomposed decedent was found to have extensive air and fluid in the pleural and peritoneal cavities, with a 15 cm postmortem gastric wall defect. The left hemidiaphragm which had a 4 cm full-thickness defect within an area of dark discoloration and thinning. The decedent died as a result of acute ethanol intoxication.

Case 2:

A 27-year-old male was found deceased in a prone position wedged between the second and third rows of a minivan. Postmortem radiography demonstrated pneumoperitoneum. At autopsy, there was minimal decomposition on external exam. On internal exam, air and fluid were present within the left pleural cavity. A 12 cm postmortem defect was identified within the gastric wall, with extrusion of gastric contents into the thoracic cavity. Also evident were multiple full-thickness defects involving the darkly-discolored and thinned left hemidiaphragm, ranging up to 3.5 cm in greatest dimension. The cause of death was the combined toxic effects of methamphetamine and ethanol.

Discussion:

In both of the presented cases, fluid and air within the peritoneal and left pleural cavities with diaphragmatic defects initially caused diagnostic uncertainty at autopsy. Careful examination disclosed gastric wall defects and supported gastromalacia with associated diaphragmatic disruption as the explanation for the findings. The cases serve to remind forensic pathologists that gastromalacia, although rare, may occasionally result in associated diaphragmatic destruction, with resultant air and fluid within the left chest cavity at autopsy.

P126 10-year Retrospective Review of Violent Suicide Toxicology Profiles in Harris County

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"Violent" suicide refers to suicides carried out through violent means, including hangings, gunshot wounds, blunt force injuries, stab injuries, and other rapid, irreversible methods. These account for the majority of completed suicides in Harris County. Substance use remains one of the strongest predictors of suicide in the United States. Research consistently demonstrates a link between substance use, mental health disorders, and high-risk behaviors like suicide. However, the association between specific substances and violent suicide has not been thoroughly investigated.

This study compares the toxicologic profiles of violent suicide methods in Harris County. Autopsy records from the Harris County Institute of Forensic Sciences Laboratory Information System were collected from January 1, 2015 to December 31, 2024. Each case was grouped into one of five “cause of death” categories— gunshot wounds, hangings, blunt force injuries, sharp force injuries, and thermal injuries— and then compared by their toxicology results and demographic data.

A total of 864 cases of violent suicides were reviewed over a 10-year period. Reflecting previous trends, 61.7% of classifications were gunshot wounds, followed by hangings (21.9%), blunt force injuries (12.8%), sharp force injuries (2.7%), and thermal injuries (0.9%). Most decedents were white men between 18 and 50 years old, with the exception of sharp force and thermal injuries which had an older age bracket. Ethanol use was present in 58.4% of cases, followed by stimulants at 38.4%. Both substances were often taken together. The only category in which ethanol was not the most used substance was thermal injury; however, this is limited by low sample size. Violent suicides had a dependent association with substances used, history of substance use, gender, age, and race, per chi-squared testing. These findings contrast with non-violent suicides over the same period (319 cases), which were more balanced between older men and women (59.6% female versus 40.4% male), with a lower use of ethanol (32.9%) and a higher use of non-stimulant substances like narcotics, sedative hypnotics, and antidepressants.

Our findings fall in line with the prevailing theory that disinhibiting drugs beget more impulsive, violent behavior. This information can inform future case management. A comprehensive investigative approach with streamlined toxicologic testing can be essential not only for accurately determining the cause and manner of death, but also informing suicide prevention strategies.

P127 Ambiguous Deaths in Anesthesia-Exposed Professionals: Forensic Challenges in Determining Manner of Death

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Deaths involving medical professionals with access to anesthetic agents present a rare challenge in forensic investigation, particularly when toxicology, gross, and histologic findings do not clearly establish causation. These cases have important implications for both forensic pathology and public health, especially in the context of occupational exposure, substance access, and vulnerable medical populations. We present two cases involving an anesthesia-exposed professional in whom postmortem detection of anesthetic agents could not be definitively attributed to intentional fatal overdose. These cases were retrospectively identified from the Saint Louis City Medical Examiner's Office through forensic case review, with analysis of scene findings, autopsy results, and toxicology reports. The first case involved a 52-year-old diabetic man who was found collapsed in his secured, heated apartment after a coworker requested a wellness check upon failure to show up for his shift at Walmart. Prior to his death, he had recently been fired from his job as an anesthesia technician for sending inappropriate pictures to his co-workers. Postmortem toxicology revealed propofol, an anesthetic agent used for procedural sedation, in the bloodstream along with severe hyperglycemia. Gross and histologic findings also showed Wischniewski spots in the gastric mucosa, suggesting a prolonged time between anesthetic administration and death. The second case involved a 41-year-old woman who worked as a veterinarian, found seated and collapsed forward with a syringe inserted in her arm. External examination revealed prominent facial cyanosis and multiple small puncture marks in the right antecubital fossa. Postmortem toxicology detected tiletamine and zolazepam, a veterinary anesthetic combination, as well as ketamine. In both cases, the manner of death was ultimately ruled an accident because classification of suicide necessitates clear evidence of intent, such as verbal or written plans or intent inferred from the nature of the act itself. In the absence of sufficient evidence to support intentional overdose, these deaths could not be determined as suicide. Overall, the presence of anesthetic agents alone is insufficient to establish intent or causation, especially among individuals with occupational access. Recognition of this limitation plays an important role in both accurate death determination and in developing risk mitigation strategies for anesthesia-exposed professionals. From a public health perspective, these cases highlight a vulnerable population in which anesthetic access contributes to diagnostic challenges in death investigation. They also emphasize the need for preventative measures in high-risk work environments, including improved access control, enhanced occupational monitoring, and better mental health support for healthcare professionals.

P128 Killer Cars: Three Accidental Carbon Monoxide Deaths in Outdoor Motor Vehicles

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Carbon monoxide (CO) is an odorless, colorless, tasteless, and non-irritating gas emitted from combustible engines. When inhaled, CO binds to the hemoglobin molecule with 200 times the affinity of oxygen. This blocks the binding of oxygen to the hemoglobin molecule, thereby reducing the release of oxygen to peripheral tissues and causing hypoxia. Symptoms are nonspecific and include headache, dizziness, fatigue, nausea, vomiting, and chest pain. Those exposed may become sick or altered before realizing they have been exposed, increasing lethality. Bright pink (so-called "cherry red") lividity is a classic indication of exposure; however, this finding can be subtle and is not always identified. Rather, it is the scene investigation that leads the forensic pathologist to suspect potential CO exposure. The diagnosis of CO toxicity is confirmed by testing carboxyhemoglobin levels in the blood.

Death from CO toxicity is often seen in fires or instances of motor vehicles or personal heaters running in enclosed spaces. It is rare that CO kills individuals inside motor vehicles that are in an open environment with an unobstructed tailpipe. This study examines three separate cases of vehicles in open environments causing accidental death by asphyxia from CO toxicity. These "killer cars" all leaked CO into the passenger compartment of the vehicle through faulty exhaust systems. Each vehicle was a different make and model and reported to be in working order, highlighting the fact that these issues may occur without forewarning.

This case series highlights the importance of performing a thorough scene exam and carboxyhemoglobin testing on all decedents found in vehicles. Maintaining a high index of suspicion is paramount to recognizing cases of CO toxicity. In addition, the cases stress the significant role death investigation can have in preventing further injury or death by immediate notification of next of kin and/or whoever obtains custody of these "killer cars".

P129 Fatal Duodenal Ulcer Hemorrhage as a Complication of Chemotherapy: A Case Report

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Peptic ulcer disease affects approximately 1% of the United States's population and leads to approximately 10,000 deaths annually. Common causes of peptic ulcer disease include H. Pylori infection, aspirin or nonsteroidal anti-inflammatory drug (NSAID) use, chronic excessive alcohol use, and hypergastrinemia. However, approximately 20% of ulcers are idiopathic or due to other causes.

We report the case of a 77-year-old woman with metastatic lung adenocarcinoma who had received two cycles of adjuvant therapy with cisplatin and pemetrexed. One week after her second dose, she presented with generalized weakness following a fall at home. She was found to be tachycardiac, anemic and hypokalemic, thought to be due to poor oral intake and chemotherapy side effects. Over the next few days, her hematocrit continued to fall, and she had an episode of melena. On hospital day 5, the patient experienced multiple episodes of bright red blood per rectum and developed hemorrhagic shock. An emergent endoscopy was performed showing an arterial bleed within a duodenal ulcer, but the bleeding could not be controlled and the patient expired. At autopsy, nearly 2L of blood was found in the gastrointestinal tract along with a large duodenal ulcer with multiple surgical clips.

This patient did not have the common risk factors for duodenal ulcer development with no history of NSAID use, heavy alcohol use or H. Pylori infection (immunostaining for H. pylori was negative). No tumor was identified at the ulcer site, or anywhere else at autopsy. However, she was receiving chemotherapy for lung carcinoma, and duodenal ulcers have been reported as a potential uncommon side effect of this specific chemotherapy regimen. Chemotherapy targets rapidly dividing cells, making the epithelium of the duodenum vulnerable as it regenerates every 3-5 days.

In this case, the decedent died in a jurisdiction where therapeutic complication is allowed as a manner of death. However, the manner of death in this case was determined to be natural, as the adjuvant chemotherapy is standard of practice for metastatic lung cancer, which was listed as the cause of death.

P130 Lost in Translation: How Language Barriers Between Non-English-Speaking Families and Healthcare Providers Can Lead to Death

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We are presenting a case of a healthy toddler of non-English-speaking immigrants who reported to the emergency department exhibiting stridor and shortness of breath. After several hours of observation and minimal medical intervention, the toddler fell asleep and his condition improved to the point of discharge from the emergency department. Shortly after awakening, however, the toddler experienced acute clinical deterioration characterized by severe respiratory distress. Less than 30 minutes later, chest compressions were initiated and the toddler subsequently coded. Medical records indicate that this was followed by successful intubation reportedly without obstruction. Despite resuscitative efforts, the child was pronounced dead approximately six hours after initial presentation.

A crucial detail was overlooked. The presiding emergency physician suspected croup, a common respiratory infection involving swelling of the vocal cords and other parts of the upper and middle airway. But, when the toddler was in the emergency room, no viral testing was conducted to confirm this suspicion. Following referral of the case to the medical examiner unit, a next-of-kin interview was conducted with the decedent's mother via interpreter. During this interview, it was disclosed that another caregiver had removed a bean from the child's mouth around the time of symptom onset, which was information not documented in the emergency department record. A postmortem CT scan and subsequent autopsy findings identified a whole, uncooked bean lodged in the toddler's airway, establishing the cause of death as foreign body aspiration with resultant airway obstruction.

This case study highlights the potential for critical clinical information to be lost despite the use of interpreter services, in this instance via a remote platform. The absence of key historical details contributed to a failure to pursue appropriate imaging or bronchoscopy that could have prevented this toddler's death. Shortcomings such as these underscore the need to evaluate the effectiveness of interpretation practices being used in medical settings, particularly regarding high-risk clinical scenarios involving non-English-speaking families.

P131 Unidentified Surgical Hardware and Fatal Lower Gastrointestinal Hemorrhage: A Case Highlighting Gaps in Surgical History Documentation Among Vulnerable Patients

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Lower gastrointestinal bleeding (LGIB) accounts for approximately 20% of GI bleeding-related deaths and presents a persistent diagnostic challenge in both clinical and forensic contexts. Iatrogenic causes like prior surgical interventions represent an underrecognized etiology, particularly in patients with fragmented or incomplete medical records. This medical school anatomical dissection case illustrates how the examination of cadaveric materials can show forensically significant findings that were absent from the incomplete documented medical history and may have directly contributed to the cause of death. A 67-year-old male donor with a known past medical history of hypertension, chronic obstructive pulmonary disease, diabetes mellitus, lumbar sacral fusion, and cholecystectomy was examined during a standard anatomical dissection course. His occupational history as a long-term painter and smoker suggested significant environmental and toxic exposures. Upon opening the abdominal cavity, a substantial volume of clotted blood was identified throughout the mesentery and surrounding viscera, consistent with fatal hemorrhage. Despite thorough examination of the abdominal vasculature, no definitive source of perforation or bleeding could be identified. Dissection of the ascending large intestine revealed five surgical suture clips on the fundus of the urinary bladder and multiple metallic foreign bodies at the

ileocecal junction; neither of which appeared in the donor's available medical records. These objects were recovered, measured, and photographed. Additional pathological findings included left ventricular hypertrophy, polycystic kidney disease, and pulmonary anthracosis; the latter consistent with his prolonged occupational exposures as a painter. The presence of undocumented surgical hardware at the ileocecal junction raises substantive questions regarding its potential iatrogenic contribution to the fatal hemorrhage. This case highlights a critical gap in death investigation: incomplete surgical histories, particularly among working-class and occupationally exposed populations who may have received fragmented care across multiple systems, can obscure true cause of death. The constellation of findings paints a picture of a patient whose healthcare interactions were likely inconsistent and poorly coordinated. Anatomical dissection serves not only as an educational tool but as a forensic resource capable of identifying pathology and surgical history missed during life. This case advocates for the integration of dissection findings into death certification review processes and underscores the public health imperative of thorough surgical record documentation in vulnerable patient populations.

P132 Acute Necrotizing Duodenitis in Fatal Unrecognized Diabetic Ketoacidosis With Concurrent Viral Illness

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Wischnewsky spots, acute necrotizing esophagitis, and acute necrotizing duodenitis are recognized manifestations of upper gastrointestinal mucosal injury in deaths associated with metabolic derangement. Although originally linked to fatal hypothermia, Wischnewsky spots are also associated with diabetic ketoacidosis and other ketotic states. Acute esophageal necrosis has also been observed in these circumstances. Acute necrotizing duodenitis is less frequently reported than gastric or esophageal involvement and may be underrecognized, though an increasing number of cases associated with diabetic ketoacidosis have been described in recent years.

The decedent was a 45-year-old male with remote alcohol use disorder and no other significant medical history. Per the investigative report, he had a one-week history of illness characterized by heartburn, dizziness, and persistent vomiting. After not hearing from the decedent for a day, family members entered his residence, where he was found deceased in the bathroom shower, partially clothed. Emergency medical services were contacted, and death was pronounced at the scene. Partially used over-the-counter cold medications, antacid tablets, and cough drops were identified, as well as a bucket partially filled with liquid at the bedside.

Autopsy examination of the upper gastrointestinal tract demonstrated patchy brown-black discoloration of the distal esophageal mucosa, scattered Wischnewsky spots in the distal stomach, and prominent horizontally oriented black mucosal patches in the proximal duodenum. Histologic evaluation of the esophageal and duodenal lesions showed diffuse necrotizing mucosal inflammation with associated brown pigment deposition, while the gastric Wischnewsky lesions showed similar pigmentation but less prominent inflammation. The kidneys showed no Armanni–Ebstein change. In addition to the gastrointestinal findings, postmortem nasopharyngeal respiratory viral testing was performed and detected seasonal coronavirus.

Postmortem testing on vitreous and femoral blood demonstrated biochemical evidence of ketoacidosis. Vitreous dipstick testing performed at autopsy was positive for elevated glucose and ketones, and send out quantitative vitreous testing showed elevated glucose (303 mg/dL). Femoral blood testing showed acetone (54 mg/dL) and beta-hydroxybutyric acid (990 mcg/mL). A femoral blood volatile panel was positive for acetone (>1.0 mg/dL) and isopropanol (3.0 mg/dL).

This case adds to the limited literature on acute necrotizing duodenitis in diabetic ketoacidosis by documenting duodenal-predominant mucosal injury as a presenting manifestation of fatal diabetic ketoacidosis in a previously undiagnosed patient with concurrent viral illness. It also supports careful examination and histologic sampling of duodenal discoloration in sudden unexplained deaths, as duodenal necrosis may be more prominent than gastric or esophageal involvement.

P133 Spontaneous Coronary Artery Dissection and its Role in Maternal Mortality

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Spontaneous coronary artery dissection (SCAD) is a non-atherosclerotic, non-traumatic cause of acute coronary syndrome, myocardial infarction, and sudden cardiac death that disproportionately affects younger individuals, particularly women. Although clinical recognition of SCAD has improved, fatal cases remain underrecognized, as diagnosis frequently occurs only at autopsy. In the forensic setting, SCAD represents a critical consideration in sudden natural death and pregnancy associated mortality.

We present a case series of 11 decedents in which the cause of death was attributed to acute or complications of remote SCAD at our institution over the course of a 10-year period. Comprehensive medicolegal investigation, gross examination, and histopathologic evaluation of the coronary arteries and myocardium were performed in all cases. Demographic data, pregnancy or postpartum status, circumstances of death, coronary artery distribution, morphologic characteristics of dissection, myocardial findings, and the presence or absence of luminal thrombus were reviewed.

The cohort consisted primarily of women with ages ranging from 28-55. There were two male decedents, aged 58 and 60, both with underlying hypertensive and atherosclerotic cardiovascular disease. The left anterior descending coronary artery was most frequently involved, with several cases demonstrating multivessel dissection. Acute myocardial ischemia or infarction was present in most cases. Coronary thrombus was seen in only one case and was seen in the false lumen, supporting previous studies demonstrating that thrombosis is not a dominant feature of fatal SCAD. Four of the cases occurred during the peripartum/postpartum period, half of which had underlying hypertensive cardiovascular disease while the rest had no significant medical history. These cases all involved at least two vessels.

This case series highlights SCAD as an important and potentially underdiagnosed cause of sudden death encountered in medicolegal practice, including maternal mortality investigations. Due to the rarity of pregnancy-associated spontaneous coronary artery dissection (PSCAD), we hope to underscore the relevance of SCAD within the spectrum of pregnancy associated and pregnancy related deaths investigated by medical examiners. Recognition of its characteristic pathologic features, particularly intramural hematoma without significant atherosclerosis or luminal thrombus, is essential for accurate determination of cause of death. Routine meticulous examination of the coronary arteries is critical in sudden deaths of young and otherwise healthy individuals, and in women who are pregnant or postpartum, to ensure appropriate classification and public health reporting of SCAD-related fatalities.

P134 Kaposi Sarcoma: From Biopsy to Autopsy

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A 33-year-old male presented to the Emergency Department with new onset of weakness, nausea, and vomiting. He had been diagnosed as having Human Immunodeficiency Virus (HIV) infection three months prior that rapidly progressed to Acquired Immunodeficiency Syndrome (AIDS). His CD4+ T-cell count at time of admission was 7 and his HIV-1 RNA viral load was detected (<1.47) but below the limit of quantification. Endoscopy revealed esophagitis, gastritis, and duodenitis. The duodenitis was grossly characterized by severe diffuse inflammation, congestion, and raised nodularity resulting in moderate stenosis of the duodenal bulb. Biopsies taken at the site showed a low grade neovascular proliferation within the lamina propria which stained positive for vascular endothelial markers and Herpes Virus type 8 (HHV8), confirming the diagnosis of Kaposi sarcoma (KS). Over the course of his hospitalization, the patient continued to deteriorate. He developed bilateral pleural effusions and ascites positive for HHV8, abnormal liver function tests, pancytopenia requiring increasing amounts of packed red blood cells (pRBCs), and probable immune reconstitution syndrome. The patient died after 29 days in hospital.

External examination at autopsy showed severe jaundice of the skin and eyes, but no skin lesions attributable to KS. Internal examination showed sanguinous pleural effusions and ascites, as well as multiple raised, well demarcated red-purple lesions in the gastrointestinal (GI) tract and on the

epicardium. The intrahepatic bile ducts were thickened with dilated ducts involving the gallbladder neck. The lungs, pancreas and spleen all displayed foci of hemorrhage and necrosis. Microscopy revealed vascular proliferations within the GI tract, epicardium, lungs, spleen, gallbladder and bile ducts, pancreas and lymph nodes, positive for HHV8, confirming the diagnosis of KS. Additionally, the liver displayed multiple foci of infarct necrosis with intracanalicular and ductal bile stasis due to biliary and hepatic artery involvement by tumor. The cause of death in this case is attributed to hepatic failure due to Kaposi Sarcoma secondary to HIV/AIDS.

KS is a locally invasive, typically low-grade proliferation of vascular channels caused by infection with HHV8. The disease course in HIV/AIDS patients is more aggressive and commonly disseminated, carrying a worse prognosis. In 2023, approximated 35,000 new cases of KS were diagnosed world-wide and half resulted in death. Sub-Saharan African KS cases comprise over 70% of the case burden. There is no known cure for KS, but treatment of underlying disorder compromising the immune system, surgical resection, radiation and even systemic chemotherapy can be utilized.

P135 Fatal *Streptococcus salivarius*-Induced Waterhouse-Friderichsen Syndrome in a Vulnerable Geriatric Patient

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Introduction:

Waterhouse-Friderichsen Syndrome (WFS) is a rare, deadly disease involving bilateral adrenal hemorrhage, classically in the context of meningococcal sepsis. We present a case of WFS caused by *S. salivarius*, a gram positive viridans group streptococcus that typically colonizes the oral cavity and gastrointestinal tract and is widely regarded as a benign commensal species.

Case:

A 69-year-old female with a past medical history involving coronary artery disease, lung cancer and recurrent falls was initially hospitalized and diagnosed with a left clavicular fracture and traumatic rhabdomyolysis after being found down at her home by family members. Following medical stabilization, she was placed in a skilled nursing facility. Weeks later, family members found her minimally responsive during a visit, and called emergency medical services despite reassurance from staff at the facility. The patient ultimately coded en route to the hospital, and time of death was called after resuscitation efforts failed.

A forensic autopsy was performed and revealed extensive hemorrhage of both adrenal medullae. Microscopic examination of the adrenal glands also showed evidence consistent with hemorrhage and associated inflammation. The cutaneous petechiae or purpura classically associated with meningococcal WFS were not noted; however, culture of the tissue was positive for *Streptococcus salivarius*. The remainder of the autopsy was significant for the presence of a subacute left clavicle fracture with associated rhabdomyolysis, cardiomegaly (420 gm), severe coronary artery atherosclerosis status-post bypass surgery, remote gastric bypass surgery, pulmonary emphysema, and absence of residual lung carcinoma. The cause of death was Waterhouse-Friderichsen Syndrome due to *S. salivarius* infection following recent ground level fall with clavicle fracture. Significant contributing conditions included hypertensive and atherosclerotic cardiovascular disease and pulmonary emphysema. The manner of death was classified as accidental.

Discussion:

While WFS is commonly caused by meningococcemia, this case highlights the pathogenicity of *S. salivarius* in vulnerable hosts. We hypothesize that the decedent's initial trauma induced systemic inflammation and contributed to mucosal barrier compromise, and that this physiologic state facilitated translocation of oral or gastrointestinal commensals into the bloodstream. This case underscores the critical role of the forensic autopsy in identifying atypical infectious causes of death, especially after trauma that would otherwise be considered minor, and suggests the need for greater clinical vigilance in the post-traumatic monitoring of vulnerable geriatric patients.

P136 Accidental Overdoses in East Tennessee with Novel Synthetic Opioid N-Propionitrile Chlorphine: A Case Series

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N-propionitrile chlorphine is a recently discovered synthetic opioid that was first listed in East Tennessee as a cause of accidental overdose in late 2025. Since then, there have been approximately 40 more cases reported by the Knox County Forensic Center. Preliminary research has shown that this new drug is at least ten times stronger than fentanyl and does not respond as readily to naloxone administration. This case series focuses on 38 individuals who have an accidental manner of death with a cause of death directly related to N-propionitrile chlorphine toxicity. The goal of this research was to create a descriptive clinical picture of this lethal illicit drug that thus far has no established research in humans. A descriptive frequency statistical analysis was performed on patient demographics and associated drug compounds to discover any similarities in these individuals and their concomitant drug use. Findings showed a 73.7% association with methamphetamine, a 65.8% association with fentanyl, and a 44.7% association with naloxone. The population consisted of majority white males with a mean age of 43. All the decedents had a history of past or current illicit drug use. Incidental findings of positivity for medetomidine were also seen and not previously identified in past toxicology research for Knox County. As new drug formulations and analogues are being created so frequently, this cases series serves to identify new opioids and potential incidental findings of other drugs emergently.

