National Association of Medical Examiners

MEETING PROGRAM

2015 Annual Meeting & Exhibits
October 2-6, 2015
Charlotte, North Carolina

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Welcome to the NAME 2015 Annual Meeting!

Dear Colleagues and Friends,

Welcome to the National Association of Medical Examiners 2015 Annual Meeting. The NAME Annual Meeting provides an international forum for discussion of a broad range of issues pertaining to death investigation. This year we have much to discuss and a wonderful host city to enjoy.

Meeting Highlights
The 2015 Annual Meeting will be held from Friday, October 2 through Tuesday, October 6, 2015 at the Westin Charlotte. Charlotte is a city where cosmopolitan character meets southern comforts.

Our meeting will feature presentations and posters that cover a broad range of topics. There will be special sessions on in-custody deaths and maintenance of certification, including a special presentation by Rebecca Johnson, M.D., Chief Executive Officer of the American Board of Pathology. These matters pertain to NAME and all members, and reflect the increased visibility of NAME and the practice of forensic pathology/medicolegal death investigation.

The scientific field trip on Sunday afternoon will consist of a visit to the NASCAR Hall of Fame Theater for their “Safety in the Car” presentation.

The advance program and other information are available on NAME’s website at http://www.name2015.org/.

Social Events
The meeting will begin with our annual Friday evening welcome reception and dinner at the Westin Charlotte. Also, please help us welcome all international attendees during the international attendees’ reception to be held immediately prior to Friday’s welcome reception and dinner. On Saturday evening there will be an optional private NASCAR Hall of Fame Reception. A resident and fellow reception will be held Saturday early evening, between the scientific sessions and the NASCAR Hall of Fame Reception.

The Rigor Run/Dead Man’s Walk will take place early Sunday morning. The Cadaver Open Golf Tournament will be held Sunday afternoon following the morning scientific sessions.

The NAME Business Meeting will be held at the Westin Charlotte on Monday morning before the scientific sessions begin for the day. The business meeting will include discussion of matters of interest to all NAME members; we urge you to attend so that you may contribute your voice and vote to the decisions made by NAME. The NAME Luncheon and Award Ceremony will take place at the hotel on Tuesday afternoon. NAME looks forward to presenting the Milton Helpern Laureate Award to Donald Reay, M.D., in recognition of his dedication to education, research, and the practice of forensic pathology.

Special Acknowledgements
We gratefully acknowledge all who have provided input and effort into the planning and implementation of the meeting, especially the Members and Chairs of the Education, Program and Publications Subcommittees. Thank you to our speakers for their contributions to the program and to our colleagues who have been appointed to moderate sessions. We would not be here without the expertise of the American Society for Investigative Pathology (ASIP), which serves as meeting manager, and of course our Executive Director, Dee McNally. In particular, please thank Tara Snethen of the ASIP team and Dee McNally when you see them.

Finally, the leadership and members of NAME acknowledge the gracious support of vendors and sponsors, without whom the meeting would be impossible.

We hope that the scientific program organized by the Program Committee will meet your highest expectations. The leadership of NAME asks all members to guarantee future successful meetings and the overall success of NAME by actively participating in the organization by joining one of our many committees and by completing the online meeting survey that will be sent to all participants at the end of the meeting.

As the 2015 NAME President and the 2015 Program Chair, we welcome both our established and new colleagues and look forward to your active participation, which is essential to the success of this meeting. We hope that our new colleagues will consider joining NAME to take advantage of the year-round interactions that our current members enjoy.

James Gill, M.D., 2015 Program Chair
Marcus Nashelsky, M.D., 2015 President
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NAME 2015 Annual Meeting & Exhibits  
The Westin Charlotte – Charlotte, North Carolina, USA

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D. Kimberly Molina, MD, Ex-Officio  
Robert Stoppacher, MD, Ex-Officio  

EPP-Development of Self-Assessment Modules (SAMs)  
Michelle Aurelius, MD  
Andrew Baker, MD  
Nicholas Batalis, MD  
Cassie Boggs, MD  
Clare Bryce, MD  
Steven Clark, PhD, Advisor  
Mark Flomenbaum, MD, PHD, Advisor  
M.G.F. Gilliland, MD  
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Maneesha Pandey, MD  
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Andrea Wiens, DO  

EPP-Education / Program  
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Martha Burt, MD  
James Gill, MD  
Laura Knight, MD  
Dianne Little, MBBS  
Roger Mitchell, MD  
Brian Peterson, MD  
J. Keith Pinckard, MD  
Gregory Schmunk, MD  
Tara Snethen, Consultant  
Mark E. Sobel, Consultant  
Robert Stoppacher, MD  

EPP-Forensic Fellow In-Service Exam  
Bamidele Adeagbo, MD  
Russell Alexander, MD  
Mary Dudley, MD  
Eric Eason, MD  
Kristin Escobar Alvarenga, MD  
Kathryn Haden-Pinneri, MD  
Dawn Holmes, MD  
Tera Jones, MD  
Michelle Jorden, MD  
Wendy Lavezzi, MD, Chair  
Scott Luzi, MD  
Rebecca MacDougall, MD  
Michael Markey, MD  
Hilary McElligott, MD  
Jerri McLemore, MD  
Joseph Prahlow, MD, Advisor  
Susan Presnell, MD  
Lori Proe, DO  
Christopher Rogers, MD  
Karen Rogers, MD  
Marius Tarau, MD  
Michael Ward, MD  

EPP-Forensic Pathology Fellowship Training  
Russell Alexander, MD  
Eric Eason, MD  
Randy Hanzlick, MD  
Donald Jason, MD  
Deborah Kay, MD  
Meredith Lann, MD  
Scott Luzi, MD  
Rebecca MacDougall, MD  
D. Kimberly Molina, MD, Chair  
Eric Peters, MD  
J. Keith Pinckard, MD  
Reade Quinton, MD  
Christopher Rogers, MD  

EPP-Journal  
Martha Burt, MD  
Ling Li, MD  
Owen Middleton, MD, Chair  
J. Keith Pinckard, Ex-Officio  
Joseph Prahlow, MD  
Robert Reichard, MD  

EPP-Position Papers  
Charles Harvey, MD  
Owen Middleton, MD, Chair  
Agnieszka Rogalska, MD  
Steven Shapiro, MD  

EPP-Scientific Presentations  
Awards  
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Brian Peterson, MD  

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Roberta Geiselhart, BSN  
Tom Hensley, F-ABMDI  
Matthew Lunn, MS
NAME 2015 Committees

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<tr>
<th>NAME Foundation Board of Trustees</th>
<th>Liaisons</th>
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<tr>
<td>John Butts, MD</td>
<td>American Medical Association CPT Advisory Committee</td>
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<td>Mary Case, MD</td>
<td>J. Scott Denton, MD, Delegate</td>
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<td>Michael Graham, MD, Treasurer</td>
<td>Association of Pathology Chairs (APC) Liaison</td>
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<td>Margaret Greenwald, MD, Vice-Chair</td>
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<td>Randy Hanzlick, MD</td>
<td>College of American Pathologists (CAP) Liaison</td>
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<td>Yvonne Milewski, MD</td>
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<td>Marcus Nashelsky, Ex-Officio</td>
<td>Intersociety Pathology Council Liaison</td>
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<td>Thomas Noguchi, MD, Founding Director</td>
<td>Mary Ann Sens, MD</td>
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<td>Joseph Prahlow, MD, Chair</td>
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<td>Michael Rieders, PHD</td>
<td>Robert Pfalzgraf, MD, Delegate</td>
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<td>Gregory Schmunk, MD, Secretary</td>
<td>Daniel Schultz, MD, Alternate Delegate</td>
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<td>World Association for Medical Law (WAML)</td>
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<td>John Hunskaker, MD, JD</td>
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<td>Charles Stahl, MD</td>
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<td>William Stturner, MD</td>
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<td>Ross Zumwalt, MD</td>
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<td>Standards, Inspection and Accreditation</td>
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| SIA - Standards                   |                            |
| Sally Aiken, MD                   |                            |
| Jonathan Arden, MD                |                            |
| Andrew Baker, MD, Chair           |                            |
| Steven Clark, PHD, Consultant     |                            |
| Stacy Drake, PHD                  |                            |
| Norma Farley, MD                  |                            |
| Marcella Fierro, MD               |                            |
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| James Gill, MD                    |                            |
| Charles Harvey, MD                |                            |
| Jeffrey Jentzen, MD               |                            |
| Eric Kiesel, MD, PHD              |                            |
| Owen Middleton, MD                |                            |
| Valerie Rao, MD                   |                            |
| Karen Ross, MD                    |                            |
| Gregory Schmunk, MD               |                            |
| Carl Stacy, MD                    |                            |

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| Lindsey Thomas, MD, Ex-Officio    |                            |

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| American Medical Association |                            |
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| Robert Pfalzgraf, MD, Delegate |                            |
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| Marcus Nashelsky, MD |                            |
| Kurt Nolte, MD |                            |
| World Association for Medical Law (WAML) |                            |
| Thomas Noguchi, MD |                            |
CME Accreditation Statement: This activity (“National Association of Medical Examiners 2015 Annual Meeting”) has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American Society for Clinical Pathology (ASCP) and the National Association of Medical Examiners (NAME). ASCP is accredited by the ACCME to provide continuing medical education for physicians.

The ASCP designates this “live” educational activity (“NAME 2015 Annual Meeting”) for a maximum of 23.5 AMA PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Educational Objective/Target Audience
The objective of the NAME 2015 Annual Meeting is to increase basic and applied pathology knowledge, focusing on autopsy and forensic pathology. The NAME 2015 Annual Meeting is designed to meet the participants’ education needs in the physician competency area of Medical Knowledge, as defined by the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS), and to support participants’ lifelong learning towards a goal of promoting patient safety and improving patient care and is specifically targeted to forensic pathologists, medical examiners, coroners, death investigators, forensic administrators and forensic scientists.

At the completion of the NAME 2015 Annual Meeting, participants should be able to:
1. discuss medico-legal death investigation protocols;
2. describe regulations and competencies for medical examiners;
3. discuss the forensic investigation of accident- and trauma-related death;
4. discuss forensic science approaches to investigation of domestic violence and homicides; and
5. discuss forensic science approaches to sudden death in children and adult populations.

Disclosure of Financial Relationships and Resolution of Conflicts of Interest:
In order to ensure balance, independence, objectivity and scientific rigor in all its educational activities, and in accordance with ACCME Standards, the ASCP requires that all individuals in a position to influence and/or control the content of ASCP CME activities disclose to the ASCP and subsequently to learners whether they do or do not have any relevant financial relationships with proprietary entities producing health care goods or services that are discussed in CME activities. Faculty are asked to use generic names in any discussion of therapeutic options, to base patient care recommendations on scientific evidence and to base information regarding commercial products/services on scientific methods generally accepted by the medical community. All ASCP CME activities are evaluated by participants for the presence of any commercial bias and thus input is used to subsequent CME planning decisions. The primary purpose of this “live” CME activity is educational and the comments, opinions, and/or recommendations expressed by the faculty or authors are their own and not those of ASCP or NAME.

Planning Committee Disclosures: The Education, Program and Publications (EPP) Planning Committee members and staff of this CME activity have no relevant financial relationships with commercial interest to disclose. The members of the NAME 2015 EPP Planning Committee are:

Sally Aiken, MD
Martha Burt, MD
James Gill, MD
Laura Knight, MD
Dianne Little, MBBS
Denise McNally (Staff)
Owen Middleton, MD

Roger Mitchell, MD
Brian Peterson, MD
J. Keith Pinckard, MD, PhD
Gregory Schmunk, MD
Tara Snethen (Consultant)
Mark Sobel, MD, PhD (Consultant)
Robert Stoppacher, MD
Faculty Disclosures: All invited faculty of CME-designated sessions have been asked to disclose any relationships that, in the context of their presentation, could be perceived by some as a real or apparent conflict of interest. None of the faculty have disclosed any relevant relationships that could be perceived by some as a real or apparent conflict of interest; no faculty will be discussing any off-label or investigational use of drugs/devices. They are:

Josh Akers
Youssef Al hmada
Russell Alexander
Deirdre Amaro
Thomas Andrew
Daniel Atherton
Michelle Aurelius
Andrew Baker
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Casey Bitting
Ryan Blumenthal
Julie Bolcer
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Ross Miller
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Catherine Morris
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Susan Parson
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Susan Presnell
Edward Reedy
Michael Rieders
Charlotte Sadler
Carl Schmidt
Sapan Shah
John Sherbeck
Amanda Spencer
Phoutthasone Thirakul
Jason Tovar
Amber Wang
Margaret Warner
Andrea Wiens
Kona Williams
Tiantong Yang
Andrea Zaferes

ADDITIONAL INFORMATION
How to Apply for CME Credit:
CME application forms will be available online at [www.name2015.org/cme](http://www.name2015.org/cme) by October 2, 2015 and must be submitted no later than December 31, 2015. You will receive your CME certificate within two weeks of successful submission of your online application. The American Society for Investigative Pathology (ASIP) is assisting NAME as Meeting Manager for the 2015 Annual Meeting and will be handling your CME application according to ASCP procedures. Should you have questions about your CME application (or do not receive your certificate within the timeframe explained above), contact the ASIP Education Office (phone 301-634-7440; fax 301-634-7990; email cme@asip.org or write to the ASIP Education Office, 9650 Rockville Pike, Suite E-133, Bethesda, MD 20814).

Please refer to the NAME 2015 Annual Meeting CME Workbook for a consolidated list of sessions that are eligible for AMA PRA Category 1 Credit(s)™. Visiting exhibits is not an approved continuing medical education activity because of ACCME standards that are designed to prevent commercial bias. A maximum of 3.0 hours can be credited for viewing posters. The meeting program lists those events that are not a continuing medical education activity (such as social events, committee meetings, and meals) with the designation “NOT CME.” There will also be signs outside of sessions that are not eligible for AMA PRA Category 1 Credit(s)™. If you have any questions about CME eligibility of a session, please ask at the registration desk.
Self Assessment Module (SAMs): NAME is approved by the American Board of Pathology (ABP) as a provider of SAM credits. ASIP is assisting NAME as Meeting Manager for the 2015 Annual Meeting and will be handling the processing of the SAM credits. To receive a maximum of 14.5 SAM credits, you must successfully complete an online SAM examination by achieving a passing score of 80%. The SAM examination will be available online (www.name2015.org/sam) by October 2, 2015 and consists of 103 questions based on oral presentations given during the meeting. Upon achieving a passing score on the SAM examination (83 correct answers), you will be prompted to complete a SAM Credit Request Form, which should be submitted by December 31, 2015 to the ASIP Education Office (fax 301-634-7990; email cme@asip.org or write to ASIP Education Office, 9650 Rockville Pike, Bethesda, MD 20814). You will receive your SAM certificate within two weeks of successful submission of your SAM Credit Request Form.
## CME & SAM PAYMENT FORM

National Association of Medical Examiners (NAME)  
2015 NAME Annual Meeting & Exhibits  
October 2-6, 2015  
The Westin Charlotte, Charlotte, NC

*Note: All dollar amounts are in US Dollars

### CME FEES
- □ NAME Member - $150
- □ Non-Member - $200

### SAM FEES
- □ NAME Member - $150
- □ Non-Member - $200

Please return this registration form by fax (888) 370-4839 or email to name@thename.org
to:

Denise D. McNally, Executive Director  
National Association of Medical Examiners  
31479 Arrow Lane, Marceline, MO  64658  
Tel: (660) 734-1891  
Email: name@thename.org  
Web: www.thename.org

### Registration Information

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### PAYMENT INFORMATION

Total Amount Owed $ __________________  

- □ Check Enclosed (US Dollars)  
- □ VISA  □ MC  Exp. Date__________

Credit Card #____________________________________________________

CCV No.____________

Name on Card_____________________________________________________

Signature_______________________________________________________
NAME 2015 Annual Meeting & Exhibits
The Westin Charlotte – Charlotte, North Carolina, USA

NAME 2015 MEETING PROGRAM

THURSDAY – OCTOBER 1

COMMITTEE MEETING [NOT CME]:
8:00 AM – 5:00 PM  Executive Committee Meeting (Invitation Only)
Stonewall Boardroom, Level Two

FRIDAY – OCTOBER 2

GENERAL INFORMATION [NOT CME]:
10:00 AM – 4:00 PM  Pre-Registration (Exhibitors & Attendees)
Grand Promenade, Level Two
10:00 PM – 4:00 PM  Installation of Exhibits
Grand Ballroom ABC, Level Two
4:30 PM – 6:30 PM  Grand Opening of Exhibits
Grand Ballroom ABC, Level Two
4:30 PM – 6:30 PM  Welcome Reception (Pre-Paid Registrants/Ticket Holders Only)
Grand Ballroom ABC, Level Two
5:30 PM – 6:30 PM  International Attendee Reception
Harris Room, Level Two
Sponsored by The Musculoskeletal Transplant Foundation
6:30 PM – 9:00 PM  Welcome Dinner (Pre-Paid Registrants/Ticket Holders Only)
Providence Ballroom, Level One

COMMITTEE MEETINGS [NOT CME]:
6:45 AM – 8:00 AM  Foundation and Board of Directors Meeting & Continental Breakfast
Providence Ballroom I, Level One
7:00 AM – 8:00 AM  Foundation Meeting
Providence Ballroom I, Level One
8:00 AM – 4:00 PM  Board of Directors Meeting
Providence Ballroom I, Level One
12:00 PM – 1:00 PM  Board of Directors Lunch
Tryon Room, Level Two
1:00 PM – 4:00PM  Inspection and Accreditation Training Session
Brevard Room, Level Three
4:00 PM – 5:00 PM  NAME Foundation Business Meeting
Trade Room, Level Two
4:00 PM – 5:00 PM  Ad Hoc Meeting on Protocols for Interagency Interactions in Mass Fatality Incidents
Stonewall Boardroom, Level Two
4:00 PM – 6:00 PM  Ad Hoc Meeting on Organ and Tissue Procurement
Kings Room, Level Two

SATURDAY, OCTOBER 3, 2015

*Indicates the following:
*John Smialek Best Resident Paper/Poster Competition
**Mary Fran Ernst Best Affiliate Paper/Poster Competition
***Susan P. Baker Public Health Impact Award
****Best Student Paper/Poster Competition

GENERAL INFORMATION:
6:00 AM – 7:00 AM  NAME Foundation Yoga by Donation [NOT CME]
Trade Room, Level Two
6:45 AM – 8:00 AM  Buffet Breakfast (Pre-Paid Registrants/Ticket Holders Only) [NOT CME]
Providence Ballroom, Level One
7:00 AM – 5:20 PM  Registration [NOT CME]
Grand Promenade, Level Two
8:00 AM – 4:00 PM  Exhibits [NOT CME]
Grand Ballroom ABC, Level Two
12:00 PM – 5:20 PM  Posters
Grand Promenade, Level Two
5:20 PM – 6:20 PM  Resident/Fellow Reception [NOT CME]
Harris Room, Level Two
6:45 PM – 9:30 PM  Private NASCAR Hall of Fame Reception (Optional) [NOT CME]
*Additional Payment Required*
Offsite (Transportation Not Provided)
COMMITTEE MEETINGS [NOT CME]:
7:00 AM – 8:00 AM International Relations Committee Meeting
*All International Attendees Welcome to Attend*
Harris Room, Level Two
12:30 PM – 2:00 PM Past Presidents’ Committee Meeting and Lunch
Morehead Room, Level Two
12:30 PM – 2:00 PM Ethics Committee Meeting and Lunch
Kings Room, Level Two
12:30 PM – 2:00 PM Journal Editorial Board Meeting
Independence Room, Level Two

PROGRAM INFORMATION:
8:00 AM – 9:50 AM SESSION 1: PREDOMINATELY PEDIATRICS
Moderators: Elizabeth Bundock, Vermont Office of the Chief Medical Examiner,
Burlington, Vermont, USA and Candace Schoppe, NY Office of the Chief Medical
Examiner, New York, New York, USA
Grand Ballroom D, Level Two
8:00 AM – 8:20 AM 1.1 Description of Death Scene Investigation and Autopsy Practices Among SUID Cases
in Seven US States, 2010-2012
Alexa Lambert, MPH, DB Consulting Group Inc., contractor at Centers for Disease Control
and Prevention, New Orleans, Louisiana, United States of America
8:20 AM – 8:50 AM 1.2 The Sudden Death in the Young (SDY) Case Registry: Improving Death Investigation
on Young Sudden Death
Heather MacLeod, MS, Sudden Death in the Young (SDY) Case Registry, Elmhurst,
Illinois, United States of America
8:50 AM – 9:05 AM 1.3 A Look at Cardiac Pathology and Obesity in Forensic Cases of Sudden Unexpected
Death in Epilepsy
*Stephanie Powers, MD, Office of the Medical Examiner of Cook County, Chicago, Illinois,
United States of America
9:05 AM – 9:20 AM 1.4 Implications of Death Certification on SUDEP Research
***Daniel Atherton, MD, University of Alabama-Birmingham, Birmingham, Alabama, United
States of America
9:20 AM – 9:35 AM 1.5 Non-abusive Bilateral Retinal Hemorrhages Extending to the Ora Serrata in an Infant
with a Ventriculo-Peritoneal Shunt for Post-Hemorrhagic Hydrocephalus
*Tiffany O’Neill, DO, Wake Forest Baptist Health, Winston Salem, North Carolina, United
States of America
9:35 AM – 9:50 AM 1.6 The Explosive Effects of Lightning: What are the Risks?
***Ryan Blumenthal, PhD, University of Pretoria, Pretoria, Gauteng, South Africa
9:50 AM – 10:30 AM VISIT EXHIBITS [NOT CME]
Grand Ballroom ABC, Level Two
9:50 AM – 10:30 AM BREAK [NOT CME]
Grand Ballroom ABC, Level Two
Sponsored by our Platinum Level Corporate Partner, Lodox NA LLC
9:50 AM – 10:30 AM VISIT POSTERS
Grand Promenade, Level Two
10:30 AM – 12:30 PM SESSION 2: CERTIFICATIONS
Moderators: Susan Ely, NY Office of the Chief Medical Examiner, New York, New
York, USA and Randy Hanzlick, Fulton County Medical Examiner Office, Atlanta,
Georgia, USA
Grand Ballroom D, Level Two
10:30 AM – 10:50 AM 2.1 Medical Therapy-related Deaths and the Medical Examiner
*Kacy Krehbiel, MD, University of New Mexico, Albuquerque, New Mexico, United States
of America
2.2 A Forensic Pathologist's Experience with Therapeutic Complications in Medical Examiner and Coroner Jurisdictions: A Proposal for Guidelines
Michael Caplan, MD, Suffolk County (NY) Office of the Medical Examiner, Hauppauge, New York, United States of America

2.3 Leveraging Death Certificates for Disaster-related Mortality Surveillance
**Margaret Warner, PhD, Centers for Disease Control and Prevention, National Center for Health Statistics, Hyattsville, Maryland, United States of America

2.4 Epidemiology, Contributing Factors, and Injuries in 28 Electrocution Fatalities in King County, Washington
Desiree Marshall, MD, King County Medical Examiner's Office, Seattle, Washington, United States of America

2.5 Infant Death Certification at Cook County
*Mike Eckhardt, MD, University of Chicago, Northshore, Evanston, Illinois, United States of America

2.6 Fatal and Nonfatal 25I-NBOMe Intoxications
Mark Koponen, MD, University of North Dakota School of Medicine and Health Sciences, Grand Forks, North Dakota, United States Of America

2.7 Unintentional Asphyxial Deaths by Unusual Sequences of Events: Report of Four Cases
Wendy Gunther, MD, Office of the Chief Medical Examiner, Commonwealth of Virginia, Norfolk, Virginia, United States of America

2.8 Overview of Investigation of Deaths Temporally Related to Law Enforcement Apprehension
Michael Graham, MD, St. Louis University, St. Louis, Missouri, United States of America

2.9 Drug-induced Excited Delirium Syndrome: Pathogenesis and Pathophysiology
Deborah Mash, PhD, University of Miami Miller School of Medicine, Miami, Florida, United States of America

2.10 Suicidal Suffocation With Inert Gases
Brian Elias, MPA, Los Angeles County Department of Medical Examiner-Coroner, Los Angeles, California, USA

2.11 The Science of Positional (or Restraint Associated) Asphyxia.
Tom Neuman, MD, University of CA, San Diego, San Diego, California, United States of America

2.12 Suicide in Jail: A 10-Year Retrospective Study
Matthew Kucmanic, Case Western Reserve University, Cleveland, Ohio, United States of America

2.13 Spit Hood-related Fatalities: An Under-recognized Cause of Death in Custody
Joyce deJong, DO, Western Michigan University Homer Stryker, MD School of Medicine, Kalamazoo, Michigan, United States of America
4:45 PM – 5:15 PM  3.7 Conducted Electrical Weapons: Understanding the Basics  
*Donald Dawes, MD, Lompoc Valley Medical Center, Santa Barbara, California, United States of America*

5:15 PM – 5:20 PM  Questions

**SUNDAY, OCTOBER 4, 2015**

**GENERAL INFORMATION:**

6:00 AM – 7:00 AM  NAME Foundation Yoga by Donation [NOT CME]  
*Trade Room, Level Two*

6:30 AM – 8:20 AM  Rigor Run/Walk (Optional) [NOT CME]  
*Additional Payment Required*  
*Main Entrance, Main Lobby*  
*Sponsored by our Platinum Level Corporate Partner, Lodox NA LLC*

6:30 AM – 8:20 AM  Affiliate Business Meeting [NOT CME]  
*Tryon Room, Level Two*

6:45 AM – 8:20 AM  Buffet Breakfast (Pre-Paid Registrants/Ticket Holders Only) [NOT CME]  
*Providence Ballroom, Level One*

7:00 AM – 1:00 PM  Registration [NOT CME]  
*Grand Promenade, Level Two*

8:00 AM – 1:15 PM  Exhibits [NOT CME]  
*Grand Ballroom ABC, Level Two*

8:00 AM – 6:00 PM  Posters  
*Grand Promenade, Level Two*

1:00 PM – 5:00 PM  21st Annual Cadaver Open Golf Tournament (Optional) [NOT CME]  
*Additional Payment Required*  
*Sponsored by CryoLife, Inc.*

1:15 PM – 5:00 PM  Scientific Field Trip: NASCAR Hall of Fame Theater “Safety in the Car”  
*Offsite*

4:00 PM – 6:00 PM  Registration [NOT CME]  
*Grand Promenade, Level Two*

**COMMITTEE MEETING [NOT CME]:**

12:45 PM – 5:45 PM  Strategic Planning Committee Meeting  
*Trade Room, Level Two*

7:00 PM – 9:00 PM  Forensic Pathology Training Subcommittee Meeting  
*Trade Room, Level Two*

**PROGRAM INFORMATION:**

**SESSION 4: AUTOPSY**

**Moderators:** Thomas Gilson, Cuyahoga Co Medical Examiner Office, Cleveland, Ohio, USA and Thomas Andrew, New Hampshire Office of Chief Medical Examiner, Concord, New Hampshire, USA

8:30 AM – 10:00 AM  
8:30 AM – 8:50 AM  4.1 The Evolution of the Autopsy  
*Patrick Hansma, DO, Cuyahoga County Medical Examiner, Cleveland, Ohio, United States of America*

8:50 AM – 9:05 AM  4.2 Identifying Errors in Forensic Autopsy Reports Using a Novel Web-based Program  
*Matthew Cain, MD, University of Alabama at Birmingham, Birmingham, Alabama, United States of America*

9:05 AM – 9:20 AM  4.3 Tracking Drug Overdoses Using Google Fusion Tables  
*Matthew Cain, MD, University of Alabama at Birmingham, Birmingham, Alabama, United States of America*

9:20 AM – 9:35 AM  4.4 Interpretation of Methadone Levels in a Deceased Breastfed Infant: Pharmacogenetic and Postmortem Considerations  
*Charis Kepron, MD MSc, Ontario Forensic Pathology Service, Ottawa, Ontario, Canada*

9:35 AM – 9:50 AM  4.5 The “Value-added” Forensic Autopsy: Public Health, Other Uses, and Relevance to Forensic Pathology’s Future  
**Randy Hanzlick, MD, Fulton County Medical Examiner and Emory University School of Medicine, Atlanta, Georgia, United States of America**
9:50 AM – 10:00 AM  4.6 Association of Antemortem Central Nervous System (CNS) Symptoms and Location of Aortic Dissections: A Retrospective Study from 2001-2014.  
*Wendy MacKerricher, BMBS, University of Arizona, Tucson, Arizona, United States of America

10:00 AM – 10:40 AM  VISIT EXHIBITS [NOT CME]  
Grand Ballroom ABC, Level Two

10:00 AM – 10:40 AM  BREAK [NOT CME]  
Grand Ballroom ABC, Level Two  
Sponsored by The Musculoskeletal Transplant Foundation

10:00 AM – 10:40 AM  VISIT POSTERS  
Grand Promenade, Level Two

10:40 AM – 12:40 PM  SESSION 5: TOXICOLOGY  
Moderators: Christina Stanley, Office of Chief Medical Examiner, Farmington, Connecticut, USA and Michelle Barry Aurelius, NC Office of Chief Medical Examiner, Raleigh, North Carolina, USA  
Grand Ballroom D, Level Two

10:40 AM – 11:00 AM  5.1 Making a Difference in an Epidemic of Fentanyl Deaths in Maryland: Geographic Information Systems (GIS) and Collaboration with the Drug Enforcement Administration  
***Russell Alexander, MD, Office of the Chief Medical Examiner, State of Maryland, Baltimore, Maryland, United States of America

11:00 AM – 11:15 AM  5.2 Curbing the Growing Drug Abuse Epidemic in Virginia  
Kathrin Hobron, MPH, Virginia Department of Health, Office of the Chief Medical Examiner, Richmond, Virginia, United States of America

11:15 AM – 11:30 AM  5.3 Heroin Toxicity where 6-Acetylmorphine (6-AM) is Not Detected by Toxicological Analyses  
*Ashley Ellis, MD, Virginia Commonwealth University, Richmond, Virginia, United States of America

11:30 AM – 11:45 AM  5.4 Methamphetamine-positive Deaths in Hennepin County, Minnesota: A 15-Year Review of Cause of Death, Manner of Death, and Toxicological Findings  
Andrew Baker, MD, Hennepin County, Minnesota, Minneapolis, Minnesota, United States of America

11:45 AM – 12:05 PM  5.5 Rocky Mountain High: Forensic Consequences of Legalization of Marijuana in Colorado  
***Kelly Lear-Kaul, MD, Arapahoe County Coroner’s Office, Centennial, Colorado, United States of America

12:05 PM – 12:20 PM  5.6 Fatal Acute Intoxication due to Synthetic Cannabinoid AB-CHMINACA and Trends of Synthetic Cannabinoid Use in Relation to DEA Restriction  
Shannon Crook, MD, University of Kentucky, Lexington, Kentucky, United States of America

12:20 PM – 12:30 PM  5.7 Acetyl Fentanyl Deaths in Metro Detroit: The Rise of New Age Street Opiates  
Avneesh Gupta, MD, University of Michigan/Wayne County Medical Examiner Office, Detroit, Michigan, United States of America

12:30 PM – 12:40 PM  5.8 A Case Report of Morphine Overdose with 6-Monoacetylmorphine Detected and Retrospective Review of 6-Monoacetylmorphine in Morphine-Positive Vermont Deaths  
Alison Krywanczyk, MD, University of Vermont Medical Center, Burlington, Vermont, United States of America

12:40 PM – 2:00 PM  LUNCH (ON YOUR OWN) [NOT CME]

12:40 PM – 2:00 PM  VISIT EXHIBITS [NOT CME]  
Grand Ballroom ABC, Level Two

12:40 PM – 2:00 PM  VISIT POSTERS  
Grand Promenade, Level Two
2:00 PM – 5:00 PM  
Scientific Field Trip: Safety in the Car  
(Pre-Paid Registrants/Ticket Holders Only)  
Offsite  
Please note: The Scientific Field Trip is eligible for up to 1.0 AMA PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

4:00 PM – 6:00 PM  
Poster Presenters at Posters  
Grand Promenade, Level Two

MONDAY, OCTOBER 5, 2015

GENERAL INFORMATION:
6:00 AM – 7:00 AM  
NAME Foundation Yoga by Donation [NOT CME]  
Trade Room, Level Two
6:45 AM – 8:00 AM  
Buffet Breakfast (Pre-Paid Registrants/Ticket Holders Only) [NOT CME]  
Providence Ballroom, Level One
6:45 AM – 8:00 AM  
Chief’s Breakfast [NOT CME]  
Tryon Room, Level Two
7:00 AM – 6:00 PM  
Registration [NOT CME]  
Grand Promenade, Level Two
8:00 AM – 3:40 PM  
Exhibits [NOT CME]  
Grand Ballroom ABC, Level Two
8:00 AM – 3:40 PM  
Posters  
Grand Promenade, Level Two
12:00 PM – 1:20 PM  
Femme Fatale Luncheon (Optional) [NOT CME]  
*Additional Payment Required*  
Harris Room, Level Two  
Sponsored by The Musculoskeletal Transplant Foundation
6:30 PM – 8:30 PM  
Board of Directors Reception (Invitation Only) [NOT CME]  
Trade Room, Level Two

