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The purpose of The Journal is to promote legal nurse consulting within the medicallegal community; to provide novice and experienced legal nurse consultants (LNCs) with a quality professional publication; and to teach and inform LNCs about clinical practice, current legal issues, and professional development.

MANUSCRIPT SUBMISSION

The Journal accepts original articles, case studies, letters, and research. Query letters are welcomed but not required. Material must be original and never published before. A manuscript should be submitted with the understanding that it is not being sent to any other journal simultaneously. Manuscripts should be addressed to JLNC@aalnc.org. Please see the next page for Information for Authors before submitting.

MANUSCRIPT REVIEW PROCESS

We send all submissions blinded to peer reviewers and return their blinded suggestions to the author. The final version may have minor editing for form and authors will have final approval before publication. Acceptance is based on the quality of the material and its importance to the audience.

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ARTICLE SUBMISSION

The Journal of Legal Nurse Consulting (JLNC), a refereed publication, is the official journal of the American Association of Legal Nurse Consultants (AALNC). We invite interested nurses and allied professionals to submit article queries or manuscripts that educate and inform our readership about current practice methods, professional development, and the promotion of legal nurse consulting within the medical-legal community. Manuscript submissions are peer-reviewed by professional LNCs with diverse professional backgrounds. The JLNC follows the ethical guidelines of COPE, the Committee on Publication Ethics, which may be reviewed at: <http://publicationethics.org/resources/code-conduct>.

We particularly encourage first-time authors to submit manuscripts. The editor will provide writing and conceptual assistance as needed. Please follow this checklist for articles submitted for consideration.

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- Submit only original manuscript not under consideration by other publications
- Put title and page number in a header on each page (using the Header feature in Word)
- Place author name, contact information, and article title on a separate title page, so author name can be blinded for peer review
- Text: Use APA style (Publication Manual of the American Psychological Association, 6th edition) (<https://owl.english.purdue.edu/owl/resource/560/01/>)
- Legal citations: Use The Bluebook: A Uniform System of Citation (15th ed.), Cambridge, MA: The Harvard Law Review Association
- Live links are encouraged. Please include the full URL for each. Be careful that any automatic formatting does not break links and that they are all fully functional.
- Note current retrieval date for all online references.
- Include a 100-word abstract and keywords on the first page
- Submit your article as an email attachment, with document title articlename.doc, e.g., wheelchairs.doc

INSTRUCTIONS FOR ART, FIGURES, TABLES, LINKS

- All photos, figures, and artwork should be in JPG or PDF format (JPG preferred for photos). Line art should have a minimum resolution of 1000 dpi, halftone art (photos) a minimum of 300 dpi, and combination art (line/tone) a minimum of 500 dpi.
- Each table, figure, photo, or art should be submitted as a separate file attachment, labeled to match its reference in text, with credits if needed (e.g., Table 1, Common nursing diagnoses in SCI; Figure 3, Time to endpoints by intervention, American Cancer Society, 2003)

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Susan Carleo
RN, CAPA, LNCC

President, AALNC

A Message from the President

Dear AALNC Members & JLNC readers,

Writing this message gives me the opportunity to remind everyone of the tremendous benefits of being an AALNC member. If you want to broaden your professional network by building connections with other LNCs, expand your knowledge with continuing education resources, and grow your practice, now is the time!

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Join or renew, and take advantage of AALNC's amazing benefits. Now is the time! Remember:

"Your big opportunity may be right where you are now." ~Napoleon Hill

Sincerely,

Susan Carleo, RN, CAPA, LNCC
President AALNC

Editor's Note

I was in Chicago in September and happened to have a day free, so I put on my old Kevin Youkilis Red Sox jersey and cap and went over to Wrigley Field to take in a ballgame. One of Boston's former pitchers started for the Cubbies; there was jubilation in the stands when the big W banner went up as they clinched their division.

Soon thereafter Cubs and the Cleveland Indians commenced one of the best Series ever (and both teams loaded with Red Sox talent, so we rooted for both sides at our house). Two days before Election Day, it came right down to the wire: a thrilling Game 7 at the end of an incredible set of circumstances, not the least of which being that the Cubs hadn't won a World Series in 108 years, and Cleveland since 1948. As you can imagine, both sides' fans were boisterous, passionate, and aching, just aching for victory, but also holding their breaths with anxiety, knowing that one team had to lose.



The announcement came over the PA: "To honor America with a performance of our national anthem, we invite the fans to sing along as we welcome members of the string section of The Cleveland Orchestra." If you weren't watching, you can see and hear people of all sizes, shapes, and colors, Cubs and Indians fans side by side, joining in, singing, and cheering lustily in unison at https://www.youtube.com/watch?v=81h_JvXKrQ8. I recommend it. My first thought was that this was remarkable so close to the end of a dreadful election cycle. Here it was. This, THIS is what our country needed, for us to put acrimony on hold, if only for a few minutes to start, do something meaningful together, and celebrate our great good fortune to be here, because what we share is always so much more than what divides us. I want to see this at every game forever—the National Anthem sung not by a rock star or a celebrity, or even a cute kid, but the entire stadium, all of us.

Well, we all know how the Series ended. It was by the closest of margins, just one run, in overtime, after a rain delay, with both teams giving it everything they had, and we wished it could have gone on forever. One team may have lost. But not baseball: baseball, sweet baseball, won.

As I write this, our national elections have just finished. Our fellow citizens, and many citizens of other nations, await our nation's future with the same kinds of anticipation and apprehension. Fortunately for us all, as a nation of laws we have a longstanding tradition of peaceful transition between governments. While some of us are elated and some of us crushed, it's up to all of us to take a deep breath and do what we know is best: consider what we want for the well-being of the country, not just now, or for the next two or four years, but for everyone's children and grandchildren. If we can all do that, even a little bit at a time, then no matter who wins an election on any given Tuesday, we all win.

Wendie A. Howland

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Editor, JLNC

LACK OF VETTING "SANE" SINKS CASE

In this issue there are several references to sexual assault cases. Recently I saw a ruling out of the U.S. 10th Circuit Court of Appeals, where a SANE nurse (or that was what she claimed to be on the stand) testified in a case in OK and her testimony basically is what the jury used to convict the defendant.

(Link at <http://caselaw.findlaw.com/us-10th-circuit/1733655.html>)

However, post conviction the defense found out that not only was she not certified as a SANE nurse at the time of the trial, but also that the TX Board of Nursing previously found in 2007 that she misrepresented herself as a certified SANE nurse in a different case when she stated she was "certified by the Texas Attorney General's office."

In this case the Court of Appeals granted a writ of habeas corpus and ordered the State of OK to "retry him within a reasonable time," due to a Brady

violation: the Court found that 1) the prosecution suppressed the evidence of the nurse's lack of certification from the defense and 2) the evidence that the nurse presented was material to the person's conviction.

So the prosecution is in trouble because they didn't vet their star witness, and the nurse is probably in trouble with both the Texas and OK boards of nursing.

James Hanus, RN, BSN, OCN, MHA
Clinical Appeals Specialist
JLNC Editorial Committee



STUDY: MEDICAL ERRORS THE THIRD BIGGEST CAUSE OF DEATH IN US

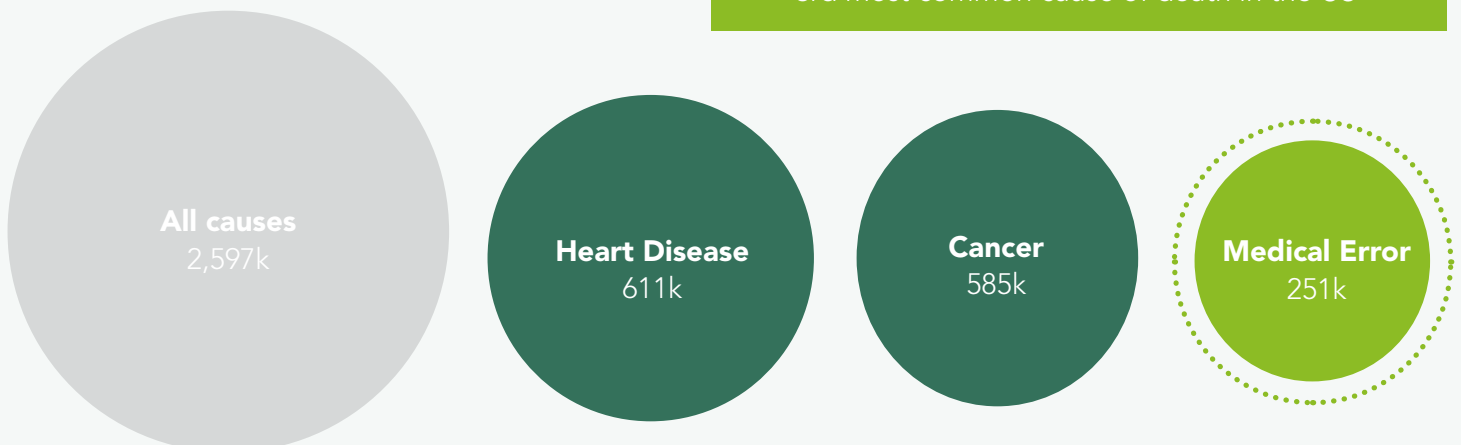
This link will take you to an article describing this study. It also includes links to a series of search results for statistical data regarding deaths and outcomes from medical errors.

<http://tinyurl.com/gvja4nm>

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CAUSES OF DEATH, US 2013

Based on the estimate, medical error is the 3rd most common cause of death in the US



Test Your Case Screening Skills

You're an in-house LNC in a med-mal firm, and your secretary took these notes from phone calls and passed them along. You decide: reject, or investigate? Answers on page 35.

Test Your Case Screening Skills

Elizabeth Zorn, RN, BSN, LNCC

Case #1

Intake 7/23/02: (39 yr old female). Surgery on back by Dr. Brad Pitt on 4/9/01 at Mercy Hospital – he has since left for Glendale, MO. Four doctors since surgery have looked at the x-rays and diagnostic studies and told her that the problem was that he screwed into the main nerve of her leg. Recent surgery was by Dr. Clooney at Park Ridge who took the screw off.

She was a factory worker at Emco, Inc - has been out of work since 4/9/01. Still has weakness in the leg with numbness, pain, foot turns out - Dr. Clooney told her the nerve had been pinched off for some eight months and may have permanent consequences and may not come back.

Case #2

John Simon called re: his newborn son, Tom, born 5 weeks prematurely on 4/27/11. He was diagnosed at birth with Beckwith Wiedemann Syndrome (BWS) - enlarged organs. His kidneys are adult sized. Weighed 7 lbs. 7 oz. at 5 weeks early. He was delivered in an ambulance by a paramedic on the way to Mercy Hospital. John found out that the paramedic left the cord attached - not cut soon enough and that the baby had stopped breathing twice in the ambulance (and not documented). Three days later the baby was transferred to Children's Hospital.

John and his wife Mary have many issues and questions. Mary's OBGYN, Dr. Wall, retired just before the birth without any warning or communica-

tion. Mary's care was taken over by Dr. Singer. John said that he and Mary repeatedly asked for internal exams but Mary never had one during her whole pregnancy. They returned to the office weekly to have the baby measured. Had 5-7 ultra sounds - why weren't they told if there was an issue? They did decline amnio. Found out that Mary had a corrupted cervix (open the whole pregnancy) - again, nobody told them. John & Mary complained for two days that the baby's eyes were rolling to the back of his head - found out that was an apnea issue brought on by low sugar. Beckwith Wiedemann can cause a person to develop cancerous tumors on liver and can cause sugar management issues.

Check your answers on page 35. 🐾



A Case with Nursing and Medical Experts

E. Kenneth Snyder, JD, BSN

Editor/Publisher Legal Eagle Eye Newsletter for the Nursing Profession

A recent case from the Court of Appeals of Texas showed how nursing and medical experts can work effectively together within their own spheres of expertise. The case was featured in the July 2016 issue of *Legal Eagle Eye Newsletter for the Nursing Profession*.*

GENERAL STANDARDS FOR EXPERT OPINIONS IN MALPRACTICE CASES

To make out a prima facie civil case of professional negligence by a physician, nurse or other healthcare provider, the plaintiff patient or deceased patient's family must provide the court with expert testimony setting out the applicable standard of care, specific evidence showing how the provider

failed to meet the standard of care and further testimony explaining the cause-and-effect relationship between that failure and the harm alleged to have befallen the patient.

On the other side, the defendant individual healthcare provider or institution may be able to defend the case by showing that any one of the above essential elements of the plaintiff's case is missing or that the

factual basis for the expert's opinion is insufficient or that the expert is not qualified to state the opinion that he or she has tried to give. Only two out of three of these essential elements is not two-thirds of a case, it is nothing.

NURSING VERSUS MEDICAL EXPERTS

As a general rule nurses can testify as to the standard of care for nurses, but

A court will accept a physician as an expert on the standard of care for nurses if and only if the physician can show that he or she has sufficient expertise.

nurses cannot testify as to the standard of care for physicians. Conversely, most physicians cannot testify as to the standard of care for nurses. A court will accept a physician as an expert on the standard of care for nurses if and only if the physician can show that he or she has sufficient expertise, perhaps from experience supervising nurses in the workplace or by teaching nurses in a hospital or educational context.

As to the cause-and-effect relationship linking nursing negligence to harm suffered by the patient, a court will not accept a nurse as an expert, except perhaps in the most straightforward cases, like a broken leg caused by a fall caused by failure of the nurses to assess the patient and implement fall precautions.

THE FACTS OF THE CASE

A patient who had recently had breast cancer surgery was taken to the hospital by ambulance for severe back pain radiating down her right leg. The emergency physician ordered pain medication, an antibiotic and an abdominal and pelvic CT which showed bladder and bowel distention.

Around 9:30 p.m. that evening the patient's nurse became aware that the patient had started to experience weakness in her lower extremities, but the nurse did not communicate that significant change in her health status to any of the physicians.

The next morning the patient still had severe back pain. Around noon a nurse

finally told a hospitalist physician that the patient was complaining of numbness and tingling in her right leg, the first such report by a nurse to a physician.

The morning after that a nurse found that the patient could not move her legs at all. Her breast cancer physician examined her at 8:10 a.m. and ordered a "stat" MRI which was not done until 12:40 p.m. and not read until 1:42 p.m. Surgery was started at 6:30 p.m. but could not remove a blood clot from a spinal hematoma which had rendered the patient paraplegic.

The court accepted expert testimony on behalf of the patient from a nurse and a physician that the nurses violated the standard of care by failing to communicate promptly the weakness in the patient's lower extremities to at least one of the patient's physicians or physician's assistants. The court further faulted the nurses for not expediting the "stat" MRI.

The physician is board certified in family practice, emergency medicine and geriatrics. His medical board certifications, however, did not qualify him as an expert on the standard of care for nurses. Instead, the court accepted him as an expert because he had worked with nurses caring for patients in hospitals since 1973 and had taught a college course for nurses which included a segment on the standard of care.

The patient also brought in a second physician, a neurosurgeon, to establish the essential cause-and-effect link between the nurses' failure to communi-

cate timely with the physicians and the patient's neurological injury. It would have been wholly inappropriate for a nurse or even the family practice physician to try to testify as an expert on that highly technical question.

THE PATIENT'S NURSING EXPERT

The court said the opinion of the patient's nursing expert, a nurse, would carry the day for the patient as to the nursing standard of care, even if the hospital's objection to the family practice physician as nursing expert was sustained and his testimony was thrown out.

The nurse testified a nurse has a fundamental responsibility to communicate promptly with the physician as to significant changes in the patient's health status. Her review of the chart showed a complete absence of documentation as to the weakness in the lower extremity being brought to a physician's attention during the critical time from 9:30 p.m. the first evening until noon the next day.

Again, the patient's nursing expert was not qualified and did not attempt improperly to state an opinion that the patient was harmed by the delay in coming to grips with the full extent of the problem, performing an MRI and starting a surgical intervention. That was a critically important fact for the patient's case that could not be proven even with the family practice physician's opinion, but only with an opinion from a neurosurgeon. Of course, the neurosurgeon, by the same token, would not have been accepted by the court as an expert on the nursing standard of care.

REFERENCES

*Communication With Physician: Court Sees Nursing Negligence, Legal Eagle Eye Newsletter for the Nursing Profession (24)7 Jul. '16 (page 6). www.nursinglaw.com/jul16hd41q.htm See Tenet Hospitals v. De La Rosa, No. 08-13-00290-CV, 2016 WL 1696867 (Tex. App., June 8, 2016).



North America's Evolving Nursing Specialty

Sheila Early RN, BScN

Forensic nursing as a nursing specialty has been evolving at warp speed over the past two decades. The beginnings of what we now call forensic nursing actually began formally in the 1940s in Britain and mid-1970s in Canada. Future-minded health care providers recognized the need for addressing their patients'/clients' legal needs as well as their health care needs around the United States of America (USA) particularly around sexual

violence in the mid-1970s. It was not until 1986 when Virginia Lynch articulated the interrelationships between nursing science, forensic science, and criminal justice in her master's thesis at the University of Texas that forensic nursing became known. 1992 saw the formation of the International Association of Forensic Nurses (IAFN), which has become the global leader for forensic nursing with the mission to "Provide leadership in forensic

nursing practice by developing, promoting and disseminating information internationally about forensic nursing science (IAFN, 2016)."

The growth of forensic nursing not only in North America but globally speaks to the recognition that:

"Violence and its associated trauma are widely recognized as critical health problems throughout the world" (Lynch and Barber Duvall, 2011).

Since the American Nurses Association recognized forensic nursing as a specialty in 1995, the concept has spread to several countries and has developed many subspecialties that speak to the need of all health care providers to be cognizant of the principles of forensic nursing science.

IN THE BEGINNING....