P137 Death by Spork

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Foreign body ingestion is a diverse health issue, ranging from accidental ingestion in children to malingering in prisoners. A small number of cases associated with foreign body ingestion are seen with mental illness. Schizophrenia has a spectrum of presenting symptoms with differing levels of severity, commonly including visual or auditory hallucinations or commands. Rarely, these hallucinations involve commands to ingest foreign objects. This case review highlights the potential consequences of repeated foreign body ingestion. A 29-year-old male with schizophrenia was found unresponsive in his jail cell. He had a history of recurrent foreign body ingestion, multiple abdominal surgeries for foreign body ingestion, including an ileostomy site following a bowel resection. During his last hospital admission, a computed tomography scan revealed bowel necrosis with abscess and multiple foreign bodies. General surgery recommended comfort care and hospice due to his significant surgical history. Postmortem examination revealed the small intestine to contain two halves of a pencil, two plastic spoons, a segment of coated wire, fragments of plastic and paper, and twelve plastic sporks; all of which had been inserted through his ostomy site. This resulted in bowel necrosis and wall perforation. The cause of death was determined to be small bowel necrosis due to foreign body – spork insertion. This case highlights the need for careful review of medical history and autopsy in schizophrenic patients.

P138 Hodgkin Lymphoma Masquerading as Erythrodermic Psoriasiform Dermatitis: A Postmortem Diagnosis

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A 68-year-old female presented to the hospital with atypical chest pain and a skin rash, involving her popliteal fossa. Initial CT imaging demonstrated prominent mediastinal and hilar lymphadenopathy, and outpatient follow-up was recommended but ultimately not obtained. Over the subsequent three months, the patient had multiple hospital encounters for worsening rash with desquamation and progressive spreading. The rash was initially diagnosed as ichthyosis based on clinical appearance but worsened despite topical treatment. A subsequent skin biopsy revealed psoriasiform and spongiotic dermatitis. During her final hospitalization, she developed hypotension and lactic acidosis, requiring intubation and

was ultimately pronounced deceased. A hospital autopsy was ordered to clarify cause of death. Autopsy revealed a diffuse, desquamative skin rash involving greater than 80% of the body surface area and extensive lymphadenopathy with matting of the lymph nodes. Histological examination of the lymph nodes revealed atypical cells morphologically consistent with Reed-Sternberg cells. This case highlights an atypical erythrodermic psoriasiform manifestation of Hodgkin lymphoma and the importance of autopsy in the instance of unusual and perplexing natural deaths. Furthermore, autopsy rarely is utilized for the evaluation of hematological and dermatological conditions but played a key role in this case.

P139 Integrating Biomechanical Principles into Imaging-Based Trauma Interpretation in Forensic Practice

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Introduction:

Imaging modalities are increasingly utilized in forensic and medicolegal death investigation for the evaluation of skeletal trauma. While advances in imaging have improved visualization, interpretation remains dependent on the examiner's ability to distinguish antemortem, perimortem, and postmortem changes, particularly in complex or decomposed cases.

Objective:

This study presents a framework for incorporating biomechanical principles into imaging-based trauma analysis to enhance interpretive accuracy in forensic practice.

Methods:

A conceptual and applied approach examines how mechanical forces—tension, compression, bending, and torsion—are reflected in skeletal structures and fracture patterns observable through imaging. Trauma patterns are evaluated in relation to bone structure, including geometry, cortical thickness, and anatomical variation.

Results:

Integration of biomechanical principles provides a structured method for evaluating skeletal trauma beyond descriptive observation. Linking fracture characteristics to underlying mechanical processes supports more consistent differentiation between trauma types.

Discussion:

Incorporating biomechanical analysis into imaging-based forensic workflows enhances trauma interpretation and supports more informed medicolegal decision-making, particularly in cases involving limited context or vulnerable populations.

P140 Delayed Homicide due to Sexual Assault Occurring Three Decades Previously

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Homicide certification following remote injury presents unique medicolegal challenges. Beyond the necessity for establishing a direct pathophysiologic link between the original injurious event and death, many complicating factors may present a challenge in proving delayed homicide. The absence of adequate documentation of the original injury, jurisdictional differences between where the injury and death occurred, and improper or lack of reporting of death to proper authorities are common barriers. Due to prolonged survival and underreporting, delayed homicides may be missed altogether, leading to failure of justice and underestimation of crime trends. If such cases are not identified, further injustice will impact marginalized populations, such as victims of sexual violence.

We report the case of a 45-year-old female with documented history of rape three decades prior to death, from which an HIV infection and seizure disorder was acquired. Preceding death, the decedent presented with marked cachexia, had been bedridden for three weeks. At medicolegal autopsy, left lower lobe

pneumonia was evident. Additionally, examination of brain tissue revealed hippocampal sclerosis and acute hypoxic injury to the cerebellar dentate nucleus. Postmortem toxicology was positive for dextromethorphan and topiramate (4,704 ng/mL), consistent with active antiepileptic treatment. The cause of death was certified as I – Pneumonia; II – Seizure Disorder; Human Immunodeficiency Virus Infection.

The manner of death was certified as a homicide due to the clear pathophysiological link between the rape to the cause of death. The acquired HIV infection and the development of a seizure disorder were related to the sexual assault, as per documentation in medical records. Over time, the seizures and HIV infection led to a severely compromised, immunodeficient state, resulting in predisposition to pneumonia. This case underscores the importance of a longitudinal approach to forensics, where sexual violence is reframed from solely being an acute traumatic event to being a chronic and potentially mortal exposure. The public health implications of this are significant. Survivors of sexual violence often experience barriers to care, underreporting, and patchy documentation. When delayed homicides are not identified, the long-term mortality and morbidity of sexual violence is underestimated and may prevent sufficient allocation of resources for prevention, support, and care in this vulnerable population. Ultimately, by adequately recognizing delayed homicides, the gap between sexual violence victims and health equity can be bridged.

P141 Accessibility Audit of the Future Forensic Pathologists Committee and National Association of Medical Examiners Web Presence

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Digital accessibility is essential for everyone who uses the internet. Approximately 1 in 6 people worldwide live with a disability (WHO, 2023), and access to information is a human right (United Nations, 2006) that is particularly threatened by a fractured World Wide Web. Pending requirements under Title II of the Americans with Disabilities Act will further pressure medical examiner / coroner offices to meet accessibility standards as early as April 2027 (Federal Register, 2026). Principles of Universal Design (CAST, 2024) emphasize that systems designed with accessibility in mind create more access for all, not only those with disabilities. While many accessibility tools are now built into operating systems, web browsers, content management systems, and default settings, access requires conscious and consistent effort to ensure that everyone who wants to connect with online resources and with each other, can. Improving the digital accessibility of the National Association of Medical Examiners (NAME) and the Future Forensic Pathologists Committee (FFP) Learning Platform aligns with multiple goals in NAME's 2022-2030 Strategic Plan.

In 2025, the FFP launched a pilot learning platform to host opportunities for students and trainees to learn and connect with educational opportunities. In an effort to support as many learners as possible, the authors have completed a comprehensive accessibility audit of the NAME website (TheNAME.org) and FFP learning platform (ForensicPathologyEducation.org) in collaboration with the Website and Opportunity & Access Committees for both platforms, we measured our adherence to the Web Content Accessibility Guidelines (WCAG 2.2), the foremost standards for general web accessibility. We have also incorporated interdisciplinary perspectives on contemporary digital accessibility as applied to our web presence. These efforts have resulted in several suggestions to guide continued and improved accessibility of NAME's and FFP's web-based content. We encourage NAME members to use this brief introduction to launch efforts to improve the accessibility of their own websites and web-based projects.

P142 Grill Brushes as a Hidden Death Risks: What are we Missing?

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Injuries related to the use of grill brushes with wire bristles continue to pose a threat to public safety. In March 2026, a recall of over 10.2 million wire bristle grill brushes underscored the magnitude of this hazard. These injuries are particularly concerning because individuals are often unaware of bristle ingestion, leading to delays in diagnosis and appropriate medical treatment.

A review of published cases and reports submitted to the U.S. Consumer Product Safety Commission demonstrates that most injuries involve the aerodigestive tract, with management ranging from self-removal to complex surgical interventions. Although fatalities are rare, they have been documented.

A query of the Consumer Product Safety Commission National Electronic Injury Surveillance System (NEISS) database from January 1, 2011, through December 31, 2025, was conducted using relevant codes and search terms to identify cases for analysis. Of 74 identified cases, 50 (67.5%) required medical intervention, with the majority of those (35; 70%) necessitating surgical management. All cases involving bowel injury required surgery and may represent a higher-risk subset. Notably, the only deaths identified (2 cases; 2.7%) were associated with bowel perforation.

These findings highlight a critical gap in surveillance: there is currently no reliable mechanism to identify or longitudinally track patients who develop delayed complications that may ultimately result in death. This raises the possibility that fatalities related to wire bristle ingestion are underrecognized and underreported, particularly given the nonspecific clinical presentations and potential for delayed disease progression.

P143 A Rare Report of Glycogen Accumulation Near the Site of a Recent Myocardial Infarction with an Unexpected Genetic Finding of Uncertain Significance

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Introduction:

Myocardial infarction (MI) remains a leading cause of sudden cardiac death, and autopsy examination occasionally reveals unexpected histological findings that challenge pathological interpretation. While glycogen accumulation within cardiomyocytes is associated with glycogen storage diseases (GSDs), it is also a recognized feature of myocardial hibernation, an adaptive response of cardiomyocytes to chronic ischemia characterized by sarcomere loss and glycogen replacement. However, localized glycogen deposition confined to the peri-infarct zone is seldom reported at autopsy. We present such a case in a patient with severe atherosclerotic cardiovascular disease and an incidental pathogenic variant in PHKG2, a gene associated with autosomal recessive liver GSD type IXc.

Case:

The decedent was a 58-year-old female with limited medical history who was reportedly witnessed to become unresponsive while sitting on the couch speaking with a family member. EMS responded and pronounced death shortly after arrival. Family reported that the decedent complained of dyspnea and chest pain over the preceding days. Due to limited medical history, a full autopsy examination was performed, including toxicology and histology.

Autopsy examination demonstrated cardiomegaly, arterionephrosclerosis, significant atherosclerosis, and a recent MI (days to weeks in age). Microscopic examination showed myocytes with clear vacuolated cytoplasm near the recent MI. Subsequent PAS and PAS-D staining demonstrated glycogen in the cells of interest. Due to the unexpected presence of glycogen, a GSD genetic panel was performed after consent from next of kin. The panel was positive for a pathogenic variant in PHKG2, associated with autosomal recessive liver GSD type IXc. This result is insufficient to cause disease. The cause of death is hypertensive and atherosclerotic cardiovascular disease, and the manner of death is natural.

Discussion:

The glycogen accumulation confined to the peri-infarct zone likely represents a histological footprint of pre-existing myocardial hibernation. Chronic coronary hypoperfusion induces cardiomyocyte dedifferentiation, characterized by sarcomere loss and glycogen replacement, driven by hypoxia-inducible factor (HIF)-mediated upregulation of glycogen biosynthetic enzymes. Upon acute infarction, necrotic myocytes preserved the accumulated glycogen in situ. An alternative hypothesis involving ischemia-induced aberrant gene expression lacks a unified mechanistic pathway in the current literature. While the incidental heterozygous PHKG2 variant is insufficient to cause GSD type IXc, the question of whether carrier status modifies glycogen metabolism under ischemic stress remains of uncertain significance. This case highlights the value of comprehensive autopsy examination and the interpretive challenges of unexpected histological and genetic findings in the setting of ischemic heart disease.

P144 Ruptured Myocardial Infarction/Aneurysm and Methamphetamine and Ethylone

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Emerging synthetic drugs, such as ethylone, are increasingly being abused; however, they are not necessarily identified in routine toxicology testing. As with certain other illicit drugs, ethylone could theoretically contribute to a death via exacerbation of underlying natural disease. We present the case of a man who died from a ruptured myocardial infarct (MI) with toxicology testing positive for methamphetamine and ethylone.

A 55-year-old man was found deceased on a public bench, with his genitals exposed through unzipped pants. Medicolegal autopsy revealed an absence of lethal injuries but was significant for hemopericardium related to a ruptured left ventricular aneurysm/myocardial infarction. On toxicology analysis, femoral blood was positive for cannabinoids and amphetamines, with a methamphetamine level of 201 ng/mL. Urine was positive for amphetamines, cannabinoids, and ethylone. The cause of death was cardiac tamponade due to hemopericardium due to ruptured left ventricular aneurysm related to myocardial infarct due to underlying coronary artery atherosclerosis with a contributing cause of the toxic effects of methamphetamine and recent ethylone exposure. The manner of death was accidental. The context of genitalia exposure could not be elucidated.

It is known that certain deaths related to natural disease mechanisms may be exacerbated by drug use. For example, cocaine may contribute to a death due to a ruptured berry aneurysm. Stimulants similar to those mentioned increase catecholamines, increasing workload of the heart while simultaneously constricting vasculature and increasing stress on the heart. Synthetic cathinones, like ethylone, are becoming increasingly accessible and are commonly referred to as "bath salts." Cathinones naturally occur in khat plants, but are chemically engineered by using commercial solvents to make variations like ethylone. Ethylone is abused to mimic effects of other stimulants. Synthetic cathinones can impair mitochondrial function leading to cardiomyocyte stress and disrupt electrolytes causing arrhythmias. Ethylone also has stimulatory effects on the cardiovascular system.

The case highlights the importance of understanding how synthetic drugs may potentially contribute to certain otherwise "natural" deaths. The case also serves to suggest that it might be worthwhile to broaden the definition of vulnerable populations to include individuals connected to the sex industry, where substance use may overlap with occupational and social risk factors. It is important for the forensic community to recognize the growing availability of synthetic drugs and incorporating their detection into routine toxicological analyses. Improved awareness of these substances can support more effective prevention, identification, and public health responses.

P145 Demographic Patterns in All-Terrain Vehicle Fatalities within the State of Georgia: A Retrospective Autopsy-Based Study

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Introduction:

All-terrain vehicle (ATV) use is associated with significant morbidity and mortality and remains an ongoing public health concern, particularly among pediatric populations. Children account for a disproportionate share of ATV-related injuries and deaths, with risk factors including lack of protective equipment, use of adult-sized vehicles, and high rates of rollover events. ATV-related injuries and fatalities have increased over time with growing recreational use, and pediatric cases represent a substantial proportion of emergency department visits and hospitalizations. Characterizing demographic patterns in fatal cases within the state of Georgia may help identify high-risk populations and inform targeted prevention strategies.

Methods:

A retrospective review of de-identified medicolegal autopsy cases involving ATV-related fatalities was performed. Cases flagged for exclusion were omitted. Demographic variables, including age, sex, race, and county, were analyzed using descriptive statistics. Age was stratified into pediatric (<18 years), young adult (18-24 years), adult (25-44 years), and older adult (45-64 years) groups.

Results:

Nineteen cases were included. The mean age was 28.3 years (median 22; range 7–62). Males comprised 73.7% of decedents (n=14), while females accounted for 26.3% (n=5). The cohort was predominantly White (100%, n=19).

Age stratification demonstrated that pediatric decedents (<18 years) represented 42.1% (n=8), young adults (18–24 years) 10.5% (n=2), adults (25-44 years) 26.3% (n=5), and older adults (45-64 years) 21.1% (n=4). No adults greater than 65 years of age were identified. Geographic clustering was observed, with Morgan County contributing the highest number of cases (n=3), followed by multiple counties with two cases each to include Crawford, Chattooga, and Appling counties.

Discussion:

ATV-related fatalities disproportionately affect males and demonstrate substantial involvement of pediatric populations. The wide age distribution highlights risk across most of the lifespan, while regional clustering suggests environmental and access-related contributors. These findings support targeted prevention strategies, including pediatric safety interventions, helmet use enforcement, and region-specific public health initiatives aimed at reducing ATV-related mortality.

P146 Molecular Autopsy in Resource Limited Settings: Utility Beyond Diagnostic Yield in Hospital Autopsy Practice

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Introduction:

A significant proportion of hospital autopsies remain inconclusive despite comprehensive gross and histologic evaluation. Increasingly, autopsy is recognized not only for determining cause of death but also identifying heritable conditions with important implications for surviving family members. This positions autopsy at the intersection of forensic pathology and public health, where postmortem diagnoses can inform cascade genetic testing, risk stratification, and preventive care in living relatives. Molecular autopsy has emerged as a tool to identify occult genetic etiologies, particularly in sudden or unexplained deaths, and cases suspicious of inherited diseases. However, its implementation in practice remains limited, largely due to cost constraints. This study evaluates the utility of targeted genetic testing in a hospital autopsy setting.

Methods:

A retrospective review was conducted of all hospital autopsies performed at the University of Washington

between 2023 and 2025 in which postmortem genetic testing was undertaken. Testing was selectively performed based on clinical suspicion and family concerns. Five cases were supported by faculty startup funds, while one case was funded through insurance. Clinical history, autopsy findings, type of genetic testing, and results were reviewed to assess diagnostic yield and potential downstream impact.

Results:

The cohort included six decedents aged 10 to 63 years. Genetic testing modalities included targeted gene panels and genomic sequencing with deletion/duplication analysis. A pathogenic germline variant (BRCA2 in a decedent with multiple malignancies) was identified in 1 of 6 cases (17%), while 5 cases (suspected heritable cardiovascular disease, connective tissue disorders, and unexplained neurologic conditions) demonstrated no reportable variants. Despite the low diagnostic yield, testing provided clinically meaningful information. In the positive case, family members were referred for genetic counseling, while in the other cases, heritable conditions were effectively excluded, thereby informing risk assessment for surviving family members.

Discussion:

In this series, targeted molecular autopsy demonstrated limited diagnostic yield but significant clinical and public health utility. With or without pathogenic findings, genetic testing contributed to family counseling and risk stratification, underscoring its role beyond cause of death determination. Strategic and selective implementation of genetic testing represents a feasible approach in resource-limited settings. These findings support the integration of molecular autopsy into hospital practice as a bridge between forensic pathology and public health, particularly for vulnerable populations at risk for inherited disease.

P147 Marjolin Ulcer: A Rare Complication in a Gunshot Wound Death

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Marjolin ulcer is a clinical and histological diagnosis of malignant neoplasm, most frequently squamous cell carcinoma, at the site of chronic inflammation or previous injury and scarring. Due to late diagnosis, Marjolin ulcers have a high mortality rate. We present a 52-year-old incarcerated man who sustained a gunshot wound of the lumbar spine in 1993, resulting in paraplegia at the level of L3/4. His immobility led to chronic decubitus ulcers and osteomyelitis requiring long-term management. In 2025, he was diagnosed with malignant, metastatic squamous degeneration involving the ulcerated soft tissue and underlying bone, with metastatic spread to regional lymph nodes. Even with palliative radiation therapy, he died within 5 months of diagnosis. His death was ruled a homicide. This case report provides guidance for future forensic autopsy cases with similar features to aid in recognition and diagnosis of this rare complication.

P148 Acute hydrocephalus and Fibrinoid Vascular Destruction: Sudden Unexpected Death in a Toddler Explained by Rare Infectious Sequelae

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Introduction:

Central nervous system (CNS) infection, typically bacterial, may present as acute hydrocephalus due to ventricular inflammation. Viral infection is uncommonly associated with CNS vasculopathy and even more rarely presents with acute hydrocephalus. Herein, we describe a case of a toddler with a known rare genetic disorder and sudden unexpected out-of-hospital arrest, clinically diagnosed with acute hydrocephalus and herniation of unknown etiology. Autopsy confirmed Rhinovirus/Enterovirus-associated CNS and pulmonary pathology. This case illustrates a rare infectious complication which forensic pathologists and forensic neuropathologists should be aware.

Case:

The decedent was a 3-year-old male with OTX2 gene mutation. Mutations of this homeobox containing transcription factor manifest as micro/anophthalmia, among other craniofacial and midline abnormalities.

In our decedent, this resulted in micro/anophthalmia and subsequent blindness; he was also nonverbal. He was well cared for at home by his family. A recent history of upper respiratory infection and subjective fever was noted. He was heard screaming during a presumed nap and was found unresponsive and cyanotic. EMS achieved ROSC after nearly an hour of resuscitative efforts. Hospital testing revealed PCR positivity for Rhinovirus/ Enterovirus (negative blood and urine cultures), acute systolic heart failure, severe hydrocephalus with 3rd and 4th ventricle herniation despite external ventricular drain placement, and hypoxic brain injury.

The brain showed marked hyperemia and congestion with uncal and tonsillar herniation. Punctate white matter hemorrhages were seen in cortical white matter as well as the cerebellum and brainstem. The fourth ventricle and cerebral aqueduct were patent. The lungs showed acute bronchitis/bronchiolitis with acute lung injury, and no cytopathic viral effect. There was diffuse reactive lymphadenopathy. Features of OTX2 mutation and prolonged survival following out-of-hospital arrest were also seen.

Discussion:

Autopsy demonstrated massive cerebral edema and central nervous system fibrinoid vascular destruction involving medium and small arteries with associated parenchymal hemorrhage, herniation, and global hypoxic-ischemic injury. No obstruction of the ventricular system was seen. Despite prominent findings related to the decedent's known genetic disease, immunodeficiency is not described in this syndrome and dysmorphism is an insufficient explanatory mechanism for his clinical presentation. Rather, hydrocephalus and respiratory arrest due to Rhinovirus/ Enterovirus infection involving the CNS and lungs is the cause of his out-of-hospital arrest and death. This case illustrates the importance of familiarity with rare disease mechanisms before attributing a natural death to an underlying genetic condition instead of other, potentially reportable disease.

P149 Spontaneous Dissection of Left Internal Mammary Artery Graft Complicating Coronary Artery Bypass Surgery

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Spontaneous left internal mammary artery (LIMA) graft dissection is a rare, life-threatening complication of coronary artery bypass grafting (CABG) that typically presents as acute coronary syndrome months to years postoperatively. Fourteen case reports have described this complication based on clinical and imaging findings alone, without postmortem analysis. We present the first autopsy with a histopathological description of spontaneous LIMA graft dissection, causing sudden death eight days after surgery.

A 48-year-old undomiciled woman with uncontrolled hypertension, coronary artery disease, aortic insufficiency, mitral regurgitation, chronic kidney disease, and a history of methamphetamine use underwent CABG with LIMA bypass of a stenotic obtuse marginal artery, concurrent bioprosthetic aortic valve replacement, and mitral valve repair. Her postoperative course was unremarkable, and she was discharged on day seven to a family member's home. The following morning, she was found deceased after reporting only mild back pain the prior evening.

The autopsy revealed an acute dissection extending along most of the LIMA graft, with a medial dissection plane and luminal collapse, sparing the sternal surgical site and anastomosis. Histologically, the dissection plane demonstrated an admixture of erythrocytes, fibrin, and scattered inflammatory cells including karyorrhectic neutrophils along the false-lumen lining. No medial inflammatory infiltrate to suggest vasculitis was identified. There were slight medial degenerative changes without overt fibromuscular dysplasia. The dissection segment had an adventitial infiltrate predominantly composed of lymphocytes and histiocytes, with scattered eosinophils. Comparing the inflammatory pattern to the characterized evolution of acute aortic dissections, findings were most consistent with a dissection less than 24 hours old, supporting onset between discharge and death. Postmortem toxicology was positive only for tramadol. The cause of death was certified as spontaneous LIMA graft dissection complicating CABG for treatment of atherosclerotic cardiovascular disease.

This report uses high-quality gross and microscopic images to highlight the first autopsy case with histopathologic examination of a dissected LIMA graft, documenting this complication in the early

postoperative period. It also highlights the intersection of substance use, housing instability, and complex cardiovascular disease as contextual factors in potential perioperative risk. Forensic and hospital autopsy pathologists should be aware of this rare but potentially fatal therapeutic complication in decedents with a history of CABG surgery.

P150 Patterns and Trends in Homicide: A 25-Year Review from the St. Louis City Medical Examiner's Office

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Recent public health data shows the rate of homicides has increased in the United States over the past decade. The Bureau of Justice Statistics reported a 34% increase in homicide rates from 2014 to 2023, with a 16.7% increase in the percentage of homicides involving firearms. To further characterize these trends within a medium-sized urban city, a retrospective analysis was conducted.

Case files from the St Louis City Medical Examiner's Office (STL MEO) were reviewed to identify homicide cases from 2000 to 2024. Demographic information, cause of death (COD), injuries and modalities, as well as information of the incident were collected.

4,667 cases were identified with a male to female ratio of 6.1:1 and an age range of 8 minutes to 92 years (median: 29 years). The injury modalities were broadly categorized as follows: Gunshot Wound (87.1%), Blunt Force (6.6%), Sharp Force (4.8%), Asphyxia (1.4%), Smoke/Thermal Injury (0.4%), and Other (1.1%). Examples of modalities classified as "Other" include drowning, toxicity, and homicidal violence of undetermined nature. In 56 cases (1.2%), multiple modalities were involved. Delayed deaths, defined as greater than 30 days from incident, accounted for 3.1% of cases. Of the cases with known incident zip codes, 3105 cases (79.9%) were from zip codes entirely within St. Louis City limits, with an additional 440 cases from zip codes partially within city limits.

