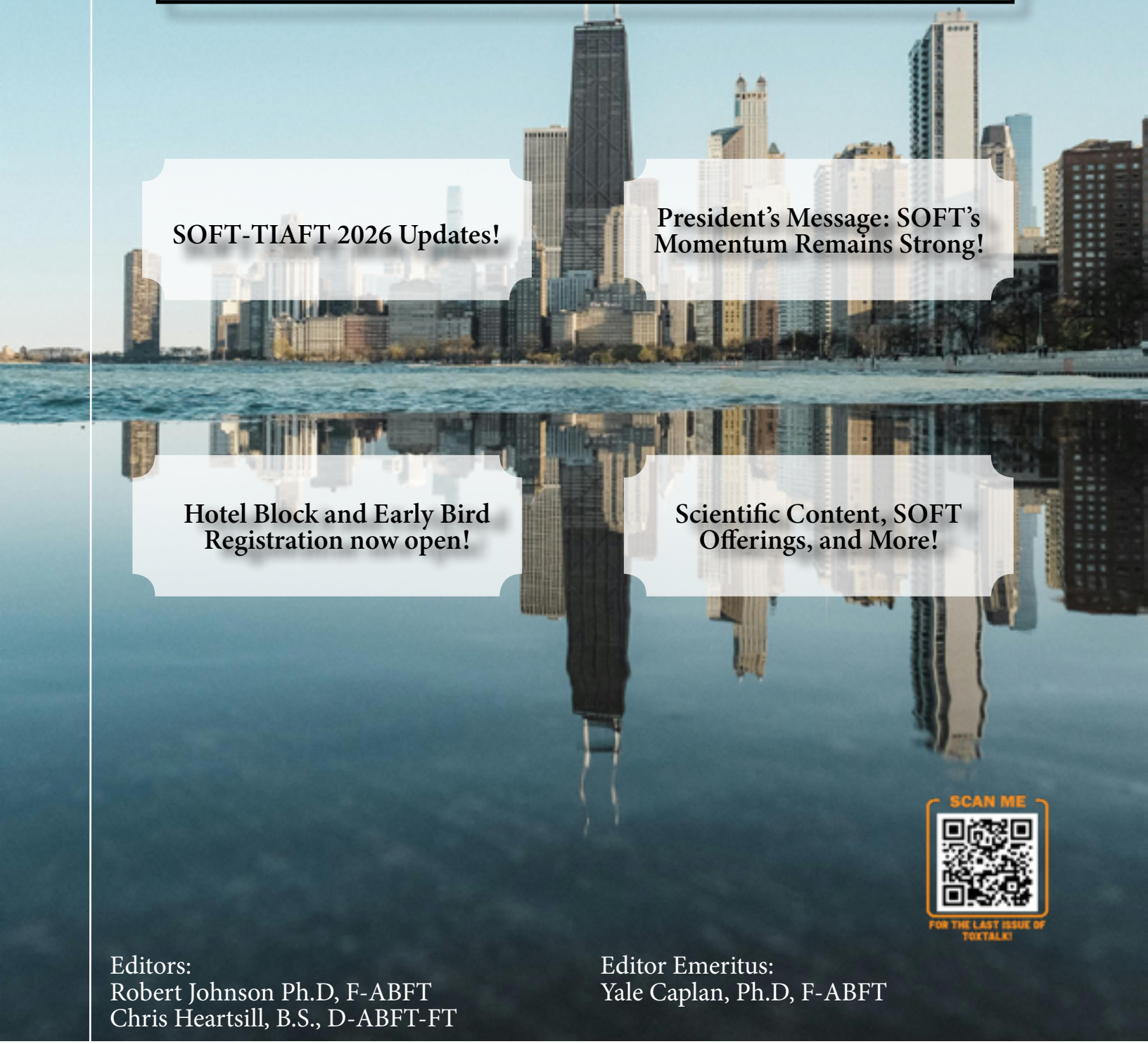
2026 Volume 50 Issue 2

TOXTALK®



SOFT-TIAFT 2026 Updates!

President's Message: SOFT's Momentum Remains Strong!

Hotel Block and Early Bird Registration now open!

Scientific Content, SOFT Offerings, and More!

SCAN ME

FOR THE LAST ISSUE OF TOXTALK!

Editors:
Robert Johnson Ph.D, F-ABFT
Chris Heartsill, B.S., D-ABFT-FT

Editor Emeritus:
Yale Caplan, Ph.D, F-ABFT

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2026 SOFT Leadership

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[Click here to see the full committee list for 2026!]

President Jeri Ropero-Miller, Ph.D

President's Message

As we enter the second quarter of 2026, SOFT's momentum remains strong!

Busyness abounds as committees, volunteers, leadership, and the SOFT office are advancing key priorities that strengthen our foundation while expanding opportunities for engagement, collaboration, and professional growth.

This quarter, the Board has focused on initiatives that position SOFT for long-term sustainability. The Business and Operations Strategy effort is helping align governance, resources, and programs to support continued growth, while committee survey reviews are ensuring our structure reflects evolving member needs.

We are also advancing updates to Committee Handbooks and revisions to Policies and Procedures—critical work that improves consistency, transparency, and continuity across the Society. These efforts directly support SOFT's mission and your experience as a SOFT member.

The Executive Committee met in Phoenix (May 11-14) for a vital working session to further advance these priorities and align on strategic direction for the remainder of the year.

Our committees remain the engine of SOFT, and member engagement is essential to their success. Open committee meetings, running from April through July, provide a direct pathway for all members to learn, contribute, and connect—whether formally appointed or not. Participation demonstrates the value of transparent and inclusive engagement—I encourage you to take part.

In parallel, participation in ToxHub continues to grow as a valuable resource for curated scientific content. I encourage you to contribute content and engage with the weekly emailed summaries to stay current and connected to emerging topics across the field.

Planning is well underway for the SOFT–TIAFT Joint Meeting, September 19–24, 2026.

This global collaboration represents a defining opportunity to showcase our science, strengthen international partnerships, and advance the field together as friends and colleagues. Registration is open—make plans now to attend, present, and engage. Simon Elliot, TIAFT President, and I are thrilled with the program committee, led by Hosts Andre Sukta and Luke Rodda. All the hard work and phenomenal planning ensures that you will get full benefits. We cannot wait to see you in Chicago!

Congratulations to the 2026 SOFT Award recipients. Your contributions exemplify excellence in forensic toxicology and reflect the strength and impact of our community.

SOFT's progress is driven by you—your expertise, engagement, and commitment to advancing the field. Stay involved, participate in committees, and contribute your voice and your scientific knowledge.

I look forward to connecting with you in the coming months and in Chicago this fall.

-Jeri Ropero-Miller

Acknowledgement: Co-Pilot 365 Enterprise enhanced my writing as my AI editor.

SOFT-TIAFT 2026 JOINT MEETING

Science on the Skyline — Chicago, Illinois
September 19–24, 2026 | Hilton Chicago

Welcome to Chicago!

The meeting will take place from Saturday, September 19, through Thursday, September 24, 2026. It will begin Saturday evening with a joint SOFT Young Forensic Toxicologist and TIAFT Young Forensic Scientist Symposium, followed by two days of workshops and two and a half days of scientific presentations.

Throughout the week, attendees can participate in additional lunch-and-learn opportunities, welcome events, committee and business meetings, interactions with a range of vendors, and a variety of social activities both within and around the conference venue. Programming and information for accompanying guests will also be available.

Please note that there are no scientific sessions scheduled after the close of the meeting, with the Presidents' Banquet and Gala Dinner serving as the final event.

In March, Ann Marie Gordon (F&B), Denice Teem (F&B), Beth Olson, and Abby Russo joined us in Chicago for the 2026 site visit and conducted a comprehensive walk-through to help ensure a seamless experience for all attendees.

THE FIELD MUSEUM

We are excited to showcase one of Chicago's great museums for our networking event on Tuesday night. The Field Museum opened on June 2, 1894, at the site where the Museum of Science and Industry now stands. Because the original building did not age well, the museum relocated in March 1920 to its current location.

SOFT-TIAFT 2026 JOINT MEETING Cont.

The Field Museum houses nearly 40 million objects; however, only a fraction are on display to the public. Must-see highlights include SUE, the largest and most complete Tyrannosaurus rex ever discovered; Máximo the Titanosaur; Inside Ancient Egypt; Evolving Planet; The Ancient Americas; Tsavo Lions; and The Grainger Hall of Gems.

Workshops: Two Days, 24 Sessions

Thank you to everyone who submitted workshop proposals. The Workshop Coordinators—Sue Pearring, Craig Chatterton, and Karen Scott—have worked hard to build a schedule that refreshes training, advances professional knowledge, and inspires new thinking.

The workshop program will be posted on the website soon, and we are very excited about the range of options. We received more than 24 proposals, and due to limited available slots, some presenters were asked to merge sessions or consider submitting in future years.

Scientific Program

The Scientific Coordinators—Donna Coy, Brigitte Desharnais, Suman Rana, and Jennifer Schumann—received 473 submissions by the abstract submission deadline. We are thrilled with the response and extend our sincere thanks to everyone who submitted abstracts, as well as special appreciation to all reviewers.

Free Evening (Wednesday, September 23)

One of the unique benefits of a joint SOFT/TIAFT meeting is the opportunity for attendees to experience the host city. Wednesday evening will be free for individual plans, with optional organized social activities available for those who wish to explore Chicago independently or in smaller groups. Separate registration will be required for organized activities.

We will offer four optional events, covering themes ranging from architecture to mob history. Details coming soon!