Since current definitions of forensic nursing vary depending on the source, this article will use definition approved by IAFN in their 2009 Scope and Standards of Practice: "Forensic nursing is the practice of nursing globally when health and legal systems intersect. (IAFN, 2009)"

Florence Nightingale can easily be called a forensic nurse as she cared for victims of war, trauma, and violence during the Crimean War (Wikipedia, 2016). Lynch (Lynch and Barber Duvall, 2006) states in her first textbook that prior to the French Revolution, midwives testified in incidents of sexual assault and pregnancy. So they too could be called forensic nurses by today's definition. Forensic psychiatric nurses have been part of the British health care system for centuries (Lynch and Barber Duvall, 2006)

In 1975, Canadian forensic pathologist Dr. John Butt of the Calgary, Alberta's Medical Examiner's Office hired registered nurses (RN) to work as death investigators (Early, 2016). This was the beginning of RNs being formally linked to forensic sciences, health sciences, and justice system in Canada. At the same time, RNs and nurse practitioners in USA communities such as Memphis TN, Minneapolis MN, and Amarillo TX were implementing nursing protocols for the care of their sexually assaulted patients in the form of Sexual Assault Nurse Examiner (SANE) programs (Forensic Nursing, 2009). Interest in the SANE role spread slowly and mostly by early published articles and word of mouth in those pre-Internet years.

Since the American Nurses Association recognized forensic nursing as a specialty in 1995, the concept has spread to several countries and has developed many subspecialties that speak to the need of all health care providers to be cognizant of the principles of forensic nursing science.

In 1992, a group of mostly sexual assault nurse examiners met in Minneapolis MN hosted by Dr. Linda Ledray. Many pioneers of forensic nursing were there, including Virginia Lynch who introduced forensic nursing as a scientific discipline in 1989 (Forensic Nursing, 2009). Of the 72 individuals attending, two were Canadian nurses. After much debate over terminology, the International Association of Forensic Nurses was formed with Virginia Lynch as its first president.

For over two decades IAFN has grown to its current membership at 3,600 from 24 countries (IAFN, 2016) with significant developments in practice and education resources including:

- **1995** ANA recognizes forensic nursing as a nursing specialty
- **1997** Scope and Standards of Forensic Nursing Practice published in conjunction with ANA
- **2002** Certification for Nurse Examiners in Adult/Adolescent Sexual Assault (SANE-A[®])
- **2004** Core competencies for advanced practice forensic nurses established
- **2005** Journal of Forensic Nursing[®] published
- **2006** Certification for Nurse Examiners in Pediatric Sexual Assault (SANE-P[®])

- **2009** *Forensic Nursing: Scope and Standards of Practice* revised and published with ANA
- **2009** *Forensic Nurse Death Investigator Education Guidelines* developed
- **2013** *Intimate Partner Nurse Examiner Education Guidelines* published
- **2013** *Forensic Nurse Death Investigator Education Guidelines* (revised) published
- **2013** *Atlas of Sexual Violence* published
- **2015** *Sexual Assault Nurse Examiner Adult and Pediatric Education Guidelines* published combining previous separate Adult/Adolescent and Pediatric documents
- **2016** *Core Curriculum for Forensic Nurses* published

One main avenue for dissemination of forensic nursing education and research the IAFN Annual conferences held in USA and Canada. From those known as the "Minneapolis 72" to the 2016 conference in Denver CO with 900+ registered delegates, forensic nurses from many countries have come together to share their similarities and discuss their differences in forensic nursing.

EVOLUTION OVER TWO DECADES

Forensic nursing roots began in North America in death investigation and care

of the sexually assaulted patient/client in the 1970s. Now there are many forensic nursing roles within the health care system and beyond. Some are well known, while others struggle for recognition. Looking at these indicate the directions forensic nursing has taken.

In her seminal book *Forensic Nursing* (2006) Virginia Lynch described nine roles:

- + clinical forensic nurse
- + forensic nurse investigator
- + forensic nurse examiner
- + sexual assault nurse examiner
- + forensic psychiatric nurse
- + forensic correctional, institutional or custodial nurse
- + legal nurse consultant
- + nurse lawyer
- + nurse coroner

Hammer, Moynihan and Pagliaro reiterate these in their book (2006). Constantino, Crane and Young in 2013 added *forensic assessment and consultation team* and Amar and Sekula (2016) added *forensic clinical nurse specialist* and *risk manager* to the list. Their brief descriptions of each role follows:

Forensic Clinical Nurse Specialist: The registered nurse is “prepared to provide expert forensic patient care while also serving colleagues as consultants, educators and researchers.” (Sekula, 2005; Amar and Sekula 2016)

Risk Manager: “with a strong background in forensic science, nurses with advanced degrees in forensics are well prepared to serve as forensic investigators and as experts in risk management.”

Forensic Assessment and Consultation Team: Team members from sexual assault and domestic violence teams combine to provide examinations and assessment for both victims and/or suspects that are referred to the team

Clinical forensic nurse: The registered nurse “provides care for the survivors of crime related injury and deaths.”

Forensic nurse investigator: The registered nurse working within a medical examiner or coroner’s role “represents the decedent’s right to social justice through a scientific investigation of the scene and circumstances of death.”

Forensic nurse examiner: The registered nurse can provide analysis of “physical and psychological trauma, questioned deaths and or psychopathology evaluations related to forensic cases and interpersonal violence” and “is cross-trained in several subspecialties and serves a wider range of forensic patients.”

Sexual assault nurse examiner: This role requires the registered nurse to have specialized education and skills to provide a comprehensive forensic-medical examination and evaluation as well as “maximizing the collection of biological, trace and physical evidence and minimizing the patient’s emotional trauma.”

Forensic psychiatric nurse: The registered nurse “specializes in the assessment and intervention of criminal defendants, patients in legal custody who have been accused of a crime, or have been court mandated for psychiatric evaluation.”

Forensic correctional, institutional or custodial nurse: The registered nurse “specializes in the care, treatment, and rehabilitation of persons who have been sentenced to prisons or jails for violation of criminal statutes and require medical assessment and intervention.”

Legal nurse consultant: The American Association of Legal Nurse Consultants (AALNC) lists legal nurse consulting as “the analysis and evaluation of facts and testimony and the rendering of informed opinions related to the delivery of nursing and other healthcare services and outcomes, and the nature and cause of injuries. The legal nurse consultant is a licensed registered nurse who performs a critical analysis of clinically related issues in a variety of settings in the legal arena. The nurse

expert with a strong educational and experiential foundation is qualified to assess adherence to standards and guidelines of practice as applied to nursing practice.”

Nurse attorney: A registered nurse who also has a valid “Juris Doctorate degree who practices as an attorney-at-law generally specializing in civil or criminal cases involving healthcare-related issues.”

Nurse coroner: The registered nurse may be either elected into this position as in the USA or be hired into the role as in Canada. The role provides specific jurisdictional powers to provide “investigation and certification of questioned deaths, to determine the cause and manner of death as well as the circumstances pertaining to the decedent’s identification and notification of next of kin.”

Emergency Nurse: There are additional roles in nursing that encompass forensic nursing principles and practice. The Emergency Nurse routinely cares for individuals related to trauma, violence, intentional/unintentional injury, workplace injuries, vehicular events, medical emergencies that may have legal implications, are deceased or dying, human trafficking, stabbings, gunshot wounds, or interpersonal violence of all kinds. They may see perpetrators of trauma, violence and/or crimes, and persons who are convicted of crimes, suffer from mental illness, addiction, and intentional/unintentional drug ingestions.

Henderson, Nahoka and Amar (2012) state “the era has come when competent and proficient forensic practice within the ED setting should no longer be a consideration but a constant and minimum standard.” Their study of the forensic knowledge, practice and experiences of ED nurses and physicians found that, “to provide competent care to this patient population, providers could benefit increased forensic education.” Eisert (2010) previously concluded that “as victims of violence



enter emergency departments, the staff members have the unique opportunity to recognize, collect, and preserve forensic evidence.”

In light of current research in the ED, it follows that forensic nursing principles and practice are also applicable to the clinical practice of other critical care nurses. Hoyt (2006) stated “becoming involved in forensic nursing is a distinct duty of professional nurses and is not an option.”

Public Health Nursing was defined by the Association of Public Health Nurses (APHN) in 1996 as “the practice of promoting and protecting the health of populations using knowledge from nursing, social, and public health sciences.” Public health nurses give care in settings which allow them to see into patients’ homes and communities. They care for patients/clients across the lifespan, especially vulnerable populations, being well positioned to address the World Health Assembly (WHA) Resolution WHA49.25 “Preventing violence: a public health priority” (World Health Assembly, 2002). Thus, public health nurses are mandated to be knowledgeable and skilled in forensic nursing principles and guidelines in order to promote and protect the health of the populations they serve. Ferguson and Speck (2010) stated “While forensic nurses have routinely kept to specific specialty areas such as sexual assault and death investigation, public health offices would benefit from the content expertise of forensic nursing specialty in a variety of ways.”

Forensic Nurse Educators: The current general nursing curriculum lacked formal education in forensic nursing’s body of knowledge; specialty education progressed slowly from Lynch’s teachings in 1986 to the late 1990s. Forensic nursing had to differentiate itself from other nursing specialties before forensic nursing curricula could advance. Arlene Kent-Wilkinson, a Canadian forensic nurse educator and researcher, studied North American forensic nursing education as her PhD thesis in 2008. In her 2009 JFN article she concluded “the forensic nursing process is a combination of the nursing process, the scientific process and the legal process (Kent-Wilkinson, 2009).”

So forensic nursing education had to include nursing science, forensic science AND criminal justice including criminal laws of the land. Simmons and Grandfield also described the value of forensic nursing education thusly “strengthening forensic nursing education would produce positive outcomes, including improved patient care, better patient safety, enhanced access to services, less burden on the health care system, increased confidence and skill of nurses providing care, higher patient satisfaction and more options for those in violent situations (Simmons and Grandfield, 2013).”

Forensic nursing specialty certificates and advanced degrees to the level of PhDs proliferated in the USA. Canada, however, continued to have limited educational opportunities for forensic

nursing education beyond the training of sexual assault nurse examiners until the early 2000’s when University of Calgary, Mount Royal College (now Mount Royal University) and British Columbia Institute of Technology developed specific forensic nursing or forensic health sciences programs. Forensic nursing in Canada is recognized as a special interest group and not a nursing specialty at this time. Advanced degrees are also lacking unless master’s and doctoral students choose a forensic focus for research.

Forensic nursing education is finding its way into general and specialized nursing programs as forensic nurses create unique opportunities for themselves based on their specialized backgrounds, experiences, and interests. For example:

- A registered nurse with a background in law enforcement and death investigation creates a role within a workplace safety organization that investigates serious and fatal workplace events.
- A registered nurse working in occupational health and addictions monitoring for workplaces becomes a sexual assault nurse examiner and transfers forensic nursing principles to her “day job” by instituting chain of custody documentation for all toxicology urine samples collected and by applying expert witness skills in testimony at inquiries and investigations.
- A registered nurse with forensic education provides consultation

to a neonatal ward when tracking donated breast milk becomes a risk management issue.

- A forensic nurse examiner (FNE) is asked to assess a patient in the ICU after staff's concerns of possible elder abuse. The FNE performs a head to toe assessment of the patient and reviews all documentation since admission. The FNE finds documentation on the paramedic call sheet indicating there was damage to the kitchen wall near the unconscious patient. The patient was found to have significant bruising behind one ear, a possible indication of blunt force trauma.
- An emergency nurse educator reviews a civil case regarding a 6-year-old who suffered brain damage after a missed diagnosis of meningitis at age 18 months. By using forensic nursing skills in chart review and patient history, the nurse moves into the realm of legal nurse consulting.
- An operating room nurse cleans a bullet retrieved from a patient's chest with a hard plastic brush before handing it over to the attending police officer. Subsequently it is found that markings on the bullet have been damaged. The nurse becomes the project leader to develop a forensic evidence retrieval policy for the operating room.

Forensic Nurse Researchers: Sackett in an editorial of the British Medical Journal (Sackett, 1996) described evidence-based medicine as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patient." This concept evolved into what we now know as evidence based practice (EBP), the cornerstone for changes in clinical practice.

Forensic nursing researchers link findings to clinical practice as forensic nursing's body of knowledge expands. Forensic science research also contrib-

utes to changes in practice. We will continue to need research in many areas of forensic nursing into the foreseeable future.

In 2009, IAFN established the Ann Burgess Forensic Nursing Research Award to honor forensic nursing researchers who have made significant contributions to the body of forensic nursing research as related to application of research to the clinical practice of forensic nurses. The yearly recipients of this award have already changed past practice to "best practice."

GLOBAL PERSPECTIVES

Forensic nursing concepts expanded globally, to Canada with the formation of the Forensic Nurses Society (now the Canadian Forensic Nurses Association) in 2007 and beyond North America, with organizations in Australia (Australian Forensic Nurses Association) and United Kingdom (United Kingdom Association of Forensic Nurses and Paramedics). Japan has a newly-formed association and countries such as Kenya, South Africa, India, Italy, and Netherlands, for example have had groups of forensic nurses for several years. Virginia Lynch has traveled to over 30 countries introducing the concepts of forensic nursing science to diverse nursing and medical populations around the globe (Lynch, personal communication, 2016).

In May 2016, the 69th World Health Assembly adopted resolution WHA.9 ~~ "WHO global plan of action to strengthen the role of the health system with a national multisectoral response to address interpersonal violence in particular against women and girls and against children (WHA, 2016)," in development since the release of WHO's World Report on Violence and Health in 2002. The global plan focuses on four strategic directions:

- strengthen health system leadership and governance

- strengthen health service delivery and health workers'/providers' capacity to respond
- strengthen programming to prevent interpersonal violence
- improve information and evidence (WHO, 2016)

Forensic Nurses provide care to victims and perpetrators of violence, trauma and/or crime. So the WHO directives to the health system leadership and delivery of care can only strengthen the roles of forensic nurses in all their subspecialties within the health systems globally. The forensic nurse also has a role in prevention of violence and this is exactly what is being asked for in this global plan of action. Forensic Nurses in all the subspecialties and unique roles must become familiar with WHO's plan and then advocate for its adoption by the health systems they work in. The plan has a 15 year life span and the time is right for forensic nurses to be leaders in prevention of violence as well as delivering skilled health care to their patients/clients.

CONCLUSION

Forensic nursing's path to specialty nursing status globally is still a work in progress because forensic nursing is made up of so many subspecialties interacting uniquely with forensic science and the criminal justice system. What IS complete, however, is the change in health care delivery and patient outcomes that all forensic nurses have accomplished in the past three decades. The care of those who have undergone sexual violence as children, adolescents, adults, or elders **will not go back to what it was** before; forensic corrections and forensic psychiatric nurses have also changed the care their patients/clients receive. The future for forensic nursing is bright as innovative ways to improve care of those who have been subjected to violence, trauma, and/or crime continue to evolve.



The care of those who have undergone sexual violence as children, adolescents, adults, or elders will not go back to what it was before; forensic corrections and forensic psychiatric nurses have also changed the care their patients/clients receive.

Forensic nursing is not for the faint of heart but it is for those who want to be game-changers in the health systems of the world. 🌍

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The Role of the Forensic SANE Nurse in Pediatric Sexual Assault

Jennifer L. Orr, BSN, RN, CLNC

Legal nurse consultants (LNC) reviewing pediatric sexual assault cases should have advanced training as a forensic nurse when becoming involved in criminal cases. Nurses who want to consider legal forensic nursing as a career will benefit from a background in trauma, critical care, or emergency nursing. Deoxyribonucleic acid (DNA) analysis, toxicology, and interpreting forensic evidence will

enable the LNC to assist the prosecution or defense. A subspecialty, pediatric sexual assault nurse examiner (SANE-P), is an asset to hospitals and pediatric practices nationwide.

STATISTICS

The Department of Health and Human Services documented thirty thousand fewer child sexual assault cases in 2012 (686,000) compared to 2008 (716,000)

(US Department of Health and Human Services, 2014). Reports showed that 12% - 25% of girls and 8% - 10% of boys were sexually abused by age 18, most often by a male family member or trusted acquaintance. Pediatric sexual abuse is far more common than childhood cancer, juvenile diabetes, and congenital heart disease combined. Unfortunately, many cases are not reported until later in adulthood.

HISTORY AND DEFINITION OF PEDIATRIC SEXUAL ASSAULT NURSE EXAMINER

The first use of sexual assault nurse examiners (SANEs) began in the late 1970s in Minnesota, Tennessee, and Texas. In 1992, members from 31 SANE programs from the United States and Canada founded the International Association of Forensic Nurses (IAFN). The American Nurses Association recognized forensic nursing as a specialty area in 1995. The first Adult/Adolescent (SANE-A) credentialing was in 2002 and the first Pediatric (SANE-P) in 2007.

The SANE-P training includes skills for evidence-based and patient-centered care, including specialized examination, documenting injuries (e.g., genital and anogenital), and collecting and preserving forensic evidence. SANE-Ps testify as experts, provide emotional support to the child and family, and make referrals to appropriate crisis and community counseling centers vital for future emotional and psychological recovery.

IDENTIFYING PEDIATRIC SEXUAL ASSAULT

Trained physicians, SANE-Ps, nurse practitioners, and physician assistants play an integral part in pediatric sexual assault cases where examiners recognize 80% of cases fail to reveal physical forensic evidence. The American Academy of Pediatrics cautions that body swabs collected in pre-pubertal children >24 hours after a sexual assault may yield questionable forensic evidence. Clothing or undergarments most frequently contain forensic evidence used in court. (Girardet, Bolton, et al., 2011)

Careful identification through proper forensic interview of the pediatric patient guides the SANE-P to either initiate collection of forensic evidence or refer to appropriate counseling and crisis center. If the patient is under

18 years-of-age and sexual assault has occurred, the standard protocol requires law enforcement and social services be notified immediately. Additionally, when examining a child, the local crisis center should be contacted to support the non-offending family members during the initial examination (Jenny and Crawford-Jakubiak, 2013).