The number of homicide cases per year increased over the study period, from 138 cases in 2000 to 190 in 2024. Over the last five years of the study period (2020-2024), the average number of homicide cases per year was 239 compared to 139 over the 2000-2004 period, a statistically significant increase of 73%. Similarly, an increase in gunshot homicides from 75.1% to 92.9% was identified when comparing the same 5-year periods. The highest number of homicide cases was in the year 2020 (308) with nearly 95% of cases involving firearms.

The number of homicide cases reported to the St. Louis City Medical Examiner's Office and the percentage of cases involving firearms have steadily increased over the past 25 years. These results align with reported national trends and aim to provide objective data as a foundation to strengthen and inform public health efforts to address this trend.

P151 A Relative Reason: Sudden Death and a Suspected Metabolic Disorder

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In autopsies where genetic or acquired metabolic abnormalities are suspected, molecular testing and family interviews can play an important diagnostic role.

A 26-year-old male with a past medical history of psoriasis was found unresponsive in his residence after a brief period of illness involving nausea, vomiting, and muscle pain. On calling the decedent's mother, she described him as "sickly," stating that he had digestive issues from a young age and would get sick after consuming protein. His newborn screen was normal, and he had no formal medical diagnoses. Shortly following his autopsy, a cousin of the same age was hospitalized with acute liver failure of unknown etiology, requiring a transplant. In the months following transplantation, the cousin was diagnosed with lipodystrophy syndrome.

Autopsy revealed marked hepatomegaly with diffuse, severe steatosis, steatohepatitis, and cholestasis. The kidneys exhibited subnuclear vacuolization of tubular epithelial cells ("Armanni-Ebstein lesion"). Toxicology was positive for beta-hydroxybutyric acid (55 mcg/mL) and acetone (7.0 mg/dL), and negative for all tested drugs of abuse, including ethanol. Vitreous glucose levels were normal. While autopsy findings were nonspecific, they suggest underlying metabolic disease. Minor elevations of ketones are less likely due to diabetic or alcoholic ketoacidosis. Outside of these, relative malnutrition should be considered as an underlying cause, raising the possibility of an undiagnosed congenital or acquired metabolic disease. This hypothesis is supported by concurrent presentation of a relative with severe liver dysfunction attributed to a lipodystrophy syndrome, forms of which are heritable.

For cases of undiagnosed metabolic disease, a molecular autopsy via genetic testing can be a useful tool. While most articles on molecular autopsy focus on sudden cardiac death, molecular investigations can be useful for identifying inborn errors of metabolism or acquired metabolic disorders. Additionally, cases like this one highlight the importance of open dialogue with those close to the decedent and thorough investigation in cases with familial disease distribution. In this case, genetic workup may have been considered to help illuminate the underlying cause of death, however, the concomitant diagnosis of the cousin's acute liver failure due to lipodystrophy provided sufficient reasonable suspicion and allowed for the determination that, based on the investigative information, clinical history, and autopsy findings, the cause of death was complications of metabolic liver disease. Given the circumstances as currently known, the manner of death was natural.

P152 Sugar, Spice, and Suicide: The Determination of Elderly Females

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Suicide in the elderly population may pose unique medicolegal death investigation challenges. Indications of intent may be subtle, and elderly deaths are frequently triaged as non-suspicious. However, the elderly (85 years and older) have the highest suicide incidence rate. Most are male and many involve firearms. Intent may remain ambiguous even after rigorous investigation. Our cases emphasize reliance on multidisciplinary collaboration, detailed scene investigation, complete forensic autopsy, and an unbiased approach.

Case 1:

An 89-year-old female independent in activities of daily living (ADL) and with chronic, severe pain and recent prescription medication attempted overdose was found deceased in her gasoline-powered vehicle which had an empty gas tank and ignition key in the "on" position, in her enclosed garage. Ambient temperature was approximately 100F. A suicide note was present. Autopsy revealed toxic but typically non-fatal carbon monoxide levels (28.1%), severe coronary artery disease, hypertensive changes in several organs, and decomposition advanced beyond expected for her last known time alive consistent with environmental exposure. Death was attributed to carbon monoxide toxicity and hyperthermia; severe coronary artery disease was a contributing condition.

Case 2:

A 99-year-old female who was independent in ADLs was found submerged in the bathtub of her clean, well-stocked apartment. Overt indicators of suicidal ideation on scene included a suicide note, obituary instructions, and notes on valuables indicating who should inherit them. Family reported prior suicide attempts. Potential contributors to drowning observed at the scene included prescription medications and ethanol. Autopsy including toxicology and vitreous fluid studies were crucial to determine drowning as the cause of death with amlodipine toxicity and starvation ketosis, both inherently intentional given her independence, as contributing.

Case 3:

A 99-year-old female predominantly independent in ADLs was run over by an emergency response vehicle as it was leaving her assisted living facility to transport another resident. Video showed the decedent walking alone through the lobby in the direction of the emergency response vehicle. Aerial satellite footage showed demarcated recreational walking paths away from this area. Medical records and family member interviews revealed a strong desire for death, including requests for a firearm. Limited vehicle camera views showed no slipping / tripping hazards and patterned blunt force injuries were concordant with intentional placement beneath the fire engine in line with the tires prior to vehicular movement. As no suicide note was present and family adamantly denied suicidal ideation, this death was classified as undetermined.

P153 Sudden Death from Chronic Seizure Disorder, Developmental Venous Anomaly, and Methamphetamine Use

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Sudden unexpected death is a leading cause of mortality among individuals with chronic seizures. Risk factors include poorly controlled seizures, structural brain abnormalities, and substance use. Developmental venous anomalies (DVAs), or venous angiomas, alter cerebral hemodynamics. Chronic methamphetamine use is associated with neurotoxicity, cardiovascular damage, and increased seizure susceptibility. With the increased stimulant-involved overdose death rates, more attention is due to medically vulnerable individuals whose underlying conditions amplify drug toxicity. We present the case of methamphetamine-related death in a seizure patient with a venous angioma of the brain.

A 48-year-old white female was found in the driver's seat, slumped over to her right. A bystander was alerted and called 9-1-1, but she was pronounced dead at the scene. Spilled prescription medication oxcarbazepine was seen in the center console area, along with vomit. Narcan and Valtoco nasal sprays were found in the car, with no evidence of illicit drugs. Medical history was notable for long-term lower extremity, lower back, and abdominal pains, speech impairment, near-daily migraines, poorly-controlled absence and tonic-clonic seizures, and a right frontal venous angioma diagnosed on MRI. The patient also experienced an 84-lb weight loss in the last 11 months.

At autopsy, findings included an approximately 3 x 2.5 x 2 cm venous angioma within the white matter of the right frontal lobe of the brain, mild atherosclerosis of the aorta and coronary arteries, biventricular dilatation, and a markedly dilated colon. Toxicologic testing revealed a methamphetamine level of 213 ng/mL and a gabapentin concentration of 25,588 ng/mL. The cause of death (COD) was the toxic effects of methamphetamine, with contributing causes of a seizure disorder and a venous angioma of the brain. The manner of death was accident.

The case represents an example of how difficult it can be to certify a death when there are multiple competing explanations. The acute illicit drug intoxication cannot be ignored in this case; however, the history of poorly-controlled seizures, and the presence of seizure medications in the car suggests that seizures might have also played a role in death. Ultimately in this case, the COD was considered multifactorial, with overlapping contributions from epilepsy, the cerebral angioma, and methamphetamine. One proposed mechanism involves a lowered seizure threshold from the angioma, postictal respiratory depression and cardiac arrhythmias, and accentuated arrhythmias from methamphetamine toxicity synergistically leading to the fatal outcome.

P154 Ketorolac Use in Kidney Stone Pain Management: Adverse Effects and Vulnerable Populations

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Ketorolac is a potent non-steroidal anti-inflammatory drug (NSAID) that is often used in the treatment of moderate to severe acute pain. Ketorolac is an effective alternative or adjunct to opioid medications which often produce more adverse side effects. It is the first-line medication in the emergency department (ED) for treatment of pain caused by renal colic involving kidney stones. While ketorolac is relatively safe, it poses significant side effect risks, especially in vulnerable populations. We present two cases in which adverse outcomes of ketorolac eventually resulted in accidental death.

An 80-year-old man presented to the ED with pain attributed to kidney stones. He was prescribed ketorolac for pain management until subsequent cystoscopic stone removal about 2 weeks later. The decedent continued taking ketorolac after the cystoscopy and later presented with abdominal pain from a duodenal ulcer. That visit revealed that he had been erroneously taking ketorolac since the original prescription, amounting to several weeks of continuous use with ulcer formation. Subsequent surgery to repair the duodenal ulcer led to complications, eventually resulting in his death.

A second case involved a 53-year-old man with known history of cardiovascular disease who presented to the ED with pain attributed to kidney stones. He was given ketorolac for pain management per the nursing protocol. The decedent had a known allergy to Celebrex and developed clinical anaphylaxis after ketorolac administration. He died from anaphylaxis and subsequent cardiac complications.

Significant injury or death from side effects of Ketorolac is relatively rare. The elderly population is exceptionally vulnerable to adverse effects compared to the general population. Elderly patients are more likely to have pre-existing comorbidities making them more susceptible to adverse effects. Similarly, lower levels of health literacy also increase the risk of adverse effects from Ketorolac. Lower health literacy is correlated with higher rates of misunderstanding medication information including directions for taking the medication and potential side effects. Another vulnerable population is those with known drug allergies. Inadvertent administration of medications or medication classes known to have previously produced anaphylaxis can result in significant morbidity or death.

The use of Ketorolac in the elderly, comorbid, lower health literacy, and/or allergy-prone populations should be undertaken with caution as adverse and possibly fatal effects may occur. Care protocols and healthcare providers should take these populations into account when prescribing or administering Ketorolac for pain management.

P155 Neonatal Death in the Setting of Necrotizing Enterocolitis After Delivery at Term: An Autopsy Case Series

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Introduction: Necrotizing enterocolitis (NEC) is a severe gastrointestinal disease with high neonatal mortality that is classically diagnosed in the setting of preterm birth; however, up to 10% of NEC cases may arise within infants delivered at term, particularly when comorbidities such as birth asphyxia, congenital heart disease, and gestational diabetes are present. This case series illustrates the importance of recognizing NEC as a potential cause for neonatal mortality in infants delivered at term.

Methods: From a single medical center database of pathology cases, we searched for all cases with NEC diagnosis on pediatric autopsy or surgical pathology reports that pertained to children delivered at term (>37 weeks). We identified three patients with autopsy diagnosis and five patients with surgical diagnosis only that definitively met these criteria. Clinical histories and pathology findings were reviewed, with emphasis on categorizing the gross and histologic features described in these cases.

Results: Within the autopsy after term delivery cohort, one neonate was early term (>37 weeks) and two were full term (≥39 weeks). In two of these cases, NEC was clinically diagnosed within the first week of life, and the third case was diagnosed within the first month of life. All three patients developed severe NEC with transmural bowel involvement and perforation.

In terms of comorbidities within the autopsy after term delivery group, all pregnancies had gestational diabetes mellitus. Neonatal comorbidities, especially cardiopulmonary, were present in all cases but varied from patient to patient. All three patients were dependent on mechanical ventilation.

At autopsy, all cases revealed extensive gastrointestinal involvement from small intestines to proximal colon. Grossly, the bowels were dusky and friable with transmural necrosis, perforation, and peritoneal contamination. Histopathology showed hallmark features of NEC, including coagulative intestinal wall necrosis, submucosal gas cysts, mucosal ulceration, inflammatory infiltrates, and bacterial invasion.

By comparison with the five surgical pathology cases of NEC after term delivery the autopsy cases showed more extensive necrosis, higher rates of perforation, and systemic complications. The surgical only cases more often showed a localized disease extent amenable to resection.

Discussion: This case series highlights that NEC in term neonates can be severe and fatal. Autopsy findings of advanced transmural necrosis, pneumatosis, and perforation emphasize the potential for aggressive nature of NEC despite delivery at term. Recognition of NEC as a cause of death in term infants is critical for accurate diagnosis and broader understanding of its pathogenesis beyond traditional risk profiles.

P156 Benign but Deadly: Fatal Airway Obstruction from Undiagnosed Adult Laryngeal Papillomatosis

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Adult laryngeal papillomatosis is an uncommon manifestation of human papillomavirus infection and is typically characterized by a chronic, relapsing course with symptoms such as hoarseness, cough, and sputum production. Although generally considered benign, progressive lesions may rarely lead to critical airway compromise and sudden death.

We report the case of a 58-year-old man with a history of diabetes mellitus who had a multi-year history of productive cough with copious phlegm, reportedly worsening in the weeks preceding death. On the night prior to death, he developed increasing respiratory difficulty and was later found gasping for air and reportedly choking on his phlegm before becoming unresponsive. Emergency medical services transported him to the hospital, where endotracheal intubation was attempted. During airway management, an apparent occlusive "foreign body" was visualized. Partial removal with forceps allowed for successful intubation and ventilation. Despite aggressive resuscitative measures, the patient was pronounced deceased. The initial clinical impression was fatal choking on a food bolus.

Postmortem examination revealed an obstructive laryngeal papillomatous lesion occupying the upper airway, abutting the endotracheal tube. No discrete food bolus sufficient to account for complete airway obstruction was identified. The lesion was consistent with laryngeal papillomatosis and provided a structural basis for progressive airway narrowing and acute obstruction.

This case highlights laryngeal papillomatosis as a rare but important cause of fatal airway obstruction in adults and underscores the potential for misdiagnosis as foreign body aspiration or choking. Chronic respiratory symptoms such as longstanding productive cough may represent an underrecognized clinical clue. Recognition of this entity is critical in both clinical and forensic settings to ensure accurate determination of cause and manner of death and to raise awareness of its potentially life-threatening complications.

P157 A Dissection in Disguise: Two Cases of Acute Aortic Dissection Masquerading as Benign Illness

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Acute aortic dissection (AAD) is a cardiovascular emergency with high mortality, yet presentation can be deceptively nonspecific. We present two cases which illustrate mechanisms by which AAD may be unrecognized prior to death.

The first decedent was a 46-year-old male with a history of paroxysmal atrial fibrillation, hypertension, congestive heart failure, and a solitary kidney who presented with nausea, weakness, and inability to tolerate fluids. He was diagnosed with acute kidney injury (AKI) secondary to dehydration and medications and was found unresponsive at home several hours following discharge. Autopsy revealed an aortic dissection originating in the proximal ascending aorta superior to the coronary ostia and extending to the aortic bifurcation, with hemopericardium (300 mL), bilateral hemothoraces, and extension of mediastinal hemorrhage through the pretracheal fascia into the right cervical soft tissues.

The second decedent was a 59-year-old female with no significant cardiovascular history who experienced several days of progressive weakness, vomiting, low back pain, chest tightness, and chills. Her symptoms were attributed to a viral illness, and further medical evaluation was declined. She was subsequently found unresponsive at home by a family member. Autopsy demonstrated AAD with hemopericardium, bilateral hemothoraces, and dissection extending into the bilateral subclavian arteries, right common carotid artery, and superior mesenteric artery, with resultant subacute intestinal ischemia.

These cases underscore two distinct pathways by which AAD may evade antemortem recognition: 1) diagnostic anchoring to an alternate explanation by the healthcare team, and 2) minimization of clinical presentation by the decedent. The first case highlights how the combination of nonspecific symptoms and anchoring to other plausible etiologies (i.e., AKI) led to insufficient workup for a man with significant cardiovascular risk factors for AAD. The second case highlights the lack of proper medical evaluation and access to potential life-saving care due to the decedent's minimization of her symptoms. Interestingly, both deaths were impacted by the decedents' prior fluid/dehydration status, which may be an underrecognized risk factor for AAD. Additionally, postmortem histologic examination revealed features of chronicity which highlight how dissections may subtly evolve over time and evade detection. Forensic pathologists should maintain a high index of suspicion for AAD in cases of sudden unexpected death preceded by nonspecific prodromal symptoms, and thorough medicolegal autopsy remains essential in establishing the diagnosis when it is missed in life.

P158 An Atypical Presentation of Disseminated Herpes Simplex Virus (HSV) Infection in a Newborn: A Case Study and Review of HSV Presentation in Neonates

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Neonatal herpes infection is a relatively uncommon viral infection in developed nations, occurring in roughly 1:10,000 births in the US. Transmission generally occurs during delivery and risk of transmission can be mitigated through cesarean delivery. Rarely intrauterine transmission can rarely occur, with risk of intrauterine transmission increasing with primary maternal infection. Disseminated herpes is a severe infection with a high mortality rate, especially without prompt treatment. Here we present a fatal case of disseminated herpes with atypical presentation in a newborn.

The decedent was a newborn female born to a 19-year-old G1P0 mother, who had received consistent prenatal care. Her STI panel and GBS screen were both negative. Mom was admitted at 38 weeks gestation for elective induction of labor. Three days following admission she developed fever with abdominal pain and non-reassuring fetal heart rate. Newborn was delivered via emergent c-section. On presentation to the NICU, baby had persistent fevers. Blood culture grew GBS, appropriate anti-biotic therapy was immediately started with no subsequent improvement. On day 3 of life baby required supplemental oxygen to maintain oxygen saturation. On Day 5 of life baby went into acute respiratory

failure and was intubated. Chest x-ray showed hyperinflated lungs with diffuse, bilateral opacities. The baby developed profound bradycardia (<60 bpm). Code was called; baby was declared dead following 45 minutes of resuscitative efforts.

Autopsy findings revealed unremarkable gross findings. Microscopic examination of the liver revealed diffuse chronic inflammation with abundant multinuclear giant cells and focal hemorrhage. Additionally, all five lung lobes showed multifocal karyorrhectic necrosis with intraalveolar hemorrhage with admixed fibrin. HSV immunoperoxidase stained positive in the affected liver and lung tissue, indicating disseminated HV infection at time of death. Autopsy findings were supported by clinical findings in mother after endocervical swabs were positive for HSV 1 by PCR. Cause of death was acute respiratory failure due to concurrent GBS infection and disseminated viral herpes.

The atypical presentation of disseminated HSV in this birth demonstrates the potential course of disease without prompt intervention. Many of the signs and symptoms of the disease were not present at the time of delivery, mother of the deceased was unaware she had HSV, screening exams were negative, and baby was delivered via cesarean section, widely considered the preferred method of delivery to avoid maternal-fetal HSV transmission. Assuming accuracy of the screening exam, new onset primary HSV infection greatly increases risk of intrauterine transmission.

P159 Atraumatic Splenic Rupture Secondary to Infectious Mononucleosis: A Classic Case Arising in Unusual Circumstances

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Splenic rupture is a potentially life-threatening condition that most commonly occurs secondary to blunt force trauma; splenic rupture rarely occurs atraumatically or idiopathically. Although rare, atraumatic splenic rupture (ASR) presents clinically similar to traumatic splenic rupture with severe abdominal pain and distension, Kehr's sign, hemodynamic instability, and loss of consciousness. ASR is a life-threatening condition with a high mortality rate between 12% and 20%. Approximately 0.1-0.5% of ASR cases are associated with Epstein-Barr virus (EBV) induced mononucleosis. Infectious mononucleosis (IM) is caused by EBV and spread via oral transmission, with increased prevalence in teenagers and young male adults with the average age of diagnosis at 22 years old. IM typically presents with a viral prodrome of upper respiratory symptoms, sore throat, headaches, myalgias, fever, fatigue, cervical lymphadenopathy, and decreased appetite. Patients with IM may also experience hepatosplenomegaly, leukocytosis, and elevated liver enzymes.

A previously healthy 18-year-old male presented to urgent care with upper respiratory symptoms and subsequently tested negative for COVID-19, influenzae, and streptococcal infection. The patient was sent home with cephalexin and presented the following week with worsening symptoms in conjunction with a new rash. Upon physical examination, the provider noted a unilaterally enlarged cervical lymph node, prompting a complete blood count (CBC) and a monospot test which revealed leukocytosis and positive heterophile antibodies, respectively. The patient was released, however was witnessed experiencing a syncopal episode and transferred to the nearest hospital. There was no known history of trauma or intense physical activity prior to his witnessed syncopal event. Despite aggressive medical interventions, the patient decompensated into a nonsurvivable state, and care was withdrawn.

At autopsy, external examination was unremarkable aside from evidence of medical intervention and petechiae, which were continuous from the lower abdomen to the bilateral feet. Internal examination revealed extensive intra-abdominal hemorrhage (7250 mL). The internal organs were otherwise unremarkable with exception of the spleen, which appeared diffusely hemorrhagic with an obvious defect. Histologically, the splenic sections demonstrated red pulp expansion and extensive hemorrhage. EBV in situ hybridization of the splenic sections highlighted scattered positive cells, compatible with known EBV infection. No evidence of traumatic injury was identified.

We present a classic case of EBV-induced splenomegaly complicated by terminal splenic rupture resulting in catastrophic hemorrhagic shock and death. This case reiterates the importance of autopsy, not only in

determining cause, manner, and mechanism of death, but ultimately in improving clinical outcomes and public health.

P160 Homicide by Stroke: The Pathophysiological Link Between External Stressors and Intraparenchymal Hemorrhage

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Intraparenchymal brain hemorrhage (IPH) occurring under intense emotional stress or following non-lethal physical injury may be classified as unnatural. When IPH is precipitated by the criminal actions of another, the manner of death may be certified as homicide.

The mechanism involves sympathetic nervous system activation during an acutely stressful event. This results in a catecholamine surge and intense blood pressure increase. Hemodynamic shifts cause cerebral vessel rupture, typically in the basal ganglia, thalamus, pons, or cerebellum. The fatality rate is high - half die within 48 hours. Terminal mechanisms result from mass effect and/or cerebral injury, usually brain herniation. In this study, we present three cases of death by hemorrhagic stroke.

Case 1:

A 55-year-old man was physically assaulted and sustained blunt force injuries including facial bone and two rib fractures. Upon emergency department arrival, his Glasgow Coma Score (GCS) deteriorated from 15 to 8. CT scan revealed acute right frontal lobe IPH with subdural extension. He died 10 days after admission. Autopsy noted hypertensive changes and negative toxicology for stimulants. Manner of death – homicide.

Case 2:

A 59-year-old homeless man was physically assaulted by an unknown individual and sustained blunt force injuries including facial bone and one rib fractures. Following hospital admission, his GCS deteriorated from 15 to 10 with worsening headache. CT scan revealed acute cerebellar IPH with intraventricular (IV) extension. He died after 7 days. Autopsy noted hypertensive and atherosclerotic disease, and negative toxicology for stimulants. Manner of death – homicide.

Case 3:

A 68-year-old female with medically documented hypertensive crisis and post-traumatic stress disorder following prior physical assault by her domestic companion was found unresponsive in her residence. The prior domestic companion was discovered hiding illegally in the residence despite a restraining order. Upon emergency department arrival, a head CT showed left temporoparietal IPH with IV extension. She died within several hours. Autopsy noted cerebral and cardiac hypertensive changes, and negative toxicology for stimulants. Manner of death – undetermined, given the strong suspicion for an altercation but lack of definitive evidence.

Death from a natural disease process in association with a homicidal act is uncommon. Forensic guidelines for stress-induced cardiac death with non-lethal injuries are established. Criteria for IPH in similar contexts are not defined but should be similarly approached. Certification of homicide in these instances relies on the temporal relationship between the inciting criminal act and the onset of neurological symptoms and relies on thorough medicolegal investigation.

P161 Fatalities and Intoxications Involving Novel Kratom Alkaloids 7-Hydroxymitragynine and Mitragynine Pseudoindoxyl

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The predominant psychoactive component of kratom (*Mitragyna speciosa*) is mitragynine; however, several other alkaloids are present in the plant, at lower concentrations. One of these alkaloids is 7-hydroxy mitragynine, also a metabolite of mitragynine. Kratom extract can be enhanced to increase mitragynine content or to convert mitragynine to elevated levels of 7-hydroxy mitragynine. An additional kratom alkaloid, mitragynine pseudoindoxyl, can be enhanced in products or appear in biological specimens through enzymatic or chemical conversion from 7-hydroxy mitragynine. 7-Hydroxy mitragynine and mitragynine pseudoindoxyl are reportedly 10x and 100x more potent than mitragynine, respectively. Both substances are currently unscheduled federally in the United States, although some states have scheduled 7-hydroxy mitragynine and/or kratom alkaloids through different legislative language. Beginning in late 2025, intoxications and fatalities associated with 7-hydroxy mitragynine and mitragynine pseudoindoxyl began increasing. These deaths have significant public health implications, while laboratory testing has created analytical and interpretive challenges for forensic toxicologists and medical examiners.