Also, be sure to visit the website for a list of events taking place before, during, and after the meeting—Chicago always has something happening. For our food enthusiasts, the website will also include a list of Michelin-starred restaurants with direct links to assist with reservations.

We look forward to welcoming you to Chicago in September 2026!

SOFT-TIAFT 2026 Meeting Hosts:

Andre Sukta and Luke Rodda

For more information on the annual meeting, click here!

Abstracts Are In!

Final decisions: July 17, 2026

A heartfelt thank you to everyone who submitted an abstract for consideration, and who volunteered to review abstracts! We received 472 abstracts from 48 countries, and will review each of them with care in the next few weeks.

Abstract revision will open on Monday, June 1st 2026 and revised abstracts are due on Friday, June 19th 2026.

Final decisions will be sent out Friday, July 17th 2026.

We wish everyone good luck with their submission – we're convinced your contribution will help us put together a great scientific program!

- SOFT-TIAFT 2026 Scientific Program Coordnators

Donna Coy

Brigette Desharnais

Suman Rana

Jennifer Schumann

SOFT-TIAFT 2026 Scientific Program Committee

BECOME A SOFT-TIAFT 2026 VOLUNTEER!

We're on the lookout for excited volunteers to help make the SOFT-TIAFT 2026 meeting a success! Volunteers are not required to be SOFT or TIAFT members. Apply to be a volunteer!

Volunteering is a wonderful way to contribute to our event. Some opportunities include:

- Assisting attendees at the check-in desk and be their first point of contact.
- Workshop registration check in. Volunteers are also able to sit in on workshops.
- Help direct participants during the Karla Moore Fun Run/Walk on Thursday morning.
- Meeting and interacting with professionals from various backgrounds, building new connections, and strengthening your professional network.

It's a fantastic opportunity to meet new friends or reconnect with familiar faces while helping us host another memorable meeting!

Explore the various volunteer roles and find the one (or more!) that suits you best. Apply by July 31, 2026 to be part of the 2026 volunteer team!

- Sarah Douglas and Svante Vikingsson

Upcoming Legacy Luncheons

Don't miss the next chapter in our Legacy Luncheon series, featuring toxicology trailblazers!

Upcoming

- **Dr. Michael "Mick" Smith: "A Road Less Travelled"** - Tuesday, June 23rd 10:00 AM Pacific/1:00 PM Eastern

- **Dr. Timothy Rohrig: "Life Experiences, Lights, Camera, Testimony: Various Cases Throughout the Decades"** - Date and details coming soon—watch your inbox and the SOFT events page for registration.

In Case You Missed It

Dr. Barry Levine's Legacy Luncheon on May 7, titled "My Journey Through Forensic Toxicology," offered invaluable career insights and reflections.

Access On Demand

View Dr. Levine's full talk—plus the entire Legacy Luncheon catalog—in the SOFT Learning Center.

- Dr. Bill Anderson: "Toxicology: Rocky Top to Reno, A 50-year Journey"
- Dr. Vina Spiehler: "From Beckman Instruments (BI) to AI Expert Systems"
- Dr. Graham Jones: "(Why) I Never Wanted to Become a Forensic Toxicologist"
- Dr. Bruce Goldberger: "Synergy in Forensic Toxicology"
- Dr. Marilyn Huestis: "My Unusual Path to Improving Understanding of Cannabinoid Pharmacology through Three Decades of Controlled Human Cannabinoid Administration Studies"
- Mr. Patrick Harding: "The Legacy of the Robert F. Borkenstein Courses"
- Dr. Alan Wayne Jones: "50 years of forensic toxicology across two continents"
- Dr. Yale Caplan: "From Pharmacy to Forensic Toxicology – A Journey"
- Dr. Marina Stajic: "When Death Delights"
- Mr. H. Chip Walls: "The Journey That Shaped Me: Lessons from June K. Jones and Beyond"

Check out the Legacy Luncheon Series and more

in the Learning Cetner's On-Demand Library!

Regional Toxicology Liaison Program

Submitter: Amy Miles, RTL Program Manager

During the first quarter of 2026, the Regional Toxicology Liaison (RTL) Program continued to strengthen forensic toxicology practice nationwide through training, collaboration, and targeted technical support. RTLs worked closely with state and local forensic laboratories, traffic safety partners, judicial stakeholders, and national organizations to enhance testimony readiness, improve data quality, and foster consistent application of forensic toxicology standards across jurisdictions.

A major focus of the quarter was courtroom testimony training. RTLs delivered four in-depth training sessions in Massachusetts and Texas, including a coordinated, three-region rollout for the Texas Department of Public Safety to accommodate its central laboratory and eight satellite labs. These sessions incorporated laboratory staff, prosecutors, DREs, and judicial partners, and addressed alcohol, drug, and combined-drug testimony under current scientific and legal frameworks.

RTLs also expanded national engagement on emerging toxicology issues. An evidentiary oral fluid webinar, organized in collaboration with NASID and Responsibility.org, attracted more than 300 live attendees and significant on-demand viewing. In parallel, RTLs contributed to ANSI/ASB standards development, OSAC initiatives, and national discussions on impaired driving data, cannabis testing, and laboratory reporting practices.

Quarterly Highlights

- Testimony Training: Four in-person and virtual trainings delivered across Massachusetts and Texas, including a three-region rollout for the Texas Department of Public Safety.
- Oral Fluid Engagement: Organization and delivery of a national evidentiary oral fluid webinar with extensive live and post-event participation.
- Standards & Guidance: Active RTL participation in ANSI/ASB (ASB 054 and ASB 120) standards revisions, OSAC toxicology efforts, and national position statements.
- Leadership & Wellness: Planning initiated for a multi-module RTL Leadership Webinar Series and development of wellness-focused programming addressing occupational stress in forensic toxicology.
- Program Recognition: Mid-South RTL Chris Heartsill received the 2026 Robert F. Borkenstein Award for outstanding contributions to forensic toxicology.

Looking ahead, the RTL Program will continue to support laboratories through testimony training, standards education, impaired driving data initiatives, and leadership development opportunities. By maintaining close collaboration with forensic practitioners and justice system stakeholders, RTLs remain committed to advancing high-quality, scientifically sound forensic toxicology nationwide.

For more information about the RTL program and it's liasons, visit our website!

CFSO Update

Marc LeBeau, Ph.D. F-ABFT
SOFT CFSO Liaison

The start of 2026 has been exceptionally active for the Consortium of Forensic Science Organizations (CFSO), with a strong focus on toxicology-specific advocacy, managing emerging drug threats, and pursuing sustainable federal funding.

As a reminder, SOFT is one of six member organizations of the CFSO. The consortium was established to enable the member organizations to communicate with a unified voice on issues of mutual interest, thereby enhancing our capacity to influence national public policy and to seek increased federal funding for public crime laboratories and medical examiner/coroner offices.

Drunk Driving Prevention and Enforcement Act

CFSO has officially endorsed the Drunk Driving Prevention and Enforcement Act (2026), recently introduced in the House. This bipartisan legislation mandates the integration of passive, advanced anti-drunk driving technology into new vehicles.

Further, CFSO worked closely with the bill's sponsors to ensure that forensic toxicology remains a cornerstone of the legislation. Our advocacy focused on:

- Resource Allocation: Securing federal grants for states to modernize laboratory instrumentation and standardize testing protocols for DUI enforcement.
- National Data Collection: Supporting the establishment of a National Drug-Involved Crash Data Collection System. This system will streamline the sharing of toxicology data nationwide, providing a clearer picture of poly-substance impairment on our roads.
- Standardization: Emphasizing the need for uniform reporting and testing standards to improve the defensibility and consistency of toxicology results in impaired driving prosecutions.

Emerging Drug Trends and Analytical Support

Efforts continue to address novel psychoactive substances (NPS). The CFSO actively advocated for an amendment to the proposed **Nitazene Control Act** to remove the requirement to prove mu-receptor activity. This change aims to simplify the scheduling process for these potent compounds by making the chemical structure alone enough for their control.

In direct support of laboratory operations, a letter has been drafted to the CDC for a **Certified Reference Material (CRM) kit program** targeting designer benzodiazepines and synthetic cannabinoids. Modeled after the successful traceable opioid material kits, if the CDC agrees to proceed with this request, it would provide laboratories with standardized reference materials for substances such as bromazolam and various MDMB-PINACA analogs at no cost, enabling faster method development and validation.

Furthermore, the February 2026 GAO report, *"Street Drug Analysis: Factors Affecting the Detection and Identification of Emerging Substances,"* has been a key topic of discussion. The report validates our community's concerns regarding the resource gaps that hinder the effective identification of emerging substances.

FY2027 Appropriations Priorities

CFSO has finalized its fiscal year 2027 budget requests to Congress, emphasizing the following for the toxicology community:

- Paul Coverdell Forensic Science Grants: Requesting $50 million without the $17 million carve-out for opioid investigations, ensuring broader support for all forensic disciplines and medical examiner/coroner (MEC) offices.
- CARA Forensics Support: Seeking a $20 million carve-out dedicated specifically to forensic investigations into opioids and synthetic drugs.
- Byrne JAG: Requesting a $10 million carve-

CFSO Update Cont.

out for emerging drug analysis to provide practitioners with the technology and training necessary to detect novel substances.

Private Laboratory Access to CODIS

CFSO issued a position statement opposing HR 7916 (the CODIS Access Modernization Act of 2026), which would grant private laboratories direct access to the national DNA database. Our formal position emphasizes that CODIS is a core governmental function requiring long-term accountability, database integrity, and institutional oversight that the private marketplace is not positioned to provide.