Educating the general public and law enforcement officials about the different forms of physical and non-physical sexual abuse is important when investigating pediatric sexual abuse patients. Many law enforcement professionals believe the only form of pediatric sexual abuse is through violent sexual penetration where injury or death occurs. The SANE-P has an incredible opportunity to educate the differences between physical injury and non-physical injury (i.e. fondling, oral-genital, genital or anal contact without penetration), and how each contributes to the emotional trauma of pediatric sexual abuse patients.

IDENTIFYING CONSENSUAL ASSAULT

Law enforcement handles consensual sexual assault differently. According to the Guidelines for Child Abuse Reporting of Consensual Sexual Activity, mandatory reports must be filed with law enforcement agencies by jurisdiction and to the Department of Children and Family Services (each law varies by state and department); see the applicable jurisdiction details.

When should a parent or adolescent child file a report?

- If the child is 15 years or younger, a case must be filed.
- If the child is 13, 14, or 15 and the sexual partner is 4 years older than the patient, a report must be filed.
- If the sexual partner is 18 years of age, but less than 4 years older than the child, the law may charge the teen with corruption.

- If the child is less than 4 years' age difference from the sexual partner and above the age of consent for the sexual activity the family does not have to file a report.
- If a child is 16 years of age, which is considered the legal age of consent, a parent can file a report if the sexual partner is age 18 or older. The prosecuting attorney may charge the 18-year-old adult with a misdemeanor.
- When an adolescent with cognitive or physical deficits has been coerced, forced, or deceived, a sexual abuse report must be filed.

WHY IT'S IMPORTANT TO USE A PEDIATRIC SEXUAL ASSAULT NURSE EXAMINER (SANE-P)

Emergency and primary care medical professionals recognize the need have forensic medical exams and advocacy for pediatric patients be properly trained and certified. If primary care physicians lack specialized training, they should refer the patient to a skilled sexual assault provider/institution and report to law enforcement. After SANE forensic nursing programs began, there was significant improvement in the documentation and evaluation of anogenital injury and sexually transmitted infection testing (STIs) (Horner, Thackeray, Scribano, et al., 2012).

In a study by Nationwide Children's Hospital, Columbus OH, prosecution outcomes when trained SANE-Ps assessed pediatric sexual abuse patients were compared with the outcomes when untrained, non-pediatric emergency room physicians and pediatricians performed the assessment (Horner, Thackeray, Scribano, et al., 2012). The study reported that 36% of cases reviewed by SANE-Ps resulted in plea bargains and trial convictions, versus 17% in the non-pediatric trained group. This study demonstrates the necessity for hospital facilities to employ

SANE-Ps testify as experts, provide emotional support to the child and family, and make referrals to appropriate crisis and community counseling centers vital for future emotional and psychological recovery.

advanced trained certified professionals as well as an obligation for non-pediatric facilities to provide specialized training for their employees. If an institution is unable to provide a certified examiner, then appropriate referral to outside resources should be expected. This will only benefit the child.

SYMPTOMS OF PEDIATRIC SEXUAL ABUSE

Staff working in acute and non-acute settings may see pediatric patients with symptoms concerning for sexual assault. When a child is brought to the ED within 72 hours from the alleged sexual assault, these signs and symptoms include anogenital trauma, bleeding, genital irritations, encopresis, enuresis, pregnancy, oral trauma, or a STI diagnosis. Most children do not report abuse to family members immediately or present to the ED for months or years. Because the sexual assault occurred over an extended period of time, physical injury would be difficult to identify and collection of forensic evidence would not be warranted. However, it is important to identify subtle clues to identify a minor in a potentially harmful environment. (Jenny and Crawford-Jakubiak, 2013).

SIGNS OF SEXUAL ABUSE IN PEDIATRICS

Sexually-abused children typically exhibit psychosocial, behavioral, and medical problems. Behavioral changes

include aggression, problems in school, regression, thumb sucking, using past security objects, depression, and change in appetite. According to the U.S. National Library of Medicine (2014), one in 4 girls and 1 in 10 boys are sexually assaulted before they turn 18.

- Sexual abuse is any activity where the abuser becomes sexually aroused or it can be without any physical contact. To distinguish between two forms of sexual assault and decide on how to proceed to an age appropriate forensic interview to document event disclosure, the examiner will consider the following (The National Center for Victims of Crime, n.d.):

Sexual abuse where the abuser becomes aroused includes the following:

- Touching the child's genitals and digital penetration
- Rubbing the child's genitals against a child's skin or over top of clothing
- Inserting objects into the child's anus, vagina, or mouth
- Penetration of the vagina or anus

Sexual abuse without physical contact includes:

- Masturbation in front of the child
- Forcing a child to watch pornography
- Forcing a child to pose for pornography
- Exposure of one's own genitals in the presence of a child

Once the SANE-P has identified and documented a suspected form of

sexual assault, the next assessment must include differentiating, in a compassionate and non-threatening way, whether the child is experiencing signs of sexual abuse or some other form of abuse or neglect. Child sexual abuse symptoms most often are non-specific, making it difficult to decipher from normal child physiologic developmental behavior. The SANE-P's knowledge, skill, and training is critically important for making this determination based on the following (U.S. National Library of Medicine, 2014):

Suspicious signs include:

- A child keeping secrets and/or withdrawn behavior
- Having an adult within the family display a sense of control over the child interacting with other adults
- The child has tried to run away
- The child understands, talks about sex, and shows promiscuous behavior outside the normal developmental range
- The child has trouble sitting or standing
- The child tells another adult of being sexually abused
- A family or family member has witnessed abuse

Physical symptoms:

- Encopresis, bowel control issues
- Headaches and stomachache
- Sleeping problems
- Genital or rectal problems such as pain while urinating, discharge, or vaginal itching
- Change in eating behaviors, loss of appetite; anorexia

Adolescent signs and symptoms may include:

- Use of illicit drugs or alcohol
- Promiscuous behavior and engaging in risky sexual behaviors
- Poor grades in school



- Withdrawing from social events; a change from regular activity
- Fears, more than just a typical developmental anxiety or fear children and adolescents frequently encounter

COLLECTION OF FORENSIC EVIDENCE

Forensic evidence to help identify perpetrator and methods of assault includes:

- Biological evidence: blood, semen, sperm, hair, or skin fragments.
- Carpet fibers, debris, clothing, and undergarments

Rape evidence collection kits are available in many EDs and routinely include detailed instructions for careful handling of clothes and specimen collection (New Hampshire, Office of the Attorney General, 2015).

The time frame for forensic evidence collection has been extended to 96 hours in the acute care setting and should be conducted using the pediatric sexual assault protocol (Botash, A., n.d.). The U.S Department of Justice (2014) indicates any local law enforcement must follow proper handling of all forensic evidence by jurisdiction.

Proper collection of physical evidence requires that the examiner mark any specimens obtained with the exam date, examiner's initials, victim's name, and chain of custody when samples are transported. Photographs may be taken by physicians, nurses, nurse

practitioners, police officers, social workers, and other personnel and must be labeled with the photographer's initials. Any physical evidence, including photographs, must also be marked with the jurisdiction's case number. (New Hampshire, Office of the Attorney General, 2015).

Obtaining complete and detailed information about the alleged assault may include questions regarding the use of condoms or lubricants, and whether the victim has washed, voided, defecated, or bathed since the contact. In the adolescent population, the history should also document if a female patient is menstruating (Girardet et al., 2011). Diagnosis in most pediatric sexual assault cases is based on the statement of the patient obtained by a qualified physician, SANE-P, or another forensic expert. Documentation of disclosures should be conducted in a non-biased manner and should be quote the patient's exact words (Jenny and Crawford-Jakubiak, 2013).

SEEKING TREATMENT

Seeking treatment for those affected by sexual assault can be an emotional and traumatizing experience. Many children are fearful of "breaking the rules" and don't want to upset or disappoint the alleged abuser, which is why so many of these cases go unreported into adulthood. The following scenarios are common:

- The pediatrician is often the first professional to become aware that sexual assault has occurred.
- Social services or law enforcement professionals bring the suspected pediatric patient or adolescent to the pediatrician or ED for a non-acute medical evaluation as part of the initial investigation.
- In acute situations (less than 96 hours from the alleged incident), the child has a medical evaluation, forensic evidence collection, and crisis management in the ED.
- The child presents to the pediatrician or ED because a caregiver or other individual suspects abuse because of behavioral or physical symptoms.
- The pediatrician notes behavioral or physical signs of sexual abuse during a routine physical assessment (Jenny & Crawford-Jukubiak, 2013).

THE EXAMINATION OF THE PRE-PUBESCENT CHILD IN THE PRIMARY CARE SETTING

As a representative example, New Hampshire law mandates that any and all suspicious pediatric sexual assault cases under the age of 18 be reported to law enforcement and child protection authorities immediately (New Hampshire, Office of the Attorney General, 2015).

- An interview should be done in an age-appropriate environment and independently, without the parent or caregiver present if at all possible.
- Examination is conducted in a child advocacy center or a pediatric hospital by a SANE-P, certified physician or physicians' assistant.
- Thorough anogenital exams should be conducted only if absolutely necessary (<72 hours from the suspected assault) with the avoidance of unnecessary multiple exams, as this can be traumatizing for children.
- When examining the adolescent

patient, the American Academy of Pediatric guidelines will be followed; these suggest using a speculum for intra-vaginal examination. Speculum examination is only required after an acute sexual assault to document injuries and collect forensic specimens. Speculums are NOT to be used in the pre-pubescent children to avoid additional emotional trauma (New Hampshire, Office of the Attorney General, 2015).

- Testing for sexually transmitted infections is now required for all age groups. Treatment is given only after positive results. Bacterial vaginosis and genital candidiasis are not indicators of sexual abuse (Jenny and Crawford-Jakubiak, 2013).

THE EXAMINATION OF THE PRE-PUBESCENT CHILD IN THE EMERGENCY SETTING

In pre-pubertal children, it is highly unlikely to have body swabs positive for evidence 24 hours after a sexual assault. However, failure to collect evidence on pre-pubertal children could result in missed opportunities to identify additional forensic evidence that could be submitted in court proceedings. With advancement in DNA technology, it will be necessary to frequently re-evaluate clinical and forensic practices in the collection of forensic evidence (Thackeray et al., 2011). Research states that “although body swabs were important sources of evidence for older children, they were significantly less likely than nonbody specimens to yield DNA among children younger than 10” (Girardet R., et al., 2011).

SUMMARY

The development and implementation of SANE-P’s in the clinical setting for pediatric sexual assault patients has not only improved documentation of injuries but also increased plea bargains and trial convictions of the abuser. Advocating for the patient and family through

appropriate examination techniques, providing emotional support, and referring to crisis and community services have proven to be a starting point to the emotional and psychological recovery of the child or adolescent sexual assault patients. Community services remain in constant communication providing therapy and support groups to families and children.

SUGGESTIONS FOR THE LNC

1. Review documents related to date and time of injury and the age of the patient at the time of the assault.
2. Review documents related to any forensic evidence collected at the time of assault.
3. Review documents from child protection agency, social services, crisis centers, psychologists, and SANE-P’s who conducted the examination, and any law enforcement reports, if applicable.
4. Distinguish what form of sexual assault occurred at the time of the incident: physical sexual abuse or non-physical sexual abuse.
5. Review any documents from community and counseling centers that provide follow-up crisis interventions to patients and their families. 🍷

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Working for the Defense

Cari Caruso RN SANE-A

Keywords: Forensic nursing, SANE, legal nurse consulting, defense, objective

Our healthcare and the legal systems intersect in forensic nursing (Forensic Nursing Science, 2011). We interact with law enforcement and the crime lab, provide medical intervention, obtain advocacy for the patient, and, if the case is assessed to have merit, work within the legal system.

As registered nurses, we advocate for patients' health and well-being, but as forensic nurses, we are not advocates. That sets us apart from others and

maintains our impartiality as testifying experts. Those who work with patients with interpersonal and sexual violence are aware that their own credibility as forensic nurse examiners depends on their own integrity and impartiality. While many people are familiar with SANE work with sexual assault victims, some work with the defense, critiquing the prosecution expert's work in these cases to help assure that the innocent have the defense they deserve. This article describes information needed for that process.

FORENSIC NURSING PRACTICE: SANE

The forensic examination should be done methodically using critical thinking, nursing judgment, and the guidelines of the National Protocol (US Department of Justice, 2013) and those of the program's own policies, procedures, and protocols. Forensic nursing includes providing compassionate, personalized nursing assessment, while objectively documenting, collecting physical evidence and photographing what we have heard, observed, and

experienced without exaggeration, editorializing, or speculation on the history's veracity. The forensic nurse's role is not whether to believe or not to believe the patient; it is to document what the patient reports.

The forensic nurse will inspect the patient's body and anogenital structures, note unusual findings or apparent injuries, and apply differential diagnosis to the findings. Standard of practice is to diagram and photograph findings and collect appropriate samples that could be used for evidence and exemplars, provide resources for the patient, and provide the patient with prophylaxis for sexually transmitted infections (STI) and pregnancy (CDC, 2015)

The expert's assessment comprise the elements within her/his scope of practice regarding forensic examination and documentation, nursing care, and medical care of the patient. The initial examination ought to have been conducted comprehensively and objectively and its findings documented appropriately. However, this is often not the case.

The examining expert can err for a number of reasons, including knowledge deficit and overstating findings. The examiner must be knowledgeable about differentiating normal findings, normal variants, hygiene issues, and common skin and medical conditions that could be confused with injury. When sexual assault or abuse is reported, there may be findings related to sexual contact, findings of a non-sexual nature, or no anogenital findings at all.

The forensic nurse examiner may also examine the suspect, inquiring only about the suspect's health and current physical condition, but not the circumstances of the reported event; that would be up to law enforcement (LE). Suspect examinations and history do not include an interview regarding the accusations. (Markowitz and Faugno, 2011).

Forensic nursing includes providing compassionate, personalized nursing assessment, while objectively documenting, collecting physical evidence and photographing what we have heard, observed, and experienced without exaggeration, editorializing, or speculation on the history's veracity.

If bias is evident, the examiner loses objectivity and credibility and can no longer be a neutral medical professional but has become a representative for one of the parties. The examiner's findings may determine case management decisions, including whether or not to prosecute or defend it; reckless or biased interpretation of findings can wrongly influence the investigation and litigation, with devastating results.

If a case goes to trial, the nurse examiner who had conducted the forensic examination on the reported victim or suspect of a sexual assault event will most likely be called to testify by the prosecution. The examiner could also be called by defense.

The examiner who had conducted the examination will only have the perspective of the reporting victim. In contrast, the reviewing defense forensic nurse expert will have records from a variety of sources, transcripts, photographs, and interviews of those involved including any possible witnesses.

Intimate crimes such as sexual assault, domestic and interpersonal violence, and child physical and sexual abuse, require careful and objective investigation. An investigation may uncover cause to move forward with the case or various

motivations and influences for false or unsubstantiated reporting. Only the jury can make the final decision. (Federal Rules of Evidence 702-704, n.d.)

RECORDS

All consequential records must be provided in order for the expert to conduct a proper review. The initial forensic examiner has one perspective of the case; there is always at least one other perspective.

Many examiners do not consider the fact that someone else may review their work. Other than for court proceedings, the records and photographs can be used for peer review, chart review, case review, education, and evaluation of the medical professional to ensure accuracy and competence. A defense expert may see the examiner's reports, photographs, and documentation, too.

Report language should be descriptive, with common, understandable language (e.g., "redness," not "erythema" and "bruises," not "contusions" or "ecchymosis"), since lay people such as law enforcement and attorneys will read the reports. However, terminology must still be extremely specific and accurate regarding anatomical structures.



Records are usually obtained from the district attorney (DA) through discovery. Any expert should know what records are generally included for a given type of case. The request will likely ask for, "Any and all records and imaging related to this patient's case." However, the DA may not have received all needed records initially. Sometimes, the prosecutor has not turned them over and sometimes the prosecutor does not know they exist. The SANE defense expert will be expecting a forensic examination report and photographs. There may also be nurse's notes, a narrative report, a medical administration record, aftercare instructions, addenda, and dictation.

The patient should have signed a consent for examination and photography

before the examination begins. The age of consent for this may be different than the usual age of consent for other medical examination. For example, in California a person must be 12 years old and older to sign their own consent for examination and treatment (Office of Criminal Justice Planning, 2001). In many jurisdictions, documents used for official criminal investigations are exempted and are treated differently from ordinary medical records. In most jurisdictions forensic records are kept separate from medical records and may only be obtained by subpoena.

Some documents that may be helpful in a review, depending upon the history, are listed below:

- Forensic exam record, unredacted
- Exam photos/videos (on disc or flash drive)
- All documentation related to exam
- Reported victim statements/interviews
- Forensic examiner's curriculum vitae
- Additional medical records
- Crime lab reports
- Program policies, procedures, protocols
- Police reports
- Preliminary hearing
- Witness statements
- Investigator's reports
- Interviews and transcripts
- Other court proceedings
- Defendant statements
- Charge summary & priors
- Miscellaneous applicable records, e.g., phone, weather, texts

EXAMINATION

When a victim presents for medical attention, emergent and urgent medical issues take priority and the forensic issues will be secondary. The forensic examination for reporting victims is completely voluntary, and under the Violence Against Women Act (US Department of Justice, 2005), they may choose to have an evidence kit collected and stored, but do not have to cooperate with law enforcement or go forward with the investigation.

At this time, the time limit within which to perform an acute examination for an adolescent (12 years and older or pubertal) and an adult (18 years old and older) has been up to 120 hours after the event since the early 2000s. Some programs have extended their window of opportunity to collect biological evidence as technology advances and smaller sample quantities can be analyzed.