PROGRAM INFORMATION:
8:00 AM – 9:50 AM  
NAME Business Meeting [NOT CME]  
Grand Ballroom D, Level Two
9:50 AM – 10:30 AM  
VISIT EXHIBITS [NOT CME]  
Grand Ballroom ABC, Level Two  
Sponsored by our Platinum Level Corporate Partner, Lodox NA LLC
9:50 AM – 10:30 AM  
BREAK [NOT CME]  
Grand Ballroom ABC, Level Two  
Sponsored by our Platinum Level Corporate Partner, Lodox NA LLC
9:50 AM – 10:30 AM  
VISIT POSTERS  
Grand Promenade, Level Two
10:30 AM – 12:00 PM  
NAME Business Meeting [NOT CME]  
Grand Ballroom D, Level Two
12:00 PM – 1:20 PM  
LUNCH (ON YOUR OWN) [NOT CME]
12:00 PM – 1:20 PM  
VISIT EXHIBITS [NOT CME]  
Grand Ballroom ABC, Level Two
12:00 PM – 1:20 PM  
VISIT POSTERS  
Grand Promenade, Level Two
12:00 PM – 1:20 PM  
Femme Fatale Luncheon (Optional) [NOT CME]  
*Additional Payment Required*  
Harris Room, Level Two  
Sponsored by The Musculoskeletal Transplant Foundation
1:20 PM – 3:00 PM

SESSION 6: RADIOLOGY/BONES

Moderator: William Rodriguez, Office of the Chief Medical Examiner, Dover AFB, Delaware, USA

Grand Ballroom D, Level Two

1:20 PM – 1:50 PM

6.1 The Korea 208: Individual Identifications from a Large Commingled Skeletal Assemblage using Anthropology and DNA Testing
Edward Reedy, PhD, MD, Defense Pow/Mia/Accounting Agency, Hickam AFB Hawaii, United States of America

1:50 PM – 2:00 PM

6.2 The Utility Of Postmortem Computed Tomography in Supplanting Autopsies in Determining Cause of Death in Pediatric Trauma Fatalities
Jason Morin, Vancouver General Hospital, Vancouver, British Columbia, Canada

2:00 PM – 2:15 PM

6.3 Dating Fractures on Postmortem Radiographs: How Accurate is This When Compared With Postmortem Histology?
Charis Kepron, MD MSc, The University of Ottawa, Ottawa, Ontario, Canada

2:15 PM – 2:30 PM

6.4 Benefits of Utilizing Full-body Digital Radiography in Forensic Pathology
Kyla Jorgenson, MS, Oklahoma Office of the Chief Medical Examiner, Tulsa, Oklahoma, United States of America

2:30 PM – 2:45 PM

6.5 Virtual Dissection: Roles and Limitations of Radiologic Imaging
Edward Mazuchowski, II, MD, PhD, Armed Forces Medical Examiner System, Dover AFB, Delaware, United States of America

2:45 PM – 3:00 PM

6.6 Introduction to the National Commission on Forensic Sciences and Proposed Core Values for Medicolegal Death Investigation
Stephen Cina, MD, Cook County Medical Examiner’s Office, Chicago, Illinois, United States of America and John Fundenberg, D-ABMDI, Clark County Office of the Coroner/Medical Examiner, Las Vegas, Nevada, United States of American

3:00 PM – 3:40 PM

VISIT EXHIBITS [NOT CME]
Grand Ballroom ABC, Level Two

3:00 PM – 3:40 PM

VISIT POSTERS
Grand Promenade, Level Two

3:40 PM – 5:55 PM

SESSION 7: MOC

Moderator: James Gill, Connecticut Office of Chief Medical Examiner, Farmington, Connecticut, USA

Grand Ballroom D, Level Two

3:40 PM – 4:40 PM

7.1 SPECIAL PRESENTATION: The American Board of Pathology and Maintenance of Certification
Rebecca Johnson, MD, American Board of Pathology, Tampa, Florida, United States of America

4:40 PM – 4:50 PM

Questions and Answers

4:50 PM – 5:00 PM

7.2 Evidence Basis for Maintenance of Certification
Amy Martin, MD, Amy Martin, MD, LLC, Denver, Colorado, United States of America

5:00 PM – 5:55 PM

7.3 A Forensic Pathologist Panel on Maintenance of Certification (MOC): Point and Counterpoint
Laura Knight, MD, Washoe County Medical Examiner-Coroner Office, Reno, Nevada, United States of America

TUESDAY, OCTOBER 6, 2015

GENERAL INFORMATION [NOT CME]:
6:45 AM – 8:00 AM Buffet Breakfast (Pre-Paid Registrants/Ticket Holders Only)
Providence Ballroom, Level One

7:00 AM – 4:10 PM Registration
Grand Promenade, Level Two
PROGRAM INFORMATION:

8:00 AM – 10:00 AM  SESSION 8: POTPOURRI
Moderators: Steve Shapiro, Vermont Office of the Chief Medical Examiner, Burlington, Vermont, USA and Kathleen McCubbin, New York Office of Chief Medical Examiner, Brooklyn, New York, USA

Grand Ballroom D, Level Two

8:00 AM – 8:15 AM
8.1 Suicide Investigation Reporting Tool (SIRT): A Comprehensive and Standardized Coding Form to Aid Investigators in Reporting on Deaths by Suicide
Cheryl Meyer, PhD, JD, Wright State University, Dayton, Ohio, United States of America

8:15 AM – 8:30 AM
8.2 Rapid DNA Analysis for Identification of Human Remains and Family Reunification
Christopher Miles, BS, Department of Homeland Security, Science and Technology Directorate, Washington, District of Columbia, United States of America

8:30 AM – 8:50 AM
8.3 Multidisciplinary Case Conferencing: A Collaborative Tool to Achieve Case Consensus in a Coroner-based Medicolegal Death Investigation System.
Allison Edgecombe, MD, Hamilton Health Sciences, Hamilton, Ontario, Canada

8:50 AM – 9:30 AM
8.4 Heart Disease and Manner of Death Certification in Scuba Divers
Charlotte Sadler, MD, University of California, San Diego (UCSD), San Diego, California, United States of America

9:35 AM – 9:50 AM
8.5 Aortic Dissections and Stimulant Drug Abuse in New Mexico: A 37-Year Retrospective Review
Michelle Aurelius, MD, North Carolina Office of the Chief Medical Examiner, Raleigh, North Carolina, United States of America

9:50 AM – 10:00 AM
8.6 Sudden Unexpected Death Associated with Idiopathic Intracranial Hypertension
*Hannah Garza, MD, Wake Forest Baptist Health, Winston Salem, North Carolina, United States of America

10:00 AM – 10:10 AM BREAK [NOT CME]
Grand Ballroom ABC, Level Two
Sponsored by The Musculoskeletal Transplant Foundation

10:10 AM – 12:10 PM  SESSION 9: INTERACTIONS AND DISSECTIONS
Moderators: Dan Schultz, LifeLink Tissue Bank, Tampa, Florida, USA and Grace Dukes, University of Kentucky, Lexington, KY

Grand Ballroom D, Level Two

10:10 AM – 10:40 AM
9.1 Interagency Cooperation in the Recovery of Anatomic Specimens
Francisco Diaz, MD, Wayne County Office of the Medical Examiner, Detroit, Michigan, United States of America

10:40 AM – 11:00 AM
9.2 Risk Management in Forensic Pathology Practice: Gaps in Professional Liability Insurance Policies for Forensic Pathologists
Sapan Shah, MD, JD, Flagship Physicians Insurance, Des Plaines, Illinois, United States of America

11:00 AM – 11:15 AM
9.3 View from the Frontline: Handling Media Requests
Julie Bolcer, MA, BA, NYC Office of Chief Medical Examiner, New York, New York, United States of America

11:15 AM – 11:25 AM
9.4 SUID Tissue Consortium to Help Solve the Dilemma: Asphyxia or Brain Abnormality
Larissa Gregorin, MPH, American SIDS Institute, Naples, Florida, United States of America

11:25 AM – 11:35 AM
9.5 Histopathology of the Liver in Alcoholic and Diabetic Ketoacidosis
Jacqueline Parai, MD, MSc, The University of Ottawa, Ottawa, Ontario, Canada

11:35 AM – 11:55 AM
9.6 Posterior Neck Dissection: A Special Autopsy Technique That Should Be Standard in Trauma Victims
Robert Pfalzgraf, MD, Office of the District 21 Medical Examiner, State of Florida, Fort Myers, Florida, United States of America
11:55 AM – 12:10 PM  9.7 Common Pitfalls in Cardiac Pathology
Emily Duncanson, MD, Jesse E. Edwards Registry of Cardiovascular Disease, Saint Paul, Minnesota, United States of America

12:10 PM – 2:00 PM  NAME Luncheon & Award Ceremony (Pre-Paid Registrants/Ticket Holders Only) [NOT CME]
Milton Helpern Laureate Award will be presented to Donald T. Reay, MD, Oak Harbor, Washington, USA
Providence Ballroom, Level One

2:00 PM – 4:00 PM  SESSION 10: NEW TOOLS
Moderator: J. Keith Pinckard, Travis County Medical Examiner's Office, Austin, Texas, United States of America
Grand Ballroom D, Level Two

2:00 PM – 2:20 PM  10.1 A New Tool for the Travis County Medical Examiner's Office in Austin, Texas
Adam Denmark, SmithGroupJJR, Phoenix, Arizona, United States of America

2:20 PM – 2:35 PM  10.2 The Human Postmortem Microbiome as a New Forensic Tool
Carl Schmidt, MD, MPH, University of Michigan / Wayne County Medical Examiner, Detroit, Michigan, United States of America

2:35 PM – 2:55 PM  10.3 Neurodegenerative Diseases for the Forensic Pathologist
Amanda Fisher-Hubbard, MD, University of Michigan, Ann Arbor, Michigan, United States of America

2:55 PM – 3:15 PM  10.4 NZ Cardiac Inherited Disease Group (CIDG): What it is, and the Role of the Forensic Pathologist
Paul Morrow, MD, National Forensic Pathology Service, NZ, Shelburne, Vermont, United States of America

3:15 PM – 4:00 PM  10.5 National Association of Medical Examiners ad hoc Research Committee: A Mini-workshop on Obtaining Grant Funding for Forensic Pathology Research
J. Keith Pinckard, MD, PhD, Travis County Medical Examiner's Office, Austin, Texas, United States of America

POSTER PRESENTATIONS:
Please note posters must be on the assigned board by Saturday, October 3, at 12:00PM and remain posted until Monday, October 5 at 3:40PM. It is required that presenters are to stand by their posters during the presentation time for discussion of their posters with meeting attendees that will occur on Sunday, October 4, 4:00PM - 6:00PM.
Grand Promenade, Level Two

P1 Identification of β-Hydroxythiofentanyl in Two Postmortem Cases
Laura Labay, PhD, NMS Labs, Willow Grove, Pennsylvania, United States of America

P2 Fatal Balamuthia Meningoencephalitis in an Immunocompetent Young Adult: What Should the Forensic Pathologist Know?
Phoutthasone Thirakul, MD, University of California, San Diego, Tampa, Florida, United States of America

P3 Os Odontoideum Mimicking Acute Odontoid Peg Fracture: Case Report and Review of the Literature
*Amber Wang, MD, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania, United States of America

P4 A Series of Accidental Deaths in Southcentral Alaska: Are they Victims of Climate Change?
*Grace Duke, MD, University of Kentucky, Lexington, Kentucky, United States of America

P5 Varicella zoster Virus Vasculopathy
Kathryn Haden-Pinneri, MD, Harris County Institute of Forensic Sciences, Houston, Texas, United States of America

P6 Sudden, Unexpected Death Due to Neurosarcoidosis: A Series of 3 Cases.
*Cody Carter, MD, University of Michigan, Ann Arbor, Michigan, United States of America

P7 Her Death was a Fluke! Sudden Death in a 58-Year-old Epileptic with Cerebral Paragonimiasis: Case Report and Brief Review of Most Common Parasitic Causes of Epilepsy
Deirdre Amaro, MD, University of California, San Diego, San Diego, California, United States of America
P8 The Reporting of Toxicology Results and the Submission of Data Records for Courtroom Proceedings
Michael Rieders, PhD, NMS Labs, Willow Grove, Pennsylvania, United States of America

P9 Amyloidosis and Unexpected Death: Seven Cases and a Review of the Literature
Susan Presnell, MD, Medical University of South Carolina, Charleston, South Carolina, United States of America

P10 The Utility of Screening for 6-MAM instead of Propoxyphene
Matthew Cain, MD, University of Alabama at Birmingham, Birmingham, Alabama, United States of America

P11 Sudden Unexpected Death of Young People Associated with Coronary Artery Anomalies and Sports Events: A Retrospective Analysis of Five Cases.
Jayantha Herath, MD, DLM, FCAP, FRCPC (AP&FP), Ontario Forensic Pathology Service, Toronto, Ontario, Canada

P12 Dissection Allows Certification of a Pill Death that is Neither Asphyxiation nor Intoxication
Thomas Andrew, MD, Office of Chief Medical Examiner, Concord, New Hampshire, United States of America

P13 Three Cases of Bilateral Vertebral Artery Dissection
*Christopher Ball, MBBS, University of Ottawa, Ottawa, Ontario, Canada

P14 Dieulafoy’s Lesion: A Rare Cause of Fatal Upper Gastrointestinal Hemorrhage
*Adam Covach, MD, University of Wisconsin Hospital and Clinics, Madison, Wisconsin, United States of America

P15 Diluteazem Associated Deaths in Ontario Canada: Retrospective Review of 5-Year Data
Rebekah Jacques, MD, Ontario Forensic Pathology Service, Toronto, Ontario, Canada

P16 Vasculitis Associated with Cocaine Use
*Christopher Ball, MBBS, University of Ottawa, Ottawa, Ontario, Canada

P17 The Necessity of Dissection and Microscopy in a Case of Cystic Tumor of the Atrioventricular Node
Julie Huss, MD, David Geffen School of Medicine at UCLA, Los Angeles, California, United States of America

P18 Quilty Effect Gone Bad: Massive Myocardial Infiltrates in a Pediatric Heart Allograft
Josh Akers, MD, Nebraska Medicine, Omaha, Nebraska, United States of America

P19 Cold Deaths in the Windy City: Hypothermia Related Deaths in Chicago
Kimberly Golden MD, Northwestern McGaw Feinberg School of Medicine, Chicago, Illinois, United States of America

P20 Homemade Chloroform as a Final Exit
Jason Tovar, MD, Sacramento County Coroner, Sacramento, California, United States of America

P21 Fatal Aortoesophageal Fistula Due to Swallowed Button Cell Battery in a 2-Year-old Child
*Grant Herndon, DO, Dallas County Southwestern Institute of Forensic Sciences, Dallas, Texas, United States of America

P22 A 20-Year Retrospective Review of Pediatric Homicides by Drowning in Cook County, Illinois
*Kirstin Howell, MD, Northwestern University Feinberg School of Medicine, Chicago, Illinois, United States of America

P23 Spontaneous Coronary Artery Dissection in a Healthy Young Woman: Case Report and Review of the Literature
*Peter Mazari, MD, PhD, Hospital of the University of PA, Philadelphia, Pennsylvania, United States of America

P24 Recertification from Suicide to Undetermined in a Previously Healthy Adult Taking Varenicline
*Amanda Maskovyak, MD, Cuyahoga County Medical Examiner's Office, Cleveland, Ohio, United States of America

P25 The Role of the Medicolegal Death Investigator (MLDI) in a Mass Fatality
**Tom Hensley, F-ABMDI, Jackson County Medical Examiner's Office, Kansas City, Missouri, United States of America

P26 Sudden Unexpected Death in Epilepsy: A Case Associated with Video Game Play
David Manthei, MD, PhD, University of Michigan Health System, Ann Arbor, Michigan, United States of America

P27 Pulmonary Thromboembolism Resulting from a Leiomyosarcoma of the Pelvis
*Casey Bitting, DO, University of New Mexico School of Medicine, Albuquerque, New Mexico, United States of America
P28 The Use of Immunohistochemistry to Differentiate Melanoma from Metallic Fragment Deposition from a Projectile in the Brain of a Patient with No Medical History Provided
*Youssef Al hmada, MD, University of Mississippi Medical Center, Jackson, Mississippi, United States of America

P29 Tandem Bullet Homicide
****Samuel Prahlow, Valparaiso University, Galien, Michigan, United States of America

P30 Death on the Job: A Two-year Review and Policy Discussion
Zachary Michalicek, DO, University of Chicago Medical Center, NorthShore Program, Chicago, Illinois, United States of America

P31 Postmortem Brain Abnormalities Identified Four Months Following an Attempted Hanging
Amanda Spencer, DO, Penn State Hershey Medical Center, Hummelstown, Pennsylvania, United States of America

P32 Neuropathologic Findings in Two Cases of Sudden Death in Childhood Associated with Congenital Hydrocephalus
Andrea Wiens, DO, Oklahoma Office of The Chief Medical Examiner, Tulsa, Oklahoma, United States of America

P33 Basal Vacuolization Marks Ketoacidosis
*Colin Hebert, MD, Vidant Medical Center at East Carolina University, Brody School of Medicine, Greenville, North Carolina, United States of America

P34 Suicide by Natural Gas
Allison Edgecombe, MD, Hamilton Health Sciences, Hamilton, Ontario, Canada

P35 Takayasu Arteritis: A Rare Cause of Sudden Cardiac Death in a Young Person
Beth Frost, DO, University of Kentucky, Lexington, Kentucky, United States of America

P36 Hemoglobinopathy Masquerading as Cerebral Infarct and Hemorrhage: An Important Addition to the Differential Diagnosis.
*Susan Parson, MD, MS, Cedars Sinai Medical Center, Los Angeles, California, United States of America

P37 Body-Found-in-Water Death Investigation
Andrea Zaferes, BA, Dutchess County Medical Examiner, Shokan, New York, United States of America

P38 Identifying Modifiable Reasons for Performing External Examinations Only at the Coroner’s Office.
Maneesha Pandey, MBBS, Lucas County Coroner's Office, Toledo, OH, United States of America

P39 WITHDRAWN

P40 Analysis of Deaths Related to Alleged Medical Malpractice: A Retrospective Study of Forensic Autopsy Cases in Beijing, China, 2002-2011
Tiantong Yang, MD, China University of Political Science and Law, Beijing, China

P41 Aortic Root Dissection, Type A, Extending into Three Coronary Arteries Causing Sudden Unexpected Death in a 37-Year-old Non-pregnant Woman
*Melissa Brents, MD, University of Mississippi Medical Center, Jackson, Mississippi, United States of America

P42 WITHDRAWN

P43 Suicide by Bomb, with Decapitation
Samuel Prahlow, Valparaiso University, Galien, Michigan, United States of America

P44 Pediatric Death Investigation in Ontario, Canada: Analysis of a 6-Year Period from 2005 to 2011
Kona Williams, MD, FRCPC, Office of the Chief Coroner and the Ontario Forensic Pathology Service, Toronto, Ontario, Canada

P45 Intimal Sarcoma Presenting as Fatal Bilateral Pulmonary Embolism with Cardiac Tamponade
*John Sherbeck, MD, University of Michigan, Ann Arbor, Michigan, United States of America

P46 A Medical Examiner Officer’s Experience with Vagal Nerve Stimulators
Ross Miller, MD, Jackson County Medical Examiner's Office, Kansas City, Kansas, United States of America

P47 Sudden Death in an Individual with Neurofibromatosis Type 1
Ross Miller, MD, Jackson County Medical Examiner's Office, Kansas City, Missouri, United States of America

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P48 Sudden Death due to Spontaneous Small Bowel Perforation within an Incarcerated Umbilical Hernia
*Amanda Maskovyak , MD, Cuyahoga County Medical Examiner's Office, Cleveland, Ohio, United States of America

P49 Homemade Deer Hunting Tree Stand: A Unique Cause Of An Asphyxial Death
Erin Haer, MS, DO, Wake Forest Baptist Health, Winston-Salem, North Carolina, United States of America

P50 An 8-Year Review of Accidental Swimming Pool Drownings at the West Tennessee Regional Forensic Center, 2006 - 2013
Catherine Morris, MD, The University of Tennessee Health Science Center, Memphis, Tennessee, United States of America

Join us next year in Minneapolis, Minnesota
September 9-13, 2016
Hyatt Regency Minneapolis
Exhibit Schedule

**Exhibit Installation**
Friday, October 2  
10:00AM – 4:00PM

**Exhibitor Registration Open**
Friday, October 2  
10:00AM – 4:00PM  
Saturday, October 3  
8:00AM – 4:00PM  
Sunday, October 4  
8:00AM – 12:30PM  
Monday, October 5  
8:00AM – 3:40PM

**Exhibit Dates and Overall Hours**
Friday, October 2  
4:30PM – 6:30PM  
*(Exhibits Open during Opening Reception)*
Saturday, October 3  
8:00AM – 4:00PM  
Sunday, October 4  
8:00AM – 12:30PM  
Monday, October 5  
8:00AM – 3:40PM

*Please note: You are only required to be at your booth during designated break times as noted in the Meeting Program and below; however the hall will be open during the above hours.*

**Published Visiting Hours**
Friday, October 2  
4:30PM – 6:30PM
Saturday, October 3  
9:50AM – 10:30AM  
12:30PM – 2:40PM
Sunday, October 4  
10:00AM – 10:40AM  
12:40PM – 2:00PM
Monday, October 5  
9:50AM – 10:30AM  
12:00PM – 1:20PM  
3:00PM – 3:40PM

**Exhibit Dismantling**
Monday, October 5  
3:40PM – 9:00PM

*No packing or dismantling of exhibits will be permitted until 3:40PM, Monday, October 5. Early departure will result in the company or group being penalized a fee no less than $500 and may result in being prohibited from participating in future NAME events.*
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For more information visit: www.takesbrains.org

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For more information visit: www.crcpress.com

CRIME LAB DESIGN (BOOTH #209)
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DODGE COMPANY (BOOTH #305)
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For more information visit: www.dodgeco.com

FORENSIC ADVANTAGE SYSTEMS (BOOTH #211)
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No company description provided

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Full-body, high-speed digital radiology with low radiation emission and scatter. Lodox provides a time-saving, low-dose investigation of the entire body in less than 5 minutes. Institutions across the U.S. and around the World benefit in multiple applications such as major Trauma centers, ER’s, Mass Casualty, Pediatric imaging, Bariatric imaging, Bone Scans, and Forensic Medical Investigations. Miss nothing…Faster.
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For more information visit: www.mortechmfg.com
MWL ARCHITECTS (BOOTH # 313)
McClaren, Wilson & Lawrie, Inc. is a leader in architecture specializing in the forensic sciences and law enforcement with more projects worldwide in its field of expertise, than any other firm. We have been trusted to design facilities as large as 665,000 SF to smaller facilities repurposed from existing structures. Planning Your Future—Right From the Start
For more information visit:  www.mwlarchitects.com

THE NAME FOUNDATION (BOOThs 110/112)
The NAME Foundation, a not-for-profit 501c3 corporation, has been created to foster the intellectual development and leadership of young forensic pathologists, advance the forensic sciences through financial support of research and to fund humanitarian projects which will bring our expertise as medical examiners and public health physicians to underserved communities. The NAME Foundation accepts donations from individual and corporate donors to promote excellence in forensic science. The Foundation will focus on sustaining recruitment into the field, promoting education and leadership, and funding research in forensic pathology and death investigation. The Foundation will also support efforts designed to preserve the history and follow the progress of the forensic sciences and NAME.
For more information visit: www.thename.org

THE NATIONAL CENTER FOR THE REVIEW AND PREVENTION OF CHILD DEATHS / SUDDEN DEATH IN THE YOUNG CASE REGISTRY (BOOTH # 205)
The National Center for the Review and Prevention of Child Deaths (NCRPCD) serves as a resource and data center for state and local Child Death Review (CDR) programs. It promotes, supports and enhances child death review methodology and activities at the state, community and national levels. NCRPCD serves as the Data Coordinating Center for the Sudden Death in the Young (SDY) Case Registry, a resource designed to increase understanding of the prevalence, causes and risk factors for sudden death in the young.
For more information visit:  www.childdeathreview.org

NATIONAL DISEASE RESEARCH INTERCHANGE (BOOTH #302)
The National Disease Research Interchange (NDRI) is a 501(c)(3) not-for-profit, NIH-funded organization that provides project-driven human biospecimen service to academic and corporate scientists. NDRI has 35 years of experience globally distributing human biospecimens for research. Our extensive recovery network has the expertise to provide anatomical structures, organs, and tissues with annotated data.
For more information visit:  www.ndriresource.org

NATIONAL INSTITUTE OF JUSTICE (BOOTH #100)
NIJ is the research, development and evaluation agency of the U.S. Department of Justice and is dedicated to researching crime control and justice issues. NIJ provides objective, independent evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the State and local levels.
For more information visit:  www.nij.gov

NMS LABS (BOOTH #310)
NMS Labs has been setting the standard for excellence in forensic testing and clinical toxicology for over 40 years, responding to the needs of the criminal justice system, coroners, healthcare providers, and medical researchers with state-of-the-art tests that other labs do not or cannot provide. NMS Labs is an ASCLD/LAB International (ISO 17025) accredited laboratory and is passionate about promoting public health and safety.
For more information visit:  www.nmslabs.com

QUALTRAX (BOOTH # 400)
Qualtrax Compliance Software helps ease the burden by providing a complete document and process automation software for compliance to industry, customer and internal standards.
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RTI DONOR SERVICES (BOOTH #306)
RTI Donor Services is an AATB-accredited not-for-profit tissue recovery network dedicated to serving donor families and the donation community in perpetuating the circle of life. We help to enhance the lives of others by working with organ and tissue agencies to provide responsible stewardship of the gift of donation. In the communities that we serve, RTI Donor Services offers families the option of tissue donation, provides family aftercare services and offers community information and awareness. RTI Donor Services may be accessed through the internet at www.rtidonorservices.org or on Facebook at www.Facebook.com/RTIDonorServices.
For more information visit:  www.rtidonorservices.org
The SUDC FOUNDATION (BOOTH # 103)
The SUDC Foundation’s mission is to eliminate the tragedy of sudden unexpected and unexplained death in childhood. A centralized resource for sudden death in children, it’s dedicated to supporting grieving families by developing support and advocacy programs specific to their needs. It works with families, professionals and the general public to share accurate information, advance medical research, including the SUDCRRRC, and advocate for issues relative to SUDC.
For more information visit: www.sudc.org

TISSUE TECHNIQUES PATH LABS (BOOTH # 212)
Tissue Techniques has been providing histology services for the past 18 years. Services provided are as follows: H&E, Special Stains, Immunohistochemistry, and more. Specimens supplied to the lab are processed in a timely and dedicated manner as to provide high quality slides, at reasonable prices. Tissue Techniques prides itself on providing Top Quality services and all work is guaranteed.
For more information visit: www.tissuepathology.com

TOTALPOST SECURITY SYSTEMS (BOOTH #311)
Company name has been changed. Please see ADVANCED DETECTION SOLUTIONS

TRANSGENOMIC, INC (BOOTH # 203)
Transgenomic Inc. is a global biotechnology company advancing personalized medicine in cancer and inherited diseases through its proprietary molecular technologies and world class clinical and research services. Transgenomic’s molecular clinical reference laboratory specializes in genetic testing for cardiology disorders under its FAMILION brand. Its areas of expertise include channelopathies, cardiomyopathies, sudden unexpected death and whole exome sequencing.
For more information visit: www.transgenomic.com

UNIVERSITY OF MARYLAND BRAIN AND TISSUE BANK (BOOTH #207)
The University of Maryland Brain and Tissue Bank and the National Institutes of Health seek to enhance the availability of post-mortem autopsy tissue from individuals with autism. The assistance of medical examiners is sought in identifying deceased individuals with autism. The Bank obtains permission for tissue donation from the next of kin. Medical examiners make autism research possible.
For more information visit: www.btbank.org

VERTIQ SOFTWARE LLC(BOOTH #201)
CME-V3 is a 100%web-based case management application with dynamic workflow configuration. Accessible from any device with HTML5 Internet browser connectivity it is offered as both an in-house and hosted solution. CME-V3 records, tracks, reports demographic, pathological and statistical data of deceased persons and others associated with a case.
For more information visit: www.vertiq.com
OPTIONAL MEETINGS/ACTIVITIES

INSPECTION AND ACCREDITATION TRAINING SESSION [NOT CME]
Date: Friday, October 2, 2015
Time: 1:00 PM – 4:00 PM
Attendance at a NAME Inspection and Accreditation Training Session is REQUIRED for all those NAME members desiring to be a certified inspector and for those certified inspectors who need to participate at least once in five years to maintain certified. Preregistration is required; however, there is NO charge for this Training Session.

OPTIONAL SATURDAY PRIVATE NASCAR Hall of Fame Reception [NOT CME]
Date: Saturday, October 3, 2015
Time: 6:00 PM – 10:00 PM
Cost: $100 per person
Join us at the NASCAR Hall of Fame for a private heavy Hors D’oeuvre Reception and enjoy the third and fourth floors known as Race Week and Heritage Speedway. You can explore history while engaging with interactive content. The Hall is jammed-packed with traditional exhibits; it is also fueled with more than 50 interactive experiences like tire-changing stations and realistic racing simulators. There are plenty of exhibits with artifacts and NASCAR collections.

OPTIONAL SUNDAY RIGOR RUN/WALK [NOT CME]
Date: Sunday, October 4, 2015
Time: 6:30 AM
Cost: $20.00 per person
The NAME Rigor Run/Walk will be approximately 3 miles. The route will start and end at the meeting hotel. Registrants for the Rigor Run/Walk will receive a terrific t-shirt, a route map, and a bottle of water. Runners and walkers can go to the Sunday morning continental breakfast after returning to the hotel. Note: T-shirts will be available on a first come first serve basis. There will be shirts in sizes S, M, L and XL.

**MAP TO BE PROVIDED BY HOTEL**

OPTIONAL SUNDAY 21ST ANNUAL CADAVER OPEN GOLF TOURNAMENT [NOT CME]
Date: Sunday, October 4, 2015
Time: 1:00 PM
Cost: $80.00 per player
The tournament will take place at The Golf Club at Ballantyne. Fees include: Green fees, cart rental, use of driving range, chipping and putting areas, cart signs, personalized bag tags and score cards, tournament set-up-contests, rules/format and pairings/handicap sheets, professional staffing and scoring, club cleaning and gratuity. Format: Consecutive Tee Times – Four Person Scramble Starting at 1p.m.

SCIENTIFIC FIELD TRIP: NASCAR Hall of Fame Theater “Safety in the Car” – Limited Availability
Date: Sunday, October 4, 2015
Time: 1:00 PM – 5:00 PM
Cost: $45 (Included in Full Registration)
An optional scientific field trip is planned to visit the NASCAR R&D Center in Concord, NC. Eligible for up to 1.0 AMA PRA Category 1 Credit(s)™. Tom Gideon, PE, Senior Director of Safety for NASCAR’s Research and Development Department will do a presentation entitled “Safety in Racing - The Keys to Improved Driver’s Safety.” Purpose:
- Share the research and development done by NASCAR and others over the years to improve driver’s safety in racing. Provide a historical perspective of racing injury and death. Explain the deaths due to basilar skull fractures, and the physics that cause that fracture, and the fix. Show the latest forms of driver restraints, how they work, and the latest NASCAR rules requiring a minimum 7-point restraint.
- Show how high G sleds, incident data recorders, and anthropomorphic dummies are used to develop better safety systems and “post-mortem” a severe crash incident.
- Look at the NASCAR vehicle and point out the protection offered by each of the features on the vehicle.

OPTIONAL CHIEF’S BREAKFAST WORKSHOP
Date: Monday, October 5, 2015
Time: 7:30 AM – 8:30 AM
For NAME members who aspire to be chiefs, are currently chiefs, or are interested in common administrative issues. This inaugural breakfast will feature advice from current and retired chief legends: Drs. Fierro, Reay, Donoghue, and Lakshmanan. Preregistration is required; however, there is NO charge for this Workshop.

OPTIONAL FEMME FATALE LUNCHEON [NOT CME]
Date: Monday, October 5, 2015
Time: 12:00 PM – 1:30 PM
Cost: $65.00 per person
Femme Fatales (Ladies) - Plan to join your forensic colleagues for lunch and get acquainted. This is a luncheon for all forensic femme fatales! Register early as space is limited!
MILTON HELPERN LAUREATE AWARD

THE NATIONAL ASSOCIATION OF MEDICAL EXAMINERS

The National Association of Medical Examiners began, as many great organizations do, from the dreams, ideas and wisdom of a few farsighted, socially conscious individuals. Back in 1965, Milton Helpern recognized the need for the nation’s Medical Examiners to share their knowledge, expertise and experience in order to improve the medicolegal investigation of death in this country.