Data Modernization and Standards

We are continuing to push for a **National Forensic Science Data Infrastructure Act** to improve interoperability. This includes the development of electronic bridges to connect toxicology results and death investigation data with national surveillance systems such as NFLIS and SUDORS. Additionally, the CFSO Board is tracking an **AMA resolution** regarding standards for forensic toxicology laboratories used in litigation to assess its potential impact on practitioners.

Other CFSO Activities

- **Strategic Plan:** The 2026-2027 CFSO Strategic Plan is currently undergoing final review to ensure it accurately reflects the goals of our member organizations.
- **Forensic Science Caucus:** SOFT Members have been encouraged to reach out to their Representatives to invite them to join the House Forensic Science Caucus, which is a vital tool for educating Congress on the issues affecting our profession.

Learn more about CFSO on our website!

American Academy of Forensic Sciences (AAFS)

What an incredible meeting we had in New Orleans! Thank you to everyone who attended and contributed to such a successful event. A huge thank you goes out to our generous sponsors for the Toxicology Reception and Open Forum. I also want to extend my deepest gratitude to all the workshop chairs, presenters, moderators, and abstract reviewers. Your hard work and dedication were the backbone of our outstanding program!

New Leadership & Getting Involved

I am thrilled to announce the new Toxicology Section leadership team:

- Secretary: **Svante Vikingsson**
- Program Chair: **Curt Harper**
- Program Co-Chair: **Donna Papsun**

As we look ahead, there are several ways for you to get involved and share your expertise:

- **Propose a Workshop:** Have a great idea for a workshop? Reach out to Program Chair, Curt Harper (Curt.Harper@adfs.alabama.gov), with your proposals and plans.
- **Submit an Abstract:** Don't miss the chance to present your research! This is a wonderful opportunity to get feedback from peers across various specialties and spark new collaborations. The abstract deadline is August 1, 2026
- **Become an Abstract Reviewer:** Lend your expertise and earn service credit toward your membership promotion. Please email Curt Harper (Curt.Harper@adfs.alabama.gov) if you are interested in serving.

Recognize Excellence - Nominate a Colleague

Now is the perfect time to recognize the outstanding contributions of our peers. We encourage you to nominate deserving colleagues for the AAFS Toxicology Section awards and scholarships.

- Nomination Deadline: August 1, 2026
- Nomination packets must include: (1) a nomination letter (must be a Member or Fellow of the AAFS Toxicology Section), (2) the nominee's current CV, and (3) an additional letter of support from an AAFS Toxicology Section Member or Fellow.
- Submit nomination packets and any questions to: Kari Midthun (kari.midthun@nmslabs.com), Awards & Scholarships Committee Chair.
- A full list of awards can be found in the AAFS Policy and Procedure Manual (pp. 161–165). You can view past awardees on the Toxicology Section Awards page.

Advance Your Career with AAFS

Are you thinking about advancing to Member or Fellow, or applying as an Associate Member? AAFS membership opens doors to committee service, networking, mentorship, grants, and leadership roles. Learn more about membership categories and promotion requirements here. For more detailed information related to membership and promotion, please refer to the AAFS Policy and Procedure Manual (pp. 26–27, 37–38, 42, 54–55).

Mark Your Calendars

Get ready for the 79th Annual AAFS Meeting in Orlando, FL, from February 15–20, 2027. We will be celebrating our theme: "Around the World and Beyond"!

Best regards,

Erin Karschner

2026-2027 AAFS Toxicology Section Chair

Young Forensic Toxicologists (YFT)

Annual Meeting Events and Awards!

The Young Forensic Toxicologist (YFT) committee is actively working hard to prepare for this year's joint SOFT-TIAFT annual meeting in Chicago, IL! We would like to encourage anyone who may be interested in YFT to also attend our open committee meeting on Tuesday, July 21st by signing up at this link. By attending the open committee meeting you can see what goes into planning our YFT programs to see if you may be interested in joining the committee next year!

We are excited to announce that our YFT Chair, **Whitney Brown**, and YFT member, **Chase Perkins**, will be hosting a workshop at the upcoming SOFT-TIAFT meeting titled *"Abused and Misused: The Importance of Prescription, Over-The-Counter, and Lesser-Discussed Drugs in Human Performance Forensic Toxicology"* on Monday, September 21st from 1:30-5:30PM. Please sign up for the workshop if you're interested in learning more about antihistamines, methorphan, SSRIs, ketamine, and zolpidem and their importance to human performance forensic toxicology from around the world.

The YFT committee also recently collaborated with the Publications Committee on the "Reviewing Abstracts – Tips and Tricks" webinar in March as moderators for the breakout groups. After discussing tips to keep in mind when reviewing abstracts, attendees were divided into smaller breakout groups where they discussed previously submitted abstracts and the feedback that they would give as a reviewer. The webinar was well received with a great turnout and plenty of stimulating discussions.

The YFT committee is hosting multiple events this year at the SOFT-TIAFT joint meeting, please come join us! The date, time, and description for each of the events are provided below. If you have any questions, please reach out to us at YFT@soft-tox.org.

Professional Development Fair (PDF)
Saturday, September 19th, 5:30-6:30 PM

The PDF is held before the YFT/YSC symposium and gives attendees the opportunity to connect with accreditation and certification agencies, academic programs, and laboratories. Participants can explore continuing education, professional training, board certification, and career pathways, including internship opportunities. Although sponsored by YFT, all annual meeting attendees are encouraged to attend. If you're interested in exhibiting, keep an eye out for the upcoming email with details. A job board will also be available near registration, please bring any positions you'd like to post.

YFT/YSC Symposium
Saturday, September 19th, 5:30-10:00 PM

The YFT/YSC symposium is an opportunity for young forensic toxicologists (must be 41 years of age or under) to come together for a night of professional networking and discussion. Attendees are invited to participate in a social hour where heavy appetizers, desserts, and drinks are provided. The program will begin with the professional development fair (PDF), followed by an activity to network with other young forensic toxicologists and meet the SOFT/TIAFT Board members. The YFT/YSC committees will then present the evening's speakers (past award winners, mentor talks, and a panel discussion), ending the night with an open forum for questions.

YFT/YSC Night Out
Wednesday, September 23rd

The SOFT YFT committee, in partnership with TIAFT's YSC committee, would like to introduce the YFT/YSC Night Out! Taking place on Wednesday night, the Night Out is a chance to network with other young forensic toxicologists over dinner in a more casual setting off-site. Food and beverages will be covered individually but the opportunity to network with peers from around the world is priceless!

Leo Dal Cortivo (LDC) Award
Thursday, September 24th

The winners of the SOFT 2026 Leo Dal Cortivo Best Poster Award and Best Platform Presentation Award will each receive a cash prize of $1,000 in addition to free registration at a future SOFT meeting. To be eligible for the award, the applicant must meet the following:

- Be the first, and presenting, author
- Be registered for the meeting
- Be less than 41 years old on the first day of the meeting
- Be a SOFT member, or a co-author must be a SOFT member

Reminder, applicants may only submit **one** entry, either poster or platform presentation. If multiple submissions are received, the applicant will be contacted to choose which submission they would like to have judged.

Stay tuned for more updates regarding YFT activities in the next issue of ToxTalk!

YFT COMMITTEE:

CHAIR
WHITNEY BROWN

VICE CHAIR
ERIKA PENNINGS

SECRETARY
ARECELIS VELEZ

PAST CHAIR
ELISA SHOFF

MEMBERS
CHASE PERKINS
SARAH TOMA
LUKE GARCIA
MAHAGANI THOMAS
KIMBERLY KARIN
TRACI REESE
SARA WALTON
MELINDA HECTOR

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Professional Mentoring Program (PMP)

Each year at the conclusion of the mentoring program the committee collects survey responses from the participants for that year. Last year's respondents indicated that the top resource for them was ToxTalk. In response to that the professional mentoring committee is providing an easy to access list of resources for participants to use, broken down by the most common goals we have seen.

Development of Interpersonal/Leadership Skills

These are goals that focus on learning to be a leader at the bench, managing a team, communicating with team members, increasing comfort when testifying, personal growth, and networking.

Books:

- What Got You Here Won't Get You There by Marshall Goldsmith

This book explains that the behaviors and habits that help people succeed early in their careers often become barriers as they rise into leadership roles. Goldsmith highlights common interpersonal habits that limit effectiveness—like not listening, needing to win too much, or failing to give proper recognition—and shows how small behavioral changes can create big leadership improvements. The core message: advancing to the next level requires self-awareness, humility, and a willingness to change long-standing habits.

- Be The Unicorn Workbook: Data-Driven Habits that Separate the Best Leaders From the Rest by William Vanderbloemen

This book focuses on the traits and daily practices that make certain leaders stand out—what Vanderbloemen calls "unicorn leaders." Based on research and interviews, he identifies habits such as adaptability, emotional intelligence, communication clarity, and consistent execution. It provides prompts and exercises to help readers measure themselves, build stronger habits, and intentionally grow into high-impact, high-trust leaders. It's practical, reflective, and designed for step-by-step habit transformation.

Podcasts: The Remarkable Leadership Podcast

- Building Relationship Currency with Ravi Rajani - The Remarkable Leadership Podcast

Communication expert Ravi Rajani discusses the idea of "relationship currency"—the value built through genuine, intentional connections. He explains how small habits like authentic listening, thoughtful compliments, and asking deeper questions strengthen trust and influence. Rajani emphasizes that charisma is a learnable skill rooted in making others feel seen and valued. The conversation highlights practical ways leaders can build stronger relationships and become more effective through everyday communication habits.