If an examination is outside of the acute time frame, it is considered non-acute.

The goal of reviewing the forensic examiner's report is to provide an analysis of the examiner's work with scrutiny for correct terminology, correct identification of anatomical structures, and accurate identification of findings.

The examiner performs the same victim interview for medical and event history and the same physical examination, but will collect no samples, depending upon how distant the event in time.

Children's programs (prepubertal or 12 years old and under) may vary, but generally, the time frame for an acute exam is between 48 and 72-96 hours.

REVIEWING AN EXPERT'S REPORT

The goal of reviewing the forensic examiner's report is to provide an analysis of the examiner's work with scrutiny for correct terminology, correct identification of anatomical structures, and accurate identification of findings. The defense forensic nurse examiner must have a working knowledge of differential diagnosis; keeps current; and knows how to use available literature, tools, and their limitations and reliability.

Literature can become obsolete and invalidated over time. So can many techniques in the forensic nursing world, yet are still in use although more contemporary practices are or should be used. The defense expert reviewer will have an eye out for outmoded references and practice.

The nurse reviewer will expect to see that the examiner adhered to standards

of care and policies, procedures, and protocols that are customary for the specialty (International Association of Forensic Nurses, 2015) from patient presentation to discharge. The reviewer will also look for presence or absence of bias, exaggeration, critical thinking, and nursing judgment.

The attorney client deserves an honest and candid opinion. We can provide the facts of our observations and provide opinions but we cannot come to the ultimate decision; we allow those who will adjudicate the case to put all the pieces together and come to an educated decision. 🍷

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Forensic Psychiatric Nursing and the LNC

Rachel Regan Boersma, Ph.D., R.N.

Law and professional practice standards codified at the state and federal levels govern all domains and areas of nursing practice. Ethical nursing practice is governed by professional organizations in the national and international spheres of professional practice. The legal nurse consultant must be fluent in both.

Psychiatric nursing or mental health nursing focuses on the identification and treatment of mental illnesses. Individuals with psychiatric illnesses

present in every setting: outpatient and inpatient, on a general medical-surgical unit, in a mental health specialty unit, in a community, jail, or prison.

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013), DSM-5, is the bible of psychiatric practice. The DSM-5 delineates 10 distinct personality disorders divided into three distinctive groups: the odd or bizarre cluster, the dramatic cluster, and the anxious or fearful cluster. Each

requires very different competencies and strategies for care and management. The two major mental illnesses (bipolar disorder and schizophrenia) have subtypes and have their own very different competencies and strategies.

Individuals may experience multiple psychiatric disruptions throughout the life span, ranging from mild to severe, such as anxiety, grief, depression, post-traumatic stress disorder, bipolar disorder, schizophrenia, and various personality disorders. Clearly knowing

how to care for and about a diverse group of individuals, any of whom could be suffering with one or frequently more psychiatric disorders, can be challenging.

Individuals with a diagnosable psychiatric disorders have higher rates of substance use disorders than the general population; in 2014, 20.2 million US adults had a substance use disorder and 7.9 million or 39.1 percent also had diagnosable mental illness as defined by the DSM-5 (Center for Behavioral Health Statistics and Quality, 2015). Caring for mentally ill patients suffering with substance use disorders (dual diagnosis patients) is considered a sub-specialty of psychiatric nursing.

Forensic nurses practice at the intersection of forensic science and nursing science in almost all practice areas including but not limited to victims and perpetrators (living and deceased) in the health care system, court systems, or child protection systems. LNCs may consult such nursing experts for cases that are primarily psychiatric or medical cases with a complicating psychiatric component.

SAMPLE CASES

The following cases were real cases in which the author was the forensic psychiatric nursing testifying expert. Specific details of the cases were omitted or changed to protect the identity of the individuals.

Case #1 – Suicide on a Locked Psychiatric Unit

A legal nurse consultant (LNC) performed a case review for merit concerning a suicide on a locked psychiatric unit. The LNC knew that any inpatient suicide would trigger myriad formal reviews, both internally and by accrediting and licensing agencies and recognized also that others, such as the medical examiner or coroner (depending upon the state's model where the death occurred) would be involved.

Forensic nurses practice at the intersection of forensic science and nursing science in almost all practice areas including but not limited to victims and perpetrators (living and deceased) in the health care system, court systems, or child protection systems.

What records would be necessary for a preliminary screening for merit, and what records would need closer scrutiny? The LNC was not a psychiatric nursing professional or forensic psychiatric nursing professional, so consultation with an expert was necessary.

Nurses offer expert opinions on nursing care; physicians do not. The LNC and counsel will need both. An expert forensic psychiatric nurse will identify records, documents, reports, standards of professional practice, and current peer reviewed research, either behind the scenes or as a testifying expert. Materials the expert will need include:

- ♦ *General Records of Interest*
- ♦ *Hospital Records*
 - All current and past psychiatric treatment records (inpatient and outpatient)
 - Medical records for at least the last five years to determine if a co-existing medical condition could have exacerbated the psychiatric condition
 - Contemporary nursing, unit-specific, and laboratory policies and procedures. Request the index of policies and procedures because if a specific title is not requested during discovery then a valuable resource may not be produced.
 - Training records for all unit nursing and ancillary staff, a copy of the unit master staffing pattern,

and the specific unit staffing during the shift (Adequate if a patient with suicidal ideation is admitted?)

- Shift to shift report for the day (if available)
- Patient acuity scales
- Copies of any unit communication book or log book pages for that day
- Unit surveillance tapes for the day
- Detailed unit floor plan (Blind spots and review the use of and placement of convex mirrors?)
- ♦ *Licensing and Accrediting Agencies and Organizations*
 - Sentinel event records at both state licensing levels, e.g., Department of Public Health and the Department of Mental Health
 - The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) or other accrediting agency sentinel event records
 - Previous facility and unit inspections and surveys
 - Professional practice disciplinary records for involved licensed professionals
- ♦ *Forensic and Legal Agencies and Organizations.*
 - Postmortem or autopsy records
 - Police records (including photographs and videos)

- Emergency Medical Services (EMS) records including call transcripts
- Toxicology results from the medical examiner’s/coroner’s office

Case #2 - The Medically Compromised Aggressive Psychiatric Patient

Mr. M. (age 64) has a long history of bipolar disorder and aggressive behavior. He is diabetic, has a Charcot’s foot, diabetic ulcerations on his feet, arterial insufficiency, and a upper respiratory infection (URI) for which he is receiving antibiotic treatment. He is entering a hypomanic state (elevated mood with disinhibition) or manic state (excitement, euphoria or irritability, delusions, grandiosity, and the like) and has been threatening, verbally aggressive, suspicious, destroyed property at home (punching walls, breaking objects), and ultimately brandishing a knife at family members. A neighbor hears the commotion and calls the police. The police enter the home and take Mr. M. into custody after he waves the knife at them and transports him to the Emergency Department (ED) where he requires restraints after continuing his aggressive posturing and language. He is evaluated by a licensed psychiatric professional and after consultation with the attending physician and psychiatrist on call and is admitted to the locked psychiatric unit.

The unit psychiatric social worker contacts the family and learns that Mr. M. has not been taking his psychiatric medications recently. Mr. M’s psychiatric mood stabilizers and anti-psychotic medications are restarted. However, after two weeks he is still agitated and at times aggressive. He has also developed diarrhea as a side effect of his antibiotic treatment. The nursing staff try to keep his diabetic foot ulcers clean and try to have him remain in a wheelchair rather than risk further injury to his Charcot’s

foot. Because of his disorganized thinking, he is found walking the unit with feces down his legs and on his feet. The aides shower him.

After approximately three weeks, his wife notifies the nursing staff about several new blackened lesions/ulcers on his foot. His vital sign record shows a slight fever occurring over the past three days, but the mental health worker charged with taking vital signs did not report this. The attending psychiatrist and medical physician decide to transfer Mr. M. to a medical unit with one-to-one supervision.

The infected ulcers worsen and he becomes increasingly ill and delirious. He has a below the knee amputation (BKA) to prevent further sepsis. Two weeks later he undergoes above the knee amputation when the BKA site becomes necrotic. He remains septic with sequential organ failure, and dies. The family consults an attorney.

Recognizing the psychiatric and medical complexities, the LNC contacts a testifying expert (TE) forensic psychiatric nurse who reviews the records closely, especially regarding the medical care of this aggressive, disorganized psychiatric patient. The TE is thoroughly familiar with the Scope and Standards of Mental Health Nursing, the state Nurse Practice Act (especially regarding delegation to and supervision of unlicensed workers), nursing interventions, the MAR for the patient, etc.

The TE prepares a chart that graphs medications, mood and behaviors, and vital signs. A pattern emerges; pattern recognition is part of forensic nursing education. The TE notes that ointment for the diabetic foot ulcers was often not given and recognizes that omitting the foot ointment may have exacerbated his underlying medical condition. The TE notes that due to his foot deformity, level

of aggression, and frequent fecal soiling he wears non-slip socks, not sneakers or shoes. The staff diligently showered him and made certain that he always wore the socks to prevent falling, but they also indicated how agitated and suspicious he was under running water. The TE hypothesized that Mr. M. lacked the capacity to cooperate after a shower and that his feet perhaps were damp prior to being dressed in his socks.

The TE requested copies of maintenance records for the unit, specifically the shower stalls, and noted that there were frequent tickets filed for slow draining showers clogged with patient hair, toilet paper, and other foreign substances. After reviewing these records, the TE subsequently hypothesized that fecal material may not have been adequately rinsed off Mr. M’s feet because he would be standing in undrained water. Due to Mr. M’s agitation and foot pain, the unit psychiatric nurse failed to remove his socks and inspect his feet prior to applying ointment. This chain of events might be the catalyst for his subsequent sepsis and premature death.

All of the autopsy records, laboratory records including wound cultures, educational records, and other materials supported the TE’s conclusion that the chain of events resulted in infection, including the psychiatric nurses’ failures to remove his socks, inspect his feet, and apply the topical medication. This did not exonerate other health care professionals in this case from all responsibility, but the TE opined that psychiatric nursing practice and standards of practice on a locked unit included such basic professional practice standards as administering topical medicines (as delineated in basic nursing textbooks) in additions to the standards for psychiatric practice. The case settled out of court for many millions of dollars for the family.

Case #3 – The Dually-Diagnosed Patient Who Overdosed

Ms. S., aged 23, had a long history of self-cutting, bulimia, alcohol, cocaine, and amphetamine abuse, and post traumatic stress disorder (PTSD) arising from childhood sexual abuse. More recently, she abused intravenous IV heroin after her orthopedic surgeon discontinued her prescription for oxycodone and acetaminophen (Percocet). She later revealed that only opioids offered relief from the intrusive recollections of her sexual abuse; alcohol no longer helped.

After an arrest for driving under the influence of drugs and alcohol, she entered inpatient drug rehabilitation for two weeks and detoxed successfully. She was stabilized on psychotropic medications to treat her PTSD and discharged to her parents' home with a prescription for a one-month supply. Subsequently, her parents insisted that she enter a halfway house residence and intensive outpatient program (IOP) in a nearby state to continue her recovery.

She walked from the halfway house to the IOP daily and attended 12-step meetings there nightly. This halfway house was in a neighborhood with an active drug trade. Ms. S. did not make an appointment to be followed by an outpatient psychiatrist for medication management and ran out of her psychiatric medications after one month. Approximately two weeks later, she overdosed on IV heroin during her evening walk to a 12-step meeting. Her parents consulted an attorney who sent the limited case information to an independent LNC for review.

Upon initial screening, it appeared to the LNC that several breaches of communication and supervision occurred in this case and that multiple and distinct treatment provider types

were involved. The LNC identified a forensic psychiatric nurse TE with a subspecialty in substance abuse treatment to review the case. This expert recognized significant details:

- + PTSD
- + Bulimia nervosa
- + Alcohol abuse
- + Cocaine abuse
- + Amphetamine abuse
- + Heroin abuse
- + Self-cutting
- + Court mandated treatment and subsequent court ordered probation supervised out of state but originally imposed in Ms. S.'s home state
- + An inpatient substance abuse treatment center that was part of a chain of treatment centers owned by a larger for-profit corporation
- + A half-way house owned by a non-profit corporation
- + A IOP based in a hospital lacking a psychiatric service

This complex case crossed diagnostic groups, levels of care, and state lines.

Therefore careful review required scrutiny of professional practice standards specific to each diagnosis, level of care, and state.

Records showed that Ms. S. had a minor criminal record for shoplifting and uttering. The TE developed a list of other documents to be sought through discovery, which proved to contain some very important information.

First, neither the treatment center nor its parent company was licensed to provide services to dually-diagnosed individuals, only to individuals with primary substance use disorders.

It was also necessary to discover whether the parent company provided adequate resources for patients whose residential stay was funded via a capitat-

ed contract. This would reveal whether psychiatric care and supervision were based on funding resources for out-of-network providers or on retainer.

The facility's and insurance company utilization initial and concurrent reviews provided answers to more questions: Was this the proper facility for this patient? Was psychiatric assessment and intervention appropriate? Was the referral to the halfway house and IOP appropriate for Ms. S.'s level of psychiatric and substance use disorders?

Review of Ms. S.'s hospital discharge and referrals revealed deviation from national standards of practice: appointments with an outpatient provider should have been set prior to discharge. The utilization review nurse for the facility learned on Friday that Ms. S.'s last covered day was on Sunday with discharge on Monday morning. Discharge planners did not work on the weekends and no one had the foresight to set an outpatient psychiatric appointment timely despite knowing that discharge would be soon.

The halfway house was not licensed for dual diagnosis clients, nor adequately supervised or staffed for these complex patients. Regarding their clinicians' education, expertise, training, and supervision, all except for the house manager were unlicensed persons whose expertise derived from their own historical substance abuse. Although a policy of random drug screens was in place, in practice such drug screens were rarely conducted.

Similar review of the intensive outpatient program and the probation system for appropriateness of this level of care for a dually-diagnosed individual, the level of psychiatric care, if any, provided during the program, the credentials of care providers, their education, and their expertise disclosed further deficiencies.

As in the hospital and halfway house, case management communication was virtually nonexistent. For example, the probation department thought random drug screens were being conducted at the halfway house. The halfway house thought the IOP was doing them and sending results to the probation department. The IOP staff thought that the local probation department and the halfway house were both doing them. And finally, IOP staff did not think there was a problem because they were never received any positive results.

A review of autopsy and post-mortem toxicology records (vitreous humor concentrations) revealed that Ms. S. died from a massive overdose of heroin cut with strychnine. Further, the post mortem physical exam showed multiple cuts on her inside thighs and vaginal area in various stages of healing, indicating that Ms. S. had returned to self-cutting. Further, her stomach and intestines were devoid of foods, her

- The staffing, training, expertise, and psychiatric care was insufficient for the care of such a complex case.
- The parent company of the substance abuse treatment facility demonstrated a pattern of precipitous discharge planning when insurance benefits ceased.
- The discharge planning activities delineated in internal policies and procedures, including appointment setting, were frequently disregarded due to inadequate staffing and resources.
- The halfway house was not licensed for the care of dually diagnosed clients.
- The staff at the halfway house were inadequately educated and supervised.
- Policies and procedures at the halfway house did not allow the transportation of unlicensed clients to offsite activities despite the house's positioning in an area where drug dealing was occurring (failure to protect).

- The IOP was also not licensed to provide care for dual diagnosis clients, nor was the staff education and expertise adequate.
- The IOP did not have appropriate psychiatric evaluation, consultation, or staff supervision to care for such a complex case.
- The IOP did not communicate with the referring substance abuse treatment facility, the probation department, the halfway house, or Ms. S.'s family.
- The insurance company had provided several days of notice (as revealed by utilization review records obtained from the insurance company) that Ms. S. needed to be stepped down to a lower level of care based upon discussions with the substance abuse facility's utilization review agent.
- The insurance company failed to provide appropriate case management services for Ms. S., a case or care manager that would coordinate all of these various agencies and providers.
- The medical examiner's autopsy and post-mortem toxicology demonstrated that Ms. S. had injected drugs several times before her death and that she died from heroin overdose and strychnine poisoning.

This case settled out of court after suit was filed against all three levels of care and the parent companies. The probation department was not part of the suit due to governmental immunity in the jurisdiction.

SUMMARY

The role of the forensic psychiatric nurse can be critical in review of cases with elements similar to those described above. The forensic psychiatric nurse navigates easily within and across domains, knowing the laws governing care of psychiatrically ill patients, substance abusing patients, and patients with co-existing disorders. Knowing typical routines on psychiatric units is

The ability of the forensic psychiatric nurse to review a multitude of critical records can provide the depth and breadth of a case for either the plaintiff or the defense team.

tooth enamel was eroded, and inflammation was noted in her esophagus. Last, she had several fresh needle puncture wounds characteristic of IV drug use between her toes.

The expert forensic psychiatric nurse concluded and opined during deposition as follows:

- The substance abuse treatment facility was not licensed for the care of dually diagnosed individuals.