Between January and April 2026, 101 postmortem toxicology cases were submitted to the Center for Forensic Science Research and Education (CFSRE) and NMS Labs for kratom alkaloid testing. Analysis was performed using liquid chromatography quadrupole time-of-flight mass spectrometry (LC-QTOF-MS) for the identification and quantification of mitragynine, 7-hydroxy mitragynine, and mitragynine pseudoindoxyl. Basic demographic and case information were collected.

At least one kratom alkaloid was detected in 97% (N=98) of cases. Mitragynine pseudoindoxyl was detected with blood concentrations ranging <1-580 ng/mL (N=98, mean±SD: 130±122 ng/mL, median: 100 ng/mL). 7-Hydroxy mitragynine was detected in 76% of cases, with blood concentrations ranging 1.1-5000 ng/mL (N=77, average±SD: 150±560 ng/mL, median: 48 ng/mL). Low levels of mitragynine were identified alongside mitragynine pseudoindoxyl and 7-hydroxy mitragynine in most cases (N=93) and about one-third (N=34) were less than 5 ng/mL. Case histories included prior drug use history, unresponsiveness or labored breathing, and presence of kratom or kratom-type products at the scene. The manner of death was typically listed as accident. The cause of death often listed “toxic effects of” or “intoxication” involving 7-hydroxy mitragynine and/or other kratom alkaloids.

Kratom alkaloids, particularly 7-hydroxy mitragynine and mitragynine pseudoindoxyl, have begun to proliferate causing intoxication and deaths. Forensic toxicology testing for kratom alkaloids is difficult due to analyte interconversion, stability, and isomer concerns. Medical examiners and coroner offices should be aware of the analytical and interpretive difficulties with these emerging substances.

P162 The “Glove Method”: Intraoperative Detection of Lead-Based Gunshot Residue in Scalp Hair as an Aid to Close-Range Fire Determination

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In gunshot wounds to the head, overlying hair can prevent gunshot residue (GSR) deposit on the scalp, potentially leading to mis-identification of close-range shots. This presentation will demonstrate how the use of a novel method to help identifying close gunshots to the head. The ‘Glove Method’ is a practical intraprocedural technique that transfers lead-based GSR from scalp hair onto a white cotton/polyester glove for colorimetric reagent detection using a tartaric buffer solution and sodium rhodizonate (NaRh). To the best of authors’ knowledge, this is the first described method using scalp hair as a transfer substrate for macroscopic colorimetric GSR detection at forensic autopsy. The key significant element is that the glove will only show the characteristic color reaction with a close-range gunshot as intermediate and indeterminates range gunshots will not create GSR-lead deposits.

The study population includes deaths due to self-inflicted gunshot wound to the head. Two reagents are employed: a tartaric buffer solution and a freshly prepared NaRh solution. The procedure is performed after photographic documentation of the wounds in their unaltered state and prior to body cleaning, preserving the evidentiary integrity. A white cotton/polyester glove, worn over a disposable glove, is saturated with the tartaric buffer. The examiner vigorously rubs the glove against the hair overlying and adjacent to the entrance wound for at least two minutes, replicating a shampooing action. NaRh is subsequently sprayed onto the glove. A pink-to-red colorimetric reaction indicates lead-based GSR transferred from the hair.

While NaRh testing is established for detecting lead-based GSR on skin, clothing, hands, and other objects, no published protocol uses hair as the primary sampling substrate. A key methodological advantage of this transfer-based approach is avoidance of direct NaRh application to intact hair, which produces non-specific reddish-brown staining of the keratogenous zone of hair follicles independent of lead content. The glove serves as an intermediate substrate, circumventing this potential false-positive background. The tartaric buffer optimizes the pH for the lead-rhodizonate reaction, while the cotton/polyester weave provides a white background against which the pink lead-reactive color is readily visible. The method is inexpensive, rapid, compatible with the standard autopsy workflow, and produces a permanent documentable exhibit.

Preliminary in vitro testing has shown promising results. The study is ongoing and validation in human autopsy cases is still pending. Results and video documentation of the technique will be presented to the attendees

P163 Congenital Intracranial Teratoma: a Case Report, Literature Review, and Discussion of its Relevance to Forensic Pathology

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Neonatal brain tumors are uncommon, representing 0.5 to 1.9% of all pediatric brain tumors. Neonatal brain tumors occurring within sixty days of birth can further be classified as congenital brain tumors. The most common congenital brain tumor is teratoma, accounting for up to 30% of all brain tumors detected in fetuses and neonates. Clinical suspicion of congenital teratoma commonly arises based upon the findings of second-or-third-trimester ultrasounds. The mortality of intracranial teratomas of the fetus and newborns is abysmal, with mortality rates documented as high as 93%. Most intracranial teratomas identified in utero commonly result in death before or shortly after birth.

We report on a case of a 29-year-old G1P0 female that was 31 weeks pregnant and underwent a fetal ultrasound, which revealed a mass with scattered hypoechoic areas within the fetal cranium. A premature female neonate was delivered via cesarean section and passed after 5 days of life. At autopsy only an 870-gram, mottled mass with no identifiable cranial nerves was present in the neonate's cranium. Only 1% of the mass was identifiable brain parenchyma; the remainder of the mass was immature teratoma. This case and the accompanying literature review discuss key clinical features of congenital teratomas. The case will also explain the steps taken to arrive at a diagnosis of an immature teratoma. The discussion will elaborate on how congenital teratomas can be relevant in forensic pathology.

P164 Invisible in Life, Unclassified in Death: R99 and the Marginalization of the Vulnerable

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Introduction:

Billions of public health dollars are allocated annually based on information derived from death certificates. Among the key responsibilities of the certifier is the ordinal listing of underlying cause(s) of death (COD), which nosologists subsequently classify using ICD-10 codes. One such code, R99 (ill-defined and unknown cause of mortality), is particularly consequential, because any death receiving

this designation is automatically excluded from public health analyses and effectively lost from the data. In 2024 alone, nearly 11,000 deaths nationwide were assigned an R99 code. Members of NAME Public Health Ad Hoc Committee (NPHAHC) hypothesized that identifiable, actionable trends exist in R99 classification, and that targeted training may be required to minimize the loss of mortality data used to inform public health.

Methods:

Members of NPHAHC collected death certificate data from their respective jurisdictions for all deaths assigned one or more R99 ICD-10 codes over a 5-year period, from 2019 through 2024. Cases were categorized by certifier type (physician, medical examiner, coroner, etc.), year of death, manner of death, immediate cause of death, contributing conditions, age, and sex. Logistic regression was performed to evaluate the association between each variable and assignment of an R99 code for all deaths.

Results:

Preliminary data from jurisdictions representing more than 190,000 deaths over a five-year period indicate that the proportion of R99-coded death certificates was lowest among cases certified by medical examiners and higher among those completed outside medical examiner jurisdictions. Deaths assigned R99 codes were overwhelmingly classified as natural in manner. By state, the highest rate of R99-coded deaths were in West Virginia, Minnesota, and Oregon. In Connecticut alone, 123 deaths (0.4% of total deaths) received an R99 code and were at risk of not being counted for public health data.

Discussion:

The NPHAHC has developed recommendations and targeted training materials for NAME members to disseminate to certifiers outside the medical examiner system, a critical step toward preventing vulnerable deaths from being obscured by R99 misclassification. There is also opportunity to educate all certifiers on ICD-10 coding practices, including how specific terminology in death certification affects vital statistics and public health reporting.

P165 From Annual Reporting to Real-Time Intelligence: Multi-Jurisdictional Analytics Across 177,000 Death Investigation Records through a Secure, Auditable Forensic Data Platform

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Introduction: Death investigation at metropolitan scale remains a data problem nationwide. A regional medical examiner office, such as ours at Wayne County medical examiner's office, handles tens of thousands of cases per year creating case files, toxicology, autopsy, demographic, and jurisdictional records. Usually, this data sits in siloed systems and is only aggregated for periodic reports. Real-time, multi-jurisdictional analytics is both time and labor intensive.

Objective: To demonstrate how Wayne County Medical Examiner's Office, representing 43 communities, is now delivering real-time analytics, and secure dashboards across over a decade of death investigation data, without compromising chain of custody or jurisdictional sovereignty.

Methods: We deployed Health Data Explorer, a secure analytics platform built with our technology partner, Acoer. The platform ingests case-level autopsy, toxicology, demographic, jurisdictional, and scene data from the Wayne County Medical Examiner's Office and 43 communities within it. Five analytics stratifications (Death Certification, Demographics, Jurisdiction, Toxicology, Case List) support interactive filtering, geospatial heatmaps, time series, word clouds, and case-level drill-down. Role-based access control, granular permissions, and full audit trails govern internal use and external data sharing.

Results: 177,302 reports and 34,858 accepted cases (2014 to 2026) are query-able in seconds. Detroit accounts for 71% of accepted cases (19,463), with secondary clustering in Dearborn (1,843; 7%), Livonia (994; 4%), and Westland (947; 3%). A single keyword query (e.g., "fentanyl") returns 6,019 cases with full demographic, geographic, and pathologist attribution. Geographic heatmaps localize accidental overdose to specific Detroit corridors (Hamtramck, Grosse Pointe, Ferndale). Annual deaths-by-manner trend lines (peak 3,475 cases in a single year) reveal multi-year shifts undetectable in static reports. Cause-of-death

word clouds surface arteriosclerotic cardiovascular disease as the dominant natural cause, alongside fentanyl and polysubstance toxicity as the dominant accidental drivers.

Discussion: Real-time, multi-jurisdictional analytics applied to a large set of multi-jurisdiction death investigation data offers rich insights for medical examiner offices and public health departments. The solution built at Wayne State University/Wayne County Medical Examiner's Office is designed for scale, speed, and jurisdictional data sovereignty. Our vision is to be proactive for what must be next: cross-county comparative analytics, predictive modeling of emerging drug patterns, and counterfactual simulations of preventable death across an entire metropolitan region using sophisticated AI-enabled methodologies.

P166 Part I: Fundamentals of Mass Fatality Exercise Planning

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Mass fatality events are becoming increasingly common in the United States and it is imperative that the local medical examiner/coroner (ME/C) have a mass fatality plan in place and adequately prepare. Essential components of mass fatality planning consist of having an established protocol in place, and ensuring that staff are appropriately trained in carrying out tasks associated with these larger scale events. The goal of this paper is provide guidance to the ME/C office in developing a training exercise framework, scalable to the capacity of each jurisdiction.

A mass fatality incident is defined as any incident resulting in more decedents to be recovered and examined than can be reasonably managed within the routine workflow of the local ME/C jurisdiction. While most offices can manage a slight increase in the number of decedents without difficulty, many offices would have difficulty in managing more than 20 decedents at the same time in addition to routine caseload. The size, staffing, and availability of resources of a particular ME/C office undeniably play a role in planning response operations for events that yield multiple fatalities.

Often the mass fatality exercises emphasized by emergency planners focus on large-scale catastrophic scenarios with numerous fatalities. However, particular attention should be paid to preparing for smaller scale events with the capacity to yield multiple fatalities that would overwhelm the routine operations of a local ME/C office. Inter-agency collaboration and support services from Disaster Mortuary Operational Response Teams (DMORT) or other regional resources would likely be deployed for larger scale events. While it is essential to have an established plan for how these outside resources will be activated and utilized, it is beneficial that each respective ME/C office prepare and train for a scenario that mirrors a realistic surge event that would overwhelm the routine operations of the office, and would not be subject to the benefit of full disaster assets.

This paper will introduce the fundamentals of mass fatality planning including utilizing federal frameworks, networking with local resources, and assessing the assets and capabilities of the office's in-house system.

P167 Part II: Surge Protected - Stress-Testing Your Fatality Response Plan

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Mass fatality incidents are often planned for catastrophic large-scale disasters; however, many medicolegal death investigation systems are more likely to encounter a moderate surge event involving approximately 20–30 deceased persons that can still overwhelm routine operations. These incidents may arise from transportation accidents, active assailant events, natural disasters, industrial accidents, infectious disease clusters, or environmental exposures. While smaller in scale than nationally deployed disaster responses, these events demand immediate, coordinated, and disciplined management to preserve dignity of the deceased, protect evidence, and support timely identification and family notification all with the mission of determining cause and manner of death.

This presentation provides a practical framework for preparing medical examiner and coroner offices for a mid-scale surge fatality event while recognizing jurisdictional differences in authority, staffing models, investigative scope, and available resources. The session will examine scalable strategies applicable to urban, suburban, and rural systems alike.

Key operational topics include scene and facility security, unified command integration, chain of custody, transportation and transfer logistics, decontamination considerations, temporary and sustained refrigerated storage options, staffing augmentation, and continuity of routine office operations during surge conditions. The presentation will also review internal intake triage workflows once decedents arrive at the medicolegal facility, including case accessioning, personal property control, evidence documentation, photography, fingerprinting, radiography, odontological coordination, DNA collection, pathology examination prioritization, and multi-modal victim identification processes.

Special attention will be given to bottlenecks frequently overlooked in planning, including family assistance coordination, data management, media pressures, staff fatigue, emotional wellness, and maintaining investigative quality under compressed timelines.

Attendees will leave with a realistic planning model, operational checklist concepts, and scalable best practices that can be adapted to agencies of varying size and governance structure. Rather than asking whether an office is prepared for a catastrophic disaster, this session asks the more practical question: Are you Surge Protected?

P168 The Utility of CT Data and 3D Printing for Case Association and Identification

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Postmortem computed tomography (PMCT) has proven to be useful in medicolegal casework by assisting forensic pathologists in making decisions on examination approach (e.g. external vs. autopsy), visualizing internal injuries, and ultimately determining cause of death. Furthermore, CT scans have been paired with 3D printing to allow for the reproduction of anatomical structures and objects to be used for testimony or retained for future analysis. Virtual reconstructions of fragmented remains for identification purposes have also been demonstrated. This presentation demonstrates a novel use of both CT data and 3D printing to associate two cases and establish a positive identification as well as the utility of PMCT as an archival tool allowing reassessment of remains after release.

In February 2026, the King County Sheriff's Office (KCSO) reported cranial fragments found alongside a roadway. The largest cranial fragment was identified as a portion of the calvarium including the left parietal and frontal bones, accompanied by smaller cranial fragments. The King County Medical Examiner's Office (KCMEO) Anthropology Section assisted KCSO and King County Search and Rescue in an intensive pedestrian search of the area; however, no additional remains were found. Following the search, it was noted that a pedestrian died in the same location approximately four months prior when they were struck by a motor vehicle. Significant trauma to the head with disruption of the cranium was noted on review of autopsy photos of the prior case. Upon intake, a PMCT of the decedent was obtained as part of KCMEO's protocol, and the decedent was subsequently released to the funeral home following the external examination. KCMEO Anthropology was faced with the challenge of reassociating the cranial fragments in the absence of the initial set of remains and while avoiding the additional resources required for DNA confirmation.

Utilizing the PMCT data of the original pedestrian versus motor vehicle death, DICOM files of the head were exported from the picture archiving and communication system to create a 3D surface rendering of the skull. The 3D rendering was then used to print portions of the cranium most likely to match the targeted edge of the calvarium recovered the following year. The fracture margins of the 3D-printed frontal bone and recovered calvarium were reapproximated and aligned closely, thus allowing for positive identification and reassociation of remains to be made, even in the absence of the original remains.

P169 Toward a Taphonomy of Sentience: Collapse Dynamics During the Postmortem Interval

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Forensic and postmortem analyses document the transition from coordinated biological activity to irreversible collapse. Although clinical criteria define death operationally, the biological properties sustaining coherence immediately prior to collapse remain without formal characterization. The Taphonomy of Sentience provides an empirical framework for analysis of collapse dynamics during the postmortem interval and for characterization of the sequential loss of coordinated biological function following cessation of physiological regulation.

Sentience, operationalized as collapse-capable coherence across interacting biological scales, is quantified by a Sentience Index (Ψ). Following cessation of physiological regulation, collapse proceeds through progressive loss of coordinated biological function. Algor mortis, livor mortis, rigor mortis, metabolic arrest, and tissue autolysis serve as observable markers of decoupling, providing measurable evidence of the transition from integrated physiological regulation to irreversible collapse. In the absence of continuous clinical observation, postmortem change permits direct examination of collapse progression. Forensic investigation frequently addresses deaths occurring outside clinical observation, particularly among vulnerable populations affected by overdose, environmental exposure, chronic illness without access to care, and social isolation. Documentation of postmortem change provides the primary empirical record of collapse progression after loss of physiological regulation. Reconstruction of the terminal interval in unattended death depends on interpretation of postmortem findings as sequential markers of decoupling. Clinical practice routinely suppresses, alters, and restores states associated with sentience despite the absence of formal definition of the underlying property. A forensic framework for collapse-capable coherence therefore addresses a biological problem already encountered in medicine at the point where recovery is no longer possible.

P170 Drowning in Forensic Medical Practice: Pathology, Laboratory, and Medical Examiner/Coroner Interpretation

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Introduction:

Drowning remains a significant cause of accidental, suicidal, and homicidal death and continues to pose diagnostic challenges for forensic pathologists and Medical Examiner/Coroner (ME/C) systems. Despite numerous proposed markers, no single pathological, histological, radiological, or laboratory finding has

been shown to definitively establish drowning as the cause of death. This limitation is particularly important in suspected homicide investigations, where the absence of definitive evidence may hinder accurate determination of the manner of death. The aim of this review was to evaluate the available pathological and ancillary evidence used in the investigation of drowning and assess its contribution to diagnostic certainty within forensic practice.

Methods:

A comprehensive review of established forensic investigative approaches to drowning was undertaken. Evidence assessed included scene investigation findings, external and internal autopsy examination, histopathology, toxicology, diatom analysis, postmortem computed tomography (PMCT), and other ancillary laboratory techniques. Particular attention was given to the strengths, limitations, and evidentiary value of each modality in supporting a diagnosis of drowning and distinguishing it from alternative causes of death.

Results:

No individual investigative modality was found to establish drowning as the cause of death in isolation. Autopsy findings including airway froth, pulmonary edema, pulmonary congestion, cerebral edema, and petechial hemorrhages were frequently encountered but lacked specificity. Histopathological features such as alveolar edema, emphysema aquosum, intra alveolar proteinaceous material, and focal hemorrhage supported a diagnosis of drowning but were not pathognomonic. Toxicological investigations assisted primarily by identifying intoxicants or incapacitating agents and excluding competing causes of death. Diatom analysis provided supportive evidence when tissue findings corresponded with the suspected immersion environment, although interpretation remained limited by methodological concerns and the potential for contamination. PMCT demonstrated characteristic but nonspecific imaging findings. Diagnostic confidence was greatest when scene investigation, autopsy findings, histopathology, toxicology, and ancillary testing were interpreted collectively rather than independently.

Discussion:

Drowning remains a diagnosis of exclusion and one of the most challenging determinations in forensic pathology. Current evidence suggests that the highest level of diagnostic confidence is achieved through multidisciplinary integration of scene, pathological, histological, toxicological, and laboratory findings. While no single test can definitively confirm drowning, a structured evidentiary approach can strengthen medicolegal conclusions in cases where the manner of death may be uncertain, including suspected homicide. Further research is required to identify more reliable diagnostic markers and to improve the practical application and validation of existing investigative methods in routine forensic practice, particularly in cases in which homicidal drowning is suspected.

P171 From Settlement to Solution: A Medical Examiner's Roadmap to Opioid Crisis Funding Utilization

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Following the settlement of multiple lawsuits involving Janssen, Cardinal, McKesson, AmerisourceBergen, Teva, Allergan, CVS, Walgreens, Walmart, Kroger Co., Purdue/Sacklers and the Generic Manufacturers, awards totaling ~\$50 billion are available to state and local governments to combat and mitigate the effects of the opioid crisis. The amount of funding for each state varies based on population and disbursements will occur over the next ~20 years. This presentation will explain the basic components of opioid settlement funding and various strategies and use-cases for Medical Examiner's Offices. It will also highlight different distributions of settlement funds and offer MEOs insight into how they may access financial support.

The DeKalb County Medical Examiner's Office (DCMEO) and its private partner, Forensic Medicine Associates, Inc. (FMA) received opioid settlement funds in 2026 from various state and county sources; this funding is being utilized for toxicology testing and a Forensic Pathology Fellow's compensation package. DCMEO plans to pursue different avenues of opioid settlement funding annually as long as funds are available and broaden their use-cases to pilot innovative projects surrounding the investigation of opioid-related deaths, data collection and sharing, and overdose prevention efforts.

Many first responder organizations bear the immense burden of increased caseloads due to the opioid epidemic. While substance abuse and mental health treatment facilities, child welfare organizations, and prevention initiatives should obviously receive a majority of settlement funds, law enforcement agencies, correctional institutions, fire departments and emergency medical services, and ME/C offices, have experienced sustained surges in caseloads during the opioid epidemic, burdening systems which were already chronically underfunded and understaffed. When strategically appropriated, opioid settlement funding can mitigate immediate needs as well as support long-term goals within individual offices and the ME/C system nationwide.

P172 Fatal Intestinal Volvulus: A Case Series

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Intestinal volvulus is a life-threatening clinical emergency in which a loop of intestine and its supporting mesentery twists on itself with resultant intestinal obstruction and ischemia of the affected segment. Typically, it presents with severe abdominal pain, bloating, vomiting, and constipation. Immediate surgical intervention is required to prevent gangrene, perforation, peritonitis and sepsis.

The range of affected individuals include infants, children with neurodevelopmental disabilities, individuals with cognitive impairment or mental illness, and frail elderly adults who may all be at increased risk of delayed diagnosis with a fatal outcome.

All cases of fatal intestinal volvulus diagnosed in medicolegal autopsies performed at the Eastern Ontario Regional Forensic Pathology Unit (EORFPU) for 2010 – 2025 inclusive were identified for study. Their reports were reviewed to analyze decedent demographics, medical and social history, clinical presentation, imaging, and postmortem examination findings to identify any patterns of potential diagnostic and/or public health significance.

A total of twelve (12) cases were identified. The age range was 2 months - 88 years with a male predominance (9/12). Many decedents belonged to socially or medically vulnerable groups: individuals with neurodevelopmental delay (including G-tube dependence and quadriplegia), severe psychiatric illness, dementia, frailty, or limited mobility. The antemortem symptoms were frequently nonspecific. Abdominal pain, constipation, vomiting, confusion, or collapse/fall were often misattributed to benign conditions such as gastroenteritis, reflux, food poisoning, constipation, cardiac events, or injury-related pain. There were three (3) pediatric cases (all males) with atypical presentations of relatively mild symptoms. Nine (9) cases had recent healthcare contact, delayed imaging, or non-diagnostic investigations prior to death.

Postmortem examination consistently demonstrated bowel obstruction with ischemia, infarction, necrosis, peritonitis, or septic complications with volvulus as the underlying cause of death.

This case series underscores intestinal volvulus as an under-recognized cause of sudden and unexpected death, particularly among vulnerable populations with communication barriers, atypical physiology, or complex care needs. Postmortem identification of missed or delayed diagnoses provides critical insight into preventable mortality. Improved clinical awareness, lower thresholds for abdominal imaging, and enhanced surveillance of high-risk populations may reduce fatal outcomes. These findings highlight the essential role of forensic pathology in informing public health strategies, diagnostic equity, and prevention of avoidable deaths.

P173 ForensicPathologyEducation.org: Launching the National Association of Medical Examiners Learning Platform

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Forensic pathology education is fragmented, with resource availability varying across programs. This lack of standardization impacts learners across the training continuum and creates barriers for practicing forensic pathologists seeking to engage in education and professional development. These challenges are particularly pronounced for students and trainees in rural and underserved areas, where limited access to pathology departments, mentorship, and medical examiner/coroner offices limit early exposure and engagement. In the setting of growing workforce shortages and increasing case complexity, scalable, adaptable approaches are needed to address persistent gaps in pathology education.

In 2025, the Future Forensic Pathologists Committee developed and launched ForensicPathologyEducation.org. This centralized, open access web-based learning platform for the National Association of Medical Examiners, alongside the Pathology Scholars Certificate Program, provides a structured, experiential pipeline initiative for students and motivated learners, which is designed to provide early, longitudinal exposure to anatomic and clinical pathology.

