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Development and Implementation of the First Clinical Forensic Medicine Training Program

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ABSTRACT: To address the un-met forensic needs of victims who are survivors of violent crimes and trauma, the first residency-based clinical forensic medicine training program and fellowship has been established. The Kentucky Medical Examiner's Office and the Department of Emergency Medicine at the University of Louisville are currently training physicians to provide clinical forensic evaluations. The clinical forensic physicians evaluate adult and pediatric victims of blunt and penetrating trauma, sexual and physical abuse and collect evidentiary material when indicated. The development of a clinical forensic medicine training program and fellowship at the resident physician level is internationally unique.

KEYWORDS: forensic science, training program

In July, 1991 the Department of Emergency Medicine at the University of Louisville and the Kentucky Medical Examiner's Office initiated the first clinical forensic medicine training program in the United States. This program incorporated clinical forensic training into the emergency medicine residency training program and established a one-year fellowship in clinical forensic medicine.

Clinical forensic medicine is the application of forensic medical techniques to living patients. In the emergency department these techniques include the evaluation and documentation of traumatic injuries and the collection of evidentiary material for possible medicolegal presentation. Formal residency level training in clinical forensic medicine was nonexistent in the United States prior to 1991.

The Clinical Forensic Medicine program is designed to address the unmet forensic needs of patients who are survivors of violent injury and trauma and those patients who have not yet succumbed to mortal injuries [*1–4*]. Trauma victims present regularly to emergency departments in need of acute care. The emergency physician is well trained to provide competent medical treatment but may be unable, uncomfortable, or unwilling to provide the patient with an equally competent forensic evaluation. This unique ex-

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amination accurately documents and analyzes the patient's injuries prior to intervention by other medical or surgical specialties.

Common forensic errors of omission and commission occur with regularity in emergency departments [2,5]. These errors include the inadvertent failure to recognize, collect and preserve evidentiary material and an inability to accurately describe a wound's characteristics [5]. Interpretative errors frequently occur in the assessment of wound ballistics, bullet trajectory, and pattern injuries associated with blunt and penetrating trauma. These errors may deny the patient, the courts, or an accused suspect access to pertinent and critical information and evidence which would substantiate their claims of innocence or guilt.

The Current Program

A forensic physician, either the clinical forensic fellow or the forensic pathology fellow, is available to respond to the emergency department on a 24 hour on-call basis. Requests for clinical forensic consults are initiated by local, state or federal law enforcement agencies. The forensic examinations are performed with the consent of the patient, their legal guardian, the court, or with implied consent. The evaluation includes a history and physical, photographs, and anatomical diagrams. Evidentiary material is also collected when indicated. In the event that the patient has been transferred from the emergency department to surgery, an evaluation is undertaken in the operating suite in concert with the patient's trauma surgeons. The clinical forensic physician works in cooperation with the patient's treating physicians. This is done in such a manner as will not compromise the patient's hospital care or physical well being.

The clinical forensic program also provides a physician for the examination of suspects involved in physical and sexual assault cases. The physical evaluation, documentation of associated injuries, and the collection of biological standards assists in determining whether the injuries incurred are consistent with the history given by the suspect or victim.

During the first seven months of the program, July 1, 1991 to January 31, 1992, 75 official forensic consults were requested. The official consult included a history and physical, photographic documentation of all injuries and pertinent noninjured areas, and anatomical diagrams. A written report and photographic slides were provided to the investigating agency as soon as the data had been processed. The nature of the consults is listed in Table 1.