- Policies and procedures at the halfway house requiring random drug screening, were ignored and communication with outside agencies (IOP, Probation) did not occur.
- Halfway house staff did not verify the adequacy of medication for Ms. S. and did not facilitate refills either by setting an appointment for psychiatric follow-up or by contacting the sending facility for another prescription while Ms. S. waited for an appointment with a provider.



critical to understanding a case. The ability of the forensic psychiatric nurse to review a multitude of critical records can provide the depth and breadth of a case for either the plaintiff or the defense team. These include but are not limited to:

- Unit layout
- Architectural schematics
- Maintenance reports
- Unit staffing patterns
- Police reports
- Sentinel event documents
- Risk management records
- Toxicology and autopsy reports
- Federal and state statutes (across state lines)
- Nurse practice acts
- Professional standards of nursing practice

- Utilization review records (hospital and payor/insurance company)

Psychiatric issues can be confounding and fascinating. Many cases could benefit by review by psychiatric forensic nurses, such as nursing home patient-on-patient violence, allegations of dangerous behavior in a community, or cases involving incarceration, to name a few. Consider consulting a forensic psychiatric nurse to highlight and illuminate their nuances to strengthen your case. 📖

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A Legal Nurse Consultant as Death Examiner

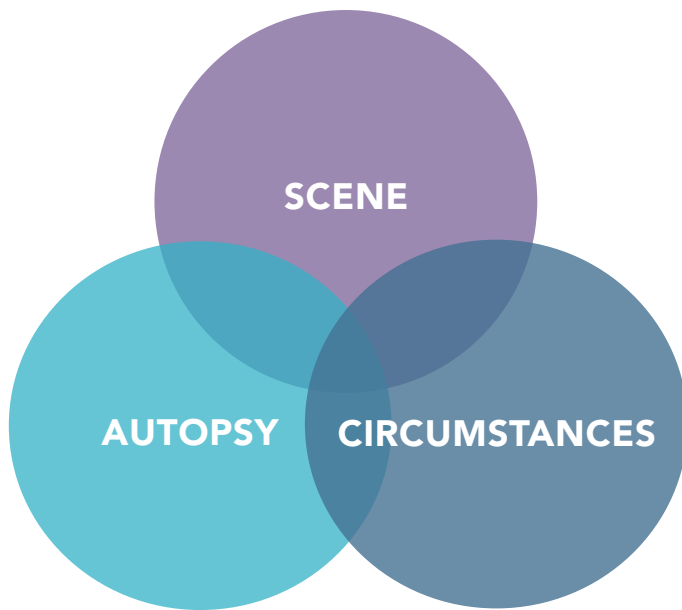
Melissa Becker RN, BA, CFN

In 1999 I stumbled across an ad for a seminar sponsored by the local coroner's office. After several eight-hour training sessions dealing with topics such as blunt and sharp force injuries, strangulations, overdoses, suicides, homicides and motor vehicle accidents, including all the guts and gore you can imagine, I was hooked. I casually slipped my business card to the presenter stating if they needed any other investigators I was interested. Much to my surprise, they did call, and thus began my career into death investigation as a deputy coroner.

The history of forensic medicine and death investigation has a very long history as outlined in Fourth Edition of Spitz and Fisher's *Medicolegal Investigation of Death*. The purpose of a death investigation is to determine the cause and manner of death, primarily, but not solely for the death certificate.

All deaths require a death certificate. While death certificates are modeled after the "US Standard Certificate of Death," each state has their own form; many can be completed on line. A treating physician can sign the death

certificate, provided the death does not fall under the jurisdiction of the coroner/medical examiner. Again, each state determines its criteria (Centers for Disease Control and Prevention (CDC), 2013). In general, a treating physician usually only signs death certificates for natural deaths. The National Association of Medical Examiners has guidelines and teaching tools for providers to fill out death certificates regarding cause and manner of death. Death investigations vary throughout the United States, and thus, the quality of the investigation varies as well. (Fig. 1)



Components of a death investigation involves three equally important components; scene, autopsy and circumstances.

There are important civil, criminal, financial, public and epidemiological implications for listing cause and manner of death. A death certificate is the primary basis for criminal charges, the legal proof of death for Social Security, and required to resolve estate issues and death benefits. It also is important for statistical data supporting decisions on research and public funding programs.

COMPONENTS OF THE INVESTIGATION

A death investigation involves three equally important components; the scene, circumstances and body/autopsy. Each component by itself is important and each component could have limited or expansive details but it is the combination of these three that impact the quality of the investigation and outcome.

Scene The scene is where the death occurred. Depending on type of case involved (e.g., motor vehicle accident, homicide, suicide, child abuse) various scene details become important, such as type of building, surroundings, indoors or outdoors, associated objects, upkeep

of property/room cleanliness etc. It may also involve the temperature of surroundings, who had access, who has been in or around the scene, how did the body come to be found, how was access gained to find the body, and so forth. (Figs. 2-5, Scene photos next page)

In a motor vehicle accident (MVA), issues such as type of roadway, type of surface, curves in the road, visual obstructions and aerial views can become very important. The death examiner will look at the event time, and if the fatal accident occurred at night, will obtain pictures during day and night. Injuries found in autopsy and be related to other factors, e.g., whether seatbelts were used, whether the person was ejected, whether the vehicle rolled over the person, or whether a foreign body intruded into the passenger compartment.

For deaths in a home, factors at the scene to consider include ancillary items, such as blankets in a crib, unkept house or an unmowed lawn, or old food sitting on counter.

Circumstances are surrounding events that may or may not have an affect on what happened: relationships (divorce, marriage, fight, child custody issues, break-ups, abusive relationships), financial issues (loss of employment, bankruptcy, foreclosure, inheritance, gambling issues), medical issues (chronic medical conditions, mental health issues, change in medications, recent surgeries or procedures, recent hospitalizations, or falls), drugs/alcohol (recent prescriptions, rehab visits, driving under the influence, court issues, drug interactions, or doctor shopping), and recent events (long plane ride, death of close friend, loss of business, or legal issues). Fig. 6. Circumstances

Body/autopsy The coroner/medical examiner orders an autopsy not for criminal/civil reasons but to determine cause and manner of death. If this can reliably be determined otherwise then an autopsy might not be done. For example, if the decedent had been hospitalized, had diagnostic testing or surgeries, or a prolonged hospital stay, the ME/coroner may sign the death certificate based on reviewing medical records. Sometimes autopsy would be limited, such as to only the brain or chest. If the death appears to be related to homicide, then a full autopsy would be done. In many civil cases an autopsy is not done, so the death certificate is issued based on opinions/presumptions. The LNC should know that in this case, important vital issues can be missed. Fig. 6. Gunshot wounds, with shot pellets visible on x-ray

The quality of the death certificate is based upon the quality of the death investigation. Death investigations cost money; more rural jurisdictions may not have the same financial resources as more urban jurisdictions. In addition, the level of training, experience and associations matter. If the local coroner is also the local clinic physician investigating the death of a colleague's patient, important issues may be overlooked or



Fig. 2-5: Scene photos

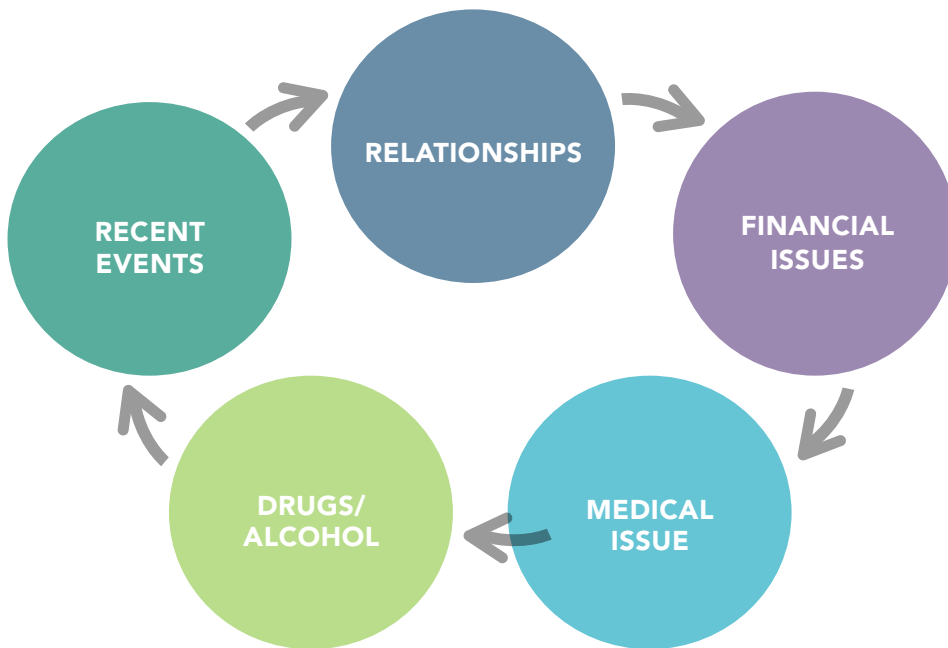


Fig. 6: Circumstances



Fig. 6: Gunshot wounds, with shot pellets visible on x-ray

not addressed. Once I evaluated a drug overdose case in which the coroner who investigated the death was the prescribing physician; he filled out the death certificate citing the manner of death as “natural.”

The person performing the autopsy needs information about the scene and circumstances. Incomplete information from a poor investigation will affect the final determinations on cause and manner of death.

Preconceived notions impact death investigation. One case involved a person with a gunshot wound to the head; the gun was found at the scene, and the emergency medical services personnel report documented “suicide, exit wound at the top of the head.” However, autopsy indicated the wound at the top of the head was in fact an entrance wound, leading to an investigation for murder.

CASE EXAMPLE #1

Driver of vehicle involved in a single vehicle motor vehicle accident in which the vehicle went off the road and the driver died at the scene.

Scene:

- ✦ Rural county road
- ✦ No witnesses
- ✦ Police report: highway speeds, small right turn
- ✦ Vehicle kept going straight over guardrail, down steep incline, landed on driver’s side of vehicle



Fig. 7: Case #2

Circumstances:

- ✦ Driver talking to wife at time of accident, told her to “Hold on!”
- ✦ Accident occurred at this time
- ✦ No braking, skid marks, unusual marks, curve in road
- ✦ Medical responders were EMTs, delayed arrival
- ✦ Prolonged extrication due to vehicle location
- ✦ Unable to get to driver to render medical care

Autopsy:

- ✦ Atherosclerotic heart disease
- ✦ Left anterior descending and right coronary artery with 75-90% blockages
- ✦ Cardiomegaly with biventricular hypertrophy
- ✦ Pulmonary congestion
- ✦ History DM
- ✦ Thoracic vertebra fx, left lateral rib fx, minimal associated hemorrhage
- ✦ Toxicology negative

Summary:

- ✦ Issue was “Act of God” vs. insurance coverage
- ✦ Suffered event from medical issue – sudden cardiac arrest R/T underlying cardiac condition
- ✦ However, argument made that circumstances prevented medical attention from reaching him timely, thus causing his death; cardiac arrest was possibly survivable without prolonged extrication and delay in getting to driver
- ✦ Lack of higher level training of first responders was also important, as no defibrillator was available.

CASE EXAMPLE #2

Driver of small vehicle runs over something in the middle of the road, stops the vehicle to find a body under the car. (Fig. 7)

Scene:

- ✦ Late at night, heavy snowfall

- ✦ Winding rural road, no streetlights, no shoulder, deep ditches on both sides
- ✦ Vehicle stopped in middle of road
- ✦ Body under vehicle, face down, hand and foot sticking out from underneath
- ✦ Massive blood loss under body
- ✦ Obvious blood, bone and tissue trail of 416 feet
- ✦ Tire tracks from vehicle appear to be in opposite traffic path (wrong side of road)

Circumstances:

- ✦ Driver did not see anything prior to running over “something”
- ✦ Passenger yelled “Watch out!” and said, “I think you ran over someone.”
- ✦ Driver did not stop right away, did not believe it was a person
- ✦ Driver had been drinking, previous DUI
- ✦ Driver and passenger switched places

prior to PD arrival, gave story that passenger had been driving

Autopsy:

- Multiple traumatic injuries associated with motor vehicle vs. pedestrian accident
- Head trauma – scalp laceration, comminuted calvarial and basilar skull fractures, cerebral laceration and destruction
- Thoracic trauma – multiple rib fractures, pulmonary contusions
- Abdominal trauma – spleen and liver lacerations, retroperitoneal hemorrhage
- Toxicology (victim) – blood alcohol .20, drug screen negative

Summary:

- At issue here was whether the victim was dead before he was hit by the car
- What was the victim's body position before being hit? Why was he in the middle of road?
- Further investigation revealed that victim had been drinking heavily and probably passed out in road prior to being struck
- Heavy snowfall and lack of lighting made victim difficult to see until it was too late
- Driver might not have been charged had he stopped immediately and not lied about who was driving
- Details of the investigation, however, was a mitigating factor in sentencing
- Opinion that victim's face was facing away from the vehicle at the time he was struck and was alive at time of being struck, given length of blood trail and large pool of blood 416 feet later
- Opinion that whether victim might have survived if driver stopped right away was unknown, but possible

Death investigations are about more than just the autopsy report, more than just the scene investigation, and more

than just the circumstances. Each of these components is vital to understanding what happened. The overall quality of the investigation directly reflects the quality of the details.

After several hundred investigations over two years, I left the coroner's office, but I continue to apply what I learned to each case I review that involves a death. This experience was very valuable in helping me to hone my investigation and critical thinking skills, of vital value for a legal nurse consultant. 🐾

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Check Your Answers

Test Your Case Screening Skills

1. Investigate

- Pedicle screw into sacral nerve probably malpractice
- 5 month delay in diagnosis and treatment of injured nerve
- Significant pain & suffering - permanent
- Permanently disabled from working
- Possible conflict between surgeon and hospital, culminating in his departure.

Disposition: \$1.4 million settlement at mediation

2. Reject

- Delay in cutting cord is not malpractice and does not cause apnea
- According to literature, may be difficult to pick up BWS on prenatal ultrasounds and no established guidelines exist for the prenatal diagnosis of this condition
- Earlier diagnosis of congenital condition would not have changed the outcome. Thus, no harm.
- Clients declined amniocentesis, which may have detected disorder.



The Continuing Enigma of Sudden Unexpected Infant Death

Thomas Andrew, MD, FCAP, FAAP

Keywords: SIDS, SUID, triple risk model, sleep environment, diagnostic shift, autopsy

Sudden unexpected infant death (SUID), even in 2016, more often than not remains incompletely explained, even after a meticulous scene investigation, complete autopsy, and thorough review of the medical record. This article discusses the evolving understanding of SUID, the dramatic decline in the diagnosis of sudden infant death syndrome (SIDS) by forensic pathologists, and the critical importance of detailed investigation of the scene and circumstances of the infant's death, including doll re-enactments of the fatal episode. It also discusses scope and limitations of autopsy and ongoing difficulty in characterizing different types of SUID accurately for epidemiological purposes.

The tragedy of the sudden, unexpected death of a previously healthy infant has been described since antiquity. One of the first recorded cases can be found in the Old Testament Book of I Kings 3: 16-28, a case of asphyxia by overlaying. Similar incidents without apparent explanation continued to haunt humankind. This phenomenon was eventually dubbed sudden infant death syndrome (SIDS) by a conference of experts in the field in 1969 (Beckwith, 1970). Etiological theories ranging from infectious to immunological reactions to vaccines to environmental exposures such as lead and black mold were advanced, but none have been definitively proven and many are now known to be invalid.

For example, in one novel hypothesis, so-called auto-brewery syndrome had once been implicated as an etiology of sudden infant death. *Candida albicans* can produce alcohol from glucose, and dominated intestinal flora in some SIDS cases. Thus the theory was ethanol production in the gut (auto-brewery) led to intoxication with enough respiratory depression as to induce prolonged apnea and death.

A paper in the German literature published in 1982 showed ethanol was produced at a maximum rate of 1 mg per gram of intestinal content per hour. The authors concluded that the intestinal production of alcohol in vivo from cases with *Candida albicans*-dominated intestinal flora does not surpass the liver's normal capacity to metabolize alcohol. Furthermore, measurable concentrations of alcohol in the blood from such cases cannot be expected from this mechanism in these kinds of deaths. (Geertinger et al., 1982)

Throughout the 1970s the wider medical community accepted the etiological theory of sustained apnea during sleep leading to a hypoxia-mediated cardiac arrhythmia. This belief stemmed in no small part from a series of sleep studies

During a critical period of abnormal neurodevelopment, multiple stressors such as subclinical infection, thermal stress, rebreathing exhaled carbon dioxide, and others can converge to produce sudden death.

published by Dr. Alfred Steinschneider. The theory came crashing down with the revelation in 1995 that a centerpiece of Steinschneider's work was, in actuality, the serial homicide of five children in the same family perpetrated by their mother. This dramatic episode is chronicled in *The Death of Innocents* by Richard Firstman and Jaimie Talan, published in 1997.

Other theories as to the root cause of the phenomenon have emerged, but the medical and scientific communities, and more importantly, families faced with the seemingly instantaneous loss of a child still face more unanswered questions than evidence-based explanations. In 1974 Congress passed the Sudden Infant Death Syndrome Act, which recognized SIDS as a significant public health issue. This Act directed the National Institute of Child Health and Development (NICHD) to take the lead on SIDS research within the U.S. Public Health Service.

EVOLVING CONCEPTS OF SUID

While a single unifying theory remained elusive, the NICHD convened another consensus conference of experts in the field in 1989 for the purpose of establishing a standard definition of what was then referred to as SIDS. Their proposed definition, published in 1991 was, "the sudden death of an infant younger than 1 year of age that remains unexplained after a thorough case

investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history." (Williger, et al., 1991) What constitutes a complete autopsy and adequate scene examination remains a subject of debate even today, but the basic definition itself has stood the test of time.

The 1980s also saw the refinement of Wedgwood's 1972 "triple risk model" of SIDS by Filiano and Kinney, eventually published in 1994. According to this model, sudden death in SIDS results from the intersection of three overlapping factors: (1) a vulnerable infant; (2) a critical developmental period in homeostatic control, and (3) an exogenous stressor(s). Death will ensue only if the infant possesses all three factors; the infant's latent vulnerability is exposed by entrance into the critical period and is subject to an exogenous stressor (Filiano and Kinney, 1994). The basic concept can be illustrated in Figure 1.