ForensicPathologyEducation.org was designed to incorporate case-based learning, interdisciplinary modules, quizzes, and a searchable database of educational opportunities. Content development was informed by core forensic pathology competencies and structured to support all education levels. The platform enables multimedia integration, iterative content expansion, and user engagement tracking to inform ongoing learning and development. It also generates completion certificates which are particularly valuable for students without access to local pathology opportunities seeking to demonstrate involvement in the field.

The Pathology Scholars Certificate Program complements the platform through online didactics, virtual and in-person shadowing, tailored hands-on experiences (including evisceration, organ dissection, specimen grossing, brain cutting, and biopsy/peripheral blood smear interpretation), as well as the completion of a capstone project. Together, the platform and certificate program broaden pathology exposure with targeted insight into forensic practice, bridging gaps between virtual learning and experiential training.

Preliminary user feedback suggests high usability and perceived educational value, particularly in supporting standardized exposure to core concepts and supplementing traditional training pathways. Ongoing data collection aims to evaluate user interaction, platform accessibility, and educational impact.

By integrating centralized interactive resources with a structured certificate-based learning experience, this model expands equitable early exposure to forensic pathology, strengthens the educational pipeline, and supports long-term workforce sustainability.

P177 Acute Bacterial Meningitis in Medicolegal Postmortem Examinations at the Eastern Ontario Regional Forensic Pathology Unit, 2020-2025: A Case Series

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Acute bacterial meningitis (ABM) is a severe acute bacterial infection of the subarachnoid space with a high mortality rate that it can be either community-acquired or nosocomial. Community-acquired bacterial meningitis (CABM) can result from either bacteremia or direct extension from local infection.

Streptococcus pneumoniae is the most common cause of ABM internationally. Group B *Streptococcus* is common in infants < 2 months old while *Streptococcus pneumoniae* is most common in all other age groups except for teenagers and young adults in which *Neisseria meningitidis* is most common.

The characteristic postmortem examination findings of ABM consist of creamy purulent exudate within the subarachnoid space with neutrophils and macrophages on histology.

The identification of *Neisseria meningitidis* as the cause is a public health concern that requires timely diagnosis and mandatory reporting to enable contact-tracing for administration of prophylactic antibiotics. A stat Gram stain of a smear of a swab of the subarachnoid is crucial in this assessment.

All cases of ABM diagnosed in medicolegal autopsies performed at the EORFPU for the years 2020 – 2025 inclusive were identified for study with a resultant cohort of 15 cases. The autopsy reports were analyzed for decedent demographic data, medical and social history, clinical presentation and workup or circumstances of death, and isolated bacterial pathogen.

The study cohort displayed a bimodal age distribution of 7 pediatric cases (age range: 5 weeks - 7 years) and 8 adult cases (age range: 45 - 71 years). The most common causative bacterium in the pediatric cases was *Haemophilus influenzae*. The most common causative organism in the adult cases was *Streptococcus pneumoniae*. No cases of *Neisseria meningitidis* were identified in either group.

Infants less than 18 months old constituted 6/7 pediatric cases. 4/7 pediatric cases came from remote communities. Meningitis was clinically suspected and investigated in only 2 of the pediatric cases. The regional infant immunization schedule recommends doses at 2, 4, 6, 12, and 18 months while the schedule for remote communities recommends that the 18-month immunizations be given earlier at 15 months.

Meningitis was not suspected or investigated in any of the adult cases. Most of the adult decedents were < 65 years old and lived in an urban setting. Five had a history of chronic drug and/or alcohol abuse. Regional immunization recommendations suggest pneumococcal immunization for adults > 65 years-old who are not at high risk of developing invasive pneumococcal disease.

This series reflects the low prevalence of acute bacterial meningitis.

P178 Decapitation in Judicial and Suicidal Hangings: Something to Think About But Not Lose your Head Over

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Hanging is a type of mechanical asphyxia that can cause death by compression of the neck and its internal structures by an applied constrictive force within an anchored noose ligature via a multiplicity of interacting mechanisms. The constrictive force in the noose is derived from the tension that develops in the ligature from the gravitational drag of the body weight when it is suspended. Suspension of the body can be complete (full) or incomplete (partial) with part(s) that remain in contact with the ground (toes, feet, knees or buttocks). Complete suspension of the body is usually affected by descent of the body through a height by stepping off a variety of launch surfaces (e.g. stool, chair, ladder, step) to result in its full vertical orientation.

Judicial hanging (JH) is a subcategory of hanging that was introduced as a form of capital punishment for certain offences with complete suspension of the body effected through its rapid decent through a distance that is long (long drop) or short (short drop), with the intended outcome of rapid death after instantaneous unconsciousness due to transection of the cervical segment of the spinal cord from dislocated fracture of the upper cervical spine at C2 with bilateral fractures of its pars interarticularis (hangman's fracture). The required force to achieve this depends on the drop length. The required drop length to generate the required force must be accurately calculated using the decedent's body weight and height. Too long a

drop length will result in the unwanted outcome of decapitation whereas too short a drop will result in prolonged suffering before death occurs.

Hanging is the most common method of suicide encountered internationally. Death (and not decapitation) is the primary aim of suicidal hanging but decapitation in suicidal hanging (DSH) can occur as a rare phenomenon with a reported incidence of 0.2% in a large cohort of suicidal hangings and only 28 published case reports in the literature.

The case of near-complete decapitation suicidal hanging of a 32 year-old man with a history of three suicide attempts, whose body was discovered hanging from the pedestrian bridge railing of a large, tall bridge by a 3 inches wide flat tow strap is presented to (i) discuss the factors that need to be considered in effecting successful JH without decapitation, (ii) review the published literature on DSH, and (iii) add to the small number of case reports of DSH.

P179 Strengthening the Future: Forensic Pathology Residency Advanced Training Grant

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Forensic pathology is in a workforce crisis with an estimate of just over half of the necessary number of practicing forensic pathologists nationally. In response to this crisis, many strategies have been implemented to improve the workforce pipeline. One successful strategy is through the College of American Pathologists (CAP) Forensic Pathology Advanced Training Grant in memory of Dr. Beth Frost, that continues to be supported by multiple organizations including the National Association of Medical Examiners (NAME) and the NAME Foundation. By the end of 2026, this grant will have successfully awarded travel funds to nine pathology residents resulting in immersive forensic pathology rotations at Accreditation Council for Graduate Medical Education (ACGME) accredited forensic pathology fellowship offices across the United States. All six awardees that have completed their experiences have either completed or secured forensic pathology fellowship positions. Six of the awardees did not have access to training sites within a 50-mile radius, showing the need for increased forensic pathology exposure and resources to pathology residents. One awardee provided valuable feedback regarding the challenges faced by trainees with J-1 visas due to the limited number of medical examiner/coroner offices that sponsor visas.

This presentation will outline how offices can be involved as a training site, recruit additional applicants, and provide resources supporting this initiative to expand and strengthen the future forensic pathology workforce. An updated application and award timeline will be presented to address trainee concerns and better improve the likelihood of completed rotations prior to entering the forensic pathology National Resident Matching Program (NRMP) match cycle.

P180 Scene-Level Intelligence From Autopsies: Predicting Countywide Drug Paraphernalia Patterns Through Private AI and Building a Foundation for Counterfactual Simulations of Preventable Overdose Deaths

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Fatal drug overdose is a leading cause of preventable death, yet toxicology alone cannot explain how overdoses occur. Scene-level detail (paraphernalia, co-use indicators, dwelling type, and harm-reduction resource availability) is routinely captured by medicolegal death investigators in narrative autopsy and investigative reports, but remains buried in unstructured text and is rarely analyzed across cases. Recurring early-risk signals therefore go unrecognized. We aim to demonstrate that scene-level intelligence can be systematically extracted from autopsy narratives using private, verifiable AI, enabling countywide prediction of drug paraphernalia patterns and a foundation for counterfactual simulations of preventable overdose deaths.

We deployed a Forensic Intelligence Platform, a Private AI system built with our technology partner, Acoer. The platform was granted secure access to 1,500+ autopsy and investigative narratives of drug-related deaths from 2020–2025. It performs structured extraction of drug paraphernalia (e.g., needles, pipes, spoons, fentanyl test strips, naloxone), scene environment, co-occurring substances, and investigator-observed behaviors. Extractions are continuously refined under forensic pathologist oversight. No external model training; no cross-jurisdictional data pooling. All inferences are cryptographically auditable, preserving full county data sovereignty.

Of the 1,500+ narratives processed, drug paraphernalia was mentioned in at least 13 cases. Five cases mentioned naloxone administration or naloxone at the scene. Six decedents were found in abandoned locations. A query for clustering of overdoses yielded that two decedents were found in the same room, an example of clustering among family members, as well as clustering of activity at a halfway house, near a hospital, and within a neighborhood at separate residences. All of the queries provided results within seconds. Cross-case analysis surfaced recurring patterns not visible from toxicology or cause of death alone. These patterns exposed specific, addressable gaps in local harm-reduction distribution and prevention outreach.

Private, verifiable AI applied to ME/C narratives surfaces actionable, scene-level overdose patterns without compromising chain of custody or data sovereignty, at a scale and consistency unachievable through manual case review. It also establishes the substrate for the next phase: Digital Twins of preventable death, counterfactual simulations combining autopsy, toxicology, investigative, and scene data to model, case by case, which interventions (e.g., on-site naloxone, fentanyl test strip use, supervised consumption, timely dispatch) could have altered the outcome. The approach repositions ME/C offices as upstream, active contributors to community overdose prevention rather than the endpoint of a fatal case.

P181 Final Disposition of a Vulnerable Population – The Indigent: Cremation in a Medical Examiner Facility

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A certain percentage of remains examined in a death investigation system (i.e., County/State Medical Examiner, Coroner, etc.) are decedents who are unidentified, indigent, abandoned, or estranged. In those instances, local government is typically responsible for the interment of remains, pursuant to the statutes or laws under which that government entity operates. Administration of Pima County's Indigent Interment Program (IIP) was transferred to the Pima County Office of the Medical Examiner (PCOME) in 2018 from its previous administrator, the Pima County Public Fiduciary (PF) Office. Under the PF, the IIP contracted with a local funeral home via a competitive procurement process to cremate both unidentified and identified remains approved through the program. PF IIP staff interred cremains in columbaria at the county indigent cemetery, regardless of identification status. Under PCOME IIP administration, unidentified remains are not cremated but retained as skeletal remains in long-term storage (LTS) at PCOME. Currently, 727 skeletal remains are interred in LTS. Identified remains approved through the program continue to be cremated and interred at the county indigent cemetery; however, cremations are now performed at the PCOME's on-site crematory.

Since 2018, the average all-cause mortality in Pima County is 12,500 deaths per year. The number of IIP applications received by the PCOME represents 5% of Pima County's total mortality that year. On average, 60% of the applications received are approved and the most common qualifying condition is no next-of-kin (NOK). In 2025, the PCOME received 493 IIP applications, 315 of which were approved (64%). Of the approved applications, 125 qualified based on abandonment (40%), 119 based on no NOK (38%), and 71 met the poverty standard (22%). All resulted in cremation as the final disposition of the remains. Cremation is a thermal process that reduces human remains to bone fragments in a machine called a cremator. Cremators use oxygen to combust the body and convert it into carbon dioxide, water, and calcium phosphate bone fragments. Bone fragments are then pulverized into a powder or sand-like material, which is its final form, and placed into a receptacle or urn. The PCOME cremated 66 identified indigent decedents in 2026 to date (4/13/2026).

P182 Dying for Sex: Analysis of Autoerotic Asphyxial Deaths in Eastern Ontario

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Introduction:

Autoerotic asphyxia is a sexual practice in which heightened arousal or pleasure is sought through cerebral hypoxia induced during an erotic act by an asphyxial method. This is most commonly achieved by reversible, self-applied neck compression with a ligature, although other methods include plastic bags, gags, and postural techniques. When death occurs, forensic interpretation may be challenging, particularly in distinguishing accidental autoerotic death from suicide, homicide, or non-autoerotic asphyxial death. This series examines autoerotic asphyxial deaths investigated by the Eastern Ontario Regional Forensic Pathology Unit (EORFPU), with emphasis on scene-autopsy correlation.

Methods:

A retrospective review of all medicolegal autopsy cases performed by the EORFPU for 2010-2025 identified 11 autoerotic asphyxial deaths. One additional case was excluded because death was attributed to mixed drug toxicity without an asphyxial component, despite evidence of contemporaneous autoerotic behavior. Cases were analyzed according to decedent demographics, medical and social history, scene findings, circumstances of body discovery, and postmortem examination findings. Scene variables included the presence and nature of pornographic material, sexual paraphernalia, environment, and state of dress. Postmortem variables included the state of decomposition, asphyxial method, signs of mechanical asphyxia, toxicology results and immediate cause of death.

Results:

All decedents were biological males, with one identifying as a woman. Most deaths occurred in secluded environments (10/11); one occurred in a communal space within a shared home. All decedents were naked or partially dressed, although dress was not recorded in one case. Pornographic material was present in 7/11 cases. Of the four cases without pornographic material, two featured sexual paraphernalia, supporting the sexualized context of the event. Signs of mechanical asphyxia were present in 10/11 cases, most commonly a ligature mark. The single case without classical mechanical asphyxial signs had an oral 'ball gag' in situ at postmortem examination. The ascribed causes of death included hanging (6), autoerotic asphyxia (2), plastic bag asphyxia (2), and ligature strangulation (1); in one plastic bag asphyxia case, autoerotic asphyxia was listed in Part 1b of the cause of death statement.

Discussion:

This series highlights that the diagnosis of autoerotic asphyxia is best made on clinicopathological correlation rather than on any single finding. In this cohort, scene findings were often more consistently informative than postmortem findings alone, and the certified cause of death varied despite broadly similar behavioral circumstances. These findings reinforce the importance of careful scene documentation and integrated investigative-pathological interpretation in the classification of suspected autoerotic asphyxial deaths.

P183 Standard Development Activities in Medicolegal Death Investigation

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The Organization of Scientific Area Committees (OSAC) for Forensic Science was created to strengthen the nation's use of forensic science by promoting the use of discipline-specific forensic science standards. To this end, the OSAC drafts proposed standards that are forwarded to standards developing organizations (SDOs), like the Academy Standards Board (ASB) that further develop and publish them, but may also generate their own standards. The OSAC also reviews standards and recognizes them on the OSAC Registry, which serves as a central repository of high quality, consensus-based, technically sound standards.

During this presentation, updates related to standards development in medicolegal death investigation will be discussed. Some of these include:

Standards on the OSAC Registry: ANSI/ASB Standard 125, *Organizational and Foundational Standard for Medicolegal Death Investigation*. 2021. 1st. Ed.; ANSI/ASB Best Practice Recommendation 007, *Postmortem Impression Submission Strategy for Comprehensive Searches of Essential Automated Fingerprint Identification System Databases*. 2018. 1st. Ed; ANSI/ASB Best Practice Recommendation 008, *Mass Fatality Scene Processing: Best Practice Recommendations for the Medicolegal Authority*. 2021. 1st. Ed.; ANSI/ASB Best Practice Recommendation 009, *Best Practice Recommendations for the Examination of Human Remains by Forensic Pathologists in the Disaster Victim Identification Context*. 2019. 1st. Ed.; 2018. 1st. Ed.

Other OSAC proposed standards: OSAC 2023-N-0022, *Best Practice Recommendation for Communicating with Next of Kin during Medicolegal Death Investigations* ; OSAC 2023-N-0004, *Standard for Interactions Between Medical Examiner, Coroner and all Other Medicolegal Death Investigation Agencies and Organ and Tissue Procurement Organizations and Eye Banks* ; OSAC 2022-N-0027, *Medicolegal Death Investigation Response to Death Locations and Incident Scenes: Best Practice Recommendations* ; OSAC 2022-N-0026, *Medicolegal Death Investigation: Terms and Definitions*; OSAC 2021-N-0007, *Media Communications Following a Mass Fatality Incident: Best Practice Recommendations for the Medicolegal Authority*; OSAC 2021-N-0008, *Victim Accounting: Best Practice Recommendations for Medicolegal Authorities in Mass Fatality Management*; OSAC 2022-N-0020, *Standard for Mass Fatality Incident Management*; OSAC 2022-N-0021, *Family Engagement Following a Mass Fatality Incident: Victim Information Center Best Practice Recommendations for Medicolegal Authority*; OSAC 2022-S-0022, *Standard for Disaster Victim Identification*.

Documents currently in development at the OSAC or by the ASB: Best Practice Recommendation for Deaths in Custody; Standard for Daily Operation Resources; Identification and Next of Kin notification. Opportunities for involvement in the process will also be presented, as well as details about the process to develop standards.

P184 Improving Surveillance and Prevention of Law Enforcement Suicides in New York City: A Medicolegal Perspective

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Suicide among law enforcement officers (LEOs) remains a critical but incompletely characterized public health issue. National surveillance initiatives, such as the FBI Law Enforcement Suicide Data Collection, rely on accurately identifying decedents as LEOs. However, death certificates and medicolegal death investigation systems sometimes lack standardized or verifiable occupation data, creating concerns about underreporting and misclassification. Accurate surveillance is essential for prevention.

A retrospective review of medicolegal death investigation data in NYC from 2015–2024 was conducted, focusing on deaths classified as suicide among individuals with known or suspected law enforcement affiliation. Cases were evaluated for completeness of occupational data, circumstances of death, and concordance between investigative findings and final death certification.

We hypothesize that reliance on structured occupation fields alone will underestimate the number of LEO suicides, with additional cases identifiable only through detailed narrative review. Misclassification is expected to occur in cases involving retired officers, ambiguous occupational descriptors (e.g., “security,” “government”), or incomplete documentation. These gaps may result in underrepresentation of LEO suicides in national datasets.

Standardized documentation of occupation and improved data linkage between medicolegal offices and law enforcement agencies are essential. Strengthening these processes supports the development of targeted, evidence-based suicide prevention strategies within law enforcement populations.

P185 Occult Atlantoaxial Rotatory Dislocation Following Minor Trauma: Diagnostic Limitations of Posterior Neck Dissection and the Role of Postmortem Computed Tomography

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Introduction:

Atlantoaxial rotatory dislocation is a rare but potentially fatal injury that may be overlooked in cases of low-impact trauma. Detection is particularly challenging in the forensic setting, as routine posterior neck dissection may not reliably demonstrate ligamentous instability at the C1–C2 level.

Case:

An individual was found unconscious near the scene of a reportedly minor motor vehicle accident and progressed to brain death within approximately 24 hours. Clinical findings were consistent with malignant cerebral edema. Postmortem computed tomography (PMCT) demonstrated atlantoaxial rotatory dislocation, likely secondary to ligamentous disruption, with associated subarachnoid hemorrhage and focal hemorrhages within the spinal cord. A posterior neck dissection was performed at autopsy; however, this approach did not demonstrate the atlantoaxial instability identified on PMCT. Neuropathologic examination revealed Duret hemorrhages within the brainstem, consistent with transtentorial herniation due to severe intracranial hypertension.

Discussion:

This case demonstrates a fatal cascade initiated by occult cervical spine instability, progressing to malignant cerebral edema and terminal brain herniation. It highlights a critical limitation of posterior neck dissection in detecting atlantoaxial injuries and underscores the essential role of postmortem imaging in forensic practice. Reliance on traditional dissection techniques alone may result in underdiagnosis of clinically significant cervical spine injuries, particularly in cases involving minor reported mechanisms and delayed neurological deterioration.

P186 Translating Autopsy Findings for Families: A Plain-Language Reporting Initiative to Enhance Understanding and Trust in Forensic Pathology

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Autopsy reports are essential medical and legal documents, yet they are often dense, highly technical, and difficult for non-physicians to interpret. These reports are routinely provided to coroners, attorneys, families, and other parties who must rely on them during periods of grief and uncertainty. For families pursuing private autopsy services, the need for clarity is often heightened by emotion, mistrust, unanswered or misunderstood medical questions, or concerns about the care their loved one received. Waiting weeks to months for a formal report, only to receive complex findings by mail or email, can further increase confusion and distress. In the absence of clear explanation, families may turn to external sources, including internet searches or artificial intelligence tools, which may provide incomplete or inaccurate interpretations. Forensic pathologists and their teams frequently address these challenges through direct communication, including pre-autopsy consultations, day-of-procedure discussions, and post-report follow-up. However, these conversations may be limited by emotional burden, variable health literacy, language barriers, and the inability of families to retain or revisit complex information over time. This project proposes the development of structured, plain-language autopsy report supplement designed to accompany the final clinical report. The supplement will summarize key findings in accessible language and include visual aids and educational materials for commonly encountered disease processes, including cardiovascular disease, obesity-related pathology, diabetes, acute and chronic substance use, alcohol-related disease, black lung, and mesothelioma. Existing educational resources, including those from organizations such as the American Society for Clinical Pathology, will be incorporated where appropriate. This approach is conceptually aligned with patient-facing initiatives in clinical pathology, such as pathology consultation clinics, which aim to improve patient understanding of complex diagnostic information. The autopsy report will remain unchanged as the official medical document, while the supplement will serve as an interpretive and educational tool. Family understanding will be assessed using surveys administered following receipt of the traditional clinical report and again after review of the plain-language supplement.

Outcomes will evaluate perceived understanding, clarity, confidence in the findings, and trust in the autopsy process. We hypothesize that plain-language autopsy report supplements will improve family comprehension, reduce confusion, and support greater trust and confidence in forensic pathology. This initiative aims to strengthen communication between forensic pathologists and the families they serve while preserving the integrity of the formal autopsy report while being responsive to the needs of the public it serves.

P187 Every Contact Leaves a Trace: Principles for Trustworthy Artificial Intelligence in Medicolegal Death Investigation

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Medical examiner and coroner offices occupy a unique intersection of medicine, public health, and the justice system. The deaths they investigate—including deaths in custody, substance use–related fatalities, and pediatric fatalities—carry consequences for family closure, public health surveillance, civil rights, and criminal proceedings. As artificial intelligence (AI) enters medicine at an accelerating pace, forensic pathology should not passively inherit tools designed for outpatient medicine or general clinical question-answering. Forensic pathologists have a professional obligation to define what trustworthy AI looks like in medicolegal practice.

AI is increasingly being evaluated in both medicine and law, not just for whether it can answer questions, but for whether it can reliably support the work that professionals actually do. In clinical medicine, benchmarks like HealthBench and platforms like OpenEvidence test AI against physician-written standards, with every response traceable to peer-reviewed sources. In law, benchmarks like BigLaw Bench ask whether AI can help produce defensible professional work product. Medicolegal death investigation, which sits at the intersection of both, has no equivalent standard. No benchmark currently exists that evaluates AI against the demands of autopsy documentation, medicolegal reporting, or courtroom admissibility. This work introduces one.

This presentation introduces a framework for evaluating and deploying AI in forensic pathology. Effective systems must function as physician-controlled tools, not autonomous authors. They must capture findings at the point of work, preserve clear and auditable links between source dictation and final report language, support office- and physician-specific formatting conventions, and make all AI-generated suggestions reviewable before they enter the record. These requirements reflect chain-of-custody expectations, records-retention obligations, and National Association of Medical Examiners (NAME) accreditation standards.

The primary contribution of this work is a structured evaluation framework spanning case vignettes and real autopsy documentation tasks, assessed across four dimensions: completeness, internal consistency, source traceability, and policy alignment.

The goal is not to replace professional judgment. It is to ensure that AI entering medicolegal death investigation strengthens documentation, preserves forensic pathologist authorship, and leaves a record that holds in court. This work is not just quality oversight. It is forensic pathology taking ownership of the tools entering its practice before someone else sets the standard for the field.

P188 An Unusual Case of Suicide by Five Self-Inflicted Gunshot Wounds

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Self-inflicted gunshot wounds (GSWs) are a common method of committing suicide, with firearm related injuries accounting for approximately half of all suicides in 2021. However, suicide by multiple self-inflicted gunshot wounds is uncommon, with a reported incidence of 0 to 5% and can pose a challenge for the medical examiner. Specifically, it requires robust investigative efforts to establish that such a case is indeed a suicide versus a homicide. Articles describing suicide by multiple GSWs are infrequent when we

reviewed the literature written in the past few decades. A recent study reported that multiple-GSW cases tend to occur in older populations, an increased proportion of revolvers used, lower muzzle energy handguns, and mostly shots to the torso. Others explored the importance of integrating scene analysis with autopsy findings to avoid misinterpreting multi-GSW suicidal deaths as homicides. We present a case from our institution of a 90-year-old male who shot himself partially witnessed by his stepdaughter 5 times using a .22 long rifle caliber revolver. Medical history included worsening depression. This case is particularly unusual in that most (3) of the GSWs were to the face (mandibular and submental entrances injuring facial structures and not entering the cranial cavity) while the remaining 2 were to the torso. Injuries within the torso included large volume hemoperitoneum, left hemidiaphragm perforations, and bowel perforation. All gunshot wounds were consistent with contact range. Corroborating information from the Deputy Coroner and autopsy findings were used to establish a plausible case for a self-inflicted GSW scenario. Our case illustrates that forensic pathologists must keep in mind the possibility of suicide in a case of multiple gunshot wounds, even to the face. Namely, evaluation requires meticulous scene analysis, timely personal and medical investigation of the decedent, and careful review of the autopsy findings.