- Motivating the Unmotivated with Matt Granados - The Remarkable Leadership Podcast

This episode explores how sustainable motivation isn't innate—it's cultivated through intentional strategies. Granados introduces a formula that combines personal connection, structured systems, and self-awareness to energize teams. He highlights the importance of love-based versus fear-based leadership, and suggests three weekly questions leaders can ask to boost engagement. Additionally, he explains individual motivation drivers—such as freedom, acknowledgment, connection, and support—and shares how his Life Pulse methodology has helped organizations increase retention, reduce burnout, and build stronger cultures.

Data/Case/Research Dissemination

These include preparing and presenting research at conferences, organizing and presenting at SOFT workshops, and improving upon scientific writing/preparing manuscripts.

SOFT Webinars:

- Reviewing Abstracts - Tips and Tricks Webinar

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Journal Websites for Manuscript Instructions:

- JAT: Instructions to Authors | Journal of Analytical Toxicology | Oxford Academic
- JFS: Journal of Forensic Sciences
- AAFS: Submission of Manuscripts | American Academy of Forensic Sciences

Career Advancement

Goals that fall under the career advancement category can include studying for and completing ABFT certification exam, reviewing and polishing resumes/CVs, practicing interview skills, and career planning such as addressing professional blind spots or pursuing advanced education.

Articles:

- Highly successful people 'demand more respect' when they use these phrases: says Career expert

Confident professionals use these five clear language swaps to sound more thoughtful and command respect

SOFT On-Demand Webinar Library:

- How to Promote Yourself

Engagement in SOFT

These goals include exploring, applying for, and actively participating in a SOFT committee as well as volunteering to review abstracts or manuscripts and meeting new people.

SOFT Opportunities:

- SOFTopics
- SOFT/TIAFT 2026
- Legacy Luncheon Series
- Committee Pages
- Attend Open committee meetings by registering through email notifications or the upcoming events listed on this page.

TedTalk:

- 3 Simple Ways to Build Stronger Relationships at Work | Alyssa Birnbaum | TED

In this 15-minute talk, psychologist Alyssa Birnbaum explores practical, research-backed methods to enhance coworker connections. She emphasizes that thriving at work isn't just about effort, but about connection—especially in hybrid or remote environments.

Technical Development

These goals are ones that involve developing and validating analytical methodology, integrating and troubleshooting new instrumentation, acquiring new skills in data analytics, and participating in the development of new ASB standards.

SOFT Committee Literature:

- Drugs and Driving Literature
- NPS Resources
- Oral Fluid Literature
- Postmortem Committee Literature

SOFT

- On-Demand Webinar Library

We hope you find these resources helpful for your mentoring partnership and we plan to integrate these into Toxhub as well! As always please reach out to anyone on the Professional Mentoring Committee if you have questions or comments about any of the resources provided here.

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Drugs and Driving Committee Updates

Submitted by Alaina Holt, Stephanie Olofson, & Seth Tracy

SOFT/AAFS Drugs and Driving Committee Special Sessions

The SOFT/AAFS Drugs and Driving Committee sponsored a special session during the 2025 SOFT Annual Meeting in Portland, OR. Highlights of the presentations are included below. The email address is listed for the author(s) that can be contacted if there are additional questions or requests for more information.

S-32 Evaluating Abnormally High Methamphetamine Concentrations and Metabolite Ratios In Driving Under the Influence of Drugs Cases
Allen Mello*, Lindsey Vosters

Wisconsin State Laboratory of Hygiene, Madison, WI, USA.

allen.mello@slh.wisc.edu

- Out of the samples reported positive and tested for MAMP from November 2023 to October 2024, four specific samples were noted as being extraordinarily high at 9,500 ng/mL, 12,000 ng/mL, 16,000 ng/mL, and 16,000 ng/mL.
- Based on law enforcement reports, it was determined that there were similarities between the route of administration and purpose of administration, in addition to the high concentrations seen. The individuals in each case had orally ingested their MAMP in order to conceal the evidence of illicit material during a traffic stop, ultimately yielding severe physiological responses.
- WSLH casework supports the approximate methamphetamine to amphetamine metabolism ratio, falling within 7-13%.
- The four cases reviewed illustrate highly elevated MAMP concentrations from oral ingestion. The 1-3% AMP:MAMP ratio is lower than the accepted 7% which may indicate recent administration of MAMP

S-33 N-2-O(h) No! The Rise of Nitrous Oxide in DUID Casework and Best Practice Recommendations
Kari Midthun*, Amanda D'Orazio, Jolene Bierly

Toxicological Services, NMS Labs, Horsham, PA, USA.

- Nitrous oxide (N2O) misuse has grown due to its ease of availability, rapid onset of effects, and increased social media attention, leading to anticipated increases in forensic testing needs for both DUID and postmortem casework.
- The nature of N2O as a volatile gas poses several challenges for investigators and lab analysts, which can make detection difficult.
- Common observations and adverse effects reported with DUID casework highlight that N2O use can affect psychomotor performance and thus prevent the safe operation of a motor vehicle.
- Based on review of case histories (DUID and postmortem) and testing practices, best practice recommendations to help reduce contamination and loss of analyte during collection and testing processes are reported.

This work will be published as:
D'Orazio AL, Bierly JJ, Midthun KM. (2026) The rise of nitrous oxide in toxicological casework: No laughing matter. Journal of Analytical Toxicology, manuscript accepted. https://doi.org/10.1093/jat/bkaf108

S-34 One Driver and Three THC Cases Supporting the Three-Legged Stool Approach to Impairment
Stephanie Olofson*

Colorado Bureau of Investigation, Arvada, CO, USA.

Stephanie.olofson@state.co.us

- A 28-year-old woman was arrested three times in a four-day span for suspected DUI crashes where 'low levels' of THC and metabolites were the only detected substances.
- Signs of poor driving included: running a stop sign, crashing into a fence and tree, side swiping a vehicle, and causing a head-on collision.
- Signs of impairment noted by the officers included: lack of balance, inability to walk in a straight line, slurred speech, confusion, and the inability to retrieve important documents. Multiple FSTs had to be stopped for safety.
- This series of cases supports the three-legged stool approach to impairment by evaluating the totality of the circumstances

S-35 Rapid Sample Preparation and Screening of Gabapentin in Oral Fluid Using LDTD-MS/MS
Sarah Demers, Mégane Moreau*, Serge Auger, Pierre Picard, Jean Lacoursière

Phytronix Technologies Inc., Québec, Québec, Canada.

m.moreau@phytronix.com

- Cut-off at 50 ng/mL of gabapentin in oral fluid.
- Fast LLE Extraction combined with AXINO-MS/MS (bases on LDTD technology) system.
- System can be adapted inside a mobile lab.
- Analysis is completed in under 10 seconds per sample.

S-37 Hidden Dangers: Potential Unintended Fentanyl Exposure in DUID Drivers
Edward Zumaeta*, Nicholas Tiscione

Palm Beach County Sheriff's Office, West Palm Beach, FL, USA.

Zumaetae@pbso.org

- With the prevalence of polysubstance use unintended fentanyl exposure in drug supply can cause adverse effects in drivers, where naloxone might have to be administered in some cases to reverse overdosing.
- Four drivers stated they intended to purchase and use heroin, alprazolam, and cocaine which resulted in serious adverse effects with fentanyl identified in the blood ranging from 6.6 – 27 ng/mL along with other impairing substances and fentanyl analogs (e.g., fluorofentanyl and carfentanil).
- Common observations seen by law enforcement officers was that drivers appeared to be confused, slow to respond, driver asleep at the wheel, lethargic movements, and unaware of what had occurred once they became responsive.
- Hidden dangers to both the individual and the motoring public lie in the uncertainty in purity and composition of the drug supply and the adverse events that could occur including impaired driving, overdose, and death.

Congratulations to Kari Midthun, winner of the CSLA Award for the best platform presentation during the SOFT 2025 Drugs and Driving Special Session. The CSLA sponsors an annual travel award of $500 that is given to the best platform presentation during the Drugs and Driving Special Session at SOFT. The Center for the Studies of Law in Action (CSLA) at Indiana University builds on the work of Professor Robert F. Borkenstein, inventor of the Breathalyzer, the first practical instrument for testing breath alcohol.

The SOFT/AAFS Drugs and Driving Committee sponsored a special session during the 2026 AAFS Annual Meeting in New Orleans, Louisiana. Highlights of the presentations are included below. The email address is listed for the author(s) that can be contacted if there are additional questions or requests for more information.

L41- Expiration, Collection, and Storage: A Multi-Factor Investigation of Blood Alcohol Testing

Sarah Douglas1, Roth Woolley2*

1Tennessee Bureau of Investigation, Nashville, TN, USA. 2Boston University School of Medicine, Boston, MA, USA.

rothwoolley27@gmail.com

- Samples (n=250, 5 replicates per combination of expiration, collection, and storage conditions) were prepared using high glucose (300mg/dL) human bank blood and gray stopper tubes.
- Samples were tested after creation, two weeks, and again at 6.5 months.
- Positive values decreased between creation and 6.5 months regardless of sterility, expiration, or storage conditions.
- All negative samples remained negative throughout the study.

L42- Behind the Calm: Benzodiazepines in Blood and Oral Fluid Samples in Alabama

Kristin Umstead*, Curt Harper

Alabama Department of Forensic Sciences, Hoover, AL, USA.

