

ADVANCING THE PRACTICE OF FORENSIC SCIENCE IN THE US — UPDATE

The Practice of Forensic Nursing Science in the United States

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The forensic aspects of nursing have long existed by serving victims of violence — both the living and the dead. In the 17th century, nursing was not considered a science and midwives filled this role, testifying in court on matters of virginity, pregnancy, and rape. Two centuries later, Florence Nightingale established the first attributes of forensic nursing when caring for service members wounded in war. During the 1970s nurses began volunteering at rape crisis centers and were finally being acknowledged for their expertise by the mid-80s. In the year 1991, forensic nursing was recognized by the American Academy of Forensic Sciences and in 2022 voted by the Academy as the 12th forensic science discipline.

Forensic health care assumes a pivotal role in both hospital and community settings by assisting persons who are victims of crime-related trauma, abuse, violence, liability, and accidents. Clinical forensic medicine merges both scientific knowledge and the criminal justice system, integrating the nursing process with public or legal proceedings in cases of trauma and/or death resulting in intentional or unintentional injury.

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As criminal clinical investigators, forensic nurses improve justice and health outcomes to individuals impacted by violence. Expert care for these patients includes direct services to individuals with precise clinical assessment recognizing subtle and serious injuries and managing victims of crime-related trauma, abuse, and maltreatment. They provide consultation expertise to nursing, medical, and law-related agencies, and expert testimony in court [1].

In the United States, forensic nurses most frequently work in hospitals, community antiviolence programs, coroner's and medical examiner's offices, correctional institutions, and psychiatric hospitals. Furthermore, their scientific knowledge provides a magnitude of opportunities available for clinical practice, advocacy, advancing research, and education in academic centers. The specialist in forensic nursing science has become a potent influence in the rule of law and provides a collective intelligence for practice and research.

Who Are Forensic Nurses?

Forensic nursing specialty roles and subspecialties apply forensic health care in the scientific investigation of trauma, death related to injuries of abuse, violence, criminal activity, liability, and accidents [1]. Forensic nursing roles have evolved through the collaborative efforts of medicine, nursing, and the law transforming how the medicolegal management of forensic patients is executed. Beginning as the most recognized specialty role, sexual assault nurse examiner, the forensic nurse addresses the comprehensive needs of the sexual assault patient by assessing, evaluating, diagnosing, and implementing holistic care to restore and promote bio-psycho-social health to a victim. As one of the most frequently committed crimes in the United States, the need for qualified sexual assault medical forensic examiners (SAMFEs) is high. The first SANE programs began in Minneapolis, MN, Memphis, TN, and Amarillo, TX. SANE (sexual assault nurse examiner) programs were designed to prioritize the holistic well-being of survivors.

In this role a comprehensive clinical forensic examination is performed on any victim reporting to a health care facility with a complaint of sexual assault, rape, child abuse, elder abuse, intimate partner violence, or human trafficking; the exam is followed by evidence collection and documentation of injuries, education, and counseling. This level of care provides physical, emotional, forensic, and legal support that continues to benefit victims long after they have left the medical facility.

In the mid-1950s, Hildegard Peplau started the first graduate program for clinical nurses specializing in psychiatric mental health at Rutgers University (New Brunswick, NJ). This program marked the beginning of the Psychiatric Mental Health Nurse Practitioner (PMHNP) role. Forensic psychiatric nurses work with individuals and families that have mental health needs, often in situations involving violent crime or abuse. They are experts in communication skills treating patients who have experienced physical or emotional trauma. They also provide advice to child patients on how to find safe outlets to cope with trauma. Forensic psychiatric nurses excel in therapeutic interventions working with children experiencing regressive behaviors. Besides victims and victim's families, the forensic psychiatric nurse evaluates and treats criminal offenders in institutions who may be mentally ill.

Correctional forensic nurses provide healthcare to those incarcerated within the criminal justice system in a variety of settings such as jails, prisons, and juvenile detention centers. The responsibilities in each setting differ due to length of incarceration, population, and types of acute and chronic disease management.

As of 2020, the International Association of Forensic Nurses (IAFN) database reveals approximately 959 programs in the United States that offer SANE care compared to 20 programs in 1991. SANEs have been found to improve survivors' experiences while seeking care after a sexual assault.

The clinical arena is expanding rapidly for the forensic nurse and will continue to do so. Besides sexual assault patients, many cases involve child abuse, elder abuse, trauma, psychiatric, risk management, human rights violations, medical error, and tissue and organ donation.