P189 Sudden Pediatric Death Due to Ileal Volvulus Secondary to Meckel Diverticulum with Mesodiverticular Band

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Meckel diverticulum is the most common congenital malformation of the gastrointestinal tract, with a reported incidence of 0.6-4% and a lifetime complication risk of 4-9%. Although typically asymptomatic, complications occur more frequently in males and in pediatric populations. These include hemorrhage, diverticulitis, bowel obstruction, and perforation. Rarely, persistence of the left vitelline artery results in a mesodiverticular band extending from the tip of a Meckel diverticulum to the mesentery. This creates a potential fulcrum for volvulus, an uncommon but recognized cause of small bowel obstruction. We report a fatal case of ileal volvulus in a previously healthy 4-year-old boy who presented to an urgent care in asystole following a two-day history of abdominal pain, vomiting, and diarrhea initially attributed to a self-limited illness. Resuscitative efforts were ultimately unsuccessful. Autopsy revealed a necrotic segment of distal ileum twisted around a fibrous mesodiverticular band connecting a Meckel diverticulum to the anterior abdominal wall. This case demonstrates a rare complication of Meckel diverticulum resulting in sudden pediatric death. The nonspecific prodrome can mimic benign gastrointestinal illness, delaying recognition of a surgical emergency. From a forensic and public health perspective, such cases highlight the importance of comprehensive medicolegal death investigation in unexpected pediatric fatalities and contribute to surveillance of congenital anomalies with lethal potential. Increased awareness among medical professionals may improve early recognition and intervention in similar presentations.

P190 Delayed Motor Vehicle Accident–Attributable Deaths Identified at Hospital Autopsy: Challenges in Hospital Death Certification

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Introduction: Deaths resulting from motor vehicle accidents (MVA) fall under medical examiner/coroner jurisdiction. However, patients who survive the initial trauma but later die from MVA-attributable complications become hospital deaths. Over time, the link to the injury becomes less apparent, and the attending physician may classify the manner of death (MoD) as "natural," with the autopsy report (AR) first identifying the connection. Studies report major death certification error rates of 34–51%. This study reviews hospital autopsy cases where the cause of death (CoD) was attributable to MVA and examines discrepancies between autopsy-determined CoD and death certificate (DC) CoD and MoD.

Methods: We retrospectively reviewed autopsy and medical records at Temple University Hospital (2019–2025). Inclusion criteria: (1) decedent had MVA history; (2) AR CoD was attributed to MVA-related trauma and sequelae; (3) death certificate was signed by attending physician; (4) autopsy was performed at the

hospital. Demographics, clinicopathological correlation, interval from MVA to death, report to Medical Examiner's Office (MEO), AR findings, DC CoD and MoD, were analyzed.

Results: Three cases identified. In all cases, DC CoD omitted prior MVA linkage and MoD was classified as natural.

Case 1: A 40-year-old female, 19 years post-MVA. Injury resulted in paraplegia, ventilator-dependent respiratory failure, and neurogenic bladder. Autopsy revealed severe muscle atrophy, stage IV decubitus ulcers, and bilateral acute lobular pneumonia with abscess formation. CoD on AR: Pneumonia due to complications of MVA-related paraplegia. AR was forwarded to MEO.

Case 2: A 69-year-old male, 4 months post-motorcycle accident with pelvic fracture. Complicated by multiple surgeries, suprapubic cystostomy, chronic immobility, pre-existing end-stage renal disease, cirrhosis, and diabetes. Autopsy revealed a large sacral decubitus ulcer (21.0 × 11.0 cm) with abscess, purulent cystostomy site, and acute bronchopneumonia. CoD on AR: Complications of MVA with systemic comorbidities contributing. MEO was notified; case was declined.

Case 3: A 62-year-old male, 14 months post-MVA resulting in paraplegia. Autopsy revealed stage IV sacral pressure ulcers with osteomyelitis and extensive infected surgical incisions from orthopedic interventions. CoD on AR: Sepsis complicating MVA-related spinal cord injury. MEO was not notified.

Discussion: Despite ARs attributing death to MVA complications and MEO notification, DCs omitted MVA from CoD and classified MoD as "natural". Contributing factors could include prolonged injury-to-death intervals, complex comorbidities, and limited certification training. Improved MEO communication may reduce case rejection. Strengthening certification strategies and amending DCs when ARs contradict them will improve mortality data and public health reporting.

P191 Fatal Grain Entrapment: A Forensic Case of Occupational Asphyxia in a Rural Agricultural Setting

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Grain entrapment represents a preventable yet frequently fatal occupational hazard in rural agricultural communities. Victims can become completely engulfed in seconds, leading to rapid hypoxia and death. Risk of entrapment is heightened in the setting of mechanical malfunction and absence of appropriate protective equipment, as these factors increase grain instability and make self-extrication nearly impossible. The specific mechanisms of mechanical and obstructive asphyxia in this event have important implications for forensic medicine, particularly in determining the cause and manner of death, and occupational safety and prevention strategies. We report a fatal case involving a 33-year-old male who became entrapped within a grain elevator in rural North Dakota.

The scene investigation indicates the victim descended approximately 30 feet into a grain pit to manually break apart frozen corn, within the context of grain drying system failure. The decedent was quickly enveloped due to sudden grain release. Witnesses reported that the decedent slowly sank and then vanished altogether. Emergency response was delayed, with an estimated 25 minutes between collapse and the initiation of cardiopulmonary resuscitation. When EMS arrived on scene, the patient was unresponsive, apneic, and pulseless, with particulate matter obstructing the airway. Advanced cardiac life support measures were initiated without return of spontaneous circulation.

An autopsy showed no significant external trauma, but a substantial intraluminal grain within the oropharynx, esophagus, stomach, and distal airways. The lungs were congested and edematous. The collective scene findings, airway obstruction by foreign particulate matter, and pulmonary forensic pathology support a diagnosis of asphyxia secondary to grain entrapment. This mechanism ultimately results in impaired oxygenation and circulatory compromise, culminating in cardiopulmonary arrest. This case emphasizes the pathophysiologic interplay between airway occlusion, thoracic restriction, and delayed rescue in fatal occupational asphyxia. Furthermore, it underscores the

importance of enforcing agricultural safety measures, including routine equipment inspection, strict adherence to protective equipment use (e.g., harnesses), comprehensive worker education, and rapid, coordinated rescue training.

P192 Overhydrated and Overlooked: A Complicated Case of Cerebral Edema

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Chiari malformations encompass anatomic abnormalities of the craniovertebral junction with protrusion of the cerebellar tonsils through the foramen magnum. Patients with Chiari malformation type 1 have underdevelopment of the posterior cranial fossa and normal development of the hindbrain. They are usually asymptomatic throughout childhood and present in their late 20s or early 30s with pressure dissociation headaches and visual disturbances. This patient population is also susceptible to obstructive hydrocephalus, a risk which can be quickly amplified by elevations in intracranial pressure. Surgical decompression is largely successful in relieving symptoms and reducing these risks, but post-surgical progression/recurrence can occur.

Here, we present the case of a 35-year-old male with a history of Chiari malformation (status-post surgical decompression in 2018 and asymptomatic since) and prior substance abuse who presented with severe headaches and associated nausea and vomiting, blurred vision, and photophobia after reportedly drinking a large volume of water in preparation for an employment drug screen. Initially, his neurological examination revealed no deficits, and he was noted to be moderately hyponatremic (128 mmol/L); sodium levels were briefly overcorrected (159-161 mmol/L) before stabilizing in a normal range. His condition slowly deteriorated, progressing to somnolence, responsiveness only to painful stimuli, and a fixed right eye gaze. CT imaging demonstrated diffuse cerebral edema, findings consistent with increased intracranial pressure, and no vascular abnormalities of the head or neck. Urine drug screening and an extensive infectious work-up were negative. Despite external ventricular drain placement, he developed respiratory depression and seizure-like activity accompanied by oxygen desaturations. His prognosis remained poor with no clear etiology for his cerebral edema, and brain death was pronounced a few days after presentation. Main clinical differentials for his cerebral edema included an acute drug toxicity, carbon monoxide toxicity, and a yet undiagnosed infection.

Autopsy (post organ/tissue procurement) demonstrated severe cerebral edema and hypoxic/ischemic encephalopathy without associated inflammation or demyelinating process. Acute lung injury and bronchopneumonia were attributed to mechanical ventilation and critical neurologic disease. Expanded toxicology of antemortem blood was negative. The decedent's mother later provided the results of an MRI from approximately one month prior to death completed as part of chiropractic treatment, which showed findings suggestive of recurrence/progression of the decedent's Chiari malformation. The cause of death was ultimately attributed to complications of Chiari malformation, with hyponatremia due to possible acute water toxicity contributing.

P193 Preterminal Vomiting as a Marker of Elevated Intracranial Pressure in Sudden Out-of-Hospital Fatalities

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Emesis is a common, non-specific symptom routinely attributed to benign gastrointestinal or viral etiologies. In middle-aged populations, however, this assumption may obscure the recognition of catastrophic neurological events, particularly spontaneous intracranial hemorrhage leading to sudden out-of-hospital death. This study examines preterminal vomiting as a potential clinical indicator of lethally elevated intracranial pressure (ICP) and brain herniation, highlighting a vital diagnostic blind spot in pre-hospital settings.

A retrospective review of the County of Santa Clara Office of the Medical Examiner database (N=555) was conducted to identify sudden deaths occurring in non-medical settings. Decedents under 60 years of age with a cause of death attributed to spontaneous intracranial hemorrhage (specifically subarachnoid or intraparenchymal hemorrhages) were included, excluding those deaths attributed to toxicologic overdose or recent infectious illness. Medicolegal death investigator reports, scene documentation, and autopsy findings were analyzed for evidence of preterminal vomiting and neuropathological markers of elevated ICP, including cerebral edema, midline shift, and structural herniation.

Twenty-five cases met inclusion criteria (mean age 47.2 years; range 28-59 years old). Preterminal vomiting was documented in 40% of cases (n = 10). Decedents with documented emesis demonstrated a significantly higher incidence of neuropathological markers of elevated intracranial pressure (ICP), consisting of cerebral edema, midline shift, or herniation, compared to those without emesis (Fisher's exact test, p = 0.042). No significant age differences were observed between the groups (p = 0.767). Anatomically, 60% of fatal lesions (n = 15) involved the posterior fossa or basal subarachnoid space – regions adjacent to the medullary area postrema, a key structure in emetic signaling. Scene investigations also suggested a behavioral prodrome: multiple individuals with documented vomiting were found collapsed in bathrooms, consistent with possible misattribution of neurological symptoms to gastrointestinal illness.

In this cohort of middle-aged adults without toxicologic or acute infectious contributors, preterminal vomiting was associated with neuropathological evidence of elevated ICP and brain herniation due to fatal cerebral hemorrhage (stroke). These findings suggest that isolated, sudden vomiting prior to collapse may represent an early clinical signal of intracranial pressure in out-of-hospital settings. Greater awareness of this presentation among public health and emergency response systems may improve recognition of neurological emergencies that initially mimic benign gastrointestinal conditions but represent fatal cerebral hemorrhage.

P194 Hidden in the Heart: The Importance of Complete Autopsy in Overdose Investigation

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In cases with strong suspicion of death due to drug toxicity, some forensic pathologists will perform an external examination and order toxicology studies without conducting a full autopsy including an internal exam. External examination alone is inadequate for investigating overdose deaths because it doesn't fully allow the pathologist to distinguish whether the decedent died from a drug toxicity or from another cause with drugs present in their system.

We report on three cases in which cause of death was considered drug overdose. However, autopsy also revealed significant cardiac findings: a 25-year-old woman with cardiac myxoma and cardiomegaly, a 28-year-old man with mitral valve prolapse and a coronary artery anomaly, and a 36-year-old man with a congenital bicuspid aortic valve.

Failing to perform a comprehensive death investigation, including a full autopsy, may prevent alternative explanations for a death from being considered. In addition, there may be implications for family members if the condition is heritable. A complete autopsy with thorough external and internal examination is necessary for optimal interpretation of toxicology results. Each case should be interpreted in the context of the circumstances of the death, health history, and autopsy findings.

P195 *Sarcina ventriculi* Found in the Stomach of a Patient with Prader-Willi Syndrome

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Sarcina ventriculi is an anaerobic, Gram-positive coccus that can be identified by its characteristic tetrad morphology on light microscopy. This rare bacterium is part of the Clostridiaceae family and can survive low pH environments, notably the human stomach. The pathogenicity of *Sarcina ventriculi* is still yet to be fully understood, but has been reported in patients with gastroparesis and gastric outlet obstruction, and

has been associated with cases of gastric perforation, peritonitis, and gastric adenocarcinomas. We report an incidental identification of *Sarcina ventriculi* in an autopsy of a 14-year-old male with Prader-Willi syndrome, presenting after a witnessed collapse and resulting death due to gastric content aspiration.

P196 Sudden Cardiac Death from Undiagnosed Anomalous Coronary Arteries in Vulnerable Populations

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Sudden cardiac death (SCD) during exertion in otherwise healthy individuals is a rare but devastating event that disproportionately affects vulnerable populations, including young athletes and physically active adults. Congenital anomalous coronary arteries (ACAs) are a well-recognized but often clinically silent cause of SCD, carrying a high risk of fatal ventricular arrhythmia, particularly when an interarterial course is present. We present two cases highlighting this phenomenon across different age groups.

The first involves a 38-year-old physically active male with no prior symptoms or known medical history, who suddenly collapsed while running. The second describes a 12-year-old boy who died suddenly while playing soccer, despite no prior symptoms, no relevant known medical history, and recent clearance three weeks prior during a routine sports physical. Autopsy in both cases revealed anomalous coronary artery origins with interarterial courses between the aorta and pulmonary artery, predisposing to exertion-induced myocardial ischemia (MI) and fatal arrhythmia. Additional findings included moderate coronary atherosclerosis and interstitial fibrosis in the adult, and concentric left ventricular hypertrophy (LVH) in the pediatric case, which may have further increased arrhythmogenic risk in these patients.

These cases underscore the limitations of current pre-participation screening and routine clinical evaluation, as ACAs, although frequently correctable with surgery if detected, often present with nonspecific or absent symptoms and are rarely detected without advanced cardiac imaging. From a public health perspective, these deaths highlight critical gaps in early identification of at-risk individuals, particularly among young athletes and active adults who are often perceived as low risk.

Forensic autopsy remains essential in identifying occult congenital cardiac abnormalities, accurately determining cause of death, and contributing to surveillance data that can inform prevention strategies. Increased awareness of ACAs, along with consideration of targeted advanced imaging in select populations, may improve early detection and reduce preventable deaths in these vulnerable patients. These cases illustrate the vital intersection of forensic pathology and public health in addressing sudden deaths among vulnerable populations and emphasize the role of multidisciplinary efforts in advancing prevention.

P198 Myocardial Infarction with Non-obstructive Coronary Arteries: An Elusive Cause of Cardiac Death

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Myocardial infarctions are a common cause of sudden death, and the majority of these decedents have significant coronary artery atherosclerosis. However, it has been observed clinically that a subset of patients have myocardial infarction with non-obstructive coronary arteries (MINOCA). Multiple mechanisms for MINOCA have been proposed, including coronary artery spasm, coronary artery dissection, and plaque rupture or erosion. This condition has long been recognized in the cardiology community, but the impact on the field of forensic pathology has been less explored. Unless diagnosed prior to death, cases of MINOCA may be difficult to identify on autopsy and are likely underrecognized. We present a rare case of a 64-year-old woman with MINOCA, left ventricular rupture, hemopericardium, and cardiac tamponade leading to death. In this case, the myocardial infarction was diagnosed four days prior to death, and cardiac catheterization showed lack of obstruction of the coronary arteries. Coronary artery vasospasm was considered the most likely cause.

Although this case had a pre-existing clinical diagnosis of MINOCA, in other cases the diagnosis may be more elusive. Autopsy findings may be minimal in cases of sudden death due to MINOCA, and therefore this condition may be underrecognized. It is possible that cases of MINOCA have been signed out as 'sudden cardiac death of unknown etiology', 'undetermined natural causes', or the like. This lack of accurate classification could prevent further investigation of this cause of death. This presentation will review the diagnosis and etiologies of MINOCA and discuss the challenges of identifying these cases postmortem.

P199 Maternal Deaths at Medicolegal Autopsy: Diagnostic Yield and Challenges Across Direct, Indirect, and Incidental Causes – A 20-Case Series

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Introduction:

Despite a decline in India's Maternal Mortality Ratio to 88 per 100,000 live births (SRS 2021–23), maternal deaths continue to reflect gaps in healthcare access, timely intervention, and sociocultural determinants. Maternal deaths represent a vulnerable population at the intersection of clinical care, public health systems, and sociocultural determinants. When subjected to medicolegal autopsy, they pose significant diagnostic and interpretative challenges. This study evaluates the spectrum of maternal deaths and highlights category-specific diagnostic and public health implications.

Methods:

A retrospective analysis of 20 maternal deaths subjected to medicolegal autopsy over a 4-year period at a tertiary care center was conducted. Cases were classified as direct, indirect, or incidental maternal deaths as per WHO criteria. Autopsy findings, histopathology, and available clinical and circumstantial data were reviewed.

Results:

Of the 20 cases, 11 (55%) were direct maternal deaths, 5 (25%) indirect, and 4 (20%) incidental deaths. In incidental deaths, low-energy trauma or otherwise survivable insults resulted in fatal outcomes, reflecting increased physiological vulnerability in pregnant and postpartum females. In indirect deaths, the cause of death was readily ascertainable and attributable to pre-existing or concurrent medical conditions. In 2 of 5 cases, pregnancy had been medically discouraged but was continued due to familial or societal pressures; in others, underlying conditions were first recognized during pregnancy.

Direct maternal deaths posed the greatest diagnostic challenge, frequently associated with gaps in antenatal surveillance, sudden clinical deterioration, and limited clinical documentation. In postpartum deaths, delayed access to medical care further contributed to fatal outcomes. Autopsy and histopathology were often non-specific, and in 4 of 11 cases (36.4%), the cause of death remained unascertained.

Discussion:

A clear diagnostic gradient exists: indirect and incidental deaths allow reliable attribution, whereas direct deaths constitute a diagnostic "blind zone." These findings highlight the interface between forensic pathology and public health, where autopsy reveals systemic gaps in maternal care.

Autopsy remains indispensable in maternal death investigation, particularly in diagnostically challenging direct cases. Beyond cause-of-death determination, it provides actionable insights into preventable factors within vulnerable populations. Strengthening antenatal care, timely intervention, and clinical documentation is essential. Representative cases illustrate key diagnostic pitfalls and learning points.

P200 When Asphyxia Isn't Obvious: The Variability of Mechanical Findings and Implications for Death Certification

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Mechanical asphyxia is a cause of death in which external forces impair ventilation by limiting the movement of air into and out of the lungs. Traumatic, compressive, and positional asphyxia are often described as distinct yet exist on a spectrum with significant overlap. Petechiae and facial plethora, classical autopsy findings, require continued circulation and may not appear in cases of rapid death or when compression causes complete blood flow obstruction. This case series characterizes the variable presentations of mechanical asphyxia and examines the impact of survival interval on autopsy findings.

Seven cases involving accidental fatal external thoracic compression were identified, including six male and one female ranging in ages 41 to 73 years. Four cases demonstrated classic asphyxia autopsy findings, including conjunctival and facial petechia, facial and/or upper torso congestion, and external evidence of sustained compression such as patterned injuries or soft tissue depression. Mechanisms included machinery entrapment, equipment rollover, and positional wedging after a fall. In contrast, three cases involved clear compressive mechanisms based on scene findings but demonstrated minimal or absent asphyxia findings. Petechiae were absent in two cases and rare in one. These cases were associated with high energy trauma, including motor vehicle accident with ejection and entrapment, crush injury from falling industrial materials (rebar) and vehicle related compression during mechanical work, with autopsy findings dominated by systemic blunt force injuries. Cases with classic autopsy findings were associated with prolonged or uncertain survival intervals, whereas those lacking classical findings involved immediate or brief survival following injury. Despite a shared mechanism of thoracic compression, only five of the seven were certified as accidental mechanical asphyxiation while two were attributed to traumatic injuries.

These findings highlight challenges for death certification. Mechanical asphyxia is underrecognized in polytrauma deaths, especially when classical findings are absent. This variability has important public health implications, as under reporting contributes to misclassification of mortality data, particularly in occupational, agricultural and fall related deaths. It also limits the accuracy of injury surveillance and reduces potential for preventative public health initiatives. Recognition of mechanical asphyxia as a spectrum, and including scene investigation, mechanism of injury, survival intervals and injury burden, may improve reporting accuracy, support consistent certification and better inform public health interventions.

P201 Firearm Grip Imprint Detected on Palm Using Fingerprint Powder

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A firearm can serve as a crucial piece of evidence at crime scenes and in deaths due to firearms. However, the location of the firearm may not always be a reliable indicator in the re-creation of events and determination of a manner of death. The firearm can be intentionally moved to disguise one manner of death for another, unintentionally displaced by anyone interacting with the scene, or could be stolen from the scene entirely. Once obtained as evidence, there is a necessity for connecting a firearm back to a user in a way that does not rely solely on its location at the scene. Common techniques for attempting to associate a firearm to its user include lifting fingerprints from the firearm or the analysis of trace DNA present on the weapon. It should be noted, however, that both techniques possess their limitations, as fingerprints can be smudged and not fully recognizable, while DNA samples can be sensitive to contamination and their analysis open to errors in interpretation. We present a case where a firearm grip became evident on a decedent's hand when applying powder for producing routine finger and palm prints. This technique was serendipitously discovered during routine collection of fingerprints and palm prints during postmortem examination. The case was a suspected homicide-suicide involving a 63-year-old male and his wife, after both were found deceased in their home from gunshot wounds. A gun was found in the husband's hand, and subsequent application of fingerprint powder to the man's palmar skin revealed unique markings consistent with the pattern of that same gun's grip. Although this finding served primarily as confirmatory evidence alongside other findings, it demonstrated the method's potential utility. This utility may be especially relevant when firearms have been moved or are absent from the immediate scene, as patterned hand impressions may help connect a specific weapon back to a decedent.

The pursuit of justice and truth are duties entrusted to forensic teams. Establishing the exact circumstances of a fatality is essential to making accurate determinations, which can be especially meaningful for vulnerable populations at increased risk of violence, whether from their community, within domestic settings, or from themselves. The described fingerprint powder technique may be particularly useful in cases involving ambiguous circumstances or possible scene alteration, as it may assist in confirming that a weapon had been previously grasped in the hand of a decedent.

P202 When Femoral Blood is the Wrong Specimen

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Femoral blood is unanimously considered the optimum specimen for postmortem toxicology. We present here a case of suicide by multiple fentanyl patches applied to the torso. Toxicology was unexpectedly negative for fentanyl in femoral blood. Subsequent testing of iliac and subclavian blood was positive for fentanyl in both. Anatomical and physiological explanations for this discrepancy are proposed. This case challenges the conventional wisdom that femoral blood is always the optimum specimen and demonstrates the value of collecting blood from multiple sites during autopsy.

P203 A Silent Infiltrator: Fatal Systemic Light Chain Amyloidosis Presenting as Refractory Cardiogenic Shock at Autopsy

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Systemic amyloidosis is a multisystem disorder characterized by extracellular deposition of misfolded proteins, often resulting in progressive organ dysfunction and eventual failure. Cardiac involvement is a major determinant of prognosis and may present with nonspecific clinical findings, posing diagnostic challenges in the antemortem setting. We report a case of fatal systemic amyloidosis diagnosed at autopsy in a 71-year-old male with a history of atrial fibrillation, heart failure, end-stage renal disease, and hypertension.