He discussed this concept with Richard Childs, the Executive Director of the National Municipal League, and a group of his close colleagues, Ali Hameli, Chief Medical Examiner, State of Delaware, Leslie Lukash, Chief Medical Examiner, Nassau County, New York, and Joseph Spellman, Chief Medical Examiner, City of Philadelphia. In the spring of 1966, these individuals formed a planning committee in order to bring Doctor Helpern’s concept to reality. This group became the foundation and heart of what was later to become the National Association of Medical Examiners.

Through the dedication and efforts of these five men, N.A.M.E. was incorporated in August, 1966. Subsequently they invited Chief Medical Examiners throughout the country to meet in Doctor Helpern’s Office. As a result of that meeting, an interim steering board was formed which later paved the way for the first annual membership meeting held at the Knickerbocker Hotel in Chicago in February, 1968.
DONALD T. REAY, M.D.

The Executive Committee and Board of Directors of the National Association of Medical Examiners is extremely pleased to present the Milton Helpern Laureate Award to Donald T. Reay, M.D. who has made outstanding contributions to the development and improvement of medicolegal investigations in the United States; who is highly respected by his colleagues for the highest excellence in forensic pathology, education, research, consultation and administration; and who has attained and is a living example of the principles, standards, and goals of the National Association of Medical Examiners.

Both Judy and Don were born and raised in the mountain towns of Wyoming and Utah. Both had uneventful childhoods and teenage experiences. They first met when Don was in his last year of medical school at the University of Utah and were married that same year. But first, Don had graduated from the University of Notre Dame (B.S. magna cum laude 1959) and returned to Utah for medical school and graduated in 1963. While in medical school he had participated in research on copper deficient anemia in swine that later would be credited as a year for board certification in pathology. Because of Don’s interest in clinical medicine, the University of Utah fashioned an internship in medicine and pathology. It was during internship that Uncle Sam sent a draft notice since the Vietnam era was on the horizon. Don joined the USAF reserve with an understanding of active duty following a completion of a residency in pathology. The next three years were spent at the University of Utah in clinical and anatomic pathology after which the American Board of Pathology deemed him board eligible. With a vacant year before active military service, Don wondered what forensic pathology was about and applied to the Cleveland Clinic sponsored forensic pathology program that was under the tutelage of Dr. Lester Adelson. Don and Judy packed up their few things and with two children, made the move to Cleveland.

The year in forensic pathology was an introduction into a new discipline that used the same anatomic tools as hospital pathology but the consequences were different. Death investigation was a process that involved other agencies with significant interest in the forensic results. It was a new experience for Don since hospital pathology usually involved surgeon-clinician interaction. Dr. Adelson gave the autopsy experience new life. At the end of his year, Don received USAF orders for active duty and was assigned to the Armed Forces Institute of Pathology in Washington D.C.

Don was assigned to the Forensic Pathology unit under the direction of Dr. Charles Stahl. The activity mostly involved review of forensic deaths throughout the military. Don became chief of the accident pathology branch after six months and concentrated on review of autopsies from traffic fatalities. During ’67 and ’68 he was certified by the American Board of Pathology in anatomical, clinical and forensic pathology. The DOT was interested in restraint systems and Don became the medical interpreter for injury patterns. His two-year assignment ended in 1970 and a dilemma
occurred: Don’s military obligation was over. Since his future was uncertain, the USAF had an exchange program with the RAF at the Institute of Pathology and Tropical Medicine outside of London. Seeking a new experience, he opted for the assignment and again, Judy and two children gathered their things and moved to England. For Don, there was a dividend hidden in the assignment since the Institute also was active in aircraft accident investigation under the charge of RAF Group Captain Ken Mason who had published on the subject. Again, forensic pathology was an integral part of their program that Don took advantage of. After the two year duty was completed, Don and Judy, this time with three children, made the move to Colorado Springs, CO where Don was assigned to the USAF Academy Hospital as chief of Pathology Services. At the time, the Vietnam War was in its final days and Don surmised that a future in the military was limited. In 1973, he learned about a full time forensic position opening up in Seattle, WA and he decided to try full time forensic pathology. Again, Judy, Don, and four children made the move to Seattle, WA where they lived for 26 years.

The Medical Examiner method of death investigation in Seattle’s King County had recently replaced the Coroner’s office that had existed since statehood of 1889. This was a bold step since the other 38 counties kept the Coroner, but later 5 other counties made the transition to an ME system. When Don arrived in Seattle, the facility was decrepit: a toxicology lab was essentially non-existent and the residue of the coroner system existed everywhere. It was the Pathology Department at the University of Washington Medical School that sought change to include a new facility at the Harborview trauma center, faculty appointments for the professional staff, and incorporating forensic pathology into their residency program. Don and his colleague were initially overwhelmed by the volume of autopsies but this improved with time. With a new facility and the university base, a forensic pathology fellowship program was established and continues today. In 1975, Don became chief due to his insistence as a capable administrator to organize and develop the bureaucracy of a county government agency. To enhance his knowledge of running a government agency, Don pursued a master’s degree in Public Administration at Seattle University that was completed in 1978. Because of his interest and research instincts, he participated in a variety of research projects with colleagues in radiology, cardiology, and anesthesiology. Since Don was staff in the Dept. of Pathology at the University of Washington Medical School, these publications (80) were essential for academic promotion. When he and his colleagues were published in the New England Journal of Medicine, he knew that the ME program was on a good footing. Don retired as Professor Emeritus in Pathology from the University of Washington in 1999.

In the 70’s and 80’s, Don pursued interests that included NAME, AAFS, and was elected president of the Washington State Society of Pathologists. He became a member of the board of directors of NAME and was elected President of NAME in 1987. Other activities over the years have included membership in the CAP Forensic committee, ASCP Forensic committee, and the American Board of Pathology Test Committee in forensic pathology. He has been a member of editorial boards for various journals.

Among the many activities he wedged into his busy life, Don joined the USAR again in 1980 and was a member of the 50th General USAR Hospital in Seattle. In 1990, he became commander of the 8250th USAR Hospital in Tacoma, WA and was activated during the first Gulf War. Fortunately there were few casualties and the tour of duty ended after 4 months. Dr. Corrine Fligner supported Don during his absence and the ME function continued uninterrupted during this time. Don retired from the USAR in 1995 with the rank of colonel and the Legion of Merit commendation.

After retiring from forensic pathology and medical examiner work in 1999, Don and Judy left metropolitan Seattle for a quiet life on Whidbey Island, north of Seattle, to watch the eagles and whales cavort in Puget Sound.
ORAL PRESENTATIONS

1.1 Description of Death Scene Investigation and Autopsy Practices Among SUID Cases in Seven US States, 2010-2012

A.B. Lambert1; C. Shapiro-Mendoza1; S.E. Parks2; L. Camperlengo2; C. Cottengim2

1DB Consulting Group Inc., contractor at Centers for Disease Control and Prevention, New Orleans, Louisiana; 2Centers for Disease Control and Prevention, Atlanta, Georgia

Introduction/Background: Sudden Unexpected Infant Death (SUID) is an infant death with no known cause before investigation. Approximately 3,500 SUIDs occur yearly in the US, most frequently reported as Sudden Infant Death Syndrome, accidental suffocation or strangulation in bed, and unknown causes. A comprehensive death investigation including autopsy, death scene investigation (DSI), and review of the infant’s medical history are critical to determine cause of death because SUIDs are often unwitnessed events with autopsy negative findings. The extent to which SUID investigations vary across states has not been fully studied.

Methods: Our analysis included SUID cases with data entered into the National Center for the Review and Prevention of Child Death Case Reporting System (NCRPCD-CRS) Version 2.2S from the seven states participating in the SUID Case Registry from 2010-2012 (n=770). We examined variables relating to DSI, autopsy, and sleep environment available in the NCRPCD-CRS system. We calculated the proportion of each autopsy and DSI component that was complete, incomplete, and missing/unknown and the proportion of cases for which sleep environment data was available overall and by state.

Results: DSI was done for 98% of cases overall ranging by state from 95% to 100%. Among DSI components most frequently reported as done overall were the narrative description of the circumstances (90%, range: 85%-99%), witness interviews (88%, range: 85%-98%), and the Sudden Unexplained Infant Death Investigation Reporting Form or jurisdictional equivalent (71%, range: 24%-100%). Scene photos (68%, range: 20%-83%), scene recreation with or without a doll (45%, range: 20%-83%), and scene recreation with a doll (37%, range: 13%-58%) were least frequently reported. All cases had an autopsy performed. Among autopsy components reported as done, toxicology (97%, range: 94%-100%) and histology (98%, range: 94%-100%) were reported most frequently, and genetic testing (23%, range: 0%-68%), other pathology, exclusive of microbiology and histology (16%, range: 6%-92%), and blood chemistry (41%, range: 17%-100%) were reported least frequently.

Conclusions: Most SUID cases in participating SUID Case Registry states have a DSI and autopsy. Our study shows that information is being shared by medical examiners and coroner with child death review teams and that there is state variation in the DSI/autopsy components done for SUID cases. Consistent DSI and autopsy protocols and practices are needed within and across states. This study serves as a baseline and future studies using the SUID Case Registry data can monitor progress in improving standardized practices.

1.2 The Sudden Death in the Young (SDY) Case Registry: Improving Death Investigation on Young Sudden Death

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The Sudden Death in the Young (SDY) Case Registry is a collaborative effort between the Centers for Disease Control (CDC), the Michigan Public Health Institute (NPHI), the National Institutes of Health’s (NIH) National Heart, Lung, and Blood Institute (NHLBI), and National Institute of Neurological Disorders and Stroke (NINDS) and grantee teams in California, Delaware, Georgia, Minnesota, New Hampshire, New Jersey, Tennessee, Virginia and Wisconsin. The registry will provide a scientifically supported estimate of the incidence of sudden death from infants to young adults (up to age 20 years) by analyzing comprehensive data including autopsy, death scene investigation, patient’s medical history and family interview information on each case. Data on each case will be gathered through Child Death Review and an advanced SDY review and entered into a centralized database managed by MPHIL. DNA samples will be stored at the University of Michigan SDY Biorepository, and after consent, may be used for: research, diagnostic testing and/or DNA banking. The goals of the registry are to better understand the epidemiology, etiologies and risk factors for SDY each case and to identify prevention strategies.

Tools for the autopsy and field and family interview were developed by SDY Autopsy Protocol Task Force, which met twice in Atlanta in early 2014. Data collection began on January 1st, 2015 in the nine grantee states. Members of the SDY Autopsy Protocol developed comprehensive tools for the death investigation with focus on the heart and brain on autopsy. Circumstances surrounding the death including activity at time of death, potential triggers, medications and family history are also captured during the death investigation. The Task Force will continually review the SDY tools, discuss state by state implementation, and work to improve SDY Death investigations, data collection methods and collaborations.

1.3 A Look at Cardiac Pathology and Obesity in Forensic Cases of Sudden Unexpected Death in Epilepsy

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Sudden, unexpected death in epilepsy (SUDEP) is a topic that permeates multiple fields of medicine as doctors seek physiologic explanations for why these patients die and what steps could be taken to prevent their deaths. Many patients with epilepsy or seizure disorders of unknown etiology die at a young age without clear evidence of seizure activity. Previous studies in the forensic literature have examined possible mechanisms of death in SUDEP, including population demographics, toxicology results, and neuropathic findings. Many consider the mechanism of death to be from cardiac arrhythmias arising from either structural heart disease or anti-seizure medications. This study focuses on the anatomic and toxicology findings in the deaths of young adults whose cause of death was in part attributable to a seizure disorder.

A search of the database of the Cook County Medical Examiner’s Office in Chicago from 2011-2013 revealed 40 individuals between the ages of 18
and 40 with either the primary or secondary cause of death due to a seizure disorder, epilepsy, or SUDEP. These cases were reviewed for demographic, autopsy (including injuries and gross organ pathology), histological, and toxicological data.

An autopsy was performed in 38 cases. The average age was 28 years (range of 19–36 years) with 25 males (63%) and 15 females (37%). Caucasians accounted for 24 cases (60%) and African-Americans for 16 cases (40%). Only 6 cases (15%) showed evidence of seizure activity (bite marks on the tongue). Out of the 21 cases with known anticonvulsant therapy histories, 5 were taking valproic acid (24%) and 6 were taking levetiracetam (29%). Polytherapy was noted in 12 cases (57%). Obesity (BMI > 30 kg/m²) was observed in 18 cases (45%) with an additional 13 cases (32%) being overweight (BMI between 25 and 30 kg/m²). With regard to cardiac pathology, 21 (55%) had pathological findings in the heart, including cardiomegaly (16 cases), left ventricular hypertrophy (11 cases), and dilated chambers (7 cases). There were no instances of advanced or critical coronary atherosclerosis. Pulmonary edema was seen in 35 (92%) of the autopsied cases while cerebral edema was only seen in 8 cases (21%). Of the 16 cases with cardiomegaly, 10 (63%) were on some kind of anticonvulsant therapy.

In conclusion, obesity and cardiac pathology were seen in the majority of these young adults with SUDEP. There are too few cases to make any conclusions regarding anticonvulsant medications and SUDEP.

### 1.4 Implications of Death Certification on SUDEP Research

**D.S. Atherton**, O. Devinsky, D.C. Hesdorffer, C. Wright, G.S. Davis


**Introduction:** Sudden unexpected death in epilepsy (SUDEP) is the leading cause of epilepsy-related death. Due to the sudden nature of these deaths, many are investigated by medical examiners. On death certificates, epilepsy is variably noted and SUDEP is rarely noted. Death certification of seizure-related deaths varies extensively, which hampers study of SUDEP. Nashef, et al, proposed a scheme categorizing death into Definite SUDEP, Definite SUDEP Plus, Probable SUDEP, Possible SUDEP, Near-SUDEP, and Not SUDEP. This retrospective study analyzed certification of seizure-related deaths using this proposed classification scheme.

**Methods:** Investigative reports from 2011-2015 from Jefferson County Coroner / Medical Examiner’s Office were searched for the terms “seizure(s)” and “epilepsy.” Cases with a history of epilepsy, seizure disorder, or multiple seizures without an indicated etiology were included. Investigative reports, autopsy findings, and toxicological findings were reviewed to categorize deaths according to Nashef’s scheme. Features of death certification within each category were analyzed.

**Results:** A total of 61 cases were included. Fifteen cases were classified as Definite SUDEP or Definite SUDEP Plus; in only 1 was SUDEP used on the death certificate. Variations of terms related to “seizure” and “epilepsy” were used in almost all the other 14 cases. Thirteen cases were classified as Probable SUDEP or Possible SUDEP; in only 1 of these was a seizure-related term mentioned on the death certificate. Death was attributed to various forms of cardiovascular disease in almost all the other 12 cases. Thirty-three cases were classified as Not SUDEP, with drugs implicated in most.

**Discussion:** This study applies Nashef’s classification scheme to medical examiner cases. The finding that the majority of cases of Definite SUDEP or Definite SUDEP Plus were certified as some variation of “seizure” or “epilepsy” and not “SUDEP” has important implications for SUDEP research. Most cases of Probable SUDEP or Possible SUDEP would be difficult for epidemiologists to identify because concomitant conditions like cardiovascular diseases are more frequently listed on death certificates. Given the 25-fold increased incidence of sudden death among young adult epilepsy patients, the majority of whom do not have risk factors for cardiovascular disease, medical examiners should consider SUDEP in addition to other causes of sudden death. This study demonstrates some of the challenges researchers face in studying SUDEP using death certificates and emphasizes the need for collaboration among medical examiners, clinicians, and epidemiologists toward a more useful certification scheme for studying the incidence of SUDEP in the population.

### 1.5 Non-abusive Bilateral Retinal Hemorrhages Extending to the Ora Serrata in an Infant with a Ventriculo-Peritoneal Shunt for Post-Hemorrhagic Hydrocephalus

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Retinal hemorrhages (RHs), considered by many physicians as a key diagnostic finding in abusive head trauma (AHT), have been reported in about 85% of fatal AHT cases. Published reports have indicated that the number, type, and location of RHs are significant for differentiating RHs observed in AHT as compared to RHs occurring in accidental head injuries or natural diseases and some authors claim that bilateral multiple RHs extending to the ora serrata have particular diagnostic specificity for AHT.

We report a case of a 3-month-old female infant who was born at 26-weeks estimated gestational age by Cesarean section for premature rupture of membranes. Complications of prematurity included bilateral grade III germinal matrix hemorrhages and ventriculo-peritoneal shunt placement for post-hemorrhagic hydrocephalus, apnea of prematurity and retinopathy of prematurity (stage 2, zone 2, no plus). She was discharged from the Neonatal Intensive Care unit at 3 ½ months of age and was advancing developmentally and gaining weight.

She was co-sleeping with family members on an air-mattress when her mother awoke to find her unresponsive. Cardiopulmonary resuscitation was initiated by first responders and continued in the emergency department for 13 minutes before she was pronounced dead. At autopsy no injuries were present and an osseous survey revealed a ventriculo-peritoneal shunt but no fractures. Monocular indirect ophthalmoscopy revealed bilateral innumerable RHs over the posterior poles. The RHs focally abutted the ora serrata, circumferentially. Her skull was dolichocephalic and no subscalpular contusions or skull fractures were present. The unfixed brain weighed 383 grams. The dura mater had thin subdural membranes bilaterally and a small epidural membrane on the right, surrounding the shunt site. The ventricular system was moderately dilated. Microscopically, the right dura mater, near the shunt site, had a thin subdural membrane with hemosiderin deposits and a thin membrane on the outer surface of the dura. The left dura mater had a thin subdural membrane with hemosiderin deposits. The ventricles contained hemosiderin deposits in the germinal matrix, consistent with remote germinal matrix hemorrhage. No abnormalities were present in the brainstem or cerebellum and the cervico-medullary junction had no axonal injury.

Forensic pathologists must be aware that RHs can occur in infants who die suddenly and unexpectedly without evidence of head trauma. It is important for forensic pathologists to perform postmortem ocular examinations on all infants dying suddenly and unexpectedly to identify conditions associated with RHs and not equate RHs solely with AHT.
1.6 The Explosive Effects of Lightning: What are the Risks?

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Whereas the explosive effects of lightning have been known to exist for some time, the precise risks associated with it have been generally unknown.

This curious injury phenomenon has existed historically under many different names in the literature: ‘lightning’s pressure blast wave’, ‘Arc blast’, ‘shattering effects of lightning’, ‘pressures developed by arcs’, ‘thunder generation of shock waves’ and ‘the sixth mechanism of lightning injury’ are but a few of the many divergent and disparate terminologies used in the past to describe this invisible blast phenomenon.

Blunt force trauma injuries and barotrauma-like injuries are often identified used in the past to describe this invisible blast phenomenon. Overpressures and distances involved with regards to lightning’s explosive effects.

This paper takes an in-depth look at the explosive effects of lightning and the main blast-related pathologies seen on lightning-strike victims. Knowledge and insight into this phenomenon may help forensic pathologists and those working in the fields of lightning injury and lightning protection.

The bomb-blast medical data and the lightning data were aligned. The tympanic membrane rupture literature-, the chest and lung barotrauma literature- and the blast-related disfigurement literature were reviewed.

By looking exclusively at the pathology of barotrauma on the human body, forensic pathologists may now get a relatively good idea as to the possible overpressures and distances involved with regards to lightning’s explosive effects.

2.1 Medical Therapy-related Deaths and the Medical Examiner

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Introduction: Deaths attributable to medical adverse events are critical incidents with great significance to the medical community. However, there is controversy regarding how prevalent these events actually are. One factor contributing to the difficulty in assessing the prevalence and characteristics of therapy-related deaths is the lack of a consistent definition of which cases should be classified as medical therapy-related. Furthermore, there is variability in the death certification of these cases due to the paucity of guidelines for their cause and manner determinations.

Purpose: The aims of this study were to (1) identify potential medical therapy-related cases in a large medical examiner jurisdiction and (2) determine the consensus rate among the practicing forensic pathologists in this jurisdiction regarding (a) cause and manner of death certification for each case, (b) hypothetical utility of the "therapeutic complication" manner for each case, and (c) identification of a case as being attributable to medical therapy.

Methods: Potential medical therapy-related deaths were identified from our office’s difficult case conference log over a 12-year period (2002-2013), with 113 cases selected for inclusion. One-page summaries including the pertinent demographics, circumstances surrounding death, autopsy findings, histologic findings, and results of ancillary testing were created for each case. Forensic pathologists in our jurisdiction were solicited to provide cause of death, manner of death, manner of death if "therapeutic complication" were available, and if a case was attributable (in whole or part) to medical therapy for each case. Results were analyzed for consensus rate between pathologists and cases were categorized by complication type.

Results: The largest majority of cases fell into the medication category (44/39.0%), followed by operative (38/33.6%), cases determined not attributable to medical therapy (31/27.4%), and nonoperative (19/16.8%). The consensus rate for original manner classification for all cases was 82%, with kappa values ranging from 0.37 to 0.53. The addition of therapeutic complication as an available manner improved the consensus rate in 4 cases and decreased the consensus rate in 37 cases. There were 73 cases that at least one pathologist attributed to medical therapy, and 19 of these cases were attributed to medical therapy by all pathologists.

Conclusions: There is poor consensus in manner classification of medical therapy-related deaths, and disagreement about which cases should be designated as attributable to medical therapy. As such, guidelines are proposed for the classification of deaths thought attributable to medical therapy.

2.2 A Forensic Pathologist’s Experience with Therapeutic Complications in Medical Examiner and Coroner Jurisdictions: A Proposal for Guidelines

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The evaluation of deaths associated with diagnostic and therapeutic procedures is among the most challenging of analyses that the forensic pathologist encounters. Unfortunately, the workup of these deaths is variable and inconsistent among different jurisdictions. While some offices readily accept such cases, others tend to discourage their entry into the medicolegal death investigation system. Such divergence in approaches is attributable at least in part to the range in complexity and technical knowledge required by the procedures, which may exceed the expertise of the individual pathologist or death investigator. Additionally, because many of these deaths reside in the perilous “no-man’s land” between hospital and forensic death investigation, some pathologists believe that they should be confined to the domain of the hospital autopsy. Gill et al (J Forensic Sci, 2006), defined therapeutic complication (TC) as a manner of death due to “predictable complications of appropriate medical therapy”. But what criteria define “predictable” and “appropriate”? In fact, a forensic pathologist may lack the knowledge base and/or experience to make such a determination; therefore requiring the implementation of reproducible guidelines. Within 3 different ME jurisdictions (2 county, one statewide) and one Coroner system over an approximately 20-year period (from 1993-2015) the author describes experience with over 150 periprocedural deaths. Within the ME systems, the limiting factors were the timely reporting of the death and awareness of the need to report such deaths. In the Coroner system, however, the philosophy of the medicolegal official contributed largely to the extent of the investigation. The author proposes the following algorithm: 1) does the risk of death from the procedure outweigh the immediate fatal potential of the disease process, a question analogous to the “but for” test proposed by Gill ("but for the procedure or treatment, would the patient have died at that time"); 2a) if NO, the manner of death is natural; 2b) if YES, assessing the predictability of the complication and the appropriateness of the procedure becomes the critical task. One suggested approach is to consult with an expert specializing in that procedure and to coordinating the investigation of such deaths through an active hospital risk management service with the clinical team and the autopsy pathology service. Such an approach could potentially relieve ME and Coroners’ Offices of their investigative burden in these deaths.
2.3 Leveraging Death Certificates for Disaster-related Mortality Surveillance

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Background: Death certificates play an important role in understanding the mortality from disasters. Death certificates are used by families for a variety of legal, administrative, and personal needs and promote resiliency after disasters; by public health officials to provide critical actionable information during and after a disaster; and by other partners as they offer verified and accurate state and national disaster mortality statistics. This presentation will (1) highlight the variations in the understanding of mortality from disasters. Death certificates are used by families for a variety of legal, administrative, and personal needs and promote resiliency after disasters; by public health officials to provide critical actionable information during and after a disaster; and by other partners as they offer verified and accurate state and national disaster mortality statistics. This presentation will (1) highlight the variations in the understanding of mortality from disasters.

Methods: Death certificates from a variety of disasters were reviewed to determine the information that could be gleaned from these certificates. Literature and state experiences in natural disasters were gathered to compare the number of deaths reported by various response agencies in order to assess the effectiveness of state-based mortality surveillance systems after recent natural disasters. The group met via a bi-weekly conference call and at a two-day summit, and prepared guidance for certifying disaster related deaths. Feedback on the draft document was solicited from experts, including medical examiner and coroner associations, nosologists, epidemiologists and vital registrars.

Results: Seventy-four Hurricane Ike deaths were captured in Texas’ active surveillance system whereas only four (5.4%) were retrospectively identified in their EDRS using key word search. Red Cross and National Weather Service reported 38 and 20 Ike deaths, respectfully. NYC rapidly reported 44 deaths associated with Sandy using their EDRS; Red Cross captured 93.2% of these deaths and among the 41 cases present in both systems, high agreement existed across variables.

Conclusion: The number of disaster-related deaths reported vary by agencies within states and the federal government. Enhanced EDRS may aid in gathering rapid and accurate preliminary death counts for immediate public health action. A working group, comprised of local, state, and federal agencies, was established to develop a framework for adapting EDRS for disasters; priorities for the group were to prepare guidance documents for EDRS developers and death certifiers.

2.4 Epidemiology, Contributing Factors, and Injuries in 28 Electrocution Fatalities in King County, Washington.

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Electrocution fatalities are an uncommon cause of death encountered by the medical examiner. Less than 500 individuals die annually in the US. Nevertheless, electrical injuries are a major concern for occupational safety as electrocution represents the third leading cause of death for US workers. Investigation of deaths suspected of being due to electrocution requires a careful scene investigation, close inspection of the body for electrical injuries, and an awareness of electrical currents and how they cause injury. For the purpose of advancing the understanding of the epidemiology, contributing factors, and injuries involved in electrocution deaths, a study was conducted on electrocution fatalities from the records of the King County Medical Examiner’s Office in Seattle, Washington. Over a 20 year period from 1994 through 2014, a total of 28 electrocution fatalities were identified. Ages ranged from 15 to 75 years and averaged 40 years. There were 4 females and 24 males. Eighteen died at the scene and 10 died in hospital or emergency department. Thirteen deaths were due to high voltage, 13 due to low voltage, and 2 due to lightning. Occupational workers accounted for 19 fatalities, 6 of which were electricians. The most common occupational exposure was to high voltage lines and a double fatality in a hot tub. Injuries documented included none in three cases, relatively minor electrical burns, arcing burns, internal organ burns, and extensive charring. Additional blunt force injuries were present in 2 cases. The pattern and extent of electrical injuries correlated with the source voltage and type of contact. Extensive burns and charring were typical of high voltage electrocutions. The results of the study confirmed that a complete understanding of electrocution fatalities requires comprehensive investigation and knowledge of electrical current. Furthermore, electrocution injuries may be subtle to nonexistent, making a high degree of suspicion and a competent scene investigation critical in all cases in which there is potential exposure to electrical current. Finally, awareness of the epidemiology and contributing factors in electrocution fatalities can translate into education and prevention measures important for public health and safety.

2.5 Infant Death Certification at Cook County

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Infant death certification is complicated, made worse by the use of multiple acronyms that attempt to define an unknown cause of death and yet give the family closure. Since its introduction, Sudden Infant Death Syndrome (SIDS) has had many revised definitions in order to refine the circumstances in which it should be employed. This has lead to great advances in scene investigation, discovering cases that would have been classified as SIDS, that now are classified as Asphyxia. This has also led to the realization that SIDS is an improper term, as an unknown cause of death cannot be said to have a syndrome associated with it and should not be classified as a natural manner. Thus, the terms Sudden Unexplained Death in Infancy (SUDI) and Sudden Unexplained Infant Death (SUID) were introduced to remedy this. Unfortunately, these terms are confusing, as some take the U to mean Unexpected and others Unexplained, and the manner of death has been classified as either Natural or Undetermined. If we as forensic pathologists cannot come together on this issue and come up with a standardized way of certifying these cases, how can we expect our clinical colleagues and families of infants to understand what we mean when we cannot find a cause of the infant’s death? The Office of the Medical Examiner of Cook County underwent a significant transition in 2012 with the hiring of a new Chief Medical Examiner. In doing so, the new office policy was to eliminate entirely the terms SIDS, SUID, and SUDI and instead classify infant deaths with negative scenes, autopsy, histology, and toxicology studies as Undetermined, with Undetermined manner of death also. In cases where scene investigation elucidates cosleeping, or an unsafe sleep environment, certification as Asphyxia due to overlay, with manner being Accident, would be appropriate. We will present cases for review and reclassification in order to show the utility of the approach.

2.6 Fatal and Nonfatal 25I-NBOMe Intoxications

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25I-NBOMe, 25C-NBOMe and 25B-NBOMe are synthetic designer substances which share a core phenethylamine structure and are potent
serotonin 5-HT2A receptor agonists. Collectively known as “2C” compounds, the phenyl of the phenethylamine core is substituted with methoxy (–OCH₃) groups at the 2- and 5-positions, thus indicating that a 2 carbon group is situated between the phenyl and the amine. These drugs contain different lipophilic substituents (I, Cl, Br) at the 4-position on the phenethylamine ring. Recently, poison control centers and hospital emergency departments have reported cases of serious intoxications of individuals with NBOMEs. Toxic effects involve the central nervous system and include seizures, hyperthermia, tachycardia and cardiac and respiratory arrests. Over the course of 2 weeks, six intoxications from 2 separate incidents with 2 deaths were investigated at the University of North Dakota Medical Examiner’s Facility. The first involved five intoxications. Subject 1 was found dead at the scene, having collapsed and died suddenly on a sidewalk near where the drugs were ingested. Subject 2 was found was found in a nearby park and was extremely agitated and combative. Laboratory findings showed mild rhabdomyolysis and metabolic acidosis. Subject was sedated, intubated and paralyzed. Supportive care was provided with complete recovery. Subjects 3, 4 and 5 were observed and released from the Emergency department with no obvious adverse effects. In the second incident, Subject 6 was found ill at home, complaining of having ingested “bad mushrooms”. He later was found in respiratory arrest. Subject was transported to local hospital where he died of anoxic encephalopathy three days later. Initial laboratory results remarkable only for severe metabolic acidosis. Initial drug screen performed on all subjects at the hospital were negative. Based on investigative information, testing for OBME was performed. Analysis was performed by Liquid Chromatography with Tandem Mass Spectrometry. 25I-NBOME was detected in the fatal ingestions with concentrations ranging from 2.4 ng/mL to 5.7 ng/mL. 25C-C-NBOMe was also detected. Metabolites of each drug were also detected. In the surviving subjects, 25I-NBOME was detected in 3 or the four subject’s hospital admission blood specimens and metabolite detected in all four subjects. 2C-C-NBOME and metabolite were detected in all 4 of the surviving subjects.

2.7 Unintentional Asphyxial Deaths by Unusual Sequences of Events: Report of Four Cases

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Asphyxial deaths, especially hangings, are commonly seen by medical examiners. Intended asphyxial deaths (suicidal hangings and asphyxiation by plastic bag) frequently present with a clear cause and manner of death, while unintentional asphyxial deaths are less common and require careful study to determine cause and manner. This presentation will review four cases in which unintentional asphyxia occurred as the end result of chains of unforeseen events as a result of decedent actions. The cases involved a 44-year-old woman found under her own vehicle dead from mechanical asphyxia, a 25-year-old woman found dead from mechanical asphyxia beside her pet python’s cage with the snake loose in the apartment, a 54-year-old man found dead in a house fire from arson with no elevation of postmortem carboxyhemoglobin, and a 51-year-old man who drowned with an arrow wound to his abdomen. In each of these cases, complete police investigation, and death scene evaluation in concert with autopsy findings, were required to determine the manner of death. Review of this case series will assist the medical examiner and death investigator with unforeseen events as a result of decedent actions. The cases involved drug overdose, cocaine intoxication, animal attack, and accidental drowning. In all four cases, postmortem carboxyhemoglobin, and a 51-year-old man who drowned with an arrow wound to his abdomen. In each of these cases, complete police investigation, and death scene evaluation in concert with autopsy findings, were required to determine the manner of death. Review of this case series will assist the medical examiner and death investigator with unforeseen events as a result of decedent actions. The cases involved drug overdose, cocaine intoxication, animal attack, and accidental drowning. In all four cases, supportive care was provided with complete recovery. Subjects 3, 4 and 5 were observed and released from the Emergency department with no obvious adverse effects. In the second incident, Subject 6 was found ill at home, complaining of having ingested “bad mushrooms”. He later was found in respiratory arrest. Subject was transported to local hospital where he died of anoxic encephalopathy three days later. Initial laboratory results remarkable only for severe metabolic acidosis. Initial drug screen performed on all subjects at the hospital were negative. Based on investigative information, testing for OBME was performed. Analysis was performed by Liquid Chromatography with Tandem Mass Spectrometry. 25I-NBOME was detected in the fatal ingestions with concentrations ranging from 2.4 ng/mL to 5.7 ng/mL. 25C-C-NBOMe was also detected. Metabolites of each drug were also detected. In the surviving subjects, 25I-NBOME was detected in 3 or the four subject’s hospital admission blood specimens and metabolite detected in all four subjects. 2C-C-NBOME and metabolite were detected in all 4 of the surviving subjects.