Kristin.umstead@adfs.alabama.gov

- The analysis of both blood and oral fluid (OF) samples provides more data regarding recency of use and helps to identify any substance that could potentially contribute to impairment.
- A majority of the cases that were positive for benzodiazepines or zolpidem had higher concentrations detected in blood versus OF and cases with high OF concentrations may indicate alternate administration routes (i.e. snorting, crushing, etc.).
- The lower concentrations and positivity rate highlight a challenge for roadside OF device screening. While they can aid law enforcement officers by indicating potential drug usage, confirmation samples of both blood and OF should be collected and sent for laboratory testing to give the most comprehensive data regarding drug use.

L43-Bromazolam in Driving Investigations: An Update

Jolene Bierly1*, Donna Papsun1, Barry Logan1,2

1Toxicological Services, NMS Labs, Horsham, PA, USA. 2Center for Forensic Science Research and Education, Horsham, PA, USA.

Jolene.Bierly@nmslabs.com

- The designer benzodiazepine bromazolam poses a significant traffic safety risk.
- It can produce CNS behavioral impairment alone and enhanced impairment in combination with other depressants.
- Bromazolam identifications in drivers steadily increased from 2021 (n = 8) and peaked in 2024 (n = 248) with identifications across all geographical regions of the United States.
- Over 95% of bromazolam cases involved drug combinations. The most prevalent combinations involved cannabinoids, fentanyl, and methamphetamine.

This work has been published as:

Bierly, J. J., Papsun, D. M., & Logan, B. K. (2024). Bromazolam in impaired driving investigations. Journal of Analytical Toxicology, 48(9), 653-658. https://doi.org/10.1093/jat/bkae074

L44-The Detection of Fluorofentanyl in Urine Driving Under the Influence (DUI) Cases

Kenson Jean*, Kristin Kahl, Lisa Reidy

University of Miami Toxicology Laboratory, Miami, FL USA

Kxj331@med.miami.edu

- Fluorofentanyl is a potent fentanyl analogue. Its molecular structure is similar to fentanyl except for addition of fluorine substitution on the aniline ring.
- Approximately one-third of fentanyl positive urine DUI cases submitted between 2022 to

2025 also had confirmed fluorofentanyl. It was the most frequently reported fentanyl analogue during that time period.

- Addition of fluorofentanyl to fentanyl could be due to using fluorinated precursor for illicit fentanyl production in which fluorofentanyl is a byproduct or could be intentional in order to enhance and prolong the effects of fentanyl.

Literature Sub Committee

The first Drugs & Driving literature review of 2026 is underway with the help of our wonderful volunteers! The literature sub-committee currently has 9 volunteers, both D&D Committee members and non-members, who assist with ongoing literature evaluation. The first review of this year is finishing up the re-review project of all literature that was listed on the Drugs and Driving Literature on the SOFT website. The last section to be re-reviewed was the "General Drugged Driving" references and we are excited to close the chapter on this several year re-review project. Be on the lookout for an update to the literature list on the SOFT website sometime between August-October 2026.

If you have any recommendations about literature you feel should be reviewed for its addition to the Drugs and Driving reference list, please contact Kristin Kahl at kwkahl@miami.edu. The Drugs & Driving literature list is available at https://soft.memberclicks.net/drugs-and-driving-literature.

Up Next

Does your laboratory have a publicly facing dashboard for reports and/or trends? Does your laboratory have readily available monographs or drug fact sheets that are available for review? We are interested in highlighting ways that laboratories are distributing that information for the next ToxTalk article. Please contact the Drugs and Driving ToxTalk committee of Alaina Holt friedrichak@vcu.edu, Stephanie Olofson stephanie.olofson@state.co.us, and Seth Tracy seth.tracy@troopers.ny.gov to contribute.

Add It To Your Calendar!

Check out our upcoming events, deadlines, and opportunities to get involved below and on the website.

June

June 10: Novel Psychoactive Substances Open Committee Meeting

June 23: Legacy Luncheon Series, featuring Dr. Michael "Mick" Smith: A Road Less Traveled

June 30: Annual Award Nomination Deadline

In case you missed it:

May

May 19 - Jul 21: Early Bird Registration Period

Tip: Remember to sign up for workshops when you register!

May 19: Room Block Opens

Drug Involved Pediatric Deaths in Georgia: A Forensic Toxicology Perspective

Denise N. Carter, Ashley Garrish, Dr. Lora Darrisaw, Dr. Michelle DiMarco, Vanessa Schmidt, Stephanie Marino, Twyla Coverson

Georgia Bureau of Investigation – Division of Forensic Sciences

Abstract

Pediatric drug-involved deaths represent a complex intersection of toxicology, public health, and child safety. This retrospective analysis of Georgia Bureau of Investigation (GBI) Medical Examiner's Pediatric Unit data from 2015–2024 examines trends in fatal drug exposures among decedents under 17 years of age. Over this ten-year period, 99 pediatric drug related deaths were documented. Case frequency rose sharply between 2020 and 2022, coinciding with the COVID 19 pandemic, when prolonged home confinement and reduced supervision may have increased access to medications and illicit substances. Fentanyl and methamphetamine were the most frequently identified drugs, reflecting broader patterns in Georgia's substance use landscape. Adolescents (13–17 years) accounted for the majority of cases, with accidental and suicidal manners of death predominating. Findings underscore the vital role of forensic toxicology in identifying emerging risks and informing prevention efforts through collaboration between laboratories, medical examiners, and public health agencies.

Introduction

Pediatric deaths involving drugs are rare but carry profound implications for forensic toxicology and public health. The Georgia Bureau of Investigation (GBI) Division of Forensic Sciences serves as the laboratory system for the state, providing comprehensive postmortem toxicology services. Pediatric drug exposures, whether accidental, suicidal, or undetermined, require specialized interpretation because of developmental, pharmacokinetic, and social factors unique to minors.

Materials and Methods

Case information was obtained from the GBI Medical Examiner's Pediatric Unit and included deaths of individuals aged 17 years and younger that occurred between 2015 and 2024. Toxicological analyses were performed using LC-MS/MS, GC-MS, and LC-HRMS/MS instrumentation following standard extraction procedures, including liquid–liquid and solid-phase extraction. Data was categorized by age, sex, race, manner of death, and substances detected. Descriptive statistics and visual summaries were generated to highlight trends and drug distribution patterns.

Results

A total of 99 pediatric drug related deaths were identified across the ten-year study period. Annual case counts increased significantly during the COVID 19 years (2020–2022), followed by a modest decline in 2023–2024. The following figures illustrate case volume, manners of death, and drug involvement patterns.

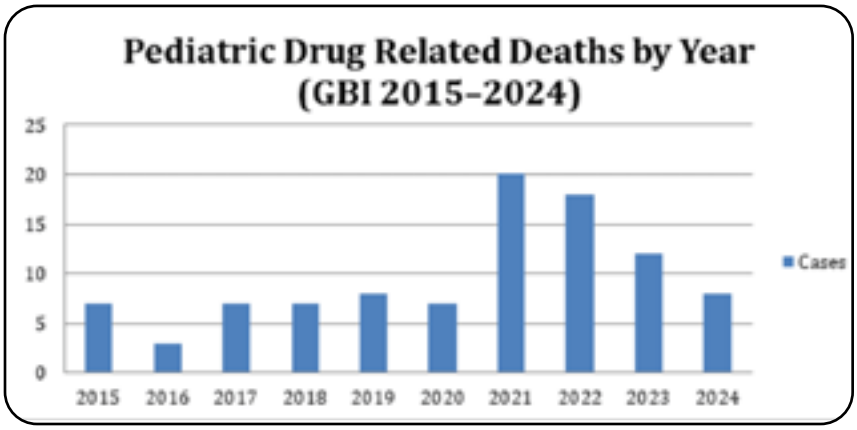

Figure 1. Pediatric drug related deaths by year (GBI 2015–2024).

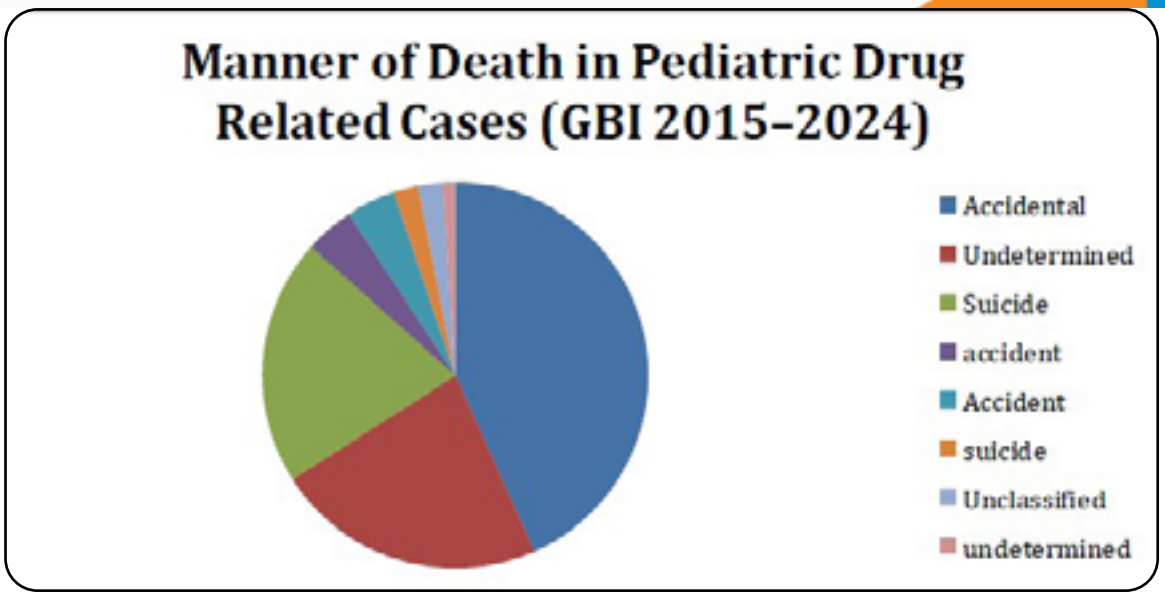

Figure 2. Manner of death in pediatric drug related cases (GBI 2015–2024).