The decedent initially presented to an outside hospital with hypotension and suspected sepsis; however, infectious workup was negative. Evidence of infiltrative cardiomyopathy was seen on the echocardiogram and a concern for cardiac amyloidosis was raised. An abdominal fat pad biopsy was done and was negative for amyloid deposition. The bone marrow biopsy demonstrated hypocellularity with 5-10% lambda-restricted plasma cells, and serum protein electrophoresis revealed an IgA lambda monoclonal protein. Despite initiation of CyBorD chemotherapy, the patient experienced rapid clinical deterioration with refractory hypotension, and eventual cardiogenic shock. He was transferred to our institution but remained too unstable for definitive cardiac biopsy and died shortly thereafter.

Autopsy revealed marked cardiomegaly (760 grams) with biventricular hypertrophy. Histologic examination demonstrated widespread pale, pink, extracellular amorphous deposits involving the myocardium and vascular walls, confirmed as amyloid by Congo Red staining. Similar amyloid deposition was identified in the spleen, kidneys, and pulmonary vasculature, consistent with systemic involvement. The spleen was enlarged (500 grams) and the lungs showed acute bronchopneumonia in addition to vascular amyloid deposition. The liver demonstrated a centrilobular ischemic injury. Coronary arteries showed moderate atherosclerosis without critical stenosis.

The cause of death was determined to be systemic amyloidosis with extensive cardiac involvement, with contributing conditions including acute bronchopneumonia, hypertension, and chronic kidney disease. This case highlights the diagnostic limitations of fat pad biopsy and the challenges of confirming cardiac amyloidosis in unstable patients. It also underscores the critical role of autopsy in identifying occult systemic diseases and establishing the cause of death in cases of unexplained cardiogenic shock. Early recognition of infiltrative cardiomyopathies remains essential, as delayed diagnosis can preclude timely intervention and contribute to rapid clinical decline.

P204 Congenital Diaphragmatic Hernia in a Female Twin Neonate

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Congenital diaphragmatic hernia (CDH) is a rare developmental defect which results in discontinuity of the diaphragm allowing for abdominal viscera to herniate into the thoracic cavity. Occurring on 2-3 out of every 10,000 live births, CDH diagnosis is usually made in utero during routine prenatal ultrasounds around 22-24 weeks gestational age (GA). The goal of early prenatal diagnosis is to determine eligibility for Fetal Endoscopic Tracheal Occlusion and reduce the high mortality risk associated with this birth defect. Because diagnosis is often achieved via prenatal ultrasound for early intervention, it is uncommon to make an initial diagnosis of CDH at autopsy. We present a case of right sided CDH diagnosed at autopsy in a live born female twin neonate.

A 32 week and 5 days gestation monochorionic-diamniotic female twin neonate was delivered via cesarian section due to breech presentation and immediately experienced severe respiratory distress. Bilateral chest tubes drained 10 mL of blood and subsequent X-rays showed persistent opacification of the lungs bilaterally. Resuscitation efforts were not successful and she was pronounced dead 1.5 hours after delivery. The other liveborn female twin had a normal APGAR score and is healthy. The mother has a past medical history significant for one miscarriage at 24 weeks, low grade adenocarcinoma arising in a cervical polyp, and chronic hypertension. Prenatal ultrasound studies were limited. Autopsy findings showed almost complete absence of the right side of the diaphragm with the liver displaced into the right thoracic cavity, bilateral lungs which were small for gestational age by weight, and absence of the right lower lung lobe. Histologic examination confirmed absence of the right lower lung lobe. The remaining gross and microscopic findings were within normal limits for gestational age, and there were no findings to suggest a syndromic etiology of CDH. Severe pulmonary hypoplasia secondary to isolated congenital diaphragmatic hernia was the ultimate cause of death.

P205 Unexpected Metastatic Neuroblastoma Diagnosed at Autopsy in an Infant: The Forensic Pathologist's Role in Postmortem Diagnosis

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Neuroblastoma is the most common extracranial solid malignancy of infancy, arising from primitive neural crest cells of the sympathetic nervous system, most often involving the adrenal glands. Clinical presentation varies widely and may include clinically occult but advanced metastatic disease, particularly to the liver.

We report the case of a 6-month-15-day-old male with a history of gastroesophageal reflux, constipation, and genitourinary anomalies who was found unresponsive during sleep and pronounced deceased despite resuscitative efforts. There was no known prior diagnosis of malignancy. Autopsy revealed a well-developed infant without external trauma. Internal examination demonstrated a right adrenal mass and hepatomegaly with multiple tan-brown lesions. Microscopic evaluation showed a small round blue cell tumor with Homer-Wright pseudorosettes, focal necrosis, and hemorrhage, consistent with a diagnosis of poorly differentiated neuroblastoma. Liver sections confirmed metastatic disease. The cause of death was metastatic neuroblastoma, and the manner of death was natural.

This case highlights the potential for advanced, clinically unrecognized malignancy in infancy and underscores the essential role of the forensic autopsy in identifying undiagnosed disease. Forensic pathologists are often tasked with delivering first-time, life-altering diagnoses postmortem, providing critical information that contributes to family understanding, potential genetic considerations, and closure.

P206 Advancing Traumatic Brain Injury Diagnosis in Road Traffic Causalities: Utilizing Circulating Biomarkers For Enhanced Detection

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Traumatic brain injury (TBI) remains a significant global health challenge and a major contributor to mortality and morbidity, particularly following road traffic accidents (RTAs), which are the predominant cause of TBIs in India. In many instances, TBIs occur without external signs, complicating diagnosis during autopsy and limiting the utility of conventional imaging or gross pathological evidence. To address this gap, an autopsy-based study is currently in progress at the Department of Forensic Medicine and Toxicology, AIIMS Bathinda, aiming to assess the utility of circulating biomarkers in identifying traumatic brain injuries among road traffic casualties.

The study was designed as a prospective, observational investigation. Blood samples were collected during medicolegal autopsies from deceased individuals who had sustained traumatic brain injuries in road traffic accidents. Cases involving advanced decomposition or lack of consent were excluded. A total of 47 cases and 47 age-matched controls are being studied. The blood samples were processed in the laboratory for biochemical analysis, and demographic and clinical data were recorded using a structured proforma. Statistical analysis was planned using SPSS v21.0, with variables assessed for normality and compared using appropriate parametric or non-parametric tests. A p-value of <0.05 was considered statistically significant.

Preliminary literature indicates that biomarkers such as GFAP, NSE, IL-6, and BDNF have demonstrated potential in clinical and forensic evaluation of TBIs; however, no single marker has yet proven both sensitive and specific enough for standalone use. This ongoing study intends to evaluate whether a combination of selected biomarkers can reliably detect intracranial hemorrhages and TBIs, particularly in cases lacking visible external injuries. The findings are expected to contribute to the development of a biochemical toolkit that can complement traditional autopsy techniques in improving the accuracy of TBI diagnosis in forensic settings.

P207 Meningiomatosis in the setting of Neurofibromatosis Type II: Syndrome Recognition and the Duty of Care after Autopsy

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Introduction:

Neurofibromatosis type 2 (NF2) is a hereditary tumor syndrome caused by a pathogenic variant in the *NF2* gene. While the classic lesion of NF2 is bilateral vestibular schwannomas, NF2 is also associated with meningiomas, ependymomas, glial microhamartomas, and ocular lesions including cataracts and retinal hamartomas. Approximately 50% of NF2 patients will develop meningiomatosis, defined as two or more meningiomas in different locations, occurring either simultaneously or sequentially. NF2 patients with intracranial meningioma(s) have a significantly increased risk of mortality. Herein we present a patient with extensive NF2-related craniospinal tumor burden, including meningiomatosis.

Case:

The patient was a 25 year old woman with genetically confirmed neurofibromatosis type 2 (NF2). Her surgical history included resection of left and right vestibular schwannomas as well as resections for multiple intracranial and spinal cord meningiomas (CNS WHO grade 1 and 2). She had ventriculoperitoneal shunts for management of hydrocephalus, complicated by multiple shunt failures and subsequent revisions. Medical management of her meningiomas included radiation therapy, bevacizumab, pembrolizumab, and brigatinib. The patient ultimately transitioned to comfort care and passed in the setting of aspiration pneumonia.

Discussion:

As illustrated by the patient discussed herein, NF2-associated lesions can arise at an early age with extensive tumor burden. While this patient was clinically diagnosed with NF2 prior to their death, identification of multiple meningiomas, ependymomas, or schwannomas during autopsy should trigger consideration of NF. Both NF1 and NF2 may present congenitally and as sudden unexpected death.

Recognition of these and other syndromes by the autopsy pathologist is crucial to the cause of death and for surviving relatives for which genetic testing is likely indicated. Swift communication by forensic pathologists of this "critical value" via a letter or other means to the next-of-kin is an essential medical examiner duty of care, as uncovering familial NF diagnoses has important implications in lifetime health screening recommendations, as well as morbidity and mortality.

P208 Illicit Stimulant Use in the Setting of Aneurysm Rupture

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Cocaine and methamphetamine are both known to induce severe, acute hypertension. Hypertension, in turn, can lead to ruptured aneurysms. For this project, we analyzed medical examiner autopsy cases of ruptured aneurysms from Western Michigan between 2014 and 2025 to identify cases that contributed cocaine and/or methamphetamine/amphetamine in the cause of death statement. 66 aneurysm-related deaths were identified, with 35 cerebral berry aneurysms, 15 thoracic aortic aneurysms, and 16 abdominal aortic aneurysms. Five deaths (one berry aneurysm and four thoracic aortic aneurysms) had no toxicology performed and were therefore excluded for a study total of 61 deaths. Nine deaths (15%) were classified as accidents due to methamphetamine/amphetamine use, while three (5%) contributed cocaine use. Based on this data, approximately 20% of all ruptured cerebral berry and aortic aneurysm deaths found during medicolegal autopsies had acute illicit stimulant involvement. Methamphetamine/amphetamine-related deaths were involved in cerebral berry, thoracic aortic, and abdominal aortic aneurysm ruptures, with cerebral being the most common. Methamphetamine/amphetamine deaths ranged from 34 to 69 years old. All three cocaine-related deaths were due to ruptured cerebral berry aneurysms in middle aged adults, ranging from 40 to 51 years of age. As ruptured aneurysms are generally considered a natural disease process, care must be taken during death investigations to ensure that illicit stimulant use is considered as a contributing factor and postmortem toxicology should be performed.

P209 An Oral History of Disaster Mortuary Operational Response Teams: Preliminary Findings

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Following a mass-fatality event, the recovery and identification of the dead is tremendously important. Today, following many large-scale, mass-fatality events, this work falls to a variety of death care workers and forensic specialists who are deployed as part of the federally-managed Disaster Mortuary Operational Response Teams, or DMORT. Started in the late 1980s by a group of funeral directors in the American Midwest who felt that the management of mass fatality remains was not standardized across jurisdictions, DMORTs have evolved over time into a complex, medico-legal system that requires collaboration between multiple professionals with diverse expertise, including medical examiners and coroners, funeral directors, forensic pathologists, dentists, anthropologists, and others. This presentation will review the preliminary findings from an oral history project dedicated to interviewing early participants in DMORT. The goal of this project is to document the first-hand perspectives of those who contributed to the system's development and who can provide insight into its growing pains. While there is extensive literature on the development of identification technologies, DVI protocols, and disaster management over the last 40 years, this project seeks to fill the gap in our knowledge about the individual experiences of DMORT staff. It will add to institutional histories of DMORT by exploring personal motivations behind this work and how that work is shaped by the particular overlap of individual personalities, technological innovations, and the highly-specific circumstances of each disaster event. These interviews reveal that the disaster mortuary is a place in which professional training butts up against logistical complexities, political tensions, emerging technologies, and evolving public expectations that both help and hinder the work performed there.

P210 The "Grainy Truth": It's Still a Thing.

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Grain entrapment fatalities are often labeled as tragic accidents but that framing obscures a harder truth. These deaths are predictable, patterned, and disproportionately borne by vulnerable workers in agricultural communities. They occur in environments where risk is normalized, oversight is limited, and experience is often relied upon in place of adequate safety systems.

A case in our jurisdiction makes this painfully clear. The decedent in our discussion was not inexperienced and had worked at the facility for decades. In an effort to keep operations moving, he entered the top of the silo and stepped onto crusted corn, using a soda crate to stand on the surface of the grain in an attempt to break up the clumped corn for faster loading. He was accompanied by a second, much younger worker who had been on the job for only a week. Within moments, the surface gave way and he began to rapidly sink into the grain.

The young coworker, realizing what was happening, called for help while trying to hold onto his co-worker's hand. While this is occurring, the decedent is banging against the bin, calling out to a truck driver outside, still conscious, still fighting as he continues to sink. Within two minutes of getting stuck in the corn, the decedent was fully engulfed, and his co-worker was also beginning to become trapped in the grain. Rescuers were able to save the younger employee. After a few hours with the use of heavy equipment and significant resources, the engulfed employee eventually recovered from the silo.

This case is more than a single workplace tragedy. It reflects systemic failures where years of experience can create a false sense of security. As forensic professionals, we witness the aftermath of these preventable deaths firsthand, yet our role should not end once the investigation is complete. The stories carried into our offices should drive change. By using death investigation data to strengthen the community, we have an opportunity to identify risks before another tragedy strikes. Grain entrapment deaths are not inevitable accidents, they are preventable tragedies, and bridging forensic science with public health is critical to ensuring fewer families and communities experience these devastating losses.

P211 Suicide in Medically Vulnerable Older Adults: A Case of Drowning Following Chronic Illness and Functional Decline

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Suicide in older adults is a multifaceted, underrecognized issue, with social isolation, chronic illness, and declining functional status all serving as major risk factors. Over the past two decades, suicide rates among adults aged 65+ have significantly increased, with vulnerable sub-groups experiencing increases of up to 44%. Despite its emergence as a public health threat, suicide in elderly populations remains insufficiently addressed. We present the case of an 87-year-old woman with chronic lung disease who died by suicide via drowning in a shallow backyard creek in late December. Four days prior to her death, she had been evaluated following a suicide attempt in which she removed her home oxygen and lay outdoors for approximately 12 hours in freezing conditions. Daytime temperatures were 30-40°F with nighttime temperatures near 20°F at the time. After being found by a neighbor who called EMS, she was taken to the ED, where she told staff that she wanted to die. However, hours later, after she rewarmed and was joined by family, she told the ED provider she was no longer suicidal and was subsequently discharged.

This incident occurred on 12/23, and death via drowning was declared on 12/27. A note recovered from the scene confirmed suicide and documented her intent. Family reports indicated that she had been suffering from interstitial lung disease requiring home oxygen, with progressive functional decline and increasing frustration related to oxygen dependence and her medical condition. Autopsy findings did not show significant trauma but revealed asphyxia through drowning. This was supported by frothy fluid in the airways, wrinkling of the extremities, and serous fluid in the sphenoid sinuses. Additional findings included a contusion on the right lower quadrant of the abdomen. Ultimately, this case underscores the critical role of chronic disease as both a burden and a risk factor for suicide. It highlights the need for early identification of psychological distress, enhanced social support, and integrated, sustainable interventions for medically vulnerable older adults.

P212 Death as a Result of Complications of Laparoscopic Sleeve Gastrectomy: Forensic Pathology Role in Investigating Post-Operative Deaths

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As the prevalence of morbid obesity rises in the United States, laparoscopic sleeve gastrectomy has become a primary public health intervention. Although the procedure has a low mortality rate, patients with a high body mass index (BMI) and/or other comorbidities represent a vulnerable population at a higher risk of surgical failure. Forensic autopsy performance in post-operative deaths can be essential in distinguishing death related to surgical complications from other comorbidities. We present the case of a post-operative death following laparoscopic sleeve gastrectomy.

A 49-year-old obese (BMI 58.5) male with a history of cardiovascular disease and severe obstructive sleep apnea underwent elective laparoscopic sleeve gastrectomy. His post-operative course was relatively uneventful, and he was discharged home; however, he presented to the emergency department (ED) 12 days post-op with complaints of severe abdominal pain and syncope. An elevated white blood cell count was noted, and a CT scan was performed to evaluate for kidney stones. The CT scan did not visualize the surgical site. Ultimately, his symptoms were attributed to dehydration, and he received intravenous fluids, and he was discharged. At post-op day 25, the man experienced acute shortness of breath and fatigue and called 911. He suffered a cardiac arrest in the ambulance and could not be resuscitated.

A medicolegal autopsy was performed, which revealed a 2500 cc hemoperitoneum related to a disrupted gastric staple. The surgical site staple line was surrounded by infection and abscess formation. Cultures from the surgical site were positive for Enterococci, Serratia, and Streptococci. The adjacent omentum and spleen were hemorrhagic and swollen. The exam was also significant for cardiomegaly (650 g) and atherosclerosis involving the coronary arteries and aorta. The cause of death was ruled as complications of gastric reduction surgery for morbid obesity, including surgical site breakdown/inflammation/abscess formation and hemorrhage, with massive hemoperitoneum. The manner of death was ruled an accident.

From a public health standpoint, this case highlights the necessity for greater suspicion of surgical complications in the postoperative care of morbidly obese patients undergoing weight-loss-related procedures. This is particularly evident during this patient's ED visit, where post-operative complications were apparently not considered as an etiology for the patient's symptoms of abdominal pain and syncope. Forensic pathologists play a vital role in identifying deaths related to post-operative complications, but such cases cannot be identified unless proper evaluation, including autopsy performance, is pursued.

P213 Splenic Abscess in Sickle Cell Disease: A Rare Cause of Fatal Peritonitis

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Secondary Bacterial Peritonitis (SBP) is an acute infection of the peritoneum resulting from the rupture of the gastrointestinal or the urogenital tracts or their associated solid organs, usually due to trauma, surgery or perforation in the setting of persistent inflammation. Around the globe, secondary peritonitis accounts for about 1% of urgent/emergent hospital admissions and is the second most common cause of sepsis in the ICU. Splenic abscess is an uncommon diagnosis with a reported incidence of less than 0.7% in autopsy series, and most commonly seen in the setting of immunocompromised individuals. Although cases of splenic abscesses have been reported in patients with sickle cell disease, splenic abscesses are considered especially rare in this population because of the tendency towards early autosplenectomy. Spontaneous rupture of these abscesses resulting in SBP is an even rarer and life threatening complication, with only a handful of reports described in literature.

Herein, we present a unique case of a 45 year old African-American male with a reported history of chronic alcohol use and no recent medical provider, found supine on his bedroom floor without any evidence of trauma. The decedent had reported non-specific flu-like symptoms, bilateral lower extremity swelling, and anorexia for several days prior to death in addition to recent falls and rib pain, including the day prior to

his death. At autopsy, approximately 300ml of purulent, malodorous fluid was identified within the abdominal cavity and the visceral peritoneum of the intestines and peritoneal surface of the left hemidiaphragm displayed several tan-grey plaques. Examination of the spleen revealed a capsular defect continuous with a 5.00 x 4.0 x 2.0 cm abscess with associated acute inflammation and rupture confirmed via histologic evaluation of hematoxylin and eosin-stained tissue sections. Intravascular sickle erythrocytosis was identified. The cause of death was determined to be secondary bacterial peritonitis due to ruptured splenic abscess, and the manner was classified as natural.

This case highlights a rare and fatal complication of sickle cell disease and underscores the critical role of autopsy in identifying occult infectious processes. Reporting of these uncommon causes expands the medical literature, improves recognition among clinicians and pathologists, and may help in reaching earlier diagnosis and more effective interventions.

P214 Ask the Dead: When the Clinical Record Is Silent: The Definitive Role of Medicolegal Autopsy

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Introduction: In cases presenting without an established cause of death, the medicolegal autopsy serves as the definitive investigative tool. Three cases are presented — an infant, a child, and a middle-aged adult — in which postmortem examination identified the cause of death in the absence of any preceding clinical diagnosis or witnessed event.

Cases: An 18-month-old was found unresponsive. No choking episode had been observed. The family reported no history of foreign body ingestion, and the decedent had displayed no preceding distress or symptoms. Autopsy revealed a small rubber ball lodged within the small bowel, producing complete intestinal obstruction. This finding was entirely absent from the clinical record and was identified solely at postmortem examination.

A 55-year-old man collapsed in cardiac arrest. Family members recalled slurred speech and hip pain in the days preceding death — nonspecific complaints that had not prompted medical evaluation. He had no documented cardiac history. Autopsy revealed a myocardial abscess. Postmortem investigation identified a recent dental procedure as the likely source of bacteremia. No clinical connection between the dental visit and the cardiac presentation had been made prior to death.

A 7-year-old was found unresponsive after an episode of vomiting. The available history consisted only of the child eating granola bar in bed prior to the event. Autopsy with neuropathological consultation revealed a cerebellar infarct attributable to rupture of an arteriovenous malformation. The malformation was congenital in origin and had not been previously identified by family members or treating physicians.

Discussion:

These three cases illustrate distinct mechanisms of death — foreign body intestinal obstruction, bacteremia-seeded cardiac abscess, and hemorrhagic infarction from a congenital vascular malformation — each identified exclusively at autopsy. Collectively, they demonstrate the indispensable role of thorough internal examination, ancillary studies including neuropathological consultation, and comprehensive postmortem investigation in cases where clinical history is absent, incomplete, or misleading.

In cases lacking an established clinical diagnosis at the time of death, postmortem examination may represent the only means by which cause and manner of death can be determined. These cases affirm the continued necessity of complete medicolegal autopsy, including appropriate ancillary studies, as the definitive investigative standard in unexplained death.

P216 You're so "Vein": A Rare Vascular Cause of Death and an Incidental Complication of Cosmetic Surgery

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An 80-year-old woman with a medical history of chronic kidney disease (stage III) and losartan, pravastatin, and low-dose aspirin bottles present at the scene was found unresponsive on her bathroom floor surrounded by a large volume of blood. External examination at the time of autopsy was significant for scars consistent with remote bilateral breast augmentation and a 0.5 x 0.3 centimeter ulceration near the left lateral malleolus. There were no external injuries observed. Internal examination was significant for ruptured breast implants bilaterally and smoking related changes of the lungs (pulmonary anthracosis and emphysema). Histologic examination of the ankle ulceration revealed the cause of death: a ruptured varicose vein resulting in lethal exsanguination. Incidentally, routine histologic examination demonstrated numerous perivascular, loosely formed granulomas consisting of multinucleated giant cells and lymphocytes within the interstitium of the lungs and the portal tracts of the liver. These foreign body granulomas contained round, cleared out vacuoles with refractile particles under polarized light, consistent with silicone granulomas secondary to the patient's ruptured silicone breast implants.

Breast implant rupture with embolization of silicone and subsequent granuloma formation, while only an incidental finding in the lungs and liver in this case, raises important differential diagnostic considerations. In the lungs, these include numerous conditions such as aspiration, lipoid pneumonia, hypersensitivity pneumonitis, sarcoidosis, infection, or drug/toxin induced injury. Hepatic granulomas likewise raise the possibility of sarcoidosis, infection, or drug/toxin induced injury and could additionally be seen in primary biliary cholangitis among other autoimmune conditions. In deaths directly attributed to breast implants, complications of implant rupture are relatively infrequent, where the majority of deaths are due to the development of implant-associated anaplastic large cell lymphoma.

While varicose veins due to chronic venous insufficiency are a relatively common finding at autopsy, sudden unexpected death due to fatal exsanguination from a ruptured varicose vein is a rare occurrence. Varicosity rupture can be spontaneous or a result of minor trauma, especially if localized over bony protuberances. Medical examiners should be aware of ruptured varicose veins as a potential cause of death when investigating a scene that contains large amounts of blood without an obvious source, especially since such scenarios can initially raise concerns for a non-natural manner of death and venous ulcers can be inconspicuous upon initial examination of the body.

P217 Determination of Cause and Manner of Death in Agitated Delirium Induced by Acute Drug Intoxication in the Setting of Police Restraint

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Excited Delirium, also known as Agitated Delirium (AD), is a medical condition that exhibits extreme agitation with altered mental status. This term is no longer endorsed as a standalone cause of death, as the underlying cause for the delirious state be used for death certification. Individuals in a state of AD may not respond to verbal de-escalation tactics and resist arrest, prompting police to use physical restraints and conductive energy devices (CED). Historically, use of restraints and CEDs has been a cause for controversy and hypothesized to contribute to deaths in police custody. Individuals in custody are a vulnerable population for whom thorough death investigations are paramount. We present a case in which exhaustive scene investigation, autopsy, toxicology, and review of records, including body camera footage, was essential in establishing the manner and cause of death.