Research suggests that there are likely one or more specific neurodevelopmental disorders that can make an infant vulnerable. During a critical period of abnormal neurodevelopment, multiple stressors such as subclinical infection, thermal stress, rebreathing exhaled carbon dioxide, and others can converge to produce sudden death. Among the proposed neurodevelopmental abnormalities proposed as

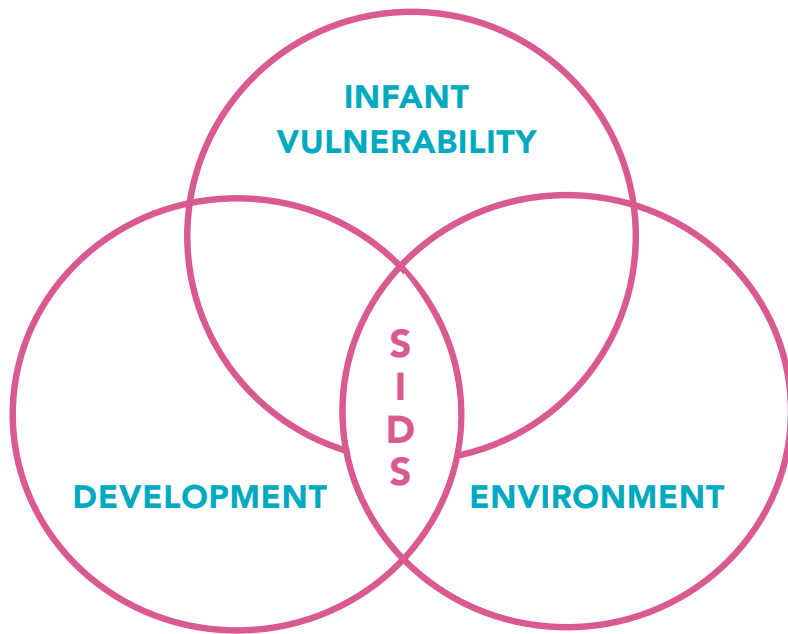


Fig. 1: Triple risk model for SIDS

causative or contributory to sudden infant death, the one that has shown the most promise involves the concept of a medullary serotonergic network deficiency. Published in 2001, the hypothesis focused on examination of serotonergic neurons in specific regions of the infant brain (ventral medulla and the medullary reticular formation). The authors suggest observed developmental anomalies of this network results in a failure of protective responses to various life-threatening stressors, particularly during sleep as the infant passes through a critical period of homeostatic control. (Kinney, Filiano and White, 2001)

There are other hypotheses. Neural, cardiac, metabolic, genetic, immunological, infectious and physiologic research remains ongoing. A survey of recent published work suggests research continues on a broad front, including:

- identification of developmental defects of specific brainstem centers involved in hearing pathways, suggesting a possible influence of the acoustic system on respiratory activity (Lavezzi, Ottaviani, and Matturi, 2015)

- a mouse model, suggesting abnormal development and loss of cerebellar Purkinje cells adversely affecting the ability to recover from hypercarbia (Calton et al., 2016)
- laryngeal reflex apnea potentiated by upper airway infection (Scadding et al., 2014),
- failure of brainstem-mediated autore-suscitation (Randall et al., 2013)

BACK TO SLEEP/BACK TO THE FUTURE

The 1990s ushered in a new era of prevention efforts focused on initially sleep position and evolving to today's emphasis on sleep environment. Studies published in Australia (Dwyer et al., 1995), New Zealand (Mitchell et al., 1994), and the United Kingdom (Markstead et al., 1995) showed a significant link between SIDS and prone sleeping. This was the genesis of public education campaigns recommending that infants be placed to sleep on their sides or backs. The newly formed American Academy of Pediatrics (AAP) Task Force on Infant Sleep Position and SIDS began to evaluate studies on

prone sleeping as a risk factor. Based on research findings, AAP formally recommended that U.S. babies be placed on their backs or sides to sleep in 1992 (AAP, 1992). In 1994 the NICHD launched the Back to Sleep® campaign in collaboration with the AAP and other entities. Conferences, informational mailings and thousands of public service announcements spread the Back to Sleep message, now called "Safe to Sleep."

Based on additional research, in 1996 the AAP sharpened their recommendation, stating that U.S. babies should be placed to sleep solely on their backs, as this is associated with the lowest SIDS risk. The AAP further recommended using firm sleep surfaces and avoiding the use of soft bedding in cribs.

A heretofore unconsidered target for sleep safety education was revealed by Rachel Moon's important retrospective study of 1,916 SIDS cases (Moon, Patel and McDermott-Shaefer, 2000). Moon found that 20.4% of deaths studied occurred in child care settings versus an anticipated 7% rate. The anticipated rate was calculated as a function of overall infant death rates against the background of time spent by infants in and out of home child care. Sixty percent of deaths in child care were in non-commercial settings. Infants in child care were more likely to be placed prone for sleep or found prone and unresponsive. This was particularly important when the infant's usual sleep position was lateral or supine.

The authors opined that infants sent home with parents who were given instructions to put their infants in the supine position for sleep were unaccustomed to prone sleep. When mothers went back to work and made child care arrangements with family or friends who had not been educated as to the risk, they tended to place infants in the prone position. Today, training in safe sleep environments is a requirement for commercial childcare providers most states.

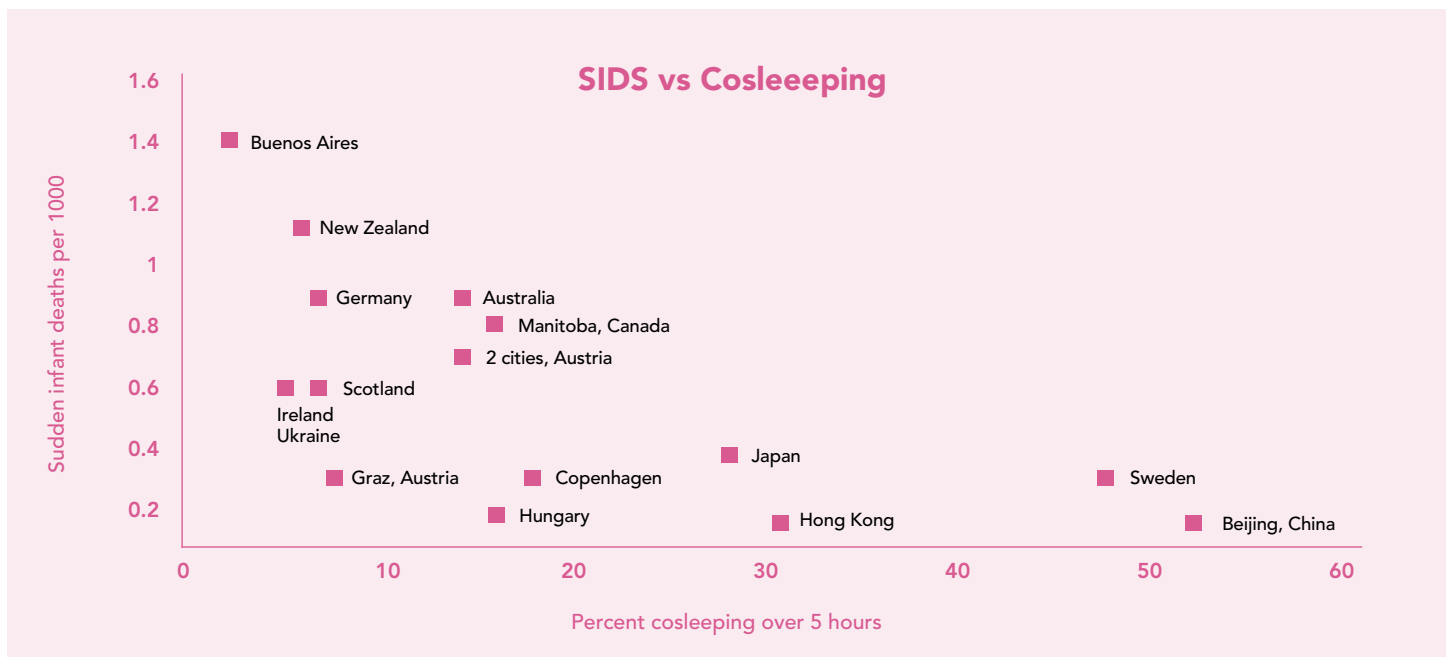


Fig. 2: Comparison of international rates of co-sleeping and sudden infant death. After Palmer in Baby Matters

Regarding the issue of firm sleep surfaces and soft bedding, there have been declines in potentially hazardous bedding use since the 1990s, but this trend has slowed since 2000.

Approximately 50% of US parents, and two-thirds of black and Latino parents, continue to use thick blankets, cushions, pillows, and other potentially hazardous soft bedding, either under or covering the infant for a variety of stated reasons, including perceived increased comfort and warmth (Salm and Ngui, 2015).

In 1997, research that continues to be controversial suggested that bed-sharing between adults and infants, especially under certain conditions, may increase SIDS risk. Notwithstanding, bed-sharing increased among new parents from 5.5 to 12.8% between 1993 and 2000. Bed-sharing also frequently means soft bedding and bed-sharing infants are twice as likely to be covered by a quilt or comforter as crib sleepers. Proponents of the “family bed” hold that bed-sharing is a normative human pattern altered by modern furniture, behavior, etc., bed-sharing promotes

more and longer breast feeding, “safe” bed-sharing is “protective” against SIDS because of increased infant arousability, and that bed-sharing is common in “low SIDS cultures.” (Palmer, 2007, Mileva-Seitz, et al., 2016)

Safe sleep advocates point to the risk of falls, overlaying, wedging, entrapment, and thermal stress combined with the factors of maternal fatigue, obesity, and impairment by drugs and/or alcohol, creating conditions that make the family bed untenable when it comes to very young infants. (Moon and Hauk, 2015, Shapiro-Mendoza et al., 2014) Furthermore, potentially hazardous bedding use is more common among infants sleeping in adult beds (71.5%), and when sharing a sleep surface (70.0%) (McBride, 2015).

The debate continues to rage today, but even the most ardent of shared sleep advocates will agree there are factors such as maternal drug and/or alcohol use, sofa sleeping, unsafe space between mattresses and/or headboards, overly heavy or fluffy bedding, and others that make bed-sharing unsafe. As recently as

2015, a Swedish study group of SIDS reported a significantly higher prevalence of bed sharing than in explained infant deaths and that prone sleeping was still overrepresented. (Möllborg et al., 2015)

DECLINE IN THE DIAGNOSIS OF (SIDS) BY FORENSIC PATHOLOGISTS

The 1990s was also the era of “diagnostic shift” when, against the backdrop of declining SIDS rates and the apparent success of the Back to Sleep campaign, there were increased numbers of cases certified as of undetermined cause and manner of death and more frequent diagnoses of accidental asphyxia due to unsafe sleeping environments (Byard and Beal, 1995, Mitchell, et al., 2000, Perrizo and Pustilnik, 2006). This was attributed to better and more comprehensive scene investigation (Images 1-3).

As early as 1977 Jones and Weston proposed specific investigative and autopsy protocols for infant deaths (Jones and Weston, 1977). Their recommendations went largely unheeded, but nine years later a controversial paper suggested



Image 1 & 2: Inflatable bed in which a 10-month-old was found wedged between a soft headboard and mattress



Image 3: Pulmonary edema foam observed in scene investigation

SUIDI INVESTIGATIVE TOP 25

- Case information
- Asphyxia
- Sharing sleep surfaces
- Change in sleep conditions
- Hyperthermia/hypothermia
- Environmental hazards (CO, chemicals, etc.)
- Unsafe sleeping condition
- Diet
- Recent hospitalizations
- Previous medical diagnoses
- History of "acute life threatening events"
- History of medical care without diagnosis
- Recent fall or other injury
- History of religious, cultural or ethnic remedies
- Potential known natural causes
- Prior sibling deaths
- Previous encounters with police or social service agencies
- Request for tissue or organ donation
- Objection to autopsy
- Resuscitative treatment
- History of trauma, poisoning or intoxication
- Any suspicious circumstances
- Other alerts for pathologist's attention
- Detailed description of circumstances
- Pathologist information (name/agency/phone)

Fig. 3: SUIDI Investigative Top 25.

that every sudden unexpected infant death case they investigated yielded a critical environmental feature that explained the death, usually caused by asphyxia. (Bass et al., 1986) This ushered in a period of renewed interest in the scene of death as critical for complete investigation.

IMPORTANCE OF A DETAILED SCENE INVESTIGATION

It is axiomatic in virtually every field of medicine that patient history carries 75 to 90% of the diagnostic weight; forensic medicine is no different. It is likewise axiomatic that the forensic autopsy begins at the scene. The diagnostic shift of the 1990s prompted a major initiative by the Centers for Disease Control and Prevention (CDC) to bring some degree of standardization to the process of infant death scene investigation.

The basic data-gathering tool developed by the CDC was the Sudden Unexpected Infant Death Investigation Reporting Form (SUIDIRF). Spurred by Congress, the CDC embarked on an effort to improve infant death scene investigation nationally and rolled out their guidelines and the first iteration of SUIDIRF in 1996 (Iyasu, et al. 1996).

Forensic pathologists resisted this, perceiving it as a top-down edict with little to no input from the community specifically charged to investigate such deaths. The CDC responded by convening a working group to review and revise

the 1996 document. It was, and still is believed that improved data collection enhances diagnostic accuracy and a more standardized approach to death investigation and certification much better informs prevention strategies.

The new working group was larger and more multidisciplinary than was involved in the prior document; their charge included developing a training curriculum to accompany the new and improved SUIDIRF. (Andrew et al., 2006). This effort culminated in five separate training academies involving representatives from ten states at each to introduce the new SUIDIRF, its goals, and objectives and train the representatives to disseminate the information in their own states. An enduring legacy of that effort is the Sudden Unexplained Infant Death Investigation Investigative Top 25 (Fig. 3). Forensic pathologists in the United States generally agree that this core information is critical to the accurate determination of cause and manner of death in infants who die suddenly, and that this information should be made available to the forensic pathologist before autopsy as it may guide autopsy technique and ancillary testing.

Item 24 is now routinely augmented in many jurisdictions by a re-enactment of the circumstances of death using a doll. When suggested by Bass in the 1980s the concept was considered scandalous, and was vigorously resisted by many pediatricians who perceived this



Image 4: SUID scene investigation doll.

as a gratuitous intrusion on caregivers' intense guilt at a highly charged moment. Time has taught us otherwise. It has become clear that parents' need to understand what happened to their baby much more frequently trumps any resentment at providing a sensitive, professional investigator critical information about the circumstances of death. The preference in my jurisdiction in New Hampshire is using a rather featureless, simple doll (Image 4) with printed signs for the "placed" and "found" position of the infant.

Results of these re-enactments have provided information that meant the difference between an etiologically specific cause of death versus certification of the death as "undetermined," as illustrated by the images above (Images 5-8).

SCOPE AND LIMITATIONS OF AUTOPSY

What constitutes a "complete" infant autopsy is still subject to debate and largely a function of resources available to the agency carrying out the examination.



Image 5: Position of mother and seven-day-old infant when breast fed



Image 6: Mother woke with infant's head wedged between her breast and right arm



Image 7: Position when napping on sofa with 22-day-old

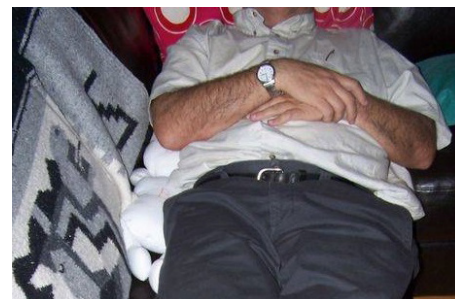


Image 8: Father awoke with infant wedged in couch

While the National Association of Medical Examiners (NAME) has promulgated forensic autopsy performance standards, the document is silent on the specifics of an infant autopsy (NAME, 2006).

At a minimum you should expect the following from the medical legal authority performing autopsies on infants in these kinds of cases in your jurisdiction:

- thorough external and systematic internal examination
- skeletal survey
- tissue sampling for microscopical evaluation
- cultures of blood, spinal fluid and other sites as indicated
- a toxicological screens
- screen for inborn errors of metabolism

Formal consultation with a neuropathologist experienced with infant brains and/or a pediatric cardiologist as indicated may be considered. When the cost of such testing falls into a range that is not prohibitive for public sector agencies like coroner and medical examiner offices, routine screening for cardiac

rhythm or structural abnormalities may become routine.

POSTMORTEM EXAMINATION COMPONENTS

External examination

The gross examination of the autopsy should begin with a detailed inspection of all external surfaces. Artifacts of resuscitation are resolved. Subtle external features, such as contusions on a non-ambulatory infant, cutaneous vesicles or pustules, petechiae, a sunken fontanelle, unusual livor mortis patterns, particularly those inconsistent with the proffered history and others may be harbingers of a diagnosis other than SIDS (Images 9-12). There may be an attempt to visualize the retinae using direct or indirect ophthalmoscopy. The presence of retinal hemorrhages will dramatically shift the focus of the autopsy. Cultures of blood, cerebrospinal fluid and perhaps a nasopharyngeal swab for viral pathogens are obtained during the external examination.

At some point during the external survey and before any internal examination takes place a radiological skeletal survey should be conducted. Note the term used here is not random or non-specific. A so-called “babygram,” in which the deceased infant is simply placed on a large radiology cassette and radiographed, is diagnostically insufficient.

The approach should mirror the radiography of suspected abuse in that there are individual, tightly collimated, coned down views of specific anatomical regions. At a minimum this should include AP and lateral views of the head, chest and abdomen, including the spine, pelvis and extremities, with separate images of the hands and feet.

Internal examination

This will consist of a systematic inspection of all internal organs with specific attention paid to critical anatomic relationships and structural normalcy of major organs. There are a number of diagnostically, nonspecific findings that are commonly seen in sudden infant death but must be interpreted holistically in the context of the entire investigation and circumstances surrounding the death. Such findings include pulmonary congestion, edema or even overt hemorrhage, petechiae on the thymus, epicardial surface and/or visceral pleura (Images 13, 14), minimal to moderate terminal aspiration and small, focal, perivascular CNS hemorrhages.