3.1 Overview of Investigation of Deaths Temporally Related to Law Enforcement Apprehension

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Death temporally related to law enforcement apprehension is a rare event in the United States. The incidence is circa 6.5/100,000 arrests or 1/1269 uses of force (0.002%). The medicolegal investigation of such a death often comes under intense public scrutiny, is often surrounded by unfounded speculation and its conclusions may be received with mistrust and, in some cases, disbelief. Although there are a wide variety of conditions that can lead to death around the time of apprehension and/or arrest, there are certain circumstances that tend to engender more scrutiny, speculation and skepticism. This presentation offers an overview of the investigation of deaths temporally associated with law enforcement apprehension. Focus will be drawn to common conditions that rarely lead to death, conditions that cause death but lack morphologic markers, deaths due to conditions with uncertain mechanisms or relationships with physical and/or emotional stress and entities that are of ongoing controversy in the evaluation of use of force during apprehension.

3.2 Drug-induced Excited Delirium Syndrome: Pathogenesis and Pathophysiology

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Excited delirium syndrome (ExDS) is a serious medical condition associated with acute onset of agitated violent behavior that is often fatal. While the contribution of restraint, struggle and the use of conductive energy devices (CED) to the cause and manner of death are debated, we have suggested that a CNS dysfunction of dopamine signaling may underlie the drug-induced delirium and autonomic crisis. We will report here on an updated case series and mortality review of excited delirium deaths (N = 101). Each investigation includes a description of the scene and circumstances surrounding the death, review of emergency department records, autopsy findings and blood and brain toxicology. The average age was 34.4 ± 6.1 in men and 32.4 ± 6.3 in women. Mean core body temperature where recorded was 103.7°F (N = 61; range 99.2 – 108°F). Although the complete pathogenesis and pathophysiologic mechanisms in substance intoxication delirium are unknown, ExDS is a brain dysfunction caused by abnormal signaling in multiple neurotransmitters, including dopamine and acetylcholine, that contribute to the final common symptoms. We designed a biomarker panel to examine a 6-gene expression profile of dopamine synaptic markers (DAT, TH, VMAT2), heat shock protein 70 (HSPA1B) and acetylcholinesterase (AChE). We also measured dopamine transporter (DAT) binding sites and HSPA1B in ExDS cases compared to cocaine intoxication deaths (N = 109) and age-matched controls that died from sudden cardiac deaths or motor vehicle accidents (N = 107). These results extended our original findings of reduced striatal DAT levels and elevated heat shock protein 70 (biomarker of hyperthermia) in ExDS (Mash et al., Forensic Sci Int. 10;190(1-3):e13-9, 2009). Since the DAT clears DA from the synapse, lower DAT expression leads to dopamine excess. In the substantia nigra, DAT and VMAT2 gene expression was decreased, while MAOA was elevated (1.7 fold, p<0.01), consistent with increased synaptic DA and monoamine metabolites. AChE expression in the substantia nigra was markedly reduced (2-fold; p<0.01) in ExDS. Lower AChE expression in DA neurons may be a compensatory response to acetylcholine deficiency. Although stress, cortisol and psychostimulant abuse are among the precipitating causes of the delirious state, our results suggest that dopamine excess and acetylcholine deficiency are critical CNS disturbances in the final common pathway to this disorder. (Funded by PHS grant from the National Institute on Drug Abuse; DA022727).

3.3 Suicidal Suffocation With Inert Gases

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Suicidal suffocation using inert gases as described in “Final Exit” is an increasingly common mechanism of death. We reviewed 114 cases of...
inert gas suicide in the years 2001 to 2014 in Los Angeles County. There was a large increase in this type of death starting in 2010. The majority of the decedents (112 cases, 78%) did not have any history of serious illness. “Final Exit” or other suicide literature was present at the scene in 21 cases (18%). Helium gas was used in 54 cases (82%), nitrogen in 17 cases (15%), propane in 2 cases, and argon and “calibration mixture” in one case each. Comparison of decedents with and without history of serious illness showed that those with serious illness were older (mean ages of 59 and 43, p<0.01) but that there was no significant difference in gender. In several cases a husband and wife committed suicide together based on the serious illness of one but not both. One case appeared to be a “copycat” suicide one month after an almost identical suicide at the same location.

It is likely that the number of inert gas suicides is underestimated, as “Final Exit” advises the decedent with a serious illness to have another person remove the suicide apparatus after death. Thus, many such cases may not be reported to the medical examiner. However, the number of such suicides that are reported to the medical examiner has increased in recent years. In many cases those who commit suicide using inert gas are relatively young and do not have a history of serious illness.

3.4 The Science of Positional (or Restraint Associated) Asphyxia.
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When an individual is restrained either by caretakers, police, first responder, or others and dies without an obvious anatomic COD, positional asphyxia (or as it is sometimes called “restraint asphyxia”, or compressional asphyxia) may be listed as the COD with the manner of death being “homicide.” In part the concept of positional asphyxiation (or asphyxiation by the application of modest amounts of weight to the victim) is based upon the homicides committed by Burke and Hare in the early 1800’s, resulting the term “Burking.” In actuality, Burke’s confession indicates otherwise and victims were really murdered by simple suffocation while restrained by body weight rather than by some form of compressional asphyxia. Yet the experimental literature to support such a diagnosis is extremely sparse and indeed the one experimental paper in the forensic literature that first suggested asphyxia as a COD in such cases (Reay, Am J. For Sci Path: 9, 16-18, 1988) was based upon an erroneous understanding of the physiology associated with physical exertion. Since that time, over a dozen experimental papers have been published, which all indicate position alone, with or without maximal restraint of the appendages as well as applied weight (up to 225 pounds) does not cause hypoxemia, does not cause carbon dioxide retention, and does not effect ventilation to a degree that any clinically important abnormality of oxygen delivery would be expected. This presentation will start with a review of the physiology of ventilation and gas exchange in general as well as asphyxiation caused by inadequate ventilation to serve as background to better appreciate the pattern and sequence of events culminating in the deaths associated with these cases. The physiologic and methodological errors present in the above-referenced paper will be reviewed, followed by a formal review and summary of all of the human-based experimental research that has been conducted in this field since. Data looking at pulmonary function testing, arterial blood gas results, and non-invasive measures of ventilation will be presented. This research summary will allow for better understanding of the difficulty in arriving at a diagnosis of positional (or “restraint asphyxia”, or compressional asphyxia) asphyxia and create a scientific basis for a better appreciation as to why this diagnosis in the vast majority of cases is questionable. Finally, data relating to the prevalence of cardiac disease in this group and the possible relationship to sudden cardiac deaths will be presented.

3.5 Suicide in Jail: A 10-Year Retrospective Study
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Suicide in prison, like all death in custody, may involve complicated investigation. Potential allegations of mistreatment and/or abuse may be raised and these possibilities need to be addressed. Apart from these investigative concerns, the occurrence of suicides in such a controlled environment raises additional questions about potential preventative measures.

Between 2004 and 2014, there were ten deaths of incarcerated individuals in Cuyahoga County (metropolitan Cleveland) Ohio. Most (80%) were white and all were male. Similar to previous reviews, the majority of decedents hanged themselves (90%) with one case of asphyxiation by airway obstruction with a foreign body. Psychiatric disorders were noted in 6 of 10 decedents while 7 of 10 had a history of substance abuse including alcoholism. Overall 9 of 10 had at least one of these disorders.

All suicide deaths occurred within one year of incarceration, which may reflect the absence of a long-term prison fatality in our county. It is noteworthy that 70% of death occurred within the first month of incarceration with 4 of 10 events occurring in less than a day including two deaths in less than 30 minutes. Positive toxicology for abused substances was noted in 75% (3) of the 4 individuals who died in less than a day and only in one other suicide, which occurred on the second day of incarceration.

Our data suggests that suicide in jail is predominantly a male phenomenon with early incarceration being a particularly vulnerable period. The presence of another inmate in the same cell as the decedent was not seen to have an independent deterrent effect. Intoxication particularly in individuals with a history of substance abuse and/or alcoholism should raise concern for potential self-harm in recently jailed individuals. Possible interventions suggested by this study might include closer direct surveillance in the early incarceration period, earlier access to mental health services as well as design modifications in holding cells with possible dedicated short-term holding areas where self-harm risks are minimized and surveillance can be optimized.

3.6 Spit Hood-related Fatalities: An Under-recognized Cause of Death in Custody
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Protective hoods are temporary devices used on restrained individuals that display spitting or biting behaviors, to protect those who must be in contact with or render care to the individual during transit or in a psychiatric hospital. Improper use of protective hoods may limit one’s ability to breathe and thereby cause or contribute to death. Because these hoods are not used as standard protocol, are removed during resuscitation attempts and subsequently discarded, death investigators are often not aware of their use. If the medicolegal death investigator is not aware of the potential use of the hood and does not inquire about the use, the potential contribution of a protective hood to a death may go unrecognized. This presentation aims to describe protective hoods, explain the proper and improper use of the protective hoods on individuals, and through the presentation of two cases of individuals in custody, demonstrate how improper use of a protective hood may contribute to death.
3.7 Conducted Electrical Weapons: Understanding the Basics

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Medical Examiners (ME) may be asked to rule on a cause of death involving a law enforcement encounter that included multiple force options, including a Conducted Electrical Weapon (CEW). While instruction on the pathology of many force options is standard in pathology education, there is a lack of education on the basic physiology of CEWs. In this presentation, the attendee will learn the basic physiology of the CEW using the TASER® X26 as the example.

The TASER X26 CEW is electrically different from the power systems encountered in standard electrocution deaths seen by MEs. There is often confusion in the ME community about the arcing voltage of the CEW, 50,000 V, in relationship to the lower voltage systems, such as the household 120 V. The CEW, powered by two 3 V Duracell® batteries, discharges pulsed electricity, versus the continuous currents delivered by residential and industrial power systems. The CEW discharges 100 µC of charge over 19 times per second leading to an average current (86% off duty cycle) of 1.9 mA. This creates very little energy and biopsy samples of subjects receiving 5-second exposures demonstrate that the electrical injury is limited to the epidermis. Animal studies have demonstrated that administration of a paralytic agent acting at the neuromuscular junction eliminates the muscle contraction, aside from minimal contraction directly at the probes. This demonstrates that the effect of the device is not from the mass action of current through the body, but due to the stimulation of motor nerves. Studies in a motivated human subject model have shown multiple variables related to the effect of the device to include most importantly the spread between the probes (volume of nerves stimulated) and the region of the probes (muscle groups affected). Other effects that have been identified include body mass index (obesity) and height.

Most studies on these devices utilize large probe spreads, causing widespread muscle contraction in subjects. The physiologic effects demonstrated in these studies may be overstated for smaller probe spreads where there is a smaller, more regional effect. It is important for MEs to have an understanding of the specific CEW exposure(s) in the case and apply their knowledge of basic CEW physiology when deciding the importance of the CEW in the case. In addition, the literature also includes comparative force option physiology that needs to be considered.

4.1 The Evolution of the Autopsy

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The history of autopsy dissection is often difficult to separate from the history of anatomic dissection. It is only in the Renaissance that the dissection techniques become definitely different. However, the methods employed by eminent physicians prior to the 19th century were seldom published in any significant detail. Today it is often claimed that the autopsy has remained relatively unchanged for centuries and only a few (erroneously named) methods are commonly known. We aim to do away with such misunderstandings and we will here demonstrate the remarkable evolution of the autopsy at the hands of its practitioners beginning in the 19th century and continued into the 21st. We opine that a solid understanding of the ongoing evolution of autopsy technique helps provide a firm argument for the continued utilization of the autopsy in daily practice and for the advancement of medicine.

4.2 Identifying Errors in Forensic Autopsy Reports Using a Novel Web-based Program

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Introduction: Autopsy reports are often complex, with ample opportunity for errors and inconsistencies. These reports are often scrutinized by both families and attorneys. Identification of errors by proofreading physicians or clerical staff can be improved by utilizing a computer program to examine reports for discrepancies.

Methods: Using HTML and JavaScript, a webpage to check age, race, and gender consistency was developed to proof reports. The program also identifies if organ descriptions are omitted from reports or if there is an inconsistency, such as ovaries in a male decedent. In deaths due to gunfire, the program checks for descriptions of the presence/absence of soot and stippling around gunshot wounds. Thirty completed reports were analyzed from the Jefferson County Coroner/Medical Examiner Office. Additionally, a separate individual, (JB) was instructed to sabotage reports and then determine if the software could detect the alterations.

Results: Of the 30 completed reports analyzed, zero errors/omissions were identified. Rarely, the computer would send a warning that an organ should be confirmed if the author used a description that differed from the software’s vocabulary (i.e. the author discussed “uterine wall” instead of “uterus”). The webpage detected 8 out of 10 errors supplied to the five sabotaged cases. These errors ranged from inconsistent age, race, and gender, to incomplete gunfire descriptions.

Conclusion: Identification of errors by a computer proofreading program can aid in identification of errors. The proofreading program can be used as a simple tool by clerical staff to identify errors and as a quality assurance tool by coroner or medical examiner offices. The webpage has been designed so that additional modules, such as strangulation proofreading, could easily be added. Furthermore, the ability of the software to detect errors will continue to improve as more words are added to its vocabulary. The webpage is freely available and can be adapted from the "GitHub" website. Users can “fork” the page, which creates a copy of the webpage with a new web address. Users can then modify the code of the copied site without jeopardizing the original webpage.

4.3 Tracking Drug Overdoses Using Google Fusion Tables

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Introduction: Drug abuse is a constantly evolving public health challenge. The discovery and analysis of trends related to drug abuse are important for interventionists, epidemiologists, and other researchers who study deaths related to drug abuse. Maps have long been used to elucidate geographic trends in medicine. For example, mapping of cholera cases led to discovery of a single water pump that was the source of the severe 1854 cholera outbreak in London. Herein, we present our method for plotting drug-death related data onto a Google map using Google's free Fusion Tables software as well as discuss its potential large-scale use.

Methods: Data was queried from the Jefferson County Coroner/Medical Examiner’s Office for deaths related to cocaine and heroin abuse occurring from 2012-2014. Queried data included demographic information (age, race, sex), as well as place of death and home address. The data was organized in Microsoft Excel for importation into the Fusion Tables software. Fusion Tables was then used to automatically plot each place of death onto a map. Filters were utilized in order to analyze potential trends.

Results: Using Fusion Tables, we established a dataset that could be automatically plotted onto Google Maps. Initial data showed Caucasian males most frequently overdosed on heroin while cocaine related deaths demonstrated a more even distribution between Caucasians and African Americans.
Americans. Comparing home address to location of death, the map demonstrated that the majority of individuals were not found dead at home, regardless of age, race, or sex. Furthermore, examination of data by year demonstrated that in 2012, 18-25 year olds and white male heroin overdoses clustered in west Birmingham (9/13 deaths) despite most home addresses being in north and central Birmingham (10/13 cases). Following 2012, the death location becomes sporadic with no definitive clusters.

**Conclusions:** Mapping data related to drug abuse is a useful tool in the discovery and analysis of different attributes of drug abuse. Fusion Tables provides users with significant flexibility with a means to manipulate and filter data to emphasize specific variables related to drug abuse. Furthermore, significant potential exists in the ability to share and manipulate and filter data to emphasize specific variables related to drug abuse. Therefore, significant potential exists in the ability to share and merge datasets with other users, as well as share customizable data manipulation functions. For example, if multiple institutions across the country merged datasets, it might be possible to observe large scale geographic trends in drug abuse unfolding via filters on demographics and time intervals.

### 4.4 Interpretation of Methadone Levels in a Deceased Breastfed Infant: Pharmacogenetic and Postmortem Considerations

**C.A. Kepron**

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Similar to other jurisdictions in North America, the province of Ontario is experiencing an increasing incidence of opioid dependency that has led to a corresponding increase in the numbers of individuals enrolled in methadone treatment programs. For pregnant women with opioid dependence, methadone maintenance treatment is the standard of care as it is associated with improved outcomes for both mother and infant when compared with untreated opioid misuse. We report a case in which elevated methadone concentrations were detected in a deceased neonate whose mother was enrolled in methadone maintenance program. A three week old male infant who was exclusively breast fed was found without vital signs in his bassinet approximately three hours after his last feeding. The resuscitation attempt was successful in restoring a pulse, but he was diagnosed with a hypoxic brain injury and pronounced dead in hospital approximately 9 hours after he was found. A complete autopsy showed no anatomic, biochemical or microbiological cause of death, and toxicologic analysis of a sample of postmortem heart blood was positive for methadone at a concentration of 79 μg/L. These concentrations were significantly higher than the minimum fatal reference value for methadone. As the maximum serum concentration reported in living breastfed infants whose mothers were receiving methadone (8.1 μg/L) which raised suspicion that the infant had been administered exogenous methadone.

Pharmacogenetic analysis was undertaken that revealed the infant was heterozygous for polymorphisms in the ABCB1 gene which encodes a p-glycoprotein that functions as an efflux transporter of the blood-brain barrier and homozygous for the CYP2B6*6 allele which may result in an impaired ability to metabolize methadone. These results provided a potential explanation for the higher than expected methadone levels in the infant's blood samples and indicated a possible genetic predisposition to methadone toxicity. As the minimal fatal reference value for methadone in infants is not known, a multidisciplinary approach to the death investigation in such cases is warranted. This should include clinical, developmental, toxicological, pathological, and pharmacogenetic considerations.

### 4.5 The “Value-added” Forensic Autopsy: Public Health, Other Uses, and Relevance to Forensic Pathology’s Future

**R. Hanzlick**

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This presentation centers on what might be termed the "value-added" forensic autopsy, one in which the autopsy goes beyond the basic tasks of determining (or even just documenting the obvious) cause, manner, and basic circumstances of death. It is important to recall that the word "forensic" is derived from the Latin "forensis" which means "forum," or "public," not "crime" or "science." Thus, the value-added forensic autopsy can be seen as one which is done with the public in mind, not focused only on needs of the criminal justice system. The value-added autopsy might be one in which a decision is made to perform an autopsy in case that might otherwise not have been autopsied, or, do a more extensive or "complete" autopsy than might otherwise have been performed, or, perhaps, do additional ancillary laboratory testing. The "value-added" concept is not offered in the financial context, but rather, the societal context.

Potential reasons for not performing value added autopsies include forensic pathologist (FP) manpower shortages, FP attitudes, death investigation system type and parent organization, work environment and payment arrangements, training, the meaning of "circumstances of death," the definition of "complete autopsy," and varying philosophies about tax dollar usage for medicolegal death investigation. The are numerous examples of how "value added" autopsies have served, and can serve the public health, public safety, criminal/civil law, medical, and research communities as well as family members and other users of forensic pathology and death investigation information. These will be discussed in this presentation. More study is needed to determine the place of value-added autopsies in the medicolegal death investigation setting.

The forensic pathology profession might be wise to consider whether it wants to remain considered as mainly a criminal justice player or in addition, take further advantage of its potential in public health, public safety, research, civil law proceedings, and other activities and disciplines which can benefit from forensic pathology information. Such contemplation and action could seal, or even secure the fate and future of forensic pathology practice.

### 4.6 Association of Antemortem Central Nervous System (CNS) Symptoms and Location of Aortic Dissections: A Retrospective Study from 2001-2014.

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Aortic dissections are a frequent cause of sudden death within the medical examiner’s office. Typically thoracic and abdominal aortic dissections are associated with chest and/or abdominal pain, followed by sudden death. However, several cases of aortic dissections with unusual presenting symptoms, such as paresthesia, headache and seizures were noted at the Office of the Pima County Medical Examiner, in Tucson, Arizona. Our aim was to identify various symptoms associated with aortic dissections and compare the location with CNS versus non-CNS symptoms. Retrospective data was collected from the archives at the Office of the Pima County Medical Examiner between January 2001 and December 2014. Original search criteria were broad to include all causes of natural death involving the aorta, with a yield of 185 cases. Those without a dissection or known antemortem symptoms were removed. The remaining 61 cases included 43 cases of aortic dissections with typical (non-CNS) symptoms and 18 cases with CNS symptoms. Data was collected to include: age, race, gender, symptoms, location of the dissection, involvement of carotid arteries, heart weight, left ventricle thickness, comorbidities including other heart diseases, body mass index, toxicology and histology. The cases were classified based on location according to the Debakey, Stanford and Crawford classification systems for aortic dissections. We found there were a greater proportion of Stanford grade A dissections (involving the ascending aorta) within the group with CNS symptoms (78%) than those without CNS symptoms (58%). In addition, 17% of cases with CNS symptoms had dissections involving the carotid arteries.
Hemopericardium was present in 67% of cases with CNS symptoms, versus 49% of cases without CNS symptoms. There were a higher percentage of females with CNS symptoms (44%), than without CNS symptoms (23%).

5.1 Making a Difference in an Epidemic of Fentanyl Deaths in Maryland: Geographic Information Systems (GIS) and Collaboration with the Drug Enforcement Administration

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Introduction: An ongoing epidemic of fentanyl overdose deaths started in Maryland in July 2013. Overdoses were commonly caused by heroin mixed with fentanyl, or fentanyl alone. One author (RA) will describe how a geographic information system (GIS) was used to determine the spatial and temporal distribution of these deaths. Discussion by a second author (CH) will show how collaboration with the United States Drug Enforcement Administration’s Baltimore Office (DEA) allowed better understanding of identified trends.

Methods: The records of the Office of the Chief Medical Examiner (OCME) for the state of Maryland were searched to identify illicit fentanyl related deaths. The incident location of each death was converted to latitude and longitude through a process called geocoding. ArcGIS was used to analyze and map the deaths. Spatial density ("heat") maps of fentanyl deaths were compared to cities with populations over 10,000. The distribution of deaths in Baltimore City was analyzed in greater detail.

Results: A total of 266 fentanyl related deaths were identified. The number of deaths per month showed a steady increase from July 2013 (2), to December 2013 (20), with a subsequent nadir in February 2014 (9). The number deaths then increased again till June 2014 (26), decreased precipitously in August 2014 (2), and rose steadily until the end of the study in February 2015 (28). Deaths began in Baltimore City and then spread throughout the state. The highest density of deaths was in Baltimore City. Greater death densities were also centered on other cities. A high density band of deaths extended from Baltimore City towards Annapolis. Deaths extended past cities and into the surrounding suburbs; this effect was most pronounced around Baltimore City. Deaths in Baltimore City appeared concentrated in certain neighborhoods. However, the activity moved between various neighborhoods over the course of the study.

Discussion: Review of the above data with the DEA allowed some of the above trends to be explained in terms of illicit drug transportation and distribution throughout Maryland. A summary of current trends in illicit fentanyl production, transportation and distribution will be given with particular emphasis on explaining trends in the fentanyl deaths described above. Also to be discussed will be how the DEA is using data from the OCME, as well as a data collection plan developed specifically for first responders to scenes of overdose incidents, to help implement a new strategy to combat illicit narcotic distribution and use in Maryland.

5.2 Curbing the Growing Drug Abuse Epidemic in Virginia

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Purpose: Similar to national trends, Virginia’s rate of drug abuse and death are steadily increasing. In 2013, fatal drug overdose was the number one cause of unnatural death in the state for the first time on record. This presentation will focus on the epidemiology of drug death in Virginia between 2004 and 2013, as well as the recent detail-specific actionable efforts and plans in Virginia between law enforcement, public health, behavioral health, licensing boards, criminal justice agencies, and others in attempt to tackle the growing epidemic in the state.

Methods: All overdose deaths occurring between 2004 and 2013 were extracted from the Virginia Medical Examiner Database System (VMEDS). Data were analyzed and compiled to include trends over time, region of death, demographic data on decedents, types of drugs used, and manner of death information. This fatality data will be presented in conjunction with other Virginia data on drug trafficking and abuse to paint a detailed picture of this public health epidemic in Virginia.

Results: The total number of fatal drug overdoses, regardless of manner, steadily increased in Virginia from 2004 to 2013 (498 and 912 deaths, respectively). In 2013, drug overdoses (n=912) were the number one cause of unnatural death, surpassing both motor vehicle fatalities (n=831) and firearm-related deaths (n=849) in the state for the first time on record.

Conclusion: Epidemiological analyses from multiple data sources have demonstrated a remarkable and significant increase in drug trafficking, usage, and death in Virginia over the past ten years. Continued multi-jurisdictional, multi-agency collaboration after establishment of a task force created by the Governor to reduce drug deaths will emphasize behavioral health treatment (mental health and substance abuse) for both users and their families, coordinated data sharing and exploration between data analysts across the state, and comprehensive training for health care providers about best practices of pain management for their patients. It will also involve establishment of drug fatality surveillance teams to collect and analyze key data elements in the lives of citizens who die due to drug overdose. There will be state-wide changes in how drug users are processed in law enforcement and managed in the criminal justice system. Drug seizure data, statewide medical facility’s chief complaint data, and medical examiner data will be analyzed frequently to measure the impact of collaborative drug intervention and prevention efforts on the overall trafficking, usage, and fatality rate of drug overdose in Virginia.

5.3 Heroin Toxicity where 6-Acetylmorphine (6-AM) is Not Detected by Toxicological Analyses

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Introduction: Heroin has a half-life of 2-6 minutes and is metabolized too quickly to be detected in autopsy samples. The presence of 6-acetylmorphine (6-AM) in postmortem samples is evidence of heroin use, but 6-AM itself has a half-life of 6-25 minutes before it is hydrolyzed to morphine, so 6-AM may not be present in sufficient concentration to detect. Codeine is present in heroin preparations as an impurity and is not a metabolite of heroin. Studies report that a ratio of morphine to codeine greater than 1 indicates heroin use. We hypothesize that the ratio of morphine to codeine in decedents abusing drugs intravenously will be no different in individuals with 6-AM present than in individuals where 6-AM is absent.

Methods: All accidental deaths investigated by the Jefferson County Coroner/Medical Examiner Office from 2010-2013 with morphine detected in samples collected at autopsy were reviewed. The presence/absence of 6-AM and the concentrations of morphine and codeine were recorded; and the M/C ratio was calculated. Presence of drug paraphernalia or evidence of intravascular (IV) drug use was documented to identify IV drug users. The proportion of IV drug users with and without 6-AM present in a postmortem sample were compared to the M/C ratio for the individuals.
5.4 Methamphetamine-positive Deaths in Hennepin County, Minnesota: A 15-Year Review of Cause of Death, Manner of Death, and Toxicological Findings

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Methamphetamine-positive fatalities are a small, but not insignificant, cohort of deaths seen by medical examiners. A search of fifteen years (2000-2014) of Hennepin County, Minnesota, autopsy records in which there was quantifiable blood methamphetamine yielded 148 cases (120 male, 28 female). Levels ranged from 0.04 to 37.06 mg/L, with an average and median of 1.44 and 0.46 mg/L, respectively. By race/ethnicity, 115 decedents were white, 17 Native American, 11 black, four Asian, and one Hispanic. Seventy-two cases were accidents with methamphetamine as the proximate cause: 23 due solely to methamphetamine (average 1.97 mg/L, range 0.26 to 6.26 mg/L), 38 mixed intoxications with alcohol and/or other drugs (average 0.63 mg/L, range 0.06 to 5.88 mg/L), and 11 aortic dissections or cerebrovascular events (average 0.47 mg/L, range 0.04 to 1.65 mg/L). Twenty-five accidents had methamphetamine as a contributing condition: 13 due to blunt injury from motor vehicle events (average 0.35 mg/L, range 0.06 to 0.85 mg/L), two due to hyperthermia/excited delirium, and 10 due to miscellaneous causes. Twenty deaths—none caused by methamphetamine—were suicides (average 2.05 mg/L, range 0.14 to 10.24 mg/L); ten gunshot/shotgun wounds, eight hangings, and one each carbon monoxide poisoning and self-immolation. Fifteen deaths were homicides (average 1.85 mg/L, range 0.11 to 7.6 mg/L), with 12 caused by firearms and three by sharp trauma. Of eight natural deaths in which methamphetamine was present in the blood, re-review suggested that three (all arteriosclerotic heart disease as the cause of death) might have been better classified as accidents. Five of eight natural deaths—one each diabetic ketoacidosis, pulmonary embolism, astrocystoma, asthma, and gastrointestinal hemorrhage complicating cirrhosis—had methamphetamine in the blood deemed neither causal nor contributory. Of the eight deaths certified as undetermined in manner, six were directly due to methamphetamine alone or in combination with other drugs, but the decedent’s intent (accident versus suicide) could not be discerned. This latter group included the highest recorded blood methamphetamine level in this series—37.06 mg/L—with no alcohol or other drugs present.

These data are consistent with previous studies showing considerable overlap in blood methamphetamine levels among deaths caused (in whole or in part) by methamphetamine and those (motor vehicle events, suicides, and homicides) in which methamphetamine was present but not the cause of death. As with nearly all potential drug-related deaths, blood levels in isolation mean little in the absence of a complete autopsy and thorough investigation.
emerged on the drug market. Three new synthetic cannabinoids have recently been placed under temporary Schedule I classification, including AB-CHMINACA (N-(1S)-1-(aminocarbonyl)-2-methylpropyl)-1-(cyclohexylmethyl)-1H-indazole-3-carboxamide). We present a case of a 54-year-old male who had a seizure-like episode, became unconscious, and died after reportedly smoking a synthetic cannabinoid laced with insect spray and acetone. Because of his known history of synthetic cannabinoid use, comprehensive testing for drugs of abuse and synthetic cannabinoids was ordered at the time of autopsy. Screening for drugs of abuse was negative, but the synthetic cannabinoid panel was positive for AB-CHMINACA. Contributory factors in this case include hypertensive and atherosclerotic cardiovascular disease. AB-CHMINACA was first encountered in the United States in February 2014 and, along with two similar compounds, was given temporary Schedule I classification by the DEA in January 2015. Clinical symptoms reported in cases of AB-CHMINACA intoxication include excited delirium, seizure, coma, agitation, myocardial infarction, difficulty breathing, and altered consciousness. On literature search, only four other reported deaths involving this compound have been identified. However, based on the specialized toxicological analysis required to detect these substances, an accurate account of the incidence is difficult to measure. Medical examiners should be made aware of this specialized testing and that novel compounds are continually emerging on the market following restriction of specifically identified synthetic cannabinoids. We will discuss the trends of synthetic cannabinoid use in relation to DEA restriction and an overview of testing methodologies.

5.7 Acetyl Fentanyl Deaths in Metro Detroit: The Rise of New Age Street Opiates
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Introduction: Acetyl Fentanyl is a Fentanyl synthetic analog discovered at the same time in 1980’s along with Fentanyl and structurally contains a phenylacetamide group whereas fentanyl has a phenylpropamide group at the corresponding position. March 2015 publication of Drug Enforcement Administration had 50 odd exhibits of acetyl fentanyl positive cases and 25 confirmed deaths. Pharmacologically, acetylfentanyl has been shown in animals to bind to mu-opioid receptors similarly to fentanyl although the potency of the acetylfentanyl appears to be lower in rat studies. We present a series of 10 fatal cases of related to acetyl fentanyl toxicity in the Detroit Metro during March and April of 2015. Material and Methods: A total of 10 cases with detectable acetyl fentanyl (minimal detection level of 0.10 ng/ml of blood) were observed within a period of less than 40 days. All cases had history of drug abuse and peripheral whole blood samples were submitted for comprehensive toxicological studies.

Results: The average concentration of acetyl fentanyl was 26.8 ng/ml in peripheral blood and ranged from 0.57 ng/ml to 37 ng/ml. Only one case had level of 0.57 ng/ml and 3 cases had levels above 30 ng/ml. Decedents were mostly male (8/10) in their middle age (range from 22 to 58 years). All cases were positive for multiple drugs (more than 2). Out of 10 cases, 9 cases were positive for fentanyl and 1 case with low acetyl fentanyl concentration was negative for fentanyl. Seven (7) out of 10 cases were positive for morphine and out of 7 cases, 3 cases were positive for 6-MAM. Various other drugs that were positive were cocaine (2), alprazolam (4), Trazodone (1), risperidone (1), clonazepam (1), olanzepam (1), amitriptyline (1), hydrocodone (1), amphetamine (1), phentermine (1), fluoxetine (1) and diazepam (3) signifying polystance abuse by drug addicts. One decedent had a history of passing snorting while snorting the alleged drugs, one within 30 minutes after use and the rest were discovered few hours/days on a well being check. 2 cases had syringes located near them on being found. Autopsy findings were significant for heavy lungs in all cases, as seen in other opiate related cases. Only 2 cases had co-morbidity of atherosclerosis (1) and liver cirrhosis (1).