The forensic nurse hospitalist provides comprehensive, medicolegal care to patients receiving treatment for trauma-related injury and questionable death in the acute care setting. Known as a transformational leader in health care today, this position offers scientific forensic consultation to patients who have experienced intentional or unintentional trauma. The role is vital to advance system-wide policy and educational efforts within the hospital setting [2].

Interpersonal violence is recognized as a criminal and social problem both in the United States and internationally. Crimes become social injustice problems often due to power and control or status and can be exacerbated by substance abuse. Societies may consider the crimes of child abuse and interpersonal violence a private family matter.

Internationally, communities are gaining momentum exchanging information and educating healthcare providers, law enforcement experts, and government officials in strategies to prevent crime using forensic science principles. The responsibility as a forensic nurse is to incorporate transcultural nursing perspectives with respect

to the ethical and moral dimensions of human care and healthcare practices of diverse cultures. They work in areas of human rights addressing the dynamics of archaic cultural traditions and religious practices that pose threats in society. Examples are female genital mutilation, honor killings, the incarceration of rape victims, and the lack of education for women and girls.

As countries establish initiatives pertaining to forensic nursing, they will be able to address major issues of prevalent crime, interpersonal and sexual violence, and the need to ensure human rights for women and children where they have been limited by cultural norms. After Kenya's initial COVID-19 lockdowns lifted and schools reopened, many female students didn't return. The reasons: the family couldn't afford it and most common was that they were pregnant. According to Bloomberg Businessweek [3], the consequences of girls leaving school increased chances of adolescent marriage, female genital mutilation, and pregnancy. Teen pregnancy rates in some Kenyan counties tripled in the first months of the pandemic, according to aid groups.

By the year 2030, nearly 20% of Americans will be 65 years of age with almost half of hospital stays represented by this older cohort. With this increase in this population, the practice of forensic nursing gerontology will thrive.

Not all forensic patients are living. Medicolegal death investigation responsibilities fall to different roles (e.g., medical examiner, coroner, medicolegal death investigator), and the specific scope(s) of these roles vary by state [4]. They work closely with crime scene investigators. Trauma may lead to death in healthcare facilities or private homes. The forensic nurse death investigator or forensic nurse coroner may be one of the first on the scene of a crime to analyze the scene, conduct body examinations, collect appropriate evidence, take crime scene photographs, and document findings. The forensic nurse investigator must scrutinize what precipitated the death and all other aspects related to the incident and then determine the necessary steps as outlined by state statutes.

Among the first documented disaster responses (involvement) to a manmade event are military nurses on the front line medically serving casualties of war. Today, the National Disaster Medical System (NDMS) is the leader in disaster response, identifying various specialties to respond when local resources are insufficient to meet the needs of the communities' disaster needs.

As part of NDMS, Disaster Medical Assistance Teams provide high-quality rapid-response medical care when public health and medical emergencies overwhelm state, local, tribal, or territorial resources. Forensic nurses in NDMS work several positions effectively — leading teams, managing logistics, providing exceptional care, and

serving in headquarters for the organization. As specialists they create disaster plans for communities and work in mobile morgues, where their medicolegal expertise serves to document injuries on the deceased; additionally, they work with the families of the dead as victim information specialists. Inclusion of forensic nurses on disaster preparedness teams amplifies the sensitive work involved when providing services for the dead.

Forensic nurses deploy as members of the Disaster Mortuary Operational Response Team (DMORTs) to support local mortuary services on location, working to quickly and accurately identify victims. As part of the process, the victim information center meets individually with families to obtain antemortem data, medical/dental records of victims, and DNA reference samples. The role includes providing technical assistance and consultation on fatality management and mortuary affairs.

Forensic nurses skilled in disaster risk management serve the public collaborating with community leaders on plans for prevention, preparedness, and response and recovery to determine a community's needs. The aim is to reduce potential damage and suffering. Prevention addresses causal factors and manageable risks while mitigation specifically refers to actions taken that can lessen the severity of a disaster's impact. Well-coordinated responses to disasters require prior planning. Disaster plans identify organizational resources, designate roles and responsibilities, create procedures and policies, and determine activities that improve disaster readiness. Community outreach mainstays are:

- Raising awareness about potential hazards and how to address them;
- Educating the public about how to properly prepare for different types of disaster; and
- Strengthening prediction systems

Levels of Practice

The practice of forensic nursing affords unprecedented opportunities to improve the global response to those affected by abuse and violence. In addition to undergraduate nursing training, generalist forensic registered nurses are specifically trained to provide comprehensive medicolegal management with demonstrated competency in the performance of the forensic medical examination of victims and suspects as part of an investigation, using forensic science to recover evidence, treating and educating patients, providing crisis intervention to patients, and referring patients to ongoing programs. They may be called to testify in court as a fact witness or as an expert.