Previously undiagnosed congenital anomalies may be revealed, particularly those of the cardiovascular system that may fully explain sudden death (Images 15, 16).

The internal examination includes obtaining various tissue and fluid samples for ancillary studies such



Image 9: Infant as found by the investigator. Livor pattern inconsistent with the position of the body.



Image 10: Distinct parallel linear marks over the occiput



Image 11: Specific questioning determined that infant was found wedged between broken crib rail and wall



Image 12: Livor pattern consistent with electronic equipment where wedging occurred

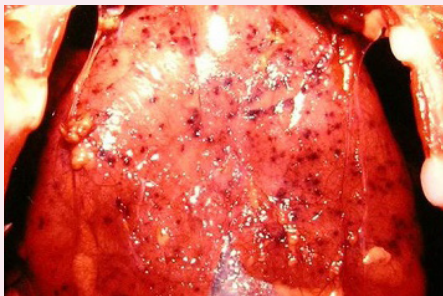


Image 13: Thymic petechiae



Image 14: Pleural petechiae

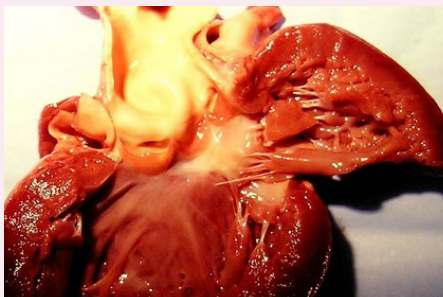


Image 15: Left ventricular hypertrophy in a 6-month-old who died suddenly during a respiratory illness



Image 16: Previously undiagnosed coarctation of aorta in infant from image 15

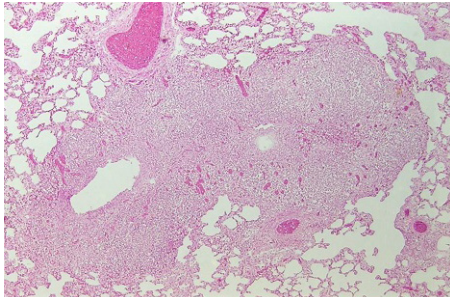


Image 17: Respiratory syncytial virus (RSV) bronchiolitis

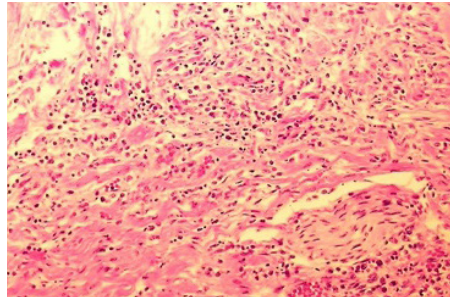


Image 18: Viral myocarditis. Note inflammation about conduction fiber at lower right

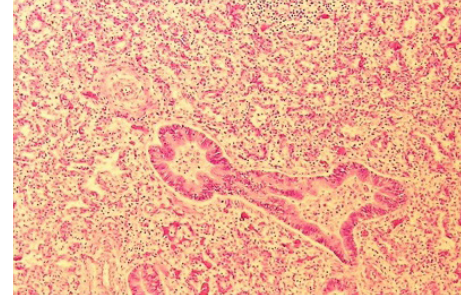


Image 19: Confluent bronchopneumonia

as toxicological analysis, screen for inborn errors of metabolism, serology, genetic studies and, of course, histological examination.

Microscopic

Other than the scene investigation, the microscope is the tool with the highest diagnostic yield when it comes to specific diagnoses responsible for sudden, natural infant death. It is this instrument that will yield diagnoses not definitively discernable to the naked eye such as infectious processes (Images 17-19), metabolic disorders (e.g. microvesicular fatty change of the liver associated with *medium-chain acyl-CoA dehydrogenase* deficiency and other inborn errors of metabolism), cardiomyopathies (e.g., histiocytosis cardiomyopathy, endocardial fibroblast stenosis) and even occult neoplasms (e.g., endocardial rhabdomyoma).

Other studies

Ancillary studies such as bacterial and viral cultures, toxicology, vitreous electrolytes and screens for inborn errors of metabolism can more clearly define diagnoses suggested by the gross and microscopical examination and in some instances may provide the diagnosis in and of themselves. The issue of screening for genes encoding ion channels responsible for prolonged QT syndrome (LQTS) and other rhythm disturbances as well as structural proteins such as desmosomal genes looms especially large in the face of increas-

ing evidence that such disorders may account for up to 10% of sudden unexpected death in otherwise previously healthy infants. (Arnestad et al., 2007; Rhodes et al., 2007; Morris, 2015)

At present, the cost of such screening studies prevents most medicolegal jurisdictions from routinely pursuing them except in very selective circumstances. Anticipated price reductions for developing technology, CDC funding for studies, and the epidemiological data on sudden unexpected death in infants and young children will enhance the evidence base and encourage more widespread testing.

Looking even farther into the future, whole-exome sequencing may yield diagnoses explaining sudden unexpected infant death that currently routinely escape us. A recent case report described a 15 day old infant who was posthumously found to have 2 mutations in the *CLCNKB* gene, leading to a molecular diagnosis of Bartter syndrome type III, the likely cause of death. (Lopez et al., 2015)

Progress is being made on the investigative and autopsy front. A recent study analyzing 770 cases of sudden unexpected infant death showed that 98% had a death scene investigation. Critical information about 10 infant sleep environment components was available for 85%. All 770 cases had an autopsy performed with 98% including

histology, and 97%, including toxicology. (Lambert et al., 2016)

Difficulty in accurately characterizing SUID for epidemiological purposes

In years past, when SIDS was recognized as a distinct entity, most infants dying suddenly and unexpectedly were assigned this cause of death. Unfortunately, though, an unknown percentage of these cases were classified improperly because there was never a thorough death scene investigation, or autopsy was inadequate or never occurred at all. Nevertheless vital records nosologists dutifully assigned the International Classification of Diseases code, R95, for SIDS (Table 1.) Epidemiological data developed from such death certificates and inferences therefrom are suspect, given these serious shortcomings.

The era of diagnostic shift introduced a new set of epidemiological issues. In some jurisdictions, the diagnosis of SIDS was abandoned altogether. Overall, diagnoses of asphyxia increased, as did certifications of cause and manner of death as "undetermined." Certificates of death were fashioned in a more descriptive manner, sometimes including the sleep environment in which the infant died if deemed to be unsafe. Ironically, the nuances of this approach to certification of death was lost on the nosologists who, when encountering any combination of the words,

ILL-DEFINED AND UNKNOWN CAUSES OF MORTALITY (R95-R99)

Excludes: fetal death of unspecified cause (95), obstetric death NOS (O95)

R95

Sudden infant death syndrome

R96

Other sudden death, cause unknown

Excludes: sudden:

- cardiac death, so described (I46.1)
- infant death syndrome (R95)

R96.0 Instantaneous death

R96.1 Death occurring less than 24 hours from onset of symptoms, not otherwise explained

Death known not to be violent or instantaneous for which no cause can be discovered

Death without sign of disease

R98

Unattended death

Death in circumstances where the body of the deceased was found and no cause could be discovered

Found dead

R99

Other ill-defined and unspecified causes of mortality

Death NOS

Unknown cause of mortality

Table 1

“sudden,” “infant” and “death” often continue to assign the R95 code. Thus, interpretation of death certificate data remains problematic.

This conundrum extends to the international level where there remains substantial variation in how different countries code sudden unexpected infant death. The proportion coded as R95 ranges from 32.6% in Japan to 72.5% in Germany. The proportion of deaths coded as accidental suffocation and strangulation in bed (W75) ranged from 1.1% in Germany to 31.7% in New Zealand. (Taylor et al., 2015) Clearly, a standardized approach to classification and vital records coding remains elusive.

Two relatively recent attempts at developing a stratified classification system of

such deaths have been published. Krouse et al. published what they termed a “definitional and diagnostic approach” to the classification of sudden, unexpected infant death in an effort to systematically stratify the kinds of deaths forensic pathologists evaluate every day (Krouse et al., 2004). Their proposed classification system was as follows:

- **Category IA SIDS:** classic features of a previously healthy infant in a safe sleep environment and complete documentation of the scene and circumstances of death
- **Category IB SIDS:** classic features but incomplete documentation
- **Category II SIDS:** meets category I criteria with specific exceptions such as similar deaths among so siblings or other relatives, the inability to rule out the possibility of suffocation

or mechanical asphyxia or autopsy abnormalities not sufficient to be unequivocal causes of death,

- **Unclassified Sudden Infant Death:** does not meet category I or II criteria and alternative diagnoses of natural or unnatural conditions are equivocal, including cases in which autopsy is not performed.

The thought was that with widespread use of this classification system, the coding system for such deaths would be more precise, for example, R95 for category IA, R95.1 for category 1B, etc. The classification never gained wide acceptance, however, and the coding, statistical, and epidemiological problems remained.

Shapiro-Mendoza et al. captured 436 sudden unexpected infant deaths reported to a case registry created by

the CDC in 2009 and published a proposed classification system based on analysis of these cases in 2014. (Shapiro-Mendoza et al., 2014) This group categorized unexplained infant death by accompanying factors:

- No autopsy or death scene investigation
- Incomplete case information
- No unsafe sleep factors
- Presence of unsafe sleep factors
- Possible suffocation due to unsafe sleep factors and explained with suffocation due to unsafe sleep factors, i.e., asphyxia.

As of this writing, there does not appear to be widespread usage of this classification system by those certifying sudden unexpected infant death. Thus, it appears the road ahead remains somewhat uncharted.

SUMMARY

Investigation, autopsy protocols, and classification of sudden, unexpected infant death continue to evolve. Informed by advances made by their basic and clinical research colleagues, forensic pathologists will continue to tease away diagnostic layers, assigning etiologically-specific causes of death in more cases and leaving a smaller percentage of those remaining truly unexplained and awaiting a unifying diagnosis, whether it be anomalies of this medullary serotonergic network or other neurodevelopmental abnormality. The forensic pathology community may come to accept a standard classification, leading to more rational coding and cleaner epidemiological data for public health experts to mine in search of prevention strategies.

The one constant is the primacy of a thorough, systematic death scene investigation with doll reenactment. Curious, that in this age of ever increasing technical wizardry, the most critical element in the evaluation of these deaths is simply asking the right questions of the

Curious, that in this age of ever increasing technical wizardry, the most critical element in the evaluation of these deaths is simply asking the right questions of the right people in the right way.

right people in the right way. A forensic pathologist armed with the “Top 25,” or as many as can be identified prior to autopsy, is more solidly positioned to deploy autopsy and ancillary assets to provide a devastated family the information they need to process their loss, and perhaps even affect future family planning. The investigative team owes the families of these infants nothing less than our very best effort on every case. This is the essence of our public health and safety mission. 🐾

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Death Investigation in Maryland

Bruce Goldfarb, BS

The history of death investigation in Maryland dates nearly to its founding in 1634. Under the authority of King Charles I, provincial Governor Leonard Calvert appointed Thomas Baldrige, a tobacco planter in St. Mary's County, as sheriff and coroner in 1637. The coroner was authorized to "[d]oe all and everything...the office of sheriff or coroner of any county in England doe."

The coroner was instructed how to determine the cause of death:

"Upon notice or suspicion of any person that hath or shall come to his or her death entirely within the limits of that hundred as you conveniently may to view the dead body and to charge the said persons with an oath truly to inquire and true verdict to grant how the person viewed came upon his or her death according to the evidence."

Two days after his appointment as coroner, Baldrige conducted his first

inquest. On Jan. 31, 1637, a jury of twelve freemen tobacco planters was called to view the body of John Bryant, who met an untimely death while felling a tree. According to a witness who testified under oath to the jury, Bryant stepped back five or six paces as the tree toppled. The falling timber glanced off another nearby tree and rebounded onto Bryant. "[T]he said John Bryant spake not one word after," the jury noted.

Examination of Bryant's body showed "two scratches under his chinne on the left side." The jury concluded that Bryant died because "his bloud bulke broke."

The tree responsible for Bryant's death was forfeited to the Lord Proprietor of the Province of Maryland --the earliest example of a deodand in the New World. It was the coroner's responsibility to ensure a proper disposition of the deodand. Acting as a sort of executor at large, the coroner also liquidated

a decedent's material possessions to settle his debts.

One of the first death investigations to include the participation of a medical person occurred in 1642. A jury of twelve St. Mary's County men was empaneled to consider the death of an infant named Anne Thompson. One member of the inquest was Robert Ellyson, who is described in records as a "Barber-Chirurgion." After viewing the body of the infant and hearing from witnesses, the panel concluded "that they do not find anything, but that the said Anne came to a naturall death."

The earliest known forensic autopsy in America was performed in St. Mary's County on Feb. 25, 1642. It was likely performed by George Binx, a "Licentiate in Physicke" serving as foreman on the coroner's inquest investigating the homicide of a Native American youth, who was shot to death by John Dandy, a blacksmith.

"[W]e find that this Indian ladd (named Edward) came to his death by a bullet shott by John dandy, which bullet entered the epigastrium neare the navel on the right side, obliquely descending, & piercing the guts, glancing on the last vertebra of the back, and was lodged in the side of Ano," the inquest reported.

The coroner system existed in Maryland for more than 300 years. For most of this time, coroners were untrained laypeople who lacked any qualification other than being an adult male. Initially, the office of coroner was combined with that of the sheriff, constable, or justice of the peace. Due to the potential for abuse, in 1666 the provincial Assembly passed an act prohibiting the same person from holding both offices, and directed the Governor to appoint coroners for each of Maryland's counties. Unlike Massachusetts, where coroners were chosen by popular vote, Maryland's tradition of appointing death investigators continues to this day.

In 1671, the Assembly set a fee for coroners – about 250 pounds of tobacco per case -- which was on a scale slightly higher than the amount paid to their counterparts in England. Although they were state officials, coroners were paid by local governments.

The 1671 act limited the duties of coroner to "the holding of inquests over the bodies of those dead by misadventure, murder, suicide, or other forms of violence, as well as the serving of writs or subpoenas upon a sheriff in any suit to which he is a party, or for the arrest of a sheriff." The coroner was authorized to make arrests in cases of homicide.

The term of service for coroners varied by jurisdiction until the Maryland Constitution of 1777, which authorized the Governor to appoint coroners to two-year terms.

GRIEVOUS AND OPPRESSIVE

Noting that "the prevailing practices of coroners are improper, grievous and oppressive," a law enacted in 1821 established a fee schedule for coroners and inquest jurors. No coroner was to be paid more than \$4.17 for his services, plus an additional \$2.50 if he provided a coffin and another \$2.50 if he dug the

grave and buried the body. Although coroners throughout the State faced a steep penalty up to \$100 for overcharging for their services, additional sums of money were allowed "for any business done" by coroners in Baltimore County. The law compensated each juror serving on a coroner's inquest 50 cents, and 12.5 cents per juror for the constable or coroner who summoned them.



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The unceremonious treatment of Baltimore's deceased, particularly the unknown dead, was fueled by a burgeoning demand for cadavers for medical education. University of Maryland was one of America's first medical schools to require human dissection, in 1833. The need for cadavers for anatomical study increased substantially as Baltimore became home to a growing number of medical schools, with at least seven institutions in business during the 19th Century.

Grave-robbing was frequently employed to acquire bodies for medical schools in Baltimore and elsewhere. Baltimore's reputation as a reliable source of cadavers for anatomical study during the 1800s earned it the nickname "the Paris of America."

The earliest statute in the U.S. related to the participation of a physician in an inquest is an 1847 Baltimore City ordinance enacted by the Maryland General Assembly. The ordinance allowed the coroner to require the attendance of a physician from the same jurisdiction to examine the body and provide testimony if a decedent was suspected to have met a violent death. A doctor who declined to cooperate with an inquest faced a fine from the coroner or justice of the peace. Otherwise he was compensated \$5-10 for his services.

Many local governments believed that coroners were lining their pockets by calling for inquests in cases when it wasn't necessary. A law similar to the Baltimore ordinance, enacted statewide in 1860, contained the same provision for physician participation in suspected violent deaths. The law also featured a key limitation on coroners, prohibiting inquests "where it is known that the deceased came to his death by accident, mischance or any other manner" except if the person died in jail or as the result of a felony.

Other duties assigned to coroners by the 1860 law included assuring the safe-

ty and security of people in his custody and, when required, burying the dead. "Whenever it shall be necessary for a coroner to bury any deceased person, he shall provide a coffin and decently bury him," the law stated.

In 1868, a State law was enacted authorizing the Governor to appoint "a competent member of the medical profession" as sole coroner for the City of Baltimore, who served a two-year term at an annual salary of \$2,000. The coroner was instructed to hold inquests over any person found dead in the city when the cause and manner of death were not already known to be accidental or natural. He was responsible for the interment of unclaimed and unidentified bodies, and was required to provide monthly reports of his activities to the police.

Postmortem examinations, when they were done at all, were performed at police stations, funeral parlors, hospitals, private homes and other places of convenience.

Baltimore made major strides in the care for its dead during the last decade of the 19th Century. On March 9, 1890, Mayor Robert Davidson approved an ordinance passed by the City Council to appoint two physicians to serve as medical examiners for the city. Four months later, city leaders appropriated \$4,000 to select "a suitable site on the water front, or easy access from the harbor, and cause to be erected thereon a building to be used as a morgue or dead-house."

MEDICAL EXAMINERS

Organized within the city's Board of Health, the 1890 ordinance authorized the appointment of a Medical Examiner and an Assistant Medical Examiner. The physicians were appointed by the Board of Health to two-year terms, at an annual salary of \$1,000 and \$500 respectively. The law directed the medical examiners to make post-mortem examinations whenever called upon by coroners or the State's Attorney. The city's health com-

missioner was also authorized to order an autopsy.