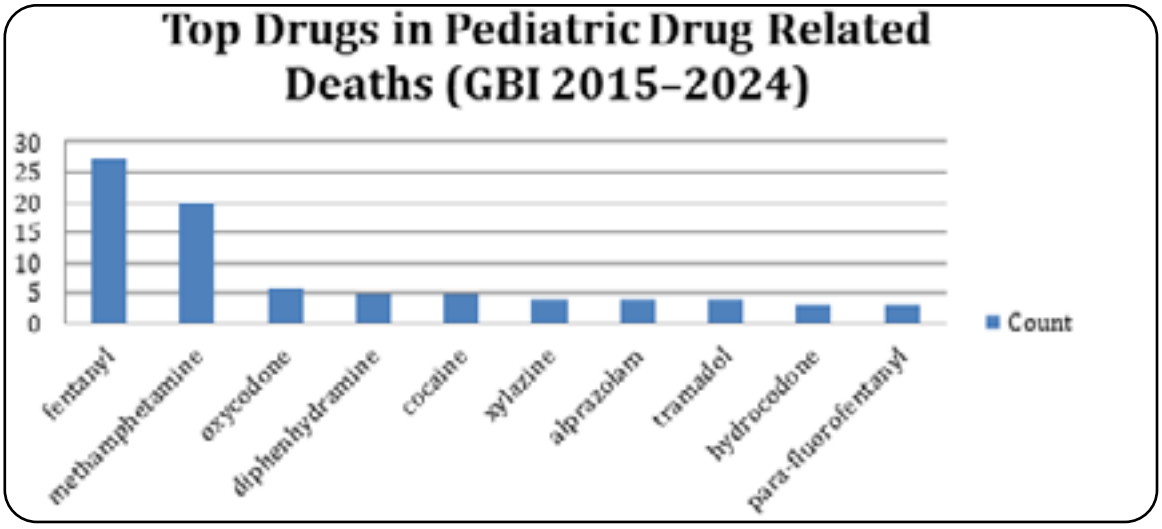

Figure 3. Top substances detected in pediatric drug related deaths (GBI 2015–2024).

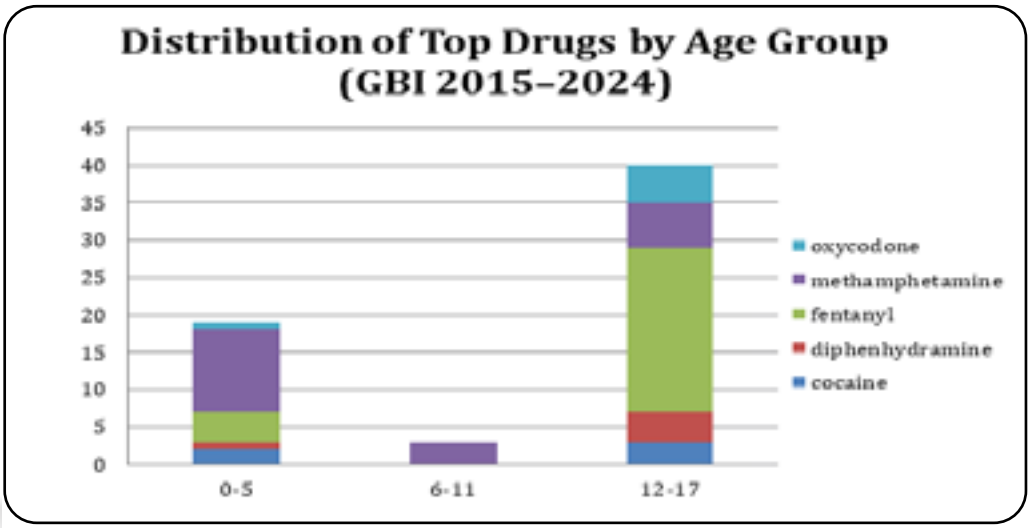

Figure 4. Distribution of top drugs by age group (GBI 2015–2024).

Discussion

The findings highlight an increase in pediatric drug related deaths during the COVID 19 period, particularly among adolescents aged 13–17 years. Extended home confinement and increased access to household medications and counterfeit pills likely contributed to these outcomes. The predominance of fentanyl mirrors national overdose trends and presents heightened risk for accidental exposures in children. Forensic toxicologists play a critical role not only in confirming substances but also in informing multidisciplinary prevention strategies through timely data-sharing and trend analysis.

While fentanyl and methamphetamine were the most frequently identified drugs, several cases also involved over the counter medications such as diphenhydramine and dextromethorphan. These findings underscore that fatal exposures in children can result from both illicit substances and medications commonly found in the home. Although the total number of pediatric cases in this review is relatively small, the data provides valuable context for emerging trends and opportunities for prevention.

Conclusions and Public Health Implications

Drug-involved pediatric deaths remain an uncommon but growing concern in Georgia. The increase during the pandemic years underscores the connection between social context and drug exposure risk. Ongoing collaboration among forensic laboratories, medical examiners, and public health entities is essential to develop prevention frameworks and community education focused on safe storage, awareness, and intervention.

"Tranq-Dope" to "Rhino-Tranq": The Gradual Displacement of Xylazine with Medetomidine from the Illicit Fentanyl Supply

Donna Papsun[1 3], Kari Midthun[1], Sherri Kacinko[1], Alex Krotulski[2 3]
[1]NMS Labs, Horsham, PA, USA
[2]Center for Forensic Science Research & Education, Horsham, PA, USA
[3]SOFT NPS Committee

Medetomidine, an alpha-2-agonist and central nervous system (CNS) depressant of the same chemical family as xylazine, has been reported in the illicit fentanyl supply since 2022. It was first reported in Maryland, but several outbreaks have been subsequently reported, including Philadelphia, Chicago, Pittsburgh, and New York City (1-3). Medetomidine exists in two enantiomeric forms, dexmedetomidine and levomedetomidine. Dexmedetomidine is approved for human use in hospital settings on its own, and levomedetomidine by itself has no approved medical or commercial uses. In contrast, racemic medetomidine is used widely in veterinary medicine. This may have spurned the colloquial term of "rhino-tranq", referring to formulations of either diverted or illicit manufactured medetomidine and illicit opioids, and follows "tranq-dope", the term often used to refer to mixtures of xylazine and illicit opioids.

The effects of medetomidine can include sedation, muscle relaxation, bradycardia, and hypotension. The duration of action of medetomidine is noted to be longer than xylazine, which may account for the heightened sedation and profound bradycardia that have been observed with medetomidine related non-fatal opioid overdoses. A complex withdrawal syndrome has followed in the wake of medetomidine adulteration (4-5). Since medetomidine is not an opioid, naloxone will not reverse sedation caused by medetomidine – complicating emergency response and prolonging unconsciousness. The dynamic and complex nature of the illicit drug supply continues to impose additional strain on emergency response and hospital care, with more complicated treatment for both intoxication and withdrawal.

In a case series of 100 specimens, medetomidine blood concentrations in non-fatal overdoses ranged from 0.1-16 ng/mL (median 1.5 ng/mL) and in fatal overdoses ranged from 1-32 ng/mL (median 0.31 ng/mL) (6). Xylazine was co-detected in 76% of cases, and fentanyl in 93%. Racemic medetomidine was reported in 90% of cases; the ten cases that were solely dexmedetomidine were categorized as medical intervention.

Determining toxicological trends around medetomidine is difficult to determine due to variable testing practices, including enantiomer differentiation. In review of 244 blood samples that reported medetomidine/dexmedetomidine by NMS Labs, fentanyl and/or norfentanyl were reported in 191 (78%); para-fluorofentanyl accounted for another 35 cases in the absence of fentanyl or norfentanyl (14%), while carfentanil and ortho-methylfentanyl each contributed to one case by themselves with medetomidine/dexmedetomidine. Carfentanil and ortho-methylfentanyl were also reported in combination with medetomidine and other opioids. Other illicit substances, such as cocaine and methamphetamine, were also reported. The co-reporting of medetomidine with a number of

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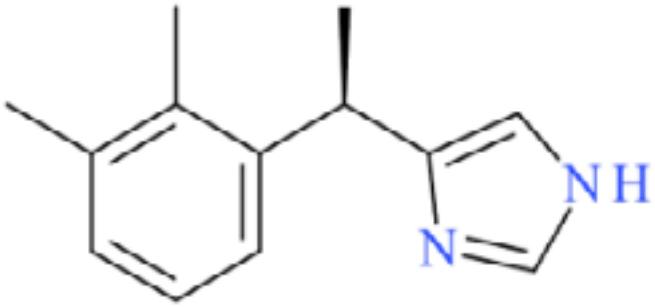
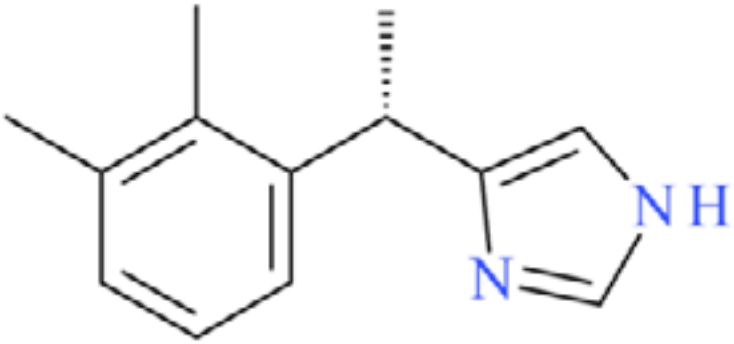
different illicit substances reinforces its growing presence in the illicit drug supply.