Conclusion: The observed 10 cases are first cases of acetyl fentanyl related deaths observed in Detroit metro area and represent the national trends of emergence of a new designer street opiate.

5.8 A Case Report of Morphine Overdose with 6-Monoacetylmorphine Detected and Retrospective Review of 6-Monoacetylmorphine in Morphine-Positive Vermont Deaths
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The ability to distinguish between various opiates in post-mortem toxicology is crucial for accurately determining cause of death. The presence of 6-monoacetylmorphine (6-MAM) is often cited in literature as definitive evidence of heroin use. However, several mechanisms by which 6-MAM may be detected in individuals without heroin use have recently been described. These include the in vitro production of 6-MAM from morphine during liquid chromatography-mass spectrometry, the formation of 6-MAM in gastric contents containing both morphine and aspirin, and the hypothesized contamination of pharmaceutical morphine with 6-MAM.

We present a case of a woman on hospice care receiving morphine by pump, in whom post-mortem toxicology revealed a morphine level of 12,000 ng/mL, a codeine level of 20 ng/mL and a 6-MAM level of 2.5 ng/mL. With thorough investigation, there was no evidence of heroin use by the decedent or heroin administration by another. To better characterize the relationship of 6-MAM to morphine levels in morphine-positive deaths, postmortem toxicology results at the Vermont Office of the Chief Medical Examiner were reviewed, and the average levels of 6-MAM and morphine and the ratio of morphine to 6-MAM were calculated.

In the presented case, we conclude this was an instance of detectable 6-MAM in morphine toxicity, most likely the result of low-level contamination in the pharmaceutical morphine.

6.1 The Korea 208: Individual Identifications from a Large Commingled Skeletal Assemblage using Anthropology and DNA Testing
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For the 36,500 U.S. troops killed in the Korean War (1950-1953), approximately 7,900 are still missing and/or unidentified. In the early 1990s, North Korea repatriated 208 boxes of human remains to the United Nations Command claiming that each box represented a single unaccounted-for US service member from the Korean War. This assemblage was named “the Korea 208 (K208)” and was sent to the Central Identification Laboratory (CIL) for analysis and identification. Contrary to North Korea’s claim, it soon became obvious that most boxes contained the remains of more than one individual. At the time the CIL received the remains, there were few systematic anthropological methods to solve the commingling issue. After advancements in DNA recovery methods developed at the Armed Forces DNA Identification Laboratory (AFDIL) in the early 2000s and the significant increase in the number of Family Reference Samples (FRSs), mitochondrial DNA (mtDNA) results provided baseline data to segregate the commingled remains into subgroups with common mtDNA sequences. As of April 2015, 601 different mitochondrial sequences have been documented in the K208. Anthropological methods used for segregation are pair matching, articulation, taphonomy, and osteometric sorting. The next step is to determine the identity of the individual. The last-known-location and the reported recovery location are compared and considered to narrow the list of possible name associations. The biological profile and dental analysis
can further narrow the list of possibilities or make a unique identification. If clavicles are present and in suitable condition, and antemortem chest radiographs are present for the possible individuals, a chest radiograph comparison may be used to likewise narrow the list or confirm the identity of an individual. If all of the preceding analyses were not sufficient to uniquely identify an individual, additional nuclear DNA testing (Y-STR and/or autosomal STR) can be used to provide further evidence as it has a much higher discriminatory power than mtDNA. In particular, Y-STR testing can be extremely useful for making an individual identification from a group of remains with a common mtDNA sequence. To date, 133 individual identifications have been made from the K208 assemblage using the technique outlined above, bringing closure to some families of the missing and giving a name to those who gave their lives willingly in “The Forgotten War.” This method could also be used by any medical examiner who is confronted by a commingled skeletal assemblage in a mass grave or similar event.

6.2 The Utility Of Postmortem Computed Tomography in Supplanting Autopsies in Determining Cause of Death in Pediatric Trauma Fatalities

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Many studies support postmortem computed tomography (PMCT) as an autopsy adjunct, however, few studies have investigated the use of PMCT in supplanting autopsy. We investigated the ability of PMCT to supplant autopsy in assigning cause of death (COD) in pediatric trauma fatalities, and whether or not there were differences in COD determinations when PMCT results were interpreted by a radiologist or a forensic pathologist.

A prospective cohort was created including all potential pediatric trauma deaths under the age of five investigated by the New Mexico Office of the Medical Investigator between 2011 and 2013 (n=61). Each decedent’s death circumstances, scene photographs and PMCT were reviewed by a radiologist who created a PMCT synoptic report and assigned a COD. The PMCT reports, and the previously described materials, were reviewed by a study forensic pathologist to also assign COD. Radiologist and pathologist COD statements were then compared against the cause of death in the original autopsy report which was determined by a different forensic pathologist blinded to the CT findings.

The cohort consisted of 38 (62.3%) males and 23 females (37.7%), ages ranging from one day to five years (median 1 year). In 52 (85.2%) of the cases, the reviewing pathologist’s COD matched that of the original autopsy pathologist, whereas 50 (82%) cases matched for the reviewing radiologists. There was no significant difference (p=0.62) between the percentage of cases where reviewing pathologists agreed with the original pathologist and the percentage where the radiologist agreed with the original pathologist. In five cases (8.2%) neither the reviewing pathologist nor the radiologist agreed with the original pathologist. Co-sleeping/suffocation deaths were the most common types of deaths where there were discrepancies with the original autopsy COD.

Overall, PMCT can supplant autopsy in determining an accurate COD in the majority of pediatric trauma deaths. If the original autopsy pathologist’s COD statement is accepted as correct, our data suggests, however, that in certain situations (e.g. asphyxia), PMCT cannot supplant pediatric autopsies. Error rates in COD determination were 15% and 18%, (pathologist vs radiologist), but the exact significance of these are unknown as COD determination is an opinion and there might be differences between practitioners with the same dataset. Since both autopsy and PMCT are imperfect tools, the most accurate cause of death statements will likely result from the combination of PMCT and autopsy.

6.3 Dating Fractures on Postmortem Radiographs: How Accurate is This When Compared With Postmortem Histology?

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Pediatricians and radiologists are frequently asked to date fractures in cases of suspected child maltreatment. There is little data in the literature to guide estimates of fracture dating in children, and the accuracy of radiologic estimates of fracture dating is not known. Direct examination of the tissues on histology is felt to be the “gold standard” for fracture dating.

The objectives of this study were to:
1) Determine the diagnostic test properties of x-ray for dating of fractures in children;
2) Examine interobserver reliability for fracture dating by x-ray and histopathology; and
3) Determine whether age, location and type of fracture are associated with accuracy of fracture dating.

Study subjects aged 0 to 12 years old with fractures documented on postmortem examination between 1999 and 2009 at the Hospital for Sick Children in Toronto, Canada were identified using a pathology database. Subjects were excluded if plain radiographs and/or postmortem pathology slides were not available for review. Radiographs and histopathology specimens were prospectively reviewed independently by two pediatric radiologists and two forensic pathologists and categorized as follows: no fracture, acute fracture, healing fracture, indeterminate age. Radiologists and pathologists were blinded to the others’ opinion. A 2X2 table was used to calculate sensitivity and specificity of x-ray for fracture dating in categories of acute and healing compared with histopathology. Interobserver reliability between radiologists and between pathologists was determined using the Kappa coefficient.

In total, 98 fractures were identified from 37 children. Thirteen fractures in 5 children were excluded due to missing slides/films or poor specimens, leaving a final study population of 85 fractures from 32 children. More than two thirds of the study population were infants (n=22, 68%), 6 subjects were between 1 and 2 years of age (18%) and the remainder (n=4, 12%) were 2 years of age or older.

In total, there were 5 cases in which significant or surprising discrepancies occurred. Most of these were rib fractures; this group also included a fracture of the femur and clavicle fractures. Interestingly, in one case with 7 rib fractures called acute by radiology and healing by pathology, the child was noted to be malmournished, possibly contributing to variation in fracture healing pattern.

Conclusion: Radiologists, pathologists and child abuse pediatricians must be aware of potential limitations and pitfalls related to dating of fractures, even within the most conservative categories of acute and healing currently utilized.

6.4 Benefits of Utilizing Full-body Digital Radiography in Forensic Pathology

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Introduction: The purpose of this study was to measure the time spent by a single autopsy assistant in obtaining full-body radiographic imaging in a forensic pathology setting. The digital radiography (DR) system was compared with a traditional cassette-based portable computed radiography (CR) system to quantify time saved by the implementation of the DR imaging system.
Methods: Decedents were examined with the and portable CR systems to provide full-body coverage with each system. Timing was divided into preparation, acquisition, and post-acquisition stages, with an additional transfer stage being required for the DR system. A neutral observer timed each stage for each decedent examined with both systems.

Results: The DR system provided an 87% time savings (p < 0.001) over the portable CR system to complete full-body radiographic scanning. While the portable CR system was faster at image acquisition (p < 0.001), the DR system was faster during the preparation (p < 0.001) and post-acquisition (p < 0.001) stages.

Conclusions: The time required for a full-body radiographic examination is markedly shortened with utilization of the DR system. Seven full-body examinations can be completed with the DR system in the time that a single full-body examination is completed with the portable CR system. In a forensic pathology setting, the DR system is therefore more time efficient than the portable CR system studied, as it provides the same scope in a shorter time period, allowing for streamlining of radiographic imaging studies.

6.5 Virtual Dissection: Roles and Limitations of Radiologic Imaging
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Radiologic imaging, both by conventional radiography and advanced cross-sectional techniques has served as both an adjunct to and substitute for anatomic dissection. Experience has demonstrated that imaging improves the accuracy and efficiency of the autopsy procedure but also has limitations that constrain its use in medicolegal death investigation.

In accordance with National Association of Medical Examiners (NAME) Forensic Autopsy Performance Standards, conventional radiography has been used to detect and locate foreign bodies and projectiles. Additionally, it is used concomitantly for viewing bone trauma. However, a single radiographic view provides limited information and best shows long bone fractures and displaced fractures of the skull and torso. Orthogonal views are a minimum for true fracture assessment. Computed tomography (CT) greatly enhances detection and characterization of fractures especially in areas of complex and/or overlapping bone (skull, spine, and ribs). The value of axial CT images is enhanced by computer processing with two-dimensional (2D) and three-dimensional (3D) reconstruction algorithms. Use of maximum intensity projections (MIP) and edge enhancement can improve fracture detection. While 3D images provide spatial orientation, the smoothing algorithms used can obscure fractures.

Whole body digital scans in two projections may provide some improvement. CT improves visualization of the attenuation differences of air, water and fat. Depending upon the location, amount and age, collections of blood may be distinguished from surrounding tissue. Assessment of vascular integrity requires contrast and postmortem angiography has been used successfully. Assessment of organ damage and small amounts of hemorrhage by CT is not sufficiently sensitive or specific enough to substitute for visual examination and dissection.

Depending upon the specific details of a case, the cause of death can potentially be made by inspection and virtual dissection. Examples of this include blunt force injury and gunshot wounds. The forensic pathologist is in the best position to decide how, when and where virtual dissection is appropriate and how it will be used to focus, guide and even replace physical dissection. To do this, the forensic pathologist must understand the strengths and limitations of imaging. As NAME establishes standards and guidelines for postmortem imaging, care must be taken to ensure that replacement of physical dissection by virtual dissection is based upon evidence from scientific studies.

6.6 Introduction to the National Commission on Forensic Sciences and Proposed Core Values for Medicolegal Death Investigation
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The National Commission on Forensic Sciences (NCFS) was formed in 2014 under the auspices of the U.S. Department of Justice (DOJ) in partnership with the National Institute of Standards and Technology (NIST). The NCFS is composed of 30 members including two NAME members, a retired Chief Medical Examiner and an Assistant Coroner. Concurrent with the NCFS, the NIST has established the Organization of Scientific Area Committees (OSAC) which includes the Medicolegal Death Investigation subcommittee (MDI) as a component. The first part of this presentation will review the mission, structure, and accomplishments of the NCFS to date and discuss ongoing initiatives and future plans as well as the role of the OSAC MDI. This will be followed by the OSAC MDI’s first achievement, a proposed set of Core Values for all professionals involved in medicolegal death investigation. All well-run businesses, organizations, and professions adhere to an ethical code, mission, vision, and a set of core values which must be considered when facing the formation of policy or any strategic or tactical decision. It is hoped that these core values will be embraced and promulgated by members of NAME, IAC&ME, AAFS, and ABMDI to foster a positive environment from which future discussion, policy formation, education, training, and cooperation can come to fruition.

7.2 Evidence Basis for Maintenance of Certification
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As of January 1, 2006, all pathologists’ primary and subspecialty board certificates are time-limited reflecting the concept that the certification process is ongoing and requires periodic reassessment. This process has been deemed necessary to assure the public that physicians maintain clinical competence and can provide a high quality of care, but many physicians across specialty lines have concerns about the relevance of the process to their clinical practice along with the financial burden and time constraints required to complete the necessary components. Maintenance of Certification (MOC) is linked to the six core competencies adopted by the Accreditation Council for Graduate Medical Education and has four main components applicable to all 24 specialties recognized by The American Board of Medical Specialties: Part I, professional standing; Part II, lifelong learning and self-assessment; Part III, cognitive expertise; Part IV, evaluation of performance and practice. An additional Patient Safety Course is also required as a requisite of Part II, although only one approved course exists in pathology, and it has limited relevance for most practicing forensic pathologists. Despite the mandate to participate in MOC, to date there is no evidence-based literature relating to pathology and its subspecialties, including forensic pathology. Therefore, one must look at the literature across medical specialties to find relevant studies exploring the value of recertification. This presentation will critically examine the existing evidence-based literature around MOC focusing on whether evidence exists that MOC is linked to overall clinical competence and improved patient outcomes and ultimately improves the quality of medical care. Forensic pathologists, through organizations like NAME, can use this information to develop practical recertification activities that are relevant to our practice as well as ways to study the validity of MOC for forensic medicine.
7.3 A Forensic Pathologist Panel on Maintenance of Certification (MOC): Point and Counterpoint

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In 2000, the American Board of Medical Specialties (ABMS) mandated that all 24 medical specialties, including pathology, must limit board certification duration to a 10 year period. With this time limitation came a complex program of activities branded “Maintenance of Certification” (MOC), of which a recertification exam every 10 years was only the tip of the iceberg. Diplomates of the American Board of Pathology (ABP) certified in the year 2006 and after must complete the MOC program in order to “maintain certification”. In November, 2014, a change was made to the MOC exam, such that pathologists who practice in a subspecialty area must maintain their primary certification as well as the subspecialty certification in order to continue to be “board certified” by ABP. This change was met initially with heated discussion among young forensic pathologists, who saw the move as arbitrary and capricious; initial anger gave way to grave concerns about the impact that the requirement to maintain primary certification might have on our ability to recruit and retain quality forensic pathologists in the field. However, initial pass rates for the MOC exam have been 100%, for the first three testing sessions, with 22 test-takers (as of the Spring 2015 exam administration) re-certifying in AP/FP or AP/CP/FP. Additional general concerns have been raised about whether an adequate evidence base exists for the merit of MOC in pathology, no evidence base for MOC has been established; and in forensic pathology specifically, it has been scarcely addressed. This panel will present point and counterpoint regarding the value/merit of MOC in daily practice, discuss real concerns for the field of forensic pathology in terms of the impact of MOC, and attempt to answer audience questions and points of discussion about MOC and possible future actions, including NAME’s potential role.

8.1 Suicide Investigation Reporting Tool (SIRT): A Comprehensive and Standardized Coding Form to Aid Investigators in Reporting on Deaths by Suicide

C.L. Meyer1, T. Irani2, D. Hamilton3, K. Delgado4, J. Heschel5, T. Moor6, T. in Reporting on Deaths by Suicide

Comprehensive and Standardized Coding Form to Aid Investigators

investigative reports, demographic information, and when available, suicide notes. The SIRT was tested and revised for face validity, inter-rater reliability, and user friendliness. The SIRT was revised to include information commonly found in investigator reports such as the presence of witnesses, description of the scene and body, specific interviews with survivors, and other information about the suicide that was not coded elsewhere. Finally, information that did not frequently appear in reports but was included on the original SIRT was deleted.

The SIRT is divided into four sections: demographic profile, characteristics of the suicide (i.e. type of trauma), previous history (e.g., drug abuse), and the probable motivation for suicide as suggested by the contents of the report and/or note. For note writers there is an additional section which codes for characteristics of the note (e.g., number of notes, whether it is dated, etc.). The SIRT can be used as a paper and pencil measure or can be adapted as an electronic form. Using the SIRT streamlines the investigative process and reduces the amount of missing information in coroner’s records. In addition, it will help improve the investigation process, assist in the research on risk factors associated with suicide, help in the development of effective suicide prevention strategies, and could eventually be adapted to address other death investigations. It can also be used to accompany the psychological autopsy process.

8.2 Rapid DNA Analysis for Identification of Human Remains

C.A. Miles1, R.L. Zimmerman2, Y. Nebiyeloul-kifle2, A.C. Sozer3, Y.M. Crandall1

The Department of Homeland Security (DHS), Science and Technology Directorate (S&T) has jointly funded the development of two Rapid Deoxyribonucleic Acid (DNA) instruments with the Departments of Defense and Justice and the Intelligence Community. What started as a Small Business Innovative Research (SBIR) project has successfully delivered two commercial systems that are ready for field use. The Rapid DNA instruments automate and integrate all of the current DNA forensic laboratory processes into a stand-alone instrument that performs high-speed, DNA analysis of up to five samples in under 90 minutes at a reasonable cost. DNA of individuals can be analyzed using the instrument in a medical examiner’s laboratory or in non-laboratory field settings reducing the staff workload and allowing non-technical field users to perform human identifications or verify family relationship claims. Rapid DNA has the potential to meet a variety of homeland security needs, including family reunification and identification of human remains. In approximately 90 minutes, the instruments can provide emergency management personnel with reliable results. Depending on the nature of the situation, on-site personnel can use the results to either create “investigative leads” or make an informed decision at a disaster scene. Rapid DNA can be used to inform a decision on the identity of up to five individuals at one time or the relationships of individuals in a family. The technology has demonstrated DNA testing reliability in tests at three federal laboratories and exceeded the industry-accepted standard of 99.5 percent likelihood of family relationships. The Rapid DNA instruments currently cost approximately $250,000 and the current cost per test is approximately $250. Both instrument cost and cost per test will decrease as use of the technology increases.
8.3  Multidisciplinary Case Conferencing: A Collaborative Tool to Achieve Case Consensus in a Coroner-based Medicolegal Death Investigation System.

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Multidisciplinary case conferencing was launched in the late 1990s in response to two highly publicized events: the scathing judicial inquiry into a serial rapist-murderer and the inquest jury recommendations of a shotgun death of a 23-year-old male. Today case conferences are routine adjuncts to Coroner-based death investigations in Ontario, Canada. A variety of cases trigger conferencing including complex homicides, unusual case circumstances, unexpected autopsy findings and evolving police investigations. The objective of this presentation is to illustrate the importance of case conferencing by providing case examples.

Case 1: A 54-year-old morbidly obese alcoholic female was found deceased supine on her bedroom floor. Her head and neck were flexed forward on the wall. Resuscitation was attempted. Autopsy demonstrated scattered contusions on the face and fractures of the hyoid bone and thyroid cartilage. Toxicology revealed ethanol and additional CNS depressants. What is the cause and manner of death?

Case 2: This 33-year-old male was the unbelted passenger in a car travelling on the highway. The car struck the guardrail, lost control and he was ejected. His girlfriend was the driver. At autopsy, he had blunt force injuries. Post-autopsy, police investigation discovered that the female intentionally caused the collision. What is the manner of death?

Case 3: This 67-year-old female was found decomposed in bed prone and lying on a pillow. The scene was unremarkable. Post resection of a meningioma a few years before precipitated a change in behavior. She had hired a lawyer and changed her will to leave everything to him. A few months later she was found deceased. Autopsy demonstrated atherosclerotic cardiovascular disease, but no injury. Toxicology was non-contributory. What is the cause and manner of death?

Case 4: This 40-year-old male with end stage metastatic esophageal cancer was found dead in his bed by his brother with a bathrobe tie around his neck. The ligature was removed from the neck prior to police arrival. What is the manner of death?

Conclusions: Case conferencing is a collaborative approach to death investigation. Case concerns are addressed and additional police investigation and/or ancillary testing may be requested. The cause and manner of death are discussed and a consensus is reached.

8.4  Heart Disease and Manner of Death Certification in Scuba Divers

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Conventional wisdom in forensic pathology suggests the most common cause of death in scuba divers is drowning, which is supported by numerous epidemiological studies. For example, reports from Divers Alert Network state that of 947 fatalities since 1992, a cause of death (COD) was assigned in 814, and, of those, drowning was cited as the COD in 70%. But, does this conventional wisdom create circular logic that a scuba diver who died in the water must have drowned? Because these epidemiological studies are based on death certification, they may reinforce this logic and bias.

In San Diego County, all diving fatalities are reviewed by a multidisciplinary committee consisting of a forensic pathologist, hyperbaric and diving medicine physicians, professional lifeguards, police, diving safety officers, equipment specialists, and professional scuba instructors, allowing for a more thorough analysis of cause and manner of death that is normally not available to most medical examiners. Our experience demonstrates cardiovascular disease plays a major role in roughly half of diver fatalities and suggests the role of natural disease in the deaths of divers has been underreported. Coronary artery disease and left ventricular hypertrophy are both independent, but synergistic, significant risk factors for sudden cardiac death and their importance is potentially not fully appreciated when a death occurs in the water. Indeed an increased risk of sudden death with left ventricular hypertrophy has been demonstrated with as little as 50 g/m increments.

In addition to discussing our observations of the role of cardiovascular disease and particularly an “enlarged heart” in scuba fatalities, the manner of death will also be addressed. NAME guidelines for sudden deaths in water from natural causes suggest giving precedence to accident as a manner of death because the death occurred in a “hostile environment.” We will discuss the mechanisms of death involved in most sudden natural deaths from heart disease and the mechanism of death in drowning to consider whether the “hostile environment” really does play a role, or whether, at least in some cases, it is irrelevant to the cause of death whether the decedent was a diver breathing underwater on scuba gear or by comparison simply running on a treadmill in the gym.

8.5  Aortic Dissections and Stimulant Drug Abuse in New Mexico: A 37-Year Retrospective Review

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Introduction: Acute aortic dissection is the most common catastrophic acute illness of the aorta with high morbidity and mortality. If untreated, acute aortic dissection has a mortality of 33% within the first 24 hours. The prevalence of aortic dissection after autopsy is 1-3%. Stimulants such as methamphetamine and cocaine are thought to predispose an aortic dissection by causing a catecholamine surge that raises the shear stress and increases the likelihood for intimal tears and dissection. The purpose of this study is to identify and characterize deaths due to aortic dissections in a culturally diverse autopsy population with an emphasis on cases with illicit stimulant drug use.

Methods: We retrospectively reviewed electronic autopsy records at a statewide medical examiner’s office. Autopsy cases were identified by searching death certificates in the electronic database for “aortic dissection.”

Results: In a 37-year period (1977-2014) in New Mexico, the medical examiner investigated and autopsied 197 aortic dissection deaths. Decedents were predominantly male (66%), White non-Hispanic (70%), and between 43 and 74 years of age, with a median age of 59 years. Toxicology was tested for in 55% cases. For illicit stimulant related dissections (6% of all cases), 42% lacked evidence of drug paraphernalia at the scene and had no documented history of illicit stimulant drug abuse. The most common risk factor for all aortic dissections was a history of hypertension (52%). Twenty-four percent of decedents were seen within two weeks by a physician and released from care prior to being found dead.

Conclusions: Forty-two percent of the decedents with illicit stimulant drug use related aortic dissections lacked a history and scene findings that may prompt a pathologist to test for illicit drugs. This highlights the need for routine toxicology on all aortic dissection cases given that a positive illicit stimulant related aortic dissection would change the manner to accident.
Despite advances in clinical medicine, aortic dissection continues to be difficult to diagnose. The diagnosis of aortic dissection was missed in 24% of decedents who were seen by a physician with symptoms within two weeks of death. Our study confirms other autopsy studies where the diagnosis is first established at autopsy in a significant number of cases. This emphasizes the importance of autopsy in the medicolegal and hospital settings to allow for appropriate classification of manner of death and provide feedback to clinicians to improve the understanding and diagnosis of aortic dissection.

8.6 Sudden Unexpected Death Associated with Idiopathic Intracranial Hypertension

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Idiopathic intracranial hypertension (IIH) is characterized by elevated intracranial pressure with an overall incidence of 0.9/100,000 but rises to 3.5/100,000 in females of reproductive age. In women aged 20 to 44 years who are 20% or more above ideal weight, the incidence increases to 19 per 100,000. No deformity or obstruction of the ventricular system is present and neuro-diagnostic studies are normal except for increased cerebrospinal fluid (CSF) pressure. The most popular causal hypothesis is reduced CSF absorption. Symptoms are headache, pulsatile tinnitus and transient visual disturbances with the major morbidity being visual loss, but IIH has no reported associated increased mortality.

We describe a 24-year-old woman with a one-month history of severe headaches. The day prior to death, she complained of a severe headache and vomited several times. At about 4:00 AM she went to bed and was found unresponsive later in the morning. Cardiopulmonary resuscitation efforts were initiated, but she was declared dead on arrival at the local hospital’s emergency department.

At autopsy, her body-mass-index was 28.8. Postmortem indirect ophthalmoscopy revealed no funder hernorrages or exudates over the posterior poles; however, the optic discs’ margins were blurred and the nerve heads were elevated above the adjacent neurosensoric retina. Microscopically, the non-inflamed optic nerve heads were swollen with associated vascular engorgement. The peripapillary photoreceptor layer, displaced by the protruding optic nerve heads, had rods and cones pushed away from Bruch’s membrane. Her brain weighed 1350 gm and exhibited moderate-severe cerebral edema that had no anatomical or histological explanation. No other natural disease processes or drugs were present that caused or contributed to her death. Based on the neuro-ophthalmological findings her cause of death was listed as cerebral edema due to idiopathic intracranial hypertension.

Causes of increased intracranial pressure include traumatic brain injury, neoplasms (primary or metastatic), hydrocephalus (communicating or obstructive), venous sinus thrombosis, hypertensive encephalopathy, hypoxic-ischemic brain injury and IIH. Individuals with acute intracranial hypertension usually present with headache, altered mental status, nausea/vomiting, seizures and occasionally sudden death. In addition to these symptoms, chronic intracranial hypertension can cause cranial nerve palsies, ataxia, memory disturbance, personality changes, or urinary incontinence.

Although IIH usually manifests with headaches, tinnitus and transient visual defects, untreated cases may develop severe cerebral edema and sudden unexpected death. The essential feature of idiopathic intracranial hypertension, optic disc swelling (papilledema), is readily identified during postmortem monocular indirect ophthalmoscopy.

9.1 Interagency Cooperation in the Recovery of Anatomic Specimens

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The FBI Detroit’s Evidence Response Team (ERT) partnered with the Wayne County Medical Examiner’s Office in a large scale operation involving the recovery of thousands of human anatomic specimens obtained fraudulently by subjects in three cities across the United States including Detroit, Michigan. The operation was conducted in a week’s time and intensive preparation was done prior to the recovery which culminated in a Field Training Exercise (FTX). This presentation will highlight the preparation, logistics, cataloging processes, and forensic biometric recovery methods used during the search warrant by the FBI. The office of the Medical Examiner in Wayne County approached the process as a mass disaster event and we will present the different facets of the process, namely the remote accessioning of the specimens, classification, photographs, evidence retrieval as well as differentiating human versus non human specimens.

9.2 Risk Management in Forensic Pathology Practice: Gaps in Professional Liability Insurance Policies for Forensic Pathologists

S. Shah1, S. Denton2


Forensic pathologists most commonly practice as salaried government employees with practice liability coverage provided by their government employer without additional coverage that extends beyond their salaried government employment. This type of liability coverage is similar to other employer offered insurance policies that exist for disability and health while employed, but do not extend beyond the scope of the government practice of carry on after employment. Occasionally the forensic pathologist will find themselves practicing in “moonlighting” or consulting roles as independent contractors that require additional risk protection.

Forensic pathologists face a multitude of professional liability risks that are not covered by the majority of standard professional liability or medical malpractice insurance policies available across the United States. Recent cases in multiple states have highlighted large gaps in coverage for forensic pathologists facing various actions who have been forced to defend themselves despite having secured and paid for professional liability insurance for years. Much of this gap in standard professional liability policies stems from the definition of an “injury” that is required to trigger coverage under these policies. Such policies require an injury to a patient be alleged in order for coverage to apply. Forensic pathologists work with expired patients and injury to these patients is not common in the course of autopsy and investigation. Rather, forensic pathologists face many types of liability that never cause injury to the patient, but may cause injury to the patient’s family or another third party. This includes liability for:

1. Inappropriate or erroneous expert witness testimony for criminal or civil actions;
2. Inappropriately sending a body to the wrong funeral home;
3. Theft from the body in possession;
4. Erroneous determination of cause of death (implications for estate proceedings, life insurance, etc);
5. Inappropriate retention of organs or tissue.

Forensic pathologists require professional liability insurance that can comprehensively cover this range of risks. Here we present examples of different policy structures and terms that we have negotiated for many forensic pathologist clients that address this range of risks and offers
greater protection than commercially available policies with standard markets across the country.

9.3 View from the Frontline: Handling Media Requests
J.K. Bolcer
NYC Office of Chief Medical Examiner, New York, New York
Julie Bolcer, the director of public affairs for the New York City Office of Chief Medical Examiner, will offer tips, advice and best practices on how to handle media requests, based on her experience as the chief spokesperson for the agency in the nation's largest media market.

9.4 SUID Tissue Consortium to Help Solve the Dilemma: Asphyxia or Brain Abnormality
L.M. Gregorin¹, B.A. Hyma², B.L. McIntire²
¹American SIDS Institute, Naples, Florida; ²Miami-Dade Medical Examiner Department, Miami, Florida
Sudden unexpected deaths of infants and toddlers are tragic to families while challenging the forensic and scientific communities. Often the only forensic finding is an unsafe sleep environment. Medical examiners across the country differ in whether to classify them as asphyxia, SUID, SIDS or undetermined. Disagreement exists as to the extent, if any, underlying pathology such as a brain abnormality is responsible. This dilemma will not be resolved without the availability of research tissue along with thorough scene data on large numbers of cases and controls.

The purpose of the SUID Tissue Consortium is to systematically obtain tissue and data from children < 4 years of age (SUIDs and controls) and bank it for current and future researchers. The Consortium has 7 ME offices collecting tissue and data which is being banked at the University of Maryland Brain and Tissue Bank (UMD BTB). Typically research tissue donation is explained to families by local donor services, with final consent obtained by UMD BTB. When consent is obtained, the tissue is collected at autopsy and samples are either fixed or frozen to be shipped later to the UMD BTB.

The consortium is managed by the American SIDS Institute. Lab equipment and dry ice are provided by them, and tissue kits and overnight shipping are provided by UMD BTB so that ME offices do not have additional costs. Cases are filtered through local donor services so that donations for live recipients take precedence over research donation. The biggest challenge to banking research tissue is obtaining consent from next of kin before the autopsy begins. Parents are difficult to reach and they often require more time to decide than is available. Other issues involve cases being missed by donor services, cases ruled out for donation by the ME and lack of viability of tissue. The consent rate is currently 12% for infants and 3% for toddlers.

The consortium began collecting data in August of 2011. Participants include 5 ME districts in Florida (Miami, West Palm Beach, Naples, Tampa and Lakeland), the Minneapolis ME and the GBI (GA Bureau of Investigation). Tissue and data have been banked on 35 infants and 3 toddlers.

In addition to efforts aimed at increasing the consent rate, the consortium is seeking to add additional ME offices within the next year.

9.5 Histopathology of the Liver in Alcoholic and Diabetic Ketoacidosis
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Ketoacidosis is a common finding at autopsy, representing around 1% of causes of death in our practice. The two most common reasons for ketoacidosis at autopsy are diabetic ketoacidosis (DKA) and alcoholic ketoacidosis (AKA). Liver disease is common in both alcoholism and diabetes mellitus. We have analysed deaths from DKA and AKA to compare the liver pathology present at death examining deaths from Toronto over a 5 year period from 2009-2013. There were 93 deaths analysed, of which 65 were deaths from DKA and 28 from AKA. The median age of the DKA cases was 52 years, mean 49.8, range 19-79, median age of alcoholic ketoacidosis cases was 52.5 years, mean 54.4 with a range of 34-78 years.