The medical examiners primarily performed autopsies on cases of homicide, and occasionally on cases of suspected poisoning. Upon completion of their investigation, the medical examiners were directed to furnish the evidence and a formal written report to the Board of Health and the State's Attorney. Baltimore's first Medical Examiner was Nathan G. Keirle, M.D., who served in that capacity for 29 years.

FUMIGATION AND BURIAL

Within the Baltimore City Health Department, the morgue was organized in the Division of Fumigation and Burial, which was also responsible for the control of tuberculosis, diphtheria, scarlet fever and other communicable diseases. Thousands of blankets, pillows and miscellaneous goods were sterilized or incinerated at the morgue each year.

During the year of 1914, the morgue received 394 bodies, primarily unidentified persons. Keirle, the city's medical examiner, performed autopsies in 67 cases (17 percent), the vast majority of which were at the request of a coroner. That same year, 880 bodies had been received by the Anatomical Board and distributed to ten medical teaching facilities in the city.

In 1914, Baltimore had coroners in each of the police districts, and one serving at large throughout the city. Coroners were appointed to two-year terms and paid a \$1,000 annual salary. They were responsible for holding inquests for deaths that occurred within their district. Cases requiring an autopsy were sent to the morgue for Keirle's examination.

A 1914 study by the U.S. Public Health Service was critical of Baltimore's coroner system:

The coroners lack organization, inasmuch as each works independently of the other and confines his particular

work to his own district; he does not care even in an emergency to accept a case which may be just over the border line. To get the most efficient service from such an important office as the coroner's office there should be one coroner appointed for the city, who would be responsible and who should be given as many assistants as would be necessary to perform the work. He should have his office in police headquarters, and there should be a coroner on duty at all times.

GUESSES AND HEARSAY

By the 1930s, the coroner-based death investigation system in Baltimore – and throughout the State of Maryland – had evolved into one that was unreliable, dissatisfactory, and vulnerable to corruption and abuse. “It’s a known fact that the old system of ‘coroner’s’ diagnosis is replete with guesses, snapshot diagnoses based often on hearsay and without personal investigation,” said Howard James Maldeis, M.D., who served as Chief Medical Examiner from 1939 until 1949.

Discrepancies and inaccuracies were so common on death certificates, he said, that “in a large proportion of cases they were worthless for giving immediate causes of death with accuracy.”

The coroner system was held in low regard by the public. The Baltimore Sun editorial page said that the “antiquated coroner system...has long provided lucrative jobs for politically minded physicians,” and that “[t]he system is a relic of the past and fails utterly to meet the present-day demand for immediate, competent inquiry into all deaths resulting from other than natural causes.”

Among the harshest critics of the system was the Medical and Chirurgical Faculty of Maryland (MedChi), the state medical society, which characterized the practice of coroners as racketeering.

Starting in the mid-1930s, MedChi members began meeting to discuss the coroner system and ways in which it

could be reformed. In April of 1937, surgeon Richard T. Shackelford, M.D., a member of MedChi’s Medical-Legal Committee, presented a paper about the problems posed by doctors testifying as witnesses in the coroner system.

Shackelford noted that a growth in insurance was among the factors contributing to an increase in court cases involving medical testimony. According to Shackelford, medical witnesses appeared in about half of all cases that come to court. Doctors, he said, were poorly equipped to be thrust into the adversarial arena of the courtroom and are often unaware of their rights on the witness stand. Physicians felt they were being exploited, losing income while testifying in court, and browbeaten into providing expert opinions for the payment of \$1 per day allotted for fact witnesses. “The average physician views this contingency with great distaste, and often goes to ridiculous extremes in his efforts to avoid it,” Shackelford said.

A NEW APPROACH

The general election of 1938 opened a door to the possibility of reforming death investigation in Maryland. MedChi had a sympathetic ear in Herbert O’Conor, a Democrat who served as Baltimore City State’s Attorney for ten years before being elected as Attorney General of Maryland in 1932. More than almost anybody, newly elected Governor O’Conor understood the deficiencies of the coroner system.

The 1938 election also brought a General Assembly determined to undertake a sweeping restructuring of state government, in which numerous commissions and departments were eliminated or reorganized. For example, lawmakers merged the Conservation Commission, the State Forestry Department, the Geologic Survey, and the State Weather Bureau into a new Department of Natural Resources.

Tackling the coroner system fit well into the reform movement, and

MedChi struck while the iron was hot. Within a month of the election, MedChi formed a committee, chaired by Shackelford, to study the issue and draft legislation for a radically different approach to death investigation.

During a series of meetings, members of MedChi discussed the shortcomings of the coroner system. Shackelford pointed out that appointments to coroner are strictly political, with no qualifications necessary to hold the office. With a two-year term, coroners had no incentive to increase their efficiency or expertise. The coroners had no supervision or accountability, and were slow and unreliable to submit reports to the Health Department and the State’s Attorney. As they had since colonial days, coroners were authorized to bring charges – or not – in cases of homicide; a situation that was vulnerable for abuse and corruption.

By 1939 there were ten physicians serving as coroners in Baltimore City. Eight were assigned to police districts, one served at-large throughout the city, and one was assigned specifically to automotive fatalities. Death investigation was uneven elsewhere in Maryland. Physician coroners served in only six of the state’s 23 counties, with magistrates acting as coroners in the remainder.

The MedChi committee sought to abolish the coroner system and replace it with a state-wide medical examiner system modeled after some of the best features of the laws governing medical examiner offices in New York City and Newark, N.J., combined with some original and innovative provisions.

Among key features of the draft legislation, which became known as the Coroner Bill:

- The abolition of the office of coroner throughout the State of Maryland, and a prohibition on inquests
- Separation of the medical and legal duties of the coroner, with the latter assigned to the State’s Attorney
- Appointment of a Chief Medical

Examiner with the authority to conduct forensic investigations without the need for permission of the State's Attorney or law enforcement agencies MedChi member were of the consensus that two years of pathology training was an adequate minimum qualification for appointment as Chief Medical Examiner. The Chief Medical Examiner would be based at the Baltimore morgue, which would serve as the primary site of autopsies for Baltimore City and the five counties in closest proximity – Anne Arundel, Carroll, Howard, Harford, and Baltimore County – and provide laboratory services and expertise throughout the state. The central Baltimore office would also be the permanent repository of forensic investigation records.

In Maryland's 18 outlying counties, Deputy Medical Examiners would be appointed for each jurisdiction based on the recommendation of the county medical society. Deputy Medical Examiners, under the supervision of the Chief, could conduct an autopsy at a local hospital or have the body transported to Baltimore.

A considerable amount of discussion among MedChi committee members centered around governance, how medical examiners would be appointed and supervised. Initially, the medical examiner's office was envisioned under the State Health Department, with appointments by the State Board of Health. Another suggestion was for medical examiners to be appointed by county medical societies or county health commissioners. None of these options were acceptable to MedChi members, who were "quite determined to keep the job out of politics if possible."

AN INDEPENDENT COMMISSION

A proposal that the committee considered most favorably called for the establishment of an independent commission, comprised of the chairman of pathology at University of Maryland and Johns Hopkins medical

schools, the director of the State Department of Health, the commissioner of the Baltimore City Health Department and the Attorney General of Maryland. The unpaid commission would be nonpartisan and nonpolitical, have expertise to appoint and supervise qualified medical examiners, and provide a link to university and state laboratories for assistance when needed.

As in New York City, authority to conduct a forensic investigation was vested in the medical examiner, and not done at the behest of the coroner or State's Attorney. "The medical examiner need not obtain permission.... Therefore, they are not handicapped and make their own decisions regarding autopsies. There are no interfering influences and the responsibility is on the examiner," Maldeis said.

Under the proposed model, the Chief Medical Examiner did not work for the coroner, the police, or the State's Attorney. His primary responsibility was to look after the interests of the citizens of Maryland, divorced from politics, the criminal justice system, and other considerations.

Baltimore Morgue/Medical Examiner Office, center, 1930s

The Coroner Bill was among the first pieces of legislation introduced during the 1939 session of the Maryland General Assembly, sponsored by Emanuel Gorfine, a Senator representing Baltimore City. Initially, the bill languished in the Senate Judicial Proceedings Committee. When presented to the full Assembly, the bill was the subject of contentious debate. Some lawmakers were skeptical of financial aspects of the legislation, while others were opposed to having the state meddle in what had traditionally been a local activity. Reporters suspected the real objection was something more tangible; "politicians do not look with much favor upon the removal of these lucrative appointments from the political sphere," one noted.

Despite an attempt to defeat the Coroner Bill by an amendment that would render it impractical, the legislation was passed on April 3, 1939 – the last day of the General Assembly – and signed into law by Gov. O'Connor on May 3., All but one of Maryland's 23 counties were covered by the new law. Cecil County, the lone holdout, joined the system in 1941.

Once the legislation was signed, events moved very quickly. The law was slated to go into effect on June 1, 1939. A new system had to be operational in less than a month. In the meantime, a citizen petition was filed with the Secretary of State requiring the new law held in abeyance until the matter could be decided by voters in the 1940 election. Attorney General William C. Walsh determined that the petition was invalid because half of the names must be residents of Baltimore City and half from the counties, and ruled that the law could take effect as planned.

Almost immediately, the newly minted Post Mortem Examiners Commission set to work developing guidelines – later formalized into regulations – to govern forensic investigations. The Commission established guides for defining sudden death and determined which deaths were medical examiner cases. Certain medical examiner cases that occurred during hospitalization could be released without a forensic autopsy subject to the approval of the medical examiner. The Commission eliminated the requirement that any deaths that occur during the first 24 hours of hospitalization are automatically coroner's cases. They also issued a requirement that hospitals designate a person responsible for providing reports and records to the medical examiner in forensic investigations.

The framework established by the Commission in 1939 remains in effect today with very little change. One minor

revision was made by lawmakers subsequent to passage of the bill; the Director of the Maryland State Police was substituted for the Attorney General on the Post Mortem Examiner's Commission. The composition of the Post Mortem Examiner's Commission has remained the same ever since.

Maldeis, who had served as post-mortem physician at the Baltimore Morgue since 1919, was appointed as the first Chief Medical Examiner by the Commission.

Maldeis deserves credit for forging a state-wide medical examiner system from a patchwork of jurisdictions, and for transforming the Baltimore Morgue into a centralized facility. He improved and expanded the morgue's laboratory capabilities, adding a part-time toxicologist and a laboratory technician to the staff, and introduced photography as a routine part of forensic investigation.

The medical examiner system proved superior to the coroner system, ultimately winning over even its most vocal critics. Death investigations were more thorough and completed sooner, and records available more promptly.

"The law definitely separates the legal and medical duties and yet creates a close cooperation between the legal agencies and the police departments," Maldeis said. "This system, through separate investigation of a death, is much more satisfactory. If the case is turned over to a grand jury, it is much better prepared for prosecution. The evidence is more direct and trustworthy. A great improvement likewise has been brought about in the accuracy of the causes of death as placed on the death certificates for medical examiner cases. This results from the more careful and efficient investigations of the deaths as compared with the coroner system."

The Post Mortem Examiners Commission served to insulate the Chief Medical Examiner from political influence, public

pressure, media, and other external forces. No consideration is factored into a forensic investigation other than the medical and scientific evidence.

Maldeis died on January 15, 1949, after a brief illness. A search to find a suitable replacement commenced immediately.

The Commission appointed Russell Fisher, M.D., Chief Medical Examiner in 1949, a position he held for the next 35 years. Fisher transformed the Baltimore Morgue into a leading center of research, education, and training in forensic pathology. Barely a year into his tenure, Fisher began conducting seminars on homicide investigation for officers at law enforcement agencies throughout the state, which included practice with Lee's celebrated crime scene dioramas, the Nutshell Studies of Unexplained Death.,

Fisher made lasting contributions to the State of Maryland and his profession. The textbook he co-edited with Spitz, *Medicolegal Investigation of Death*, is regarded as the bible of forensic pathology. Much of what is considered standards of practice in forensic pathology has its origins in Maryland. From modest beginnings, Fisher created a world-renown center of research and training that conducted thorough, science-based investigations at a cost to the public that was less than the State spent on stocking fish in recreational waters.

Fisher worked until illness forced his retirement in 1984. Three weeks later, he died at age 67.

The person appointed by the Post Mortem Examiners Commission to continue Fisher's legacy was John E. Smialek, M.D. Smialek served as Chief Medical Examiner until he died suddenly while at work on May 9, 2001. In his place, the Commission appointed David R. Fowler, MB.ChB. M.Med. Path (forens). FCAP. FAAFS, who had been at the OCME since his residency in 1993.

Planning for a new Forensic Medical Center began in 2002. The State

acquired property in the University of Maryland BioPark, a 10-acre community of life science companies and translational research centers west of the UMAB/medical center campus. Working with a team of architects and designers, Fowler and other State officials developed plans for a 120,000-square-foot six-story building occupying an entire block. When completed, the facility would be one of the largest freestanding forensic medical centers in the U.S., rivaling the military's largest mortuary at Dover Air Force Base.

Ground was broken on the site on Oct. 22, 2008, and the Forensic Medical Center of Maryland officially opened on Sept. 21, 2010, under budget with a final cost of \$43.6 million.

[The Forensic Medical Center of Maryland](#)

Among the noteworthy elements of the building:

- Energy-saving features including a curtain wall system with argon gas low E glass that is up to three times more energy efficient than standard single glazed glass; sensors to turn off lights in unoccupied spaces; water conservation measures on all plumbing fixtures; variable speed controllers on all fans and pumps; night set back operations on all HVAC systems; use of high-efficiency air cooled chillers; a system to cool the computer rooms via outdoor air in the winter time to minimize the load on chillers.
- A radio frequency identification (RFID) system for case files so they can be located at any time anywhere in the building.
- An enclosed 15,000-square-foot ground-floor receiving and mass fatality triage area that permits smooth, bottleneck-free access for transport vehicles and deliveries. Columns in the ground floor area are

fully equipped with water, electrical, data lines and other utilities necessary to set up a temporary morgue or autopsy stations in event of a mass fatality incident. The space is scaled to allow access for tractor trailers, a decontamination tent, or anything else that may be required.

- In-house histology, toxicology, and neuropathology laboratories. The toxicology lab can provide STAT results within an hour, negative results in three days, and quantified final results within five days. Sufficient space is provided for specimen preparation and storage.
- A biosafety level (BSL) III suite for handling decomposed or infectious decedents. The suite has three rooms equipped with two stations each, and includes a gowning room and shower, a pass-through sterilizer, and a dedicated elevator to the ground-floor receiving area. Two additional rooms are ready to be finished for use as BSL-III autopsy rooms in the future.
- Two spacious main autopsy rooms with eight stations each. The rooms have abundant natural light, bright, shadow-free artificial lighting, and an extremely efficient laminar ventilation system. At present, the OCME has a total of 22 autopsy stations; 16 in the main autopsy rooms and six in the BSL-III suite. The autopsy suite also has a viewing room and an operating room for harvesting tissues.
- A radiology suite with computed tomography and a Lodox low-dose X-ray machine that produces a crisp, full-body digital image in less than 15 seconds.
- Scarpetta House, a training facility donated by novelist Patricia Cornwell, who based the futuristic space-age forensic medical center in her books on the OCME. Designed

much like a studio apartment, the facility is used to stage a variety of crime scenes. Aside from being used to train the OCME's forensic investigators, Scarpetta House has been employed to train members of the Disaster Mortuary Operations Response Team (D-MORT), Baltimore City Police Department homicide detectives, attendees of the Frances Glessner Lee Homicide Seminar, and other groups.

THE OCME TODAY

The Forensic Medicine Center of Maryland is considered a model in the U.S. and internationally. OCME has hosted visits from U.S. and foreign medicolegal death investigation agencies to observe the building for their own design process, including representatives from San Francisco, Houston, Singapore, Turkey, Japan, United Arab Emirates, and the People's Republic of China.

The OCME maintains a role in resident training for the two medical schools in Baltimore, three in the District of Columbia, and the Uniformed Services University. Students have been hosted from China, Japan, Ireland, South Africa, Malaysia, and numerous other countries.

The OCME has established educational relationships in China, largely through the efforts of Assistant Medical Examiner Ling Li, M.D. In 2012, OCME formed an international study agreement with Ningbo University medical school and hosted two visiting scholars from Fudan University. Two years later, the OCME launched the U.S.-China Forensic Science Research Center, which includes a new forensic science master's program in conjunction with the University of Maryland Graduate School and the China University of Political Science and Law. Li and Fowler also produced the first English language forensic pathology textbook in China.

Today, the OCME investigates more than 9,000 deaths and conducts about 4,400 autopsies annually. The OCME's 12 Assistant Medical Examiners are supplemented by three fellows and a dozen full-time forensic investigators. The OCME has a strong institutional lineage of excellence, following policies and best practices enacted by Smialek, Fisher and Maldeis. Maryland's forensic investigation system is tightly integrated, with one centralized facility for autopsies, laboratories, records, training, and supervision. The OCME is one of the few forensic medical centers with quality assurance practices-- multiple layers of peer review with morning rounds and afternoon conferences -- to ensure that findings are as close to the truth as humanly possible.

The work at the OCME is done with remarkable efficiency, mindful of costs to the public. Among peer accredited forensic medical centers, the average cost is about \$3 per taxpayer per year, while the OCME operates at approximately \$1.97. The OCME's \$10 million annual budget is still less than the State's Fisheries Service.

These are among the reasons why the OCME is regarded as the gold standard to which other forensic investigation systems are compared. After the most recent site visit and assessment for accreditation by the National Association of Medical Examiners, evaluators called the OCME "a stellar example of modern and professional medicolegal death investigation." 🌟



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