Fentanyl and medetomidine reported blood concentrations were compared. For the 189 cases that reported both medetomidine and fentanyl, the medetomidine blood average and median concentrations were 6.1 ± 13 ng/mL and 1.2 ng/mL (range 0.11-86 ng/mL, 4 cases reported as >100 ng/mL), while the fentanyl blood average and median concentrations were 42 ± 93 ng/mL and 20 ng/mL (range 1.0 -920 ng/mL). The reported fentanyl concentration was higher than the medetomidine blood concentration in 90.8% of cases, with a median ratio of 10:1. This ratio trend of typically higher fentanyl to adulterant mimics with what was reported with xylazine. However, significant variability is also a threat posed by an unregulated, polysubstance market.

Blood samples submitted from 25 different states were represented in the data set, as well as British Columbia. Almost 50% of reported cases from the United States (n=137) were from Pennsylvania and New Jersey. General trends have demonstrated a gradual decline of xylazine with fentanyl co-reporting over 2025 and Q1 2026, with a potential corresponding incline of fentanyl and medetomidine cases during the same time period. PA and NJ cases also accounted for 36% of fentanyl, medetomidine, and xylazine all reported in combination in blood samples, underscoring that a shift is not necessarily a clean break. Medetomidine has simply added complexity to an already complex drug market.

Medetomidine has been detected in law enforcement seizures, drug-checking programs, wastewater, paraphernalia, and biological specimens across several American states, although first concentrated in the Northeast (7). These medetomidine results are racemic mixtures, indicative of illicit synthesis, rather than siphoned from veterinary sources. Medetomidine is viewed as an alternative to xylazine, as access to xylazine has been under increasing scrutiny and regulation. The unpredictable and volatile nature of the illicit drug supply presents an increasing overdose risk for those who use drugs and complicates public-health surveillance. Medetomidine is simply the latest adulterant of the diverted veterinary variety added to the polydrug market. Careful monitoring of its spread and contributions to non-fatal overdoses, fatalities, and withdrawals is required.





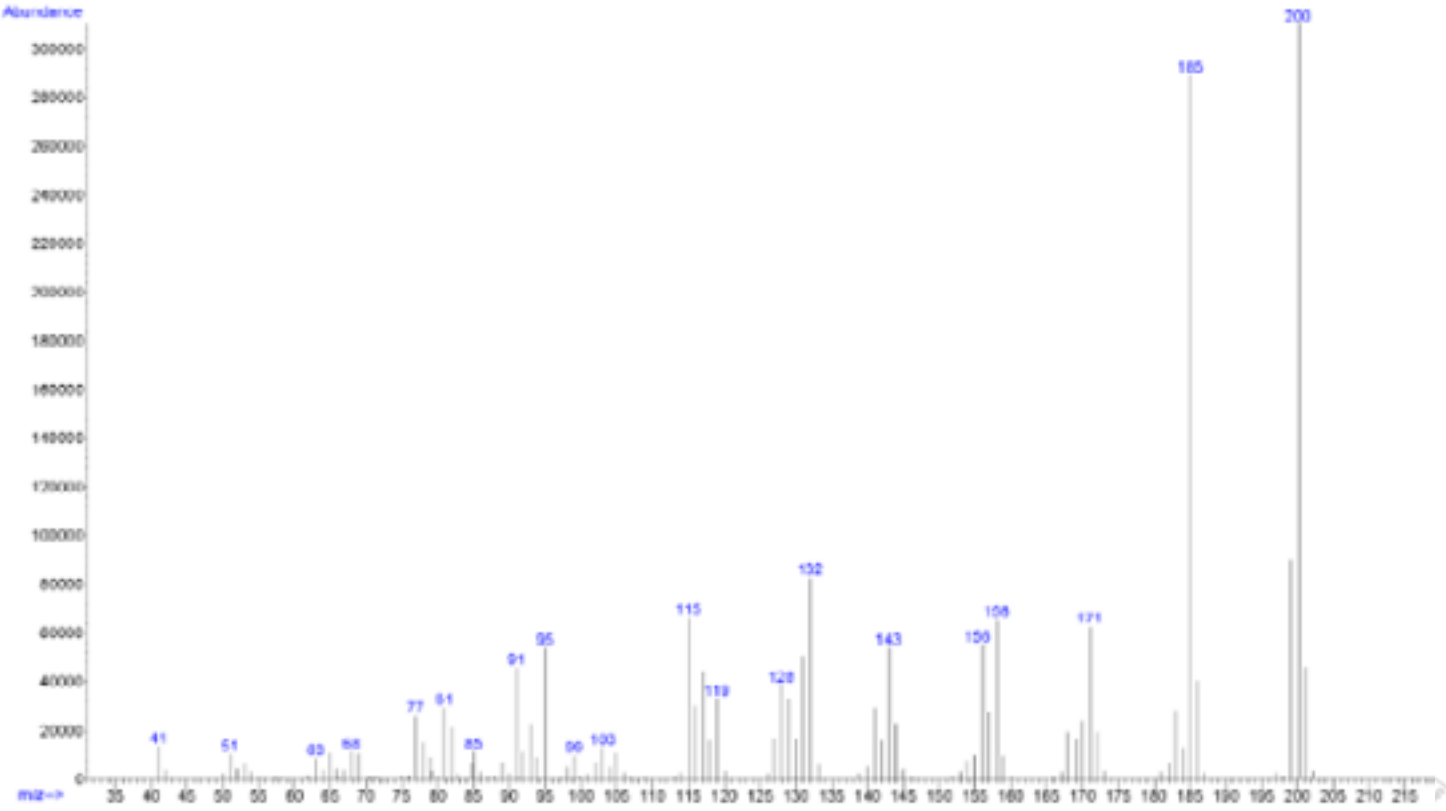
Synonyms: Medetomidine, dexmedetomidine, levomedetomine, Precedex®, Domitor®
Pharmacological Drug Class: alpha-2 agonist

Structure of Levomedetomidine

Structure of Dexmedetomidine

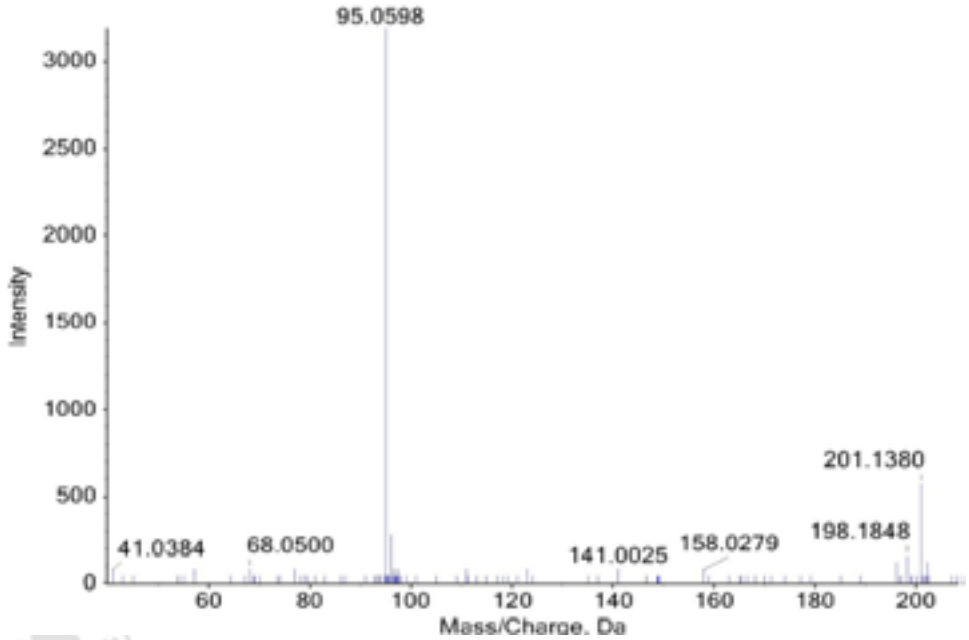
Molecular Weight: 200.3
[M+H]+: 201.1386

GC/MS Spectrum:



[Source: Agilent 5975 GC/MS, NPS Discovery, Center for Forensic Science Research & Education, PA]

LC-QTOF-MS Spectrum:



[Source: Sciex TripleTOF ® 5600+ LC-QTOF-MS, NPS Discovery, Center for Forensic Science Research & Education, PA]

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Human Factors in Forensic Toxicology – Part 1: The Introduction

Dr Hilary J. Hamnett,[1] Sue Pearring,[2] and Dr Megan Grabenauer[3]

1 School of Natural Sciences, University of Lincoln, Lincoln, UK
2 San Francisco Office of the Chief Medical Examiner, San Francisco, California, US
3 RTI International, Research Triangle Park, North Carolina, US

Introduction

You may have heard the terms "human factors" or "cognitive bias", but are not quite sure what they actually mean, or how they might be relevant to you as a toxicologist – after all, we use analytical instrumentation and apply explicit acceptance criteria to do our work. This article is the first in a series that aims to demystify the topic of human factors and explain how they apply specifically to our field. It is understood that there is a diverse range of needs among laboratories – varying caseloads, legislative requirements, levels of funding and thus, often differing protocols, procedures and practices. The big picture topic of human factors, however, is universal. We hope these articles will be a useful initial training resource for toxicologists looking to better understand this topic and improve lab processes.