Liver histology was available in each case. Each liver section was stained with hematoxylin and eosin and Masson’s trichrome and scored according to the method of Kleiner et al (Design and validation of a histological scoring system for nonalcoholic fatty liver disease. Hepatology 41.6 (2005): 1313-1321).

The following features were scored in our cases - degree (0-3) and location of steatosis (0-3), fibrosis (0-4, 4 being cirrhosis), portal (0-1) and lobular inflammation (0-2) and presence of glycogenated nuclei (0-1). P-values were derived from chi-square tests or Fisher’s exact test when cells had small expected counts. Four cases of DKA could not be scored for steatosis and 3 cases of DKA for fibrosis because of decompositional changes. Six cases of AKA and 21 cases of DKA could not be assessed for inflammation and 6 cases of AKA and 20 cases of DKA for glycogenated nuclei.

The results indicated statistically significant differences between livers in DKA and AKA for steatosis and fibrosis, with AKA having more steatosis and fibrosis, with lobular inflammation more common in DKA. No statistical difference was found for portal inflammation. Glycogenated nuclei were seen in DKA only. Cirrhosis (grade 4 fibrosis) was only seen in 3 cases of AKA and 1 case of DKA.

In conclusion there were statistically significant differences in the patterns of histopathology between DKA and AKA. However except for glycogenated nuclei, all degrees of steatosis, fibrosis and inflammation were present in either group and the median and mean ages were similar. The typical person dying of AKA and DKA is in their 50’s with fatty change and fibrosis in the liver, but without cirrhosis.

9.6 Posterior Neck Dissection: A Special Autopsy Technique That Should Be Standard in Trauma Victims
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This presentation will review the utility of the posterior neck dissection in the autopsy and determination of the cause of death in trauma victims. The situations, in which it should be performed, and the actual technique will be discussed.

Most traffic crash victims, as well as other victims of blunt injury, are signed out after an autopsy as “multiple injuries,” *blunt head injury,* or other generic, non-specific injury. Although it allows for quick turnaround time for death certification, it does not help the nosologists, who track fatal injuries or the trauma surgeons, who want feedback on the quality and appropriateness of their care. The trauma surgeons generally know that their trauma patients have multiple injuries, but do not know many times why they could not save them. Often the victim has hypotension, and the surgeon cannot detect a significant source of blood loss. Often, the cause of hypotension is neurogenic shock, and the posterior neck dissection is almost always required to show the anatomic defect that correlates with the clinical finding. It is also one of the few injuries that can cause death within seconds.

A posterior neck dissection should be performed on all trauma victims that do not have an unequivocal lethal mechanism of death, such as avulsion of the brain. An "empty heart" is a common finding in those that die in neurogenic shock, so a posterior neck dissection should be performed. If
hypotension is documented, either during pre-hospital care or in hospital care, which cannot be explained by hypovolemia, then a posterior neck exam should be performed. Unexplained hemorrhage along the fascia overlying the anterior aspects of the cervical vertebrae or unexplained basilar subarachnoid hemorrhage is an indication for a posterior neck dissection. Finally, if one is considering a diagnosis of exclusion in a trauma victim, such as a cardiac dysrhythmia from commotio cordis or underlying heart disease, then a posterior neck dissection is warranted.

A layer by layer dissection of the posterior neck from the superficial muscles to the deep structures of the vertebrae will be described.

9.7 Common Pitfalls in Cardiac Pathology
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Background: Cardiac dissection, diagnostics and referral practices are non-uniform across agencies. At the Jesse E. Edwards Registry of Cardiovascular Disease, a cardiac pathology referral laboratory, we are in a position to observe and evaluate the advantages and pitfalls associated with a variety of cardiac dissection techniques and interpretations of findings. Best practices and pitfalls will be presented.

Methods: Dissection techniques from referred cardiac specimens were evaluated by two cardic pathologists over the course of five years. Observations of common problems with dissection, microscopy and interpretation of cardiac findings were compiled.

Results: Cardiac pathology practice can be divided into the categories of dissection, microscopy and diagnostic interpretation. Dissection of hearts varies widely, ranging from “overdissection” to the point of specimen destruction, to “underdissection” where a complete dissection is assumed but areas of myocardium or coronary arteries go unexamined. Dissection should always be undertaken with an eye on preserving anatomy and pathology in case additional review or specialty consultation is sought, as outlined in previous Academic Forensic Pathology publications. Sections taken for histology should be full-thickness myocardium with sites clearly indicated, and routine sections should be taken in specific areas of the ventricles to avoid the possibility of overinterpretation of microscopic findings. Pathologists must be able to recognize a range of differential diagnoses and avoid misinterpretation of gross and microscopic findings. Finally, pathologists must recognize when it is appropriate to obtain a second opinion or cardiac specialty consultation.

Conclusion: Many common pitfalls in cardiac pathology techniques make it difficult or even impossible to generate competent postmortem cardiac diagnoses. Addition of more uniform cardiac dissection techniques, as outlined in the forensic literature, can improve postmortem diagnostic outcomes in trainees as well as experienced pathologists, particularly if specialty referral becomes necessary.

10.1 A New Tool for the Travis County Medical Examiner’s Office in Austin, Texas
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Established in 1977, the Travis County Medical Examiner’s Office (TCMEO) is a nationally accredited, regional center of forensic medical/legal death investigation. The office provides death investigation services to Travis County, and 42 surrounding central Texas counties. Based on information from the Texas State Data Center and the Office of the State Demographer, TCMEO’s primary service population is anticipated to grow by 40 percent over the next 30 years.

The proposed TCMEO is envisioned as a community catalyst that will positively impact the perception of the immediate neighborhood and vicinity as well as provide an appropriate experience for those families that it serves. Additionally, the facility will provide appropriate areas for morgue and autopsy operations, enhance staff safety, optimize flow and functionality, provide required support spaces, and enhance Travis County’s long-term ability to recruit and retain staff. Planned to be built northeast of downtown Austin, TX, the project will provide the county, as well as surrounding counties, with opportunities for expanded service and growth, instruction, and an enhanced ability to deal with mass fatality events.

This presentation will detail the history of the TCMEO, provide an overview of the steps taken during the procurement and design process, discuss important program and design elements, and review opportunities and aspirations for what a medical examiner office can be.

10.2 The Human Postmortem Microbiome as a New Forensic Tool
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The human microbiome is revolutionizing human medicine. Recent studies have shown the potential use of microorganisms using fecal bacteria therapy (e.g., endoscopy or enema) for treating select medical conditions, such as Clostridium difficile infections, Crohn’s disease, inflammatory bowel disease, and ulcerative colitis. Thus medical applications of understanding the living human microbiome demonstrate tremendous application in advancing human medicine. What is less understood is how the living microbiome changes after death, or the human postmortem microbiome (HPMM), and the potential medicolegal applications that could result from better understanding these community changes. We know from studies using cadavers and human surrogate models (i.e., mice and swine) that microbial community succession occurs after death, which demonstrates the potential application of using these prokaryotes for estimating time of death. The ideal circumstance for investigating the HPMM is through sampling during routine death investigations thus removing the constraints of restricted field studies. Here we characterize the HPMM collected during routine death investigations in the field or during autopsies using high-throughput metagenomic sequencing: a genomic sequencing technique that provides a profile of microbial diversity present in a sample.

HPMP signatures were collected from 42 cadavers [19 black (5 ♂, 14 ♀) and 23 white (11 ♂, 12 ♀)] representing four manners of death: homicide, suicide, accidental, and natural. There were distinct microbial community assemblages detected (ca. 1,100 genera) on individuals based body region and related to manner of death. The top three genera found in females were: Corynebacterium, Prevotella, and Streptococcus while men had a similar predominate genera composition that comprised of Streptococcus, Corynebacterium, and Staphylococcus. Microbial samples were collected from human remains received into the Wayne County Medical Examiner’s Office (Detroit, MI); individual DNA-Free sterile cotton-tipped swabs were used to aseptically collect from six areas – the external auditory canal, nose, mouth, umbilicus, rectum and the trabecular space between the inner and outer tables of the occipital bone. Sample collections were logistically feasible and were incorporated into routine death investigation procedures.

To summarize, we have demonstrated microbial community differences between sexes, and detected trends of microbial community differences based on manner of death. Additionally, our database allows for future investigations to potentially identify geospatial patterns correlated to microbial community structure, and detection of antibiotic resistance gene(s). However, there is a vital need to further explore the discriminate
power of this technique, which can be accomplished through an increase in sample collections.

10.3 Neurodegenerative Diseases for the Forensic Pathologist
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It is not unusual to encounter a decedent who had a clinical history of dementia. Family members frequently ask, “Did he have Alzheimer’s disease?” or “What caused her memory loss?” Oftentimes, these questions are not easy to answer. Neurodegenerative diseases are a diverse group of disorders that are characterized by a variety of common features. These diseases affect specific groups of neurons throughout the central nervous system. In many of these diseases, protein aggregates accumulate in specific cells. The clinical features of these diseases often provide insight into which part of the brain is involved. Understanding of the neuropathology, cell biology, and genetics of these diseases has allowed for the reorganization and classification of many neurodegenerative diseases.

The goals of this presentation are to discuss the definition and causes of dementia, to describe the clinical, gross, and histopathological findings in several common and uncommon neurodegenerative diseases and movement disorders, and to review an approach to these cases. This presentation will focus primarily on the neuropathological features and classification of Alzheimer’s disease, the most common cause of dementia in this country, which accounts for 60-80% of dementia cases. It will also discuss frontotemporal lobar degeneration, Parkinson’s disease, and dementia with Lewy bodies, as well as less common disorders, including progressive supranuclear palsy, corticobasal degeneration, multiple system atrophy, and chronic traumatic encephalopathy. This presentation will conclude by providing attendees with an algorithmic approach to the neurodegenerative disease workup guided by the decedent’s clinical history, symptom evolution, and gross neuropathology. Attendees should expect to learn how to approach decedents with suspected neurodegenerative diseases, to distinguish among the common neurodegenerative diseases, and to be able to provide families with more information about their loved one’s neurocognitive disorder.

10.4 NZ Cardiac Inherited Disease Group (CIDG): What it is, and the Role of the Forensic Pathologist
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The Cardiac Inherited Disease Group (CIDG) of New Zealand is a multidisciplinary group whose purpose is to investigate and prevent sudden death due to inherited cardiac disease in the young. It facilitates screening, investigation and management of at risk individuals and families. The group includes specialist cardiologists, laboratory and clinical geneticists (including genetic counselors), national and regional case coordinators and forensic pathologists who investigate autopsy negative deaths where there is a suspicion of cardiac inherited disease through a "molecular autopsy" and clinical evaluation of the family. Additionally cases of hypertrophic cardiomyopathy, suspected amyloidogenic right ventricular cardiomyopathy, and idiopathic dilated cardiomyopathy identified at autopsy may be referred for evaluation and consultation. A report is provided to the referring pathologist and coroner. The group maintains a national registry, arranges storage of DNA for future familial investigation and research, and develops and promotes best practice guidelines.

In this presentation protocols and recommendations of the CIDG are put forward, especially as they apply to the investigation of sudden autopsy negative cardiac death. The experience of the group with both adult and pediatric ("SIDS") age groups will be reviewed. A discussion of the multidisciplinary approach to sudden cardiac death and the families of victims of suspected inherited cardiac disease, including illustrative case histories will be presented. Even in cases where the cause is shown not to be due to an inherited cardiac death, the CIDG process is of great value to the forensic pathologist and family alike. CIDG may serve as a model for medical examiners and forensic pathologists who are interested in establishing a multidisciplinary approach to the investigation of sudden cardiac death due to inherited cardiac disease.

10.5 National Association of Medical Examiners ad hoc Research Committee: A Mini-wWorkshop on Obtaining Grant Funding for Forensic Pathology Research
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The charge of the National Association of Medical Examiners (NAME) ad Hoc Research Committee is "to identify and communicate research opportunities in forensic pathology and death investigation and to develop workshop opportunities for NAME members." In this mini-workshop, we will give an overview of grant funding, as this is a cornerstone of research not only in forensic pathology, but also in all branches of science and medicine. Obtaining grant funding for research or educational projects may seem like a daunting task, especially for those with limited time with which to generate pilot data and write proposals or who have no prior experience in navigating the grant process. The process can be even more challenging if access to knowledgeable personnel in academic grant departments is not available to the medical examiner/coroner office. Funding, however, can be found through many different paths. One path is collaboration with others in academia who may have more experience in obtaining funding and who have access to university resources. Such collaboration has become the norm in research. Furthermore, learning more about the world of "grantsmanship" is achievable, even for those without protected time for research or a research background. In this session, we will provide tips on how to find and follow those paths for funding and how to explore opportunities for collaboration from a representative from Wake Forest Baptist Health who handles grant research and collaborative opportunities, whether the desired outcome is a research, educational, or personal professional goal. In addition, attendees will learn from a Program Manager at the National Institute of Justice (NIJ) about the specifics of their grant program to include purpose, goals, eligibility, and emphasis on the selection criteria as are applicable to the forensic pathology community. A brief overview of NIJ’s current forensic pathology research and development portfolio will also be provided. Attendees will receive an overview of the current NIJ forensic science Research and Development (R&D) program that supports the forensic pathology community and become familiar with the knowledge and skills to write stronger grant proposals responsive to this and other funding opportunities.
We present two postmortem cases from Volusia County, Florida where cause of death was attributed to the fentanyl analogue β-hydroxythiofentanyl. Both decedents were found in their respective residences with syringe in hand, drug paraphernalia nearby and fresh needle marks. The individual from the first case (Case A) texted his mother the night before; and based on this, there was 8 hours or less between time of death and discovery. The individual from the second case (Case B) was with his family prior to them leaving. Upon return, 2 hours later, the individual was discovered. Comprehensive toxicology testing in blood was performed for both cases. Case A had norfentanyl: 8.9 ng/mL and nicotine. Case B had norfentanyl: 8.3 ng/mL; hydromorphone: 1.9 ng/mL; norbuprenorphine: 1.0 ng/mL; THC: 1.7 ng/mL; THCC: 7.2 ng/mL; nicotine and naloxone.

The syringe from Case B was submitted for testing. Analysis by GC/MS showed the presence of a substance with a spectrum matching that of fentanyl, but with a shifted retention time. This same presentation was observed in the blood specimens for both cases. This indicated the presence of a fentanyl related substance. Further testing of the syringe by QTOF allowed for elucidation of its exact mass (358.17) and molecular formula (C₃₂H₂₈N₂O₂S). An internet drug forum search and a query (“what is your favorite fentanyl analogue”) mentioned a drug (β-hydroxythiofentanyl) with a thio (sulfur) in its name. Based upon the totality of the data, an analytical standard was purchased to confirm the presence of β-hydroxythiofentanyl in the syringe and blood samples. In regard to the latter, analysis was performed by GC/MS and LC-TOF/MS. The presence of β-hydroxythiofentanyl was qualitatively identified in blood for both cases and reported. Evaluation of the chemical structure shows norfentanyl as an expected metabolite.

Limited information exists about β-hydroxythiofentanyl. It is expected to have fentanyl-like effects and in regard its use can lead to a lethal outcome. A search of the literature shows these to be the first reported postmortem cases where cause of death was attributed to β-hydroxythiofentanyl.

P2 Fatal Balamuthia Meningoencephalitis in an Immunocompetent Young Adult: What Should the Forensic Pathologist Know?

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Balamuthia mandrillaris has been recently recognized as an emerging cause of amebic encephalitis with >95% fatality rate. The Centers for Disease Control and Prevention (CDC) has reported over 200 cases worldwide, including approximately 70 in the United States. Unlike many protozoan infections, lethality is not limited to immunocompromised hosts. We report the case of a 20-year-old immunocompetent female with no known infectious disease risk factors or recent travel history who presented with progressive non-specific meningeal symptoms (e.g. headache, nausea, and vomiting). Initial head imaging showed regions of non-specific cerebral enhancement, suggestive of encephalitis. Despite aggressive therapeutic interventions, she died during her hospital admission. Consent for autopsy was not obtained; however, surgical resection provided diagnostic material.

Histopathologic examination of the initial biopsy specimen showed an abscess with granulomatous inflammation. Larger resection of the “mass” revealed acute hemorrhagic necrosis with numerous amebic trophozoites within the brain parenchyma, leptomeninges, and invading the vasculature. Speciation for Balamuthia mandrillaris was confirmed by molecular testing at the CDC.

Amebic encephalitides are most commonly due to infection by Naegleria fowleri, causing primary amebic meningoencephalitis (PAM), or by Acanthamoeba species, causing a granulomatous amebic encephalitis (GAE). Balamuthia mandrillaris is an emerging cause of fatal amebic encephalitis. Similar to Acanthamoeba, it tends to cause a GAE, resulting in multifocal hemorrhagic abscesses, but affects both immunocompromised as well as immunocompetent individuals. Due to the scarcity of available data and non-specificity of clinical symptoms and neuroimaging, risk factors and epidemiology of Balamuthia mandrillaris encephalitis are not well understood. It is therefore thought to be an under-reported cause of meningoencephalitis. Hispanic ethnicity, exposure to soil and dust in Southwestern states, and preceding skin lesions are putative risk factors. However, with the majority of cases currently diagnosed post-mortem, the forensic pathologist should consider Balamuthia mandrillaris as a potential pathogen even without those clinical and historical clues. Furthermore, greater awareness of this pathogenic entity and, consequently, greater understanding of its epidemiology and risk factors lie within the realm of the forensic pathologist.

P3 Os Odontoideum Mimicking Acute Odontoid Peg Fracture: Case Report and Review of the Literature

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The atlantoaxial complex is a common site for cervical spine injuries, of which fractures of C2, or the axis, occur most frequently. Over half of these fractures involve the odontoid process. Numerous developmental anomalies of the axis, although rare, can also occur, and may simulate trauma. Specifically, os odontoideum is a cranial-vertebral junction anomaly in which the odontoid process remains separate from the body of the axis vertebrae as an independent ossicle. We report a case of a 53-year-old incarcerated male who was found by his five cellmates hanging partially suspended by a bed sheet. Emergency medical personnel re-established a pulse for a short time, and the patient was transferred to the hospital. Imaging of the cervical spine pointed to an avulsion fracture of the odontoid process of the axis, raising the possibility of trauma and foul play. Postmortem lateral x-rays revealed a smooth ossicle with a circumferential cortical rim superior to the axis, and a posterior neck dissection failed to reveal evidence of an acute process. Contrary to the diagnosis of an isolated odontoid fracture, this is a case of os odontoideum. This case emphasizes the importance of a thorough dissection with direct visualization, accompanied by a complete investigation and radiographs. An overview of the development of the axis is also discussed, including descriptions of the various anomalies of the odontoid that may be encountered during postmortem cervical spine examination. Failure of the forensic pathologist to recognize the developmental anomalies of the odontoid could lead to improper certification of death, resulting in devastating medicolegal consequences.

P4 A Series of Accidental Deaths in Southcentral Alaska: Are they Victims of Climate Change?

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Several consequences of global climate change are well-recognized in scientific literature, including but not limited to glacial retreat and increasing global temperature. We will present a series of deaths in which these factors were likely contributory during the record temperature highs in Southcentral Alaska in 2014-15. One case illustrates fatality due to glacier calving while four more illustrate how increased ambient temperature and related secondary environmental changes can pose deadly risk to those traveling on the seasonally frozen Kuskokwim River.

The first case is that of a 28-year-old male tourist who had traveled from Italy. After a helicopter skiing tour in the Chugach Mountains, the tour...
group stopped to see the Lake George Glacier. The victim was posing for a photograph when a van-sized portion of the glacier calved, crushing him. The cause of death in this case is blunt force trauma.

Three additional cases were those of a 28-year-old male, a 51-year-old male and a 27-year-old female. All were traveling on one all-terrain vehicle (ATV) on the frozen Kuskokwim River near Bethel, Alaska in December 2014. While on their ATV, they fell into a hole in the frozen river and were recovered in proximity to that area over a period of one and a half months. Additional environmental factors included suboptimal weather conditions and time of day (darkness). Toxicology results and scene findings indicate preceding alcohol and/or illicit substance use by two of the victims.

In the fifth case, a 29-year-old male with an extensive psychiatric history and recent possible psychotic episode was also found several feet downstream from a hole in the same river approximately three hours after a witnessed fall into the hole. The cause of death in each of the last four cases is cold-water drowning.

All cases were subject to unexpected environmental changes that led to their accidental deaths. We will examine the possible role of global climate change in these cases, as well as its projected role in select causes of future mortality.

P5 Varicella zoster Virus Vasculopathy
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Varicella zoster virus (VZV) is a double stranded DNA virus in the alphaherpes family. Primary infection with the virus results in varicella (chickenpox). It is estimated that greater than 95 percent of the world’s population has been infected with the virus. Following the acute infection, the virus becomes latent in neurons of the dorsal root ganglia, cranial nerve ganglia and the autonomic ganglia. Cell mediated immunity declines with age, which can result in reactivation of the virus and the development of herpes zoster (shingles), an extremely painful skin rash with vesicles that occurs in a dermatomal distribution, typically on the torso. The most common complication is postherpetic neuralgia, which may persist for a year or longer. Other complications include myelopathy, retinal necrosis, cerebellitis and vasculopathy. First described in 1959 as a non-infectious granulomatous angiitis, VZV vasculopathy was associated with herpes zoster and immunocompromised individuals years later. Clinical symptoms include headaches, mental status changes, acute hemiplegia, vision loss, aphasia, and ataxia. Most often, multiple arteries are involved, and can be small, large or both. Virologic confirmation is best performed through detection of anti-VZV IgG antibodies in the cerebrospinal fluid because they persist for a longer period of time than the viral DNA.

Complications of VZV vasculopathy include aneurysms, subarachnoid hemorrhage, intracerebral hemorrhage, vascular ectasia and dissection. The risk of stroke is increased for up to a year following herpes zoster and is approximately 5 times increased following ophthalmic distribution zoster. The VZV infects the adventitia initially, then the media and intima. Disruption of the internal elastic lamina and decreased medial smooth muscle cells are characteristic histologic features of VZV vasculopathy which results in a weakened vessel wall which is prone to rupture.

Antiviral medications when initiated within 2 days of the development of rash decrease the duration of symptoms and can lower the likelihood of complications. Treatment of VZV vasculopathy requires intravenous administration of antiviral medications. The herpes zoster vaccine reduces the risk of shingles, therefore it is recommended in all individuals over the age of 60.

VZV vasculopathy may present as a sudden collapse or sudden death due to hemorrhagic stroke. The imaging findings may be atypical due to multifocal vascular involvement. A case report will be presented to illustrate this. It is important for medical examiners/coroners to consider this entity in the differential diagnosis for elderly individuals with intracerebral hemorrhages without the typical stroke risk factors.

P6 Sudden, Unexpected Death Due to Neurosarcoidosis: A Series of 3 Cases.
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Neurosarcoidosis is a rare inflammatory disease with heterogeneous and nonspecific symptomatology, imaging, and laboratory test findings. When not associated with clinically identifiable systemic sarcoidosis, the disease is known as isolated neurosarcoidosis, and may go undiagnosed due to variable clinical features that overlap with other neurologic diseases, as well as the requirement of a brain biopsy for definitive diagnosis. In these cases, the first and only chance for diagnosis may be at autopsy.

We report 3 cases of neurosarcoidosis with granulomas predominantly limited to the CNS, two of which were undiagnosed prior to autopsy. The history of the decedents was variable, with one person’s symptoms dominated by seizure disorder, one by headaches, memory loss, and cranial neuropathies, and one diagnosed with neurosarcoidosis prior to death. The decedents were all African-American males between the ages of 35 and 43, and each was found at home in the context of sudden death. Autopsy gross findings were subtle, and ranged from variably thickened and adhered leptomeninges to a lack of observed abnormalities. Microscopy consistently demonstrated small, compact, non-caseating granulomas, which were highly associated with the leptomeninges and penetrating vessels of the brain parenchyma, involving cortical, basilar, and spinal cord structures. Toxicology and other ancillary testing including tissue and CSF cultures were negative when performed. Granulomas were negative for organisms by acid-fast, silver stain, periodic acid–Schiff stain, and tissue gram stain. In one case, focal microscopic granulomatous disease was found in the lung and in a hilar lymph node. However, these were subclinical and not identified on antemortem serial chest radiographs.

Neurologic involvement is the third leading cause of death in sarcoidosis, after cardiac and pulmonary causes, and a higher proportion of neurosarcoidosis cases result in sudden death. Mechanisms of death caused by CNS involvement include arrhythmias from infiltration of autonomic centers, epileptic seizures, obstructive hydrocephalus from brainstem involvement, and vasculitis-induced ischemia. In many cases, however, the definitive mechanism is unknown. Due to the heterogeneity in symptoms and diagnostic findings, neurosarcoidosis often goes undiagnosed prior to death, and it is important for the forensic pathologist to suspect it and submit additional autopsy sections in the following situations: A clinical history of cranial neuropathies or new-onset seizures associated with other vague neurologic symptoms, multiple white-matter lesions and meningeal enhancement on MRI, or variably thickened dura and leptomeninges on gross examination.

P7 Her Death was a Fluke! Sudden Death in a 58-Year-old Epileptic with Cerebral Paragonimiasis: Case Report and Brief Review of Most Common Parasitic Causes of Epilepsy
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Epileptics are at increased risk of sudden death compared to the general population. Risk factors for epilepsy include trauma, infections, tumors, and cerebrovascular disease; a significant minority (15-20%) is classified as idiopathic. Without an anatomic or toxicologic cause identified, these
should methamphetamine be reported by the name methamphetamine or
This, however, is not as straightforward as it may seem. For example,
with the matrix tested.
name, concentration determined and unit of measurement in conjunction
sections involve the reporting and explaining of test results. For example,
comments. It is understood that in regard to interpretation the most critical
sections; 1) demographics, 2) analytical results and 3) reference
It is incumbent upon forensic toxicology laboratories to convey accurate
Paragonimus
parenchyma. Parasitic eggs consistent with
at home. General autopsy revealed a normally developed adult female
"years", non-compliant with her seizure medications, who was found dead
the brain is essential, though often unsatisfactory. We report the case of a
1NMS Labs, Willow Grove, Pennsylvania; 2Private, Goshen, New York
(mentacercariae) can cause extrapulmonary infection, notably of the central
westermani is found throughout China, Korea, Japan, the Philippines,
neuroschistosomiasis, and cerebral paragonimiasis are more likely to
cause seizures.
A thorough clinical and social history may help to distinguish these
potential parasitic causes of epilepsy, but the forensic pathologist is rarely
bequeathed with such diagnostically rich information and must rely instead
on autopsy findings. Neurocysticercosis is distinct histologically, but the
eggs of Paragonimus closely resemble those of Schistosoma, in particular
S. japonicum. The key distinguishing feature is the thick yellow-brown
refactile wall present in the former.
While establishing an etiology for epilepsy is satisfying for the forensic
pathologist, correct parasitic identification means little in terms of cause or
manner of death. However, it is the public health implications that justify
the additional scrutiny and investigation.

P8 The Reporting of Toxicology Results and the Submission of Data Records for Courtroom Proceedings
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It is incumbent upon forensic toxicology laboratories to convey accurate
information to help ensure appropriate case interpretation. A consistent presentation of results and other critical pieces of information across laboratories is lacking.
The components of a toxicity report are frequently divided into several sections; 1) demographics, 2) analytical results and 3) reference comments. It is understood that in regard to interpretation the most critical sections involve the reporting and explaining of test results. For example, any positive quantitative analytical result should clearly show the analyte name, concentration determined and unit of measurement in conjunction with the matrix tested.
This, however, is not as straightforward as it may seem. For example, should methamphetamine be reported by the name methamphetamine or d/- methamphetamine if chiral analysis is not performed? What if one
laboratory reports in units of ng/mL and another laboratory uses units of
mcg/mL? It is not difficult to see how this may lead to interpretive error. Even the explanation of test results in the form of a reference comment may lead to complexities. Reference comments may be derived from serum or plasma studies even though analysis was performed in whole blood. Report flags such as "elevated" or "H" for high often do not take into account the site of specimen collection (e.g., cardiac or femoral), the possibility of postmortem redistribution or analyte changes associated with increasing post mortem interval.
In 2009, the National Academy of Sciences issued a report addressing the need to better forensic science practices. The report in essence states that some forensic science laboratory reports meet the proposed standard of reporting, but many do not. The toxicology community is currently taking steps to achieve these recommendations via Office of Scientific Area Committees.
The second aspect addressing toxicology reporting practices is the turning over of analytical data and other laboratory records that substantiate the results. There are inconsistencies across laboratories in regard to this as well. Some laboratories, as an example, will provide an independent expert or the court with all documents while others will only provide the data for positive findings. Is this an appropriate practice or is it the responsibility of the expert or court to request the relevant material?
This poster presentation will afford an opportunity for an open discussion concerning toxicity report needs, ways to better their content and to confer about the necessity for the laboratory to submit comprehensive records for legal proceedings.

P9 Amyloidosis and Unexpected Death: Seven Cases and a Review of the Literature
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Amyloidosis, deposition of improperly folded insoluble proteins, may affect one organ or may be systemic. Although plasma cell dyscrasia is frequently implicated in etiology and is due immunoglobulin light chain production (AL amyloidosis), age-related amyloidosis thought secondary to transthyretin production (ATTR), and chronic inflammation-related amyloidosis thought due to acute phase reactants (AA amyloidosis), and dozens of others are also described. Clinical presentation is dependent upon the organ(s) involved and those associated with unexpected death are expected to involve the cardiovascular system. All cases received for forensic pathology examination at the Medical University of South Carolina from 2008 to May 15, 2015 were searched to identify any in which amyloidosis was listed as a final diagnosis. Seven cases were identified that met criteria and were reviewed for demographic information, presentation, cause and manner of death and assessment of pertinence of the diagnosis of amyloidosis to the cause and manner of death. The cohort identified includes individuals from 63 to 81 years of age. Interestingly, gross examination of the heart was suggestive of amyloidosis or other infiltrative process in only two of the cases reviewed and a history of myeloma was only noted in one individual. Common gross and microscopic findings are described and relevant medical history and toxicology findings are compared. The cases identified are then compared to those described in the literature.

P10 The Utility of Screening for 6-MAM instead of Propoxyphene
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Introduction: Traditionally, Medical Examiner toxiculture screening has included propoxyphene (Darvocet), a narcotic pain reliever that has a history for abuse and more importantly, the risk of cardiac arrhythmia. As of 2009, the Food and Drug Administration (FDA) advised against the use
of Propoxyphene, hence its prevalence has diminished. In contrast to this
trend, Heroin abuse has increased. According to the Medical Examiner
records in Birmingham, Alabama, more than 150 people have overdosed
on Heroin in the last 2½ years.

Toxicology testing in Jefferson County includes Enzyme Multiplied
Immunoassay Technique (EMIT) testing on serum and urine. Additional
assays are performed on positive opiate screens and eventually sent out
for Morphine quantitation, if indicated. We report our results from
switching from Propoxyphene screening to 6-monooacetylmorphine (6-
MAM) testing, a metabolite of Heroin.

**Methods:** Starting in August 2013, the toxicology service for the Jefferson
County Medical Examiner Office began tracking turnaround times for
cases involving Heroin. Traditional screening, including Propoxyphene
and not 6-MAM, was tracked for two months followed by two months of
tracking turnaround times with 6-MAM. Student t-tests were performed to
determine statistical significance. Additionally, 2 years of data were
reviewed to find propoxyphene positive cases.

**Results:** The average turnaround times before and after the transition to
include 6-MAM were 8.6 days and 3.6 days, respectively (p<0.0003). Furthermore, urine 6-MAM demonstrated 88% sensitivity compared to 77% sensitivity in urine opiate screening. Of note, 6-MAM did not perform as well on bile (24% sensitivity with 35% equivocal results). Review of two years of toxicology results indicated that propoxyphene was involved in only one case.

**Conclusion:** Transitioning from propoxyphene to 6-MAM has significantly
reduced turnaround times. Prior to 6-MAM, Alkaline drug and Codeine
testing was performed on positive opiate screens followed by send-out
testing for Morphine. Due to batch testing, results could be delayed up to
a week. These steps are removed with the 6-MAM screen and specimens
are sent to an outside lab without delay. While there is a chance that
propoxyphene detection could be delayed, this impact should be minimal
considering the rarity of propoxyphene.