The forensic clinical nurse specialist is an advanced forensic nursing role that requires a graduate degree in forensic nursing. Responsibilities of the forensic clinical

nurse specialist often include evaluating perpetrators in a case, workplace-related injuries, medical malpractice, automobile accidents, food and drug tampering, and medical equipment defects. They also develop and implement policies relating to various forensic issues and healthcare; conduct research in forensic nursing science; evaluate patient outcomes and engage in educating others about forensic nursing and evidence-based practices. They serve as consultants whether as a forensic attorney, nurse scientist, or investigator, and serve as administrators and consultants to local, state, or federal government and nongovernment institutions and organizations [5].

Forensic medicine has long been recognized as a respected component of public health; consequentially, forensic nursing is also an integral component of public health. Screening for violence is a minimum standard of care with policies and procedures to train professionals to identify and manage all patients seeking care for physical and emotional trauma [6,7]. Florence Nightingale appreciated that cramped quarters and overcrowding plus poor ventilation and sanitation were causes of death for British soldiers; she used statistics and diagrams in her analysis to underscore the root causes that led to army reform as well as health and social reform globally. A pioneer of nursing and a reformer of hospital sanitation methods, she pushed for reform of the British military health-care system, changed the design of hospitals, and developed the field of preventive medicine determined to stop contamination and the spread of infections and disease by implementing handwashing and other hygiene practices, as well as workplace safety. Following in her footsteps, the forensic nurse epidemiologist identifies biological and environmental threats to the health and safety of community populations, then mines the data to control and combat infectious diseases. They are contributing partners in gathering statistical data, which form the basis for predicting health crises and developing both preventive and interventional strategies.

The advanced practice forensic nurse is a specialist in risk management. The role encompasses identification and evaluation of risks as a means to reduce injury to patients, staff members, and visitors within an organization. They proactively work to create safety within an organization and to prevent incidents. They are involved in medical error root cause analysis to improve nursing practice. The work performed impacts research and policy that affects the human response to violence, injury, trauma, accidents, neglect, abuse, exploitation and victimization. They apply the legal requirements required and report injuries according to case law for incidents of injury, disability, and death associated with forensic events, as well as interpersonal violence.

The Changing Landscape for Forensic Nurses: Role Expansion

Research is an essential component of evidence-based practice. Some areas include advancing technologies in evidence collection research — this could be determining time since assault or recovering a DNA profile, or it could be where to swab for the ultimate yield of DNA for an area of the body. Another example is the work of Ann Wolbert Burgess, at Boston College (Boston, MA), who focused on developing ways to assess and treat trauma in rape victims, improving and revolutionizing the healthcare of at-risk populations.

The role of a forensic nurse injury analyst contributes to research regarding morbidity and mortality in clinical settings — determining intentional from unintentional wounding in cases of child abuse, trauma, interpersonal violence, accidental and industrial injuries, and more. The probes into chronic traumatic encephalopathy research have provided evidence leading to important changes for sports injuries and close contact physically. Neurodegenerative disease resulting from repeated blows to the head from assaults, military combat, or other traumatic brain injuries has influenced advancements in medical treatment interventions and improvements in protective equipment for sports as well as soldiers in conflict zones. The military values prevention efforts to keep the force safe. Since 2005 a team of forensic analysts utilized a multidisciplinary team approach including forensic nurses to improve personal protective equipment and related combat equipment for soldiers and sailors.

Forensic nurses also provide beneficial analysis for policy and practice within the emergency medical services (EMS). As public and private agencies, the need for highly trained professionals is acute. Trauma systems and hospital trauma centers including specialty care centers are positioned to integrate with other services and systems intended to maintain and enhance the community's health and safety. EMS operates at the crossroads between health care, public health and public safety. Forensic nurse trauma response specialists serve communities providing expert trauma care, identifying and documenting injuries while preserving evidence. They provide acute care as well as follow-up services ensuring that the needs of the patient are met from entry into the system through rehabilitation.