In this first article, we look at what human factors encompass – a lot – and hone in on those factors most relevant to our field.[1] A **first key point** to cover before we go into more detail, is that forensic toxicology uses a combination of objective and subjective decision making. Yes, we rely heavily on analytical chemistry and various pass/fail criteria,[2] but some subjectivity inevitably remains. Case strategy before analytical testing begins can also involve subjective decisions about which drugs to screen for.

A **second key point** is that human factors can affect our decisions, not that they always do. Human factors are not categorically bad – some human factors enable us to perform our tasks well. What we want to mitigate are not human factors at large, but their negative impacts on our work. Decisions that have been influenced by human factors are not necessarily errors, but they can be and there's no quick and easy way to tell. Similarly, not every step in a forensic toxicology case is vulnerable to human factors influence to the same extent; the important moments are **decision points**. These are spots in a process where a choice has to be made in order to continue.

Human factors will always be present when humans are present. Even automated workflows are created by humans who made decisions in their design. Many forensic toxicology practices already mitigate the negative impact of human factors (e.g., identification requires acceptable ion ratios based on predetermined criteria) so you may find some of these concepts to be familiar, but perhaps not the technical terms, while some concepts and terms may be entirely new to you.

Attention

Human factors like attention, fatigue and distraction are often associated with safety-critical industries such as aviation,[3] but what we do in forensic toxicology is justice-critical and similarly affects people's lives. Being tired or distracted can lead to lapses in attention; we see and recognize this professionally in studying driving impairment. These in turn may unknowingly cause you to rely on memory instead of pulling up an SOP, cause you to skip a step in a process, overlook an important detail or forget to write something down. Distractions can be personal/individual, or environmental such as temperature, noise or an important visitor in the lab. There are also other challenges grouped under the banner of "atten-

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tion" such as doing things at increased speed (e.g., a rush/urgent case, or a final push at the end of a workday), or experiencing boredom (e.g., a series of repetitive tasks, or similar tasks daily from year to year). Finally, there's multitasking, where we try to split our attention across several different activities.

Workload and stress

Workload can be measured as the number of cases a toxicologist is expected to manage, or the number of working hours, or days worked without a break. High workloads are common to many different types of workplaces, but can be exacerbated in forensic disciplines by backlogs of cases, insufficient staffing, cumbersome workflows, etc. Stress is also a factor in many workplaces, and the relationship between stress and cognitive ability is not simple. Some people 'thrive on stress' and their performance increases with stress, until it becomes too high, at which point cognitive function is negatively affected. There are some unique stressors in our field such as the daily scrutiny of our work, tight deadlines, being exposed to distressing information, and involvement in high-profile cases.[1]

Motives

In some forensic science workplaces, 'success' can become entangled with the goals of the client (e.g., prosecutors or law enforcement) creating inadvertent incentives.[4] Analysts who find evidence that agrees with what the client believes to be true may be deemed high performers and rewarded. These motives may or may not be obvious and may also be internal rather than external (i.e., self-motivation to agree). This is part of workplace culture – how the management operates and what the values and priorities of the lab are.

Visual assessment

It is easy to think that visual assessment is just a problem for pattern-matching forensic disciplines such as fingerprints,[5] however, toxicologists also use visual assessment.[6] This might be comparing two mass spectra, or deciding whether software has integrated a peak correctly. Visual comparisons can be at-a-glance (intuitive) with little explanation or justification, or done feature-by-feature and clearly documented with a checklist or otherwise. External factors such as lighting or screen layout can play a role in visual comparisons.

Cognitive biases

Cognitive biases are caused by unconscious processes in our thinking designed to help us make quick decisions. In many aspects of daily life they are very useful, but in forensic science they can lead to problematic reasoning.[7] Exposure to irrelevant or misleading information about a case can subtly distort our decisions. We can end up making a decision because it 'feels right' or 'seems to fit' with what we've been told. For example, if we're given information that drug paraphernalia was found at the scene, this can affect which tests we select, whether we determine an MS spectrum library comparison to be a 'match', and how we interpret the drug concentrations.

Conclusion

Where there are humans, there are human factors. Where there is knowledge, strategies for mitigating the negative impacts of human factors on our work are possible. Join us as we continue to unpack human factors in forensic toxicology. We would love to hear from those within the field who have questions or comments on this topic. You can leave these anonymously here.

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A Snapshot of Methamphetamine and Drug-Facilitated Crimes

By Celeste Wareing, M.S., D-ABFT-FT, and Meaghan R. Hessler, M.S.F.S., D-ABFT-FT
for the SOFT DFC Committee

SOFT-DFC Snapshots are short reports of critical information about the more common drugs associated with drug-facilitated crimes (DFC). They do not have complete literature reviews about the drug or drug class. One key aspect is their focus on the ability to detect a drug after a single-dose administration, as is often the situation in DFC investigations. As such, these summaries also highlight instances in which available data is limited, hoping this will encourage further research studies. Finally, SOFT-DFC Snapshots point to the use of these drugs in actual DFC cases, as cited in the medical and open literature.

Methamphetamine is a sympathomimetic amine and psychostimulant that is used for the treatment of attention-deficit hyperactivity disorder (ADHD) and a second line treatment for narcolepsy, and exogenous obesity. It is also highly addictive and comes with a boxed warning for its potential for overdose, misuse, and poisoning. [1]. It is a Schedule II controlled substance.[2]

Central nervous system stimulants, such as methamphetamine, aren't commonly associated with DFC due to the lack of amnesia and sedation associated with their use. The commonality lies in their negative impact on the user's cognition and their ability to adequately provide consent. Users can experience lowered inhibitions and increased libido. [3]

Drug Class:[4]

Stimulant

Generic Name:

Methamphetamine hydrochloride

Brand Name(s):

Desoxyn, Vicks® Inhaler

Dosage Forms:

Oral tablet (5 mg)

FDA Approval:

Methamphetamine exists as two stereoisomers: l-methamphetamine and d-methamphetamine.[5] D-more commonly associated with prescription use and misuse, as well as illicit exposure. Vicks® Inhaler only contains l-methamphetamine.[6] Methamphetamine alters the release and re-uptake of neurotransmitters: norepinephrine, dopamine and serotonin.[1] To a lesser extent, monoamine oxidase inhibition occurs.[1,7–9]

General Effect Profile:

Methamphetamine has a two-part effect profile: an initial stimulatory phase followed by a secondary withdrawal phase. The initial stimulatory phase effects include improvements in focus and mental alertness, increased energy, decrease in appetite, lowered inhibitions, reduced drowsiness and fatigue, and poor impulse control. Dose dependent acute physiological effects can include increased blood pressure, tachycardia and elevated body temperature as well as mydriasis, bruxism, dry mouth, and sweating. The secondary withdrawal phase can present 24 hours after abstinence, and may manifest with CNS depressant type effects, including exhaustion, agitation, fatigue, sleepiness, and disorientation.[10,11]. This state, also known as the crash phase, may last 1-3 days.

Metabolism/Elimination:

Extensive hepatic metabolism occurs producing two main metabolites catalyzed by CYP2D6; N-demethylation to produce amphetamine (active) and aromatic hydroxylation to produce 4-hydroxymethamphetamine.[8,9,12] Other minor inactive metabolites are also produced. According to the manufacturer, the average elimination half-life of methamphetamine ranges between 4 – 5 hours.[13] An estimated elimination half-life range is 6-15 hours.[14,15] Excretion occurs primarily in the urine and is dependent on the urine ph. Alkaline urine will significantly increase its half-life.[4,9,12,13] Under normal conditions, up to 43% of methamphetamine is excreted as unchanged parent drug in 24-hour urine, with 4-7% as amphetamine. In acidic conditions, up to 76% can be detected.[16] Methamphetamine urinary half lives in one study were measured to be approximately 23 hours.[17]

Single Dose Studies:

Twenty healthy participants (10 men; 10 women) aged between 21 and 32 years (M=25.4 years, SD=3.28 years), with an average male weight of 75.55 kg (SD=11.47) and an average female weight of 62.9 kg (SD=4.48) were administered 0.42 mg/kg d-methamphetamine. The level of d-methamphetamine detected in blood and saliva at 120 min after drug administration was 72 and 285 ng/ml, respectively, and at 170 min after drug administration was 67 and 223 ng/ml, respectively.[18]

DFC Cases:

Methamphetamine is not believed to be a typical DFC drug of choice due to is stimulating properties; however, significant prevalence is observed in DFC cases, necessitating the analysis and reporting.[19,20] It may be a substance of interest in DFSA cases due to its belief in lowering inhibitions and energizing sexuality.[11] Determining whether someone is in the initial stimulatory phase or the secondary withdrawal (crash) phase by drug concentration is not possible. It is imperative to note impairing effects in each phase could contribute to methamphetamine being a choice substance in DFC cases.[20]

Stimulant positivity has been noted across the world in DFC cases, with methamphetamine being the most, if not one of the most, prevalent stimulants recorded. Positivity has not been linked to proactive versus opportunistic administration of the substance.[20-22]

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