**P11** Sudden Unexpected Death of Young People Associated with Coronary Artery Anomalies and Sports Events: A Retrospective
Analysis of Five Cases.
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Pathology Service, Toronto, Canada
Sudden and unexpected death associated with coronary artery anomalies
in the setting of sports events is anecdotally recognized in young people.
We report five cases of sudden death associated with potentially lethal
congenital coronary artery anomalies that occurred during the period of
2010-2014. Four of five cases involved individuals aged 12 to 18
years and the other involved a 26 year old man. All of the teenagers died
in association with physical activity such as swimming, running or walking.
The 26 year old man died during sleep. In four cases sudden collapse is
reported after physical activity had ended and in one case, the emergency
departments has recorded ST elevation immediately after the collapse.
In four out of five cases the left main coronary artery originated from right
sinus of Valsalva and exhibited both an intra-arterial as well as an
interarterial course between the pulmonary trunk and ascending aorta.
In the other case the origin of right coronary artery originated from the left
coronary sinus and courses at an oblique angle between the ascending
aorta and the pulmonary trunk. The purpose of this abstract is to highlight
that: 1. Potentially lethal congenital coronary artery anomalies can be
easily missed at autopsy – the classical pathology is reviewed; 2.
Evaluating the heart for a congenital coronary anomaly typically requires
altering dissection of the proximal coronary artery; and 3. Coronary artery
anomalies may be particularly important in the setting of sudden death in
the young, yet may be incidentally noted in older individuals.

Keywords: Sudden unexpected death, Coronary artery anomaly,
Retrospective analysis

**P12** Dissection Allows Certification of a Pill Death that is
Neither Asphyxiation nor Intoxication
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Office of Chief Medical Examiner, Concord, New Hampshire
An 80-year-old female, died suddenly "vomiting blood," approximately 2
weeks after having a pill “go down the wrong way.” She was evaluated in
the emergency department at the time of the initial episode and on two
subsequent occasions. On each visit a chest radiograph was obtained.
Prescribed medications included simvastatin and atenolol. The decedent
had been a smoker since she was a young girl. Autopsy revealed a focus
of transmural necrosis in the right mainstem bronchus overlying a
bronchopulmonary fistula. Had there been an assumption that this death
was due to a complication of hypertensive and arteriosclerotic
cardiovascular disease or represented a neoplastic complication of
lifelong tobacco use, both cause of death and manner of death would
have been inaccurately certified. The published literature on complications
of aspirated foreign bodies is heavily weighted toward the pediatric
population. The United States Bureau of the Census estimates that up to
18.5% of the United States population will be over 65 years of age by
the year 2025. The presumptive certification of all sudden death in seniors as
due to natural disease in the years ahead will not only adversely skew
vital statistics, but will also prevent forensic pathologists from engaging in
the vital aspect of our professional mission of promoting and enhancing
public health.

**P13** Three Cases of Bilateral Vertebral Artery Dissection
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The vertebral artery is not routinely examined at autopsy; it is a difficult
area of the neck to examine. The underlying vascular pathology is less
well documented than other areas of the body. We present three cases of
bilateral vertebral artery dissection resulting in death. Case 1 involves a
25-year-old man who was found collapsed in his prison cell. There was
no evidence of injury to the head or neck. Examination of the brain
revealed basilar artery thrombosis and cerebral infarction; examination of
the extra-cranial vertebral arteries revealed bilateral dissection with
underlying fibromuscular dysplasia. Case 2 involves a 30-year-old woman
who suffered a motor vehicle collision approximately one month before
developing symptoms of stroke. Imaging investigations revealed basilar
artery thrombosis with right vertebral artery dissection, and multiple areas
of central nervous system infarction. At autopsy, there was bilateral
vertebral artery dissection with changes of segmental mediolytic
arteriopathy. Case 3 involves a 40-year-old man who was an assistant
referee in a soccer game. He was subject to an attack by players
following a disputed call. He had also been seen to fall a few minutes
before the attack. He drove himself home from the match and then back
to the club; approximately three hours after the attack he became unwell
and was rushed to the hospital where diagnoses of vertebral artery
dissection and cerebellar infarction were made following imaging. He died
the next day. At autopsy there was bilateral dissection of the vertebral
arteries with inflammatory response, and fibromuscular changes that had
the appearances of fibromuscular dysplasia.

Vertebral artery dissection is rare; its underlying conditions are not well
understood. It may be associated with trauma, often of a minor nature,
but has also been reported to occur spontaneously, as appears to be so
with case number 1 here. Changes of fibromuscular dysplasia and
segmental mediolytic arteriopathy have been reported. Recent genetic
studies suggest there may be collagen disorders.
These cases illustrate the methods of diagnosis, patterns of pathology, and circumstances associated with bilateral vertebral artery dissection.

**P14  Dieulafoy’s Lesion: A Rare Cause of Fatal Upper Gastrointestinal Hemorrhage**  
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**Background:** Dieulafoy’s lesion is a potentially life-threatening cause of upper gastrointestinal (GI) bleeding. The lesion consists of a submucosal artery 1-3 mm in diameter, a caliber approximately 10 times that of normal mucosal vessels. Lesions are generally located in the proximal stomach along the lesser curvature. In the absence of rupture, they are asymptomatic, but may cause significant bleeding if overlying mucosal erosion occurs. While reportedly accounting for 1-2% of upper GI bleeding episodes, it is suspected they are underrecognized, and the actual incidence is higher. As life-threatening arterial bleeding occurs in approximately 10% of cases, it is important that autopsy pathologists are familiar with this entity.

**Methods:** In order to establish the frequency, presentation, and characteristics of fatal Dieulafoy’s lesions at our institution, we retrospectively searched our electronic autopsy database PowerPath (Sunquest Informational Systems) for the 14 year span 2002-2015 utilizing the search criterion “Dieulafoy.”

**Results:** Two autopsy cases were identified. Case 1 was that of a 90 year old man who had recently undergone repair of an incarcerated hernia complicated by a necrotizing soft tissue infection. The evening prior to death, he became severely hypotensive with melena. At autopsy, there was 500 mL of fresh blood in the stomach, and hemorrhagic contents throughout the intestines. A 0.5 cm protuberant lesion was found along the lesser curvature of the stomach near the gastroesophageal junction. Histology revealed a 0.2 cm diameter submucosal blood vessel with erosion of overlying mucosa. Case 2 was that of an 82 year old man with hypotension found to have copious gastric blood and a Dieulafoy lesion along the lesser curvature of the proximal stomach by emergent esophagogastroduodenoscopy. Following clip failure, the lesion was cauterized. The patient expired postoperatively. At autopsy, 2200 ml of fresh blood was found in the stomach and 1500 ml was found in the intestines. The cauterized Dieulafoy lesion site and an incidental 2.4 cm focus of gastric adenocarcinoma were identified.

**Discussion:** In patients expiring of upper GI hemorrhage in the absence of known gastric and/or duodenal ulcers, erosive gastritis, or variceal disease, a careful examination of the gastric mucosa for Dieulafoy’s lesions should be conducted. Their rarity, small size, and ability to blend in with mucosal autolysis can make them easy to overlook at autopsy. They are likely an underreported cause of morbidity and mortality, and an increased awareness may lead to greater understanding of the epidemiology of this disease.

**P15  Diltiazem Associated Deaths in Ontario Canada:**  
Retrospective Review of 5-Year Data  
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Diltiazem is a calcium channel blocker that is prescribed for the treatment of hypertension, angina pectoris, arrhythmia and migraines. It is also a common adulterant of illicit drugs, such as cocaine. Acute diltiazem toxicity is infrequently associated with death. We report a retrospective review of all diltiazem related deaths over a 5-year period in Ontario. Our method included review of the history, post-mortem and pathology reports to gather information about psychosocial issues, access to a prescription of diltiazem, major autopsy findings, manner of death, blood concentrations of diltiazem and its metabolite. From 2010 to 2014 there were 18 diltiazem related deaths, in which 10 deaths were attributed solely to diltiazem. The highest concentration of diltiazem was 18 mg/L in the post-mortem peripheral blood. Lower levels were observed in 2 cases (1.5 and 0.32 mg/L) in which the admission blood was tested up to 1 week after having been drawn. In 12 cases, a prescription to the deceased was documented. Those causes of death attribute to mixed drug toxicity most commonly was another prescription drug, with citalopram being the most frequent medication. No illicit drugs were detected. There was a female predominance (11:7 = F:M) and deaths commonly involved an older age group (median: 65 years). Nearly all cases (16 cases) the major autopsy findings demonstrated structural heart disease, including cardiomegaly, ventricular hypertrophy and severe atherosclerotic plaques in the coronary arteries. This underlying structural heart disease suggests an indication for the diltiazem prescription. Additional findings at autopsy included the presence of pill matter within the stomach contents in half of the cases. The most common manner of death was suicide (10 cases) followed by accident (5 cases) and undetermined (3 cases). The high frequency of suicide is in keeping with the high incidence (13 cases) of depression/suicidal ideation in this series. This is the largest reported case series to review diltiazem associated deaths. This case series indicates that an advanced forensic toxicologic overview is needed as part of a comprehensive medicolegal death investigation. Otherwise the cause of death may be misattributed to the chronic heart disease, which is often seen in this older age group.

**P16  Vasculitis Associated with Cocaine Use**  
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Cocaine use has been associated with the development of vasculitis. It is under dispute whether cocaine itself can cause vasculitis, or whether some other substance is required. Levamisole is a common adulterant of cocaine that has been associated with vasculitis, among other complications.

A case of a 47 year old woman known to use cocaine is reported here. She presented clinically with widespread cutaneous changes that were identified on skin biopsy as a leukocytoclastic vasculitis. Her medical history was significant for remote diagnoses of rheumatoid arthritis and cutaneous lupus. Her social history was significant for recreational drug use (including crack cocaine and opioids), and remove intravenous drug use. There was a family history of auto-immune disease, including rheumatoid arthritis. Clinically, it was believed that her vasculitis was most likely related to her cocaine use rather than any underlying auto-immune vasculitis. Her recreational drug habit continued until she was found dead at home.

At autopsy, she had extensive vasculitic changes in the skin, with ulceration on the body. There was evidence of pneumonia with aspiration; toxicologic analysis indicated that she had taken fentanyl and morphine. She has cirrhosis of the liver.

The issues surrounding the causation of her vasculitis are presented.

**P17  The Necessity of Dissection and Microscopy in a Case of Cystic Tumor of the Atrioventricular Node**  
J. Huss, J. Woo, G. Fishbein  
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Though rare, the cystic tumor of the atrioventricular (AV) node has become known as the “smallest tumor which causes sudden death.” Less than 100 cases have been reported, the majority of which are described with some history of syncope or diagnosed heart block prior to death. Yet when reported, the course between the presentation of the heart block and sudden death is unpredictable, ranging from years to mere weeks. We present a case of a 32-year-old male diagnosed with complete heart block at 6 years of age, who died suddenly four years status-post pacemaker removal following regression to 1st degree heart block. Per
the history provided by the family, a concern for drug abuse and possible overdose was raised. As no significant findings were grossly evident to explain the cause of death, special consideration was given to the examination of the heart and both the AV node and sinoatrial (SA) node were submitted for microscopic evaluation. While grossly there was no evidence of a lesion, microscopy revealed a cystic tumor of the AV node. This case is an extreme example of the natural course of the tumor, first presenting in childhood with near complete recovery following pacemaker placement, then sudden death several years after pacemaker removal. While most sudden cardiac deaths are due to ventricular tachyarrhythmia, there are rare instances in which bradyrhythms are potential substrates for sudden death, such as the cystic tumor of the AV node. It is thought to be the location of this tumor that leads to both sudden cardiac death and its link to heart block, causing disruption of the cardiac conduction system. However, there are usually no clinical findings suggesting this rare lesion. This case highlights the potential to miss the tumor completely as there are no gross findings at autopsy. The history of heart block may be benign or remote, therefore making the necessity of dissection and microscopy of the AV node critical in patients with a history of heart block, or for that matter, any case of unexplained sudden cardiac death.

P18 Quilty Effect Gone Bad: Massive Myocardial Infiltrates in a Pediatric Heart Allograft
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Since its description in 1981, Quilty lesions have been the subject of much conjecture and investigation. They are common findings post-transplant, occurring in almost half of transplant patients. While it was originally described early in the advent of cyclosporine therapy, the exact etiology and its significance to acute and chronic rejection have remained elusive. Classically Quilty lesions are thought to occur on the endocardial surface but can extend into adjacent myocardium, with additional descriptions of similar lesions identified in the epicardium of explanted allografts.

We present a 4-year-old female patient who was found unresponsive with a history of heart transplant for Parvovirus myocarditis at age 2. At autopsy the patient’s heart was notable for multiple areas of pale myocardium. Extensive adhesions and fibrosis was present over the pericardial surface. The coronary arteries were narrowed 51-75% by transplant vasculopathy. Microscopic examination showed large aggregates of predominantly small lymphocytes in the endocardium and epicardium which extended into the myocardium. These aggregates consisted of an admixture of B- and T- lymphocytes. Occasionally reactive germinal centers were present. These were seen in a background of acute cellular rejection. Immunohistochemistry for adenovirus, CMV and parvovirus were negative as were molecular testing for parvovirus, HSV, EBV, VZV and HHV-6; In situ hybridization for Epstein Barr virus was negative. No evidence of post-transplant lymphoproliferative disorder was identified. Given the increasing incidence and survival of heart transplant patients forensic pathologists have greater demands to familiarize with transplant pathology.

This case provides potentially new insight into our understanding of the Quilty lesion both in terms of its presentation and clinical significance, and thus is crucial for proper post-mortem evaluation of a transplant patient.

P19 Cold Deaths in the Windy City: Hypothermia Related Deaths in Chicago
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Introduction: Hypothermia related deaths are a preventable and recurring problem during winter months in Chicago. Establishing hypothermia as a cause of death is often challenging for the forensic pathologist due to lack of concrete autopsy findings specific to hypothermia; which is why it is often a diagnosis of exclusion. The etiology of hypothermia related deaths is multifactorial and comprised of several risk factors such as low socioeconomic status, alcoholism, homelessness, and lack of access to warming shelters. Many factors can be reduced by raising awareness, addressing social and public health issues of ensuring there are enough warming centers in areas with large homeless populations, ensuring that information about such resources are effectively distributed to the targeted population and implementing resources for alcohol and drug treatment and prevention.

Methods: We reviewed 145 cases of hypothermia related deaths recorded in Chicago from 2009 to 2015. The parameters reviewed consist of scene investigation, location, cause of death, contributing factors, social and medical history, autopsy findings and body temperature at time of discovery.

Results: During the period from 2009 to 2015, 46 deaths occurred in January, 29 deaths occurred in February and 26 deaths occurred in December. 24/145 (16%) of the total cases occurred in homeless individuals. 40/145 (27%) deaths were related to alcoholism. 9/145 (0.06%) of cases occurred in homeless individuals with alcoholism. 68/145 (47%) of cases occurred in elderly individuals (≥ 60 yrs) and 48/68 (71%) of the elderly individuals were male. 44/145 (30%) cases had a recorded body temperature.

Deaths in the homeless were separated by zip code. 11/24 (45%) homeless persons died in the city of Chicago. One of the 24 deaths occurred in Skokie, IL and 12/24 (50%) homeless deaths had no recorded address or zip code where the death occurred. Of the cases with reported zip codes, two deaths occurred in the same zip code with a warming shelter. The remaining 9 cases occurred within a 2-3 mile radius of a warming center.

Conclusions: Most deaths related to hypothermia in Chicago occurred during the winter months. The elderly and homeless populations were most affected. The etiology of hypothermia related deaths is multifactorial. Similarly, the prevention of such deaths will require multiple levels of support. Surveillance teams are needed to locate the homeless population and to determine the most effective way for distribution of information regarding resources such as warming centers locations, alcohol/drug abuse treatment centers and support programs.

P20 Homemade Chloroform as a Final Exit
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Asphyxial deaths occur when the body is deprived of oxygen or cannot use delivered oxygen. Forms of asphyxia include suffocation, strangulation, and chemical asphyxia. Airway obstruction by a barrier such as a bag over the head or other device that occludes the airway or deprivation of the delivery of oxygen by chemical replacement of the air can lead to death. Chloroform (Trichloromethane) is a clear liquid with a pleasant odor. It was discovered in the 1800’s and has been used for anesthesia in childbirth and surgery. It has rapid onset of atheistic properties but carries unwanted effects. Deaths due to the use of chloroform have been reported since the mid 1800’s. Chloroform can be made at home by combining bleach and acetone on ice, as readily seen on the Internet. Here we present a case of asphyxia in a woman who committed suicide by placing a rag soaked with homemade chloroform inside the plastic bags that she then placed over her head. At the scene a suicide note was found next to the decedent and there were empty bottles of bleach and cans of acetone present. There were empty ice trays and an empty bag of ice. A glass jar was present that contained a dried crystalline like substance and a pickle jar that contained a clear substance. An
Pre-existing damage or inherent weakness of the arterial wall is felt to be a required precursor for SCAD, and accordingly, associations with fibromuscular dysplasia, collagen vascular disorders, and certain hormonal states (post-partum, OCP use, etc.) have been identified. However, in many cases the exact etiology of this "weakness" is unclear.

Among the 18 cases, two consisted of infants drowned immediately or soon after birth. Of the remaining 16 cases, the average age was 3.7 years with a range of 2.5 months – 11 years old. Most incidents occurred at home, although a few involved open bodies of water. All of the offenders were the caregivers at the time of death, with a female majority and most being filicide. All but two of the cases (both neonates) underwent resuscitation attempts by emergency medical services and in hospital prior to demise. There was evidence of previous abuse or child protective services involvement in seven cases, and an additional seven caregivers had a history of mental health issues, substance abuse, or brain injury. External evidence of injury was seen in 13 cases (72%), and consisted mostly of abrasions and contusions. Internal injury was seen in 11 cases (61%) and consisted mostly of subgaleal and other head and neck deep tissue hemorrhages. Autopsy findings were largely nonspecific, with visceral organ petechiae, cerebral and pulmonary edema, and frothy or serosanguinous fluid within the pulmonary system noted at autopsy or by health care workers prior to demise.

Drowning deaths are often difficult to identify and rule as homicide, especially among pediatric cases. However, there are often signs of recent or remote injury, indicating abuse. A high index of suspicion is required, especially in cases where previous abuse or caregiver mental health disease is known. Close collaboration with the investigating agencies and a careful review of hospital and first responder reports are necessary by the pathologist to help recognize this challenging scenario and correctly determine manner of death.

Herein, we discuss the case of a 36 year old woman with no significant past medical history who presented to her local ED complaining of substernal chest pain radiating to her jaw. She was discharged without a cardiac workup and instructed to follow-up with her PCP. She did so, on the same day, and was diagnosed with anxiety and GERD, though scheduled for a follow-up stress test two days later. Though her symptoms persisted, the stress test was ultimately cancelled due to inclement weather (Hurricane Sandy) and that evening she suddenly collapsed and became unresponsive. Once EMS arrived, CPR was initiated, and spontaneous circulation was regained. Emergent catheterization showed dissection of the right coronary artery with complete luminal occlusion, however stent placement was unsuccessful. Despite relative hemodynamic stabilization, she failed to regain consciousness after withdrawal of sedation. She was ultimately transitioned to comfort care and expired eight days after admission. Autopsy revealed dissection of the right coronary artery, with complete occlusion of the lumen extending from the ostia to the bifurcation of the posterior descending artery with concomitant acute infarction of the postero-septal wall of the left ventricle. Histochemical examination of multiply unaffected vessels revealed increased mucopolysaccharide deposition within the vascular media, suggesting the possibility of an underlying collagen vascular disorder.

Previously felt to be an extremely rare occurrence, spontaneous coronary artery dissection (SCAD) is now believed to be responsible for 1-4% of cases of acute coronary syndrome, and is possibly responsible for up to 24% of myocardial infarctions in women <50 years of age. Despite its apparent frequency, this entity is grossly underdiagnosed due in part to the relatively healthy young age group that it commonly affects.

In the past 20 years, 18 cases of homicide in children have been examined at the Cook County Medical Examiner's office. This is the largest study of pediatric homicides to date. The cases were reviewed to examine age, sex, race, scene conditions, autopsy findings, postmortem tests, past medical history, family and social history, and alleged assailant.

A retrospective review of pediatric (age 13 years and younger) homicides from the Cook County Medical Examiner’s office over a 20-year period (1994-2014) identified 18 cases where drowning was the primary or secondary cause of death. The cases were reviewed to examine age, sex, race, scene conditions, autopsy findings, postmortem tests, past medical history, family and social history, and alleged assailant.
and most patients have no identifiable risk factors. In such cases, chest pain in the healthy young adult is often initially diagnosed as musculoskeletal stress without an extensive workup. This underdiagnosis, coupled with the large percentage of cases which present with sudden cardiac death, means that SCAD is often first discovered at autopsy. As recent studies have suggested possible familial associations, accurate post-mortem identification has become more important than ever.

**P24 Recertification from Suicide to Undetermined in a Previously Healthy Adult Taking Varenicline**

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Smoking related disease is major source of morbidity and mortality in the United States, causing an estimated 443,000 premature deaths per year. Pharmacologic aids including nicotinic acetylcholine receptor partial agonists such as varenicline are available to help smokers quit, and are generally considered safe and effective. However, in 2009 the FDA included a black box warning for varenicline due to reports of serious neuropsychiatric side effects including hostility, agitation, depressed mood and suicidal thoughts and/or actions. Subsequent studies have failed to conclusively identify the link between these behaviors and varenicline; however the label is still currently in place.

We present a case of a 46-year-old Caucasian female with no previous psychiatric history who was reported to the Medical Examiner’s office as an apparent suicide. The decedent was found face down in the river below a bridge from which she apparently had jumped. No foul play was suspected and no suicide note was found. The case was signed out as death due to blunt impacts to the head and trunk with multiple visceral, vascular, and skeletal injuries and the manner suicide.

Subsequent investigation reveals the decedent was currently taking varenicline and had recently increased her dose in an attempt to quit smoking. Her husband also claimed she displayed unusual and bizarre behavior just prior to her death. Extensive postmortem toxicology workup revealed the presence of nicotine metabolites and varenicline. Given the uncertainty surrounding the link between varenicline and neuropsychiatric side effects and the decedent’s lack of psychiatric history, the manner was subsequently recertified as undetermined. Medical examiners should be aware of the potential contribution of varenicline to apparent suicides in otherwise healthy individuals without a history of psychiatric illness.

**P25 The Role of the Medicolegal Death Investigator (MLDI) in a Mass Fatality**

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**Introduction:** The MLDI plays a vital role in mass fatality preparedness and management. The MLDI may be called upon at the local, state and federal level to assist with mass fatality management, training exercises, and deployment. The same components of a daily death investigation the MLDI conducts are the same when a mass fatality incident occurs. MLDI’s can be utilized in all areas of the mass fatality incident due to their versatility. They may function as team leaders to direct the activities of others or function as support staff for any part of the mission.

**MLDI Role Examples:**

1. **Recovery Site/Scene** The MLDI will be useful in organization of recovery teams and function as individual team leaders. The potential for each recovery site to be a crime scene exists on every event. Because the MLDI is skilled in processing crime scenes, they will be called upon for recovery site processing. Recovery teams will be organized in order to grid the scene, search for remains, document the scene, recover remains, evidence and personal effects, assign field recovery site numbers, and deliver the remains to the staging area.

2. **Morgue Operations** The MLDI’s versatility allows him/her to function as a station leader or member within a station in all sections within the temporary morgue including trailer management. External body exams, documenting, collecting, photographing and packaging personal effects, assisting other forensic scientists and tracking bodies in trailer management are but a few tasks that may be completed by the MLDI in the temporary morgue.

3. **Victim Identification Center (VIC) – Family Assistance Center** The MLDI assists in the VIC by conducting passionate interviews with families in order to collect antemortem information, provide guidance and information to next of kin, gather medical and dental records from medical and dental professionals, input data into database and conduct searches for possible matches of antemortem and postmortem information for possible positive identification.

**Discussion:** This presentation will cover the role of the MLDI and present actual experience of an MLDI in training exercise development of a regional mass fatality asset and DMORT deployment experience to various mass fatalities over the past 18 years including Korean Airline crash in Guam (1997), 9/11 NYC Terrorist attack and American Airlines Flight 587 crash (2001), Hurricanes Katrina/Rita (2005) and Joplin, Missouri Tornado (2011).

**Key Words:** Mass Fatality, Medical Legal Death Investigator, MLDI

**P26 Sudden Unexpected Death in Epilepsy: A Case Associated with Video Game Play**

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**Sudden unexpected death in epilepsy (SUDEP) is an underappreciated cause of death, with an annual rate ranging from 1/1000 in individuals with epilepsy up to a 35% lifetime risk in uncontrolled disease. The pathophysiology of death has been attributed to cardioautonomic and respiratory dysfunction, presumably interfered with by seizure activity, but without the activity or findings of status epilepticus. Triggers for seizures in individual cases may be variably identified, and there is a high incidence of structural brain lesions. Photosensitivity is a more common cause of seizures (up to 10%), particularly in younger individuals, with occasional popular press highlights including the “Pokémon” phenomenon. Particular factors including television and video games exposures are older televisions, low frequency signals and flashes, and close proximity.

We report the case of a 26-year-old black male found prone on a bed with a video game controller near his hand with the game placed on “pause.” He had a history of epilepsy, treated with lamotrigine. His last known seizure was within the month prior to death. On the day of his death, he was last seen at 08:00, known to communicate at 11:00, and found at 15:40.

Post-mortem examination demonstrated scant blood on his anterior teeth, with minimal postmortem lacerations but without evidence of hemorrhage, contusion, or large lacerations. There was no evidence of urine on his clothing and his bladder contained approximately 50 mL of urine. His BMI was 36.9 kg/m2 with an enlarged liver (2210 grams), but without microscopic evidence of steatosis or other abnormality. The stomach contained 30 mL of partially digested food, without evidence of pill fragments. There was no evidence of internal injury. Lamotrigine concentration of iliac blood was 5.7 mcg/mL (therapeutic range: 3-14 mcg/mL). Additional electrolyte analyses were all within the reference ranges.

The brain weighed 1540 grams and showed congestion with mild left uncinal herniation. The remainder of the gross examination was
and occipital lobe was submitted. The history available within medical immunohistochemistry, and integration of a patient's history. Attendees will understand the importance of cytomorphology, University of Mississippi Medical Center, Jackson, Mississippi Y. Al hmada, A. Azar, A. Mathew, S. Strauch

Brain of a Patient with No Medical History Provided

Melanoma from Metallic Fragment Deposition from a Projectile in the P28 The Use of Immunohistochemistry to Differentiate which led to pulmonary embolism and death. All of these factors contributed to deep vein thrombosis, increased inflammation and estrogen - and malignancy. Many tumors can

First, she had venous stasis due to the obstructive effect of her tumor. Second, she had endothelial injury secondary to tumor extension. And third, she was hypercoagulable secondary to both obesity - a state of deep vein thrombosis. The patient had several risk factors for deep vein thrombosis. 

leukomyosarcoma. This rare soft tissue tumor can arise from any area of the body containing smooth muscle, including but not limited to the retroperitoneum, gastrointestinal tract and uterus. Leiomyosarcomas within the retroperitoneum typically arise from the inferior vena cava or its branches. The patient had several risk factors for deep vein thrombosis. First, she had venous stasis due to the obstructive effect of her tumor. Second, she had endothelial injury secondary to tumor extension. And third, she was hypercoagulable secondary to both obesity - a state of increased inflammation and estrogen - and malignancy. Many tumors can exhibit procoagulant activity, and can also induce adjacent, normal tissue to do the same. All of these factors contributed to deep vein thrombosis, which led to pulmonary embolism and death.

The Use of Immunohistochemistry to Differentiate Melanoma from Metallic Fragment Deposition from a Projectile in the Brain of a Patient with No Medical History Provided

A neuropathology specimen consisting of portions of temporal, parietal, and occipital lobe was submitted. The history available within medical records was “20-year-old- white male, unspecified epilepsy with intractable epilepsy”. Brain microscopy revealed reactive astrocytes, Rosenthal fibers, and macrophages containing spherical, tan-black pigment. No cytomorphological atypia was observed. The specimen was evaluated for melanoma with a panel of stains: Prussian Blue, Fontana Masson, S100, HMB-45, and Mart-1. Prussian blue and Fontana Masson stained the spherical pigment within the macrophages cytoplasm and the spherical extracellular debris. S100 had a diffuse, non-specific staining, intensifying color in the intra/extracellular spherical debris. Mart-1 and HMB-45 didn’t reveal the characteristic melanoma cytoplasmic staining; only the intra/extracellular spherical debris was highlighted.

After the panel, additional information became available. The patient was shot in the left parieto-occipital lobe with a pellet gun at 9-years-old. Afterwards, he had seizures which worsened; now occurring twice a week. A 0.5 cm, 5.42 GN, metallic, mildly deformed pellet was retrieved. Forensic pathology was consulted. The spherical debris observed on H+E stain looked similar to the black spherical soot seen in histological specimens taken from contact gunshot wounds; however given a pellet gun (air powered weapon) was used, no soot should be present. Air powered weapons expel projectiles by rapidly expanding gas, not generated from the combustion of propellants (1, 2). It is the burnt propellant that forms soot (1). Sections of soot and metallic fragment deposition were taken from a forensic autopsy case involving a contact gunshot wound with a medium caliber projectile. The H+E sections of the autopsy were compared to the neuropathology specimen, showing similar morphology of spherical debris. Autopsy sections were stained with the same panel as above. The Mart-1 and HMB-45 stained the spherical extracellular debris similar to the surgical case. The S100 and Fontana Masson stained the extracellular spherical debris similar to the neuropathology specimen, although the S100 was present only in the spherical debris. Prussian Blue had rare staining of the extracellular spherical debris and intracellular staining was attributed to red blood cells.

We believe the similar staining patterns found in the spherical debris are due to cross-reactivity between the metallic fragments of the projectile and the immunohistochemical stain. We advise the use of cytomorphology, consults, and continued contact with the surgical team in a case of unknown pigment with pan-staining immunohistochemistry.

In gunshot wound cases, forensic pathologists must account for all external skin defects (entrances, exits, other) and projectiles, including those known to have exited the body, and those that remain within the body. In certain situations, a phenomenon known as “tandem bullets” can cause difficulties when attempting to account for all defects and projectiles.

In this report, we present a tandem bullet case in which a 14-year-old was the victim of a gunshot wound homicide in which he sustained a single indeterminate-range gunshot wound of the upper abdomen. Prior to transport from the scene to the hospital, emergency care providers discovered a bullet within the clothing, adjacent to an apparent exit wound of the back. A subsequent radiograph at the emergency department showed the presence of an additional projectile internally. On internal exam, a single bullet track divided into two, with one extending to the exit wound, and one leading to a second bullet. Gross and microscopic examination of the two projectiles by a firearms examiner confirmed that they represented tandem bullets. Classically, tandem bullets are associated with self-loaded or poor-quality cartridges, as a projectile from a cartridge with non-optimal gun powder becomes lodged in the barrel because of insufficient force to discharge it from the gun. Subsequent discharge of a normal round causes both
bullets to be expelled from the gun. Depending on the range-of-fire, tandem bullets may produce a single entrance wound or separate entrance sites.

In clinical practice, trauma specialists sometimes refer to the "bullet rule," wherein the sum of bullet wounds on the skin surface (entrances and exits) and the number of projectiles detected on imaging studies should always be an even number. Forensic pathologists essentially follow the same reasoning, ultimately requiring an accounting for all skin defects and projectiles. If the "bullet rule" is "broken," further investigation is warranted to account for the discrepancy. A situation involving tandem bullets with a single entrance wound is one of several instances wherein the bullet rule may be "broken." In the case presented, the bullet rule is broken because the number of projectiles on x-ray (1) plus the total number of entrances (1) and exits (1) is three, an odd number. In addition to discussing tandem bullets, this report will provide a review of other situations in which the bullet rule may be broken.

P30 Death on the Job: A Two-year Review and Policy

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Introduction: Deaths at the workplace can represent a significant caseload in the medical examiner setting. Establishing and adhering to clear criteria for which cases demand a full postmortem exam can be a challenge, due to both variances in national, regional and local guidelines as well as budgetary and resource limitations.

Methods: Records were obtained from The Office of the Cook County Medical Examiner for a two-year period (2012-2013) for deaths which were flagged as "injury at work." For each case, the age, sex, race, manner, cause of death and whether or not a full postmortem exam was performed was recorded. Performance standards were obtained from the National Association of Medical Examiners, The Illinois Coroners and Medical Examiners Association and The Office of the Cook County Medical Examiner.

Results: A total of 224 cases were reviewed. The average age was 52.4 years. Males accounted for 197 (88%) of the cases and females accounted for 27 (12%). Caucasians comprised 71% of deaths while Blacks comprised 25% of deaths. As for manner, 142 (63%) were natural, 63 (28%) were accidental, 15 (7%) were homicide and 4 (2%) were suicide. There were 157 cases (70%) in which a full postmortem examination was performed. For nearly all cases in which a full postmortem exam was not performed the cause of death was multiple injuries/blunt trauma or a cardiovascular death.