During the same seven month period 54 unofficial or curbside consults were requested by law enforcement agencies or other physicians. The unofficial consult consisted of a physical exam with or without photographic documentation and anatomical diagrams. A

TABLE 1—*Forensic consultations (July 1,1991 to January 31, 1992). N = 75.*

Nature	#	%
Collection of Biological Standards	22	30
Evaluation of Blunt Trauma (*Assault*)	14	19
Adult-9 Child-5		
Evaluation of Penetrating Trauma	11	15
GSW-9 Stab-2		
Evaluation of Motor Vehicle Trauma	10	13
Driver vs Passenger-8		
Physical Examination of Suspect	9	12
Evaluation of Sexual Assault	7	9
Adult-4 Child-3		
Evaluation of Burn Victim (*Child*)	1	1
Review of Medical Records (*Child*)	1	1

TABLE 2—*Forensic consultations—unofficial (July 1, 1991 to January 31, 1992) (N = 54).*[a]

Nature	#	%
Evaluation of Penetrating Trauma	21	39
GSW-16 Stab-5		
Evaluation of Blunt Trauma (Assault)	16	30
Adult-13 Child-3		
Evaluation of Motor Vehicle Trauma	12	22
Evaluation of Sexual Assault	5	9
Adult-5		

[a]Unofficial indicates a full consult was not requested by the law enforcement agency or a physician.

written report was not prepared in these cases but the photographic slides and anatomical diagrams were retained on file. The nature of these consults is listed in Table 2.

Curriculum

The Department of Emergency Medicine, and the division of Forensic Pathology at the University of Louisville in conjunction with the Office of the state's Chief Medical Examiner have developed two distinct curricula for the training of emergency medicine residents. The first is designed to introduce forensic topics and techniques into the core curriculum of emergency medicine resident training. The second, a one year fellowship, is designed to educate emergency medicine trained residents as clinical forensic physicians.

Forensic lectures are given monthly to the emergency medicine residents. Lectures are presented by the clinical forensic fellow, the state medical examiner's office, the commonwealth attorney's office, forensic scientists from the state crime laboratory, a forensic odontologist, and other forensic experts from within the University and around the state. Lecture topics are listed in Table 3.

The goal of the 12 month formal clinical forensic fellowship is to prepare the emergency physician as a forensic expert in the evaluation of nonfatal injuries, just as the forensic pathologist is an expert in cases of fatal injuries. The clinical fellow cross-trains with the forensic pathology fellow and is also assigned to other agencies for training. Agencies that assist in the training include: the physical and sexual assault units of the Louisville and Jefferson County Police Departments, and Kentucky State Police Crime Laboratory, the Evidence Technician Unit of the Jefferson County Police Department, the Federal Bureau of Investigation Academy, the Jefferson County Commonwealth Attorney's Office, and the Southern Police Institute, the Department of Pediatrics, the Department of Psychiatry, and the School of Law of the University of Louisville. The formal curric-

TABLE 3—*Clinical forensic medicine curriculum.*

Firearms Analysis	Evaluation and Examination of Sexually Assaulted Patients
Blood Spatter Analysis	Evidence Collection and Chain of Custody
Crime Scene Investigation	Forensic Odontology and the Recognition of Bite Marks
Forensic Photography	Forensic Toxicology and Pharmacology
Forensic Serology and DNA Analysis	Forensic Psychiatry
Evaluation of the Physically Assaulted Child	Forensic Analysis of Blunt Trauma
Evaluation of the Physically Assaulted Adult	Forensic Anatomy and Mechanism of Injury
Evaluation and Examination of Gun Shot Wounds	Motor Vehicle Accident Reconstruction
Determination of Driver versus Passenger	Forensic Aspects of Pedestrian Collisions
Courtroom Presentations and Expert Testimony	

ulum, the opportunity for extensive hands-on training afforded by more than 1200 forensic autopsies annually, and the opportunity to practice emergency medicine in an urban Level I Trauma Center provides the clinical forensic fellows with an optimum training environment for becoming a clinical forensic physician.

Discussion

The use of forensic medical techniques on living patients is well known in Latin America, Australia, Europe, and many Asian countries [*1,3*]. However, prior to 1991, clinical forensic medicine had not been introduced into the graduate or post-graduate medical curriculum of American medical education.

The "Police Surgeon" in the United Kingdom and Australia is a physician who is empowered to perform forensic examinations on living patients. The Association of Police Surgeons in Great Britain is currently involved in developing a uniform training program for police surgeons. This program in based on "foundation training," a core curriculum, and "development training," continuing education, but does not approximate the level of training a physician would receive during a 12 month clinical forensic fellowship [*6*].