A 31-year-old male was pronounced dead following his arrest and medical treatment. A complete autopsy including toxicology was performed. There was evidence of blunt force injuries to the head and neck. Reflection of the scalp and posterior neck dissection revealed hemorrhage in the frontal, parietal and left temporal scalp and soft tissue of the posterior neck. Linear, confluent and punctate abrasions were present across the torso, upper and lower extremities. Examination of soft tissues revealed superficial and deep intramuscular hemorrhage across the back, buttock, upper and lower extremities, and hemorrhage in the paraspinal soft tissue. Injuries consistent with use of a CED were present. Toxicology findings were positive for fentanyl, methamphetamine and ketamine. The cause of death was determined to be Acute Fentanyl, Methamphetamine and Ketamine Intoxication and Blunt Force Injuries. The manner of death was undetermined.

The cause and manner of death in cases of AD induced by acute drug intoxication, especially those involving police restraint and use of CEDs, are difficult to determine. While it is possible use of a CED may have contributed to the deterioration of the decedent's condition, it would be hasty to declare that its use alone caused his death. The decedent's extensive blunt force injuries are believed to have contributed to death, however due to their unknown etiology, the manner of death was determined to be undetermined. Thorough scene investigation, autopsy, and review of medical and police records, are vital to determining the manner and cause of death in cases of AD induced by acute drug intoxication in the setting of law enforcement restraint.

P218 Surprise! It's not drugs!

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Cardiac arrest is the sudden cessation of heart activity resulting in hemodynamic failure. It can lead to sudden cardiac death (SCD) if the death is due to a cardiac cause within 1 hour of the onset of symptoms or 24 hours of being healthy. Sudden cardiac arrest affects 350,000 people every year and can result from a variety of circumstances. With a 90% mortality, sudden cardiac arrest is one of the leading causes of death and affects people of all ages, with the median age in the US being between 66-68 years old. Etiologies vary with age. Younger individuals suffer from SCD due to arrhythmias, cardiomyopathies, and coronary artery anomalies, while older people have cardiovascular disease leading to SCD.

This case series examines several cases of people who died due to sudden cardiac arrest and what led to their unexpected deaths. Case 1 consists of a 37-year-old male with congenital bicuspid aortic valve stenosis, cardiomegaly (450gm), and left ventricular hypertrophy (2.0 cm) leading to sudden cardiac death. Case 2 is a 44-year-old white male presenting with a thoracic aortic dissection extending for 29 cm with a diameter of 2 cm. He had cardiomegaly (850 gm) and biventricular dilation. In addition, he had left ventricular hypertrophy (1.8cm), nephrosclerosis, an anomalous origin of a coronary artery with atherosclerosis in the aorta, which could have contributed to the dissection and SCD. Case 3 consists of a 42-year-old white female with congenital coronary abnormalities who was positive for methamphetamine. She has congenital ostial membrane of the left main coronary artery and acute angle right main coronary artery takeoff, which could have led to myocardial ischemia and SCD. Methamphetamine could have also contributed to SCD since it is cardiogenic. Both methamphetamine and coronary abnormalities are believed to have caused SCD. Case 4 examines a 34-year-old African American woman with Marfan syndrome and cardiomegaly (440gm) who presented with a 6 cm aortic dissection in the aortic arch and a 2.5 cm dissection in the ascending aorta. The dissection led to hemopericardium (300mL), which caused a cardiac tamponade and SCD.

It can be challenging to determine the cause of sudden cardiac death and take precautionary measures, especially in younger individuals who are healthy and do not have known cardiac conditions. These cases emphasize the importance of screening for congenital conditions and monitoring individuals to ensure that they do not lead to sudden cardiac death.

P219 A case review: Forensic Identification of Death Caused By Dextromethorphan Abuse Combined with γ -hydroxybutyric Acid Poisoning

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In recent years, the abuse of the third-generation drugs, represented by new psychoactive substances and their substitutes, has become increasingly prominent, posing serious legal and health problems. We reported a forensic autopsy case of death due to abuse of dextromethorphan (DXM) combined with γ -hydroxybutyric acid (GHB) poisoning.

The decedent was a 22-year-old male with a 3-year history of DXM abuse. One day at 10 p.m., he took approximately 70 DXM tablets (each containing 1.5 mg). After four hours, he consumed a beverage containing 1,4-butanediol (BDO). At approximately 10 a.m. the next day, he was found unresponsive in a face-down position in the rear seat of a vehicle and was pronounced dead despite resuscitative efforts. Autopsy was conducted 3 hours after death, and cardiac blood and urine were extracted for toxicology testing. The deceased's head was tilted to the left, with his limbs, elbows, and knee joints at a 90-degree angle. The livor mortis was dark purple and red, located on the left facial area, anterior neck, and lower part of the left chest where it was not compressed, with multiple bleeding points. The corpse showed classical signs of asphyxia including pinpoint bleeding on the bulbar conjunctiva, cyanosis of the nail beds, diffuse pericardial hemorrhage points, edema and congestion in both lungs, local pulmonary emphysema and alveolar septa rupture under the microscope. The BDO and its metabolic products GHB were detected in the blood and urine samples; the blood tested positive for DXM, with a concentration of 14.30 µg/mL, which exceeded the reported lethal concentration. Besides, the on-site investigation did not reveal any signs of fighting or bloodstains.

As for the cause of death, the BDO and GHB, along with DXM, can all cause respiratory depression and synergistically lead to asphyxiation and death. In addition, based on the distribution characteristics of the corpse rigidity, livor mortis, and bleeding points, we believed that prolonged exposure to an abnormal position in a confined space may also promote asphyxia and death.

This case highlights the complexity of determining the death cause in cases involving polysubstance abuse. Toxicological drug concentrations alone may be insufficient for accurate interpretation. Comprehensive evaluation, including death scene investigation, forensic autopsy findings, and toxicological analysis, is essential for determining the cause and manner of death.

P220 Sharp Force Neck Injury Suicide in the Setting of Phencyclidine Intoxication: A Case Report

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Suicide remains a significant public health issue worldwide, resulting in hundreds of thousands of deaths each year. In the United States, the most common methods include firearm injury, asphyxiation, and poisoning. Suicide by sharp-force injury represents a small proportion of self-inflicted deaths, and cases involving multiple anterior neck sharp-force injuries are uncommon. Sharp-force injuries to this region may cause death through a variety of mechanisms due to the presence of vital airway and vascular structures. In addition, careful examination is necessary to differentiate between suicide and homicide. The evaluation becomes even more complex when intoxication is involved. Phencyclidine (PCP), a dissociative agent, is associated with agitation, psychosis, impaired judgment, and decreased pain perception, effects that may facilitate impulsive behavior. PCP is associated with fatal self-harm, though the dissociative and psychotomimetic effects can blur distinctions between impulsive self-harm and deliberate suicidal behavior. Suicides occurring in the setting of PCP intoxication have been documented with numerous reported methods including firearms, drowning, hanging, and overdose. Self-inflicted sharp-force injury to the neck in association with PCP intoxication remains rarely described in the literature. Herein, we present a case of suicide by multiple sharp-force injuries to the neck in the setting of PCP intoxication. The decedent was an adult male found deceased in his secured residence. Autopsy revealed numerous sharp-force injuries localized to the central anterior neck, which were predominantly horizontal in orientation. The wounds involved soft tissues, strap muscles, larynx, trachea, and esophagus, with extension into deeper skeletal muscle along the spine. Toxicologic analysis of femoral blood was positive for phencyclidine. The cause of death was determined to be sharp-force injuries of the neck, and a knife was identified as the instrument. This case represents an uncommon report of self-inflicted sharp-force neck injury in the context of PCP intoxication. The multiplicity of wounds raised initial concern for homicide, however, thorough scene investigation, injury pattern analysis, and toxicologic correlation established the manner of death as suicide. Our case raises awareness of an uncommon presentation to improve forensic recognition. Increased awareness of substance-related risk factors may also inform future prevention efforts.

P221 Hidden Risks: Anesthesia Induction and Dandy-Walker Malformation

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Dandy-Walker malformation (DWM) is a rare congenital neurological anomaly characterized by hypoplasia of the vermis and cystic enlargement of the fourth ventricle, causing superior displacement of the tentorium and torcula. We report a death in which there was a finding of DWM in conjunction with congenital heart defects.

A 1-month and 11-day old infant died unexpectedly during anesthesia induction for ventriculoperitoneal and cystoperitoneal shunt placements. Medical history includes term newborn delivered vaginally and DWM noted on fetal imaging. Surgery was scheduled due to progressive macrocephaly following the last neurosurgical evaluation. Magnetic Resonance Imaging prior to admission showed significant enlargement of the posterior fossa compared to prior imaging, with moderate hydrocephalus of the bilateral lateral ventricles and third ventricle.

The patient had decreased breath sounds bilaterally following intubation, likely due to bronchospasm, but resolved following administration of epinephrine. The heart rate ceased, and resuscitation efforts were initiated and ultimately unsuccessful. Autopsy examination showed no evidence of trauma to the central nervous system. Neuropathology consult revealed findings consistent with DWM including cerebellar hypoplasia with cystic architectural disruption, widely dilated fourth ventricle, right cerebellar dentate nucleus aplasia, gliosis of the deep cerebellar white matter, and hydrocephalus. Cardiac pathology consult showed borderline cardiomegaly, persistent left superior vena cava, patent ductus arteriosus, and patent foramen ovale.

After analysis of medical records detailing multiple cardiac defects, DWM, and autopsy findings, the death was deemed to be due to bronchospasm and bradycardia during anesthesia induction. The presentation will detail the pathophysiology of DWM and emphasize the importance of incorporating specialized studies, including neuropathology and cardiovascular examinations, in the analysis of a sudden unexpected death during anesthesia induction.

P222 Echoes of Discrepancy - a Fatal Disconnect: Autopsy Findings and Clinical History Discordance - a Case Report

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Case:

This 22-year-old man was known to be asthmatic and autistic (non-verbal). He presented with appetite loss for four days, persistent vomiting for two days and a history of resolved cough from three weeks prior. Examination revealed tachycardia, dehydration and generalized abdominal tenderness. Blood investigations showed: an elevated WBC - $25.91 \times 10^9/L$, BUN -27.5 mmol/L, creatinine - 358 $\mu\text{mol/L}$ and creatine kinase - 574 U/L. His assessment was: acute gastroenteritis, sepsis and acute kidney injury. CT abdomen showed diffuse hepatic steatosis. During hospitalization, his WBC decreased. However, he developed severe metabolic acidosis, had persistently elevated BUN and creatinine and his creatine kinase markedly increased. A suspicion of toxin ingestion was highlighted. Third day post-admission, he desaturated and examination showed right lung crepitations. He was admitted to the intensive care unit and sputum culture was taken at the time of intubation. The following morning, he went into cardiac arrest and was pronounced dead.

The significant findings were those of a grossly underweight and fatty liver and pale mottling of the heart. The skeletal muscles and diaphragm appeared normal. Histology confirmed mild steatohepatitis with macro-vesicular (~ 90%) and microvesicular (~10%) steatosis. The heart showed features of acute injury. The kidneys revealed no definitive evidence of rhabdomyolysis. The lungs showed necrotizing aspiration pneumonia, associated with the Coagulase negative *staphylococcus* and *Corynebacterium striatum*

positive, antemortem sputum culture. The cause of death was aspiration pneumonia, neutrophilic myocarditis, and steatohepatitis.

Discussion:

This case highlighted autopsy/history discordance. The findings alluded to the possibility of a viral illness or toxin ingestion. This prompted consultation with other pathologists including renal and gastrointestinal specialists as well as chemical pathologists to validate findings. Additional laboratory investigations were also performed, inclusive of antemortem Troponin T and CK-MB, which were elevated. Antemortem toxicology was negative. However, same was limited to salicylates and drugs of abuse. Additionally, the clinical history was limited, including lack of knowledge of symptoms as well as denial of viral illness and the possibility of toxin ingestion or medication overdose. The deceased was autistic, non-verbal and thus unable to assist with elucidating same. Despite best efforts, no further testing could be performed due to limited panels and no agent of suspicion. So while the terminal event was Aspiration pneumonia, the inciting agent which initially led to his hospitalization still remains a mystery.

P223 Secondary Identifiers as Critical Tools in Decomposition: A Case Series Highlighting Practical Application

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Proper postmortem identification is imperative in maintaining the medicolegal process in death investigation. Confirmed identification of the decedent will be used in notification of family members, case investigation, death certification, and court hearings, all of which highlight the importance of an error-free process. Primary, more routine forms of identification include DNA analysis, dental records, and fingerprint comparison. However, these methods may not always be feasible in every case. Therefore, alternative modes of identification may be utilized to ensure accurate identification.

We present three cases with decomposition ranging from moderate to marked in which facial recognition and routine methods of identification were not practicable, requiring the use of alternative methods. Case 1 presented in a moderately decomposed state. Forensic identification was achieved via confirmation of the decedent's name inscribed within an upper denture, the presence of a tattoo compared to premortem photographs, and verification of a cerebral artery aneurysm coiling on postmortem radiography. This case highlights the use of implantable hardware in conjunction with other secondary identifiers in cases with advanced decomposition. Case 2 presented in a moderately decomposed state with insect activity. Forensic identification included a confirmation of two distinct tattoos from premortem photographs, underlining the reliability of using external physical identifiers in corroboration with premortem photographs. Case 3 presented in a moderate to marked decomposed state with advanced insect activity. Forensic identification was achieved via the verification of an implantable internal loop recorder utilizing a serial number documented in medical records. This case illustrates the importance of using a secondary method along with medical records to establish identity.

Accurate and expedited identification of decedents is essential for both maintaining the integrity of the medicolegal process and in timely notification of family members during a challenging time. In cases of advanced human decomposition where primary identifiers are impeded, the use of alternative and secondary methods is essential for minimizing both delays and errors in investigations. These methods may also be applied in cases in which identification is difficult due to reasons other than decomposition, such as trauma.

P224 "Shootout at the O.K. Corral?" The Role of Autopsy and Histology in an Apparent Double Homicide

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A 28-year-old man and his 50-year-old mother were found dead inside their secured home, each with apparent gunshot injuries. The initial scene investigation raised concern for a double homicide, and both decedents underwent forensic autopsy to clarify the events leading to death. On gross examination, the mother had two gunshot wounds of the head, including a perforating wound to the left face and a

penetrating wound of the vertex. The son had moderate decomposition and two penetrating gunshot wounds of the forehead. No significant natural disease was identified in either decedent.

The mother's injuries were consistent with homicide, and the manner of death was certified as such. In the son, the degree of decomposition limited gross assessment, particularly with respect to close-range findings. Although the external exam did not clearly show soot, histologic examination of the wound margins and adjacent skin demonstrated soot deposition, supporting a close-range discharge. This microscopic finding was critical in determining that the son's injuries were most consistent with a self-inflicted gunshot wound, and the overall manner of death was ultimately determined to be homicide suicide rather than a simultaneous homicide, as the scene findings initially favored.

This case highlights the value of the autopsy in correcting an initial scene impression that suggested a double homicide. It also shows the value of histology in decomposed firearm deaths, particularly when there is uncertainty about the range of firing. The presence of soot on microscopy provided objective support for the wound interpretation when the gross findings were no longer reliable.

A final point in this case was the possibility of tandem fire, a firearm phenomenon in which more than one round may discharge in very close temporal proximity. While uncommon, it can complicate reconstruction when multiple gunshot wounds are present, and the scene appears chaotic. Taken together, the autopsy, microscopic findings, and scene correlation were essential in separating appearance from mechanism and in arriving at the most accurate medicolegal interpretation of death.

P225 Lice, Litter, and the Lackluster

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Pediculosis corporis is a skin condition caused by body lice, typically presenting with pruritic rashes and often resolving with adequate hygiene. In forensic investigations, it can provide insight into living conditions, including neglect and overcrowding in environments such as shelters or prisons. If untreated, pediculosis corporis can progress to Vagabond's disease, a chronic condition marked by thickened and hyperpigmented skin with intensely pruritic macules. This condition is highly associated with poor hygiene and inadequate living conditions. We present the case of a 74-year-old man found unresponsive in a feces-covered bed with shallow respirations. Further investigation revealed his guardian had not paid the electricity bill, and he was without power in his home. He told friends that he gave up and refused to care for himself. At hospital presentation, he was found to be covered in lice and hypothermic with other comorbidities ultimately leading to death. The combination of environmental conditions with physical findings illustrates concerns of neglect. This case serves as an example demonstrating the importance of integrating hospital and autopsy findings with scene investigation and collaboration across agencies to identify signs of neglect. Additionally, this case serves as a teaching example for incorporating ancillary studies, such as vitreous electrolyte analysis, to assess dehydration and malnutrition, which assist the forensic pathologist in evaluating concerns for neglect.

P226 All It's Cracked Up to Be: The Importance of Quality Postmortem Examination, Supervision, and Training

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Postmortem examination is an essential component of death investigation in both the hospital and medico-legal setting. While previously unknown trauma related deaths are typically encountered in medico-legal autopsies, previously unknown trauma related deaths may still occur in the hospital setting. Though thorough medical record review is a critical component of hospital death investigation, many studies have shown significant discrepancies between the documented clinical history including clinical cause of death and autopsy findings including the cause of death (COD) determined at autopsy. This difference highlights the necessity of thorough postmortem examination in every case regardless of the medical record documentation, as well as appropriate supervision and training of residents, autopsy assistants and pathologists' assistants during hospital autopsies.

We present a case of a 79-year-old female with a history of hypertension and anxiety who was found down at home, pulseless with agonal respirations, after feeling ill for several days. Following cardiopulmonary resuscitation by emergency medical services return of spontaneous circulation was achieved. Notably, there was a delay in transfer to the ambulance due to restricted movement in the apartment (hoarding conditions with a 12- to 14-inch path through the apartment).

At hospital admission, initial labs were significant for acidosis (pH of 6.8) with elevated lactate (18.6 mmol/L), elevated CK (696 U/L) and elevated liver enzymes (ALT 1529 U/L). The patient subsequently arrested with pulseless electrical activity and was not able to be revived. The clinical cause of death was documented as cardiac arrest.

At autopsy, initial examination by the autopsy assistant and autopsy prosector was unrevealing for a definitive cause of death. More thorough investigation, by the autopsy attending pathologist however, revealed a cervical spine fracture at C5-C6 with associated soft tissue hemorrhage and background severe degenerative changes of vertebrae. Microscopic examination of the fracture site revealed hemorrhage and associated fibrosis consistent with a healing fracture site in a background of osteopenia. Additionally, bone marrow emboli were present in the right lung. The autopsy findings correspond with a fracture occurring a few days prior to death and likely explains why the decedent complained about not feeling well during that period and had limited mobility which subsequently resulted in her death.

This case demonstrates the importance of conducting a thorough postmortem examination in all cases and ensuring that trainees, autopsy assistants and pathologists' assistants are provided with adequate supervision, training and education on assessing for trauma during a hospital autopsy.

P227 Carbon Monoxide Testing: Investigating Trends That Impact Postmortem Levels

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The utility of point-of-care carbon monoxide testing and subsequent blood analysis are vital tools in determining cause of death. However, no literature exists to our knowledge that has examined the differences in the setting of carbon monoxide toxicity or death due to smoke and soot inhalation. Utilizing Medical Death Investigation Log data available through the Georgia Bureau of Investigation, a search was used to extract cases in which carbon monoxide levels were assessed. Our findings reveal significant differences between AVOXimeter spectrometer values and blood analyzed levels in the postmortem setting. While no statistical difference was noted between those with or without a smoking history on their postmortem carbon monoxide levels, future studies with included medical record information are suggested to help reveal unique trends and correlated antemortem epidemiology with postmortem findings.

P228 The Role of Documentary Evidence to Prove Manner of Death

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Objective:

To educate and introduce the forensic community to performance of a thorough medical death investigation for accurate certification of a death certificate.

In 2026, despite many advances in forensic science and advanced treatment of mental health diseases, the correct classification of suicidal deaths remains difficult. According to the CDC, in 1993 and 2024 suicides were the tenth leading cause of death in the United States and firearms were the most common method.

Suicide still remains a stigma to families. Correct classification of suicides should always be a standard, regardless of cultural or societal expectations, or for protection of family. But incorrectly classifying a death as a suicide can also lead to unnecessary pain and also impede the grieving process. We report on a case of delayed suicide (31 years) which required additional investigation steps.

The decedent had a self-inflicted gunshot wound of the head in 1993 resulting in quadriplegia. In 2024 this 62-year-old female had a cardiopulmonary arrest at her residence. It was reported to the medical death investigator that the decedent shot herself in 1993 resulting in a traumatic brain injury and quadriplegia. An examination was performed, and a pending death certificate was issued until medical records and information about the gunshot incident could be obtained.

The decedent's legal next of kin placed calls to the MEO stating the decedent's death should be ruled an accident and not suicide. The LNOK then reported the incident occurred in New York, the decedent was a former corrections officer and the GSW was inflicted with the decedent's service handgun. The investigator proceeded with an internet search, and a news article was located which reported the decedent was successful in suing the city of New York for \$7.25 million dollars citing negligence by the city for allowing her access to a firearm which she was unfit to carry. The court documents from the Supreme Court of the State of New York were also located. The manner of death for this case was subsequently classified suicide.

The correct classification of suicide remains one of the most difficult processes for medical examiners. A thorough medical death investigation can ensure the manner of death is correct.

P229 A Unique Case of Death from Ingestion of Household Cleaners

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We present a unique case of a 78-year-old woman of Indian descent having ingested household cleaner products, in an apparent suicide attempt. Per the police report, the family of the decedent watched her drink Woolite fabric softener and Swiffer wet jet fluid.

After witnessing the event, the family attempted to induce vomiting by giving her salt water. They did not call poison control or 911. She did not have a documented history of diagnosed mental illness. However, she would have manic breaks where she would become violent then return to her baseline mental status. Some of the chemicals in the mixture consumed by the decedent included: propylene glycol butyl ester, phenoxyisopropanol, acrylic polymer, C10-16 alkyldimethylamine oxide- a foam booster, didecyldimanium chloride- a corrosive and disinfectant, triethanolamine- a surfactant, and benzene sulfonic acid- a corrosive. Autopsy results included hemorrhagic gastric mucosa and patchy subarachnoid hemorrhage. Postmortem vitreous humor showed severely elevated sodium and chloride, at 173 mmol/l and 151 mmol/l, respectively. Femoral blood toxicology was only positive for caffeine.

This case highlights an uncommon suicide method in the United States, ingestion of cleaner products that are present in most households. The decedent's ethnic background should be noted as, this method of suicide is more common in other parts of the world. It also demonstrates the corrosive effects of these chemicals and products on the upper gastrointestinal tract and catastrophic resulting effects on the body's homeostatic balance of electrolytes. Finally, this case represents a significant area of study given the number of suicides in populations with undiagnosed mental health problems.

P230 Medical Examiner versus Organ Procurement Organization: "No" is a Complete Sentence

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Medical Examiners and Coroner death investigation systems are required to investigate all varieties of deaths, including suspicious deaths, to determine the cause and manner of death. Medical Examiner and Coroner (ME/C) involvement support the criminal justice system by facilitating evidence collection and proper documentation of examination findings to support a "non-natural" manner of death. The ME/C also

supports the next of kin (NOK) and family of the decedent by explaining the circumstances and findings from the postmortem examination. The reported circumstances are an essential component of the medicolegal death investigation and can set in motion events that will significantly affect the willingness of the Medical Examiner or Coroner (ME/C) to approve organ or tissue donation. Situations where the ME/C is hesitant to approve organ or tissue donation are usually not tolerated by the OPO. Despite clear explanation for the denial, the lack of willingness of the organ procurement organization (OPO) personnel to accept the rationale for the refusal can put a significant strain on a long-standing, harmonious relationship with the local OPO, especially when it appears that the OPO is unwilling to accept the duty the ME/C has to the patient and their families.

In this submission we will present two cases where brain dead, hospitalized patients were reported to the ME. Based on the reported circumstances, the medical examiner accepted jurisdiction of the patients. However, due to the circumstances surrounding the deaths, requests for organ and tissue donation were denied or significantly restricted. Despite numerous telephone conversations with OPO personnel, where clear explanations were given regarding why requests for organ and tissue donations were denied or restricted, the OPO refused to accept the ME/C not supporting organ and tissue donation. We will highlight the negative impacts that limited or inaccurate information received during a death investigation can have on a ME/C death investigation, and how it leads to denial or restriction of organ and or tissue donation. We will also provide examples of death investigations where organ and tissue donation requests are routinely denied, with little compromise.

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