A review of standards at the national, state and local level revealed a range of recommendations. The National Association of Medical Examiners recommends autopsy when the death is due to "acute workplace injury." The Illinois Coroners and Medical Examiners Association requires autopsy if "the death is due to a workplace injury, or occurs at work." The Office of the Cook County Medical Examiner requires autopsy on cases of a) industrial accidents, b) apparent natural disease but no documented significant medical history, c) apparent natural disease with documented significant medical history age 65 and younger, but not for apparent natural death with a significant documented medical history and age 56 or older.

Conclusions: Workplace deaths can represent a significant caseload in the medical examiner setting. Familiarity with national, state, local and individual office guidelines for which cases demand a full postmortem exam is essential for fulfilling duty to the public, budget stewardship and resource allocation.
deaths. Both children were delivered prematurely via cesarean section at 36 weeks gestation. The first case involves a 20 month-old girl with congenital hydrocephalus secondary to cerebral aqueductal stenosis, who was found unresponsive on an adult bed approximately four hours after she was last known alive. The second case involves a 10 year-old girl with a history of DiGeorge syndrome (22q11.2 deletion), who was found unresponsive only 10 minutes after she was last known alive. Postmortem examination revealed that these two cases had neuropathologic features in common: intact and unobstructed ventriculoperitoneal shunts, generalized brain edema, temporal lobe structural abnormalities and cerebral polymicrogyria. SUDC is extremely rare, and literature on the subject is sparse. In light of this, the authors provide a review of risk factors predisposing children to SUDC and propose possible mechanisms of death applicable to these cases, such as the role of childhood epilepsy in cardiac arrhythmias, gastrointestinal pathology and ventriculoperitoneal shunt malfunction, and the relationship between serum levels of anti-epileptic drugs and SUDC.

P33 Basal Vacuolization Marks Ketoadicosis  
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Basal vacuoles seen in proximal convoluted tubules have been identified in cases of diabetic ketoacidosis and described by some as the “Armanni-Ebstein (AE) lesion, AE phenomenon or AE Diabetic Nephropathy.” More recently they have also been described in other deaths with ketoacidotic metabolic derangements: hyperglycemia, ketoacidosis (diabetic or alcoholic), ethanol intoxication/toxicity, starvation and hypothermia. On examination, the vacuoles are not glycogen and do not stain with periodic acid Schiff (PAS) stain. Other studies have shown the basal vacuolar contents to be neutral lipid (triglycerides).

Armanni and Ebstein originally described glycogen-containing vacuoles in tubules at the corticomediullary junction, a very different lesion morphologically. A detailed morphologic analysis of the glycogen lesion in 1957 by Ritchie and Waugh described basal vacuoles containing lipid rather than glycogen in the proximal tubules in two of their eight cases and specified that these lesions were “not the portion involved by the Armanni-Ebstein lesion” (1). More recently in 2013 Zhou, et al recommended the term “basal vacuolation” be used when referring to lipid within the proximal tubular epithelium to specify lesions related to ketoacidosis. The lesions should not be confused with the Armanni-Ebstein lesion.

P34 Suicide by Natural Gas  
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Natural gas (NG) is a hydrocarbon-based energy source used to run household appliances. It is flammable, explosive and potentially lethal if inhaled. Our objective is to review suicides by NG and to emphasize the importance of case investigation. Files at our institution were searched between 1993 and 2014 for “natural gas” and “explosion”. 16 cases were retrieved and 6 cases remained after exclusion of accidents and explosions not caused by NG. Case 1: A 55-year-old male with depression was found on his lawn after his house exploded. He admitted to “undoing the gas fittings of the water tank and lighting it up”. At autopsy, he had burns of the skin, esophagus and stomach. Carboxyhemoglobin was unremarkable. Case 2: A 35-year-old male alcoholic threatened to kill himself. The next day, his house was destroyed by explosion and fire. “Stink bomb” was written on a note pad. The NG line was disconnected from the water heater. At autopsy, the body was charred and soot stained the airways. Carboxyhemoglobin was 35%. Case 3: This 31-year-old male was found in his basement. A note read “Do not enter. Gas leak”. A garbage bag was over the head and a hose attached to the cut NG line was directed towards the face. Lung tissue was positive for ethane and propane. Case 4: This 46-year-old depressed female was found inside her house after an explosion and fire. The NG line supplying the stove was intentionally opened. At autopsy, there were burns over 50% of the body and soot in the airways. Carboxyhemoglobin was 77%. Case 5: This 60-year-old female had a psychiatric history. The landlord arrived to collect rent and witnessed the house explode. The furnace had been disconnected from the NG line. At autopsy, the body was charred and soot lined the airways. Carboxyhemoglobin was 79%. Case 6: This 52-year-old female with depression was found unconscious in a fire engulfed furnace room. The NG line had been disconnected from the furnace. She survived 6 days. Carboxyhemoglobin was 67%. At autopsy, there were burns over 50% of the body. The airways had soot and inflammation. Anoxic ischemic encephalopathy was noted. Suicide by NG is uncommon. We present six cases. A thorough investigation is necessary for appropriate classification of manner of death in these cases.

P35 Takayasu Arteritis: A Rare Cause of Sudden Cardiac Death in a Young Person  
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Takayasu arteritis is a vasculitis involving the large vessels, most commonly the aorta and proximal segments of its main branches, the pulmonary artery and, in rare cases, the coronary arteries. The disease predominantly affects young females, from an age of 20 to 50 years. The yearly incidence of 3 cases per million makes this a rare disease. The incidence of coronary artery involvement is reported to be present in 15-30% of cases making coronary manifestation of the disease a particularly rare cause of sudden cardiac death. The etiology of Takayasu arteritis is uncertain, but an immunogenic association has been suggested. The condition is known to cause an inflammatory induced thickening of the walls of affected vessel walls. The condition presents in two phases; an acute phase with a wide variation of symptoms lasting weeks to months followed by an occlusive phase. An asymptomatic period may precede the occlusive phase by several years. We present a case of a 22-year-old Caucasian female with no known past medical history. She complained of chest pain and difficulty breathing when she suddenly collapsed and died at work. At autopsy she was found to have markedly congested lungs with a combined weight of 1,650 grams. The heart chambers and valves
degeneration. The findings were consistent with the diagnosis of occlusive Takayasu arteritis with isolated findings in the coronary arteries.

In these regions, the vessels showed marked stenosis with pin-point left main, left anterior descending, circumflex, and right coronary arteries. Sections of the coronary arteries showed equally affected subtotal luminal occlusion with adventitia and media replaced by fibrous scarring, obliteration of the vaso vasorum, irregular intimal thickening and medial degeneration. The findings were consistent with the diagnosis of occlusive Takayasu arteritis with isolated findings in the coronary arteries.

P36 Hemoglobinopathy Masquerading as Cerebral Infarct and Hemorrhage: An Important Addition to the Differential Diagnosis.
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Sickle cell disease (SCD), sickle cell trait or compound heterozygous variants (hemoglobin C, thalassemias) comprise a group of hemoglobinopathies resulting in red blood cell (RBC) deformation into the classic crescent or sickled shape. This RBC distortion underlies the pathogenesis, resulting in vaso-occlusion and hemolysis and potentially leading to severe end-organ injury, permanent disability and even death.

We present a case of a 60-year-old transient Black female who was found outdoors, snoring and unarousable. She was transported to the hospital and found to be suffering from pulmonary thromboemboli and multiple cerebral infarcts. A definitive diagnosis was not rendered and she expired after five (5) days when life supportive measures were withdrawn due to her poor prognosis.

Neuropathologic examination revealed multiple hemorrhagic infarcts including a large right temporal lobe intraparenchymal hemorrhage, diffuse cerebral edema with hemiation and midline shift. Brain microscopic sections showed distended intraparenchymal blood vessels containing back to back sickled RBCs, foci of acute infarcts, and diffuse acute hypoxic-ischemic neuronal change. Microscopic examination of the heart, kidneys and liver similarly revealed sickle shaped RBCs within the capillaries. The pulmonary thromboemboli were confirmed at autopsy. Toxicological analysis of accompanying hospital blood showed no evidence of alcohol or drugs of abuse. The cause of death was attributed to complications of intracerebral hemorrhage with multiple cerebral infarcts and cerebral edema due to thromboembolic phenomena due to sickle cell crisis.

We report a most unusual case of multiple hemorrhagic infarcts and pulmonary thromboemboli due to hypoxic crisis in an underlying hemoglobinopathy, likely SCD/trait. Clinical manifestations differ considerably among forms of SCD, ranging from asymptomatic anemia to significant venous thromboembolic disease, and ischemic or hemorrhagic stroke. Furthermore, it is not uncommon that past medical history or other indices of suspicion emerge.

P37 Body-Found-in-Water Death Investigation
A.P. Zafres
Dutchess County Medical Examiner, Shokan, New York
After this presentation, attendees will be able to explain the importance of applying a standardized scientific approach to the investigation of body-found-in-water (BFIW) deaths. This presentation will impact the medicolegal death investigation community by raising awareness of critical questions and evidence typically missed in BFIW cases; stating challenges specific to BFIW cases and solutions to overcome them; and providing investigative protocols and documentation forms proven effective in numerous cases, including 10 BFIW homicide investigations.

BFIW cases, which can involve such environments as bathtubs, toilets, buckets, rivers, lakes, and oceans, pose challenges when it comes to recognizing signs of foul play, as evidenced by the unusually large percentage of BFIW cases in which the manner of death is initially ruled as accident and after subsequent investigation changed to homicide. These subsequent investigations may not occur until months or years later, when another similar death occurs, life insurance companies raise concerns, or other indices of suspicion emerge.

Initial misdiagnosis in the majority of cases occurs as a result of faulty assumptions made at the scene. Examples include: “cause of death is drowning and manner is accident”; “the unsupervised toddler fell into the pool”; “the child was swept away in current”; “the boat accidentally overturned.”

Poor swim skill findings are too often used to support initial accidental drowning assumptions by investigators. Positive toxicology findings may erroneously support assumptions of an accidental or suicidal manner of death made by investigators who fail to consider that perpetrators may use substances to incapacitate their victims and conceal a homicide. These assumptions, coupled with the absence of specific BFIW and homicidal drowning training, can result in an inadequate investigation that misses homicide indicators.

When only benign circumstances are reported in the primary investigation, forensic pathologists may perform a standard autopsy or only an external examination as they lack justification to perform an autopsy more appropriate for a suspicious death. Routine exam may overlook crucial signs of injury, such as posterior neck and back subcutaneous contusions, and prevent investigators and pathologists from spotting incongruities between documented injuries and scene and witness statements.

The presentation will include an informative study of over 400 BFIW cases, among them 33 BFIW homicides. It will give examples of critical documentation often omitted during investigations that forensic pathologists can ask of law enforcement and can document in autopsy reports.

P38 Identifying Modifiable Reasons for Performing External Examinations Only at the Coroner’s Office.
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Lucas County Coroner’s Office, Toledo, Ohio
All deaths accepted at Lucas County Coroner’s Office (LCCO), Toledo Ohio, have either an autopsy performed or an external examination only, to determine cause and manner of death. At LCCO an external examination only is done on bodies of those individuals who are generally 50 years or older with established chronic diseases, and any other person with severe chronic and congenital diseases. The deaths should have no unnatural component on investigation.

The external examinations use resources such as transport fee to bring body to LCCO and investigators time to enter the data. Forensic

This case underscores the importance of detailed microscopic examination in cases revealing a mixed thromboembolihemolysis phenomenon. Screening using high pressure liquid chromatography or confirmation testing of SCD by hemoglobin electrophoresis was not performed as the diagnosis was not initially entertained. However, in the absence of other explanatory findings, the presence of sickled RBCs distending the cerebral vasculature associated with hemorrhagic infarcts is consistent with an underlying diagnosis of a sickle cell hemoglobinopathy and postmortem hemoglobin electrophoresis should be pursued for definitive diagnosis.

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pathologist and autopsy technician document, photograph and do external examinations to rule out any trauma while at the same time inventory clothes, property, medications and collect body fluids as deemed appropriate. The two steps not done routinely are performing an internal examination and toxicology screen for drugs. Most of the inspections are signed out with a natural manner and all the death certificates are completed by the Coroner’s Office. On average LCCO does approximately 19% external examinations annually of total postmortem examinations performed.

A retrospective study was done to identify various reasons for conducting external examinations only (called as inspections at LCCO) and to compare data over two separate years. In 2009 a total of 1192 examinations were performed of which there were 969 autopsies and 223 inspections. In 2014 a total of 1357 examinations were performed of which there was a total of 1098 autopsies, and 261 inspections. The purpose of the study was to determine modifiable reasons, which could be changed to reduce the number of inspections.

The reasons included deaths of individuals who had no personal physician, all veterans who were patients of Veterans Affairs Medical Center, local personal or hospital physicians not feeling “comfortable” or simply “refused” to sign the death certificate, personal physicians could not be reached in a timely manner, and family did not have a funeral home at the time of death. A few autopsy cases were inspected to accommodate religious and family objections. The most common reason for inspections was that there was no one available to sign the death certificate. Provided the deceased had a personal physician, this was considered a modifiable parameter as the physicians could be encouraged to sign death certificates and hence fewer inspection cases would be performed.

P39 WITHDRAWN

P40 Analysis of Deaths Related to Alleged Medical Malpractice: A Retrospective Study of Forensic Autopsy Cases in Beijing, China, 2002-2011

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Although more and more Chinese people have access to health care, the number of alleged medical malpractice cases have increased significantly in China in the past decade. Very few studies have been done, especially from the perspective of the forensic medicine, to demonstrate the extent and characteristics of the alleged medical malpractice cases. This study aims to evaluate the medical malpractice litigations in Beijing and to examine the role of forensic experts in the investigation of medical malpractice cases.

The Key Laboratory of Evidence Science (KLES) at China University of Political Science and Law (CULP) is responsible for investigation of almost all the alleged medical malpractice cases in Beijing. A retrospective study conducted by KLES-CULP revealed that a total of 784 deaths were resulted from alleged medical malpractice in Beijing during 2002 to 2011.

Of the 784 cases, 448 (57.1%) were male patients and 366 (42.9%) were female patents. The age of the patients ranged from 0 to 90 years, with average age of 44 years. There were 18.9% (N=148) cases in the age group of 61 to 70 forming the largest group, followed by 14.8% (N=114) cases in the age group of 51 to 60, and 13.8% (N=108) cases in the age group of 31 to 40. The alleged medical malpractice cases involved 11.3% of newborns and 15.3% of young adult aged between 21 and 30 years. Of the 784 cases, clinical departments involved in claims most often were general surgery (n=120, 15.30%), neurology (n=116, 14.79%) and cardiology (n=100, 17.26%). The remaining 40 cases involved otolaryngology, radiology hematology, anesthesiaology, and urology.

Based on the evaluation by the Forensic Appraisal Committee at KLES, medical error or medical malpractice was found in 504 (64.3%) cases. Of the 504 medical malpractice cases, the top four medical misadventures were: improper performance of procedures, insufficient diagnostic examination, diagnostic error, and medication error. Although teaching hospitals were more likely to be sued than the non-teaching hospitals (N=660, 84.2% vs N=124, 14.8%), there was no significant difference between teaching and nonteaching hospitals in the percentage of confirmed malpractice cases (N=464, 70.0% vs N=345, 61.3%).

In conclusion, medico-legal death investigation plays a significant role in the determination of medical malpractice litigations. Data from this study can also be used to improve the public healthcare system.

P41 Aortic Root Dissection, Type A, Extending into Three Coronary Arteries Causing Sudden Unexpected Death in a 37-Year-old Non-pregnant Woman

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Attendees will understand the importance of aortic root dissection as an etiology in myocardial infarctions in young, non-pregnant women and the significance of dissection of the aortic arch and ostia.

We report a rare case in which a young, non-pregnant woman presented to the emergency room for chest pain. She had an elevated ST myocardial infarction. A right coronary artery dissection was identified by cardiac catheterization. An intra-aortic balloon (IABP) was placed, emergent open heart surgery followed. A hematoma was in the ascending aorta without dissection. Grafts were placed and an echocardiogram showed ventricular function. With worsening cardiogenic shock, the IABP was removed and extracorporeal membrane oxygenation cannulation (ECMO) initiated. She declined and care was withdrawn. At autopsy, ECMO procedures were intact and grafts patent. The right, left circumflex and left anterior descending coronary arteries revealed dissection throughout their length with luminal obstruction and atherosclerosis. Sectioning at the right coronary artery ostium revealed an ascending aortic dissection in the proximal 2.5 cm without intimal tear. Microscopy revealed blood clot between the adventitia and media of the ascending aorta. The right, left circumflex, and left anterior descending arteries revealed similar dissections resulting in 70-90% luminal occlusion. There was no cystic medial degeneration. Elastin stains revealed normal elastic fibers.

Retrograde dissection reaching the coronary ostia is rare (7% of autopsies) and can be a complication of coronary angioplasty from catheter trauma and balloon inflation (1, 2). Myocardial ischemia can result from a type A aorta dissection (1, 5). ST elevations in Type A are caused by intimal dissection of the coronary arteries involved (1, 3, 4, 6, 7, 9). Mortality rates are 20%-57%, postoperatively (1, 4, 7, 9). Aortic dissections are typed by location along the aorta as Stanford A (dissection proximal to the left subclavian artery (LSA)) and Stanford B (dissection distal to the LSA) (4, 10). Three coronary ostial lesions are described. Type A lesions dissect at the coronary ostia, type B lesions involve the coronary ostia dissecting along the artery creating a false lumen, and type C lesions have circumferential detachment with inner cylinder intussusception (1, 5, 8).

In cases of recent cardiac surgery or myocardial infarction, we recommend careful dissection of the coronary arteries and aorta to identify aortic dissection.
P43 Suicide by Bomb, with Decapitation
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Suicidal explosions are rarely encountered within civilian forensic pathology practice; however, several reports are contained within the medical and scientific literature. Trauma related to suicidal explosions typically involves the head or trunk. Although the head is a common location of suicidal explosive injuries, complete decapitation is not the norm.

We present the case of 65-year-old military veteran whose body was found on its back, in a “sitting position” in a collapsed folding lawn chair, in the backyard of his home. A suicide note was found in the home, along with numerous explosives. There appeared to be total absence of the head. Remote, handheld detonating devices were found on the ground, near the body. According to neighbors, the victim was very suspicious of the government and frequently set-off fireworks and other explosives. The same neighbors had heard the largest explosion they had ever heard 4 days previously. Because of anti-government statements present within the suicide note, the local bomb squad was dispatched in order to perform a robotic search for further explosives. Once the scene was clear, the body was transported for autopsy performance. There was no evidence of any large tissue fragments anywhere at the scene.

At autopsy, there was no evidence of shrapnel or explosive materials. No residual head or neck tissue was present. The skin margins of the upper chest and shoulders demonstrated irregularly jagged borders with areas of soot and charring focally. The underlying soft and bony tissues were markedly damaged by explosive injuries. Both knees demonstrated severe injuries medially. A urine drug screen was positive for various over-the-counter and prescription drugs; however, as there was virtually no blood remaining within the body, additional toxicology testing was not performed. Positive identification was made by fingerprint comparison. Reconstruction of the event suggested that the decedent sat in a lawn-chair, placed the explosive device between his knees, and leaned forward, with his head close to the device.

The investigation of explosion-related fatalities can be a substantial challenge and requires a collaborative effort among all agencies and departments involved in the investigation. Complex evaluation of all physical evidence and circumstantial factors derived from the scene investigation and postmortem examination, including the nature, distribution, and extent of the wounds, in conjunction with preceding medical and social history greatly enhances the investigator’s ability to reconstruct the fatal event.

P44 Pediatric Death Investigation in Ontario, Canada: Analysis of a 6-Year Period from 2005 to 2011
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1Office of the Chief Coroner and the Ontario Forensic Pathology Service, Toronto, Canada; 2Office of the Chief Coroner, Toronto, Canada; 3Ontario Forensic Pathology Service, Toronto, Canada
In Ontario, Canada, death investigation is jointly provided by the Office of the Chief Coroner (OCC) and the Ontario Forensic Pathology Service (OFFS). Together, we form a division within the Ministry of Community Safety and Correctional Services. In Ontario, coroners are medical doctors with specialized training in the principles of death investigation. Forensic Pathologists are either Anatomical or General Pathologists with subspecialty certification in Forensic Pathology.

We analysed child and youth deaths in Ontario compared to the overall number of deaths in Canada, and documented trends. Information from the database of the Coroner’s Information System (CIS), the Pathology Information and Management System (PIMS), and the Pediatric Death Review and Deaths Under Five Committees (DUSC) Annual Report, 2014, were reviewed. We investigate approximately 20% of all deaths that occur within the province each year. Paediatric deaths (i.e. from live birth to the nineteenth birthday) over the past five years account for approximately 35% of deaths investigated. From 2005 to 2011, the average number of pediatric deaths investigated by Ontario was 1241, while the average number of deaths investigated overall for Canada was 3479. Between 2005 and 2011, the year-to-year totals have remained fairly consistent both in Canada and Ontario. Over this 6-year period, the OCC investigated approximately 23% of infant deaths (<1 year), 85% of deaths between 1-4 years, 54% of deaths between 5-9 years, 41% of deaths between 10-14 years, and 84% of adolescent deaths (15-19 years).

Natural and undetermined manners of death dominated the investigations of children under one, gradually changing to non-natural manners (accident, homicide and suicide) towards adolescence. Over the past five years, the DUSC reviewed between 92 and 108 cases (in 2013, 55 cases were reviewed). The manner of death for the majority of cases over the five year period was “undetermined.” One of the significant changes to the cause of deaths in these cases is classifying them as “undetermined”, where there is a comprehensive death investigation, but no conclusive findings.

P45 Intimal Sarcoma Presenting as Fatal Bilateral Pulmonary Embolism with Cardiac Tamponade
J.P. Sherbeck, J. Jenetz
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Intimal sarcoma is a rare malignant neoplasm, defined by the World Health Organization (WHO) as a malignant mesenchymal tumor arising in large arterial blood vessels, with the defining feature of predominantly intraluminal growth. Given this intravascular growth pattern, acute presentations of pulmonary intimal sarcomas share significant symptomatology and pathophysiology with acute pulmonary embolism. Moreover, given their acute presentation, definitive diagnosis is often not evident until the time of autopsy. Histologic evaluation typically demonstrates an undifferentiated high-grade sarcoma, though areas of rhabdoid, angiomatoid, and other differentiation, can be seen.

Here we report a fatal case of a previously healthy 39 year old male who presented with chest pain and respiratory distress. He was initially diagnosed a bilateral (saddle) pulmonary embolism, cardiac tamponade, and an associated mediastinal mass. The decedent underwent both pharmacological and mechanical thrombolysis, but remained refractory to therapy, without significant improvement in oxygenation. He ultimately expired prior to definitive histologic diagnosis of the mediastinal mass. The clinical impression of the cause of death was acute pulmonary embolism. Post-mortem gross examination revealed a large mass growing within the pulmonary artery lumen, with contiguous growth from the pulmonic valve to the bilateral segmental pulmonary arteries. The tumor also showed direct invasion into the pericardial space near the base of the heart. Histologic examination confirmed an intraluminal growth pattern of a high-grade sarcoma with both spindled and epithelioid features, consistent with an intimal sarcoma.

While intimal sarcoma is a rare neoplasm, sudden unexplained death suspicious for pulmonary embolism, is commonplace in forensic pathology. In this setting, intimal sarcoma represents an important entity in the differential diagnosis. Understanding of this lesion, and ability to accurately diagnose it, is essential for the forensic pathologist.
P46 A Medical Examiner Officer’s Experience with Vagal Nerve Stimulators
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1Jackson County Medical Examiner’s Office, Kansas City, Kansas; 2Jackson County Medical Examiner’s Office, Kansas City, Missouri

Introduction: The Food and Drug Administration has approved vagal nerve stimulation for treatment of refractory epilepsy. Vagal nerve stimulators (VNS) send impulses up the vagus nerve to inhibit the propagation of seizure activity as it courses through the brain. We describe four cases of individuals who died suddenly with implanted VNS.

Case Reports: Four individuals with VNS were brought to the Jackson County Medical Examiner’s Office for examination between January and March, 2015 after sudden, unexpected deaths. A 22-year-old male with seizures since age 3 was found deceased the day after an unremarkable frontal lobe resection. A 29-year-old female with uncontrolled complex partial and grand mal seizures was found deceased in bed. A 31-year-old male with epilepsy and type I diabetes mellitus had a “HI” glucometer reading the night prior to death. Lastly, a 64-year-old hypertensive male had a history of a remote stroke with resultant seizures. He had recent complaints of hyperglycemia, frequent urination, and slurred speech.

Results: The first two individuals died of epileptic seizure disorder. On examination, the 22-year-old male had findings suggestive of tuberous sclerosis. Histologic sections of his medulary nuclei demonstrated neuronal depletion and gliosis. The 28-year-old female’s examination was remarkable only for obesity and a black thyroid. The third decedent had a vitreous glucose of 509 mg/dl without ketone bodies. His cause of death was hyperglycemic hyperosmolar syndrome. The fourth decedent had cardiomegaly with extensive fibrosis, remote cerebral infarct, acute bronchopneumonia, and an electrolyte pattern consistent with diabetic ketoacidosis, which was the cause of death. Each implanted VNS was attached to the left vagus nerve in the neck.

Discussion: The vagus nerve relays signals between the brain and various parts of the body via nuclei in the medulla oblongata. These signals regulate body processes including heart rate, blood pressure, breathing, speech, and digestion. To treat seizures, stimulation is sent from the VNS to the vagal nuclei. This stimulation is thought to inhibit seizures by increasing levels of gamma-aminobutyric acid. However, the exact mechanism is poorly understood. This report presents an anatomic correlation to chronic VNS action. The neuronal depletion and gliosis correlates with the above theory of inhibitory stimulation. However, all four patients died from physiologic issues usually improved by chronic use of the VNS. Given the complex central and peripheral functions of the vagus nerve, including possibly detrimental bradycardia and bradypnea, continued study into the long term effects of vagal stimulation is warranted.

P47 Sudden Death in an Individual with Neurofibromatosis Type 1
R.J. Miller, D.C. Peterson, M.H. Dudley
Jackson County Medical Examiner’s Office, Kansas City, Missouri

Introduction: The neurofibromatoses are genetic nervous system disorders that are rarely seen in the forensic setting. They are usually diagnosed early in life, followed closely to manage disease-related symptoms and complications. This report describes a case of 59-year-old black female who died suddenly with a medical history of “neurofibromatosis”. She was diagnosed in infancy and had no additional management or follow-up concerning that diagnosis.

Case History: A 59-year-old black female was found unresponsive in a front lawn 2 ½ hours after helping her granddaughter board a school bus. Emergency personnel arrived and began resuscitation efforts en route to the hospital. Investigation revealed that she had been diagnosed with "neurofibromatosis" in infancy, but was not currently seen by a primary care provider or taking any medications. She had no antemortem complaints. After approximately one hour, she was pronounced dead in the emergency department.

Results: A postmortem external examination demonstrated multiple hyperpigmented skin spots, including café au lait spots, and multiple palpable and visible subcutaneous nodules. The postmortem internal examination demonstrated multiple nodules and tumors of the subcutaneous tissue, mediastinal and omental soft tissues, pancreas, right adrenal gland, left ovary, thyroid, and spinal cord. Additional gross findings included a right pulmonary artery thromboembolus, hypertensive and atherosclerotic cardiovascular disease, emphysema, and mild lumbar scoliosis. Histologic sections revealed multiple different tumors. Neurofibromas were identified in sections of skin and of a left T7 nerve root. A neuroendocrine tumor, consistent with a pancreatic primary, was identified in sections of the pancreas, omentum, and mediastinum. A section of the right adrenal gland demonstrated a pheochromocytoma. The thyroid gland demonstrated multinodular goiter with a dominant nodule, and endometriosis was identified in the left ovary. Incidental findings included arteriolonephrosclerosis, a left eye cataract, and bronchoalveolar atypical adenomatous hyperplasia in a section of right lung.

Discussion: Although sudden death in the setting of a pulmonary thromboembolus is common in a forensic setting, this report shares a myriad of gross and histologic findings not commonly encountered by a forensic pathologist. These findings helped us categorize the decedent’s diagnosis of “neurofibromatosis” into a more specific diagnosis of neurofibromatosis type 1. It was important to relay not only the cause of sudden death to the family, but also, given the genetic nature of her underlying disease, information about the possible inheritance of neurofibromatosis to other surviving members of the family.

P48 Sudden Death due to Spontaneous Small Bowel Perforation within an Incarcerated Umbilical Hernia
A. Maskovyak, J. Felo
Cuyahoga County Medical Examiner’s Office, Cleveland, Ohio

Umbilical hernias are estimated to occur in up to 20% of patients with long standing cirrhosis and ascites. Complications such as strangulation and infarction of the bowel or rupture of the bowel loops and/or hernia sac are uncommon but potentially life-threatening consequences. Often these events happen in association with trauma to the abdomen or after procedures such as paracentesis. Spontaneous rupture is more likely in cases where strangulation and subsequent necrosis of the bowel has weakened and thinned the incarcerated intestinal wall.

We report a case of a 63 year-old male with a history of alcohol abuse complicated by cirrhosis and ascites who was found dead in his home approximately 30 minutes after last being seen alive. He was found at rest in a seated position without evidence of recent trauma. At autopsy an ulcerated umbilical hernia was present containing a loop of perforated, necrotic small bowel. There was evidence of peritonitis including one liter of yellow-red fluid accumulation in the peritoneal cavity, multifocal areas of fibrinous debris adherent to the small bowel, and a dull gray discoloration to the peritoneal lining. The case was signed out as death due to peritonitis and spontaneous perforation of small intestine due to strangulated and infarcted small intestinal umbilical hernia and the manner natural.

Although spontaneous perforation of the bowel within a hernia sac is uncommon, it may contribute to sudden death in patients lacking a history of trauma or recent medical procedures and physicians certifying these deaths should be aware of the possibility.
Homemade Deer Hunting Tree Stand: A Unique Cause Of An Asphyxial Death

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A tree stand is a key aspect to deer hunting – small and set high up in a tree, it allows for an ideal, quiet setting for a hunter to be successful. However, with this type of equipment comes a tradeoff for risk – the safety of the hunter. Not only do tree stands have to be made and installed properly to ensure maximum safety, the operator should also be wearing a safety harness in case any malfunction should occur. Given the scenario, and the fact that some hunters opt to not wear a safety harness, it is not surprising that most accidents result in falls and subsequently, blunt force injuries. What makes our case interesting is that the decedent suffered an asphyxial death following collapse of a tree stand.

The decedent had been using a deer stand and a homemade harness that was tied around his waist when the stand gave way, leaving him suspended in the air with his feet towards to ground. This resulted in the homemade harness pushing up and in on his abdomen and chest secondary to his weight and gravity. The pressure on his upper abdomen, diaphragm, and chest, interfered with his ability to expand his chest cavity, eventually leading to a mechanical asphyxial death.

The goal of this presentation is to not only highlight a rare cause of asphyxial death, but to also address the need for evaluation of the tree stand themselves in a death investigation with focus on safety guidelines of these stands and their accompanying safety harnesses. Although tree stand mishaps often times result in blunt force trauma as the cause of death, it is important to realize that other causes of death, such as asphyxial deaths, can occur as well.

An 8-Year Review of Accidental Swimming Pool Drownings at the West Tennessee Regional Forensic Center, 2006 - 2013

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According to the World Health Organization nearly 4,000 people die per year from unintentional drowning in the United States. Drowning in swimming pools accounted for 16.3% of these deaths. The primary purpose of this retrospective study was to present the epidemiologic review of accidental swimming pool drownings reported to the West Tennessee Regional Forensic Center (WTRFC) for an 8-year period, from 2006 to 2013. The secondary purpose of this study was to compare the findings of our review with the national statistics of accidental swimming pool drownings reported by Consumer Reports.

There were 34 cases of accidental swimming pool drownings reported to the WTRFC during this 8 year period. The yearly distribution of these cases ranged from 2 deaths in 2009 and 2011 to 8 deaths in 2012. A majority of these fatalities were male (79%), black (59%), occurred during the months of May – August (94%), and occurred in a residential setting (76%). The average age was 21 years (age range 1 – 84 yo). The majority of cases (21) occurred in those less than 18 years of age (62%), with 15 (71%) of these deaths occurring in those less than 15 years of age. Furthermore, within the under 15 age group, 11 drownings occurred in those less than 5 years of age and usually involved a lapse in supervision. The majority of drownings (74%) took place in in-ground pools; however, in children less than 5 years of age swimming pool drownings were more likely to occur in above-ground pools (73%).

When compared with 2014 Consumer Reports data, the predominance of male victims, seasonal distribution, and the location of the pools are consistent. Their data also identified a greater frequency of fatalities in children less than 15 years old. However, in their report, above-ground pools were involved in only 20% of drownings in children less than 5 years of age, in contrast to our 73%.

This study provides an initial look at accidental swimming pool drownings reported to the WTRFC. The results may assist local and state programs in recognizing people at risk for accidental swimming pool drownings and to implement preventative safety measures to at-risk populations.
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