The forensic pathology community within the United States has long recognized the need for a "Police Surgeon" type physician to perform examinations on living patients [*1,3*]. Currently in the U.S. physicians and residents, principally from the specialties of emergency medicine, pediatrics, surgery and gynecology, are performing clinical forensic examinations when asked to do so by law enforcement agencies. These physicians generally have little or no forensic training and yet may be expected to render "expert" forensic opinions. Resistance to performing these forensic examinations is common as they often necessitate future court appearances, with uncompensated time away from office practices and residency training.

The presence of a clinical forensic physician or a forensically trained emergency physician or emergency nurse within the emergency department would relieve the untrained or unwilling resident or physician of many of the unwanted court appearances. This physician would also collect forensic evidence which might have otherwise been inadvertently overlooked or destroyed in the delivery of patient care. In addition, valuable forensic material and evidence would be documented and collected in a manner which would facilitate presentation at a later date.

The concept of training emergency physicians in the application of forensic techniques was presented at the American College of Emergency Physician's Annual Meeting in Boston, October, 1991 [*7*]. The presentation was enthusiastically received with numerous requests for additional information regarding establishment of similar residency programs elsewhere.

Conclusion

The time has come for the communities/colleges of emergency medicine, trauma surgery, and forensics to address the forensic needs of living persons and the mortally wounded who have not yet expired. The presence of a clinical forensic physician, or a forensically trained emergency medicine physician or nurse, in the emergency department would relieve the untrained resident or physician from the responsibility and consequences of rendering opinions which may go beyond their area(s) of expertise. Their presence would also ensure that the patient's injuries and any other physical evidence, which might otherwise have been overlooked, would be documented and/or preserved.

The clinical forensic program at the University of Louisville has two short range goals. The first is to expand the clinical forensic medicine fellowship to two fellows per year beginning in July, 1993. The second is to provide the emergency medicine residents at

the University of Louisville with a working knowledge of clinical forensic medicine. It is anticipated that once trained the fellows will gravitate to other academic emergency medicine programs in order to establish multiple centers for the teaching of clinical forensic medicine. Perhaps someday as the number of clinical forensic medicine programs increase and the medical and legal communities recognize the benefits and importance of living forensic medicine, clinical forensic medicine will come to enjoy the status of a recognized medical subspecialty.

The development of a clinical forensic medicine training program and fellowship is internationally unique. This cooperative program blending emergency medicine with the traditional forensic sciences will serve as a template for the formal training of emergency medicine residents and fellows in the science of clinical forensic medicine.

References

[1] Goldsmith, M. F., "US Forensic Pathologists on a New Case: Examination of Living Persons," *Journal of the American Medical Association*, Vol. 256, 1986, pp. 1685–1691.

[2] Smialek, J. E., "Forensic Medicine in the Emergency Department," *Emergency Medicine Clinics of North America*, Vol. 1, No. 3, 1983, pp. 693–704.

[3] Eckert, W. G., "Forensic Sciences and Medicine, the Clinical or Living Aspects," *American Journal of Forensic Medicine and Pathology*, Vol. 11, No. 4, 1990, pp. 336–341.

[4] Schramm, C. A., "Forensic Medicine and What the Perioperative Nurse Needs to Know," *AORN Journal*, Vol. 58, No. 3, 1991, pp. 669–692.

[5] Carmona, R. and Prince, K., "Trauma and Forensic Medicine," *Journal of Trauma*, Vol. 29, No. 9, 1989, pp. 1222–1225.

[6] Bourlet, A., "Police Surgeon Training," *The Annual Conference of The Association of Police Surgeons*, Torquay, England, May 1991.

[7] Smock, W. S. and Nichols, G. R., "Clinical Forensic Medicine in the Emergency Department," American Academy of Emergency Medicine, Boston, Massachusetts, October, 1991.

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