The range of potential roles for the forensic nurse suggests the prospects are abundant. Countless opportunities exist in federal and state governments as well as the private sector such as policy sponsors and lobbyists. Various governmental agencies highlight suitable positions where forensic nurses would add expertise to their missions of safety and prevention of injuries in populations (**Figure 1**).



Figure 1. Governmental agencies

- **Consumer Product Safety Commission.** The CPSC, an independent agency of the US government, seeks to promote the safety of consumer products by addressing “unreasonable risks” of injury, developing uniform safety standards, and conducting research into product-related illness and injury;
- **National Highway Transportation Safety Administration.** The NHTSA enforces vehicle performance standards and partnerships with state and local governments; reduces deaths, injuries, and economic losses from motor vehicle crashes.
- **National Transportation Safety Board.** The NTSB analyzes the information gathered to piece together a sequence of events and determine what happened to cause the accident. This report provides a description of the accident, a review of the investigative analysis, and a determination of probable cause;
- **National Center for Injury Prevention and Control.** An arm of the Center for Disease Control, the NCIPC guides national efforts to reduce the incidence, severity and adverse outcomes of intentional and unintentional injury in the United States and provides leadership in preventing and controlling injuries;
- **Office for Victims of Crime.** The OVC is committed to enhancing the nation’s capacity to assist crime victims and oversees programs and grants for service providers and other professionals;
- **National Network to End Domestic Violence.** The NNEDV is the leading voice for survivors of domestic violence and their allies. In 1994, it led efforts to pass the landmark **Violence Against Women Act (VAWA)**; and
- **National Center for Missing and Exploited Children.** The nation’s nonprofit clearinghouse and comprehensive reporting center for all issues related to the prevention of and recovery from child victimization, the NCMEC leads the fight against abduction, abuse, and exploitation.

As the role of forensic nurses expands, academic centers provide education to nursing students from undergraduate to graduate nurses in the concepts and practice of forensic nursing science and forensic health. Topics focus on injury prevention, engineering aspects of trauma and pathology, victimization, and leadership and management roles. Coursework encompasses criminal activity, traumatic events, treatment of victims and perpetrators, and scientific investigation.

Forensic nursing has evolved since the 70s expanding from the individual through system to population health. Joint venture with the eleven other forensic disciplines as recognized by the American Academy of Forensic Science (i.e., Anthropology, Criminalistics, Digital & Multimedia Sciences, Engineering & Applied Sciences, General, Jurisprudence, Odontology, Pathology/Biology, Psychiatry & Behavioral Science, Questioned Documents, and Toxicology) supports and advances patient outcomes. With the inclusion of “Forensic Nursing” as the newest recognized discipline of the Academy, the future of forensic nursing will expand. The combination of nursing plus engineering represents a new, convergent discipline, transdisciplinary interface. The nurse and engineer have the unique capability of working at a level of substantial depth in a modified approach uniting two separate disciplines [8]. Forensic professionals’ vision of an emerging career space circumscribed by the term, “STEMpathy”, originally coined by Friedman [9], as the concept that combine science, technology, engineering, and math (i.e., STEM) with human empathy, or caring.

Partnerships among providers of healthcare and practitioners of engineering are not new, and historically these partnerships have produced highly successful outcomes, including: the development of the pacemaker (1958); the computed tomography (CT) scanner (1970); and slow-release medicines (1980), among many other technologies [10]. The use of inter-disciplinary, multi-disciplinary, or cross-disciplinary approaches will further expand the role of forensic nursing.

Conclusion

Forensic nursing science is an evolving profession that is gaining traction and expanding. Forensic practitioners contribute to communities by advancing direct and indirect services to victims caught in the surge of violence in today’s world. According to Janet Barber, MSN, RN, it’s all about

relevancy. Forensic nurses distinguish themselves using not only their unique knowledge of the nursing process and proficiencies, but also their experience in the legal system, to obtain occult forensic details as a scientist allowing the facts to speak the truth. As healthcare professionals, forensic nurses are positioned to meet the needs of our environment where episodic terror, gun violence, pandemics, and rage are ever present. Forensic nurse experts are a valuable asset for healthcare, interfacing with federal, state, and local organizations and nonprofit agencies. Forensic nursing began as a more singular movement; the discipline has revolutionized into a paramount force without limitations.

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